QUEEN ANNE COUNTY, MARYLAND

2025

Multi-Jurisdictional



Hazard Mitigation Plan

Presented by
Department of Emergency Services

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Chapter 1
Planning Process



This section of the Plan describes the mitigation planning process undertaken by Queen Anne's County and participating municipalities in the preparation of this Hazard Mitigation Plan update. This section consists of the following elements:

- 1.1 BACKGROUND
- 1.2 GUIDING PRINCIPLES FOR PLAN DEVELOPMENT
- 1.3 PURPOSE
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    - 1.10.1 Public Engagement Materials
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1.1 Background

Emergency Management is the discipline of identifying, managing, and avoiding risks. It is a discipline that involves preparing for a disaster before it occurs, supporting those affected by the disaster, as well as rebuilding after the natural or man-made disaster event. Emergency Management is an ever-changing process by which all individuals, groups, and communities attempt to manage hazards in an effort to avoid or reduce the impact of disasters. One method to attempt to prevent hazards from developing into disasters all together is Hazard Mitigation Planning. Hazard mitigation is the cornerstone of emergency management. It is the ongoing effort to lessen the impact that disasters can have on people and property. Without mitigation, the same people, property and community lifelines are affected over and over again.



Effective Emergency Management Activities

Mitigation focuses on building (or rebuilding) in ways that reduce the risk more permanently. It is an activity that can occur at any point in the emergency management cycle. For example, communities can undertake mitigation actions before a disaster (the preparedness phase) or while rebuilding after a disaster (the recovery phase).

Preparedness is when we develop or update activities, programs and systems before an event happens. These activities are often tested (or exercised) in non-emergency situations. This tests their effectiveness. Emergency managers also assess potential risks, hazards and vulnerabilities in this phase.

Response focuses on the immediate and short-term effects of a disaster. It is usually focused on life safety and preventing immediate damage.

Recovery is a long-term phase that looks to return a community to normal, or to a more resilient state, after a disaster.

Source: May 2023 FEMA Local Hazard Mitigation Planning Handbook

The legislative authority that provides the legal authority for mitigation is derived from the Stafford Act, as amended by the Disaster Mitigation Act of 2000. Section 322 of the Stafford Act specifically addresses mitigation planning. This establishes the requirement that state and local governments prepare hazard mitigation plans as a precondition for receiving FEMA mitigation project grants. FEMA's 2022-26 Strategic Plan identifies empowering risk-informed decision making as a key objective for building a climate resilient nation. The mitigation planning process involves all of the critical components of understanding current and future risks, forming partnerships and identifying the most appropriate actions to build climate resilience.

Source: FEMA. 2023 Local Hazard Mitigation Planning Handbook

1.2 Guiding Principles for Plan Development

The mitigation plan belongs to the local community. While FEMA has the authority to approve plans so local governments can apply for mitigation project funding, there is no required format for the plans. FEMA reviews what is in the plan, not how it is organized. When developing the mitigation plan, keep the following principles from the Guide in mind.

Source: FEMA. 2023 Local Hazard Mitigation Planning Handbook

1. **Plan and Invest for the Future.**
   Queen Anne's County and their participating municipalities have based this plan on their experiences from the past and present and on future projections including long-term climate change considerations and changes in development.
2. **Collaborate and Engage Early.**
   Queen Anne's County has engaged a diverse group of representatives and other interested stakeholders to participant in the plan update process.
3. **Integrate Community Planning.**
   Various planning documents, policies, and initiatives have been integrated and alignment between and with have been included in the plan update process.

These principles were reviewed and adhered to throughout the plan development process as evidenced in the range and specificity of mitigation strategies. The planning process included a cross-section of members from both local and state government, as well as the municipal Council of Government. In addition, other organizations and the public participated in the planning process. A public opinion survey and hazard mitigation plan development information was posted on the county's website and social media. Finally, the plan is reflective of the area and emphasizes the value of community and resiliency.

Plan Update Note

Local mitigation plan requirements, Elements A through H, as specified in the FEMA's new Policy Guidance has been noted throughout the plan update. Many requirements call for the plan to "document," "describe," and "include" information. FEMA does not require any specific format for the plan or its content, and recognizes that many variations and types of documentation, such as narratives, tables, lists, maps, etc., may meet a requirement. Finally, an important distinction must be made between the words "shall," "must" and "should," as used in the Mitigation Planning regulation at 44 CFR Part 201. Any use of the terms "shall" or "must" denotes a mandatory requirement for plan approval. Any use of the term "should" signify a recommended action that is encouraged and may increase the effectiveness of the plan but is not mandatory or necessary for plan approval. These "should" can assist with meeting the "musts" and will strengthen the overall plan.

1.3 Purpose

Queen Anne's County developed its initial hazard mitigation plan in July 2005 which provided momentum for making homes, businesses, and communities as safe as possible against the impacts of floods, tornadoes, winter weather, and other natural hazards. The initial Plan assessed the effectiveness of prior and current programs and activities in the community and identified shortfalls; mitigation measures were further developed to help reduce Queen Anne's County's exposure to these natural hazards.

Queen Anne's County has remained dedicated in continuing the work started in 2005 by updating the Plan on a five-year cycle as stipulated under the Disaster Mitigation Act of 2000. Each iteration of the plan has included participating municipalities, resulting in a multi-jurisdictional hazard mitigation plan, as is the case with this plan update.

Disaster Mitigation Act of 2000

The purpose of the Stafford Act, as amended by the Disaster Mitigation Act of 2000, is "to reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters."

Section 322 of the act specifically addresses mitigation planning and requires state and local governments to prepare multi-hazard mitigation plans as a precondition for receiving FEMA mitigation project grants.

Source: Local Mitigation Planning Handbook - 2013

Typically, mitigation planning is described as having the potential to produce long-term and recurring benefits by breaking the repetitive cycle of disaster loss. A core assumption of hazard mitigation is that pre-disaster investments will significantly reduce the demand for post-disaster assistance by lessening the need for emergency response, repair, recovery and reconstruction. Furthermore, mitigation practices will enable local residents, businesses, and industries to re-establish themselves in the wake of a disaster, getting the community economy back on track sooner and with less interruption.

The benefits of mitigation planning go beyond reducing hazard vulnerability. Measures such as the acquisition or regulation of land in known hazard areas can help achieve multiple community goals, such as preserving open space, improving water quality, maintaining environmental health and enhancing recreational opportunities. Thus, it is vitally important that any local mitigation planning process be integrated with other concurrent local planning efforts, and any proposed mitigation strategies must take into account other existing community goals or initiatives that will help complement or hinder their future implementation. Queen Anne's County and its participating municipalities have embraced this approach, identifying multiple opportunities to link the Plan with pre-existing programs, policies, plans, and initiatives.

During the last several decades, the approach to the emergency management cycle has evolved considerably. A renewed emphasis has been placed on planning for disasters before they occur as a complement to effective response and recovery. As a result, hazard mitigation has gained increasing prominence as a critical part of emergency management. By mitigating hazards through sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards, risks can be proactively combated in a systematic manner, rather than being reacted to once they occur.

This Plan update is the result of continuing work by the citizens of the County to update a multi-hazard mitigation plan that will not only continue to guide the County towards greater disaster resistance but will also respect the character and needs of the community.

1.4 Scope

This Plan update has been prepared to meet requirements set forth by the Federal Emergency Management Agency (FEMA) and the Maryland Department of Emergency Management (MDEM) in order for Queen Anne's County to be eligible for funding and technical assistance from state and federal hazard mitigation programs. It will continue to be updated and maintained to continually address those natural hazards that result in impacts to Queen Anne's County and the development of specific mitigation measures intended to reduce their impact. This Plan will be updated, and FEMA approved within its five-year expiration date.

In addition to Queen Anne's County, the following municipalities participated throughout the 2024-2025 plan update process and seek FEMA approval. Each of these participating municipalities will formally adopt the Queen Anne's County Hazard Mitigation Plan following FEMA approval.

- Town of Barclay
- Town of Centreville
- Town of Church Hill
- Town of Millington
- Town of Queenstown
- Town of Sudlersville

The Town of Queen Anne participated in the Talbot County Hazard Mitigation Plan. The Town of Queen Anne is located in both Talbot and Queen Anne's Counties.

The Town of Templeville participated in the Caroline County Hazard Mitigation Plan. The Town of Templeville is located in both Queen Anne's and Caroline Counties.

1.5 Authority

This Hazard Mitigation Plan has been adopted by Queen Anne's County and participating municipalities in accordance with the authority granted to counties and municipalities by the State of Maryland.

This Plan was updated in accordance with current state and federal rules and regulations governing local hazard mitigation plans. The Plan shall be monitored and updated on a routine basis to maintain compliance with the following legislation and executive orders:

- Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C., Section 322, Mitigation Planning, as enacted by Section 104 of the Disaster Mitigation Act of 2000 (P.L. 106-390) and by FEMA's Interim Final Rule published in the Federal Register on February 26, 2002, at 44 CFR Part 201 Mitigation Planning.
- Maryland Department of Emergency Management (MDEM), established in the Maryland Code. The Emergency Management Policy was updated in 1991 through EXECUTIVE ORDER 01.01.1991.02 State of Maryland Emergency Management Policy.

Plan Update Note

As part of the plan update, **FEMA's FP 206-21-000: Local Mitigation Planning Policy Guide,** effective April 19, 2023, was used throughout the plan update.

1.6 Overview of Hazard Mitigation Planning & Requirements

Local hazard mitigation planning is the process of organizing community resources, identifying and assessing hazard risks, and determining how to best minimize or manage those risks. This process results in a hazard mitigation plan that identifies specific mitigation actions, each designed to achieve both short-term planning objectives and a long-term community vision. To ensure the functionality of each mitigation action, responsibility is assigned to a specific individual, department or agency along with a schedule for its implementation. Plan maintenance procedures are established to implement, as well as evaluate and enhance the Plan as necessary. Developing clear plan maintenance procedures ensures that Queen Anne's County's Hazard Mitigation Plan remains a current, dynamic, and effective planning document over time.

The local mitigation plan requirements include the following elements:

- Element A: Planning Process.
- Element B: Hazard Identification and Risk Assessment.
- Element C: Mitigation Strategy.
- Element D: Plan Maintenance.
- Element E: Plan Update.
- Element F: Plan Adoption.
- Element G: High Hazard Potential Dams (required for HHPD Grant Program).
- Element H: Additional State Requirements.

The Local Mitigation Plan Review Tool (PRT) was completed prior to plan submittal to the Maryland Department of Emergency Management (MDEM) to document the location within the plan where requirements are met.

1.7 Local Methodology and Update Process

The 2025 Queen Anne's County Muli-Jurisdictional Plan was prepared by the Department of Emergency Services, along with stakeholders from various local, state, and federal departments, agencies, and organizations, as well the public, resulting in a whole-community approach to the plan update. Technical assistance was provided by their planning contractor, Smith Planning and Design, LLC. Both 1.8 Hazard Mitigation Planning Committee, and 1.9 Multi-Jurisdictional Participation, detail the schedule of activities, as well as who was involved, while 1.10 Mitigation Planning Activities and Public Engagement, provide additional detailed information on meetings, training, and various public engagement methods employed and associated opportunities for involvement throughout the plan update process. Finally, Appendices A, C, and D provide additional documentation in the form of HMPC meeting notes, municipal participation, and public survey results.

Jurisdictions seeking plan approval include the Towns of Barclay, Centreville, Church Hill, Millington, Queenstown, and Sudlersville. While portions of the Towns of Queen Anne and Templeville are located in Queen Anne's County, both towns have elected to participate in the Talbot and Caroline County Hazard Mitigation Plans, respectively, as was the case in previous iterations of the plan. Additional information is included in 1.9 Multi-Jurisdictional Participation.

All neighboring jurisdictions were invited to participate in the plan update. The neighboring jurisdictions of Talbot, Kent, and Anne Arundel Counties actively participated and served on the Hazard Mitigation Planning Committee. Additional documentation and details are provided in 1.9 Multi-Jurisdictional Participation, and Appendix A.

Agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests were involved in the planning process. Both 1.8 Hazard Mitigation Planning Committee, and 1.9 Multi-Jurisdictional Participation, detail the schedule of activities, as well as who was involved. Opportunities for stakeholder and municipal involvement are detailed on Tables 1-2 through 1-5. Additional information is included in Appendices A, C, and D.

1.7.1 EXISTING PLANS, STUDIES, REPORTS, AND TECHNICAL INFORMATION

The review and incorporation of existing plans, studies, reports, and technical information has been included throughout the plan document. Hazard specific chapters include both source hyperlinks and endnotes. Chapter 15: Community Capabilities include planning capabilities for Queen Anne's County and all participating municipalities, see Tables 15-1 through 15-9. In addition, gaps and opportunities for further plan integration was identified in Chapter 15, and new local planning and regulation mitigation actions were identified in Chapter 17: New Mitigation Strategies & Implementation.

1.7.2 CHANGES IN DEVELOPMENT

As part of the plan update, a summary of development trend implications for risk and vulnerability has been included in Chapter 2, Section 2.8. In addition, a new section has been added to each hazard specific chapter, entitled "Changes in Development." Both the unincorporated areas of Queen Anne's County, as well as all participating municipalities are assessed for changes in development both past and projected, and how these changes interface, if any, with hazard prone areas. Potential impacts and opportunities to modify community priorities based on this examination are included, as applicable. New mitigation actions were included as a result, see Chapter 17: Mitigation Strategies & Implementation.

1.7.3 PLAN ORGANIZATION

The 2019 plan was reorganized in an effort to separate identified hazards into hazard specific chapters. Organizing the plan into hazard specific chapters allowed readers to easily access all hazard specific information in one area of the plan. In addition, this approach encourages the seamless integration of hazard specific information into other planning documents. Finally, Community Capabilities, Mitigation Status Report, and New Mitigation Strategies & Implementation are included as the final three chapters of the plan document, chapters 15-17.

The following plan update notes provide highlights of modifications, and the expansion of information included within.

Plan Organization Update Note #1

As part plan update, the hurricane and soil movement (coastal erosion hazards) have been separated into two chapters, Chapter 4 and 5, respectively. A new chapter has been added, Chapter 14, Dam Failure.

Plan Organization Update Note #2

An updated critical facilities database, including the identification of associated community lifelines was expanded upon for the plan update. A complete listing has been included as Appendix B and in Chapter 2, while applicable critical facility information has been added to the vulnerability section of each hazard specific chapter.

Vulnerable population data was added to the 2019 plan. Vulnerable populations were identified to an extent; however additional vulnerable population will be added to the plan overtime. This will be accomplished through continued collaboration and coordination efforts. The county and municipalities recognize the importance of integrating vulnerable population planning into all cycles of emergency management. Queen Anne's County strives to maintain and enhance partnerships between agencies, departments, and organizations.

Vulnerable populations have been identified in Chapter 2: Hazard Identification & Risk Assessment (HIRA) of the plan. New mapping products and data have been added. This was a new element of the previous 2019 Plan and was expanded upon, as detailed in plan update note.

Plan Organization Update Note #3

As part plan update, vulnerable populations have been updated to reflect current terminology social vulnerability. Information from the Center for Disease Control (CDC) Social Vulnerability Index and the National Risk Index has been incorporated in Chapter 2 and within each of the hazard specific chapters.

1.8 Hazard Mitigation Planning Committee

Plan Update Note

As per **Requirement 44 CFR § 201.6(c)(1), Element A2-a.**, participation including how they participated has been documented. *See 1.8 Hazard Mitigation Planning Committee and 1.9 Planning Activities and Engagement Documentation.*

As part of the plan update process, Queen Anne's County reviewed and expanded the Hazard Mitigation Planning Committee (HMPC). The 2024 HMPC included representatives from various county departments, towns, and public and private entities. The Department of Emergency Services, Lori Morris and Debra Hopkins, served as the project leads during the plan update. In addition, the county hired Smith Planning and Design, to assist in the planning process by providing technical assistance and coordination throughout the process. As you will note on Table 1-1, the expanded HMPC includes participants neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and non-profit interests to be involved in the planning process, which include community lifelines.

Community Lifelines

Community lifelines provide continuous operation of critical government and business functions and are essential to human health and safety or economic security, as described in the National Response Framework, 4th Edition.

- Local and regional agencies involved in hazard mitigation activities:
  - Examples include public works, emergency management, local floodplain administration and Geographic Information Systems (GIS) departments.
- Agencies that have the authority to regulate development:
  - Examples include zoning, planning, community, and economic development departments; building officials; planning commissions; or other elected officials.
- Neighboring communities:
  - Examples include adjacent local governments, including special districts, such as those that are affected by similar hazard events or may share a mitigation action or project that crosses boundaries. Neighboring communities may be partners in hazard mitigation and response activities, or may be where critical assets, such as dams, are located.
- Representatives of businesses, academia, and other private organizations:
  - Examples include private utilities or major employers that sustain community lifelines.
- Representatives of nonprofit organizations, including community-based organizations, which work directly with and/or provide support to underserved communities and socially vulnerable populations, among others:
  - Examples include housing, healthcare, or social service agencies.

An opportunity to be involved in the planning process means that these stakeholders are invited to participate. It could also mean they are asked to share information or input to inform the plan's content.

As such, each participant listed in Table 1-1 was invited to HMPC meetings. In addition, participants were requested to provide input throughout the plan. Surveys, fillable forms, requests for information, plan review and comment, and the sharing of public outreach materials are examples. Documentation of these various engagement opportunities for participation is detailed in 1.10 Mitigation Activities & Engagement Documentation, Table 1-5. Finally, HMPC members were provided the opportunity to review and comment on various plan components as working drafts throughout the plan update process. This included all participating municipalities. The cohesive draft plan including all plan chapters was provided in December of 2024 for review and comment.

TABLE 1-1: 2024-25 HAZARD MITIGATION PLANNING COMMITTEE TEAM MEMBERS

NAME	AGENCY, JURISDICTION, ORGANIZATION
Local and regional agencies involved in hazard mitigation activities.	
Haas, Scott Director	QAC Department of Emergency Services
Morris, Lori Asst. Chief of Special Operations	
Hopkins, Debra Emergency Planner	
Parsley, Shaelyn Emergency Planner Associate	
Morgan, Jeff Asst. Chief Office of the Fire Marshal	
English, Phillip Asst. Chief of Communications	
Yerkie, Zach Asst. Chief of Emergency Medical Services	
Hildebrand, William Liaison Officer	Maryland Department of Emergency Management
Whiteleather, Caitlin SHMO	
Barben, Marcia Hazard Mitigation Project Officer	
Quimby, Alan Director	Department of Public Works
Edgar, Lee Chief of Engineering	
Kling, John Floodplain Manager	
Moore, Shane Chief Roads Engineer	
Cohoon, Steve Public Facilities Planner	
Chandlee, Steve Director	QAC Dept. of Parks & Recreations
Watson, Mike Chief of Park Operations	
Rank, Jeffrey Director	QAC Dept. of Budget & Finance
Riley, Brian IT Director	QAC Dept. of Information Technology
DelGaudio, Megan IT Manager	
Davis, John IT Security	
Stanton, Sam GIS Coordinator	
Malasky, Beth Community Outreach Specialist-PIO	QAC Dept. of Community Affairs
Clark, Mike Executive Director of Housing & Family	QAC Housing & Community Services
Amoia, Christopher Major Operations Commander	QAC Office of the Sheriff
Bassaro, Maria Sgt.	
Rickard, Jason Cpl.	
Meyers, John Lt.	
Riggi, Anthony District Manager	QAC Soil Conservation
Hoxter, Nate	Bicycle & Pedestrian Advisory Committee
Schlotterbeck, Paul	Kent Island Volunteer Fire Department

Thomas, Buddy Fire Chief	
Faust, Bill Chairman	QAC FEC (Fire & EMS Commission)
Starkey, Dawn	
Howell, Timothy Lt./Commander	Maryland Transportation Authority Police
Foard, Brendan Corporel	
Tyler, Elizabeth Lt.	Maryland Dept. of Natural Resources
Coxon, Jacob Sgt.	
Tosten, J. Corey Lieutenant	
Connolly, Robert Lt./Commander	Maryland State Police
Sisco, Troy	Maryland Dept. of Transportation/SHA
Smith, Justin	
Lipsner, Michael	Federal Bureau of Investigations
Harvey, Tim Victim Services	
Thomas, Sierra Victim Services	
Brown, Autumn Supervisory Special Agent	
Agencies that have authority to regulate development and elected officials.	
Moredock, Amy Director	QAC Dept. of Planning & Zoning
Swinson, Vivian Zoning Administrator	
Rob Gunter, Development Review Principal Planner	
Neighboring Communities	
Pearsall, Brian Emergency Planner	Kent Co. Government - Emergency Management
Schaffle, Geneva Emergency Planner	Talbot Co. Department of Emergency Services
Seborowski, Joseph Sr. Emergency Planner	Anne Arundel Co. Office of Emergency Management
Representatives of businesses, academia, and other private organizations.	
Duncan, Barbara Director	Public Safety Chesapeake College
Phillips, Lisa Assistant Director	
Pinder, Sidney Chief Operating Officer	Queen Anne's County Public School
Saboury, Joseph	
Rickert, Paul Director	University of Maryland Extension Office
Rhodes, Jennifer Principal Agent	
Richards, Annie	ShoreRivers/Chester Riverkeeper
Kline, Steve President	Eastern Shore Land Conservancy
Wink, Judy Director Emeritus	Chesapeake Bay Environmental Center
Harvey, George Television Station Manager	QAC TV
Grove, Bruce Multimedia Specialist	
Sheehy, Renee	Delmarva Power
Kinnamon, Francis	Choptank Electric
Representatives of nonprofit organizations, including community-based organizations, which work directly with and/or provide support to underserved communities and socially vulnerable populations, among others.	
Willis, Cathy Director	QAC Dept. of Community Services
Sparks, Anne Chief of Aging and Transportation	
Ciotola, Joseph Medical Director/Health Officer	QAC Department of Health
Copp, Elizabeth Public Health Emergency Planner	

Lisle, Lisa Nurse Manager	Queen Anne's Emergency Hospital
Coppage, Susan Director	QAC Dept. of Social Services
Simmons, Jody	
Crossley, Jennifer Director	The Family Center of Queen Anne's County
Wright, Warren	QAC Drug Free Coalition
Glover, Margan Member	Queen Anne's at Home
Rhodes-Ickes, Leann	Tides of Grace
Wright, Tonya	Rebuilding Together QAC
Thomas, Larisa	
Support Staff – Planning Contractors	
Michele King & Virginia Smith	Smith Planning and Design, LLC

1.8.1 NEIGHBORING COMMUNITIES' PARTICIPATION

Table 1-1 includes stakeholders from neighboring jurisdictions, which includes the counties of Kent, Talbot, and Anne Arundel. All three (3) counties had at least one (1) representative attend one or more Hazard Mitigation Planning Committee Meetings (HMPC) held throughout the plan update process. Documentation of participation is included in Appendix A: HMPC Meeting Notes, and below.

- HMPC Meeting #1, May 9, 2024
  - Brian Pearsall- Kent County Department of Emergency Management
  - Joseph Seborowski- Anne Arundel County Office of Emergency Management
- HMPC Meeting #2, August 28, 2024
  - Brian Pearsall- Kent County Department of Emergency Management
- HMPC Meeting #3, Mitigation Solutions Workshop, October 10, 2024
  - Geneva Schaffle, Talbot County Department of Emergency Services

In addition, Queen Anne's County Department of Emergency Services participates in the Upper Eastern Shore Planners Meeting. This meeting includes emergency management staff from various Eastern Shore jurisdictions. Queen Anne's County DES staff shared highlights from the hazard mitigation plan update at the October 2nd meeting.

1.8.2 LOCAL & REGIONAL AGENCIES PARTICIPATION

As listed on Table 1-1, various departments from Queen Anne's County government were represented on the Hazard Mitigation Planning Committee Meetings (HMPC), many other participants representing local and regional agencies and organizations are listed, as well. These include agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and non-profit interests. Documentation of participation is included in Appendix A: HMPC Meeting Notes.

1.9 Multi-Jurisdictional Participation

Plan Update Note

As per **Requirement 44 CFR § 201.6(c)(1), Element A1-b.**, municipal participation including how they participated has been documented.

Representatives from each of the municipalities that participated in the plan update include:

- Town of Church Hill
  - Charles Rhodes, Town Commissioner/President
  - Nancy Lindyberg, Town Administrator/Clerk
  - Tim Brenza, Town Planner
- Town of Sudlersville
  - John Hagg, President
  - Paige Crew, Town Clerk
- Town of Centreville
  - Ashley Kaiser, Council President
  - Caroline Brinkley, Town Manager
  - Kip Matthews, Director of Public Works
  - Lt. Chuck Harris, Centreville Police Department
  - Chief Robert Hobbs, Centreville Police Department
- Town of Barclay
  - Virginia Albers, Circuit Rider
- Town of Queenstown
  - Alton Hardee, Jr. President
  - Amy Moore, Town Manager
  - Aaron Horney, Clerk & Treasurer
- Town of Millington
  - Kevin Hemstock, Mayor
  - Jo Manning, Town Administrator
- Town of Queen Anne
  - Dawn Starkey, Clerk & Treasurer
  - Starkey, Phillip Jr. Mayor
- Town of Templeville
  - Helen Knotts, Mayor

Benefits of a Multi-Jurisdictional Plan

- Improves communication and coordination.
- Enables comprehensive and regional mitigation approaches.
- Maximizes economies of scale by sharing costs and capabilities.
- Avoids duplication of effort.
- Provides organizational structure.
- Broader chances for participation.

The Town of Queen Anne participated in the Talbot County Hazard Mitigation Plan. The Town of Queen Anne is in both Talbot and Queen Anne's Counties.

The Town of Templeville participated in the Caroline County Hazard Mitigation Plan. The Town of Templeville is in both Queen Anne's and Caroline Counties.

1.9.1 PARTICIPATING MUNICIPALITIES PLANNING PROCESS DOCUMENTATION

The Queen Anne's County Hazard Mitigation Plan is a multi-jurisdictional plan. Individual jurisdictions (municipalities) participating in a multi-jurisdictional plan must meet the mitigation planning requirements. In addition, each participating municipality must formally adopt the plan and provide documentation to FEMA through the Maryland Department of Emergency Management. Once the agency receives the jurisdiction's adoption, FEMA will issue an approval letter for the jurisdiction.

Each local participant (municipality) seeking approval for a mitigation plan must engage in the planning and public participation process to review and revise the plan. Table 1-2 details each required plan element and associated municipal participation, including date completed and/or submitted. All information collected from each participating municipality has been integrated throughout the plan update. *Note: NFIP participation and repetitive flood loss properties specific to both Queen Anne's County and each participating municipality is included in Chapters 3: Flood, 3.3.2 NFIP Requirements, and Chapter 15: Community Capabilities, 15.6.9 Municipal NFIP Community Information.*

Additional municipal participation documentation includes attendance at various meetings and interviews held throughout the plan update process, included on Table 1-3. Appendix C includes additional municipal participation documentation.

Table 1-4 provides municipal participation documentation in the public engagement and outreach efforts conducted for this plan update.

TABLE 1-2: DOCUMENTATION OF PLANNING PROCESS & MUNICIPAL INVOLVEMENT						
PLAN ELEMENTS	PARTICIPATING MUNICIPALITIES					
	Town of Barclay	Town of Centreville	Town of Church Hill	Town of Millington	Town of Queenstown	Town of Sudlersville
Risk Assessment Updated Municipal Perspective	Sent: 7/1/2024 Reminder: 7/15/24 Reminder: 7/30/24 Completed: 9/12/2024	Sent: 7/1/2024 Reminder: 7/15/24 Reminder: 7/30/24 Completed: 7/31/24	Sent: 7/1/2024 Reminder: 7/15/24 Completed: 7/17/24	Sent: 7/1/2024 Reminder: 7/15/24 Reminder: 7/30/24 Completed: 9/19/2024	Sent: 7/1/2024 Completed: 7/9/24	Sent: 7/1/2024 Reminder: 7/15/24 Reminder: 7/30/24 Completed: 9/12/2024
Changes in Development Narrative	Municipal Meeting: 9/12/2024	Municipal Meeting: 9/24/2024	Municipal Meeting: 9/19/2024	Municipal Meeting: 9/19/2024	Municipal Meeting: 9/24/2024	Municipal Meeting: 9/12/2024
Capabilities Municipal Questionnaire	Municipal Meeting: 9/12/2024	Municipal Meeting: 9/24/2024	Municipal Meeting: 9/19/2024	Municipal Meeting: 9/19/2024	Municipal Meeting: 9/24/2024	Municipal Meeting: 9/12/2024
Mitigation Strategy Status & Changes	Municipal Meeting: 9/12/2024	Municipal Meeting: 9/24/2024	Municipal Meeting: 9/19/2024	Municipal Meeting: 9/19/2024	Municipal Meeting: 9/24/2024	Municipal Meeting: 9/12/2024
Mitigation Strategy Actions & Priorities	Municipal Meeting: 9/12/2024 Review of Action Items Sent: 10/21/2024 Review & Prioritization Sent: 10/25/2024 Prioritization Completed:	Municipal Meeting: 9/24/2024 Mitigation Workshop: 10/10/2024 Review of Action Items Sent: 10/21/2024 Review & Prioritization Sent: 10/25/2024 Prioritization Completed: 10/10/2024	Municipal Meeting: 9/19/2024 Review of Action Items Sent: 10/21/2024 Review & Prioritization Sent: 10/25/2024 Prioritization Completed: 11/7/2024	Municipal Meeting: 9/19/2024 Review of Action Items Sent: 10/21/2024 Review & Prioritization Sent: 10/25/2024 Prioritization Completed:	Municipal Meeting: 9/24/2024 Mitigation Workshop: 10/10/2024 Review of Action Items Sent: 10/21/2024 Review & Prioritization Sent: 10/25/2024 Prioritization Completed: 10/10/2024	Municipal Meeting: 9/12/2024 Review of Action Items Sent: 10/21/2024 Review & Prioritization Sent: 10/25/2024 Prioritization Completed:
Plan Integration Narrative- During past planning cycle	Municipal Meeting: 9/12/2024	Municipal Meeting: 9/24/2024	Municipal Meeting: 9/19/2024	Municipal Meeting: 9/19/2024	Municipal Meeting: 9/24/2024	Municipal Meeting: 9/12/2024
Implementation Municipal Perspective Narrative & Future Plan Integration	Municipal Meeting: 9/12/2024	Municipal Meeting: 9/24/2024	Municipal Meeting: 9/19/2024	Municipal Meeting: 9/19/2024	Municipal Meeting: 9/24/2024	Municipal Meeting: 9/12/2024

PLAN ELEMENTS	PARTICIPATING MUNICIPALITIES					
	Town of Barclay	Town of Centreville	Town of Church Hill	Town of Millington	Town of Queenstown	Town of Sudlersville
Plan Maintenance Municipal Perspective Narrative	Municipal Meeting: 9/12/2024	Municipal Meeting: 9/24/2024	Municipal Meeting: 9/19/2024	Municipal Meeting: 9/19/2024	Municipal Meeting: 9/24/2024	Municipal Meeting: 9/12/2024
Note: *The Town of Queen Anne participated in and adopted the 2022 Talbot County Hazard Mitigation Plan. The Town of Queen Anne is in both Talbot and Queen Anne's Counties. The Town of Templeville participated in the 2024 Caroline County Hazard Mitigation Plan. The Town of Templeville is in both Queen Anne's and Caroline Counties.*						

TABLE 1-3: DOCUMENTATION OF MUNICIPAL MEETINGS & INTERVIEWS						
MEETINGS ATTENDED & INTERVIEWS	PARTICIPATING MUNICIPALITIES					
	Town of Barclay	Town of Centreville	Town of Church Hill	Town of Millington	Town of Queenstown	Town of Sudlersville
Council of Governments: Intro to HMP	3/13/2024	3/13/2024	3/13/2024		3/13/2024	
HMPC Kickoff Meeting					5/9/2024	
Midpoint Meeting		8/28/2024			8/28/2024	
Interviews	9/12/2024	9/24/2024	9/19/2024	9/19/2024	9/24/2024	9/12/2024
Mitigation Workshop		10/10/2024			10/10/2024	

Note: *The Town of Queen Anne participated in and adopted the 2022 Talbot County Hazard Mitigation Plan. The Town of Queen Anne is in both Talbot and Queen Anne's Counties.*
The Town of Templeville participated in the 2024 Caroline County Hazard Mitigation Plan. The Town of Templeville is in both Queen Anne's and Caroline Counties.

TABLE 1-4: DOCUMENTATION OF MUNICIPAL PUBLIC OUTREACH						
ACTIVITY	MUNICIPAL PARTICIPATION IN PUBLIC OUTREACH ACTIVITIES					
	Town of Barclay	Town of Centreville	Town of Church Hill	Town of Millington	Town of Queenstown	Town of Sudlersville
Request for Posting of social media & Survey Link, QR Code	Sent: 7/1/2024 Sent: 8/29/2024	Sent: 7/1/2024 Sent: 7/30/2024 Sent: 8/29/2024	Sent: 7/1/2024 Sent: 7/30/2024 Sent: 8/29/2024	Sent: 7/1/2024 Sent: 8/29/2024	Sent: 7/1/2024 Sent: 7/30/2024 Sent: 8/29/2024	Sent: 7/1/2024 Sent: 8/29/2024
Public Survey	Hazard Mitigation Public Survey flyers in both English and Spanish were provided to municipalities for distribution as well as the social media post. This included online QR codes providing direct links to either the English version or Spanish version survey.					

1.10 Mitigation Planning Activities & Public Engagement

The preparation of the Plan update required a series of meetings and workshops intended to facilitate discussion and initiate data collection efforts with local community officials. More importantly, the meetings and workshops prompted continuous input and feedback from local officials throughout the update process. In addition, Queen Anne's County in collaboration with various stakeholders, including municipalities used various types of outreach methods during this plan update

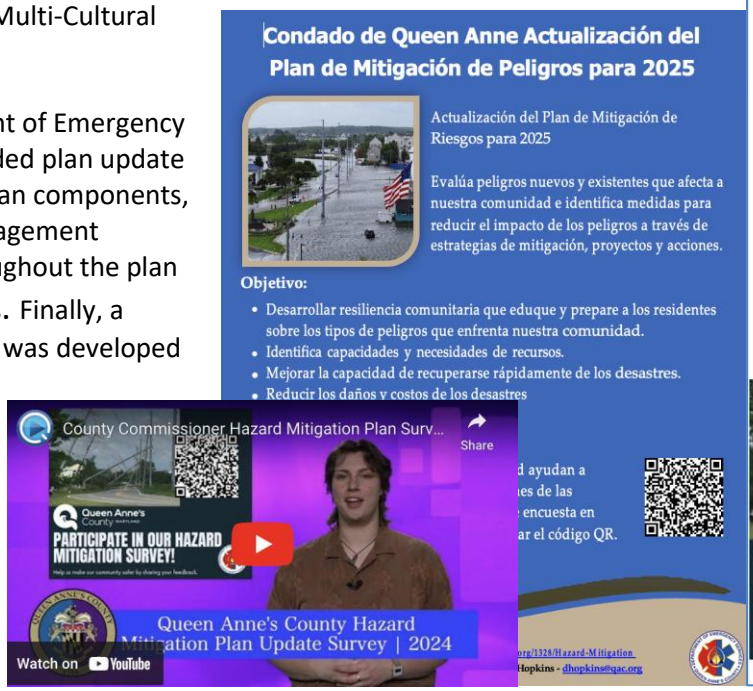
- Community Event
- Interviews
- News Media
- Public Meetings
- Website
- Questionnaires/Surveys (Both English & Spanish Versions)
- Social Media
- YouTube Video

Table 1-5 provides detailed information and corresponding dates. Blue shading on the table indicates a stakeholder meeting.

1.10.1 PUBLIC ENGAGEMENT MATERIALS

Queen Anne's County along with their participating municipalities offered a public hazard perspective survey. The survey was offered as both printed hard copies and online. Eleven (11) survey stations were provided throughout the county, to ensure inclusive participation, particularly by those members of the community that lack broadband connectivity/internet access. In addition, as a result of the Small Group Social Equity & Vulnerability Meeting held during this plan update, recommendations were made to offer the survey in both English and Spanish. Translation assistance was provided by the Department of Health. Both hard copies and the online survey were subsequently offered in both versions. Social media posts, website links, and flyers encouraged public participation. In addition, the Queen Anne's County Public Information Manager distributed the public outreach materials to the Department's Multi-Cultural Press List.

The Department of Emergency Services uploaded plan update information, plan components, and public engagement materials throughout the plan update process. Finally, a YouTube video was developed specific to the hazard mitigation plan, and public survey.



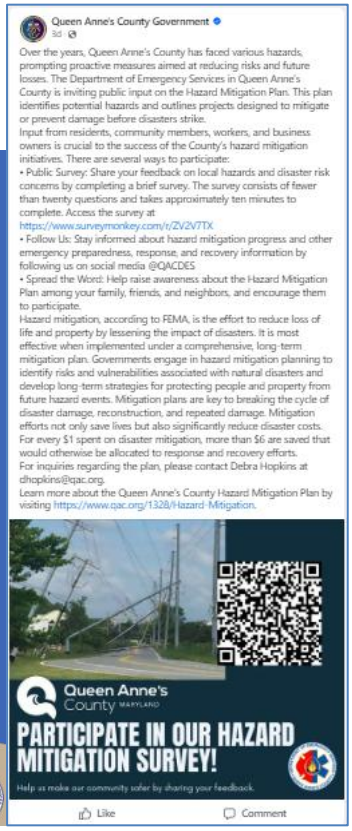


TABLE 1-5: HAZARD MITIGATION ACTIVITIES & ENGAGEMENT				
DATE	**TYPE**	**TARGET AUDIENCE**	**MATERIALS PROVIDED**	**COMMENTS**
13-Mar-24	Council of Governments	Municipalities	Hazard Mitigation Plan Update Overview	The DES Director and Assistant Chief Special Operations informed municipalities about the upcoming update of the Hazard Mitigation Plan.
25-Apr-24	Project Kick-Off Mtg.	Project Manager	Project SOW & Timeline	Discussed outreach strategy and project website. HMPC members listing review and update will be completed.
9-Apr-24	NFIP Data Request	Public	FEMA NFIP Data Request	The completed Information Sharing Access Agreement (ISAA) form submitted along with the NFIP and RLP request.
2-May-24	Press Release	Public	Press Release	QAC posted the press release on the County's website. The press release provided the public with ways to be involved throughout the planning process.
2-May-24	Social Media Post	Public	Press Release & Public Survey	The Department of Emergency Services posted about the HMP and provided the survey link on their Facebook page.
3-May-24	Social Media Post	Public	Press Release & Public Survey	The County posted about the HMP and provided the survey link on their Facebook page.
9-May-24	HMPC Kickoff Meeting	HMPC Members	Webex Meeting- Agenda	HMPC Role, HMPC, Municipal & Public Surveys & Project Website
16-May-24	Kickoff Meeting Notes	HMPC Members	Notes and Public Survey	Notes discussing the kickoff meeting, public survey, and social media post.
21-May-24	Municipal Outreach Request	Municipalities	Press Release & Public Survey Social Media Post	Provided municipalities with press release, public survey link, and social media post.
22-May-24	Social Media Post	Public	Public Survey	QACTV posted about the hazard mitigation plan and public survey on Facebook and Instagram.
22-May-24	YouTube Video	Public	Public Survey	QACTV created and release a video promoting the hazard mitigation plan and the public survey. https://www.youtube.com/watch?v=_FnN1AfIR4E
23-May-24	Talbot County Visit	Talbot County DES Director & EM Staff	EOC Tour / HMP Discussion	Talbot County staff toured QAC EOC and discussed QAC meeting with MDEM. Shared hazard risks were discussed as well as dams.
25-Jun-24	Small Group Floodplain Management Meeting	Floodplain Manager & DES staff	Webex Meeting- Agenda & FEMA NFIIP Questionnaire	During the meeting the following topics were discussed: NFIP Community Questionnaire Review, Additional Capability Questions, Assessment of 2019 HMP Floodplain Management Capability, and New Mitigation Ideas.
28-Jun-24	Small Group Floodplain Management Meeting Notes	Floodplain Manager & DES staff	Meeting Notes	Notes were provided to the Floodplain Manager and DES staff. The notes provided an overview of information obtained during the meeting and the updated NFIP Community Questionnaire.
1-Jul-24	Mitigation Action Items Status Update	HMPC Members	Fillable PDF 2019 Mitigation Action Items Status Update Form	Committee members were asked to review the 2019 Mitigation Action Items and provide a status update.

DATE	TYPE	TARGET AUDIENCE	MATERIALS PROVIDED	COMMENTS
15-Jul-24	Mitigation Action Items Status Update - Reminder	HMPC Members	Fillable PDF 2019 Mitigation Action Items Status Update Form	A reminder was sent to HMPC members.
30-Jul-24	Social Media Post	Public	Public Survey	The County posted about the HMP and provided the survey link on their Facebook page.
30-Jul-24	Social Media Post	Public	Public Survey	The DES posted about the HMP and provided the survey link on their Facebook page.
5-Aug-24	Mitigation Action Items Status Update - Reminder	Selected HMPC Members	Fillable PDF 2019 Mitigation Action Items Status Update Form	A reminder was sent to a selected group of HMPC members.
6-Aug-24	Small Group Social Equity & Vulnerability Meeting	Selected HMPC Members	Webex Meeting- Agenda	During the meeting the following topics were discussed: FEMA Hazard Mitigation – 2023 Local Plan Policy Guidance, Discussion Questions, and New Mitigation Action Ideas.
6-Aug-24	National Night Out Community Event	Public	QAC DES - Table Set-Up	Provided hazard information and QAC HMP Public Survey Station with both online QR code and hard copies.
8-Aug-24	Small Group Social Equity & Vulnerability Meeting Notes	Representatives of nonprofit organizations, including community-based organizations, which work directly with and/or provide support to underserved communities and socially vulnerable populations, among others.	Meeting Notes	Notes were provided to a selected group of HMPC Members who were invited to the meeting. The notes provided an overview of information obtained during the meeting.
16-Aug-24	Website Update	Public	Mitigation Action Status Report	The Mitigation Action Status Report was uploaded to the Hazard Mitigation Plan webpage for public review and comment.
26-Aug-24	Public Survey - Spanish Version	Public	Online Survey Link, Paper Version, QR Code	Posted on QAC website and shared with all stakeholders for their distribution.
28-Aug-24	HMPC Meeting #2	HMPC Members	Webex Meeting- Agenda	Discussed Small Group Meetings, Preliminary Survey Results, Mitigation Status Report, Municipal Input, Working Draft Chapters, Capability Assessment, and Next Steps
29-Aug-24	Meeting #2 Notes	HMPC Members	Meeting Notes	Notes discussing the kickoff meeting, public survey and social media post.
3-Sep-24	Social Media Post	Public	Public Survey	The County posted about the HMP and provided the survey link in English and Spanish on their Facebook page.

DATE	TYPE	TARGET AUDIENCE	MATERIALS PROVIDED	COMMENTS
3-Sep-24	Social Media Post	Public	Public Survey	The DES posted about the HMP and provided the survey link in English and Spanish on their Facebook page.
16-Sep-04	Floodplain Training	Town of Centreville	Training Material	Town of Centreville staff attended FEMA's L273 Managing Floodplain Development through the National Flood Insurance Program course from September 16-20, 2024.
23-Sep-24	Mitigation Solution Workshop Invite	HMPC Members	Email Invite	An invite was sent to all HMPC members to attend the Queen Anne's County HMP Mitigation Solution Workshop on October 10, 2024.
24-Sep-24	Public Survey	QAC CERT Team Members	Public Survey & HMP Information	QAC DES emailed CERT members informing them about the HMP update and requesting their participation in the public survey as well as share the survey.
27-Sep-24	Public Survey	Municipalities	Public Survey Flyer and Social Media Post	Public survey flyers in both English and Spanish were provided to municipalities for distribution as well as the social media post.
9-Oct-24	Mitigation Solution Workshop Reminder	HMPC Members	Email Invite	Mitigation Solution Workshop invite reminder was sent to HMPC members.
10-Oct-24	Mitigation Solutions Workshop	HMPC Members	In-Person Meeting Agenda	The Mitigation Solution Workshop provided an opportunity to discuss and develop mitigation strategies that could be implemented over the next five-year planning cycle.
21-Oct-24	Mitigation Solutions Workshop Notes	HMPC Members	Meeting Notes & Mitigation Action Sheets	Notes discussing the Mitigation Solutions Workshop and mitigation actions developed for the plan update.
4-Nov-24	Mitigation Action Prioritization Survey	HMPC Members	Prioritization Survey Link	HMPC members were asked to participate in the mitigation action prioritization survey.
7-Nov-24	Reminder to Prioritize Mitigation Actions	HMPC Members	Prioritization Survey Link	HMPC members were reminded to participate in the mitigation action prioritization survey.
19-Dec-24	Video	Public	Draft HMP & Comment Form	The QACTV released a short video about Hazard Mitigation and how the public can comment on the cohesive draft plan. The video was released on QACTV's YouTube channel, Facebook, Instagram, and website.
19-Dec-24	Website	Public	Draft HMP & Comment Form	The DES Hazard Mitigation webpage was updated to include to provide the cohesive draft plan, comment form, and information on the public meeting.
2-Jan-25	Social Media Post	Public	Draft HMP & Public Meeting	DES posted on their Facebook about the reviewing and providing comment on the draft HMP. The public meeting date and time were also provided.
6-Jan-25	Social Media Post	Public	Public Meeting	DES posted on their Facebook about the reviewing and providing comment on the draft HMP. The public meeting date and time were also provided.
7-Jan-25	Social Media Post	Public	Public Meeting	DES advertised the public meeting on their Facebook page.
7-Jan-25	Public Meeting	Public	Draft HMP	This meeting provided the public to ask about the Hazard Mitigation Plan and provide feedback.

1.11 Plan Review

Numerous opportunities were provided to the Hazard Mitigation Planning Committee (HMPC) and public to review and comment on the working draft chapters throughout the plan development process. Working draft chapters and comment forms were provided regularly to the HMPC during the planning process. In addition, elements of the plan were uploaded on the Department of Emergency Services' Hazard Mitigation webpage for public review and comment. In December 2024, the draft Hazard Mitigation Plan was provided to the HMPC for review and comment.

On January 6, 2025, a virtual public meeting was held to provide an overview of the draft Plan. During the meeting, the public was provided an opportunity to ask questions and obtain additional information regarding hazard mitigation projects and planning efforts. Public comments obtained during the meeting further informed the Department of Emergency Services planning efforts.

Once the Plan was reviewed by the HMPC and the public, the 2024 Plan was submitted to the Maryland Department of Emergency Management (MDEM) MEMA for initial review and coordination. MDEM reviewed the Plan in January 2025. All revisions made were based on review comments and resubmitted to MDEM. Following approval of the modifications, MDEM submitted the Plan to the Federal Emergency Management Agency (FEMA) for formal review and approval. FEMA is responsible for the final review and approval of the 2025 Plan. Once FEMA approved the Plan, the County received an Approvable Pending Adoption (APA) letter. At that time, the County and municipalities proceeded with adopting the 2025 Multi-Jurisdictional Hazard Mitigation Plan Update.

1.12 Plan Adoption

The Disaster Mitigation Act of 2000 requires that local Hazard Mitigation Plans and any updates be formally adopted by the Queen Anne's County Commissioners following review by the Maryland Department of Emergency Management and Federal Emergency Management Agency. The Plan and any updates will be subject to a public hearing prior to adoption by the County and municipalities. The County held a public session to discuss the Plan and provide an opportunity for public comment on ?? 2025. The Plan was formally adopted by the Queen Anne's County Commissioners on ?? 2025. Each municipality followed their local procedures for Plan adoption. All municipal resolutions of adoption have been included in the final official version of the Plan.

The Disaster Mitigation Act of 2000 requires Local Hazard Mitigation Plans to be monitored, evaluated, and updated during a five-year cycle. The County's Department of Emergency Services, which was instrumental in developing this Hazard Mitigation Plan, will continue to meet on a regular basis during the five-year cycle to monitor and evaluate mitigation projects and to keep the Plan current. The Hazard Mitigation Plan is to be updated and readopted at the end of each five-year cycle. In the event of a significant disaster or any substantial changes in land use or regulations that impact mitigation efforts, more frequent updates may be required. Information about plan implementation, evaluation, and plan maintenance is included in Chapter 17 New Mitigation Strategies and Implementation, Section 17.4.

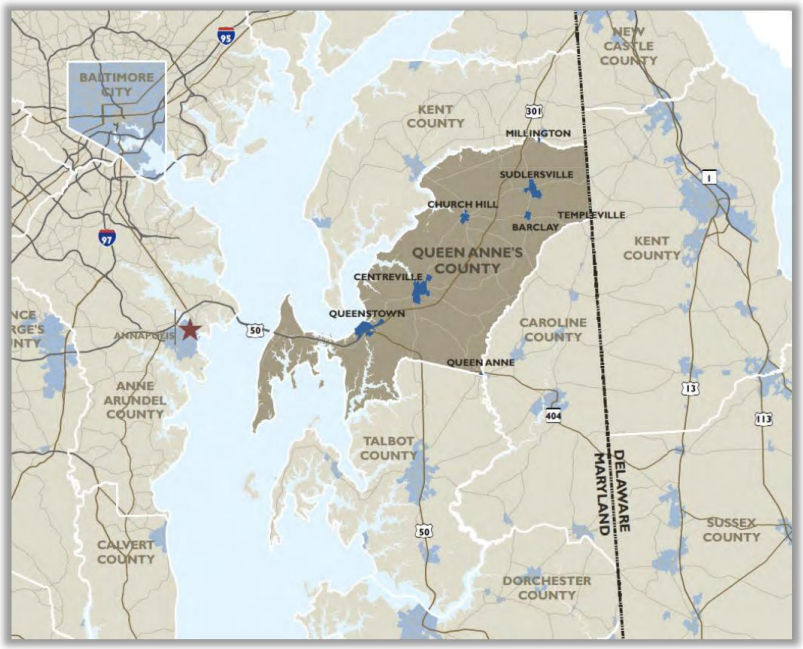
Chapter 2
Hazard Identification & Risk Assessment (HIRA)

This chapter of the Plan describes the Local Hazard Identification & Risk Assessment summary undertaken by Queen Anne's County and participating municipalities in the preparation of this Hazard Mitigation Plan update. In addition, information on critical facilities, historic properties, and vulnerable populations has been added to the plan as part of the update process. During this plan update, new or changed plan components are shown in **bold blue** text below. This section consists of the following subsections:

- 2.1 COUNTY & MUNICIPAL BACKGROUND
- 2.2 HAZARD IDENTIFICATION AND RISK ASSESSMENT (HIRA)
  - **2.2.1 Hazard Identification Update**
  - 2.2.2 Hazard Ranking
  - 2.2.3 Risk Factor Criteria
  - 2.2.4 Risk Ranking Results
  - 2.2.5 Queen Anne's County HIRA Conclusions
  - 2.2.6 HIRA Municipal Perspective
- 2.3 PROBABILITY OF FUTURE HAZARDS
- 2.4 PUBLIC OPINION SURVEY DESCRIPTION & RESULTS
- **2.5 CRITICAL FACILITIES & COMMUNITY LIFELINES**
  - **2.5.1 ESSENTIAL FACILITIES**
- **2.6 HISTORIC PROPERTIES**
- **2.7 SOCIAL VULNERABILITY**

2.1 County & Municipal Background

Queen Anne's County was established in 1706 (Chapter 3, Acts of 1706). The County was named for Queen Anne (1665-1714), who ruled Great Britain and Ireland, 1702-1714. Queen Anne's County was the first English permanent settlement in the State of Maryland, under a 1631 patent from the king. In 1629, three years before the arrival of the Ark and the Dove at St. Mary's, Captain William Claiborne, an agent of the Virginia governor, established a trading post on an island he later named "Isle of Kent." Kent Fort Manor built in 1640 and still standing is believed to be the oldest structure in Maryland.



Queen Anne's County is located on the Delmarva Peninsula in the State of Maryland. It is part of the Upper Eastern Shore Region, which comprises five counties: Caroline, Cecil, Kent, Queen Anne's, and Talbot. It is bounded in large part by water—to the north by the Chester River and Kent County, Maryland; to the east by Caroline County, Maryland and Kent County, Delaware; to the south by the Wye River and Talbot County, Maryland, and to the west by the Chesapeake Bay. The County has approximately 495 miles of waterfront, much of that being the shores of Kent Island.[i] Queen Anne's County contains the incorporated towns of Barclay, Centreville, Church Hill, Millington (portion also in Kent County), Queen Anne (portion also in Talbot County), Queenstown, Sudlersville, and Templeville (portion also in Caroline County). Each town has its own government, and, under State law, they each have their own planning authority.[ii] The 2022 Queen Anne's County Comprehensive Plan emphasizes a continuing role for its incorporated municipalities as major population and commercial, industrial, and institutional centers for the region. Concentrating population in and around the existing towns with adequate public infrastructure and services is the most efficient way to provide basic community facilities and services to residents, support historic investment in infrastructure (such as existing streets), and reduce pressure for development in rural areas and those with limited or no sewer capacity. It also maintains the County's land use tradition, namely compact communities surrounded by rural countryside.[iii]

According to the 2020 Census, Queen Anne's County had a population of 49,874 residents. This is a 4.3% increase from the 2010 Census population count of 47,798, but a notable 23.0% increase from the 2000 Census population count of 40,563. This equates to an average annual growth rate for the County of 1.04%. During the same period, the State's population saw a greater increase of 7.0% from 2010-2020, but a smaller increase of 16.6% from 2000-2020.[iv]

The Town of Barclay is a small family community in northern Queen Anne's County at the crossroads of MD 313 and MD 302. The community was founded in 1873 as Merrikton, renamed

Barclay in 1890, and incorporated as the "Town of Barclay" 1931. It is comprised mostly of single-family homes and has a diverse and multigenerational population, with a total population of 275, according to the 2020 U.S. Census. Barclay is home to several businesses; the largest employer is REEB Millwork Corp. Two state highways and a short line railroad run through the Town, which makes it a prime logistics location.[v]

The Town of Centreville is the County seat and its largest incorporated municipality. It hosts State, County, and municipal services as well as many historic sites, shops, service businesses, and unique restaurants, serving local residents as well as transient and a rural regional clientele. The Town is located at the head of navigation of the Corsica River; the Centreville Wharf and Waterfront provide public access.[vi] The population of the Town of Centreville is 4,761 people according to the 2020 U.S. Census.

The Town of Church Hill has a rich historical past and offers a unique opportunity to experience small town life. The Town was incorporated in 1876 and named after St. Luke's Episcopal Church, referred to as "Church on the Hill," which was erected in 1732 near the Town's center. Church Hill is predominately residential, with a linear mixed-use corridor along Main Street (MD 19). Institutional uses in this corridor include the Town Hall, local churches, the post office, and Church Hill Elementary School. Church Hill is surrounded by agricultural land; however, some of that land is fragmented by large lot residential subdivisions, which have altered the Town's rural farming-based character.[vii] The population of the Town of Church Hill is 797 people according to the 2020 U.S. Census.

The Town of Millington was originally chartered in 1798 and incorporated in 1890. Millington grew up as a small village located on the Chester River, sharing shores with both Kent and Queen Anne's County. The land on which it is located was settled in the late 17th century. Over the years, its name has changed, from Head of Chester to Bridgetown around 1724 and, finally in 1818, becoming the Town of Millington. Millington is still a small town with strong echoes from the past. It is walkable and self-contained with clear rural character and atmosphere. The town has two public parks within the town limits. The head of the Chester River runs through the Town, offering public fishing areas.[viii] The population of the Town of Millington is 695 people according to the 2020 U.S. Census.

The birth of Queenstown in Queen Anne's County took place in 1707 and, at that time, was named "Queen Anne's Towne." In 1710, the name changed to "Queen's Towne" and many years later the "e" was dropped, becoming one word. Queenstown was the home of the first County seat from 1707 to 1782.[ix] The population of the Town of Queenstown is 816 people according to the 2020 U.S. Census.

The community that was to become Sudlersville took root in 1740 when Joseph Sudler, a Kent Island landowner, purchased 800 acres "south of the Chester River." The land included the homestead known as Sledmore. In 1811, Dixon's Tavern and a post office were established near Sledmore in the village called Sudler's Crossroads; that name was changed to Sudlersville in 1839. At the end of that century, there were about 40 houses and an assortment of commercial, ecclesiastical, and educational institutions.[x] The population of the Town of Sudlersville is 435 people according to the 2020 U.S. Census.

2.2 Hazard Identification and Risk Assessment (HIRA)

A hazard identification and risk assessment provide the factual basis for activities proposed in the strategy portion of a hazard mitigation plan. An effective risk assessment informs proposed actions by focusing attention and resources on the greatest risks. The four basic components of a risk assessment are: 1) hazard identification, 2) profiling of hazard events, 3) inventory of assets, and 4) estimation of potential human and economic losses based on the exposure and vulnerability of people, buildings, and infrastructure.

A key step in preventing disaster losses in Queen Anne's County is developing a comprehensive understanding of the hazards that pose risks to its communities. The following terms can be found throughout this Plan.

Hazard:	Natural or man-made source or cause of harm or difficulty. A hazard can be actual or potential.
Risk:	Potential for an unwanted outcome resulting from an incident, event, or occurrence, as determined by its likelihood and the associated consequences.
Vulnerability:	Characteristic of design, location, security posture, operation, or any combination thereof, that renders an entity, asset, system, network, or geographic areas susceptible to disruption, destructions, or exploitation.

Source: DHS Risk Lexicon, 2010 Edition

Are hazard and threats different? Yes, a hazard differs from a threat in that a threat is directed at an entity, asset, system, network, or geographic areas, while a hazard is not directed.

Source: DHS Risk Lexicon, 2010 Edition

Hazards will be identified and assessed for risk in this chapter of the plan. Threats will be identified, assessed, and documented in the appendix of the plan.

The local Hazard Identification and Risk Assessment (HIRA) summary is a process or application of a methodology for evaluating risk as defined by probability and frequency of occurrence of a hazard event, exposure to people and property to the hazard, and consequences of that exposure. Different methodologies exist for assessing the risk of hazard events, ranging from qualitative to quantitative.

Queen Anne's County and its communities are vulnerable to a wide range of natural and technological hazards that threaten life and property. The hazards identified by the Queen Anne's County Mitigation Planning Committee for inclusion in this HIRA summary are those natural hazards that have impacted or have potential to impact Queen Anne's County and its municipalities and are consistent with the hazards identified by the State of Maryland and the Federal Emergency Management Agency for this part of the State and this region of the country.

To further focus on the list of identified hazards for this Plan, Table 2-1 presents a list of all federal disaster and emergency declarations that have occurred in Queen Anne's County since 1964, according

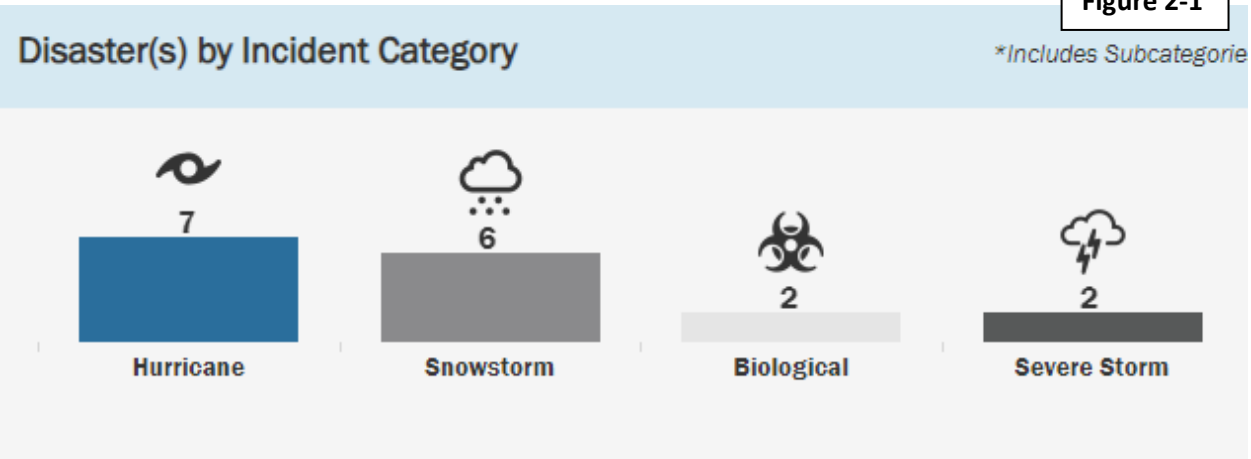
to the Federal Emergency Management Agency. This list presents the foundation for identifying what hazards pose the greatest risk within Queen Anne's County.

TABLE 2-1: PRESIDENTIAL DISASTER AND EMERGENCY DECLARATIONS IN QUEEN ANNE'S COUNTY		
DECLARATION #	**DATE**	**EVENT DETAILS**
FEMA-DR-127-MD	03/09/1962	Severe Storms, High Tides, Flooding
FEMA-EM-3100-MD	03/16/1993	Severe Snowfall and Winter Storm
FEMA-DR-1081-MD	01/11/1996	Maryland Blizzard
FEMA-DR-1303-MD	09/24/1999	Hurricane Floyd
FEMA-DR-1324-MD	04/10/2000	Winter Storm
FEMA-EM-3179-MD	03/14/2003	Snowstorm
FEMA-DR-1492-MD	09/19/2003	Hurricane Isabel
FEMA-EM-3251-MD	09/13/2005	Hurricane Katrina Emergency Shelter Operations
FEMA-DR-1875-MD	02/19/2010	Severe Winter Storm and Snowstorm
FEMA-DR-1910-MD	05/06/2010	Winter Storms and Snowstorms
FEMA-EM-3335-MD	08/27/2011	Hurricane Irene
FEMA-DR-4034-MD	09/16/2011	Hurricane Irene
FEMA-DR-4091-MD	11/20/2012	Hurricane Sandy
FEMA-DR-4261-MD	03/04/2016	Severe Winter Storm and Snowstorm
FEMA-DR-3430-MD	03/13/2020	Biological
FEMA-DR-4491-MD	03/26/2020	Biological

Source: Federal Emergency Management Agency Disaster Declarations for States and Counties – Queen Anne's County

A total of seventeen (17) disasters have been declared in Queen Anne's County between May 2, 1953, and May 29, 2024.

Figure 2-1



Federal Emergency Management Agency Disaster Declarations for States and Counties – Queen Anne's County

Significant hazard events that occurred in Queen Anne's County this past decade include:

- **Drought Event** - US Small Business Administration Disaster Declaration (SBA Disaster Loan)
  - 6-1-2016 to 9-29-2016
- **Straight Line Wind Event**
  - 5-9-2017
- **Severe Weather** - **EF2 Tornado**
  - 7-24-2017

- **Emerging Infectious Disease – COVID**
  - 3-13-2020

2.2.1 HAZARD IDENTIFICATION UPDATE

The first step in the HIRA process, hazard identification, was undertaken by the Queen Anne's County Mitigation Planning Committee and participating municipalities. Hazards identified in the 2019 plan were reviewed and discussed. The consensus was to maintain the listing of hazards previously identified with slight adjustments to titling of the hazards to coincide with the Maryland Department of Emergency Management (MDEM) and add one (1) new hazard to the hazard listing, Dam Failure. This process is consistent with the FEMA's 2023 Local Mitigation Planning Policy Guide and 2021 State of Maryland Hazard Mitigation Plan.

The hazards for this plan update include:

- FLOOD (RIVERINE, COASTAL, FLASH, URBAN FLOODING)
- TROPICAL SYSTEMS (HURRICANES, TROPICAL STORMS, NOR'EASTERS)
- SOIL MOVEMENT (COASTAL EROSION)
- DROUGHT
- EXTREME TEMPERATURES
- SEVERE WINTER WEATHER
- SEA LEVEL CHANGE
- WILDFIRE
- THUNDERSTORMS (LIGHTNING, HAIL, STRONG WINDS)
- EARTHQUAKE
- TORNADO
- **DAM FAILURE**

During the HMPC kickoff meeting held on May 9, 2024, a group activity focused on updating the local risk hazard perspective was conducted. Natural hazards identified in the previous 2019 Plan were reviewed during the meeting. An interactive exercise was conducted during the meeting to obtain a local perspective on hazards and their frequency of occurrence, particularly during this past planning cycle. Meeting attendees were asked to add their answers to the "chat" and provided comments on any hazards during this exercise. Each hazard was presented, and committee members provided one of the following answers to rate the frequency of occurrence, magnitude, and geographic extent: (I) Increase, (D) Decrease, or (NC) No Change.

Natural hazards from the previous 2019 Plan were discussed first. Results of the group exercise are as follows:

TABLE 2-2: 2024 LOCAL RISK HAZARD PERSPECTIVE

NATURAL HAZARDS	HMPC PERSPECTIVE (I) INCREASE, (D) DECREASE, OR (NC) NO CHANGE
Flooding: *Riverine, Coastal, Flash, Nuisance*	I
Tropical System: *Hurricanes, Tropical Storms, Nor'easters*	NC

NATURAL HAZARDS	HMPC PERSPECTIVE (I) INCREASE, (D) DECREASE, OR (NC) NO CHANGE
Sea Level Change	I
Soil Movement: *Coastal Erosion*	NC
Drought	NC
Severe Winter Weather	D
Extreme Temperatures	NC
Wildfire	NC
Thunderstorms: *Lightning, Hail, Strong Winds*	NC
Earthquake	NC
Tornado	NC
Dam Failure	NC

Please note, Queen Anne's County does not contain High Hazard Dams. There are no High Hazard Dams in adjacent jurisdictions. However, members did indicate that a beaver dam is causing issues on a State roadway in North County. New Maryland Department of Emergency Management (MDEM) requirements indicated that Dam Failure must be added to all hazard mitigation plans. Therefore, dam failure has been added to this plan update.

Technological hazards and threats included in the Threat Identification and Risk Assessment (THIRA) appendix of the plan were reviewed as well. Results are included in the THIRA appendix.

2.2.2 HAZARD RANKING

Once the hazards were identified and evaluated for inclusion into the plan update, the Mitigation Planning Committee then ranked these based on a Risk Factor (RF) approach. Hazards were ranked in order to provide structure and prioritize the mitigation goals and actions discussed in this plan. Ranking was both quantitative and qualitative. First, the quantitative analysis used the best available data, including GIS and HAZUS data. Then, a qualitative approach, the Risk Factor (RF) approach, was used to provide additional insights on the specific risks associated with each hazard. This process can also be a valuable crosscheck or validation of the quantitative analysis performed.

The RF approach combines historical data, local knowledge, and consensus opinions to produce numerical values that allow identified hazards to be ranked against one another. During the planning process, the Queen Anne's County Mitigation Planning Committee compared the results of the hazard profile against their local knowledge to generate a set of ranking criteria. In addition to the five categories established for the rankling criteria in the previous plan, another category, local risk perspective, was added by the 2018-19 planning committee. These criteria were used to evaluate hazards and identify the highest risk hazard.

RF Value = [(Probability x .20) + (Impact x .20) + (Spatial Extent x .20) + (Warning Time x .10) + (Duration x .10) + (Local Risk Perspective x.20)]

RF values are obtained by assigning varying degrees of risk to six categories for each hazard: probability, impact, spatial extent, warning time, duration, and local risk perspective. Each degree

of risk is assigned a value ranging from 1 to 4 along with a weighing factor for each category by the Mitigation Planning Committee. To calculate the RF value for a given hazard, the assigned risk value for each category is multiplied by the weighting factor. The sum of all six categories equals the final RF value, as demonstrated in the example equation above.

2.2.3 RISK FACTOR CRITERIA

TABLE 2-3: 2024 RISK FACTOR CRITERIA

RISK ASSESSMENT CATEGORY	LEVEL	DEGREE OR RISK LEVEL	INDEX	WEIGHT
OCCURENCES What is the likelihood of a hazard event occurring in a given year?	UNLIKELY	LESS THAN 1% ANNUAL PROBABILITY	1	20%
	POSSIBLE	BETWEEN 1% & 10% ANNUAL PROBABILITY	2	
	LIKELY	BETWEEN 10% & 100% ANNUAL PROBABILITY	3	
	HIGHLY LIKELY	100% ANNUAL PROBABILTY	4	
IMPACT What injuries, deaths, and damages have occurred?	MINOR	VERY FEW INJURIES, IF ANY. ONLY MINOR PROPERTY DAMAGE & MINIMAL DISRUPTION. TEMPORARY SHUTDOWN OF CRITICAL FACILITIES.	1	20%
	LIMITED	MINOR INJURIES ONLY. MORE THAN 10% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN 1 DAY.	2	
	CRITICAL	MULTIPLE DEATHS/INJURIES POSSIBLE. MORE THAN 25% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. SHUTDOWN OF CRITICAL FACILITIES MORE THAN 1 WEEK	3	
	CATASTROPHIC	HIGH NUMBER OF DEATHS/ & INJURIES POSSIBLE.MORE THAN 50% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. SHUTDOWN OF CRITICAL FACILITIES 30 DAYS OR MORE.	4	
SPATIAL EXTENT How large of an area is impacted by hazard event?	NEGLIGIBLE	LESS THAN 1% OF AREA AFFECTED	1	20%
	SMALL	BETWEEN 1 & 10% OF AREA AFFECTED	2	
	MODERATE	BETWEEN 10 & 50% OF AREA AFFECTED	3	
	LARGE	BETWEEN 50 & 100% OF AREA AFFECTED	4	
WARNING TIME Is there lead-time associated with hazard event?	MORE THAN 24 HRS	SELF DEFINED	1	10%
	12 TO 24 HRS	SELF DEFINED	2	
	6 TO 12 HRS	SELF DEFINED	3	
	LESS THAN 6 HRS	SELF DEFINED	4	
DURATION How long does the hazard event typically last?	LESS THAN 6 HRS	SELF DEFINED	1	10%
	LESS THAN 24 HRS	SELF DEFINED	2	
	LESS THAN 1 WEEK	SELF DEFINED	3	
	MORE THAN 1 WEEK	SELF DEFINED	4	
LOCAL RISK PERSPECTIVE	HAZARD MITIGATION COMMITTEE MEMBERS IDENTIFIED THE TOP THREE NATURAL HAZARDS THAT AFFECT OR HAVE THE POTENTIAL TO AFFECT QAC. THOSE HAZARD RATED AS "HIGH" RISK WERE ASSIGNED A "4" WHILE ALL OTHERS WERE ASSIGNED AS "1"			20%

According to the default weighting detailed in Table 2-4, the highest possible RF value is 4.0. The methodology illustrated above lists categories that are used to calculate the variables for the RF value.

2.2.4 RISK RANKING RESULTS

TABLE 2-4: RISK FACTOR RESULTS FOR QUEEN ANNE'S COUNTY AND PARTICIPATING JURISDICTIONS

#	NATURAL HAZARDS	OCCURENCES	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	LOCAL RISK PERPSPECTIVE 2024 HMPC	RF RATING
1	Flooding: *Riverine, Coastal, Flash, Nuisance*	4 (1.2)	2 (0.6)	2 (0.4)	3 (0.3)	3 (0.3)	4 (1.2)	4.0
2	Tropical System: *Hurricanes, Tropical Storms, Nor'easters*	3 (0.9)	2 (0.6)	3 (0.6)	1 (0.1)	2 (0.2)	4 (1.2)	3.6
3	Drought	4 (1.2)	2 (0.6)	4 (0.8)	1 (0.1)	4 (0.4)	1 (0.3)	3.4
4	Severe Winter Weather	4 (1.2)	2 (0.6)	4 (0.8)	1 (0.1)	3 (0.3)	1 (0.3)	3.3
5	Sea Level Change	4 (1.2)	3 (0.9)	2 (0.4)	1 (0.1)	4 (0.4)	1 (0.3)	3.2
6	Soil Movement: *Coastal Erosion*	4 (1.2)	3 (0.9)	2 (0.4)	1 (0.1)	4 (0.4)	1 (0.3)	3.2
7	Extreme Temperatures	4 (1.2)	1 (0.3)	4 (0.8)	1 (0.1)	3 (0.3)	1 (0.3)	3.0
8	Wildfire	3 (0.9)	2 (0.6)	1 (0.2)	4 (0.4)	2 (0.2)	1 (0.3)	2.6
9	Thunderstorms: *Lightning, hail, strong winds*	4 (1.2)	2 (0.6)	1 (0.2)	4 (0.4)	1 (0.1)	1 (0.3)	2.8
10	Earthquake	1 (0.3)	2 (0.6)	4 (0.8)	4 (0.4)	1 (0.1)	1 (0.3)	2.5
11	Tornado	2 (0.6)	3 (0.9)	1 (0.2)	4 (0.4)	1 (0.1)	1 (0.3)	2.5
12	Dam Failure	1 (0.3)	2 (0.6)	2 (0.4)	4 (0.4)	2 (0.2)	1 (0.3)	2.2

Source: 2024 Queen Anne's County Hazard Mitigation Planning Committee and SP&D

2.2.5 QUEEN ANNE'S COUNTY HIRA CONCLUSIONS

Based on the RF analysis, the natural hazards with the highest risk potential are "Flooding," "Tropical Systems", and "Drought," which have risk factor (RF) rating values of 4.0, 3.6, and 3.5 respectively. This is primarily due to the probability of the hazard occurring and the local risk perspective rating. No technological hazards were considered in the HIRA; however, the appendix contains the Threat Hazard Identification Risk Assessment (THIRA). The Queen Anne's County Mitigation Planning Team decided to focus on natural hazards for the public Hazard Mitigation Plan, while threats have been evaluated in the appendix to the plan, which is for official use only. The conclusions drawn from the qualitative and quantitative assessments, combined with final determinations from the Queen Anne's County Mitigation Planning Committee, were fitted into three categories for a final summary of hazard risk for Queen Anne's County based on High, Moderate or Low risk designations.

TABLE 2-5: HIRA CONCLUSIONS FOR QUEEN ANNE'S COUNTY AND PARTICIPATING JURISDICTIONS	
HIGH RISK (3.4 or higher)	Flooding, Tropical Systems and Drought
MODERATE RISK (2.6 – 3.3)	Sea Level Change, Soil Movement, Severe Winter Weather, Extreme Temperatures, Thunderstorms, and Wildfire
LOW RISK (0.1 – 2.5)	Earthquake, Tornado, and Dam Failure

Source: 2024 Queen Anne's County Hazard Mitigation Planning Committee and SP&D

2.2.6 HIRA MUNICIPAL PERSPECTIVE

The 2019 Hazard Mitigation Plan obtained municipal perspective using a questionnaire. In 2019 participating municipalities provided information on hazard affecting their jurisdiction and what they perceived as the highest risk hazards to their community.

- Town of Barclay High Hazards identified – severe winter weather, extreme temperatures, wildfire, thunderstorm, tropical systems, tornado.
- Town of Centreville High Hazards identified - flooding, severe winter weather, thunderstorm, tropical systems.
- Town of Church Hill High Hazards identified – flooding and tropical systems.
- Town of Millington High Hazards identified – flooding and tropical systems.
- Town of Queenstown High Hazards identified – flooding, severe winter weather, and tropical systems.
- Town of Sudlersville High Hazards identified – drought, severe winter weather, wildfire, thunderstorm, and tornado.

Note: The Town of Queen Anne participated in and adopted the 2022 Talbot County Hazard Mitigation Plan. The Town of Queen Anne is located in both Talbot and Queen Anne's Counties.
The Town of Templeville participated in the Caroline County Hazard Mitigation Plan. The Town of Templeville is located in both Queen Anne's and Caroline Counties.

During the plan update process, a Municipal Hazard Perspective Update questionnaire was distributed. Below provides municipalities' highest risk hazard for the plan update.

- The Town of Barclay indicated no changes to any of the identified hazards.
- The Town of Centreville indicated an increase in sea level rise risk due to high tide flooding occurs more often at the Wharf area and a decrease in dam failure risk due to the removal of the Centreville Dam at Gravel Run in 2014.
- The Town of Church Hill indicated no changes to any of the identified hazards.
- The Town of Queenstown indicated an increase in flooding due to more frequent flooding in certain areas of the town. Also, the town reported increases in drought, extreme, temperatures, and thunderstorms due to high temperatures and less frequent precipitation. Finally, the town responded that severe winter weather decreased due to warming temperatures.
- The Town of Millington indicated no changes to the identified hazards, except for coastal erosion. The Town stated the Upper Chester River banks are beginning to erode.
- The Town of Sudlersville indicated no changes to any of the identified hazards.

2.3 Probability of Future Hazards

Probability means the likelihood of the hazard occurring and may be defined in term of general descriptors (for example, unlikely, likely, highly likely), historical frequencies, statistical probabilities (for example: 1% chance of occurrence in any given year), and/or hazard probability maps.

Each of the identified hazards have been rated using the probability assessment chart below. In depth risk and vulnerability data and analysis has been included under each hazard within the Hazard Identification and Risk Assessment section and this section of the Plan.

TABLE 2-6: PROBABILITY RATING

RATING	PROBABILITY	IDENTIFIED HAZARDS
1	**Unlikely** Hazard event is likely to occur less than once every (30) thirty years.	Earthquake, Dam Failure
2	**Likely** Hazard event is likely to occur less than every five (5) years, but more often than once every (30) thirty years.	Tornado, Soil Movement, Drought
3	**Highly Likely** Hazard event is likely to occur more than once every (5) five years.	Flooding, Tropical Systems, Sea Level Change, Extreme Temperatures, Severe Winter Weather, Wildfire, and Thunderstorm.

2.4 Public Opinion Survey Description & Results

Input from community members and organizations were sought throughout the plan development process using an online public survey. The survey included three sections. A brief excerpt from each section of the survey has been provided.

Excerpt from: Queen Anne's County Hazard Mitigation Plan Survey

Beginning Section:
The Queen Anne's County Hazard Mitigation Plan is a project that aims to make sure the County is prepared for all kinds of hazards, as well as preparing for the impacts predicted by climate change.

Community members and organizations' input to the process is incredibly valuable. This survey is one way the County is collecting your insights and perspectives.

The survey consists of 16 questions and will take less than 10 minutes.

We thank you sincerely for your time.

This will not be your only opportunity to provide input. You may provide your contact information at the end of the survey if you wish, and we will keep you updated and engaged in the process.

Second Section:
The following categories of natural hazards were determined by the Hazard Mitigation Planning Committee as likely to affect Queen Anne's County.

These include any events, emergencies, or crises that may occur relatively suddenly or happen largely uncontrollably, such as natural disasters or disease outbreaks.

In our efforts to make sure planning documents address your concerns as best as possible, we are interested in knowing how concerned you are for each of the events listed below.

Third Section:
Emergencies besides natural disasters (like hurricanes and snowstorms) also have the potential to impact Queen Anne's County. The County recognizes it is important to have plans for these events, too. Indicating if you are concerned for these different events will be very helpful for Queen Anne's County in developing preparedness and response plans.

Last Section:
Do you feel that a specific group or groups in Queen Anne's County are particularly at risk for or could be harmed by any of the hazards or events listed below?

This could be due to age, location, occupation etc. This question is not intended to be limited to certain groups - we are eager to learn of any and all types and sizes of groups you think might be at particular risk.

As of November 13, 2024, a total of 216 members of the community participated in the survey. Most survey participants were from the Kent Island/Grasonville area, the Town of Centreville and the area known as North County.

Hazards level of concern results indicated that survey participants were most concerned about the following natural hazards.

- Hurricane
- Coastal Erosion
- High Wind

Additional hazards of concern identified by survey participants included the following (in order of concern).

- Transportation (congestion, traffic accidents)
- Cyber Attack
- Active Shooter
- Terrorism
- Environmental Emergencies (oil spill, hazardous materials)
- Opioid Crisis
- Disease Outbreak

An additional question was posed to survey participants pertaining to which hazard(s) they felt particularly affected their community. Results indicated in order of priority the following.

- High Wind
- Transportation (congestion and traffic accidents)
- Flooding
- Hurricane
- Coastal Erosion

In terms of social vulnerability, survey participants were asked which specific group, or groups, in Queen Anne's County are particularly at risk to hazards identified in the plan. The top five (5) groups included the following.

- Aged 65 or Older
- Civilian with a Disability
- Below Poverty
- Mobile Homes
- No Vehicle

In conjunction with updating the Hazard Mitigation Plan, the County also updated the Threat Hazard Identification Risk Assessment (THIRA). The THIRA will used survey results to inform the process. The THIRA is an appendix to the Hazard Mitigation Plan.

2.5 Critical Facilities & Community Facilities

Plan Update Note

To satisfy Requirement 44 CFR § 201.6(c)(2)(ii), Element B2a from FEMA's Local Mitigation Planning Policy Guide, critical facilities were reviewed and updated. The 2019 Plan placed special emphasis on the five (5) essential facility types: EOC, Fire/EMS, Medical, Police, and Schools. With the release of FEMA's Local Mitigation Planning Policy Guide (April 19, 2023), additional facilities such as lifelines and critical infrastructure are required to be assessed for vulnerability. Therefore, additional facility types were included in the plan update. For quality assurance, the critical facilities listing was distributed to Hazard Mitigation Planning Committee members for review and comments. Appendix B contains the detailed database as well as the essential facility risk and vulnerability data collection sheets.

As part of the plan update, this section has been expanded upon to include new critical facilities.

The Federal Emergency Management Agency (FEMA) critical facilities definition states: *Typical critical facilities include hospitals, fire stations, police stations, storage of critical records, and similar facilities. These facilities should be given special consideration when formulating regulatory alternatives and floodplain management plans. A critical facility should not be in a floodplain if possible. If a critical facility must be in a floodplain, it should be provided with a higher level of protection so that it can continue to function and provide services after the flood. Communities should develop emergency plans to continue to provide these services during the flood.*[xi]

Community Lifelines defined by FEMA is *a lifeline that enables the continuous operation of critical government and business functions and is essential to human health and safety or economic security. Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.*[xii]

FEMA has developed a construct for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster. The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function. When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.[xiii]

As part of **FEMA's Local Mitigation Planning Policy Guide requirements, community lifelines are to be assessed. Community lifelines include:**



Safety and Security - Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety



Communications - Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch



Food, Hydration, Shelter - Food, Hydration, Shelter, Agricultu



Transportation - Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime



Health and Medical - Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management



Hazardous Materials - Facilities, HAZMAT, Pollutants, Contaminants



Energy - Power Grid, Fuel



Water Systems - Potable Water Infrastructure, Wastewater Management

As part of the plan update, additional facility types were included in the overall critical facilities listing. Table 2-7 provides a composite of all critical facility types and associated community lifeline as well as the number of facilities per type. New critical facility types included during this plan update are denoted in blue text. Table 2-8 provides the overall listing of critical facilities, including community lifeline, facility type, name, and town. Map 2-1 depicts critical facilities based on their community lifelines. Appendix B provides the complete listing of critical facilities and results from the vulnerability assessment.

TABLE 2-7 CRITICAL FACILITIES & COMMUNITY LIFELINES

COMMUNITY LIFELINE	FACILITY TYPE	NUMBER OF FACILITIES
Communications	EOC	1
	Telecommunication Towers	47
Safety and Security	Fire	9
	EMS	7
	Police	6
	Government (County)	17
	Town Halls	5
	Library	3
Food, Hydration, Shelter	Schools	23
Health and Medical	Medical	5
Energy	Transfer Stations	5
Transportation	Airport	1
	Marine Facilities	5
Hazardous Materials	Fixed HazMat Storage Sites	68
Water Systems	Vacuum Collection Stations	14
	Ground Storage Tanks	8
	Pump Stations	13
	WTP	12
	Water Booster Pump Stations	2
	Water Towers	11
	WWTP	6
	Sewage Lift Stations	12

TABLE 2-8 CRITICAL FACILITIES & COMMUNITY LIFELINES MATRIX				
COMMUNITY LIFELINES	**FACILITY TYPE**	**NAME**	**ADDRESS**	**Town**
	Government	QAC Chesapeake Heritage and Visitor Center	425 Piney Narrows Road	Chester
	Government	QAC Animal Services	201 Clay Dr	Queenstown
	Government	QAC Board of Education Warehouse	305 Ruthsburg Road	Centreville
	Government	QAC Detention Center	500 Little Hut Dr	Centreville
	Government	QAC Planning and Zoning	110 Vincit St	Centreville
	Government	QAC Department of Aging - Kramer Center	104 Powell St	Centreville
	Government	QAC Sanitary District HQ	310 Bateau Dr	Stevensville
	Government	QAC Health Department - Nielson Center	205 N Liberty St	Centreville
	Government	QAC Public Works	100 Communications Dr	Centreville
	Government	QAC Parks and Landings	1935 4h Park Road	Centreville
	Government	Queen Anne' s County Board of Elections	110 Vincit St	Centreville
	Government	QAC Vincit Building	110 Vincit St	Centreville
	Government	QAC Arts Council	206 S Commerce St	Centreville
	Government	QAC Health Department	206 N Commerce St	Centreville
	Government	QAC Liberty Building & QAC States Attorney Office	107 N Liberty St	Centreville
	Government	QAC - Board of Education New Building	115 Vincit St	Centreville
	Government	QAC Circuit Court	200 N Commerce St	Centreville
	Government	QAC Community Partnership for Children and Families	320 Pennsylvania	Centreville
	Government	QAC Department of Parks and Recreation	1945 4-H Park Rd	Centreville
	Government	QAC Fire Marshal	210 White Pine	Stevensville
	Government	QAC Historic Courthouse	100 Courthouse Sq	Centreville
	Government	QAC Housing Authority	104 Powell Street	Centreville
	Government	QAC Public Works	312 Safety Dr	Centreville
	Government	QAC Soil Conservation District Shop	3002 Church Hill	Centreville
	Government	Maryland State Highway Administration District 2	311 Safety Dr	Centreville
	Government	Maryland Fire and Rescue Institute - Region 4	601 Safety Dr	Centreville
	Town Hall	Church Hill Town Hall	324 Main St	Church Hill
	Town Hall	Centreville Town Hall	101 Lawyers Row	Centreville
	Town Hall	Queenstown Town Hall	7013 Main St	Queenstown
	Town Hall	Barclay Town Hall	1602 Barclay Road	Barclay

TABLE 2-8 CRITICAL FACILITIES & COMMUNITY LIFELINES MATRIX				
COMMUNITY LIFELINES	**FACILITY TYPE**	**NAME**	**ADDRESS**	**Town**
	Town Hall	Sudlersville Town Hall	200 S Church St	Sudlersville
	Library	QAC Free Library - Kent Island Branch	200 Library Cir	Stevensville
	Library	QAC Free Library - Centreville Branch	121 S Commerce St	Centreville
	Library	Sudlersville Memorial Library	105 W Main St	Sudlersville
	Transfer Station	Church Hill Transfer Station	110 Price Station Road	Church Hill
	Transfer Station	Batts Neck Transfer Station	422 Batts Neck Road	Stevensville
	Transfer Station	Grasonville Transfer Station	401 Gravel Run Road	Grasonville
	Transfer Station	Centreville Transfer Station	401 Harper Road	Centreville
	Transfer Station	Glanding Transfer Station	223 Glanding Road	Millington
	Vacuum Collection Stations	Collection Station A	828 Main St	Stevensville
	Vacuum Collection Stations	Collection Station B	746 Thompson Creek Rd	Stevensville
	Vacuum Collection Stations	Collection Station C	1825 Sherman Dr	Chester
	Vacuum Collection Stations	Collection Station D	201 Benton Pleasure Rd	Chester
	Vacuum Collection Stations	Collection Station E	105 Tackle Cir	Chester
	Vacuum Collection Stations	Collection Station F	625 Dominion Rd	Chester
	Vacuum Collection Stations	Collection Station G	2510 Main St	Chester
	Vacuum Collection Stations	Collection Station H	3232 Main St	Grasonville
	Vacuum Collection Stations	Collection Station J	311 Long Point Rd	Grasonville
	Vacuum Collection Stations	Parks - Collection Station K	301 Perrys Corner Rd	Grasonville

TABLE 2-8 CRITICAL FACILITIES & COMMUNITY LIFELINES MATRIX				
COMMUNITY LIFELINES	**FACILITY TYPE**	**NAME**	**ADDRESS**	**Town**
	Vacuum Collection Stations	Collection Station L	617 Chester River Beach Rd	Grasonville
	Vacuum Collection Stations	Collection Station M	600 Grasonville Cemetery Rd	Grasonville
	Vacuum Collection Stations	Collection Station Q	774 Kimberly Way	Stevensville
	Vacuum Collection Stations	Collection Station R	301 Chenowith Dr	Stevensville
	Vacuum Collection Stations	Collection Station H	3232 Main St	Grasonville
	Ground Storage Tanks	Pump Station 1	3232 Main St	Grasonville
	Ground Storage Tanks	Thompson Creek Water Treatment Plant	610 Marion Quimby Dr	Stevensville
	Ground Storage Tanks	Bridge Pointe Water Treatment Plant	9025 Bridgepointe Dr	Chester
	Ground Storage Tanks	Grasonville Water Treatment Plant	5439 Main St	Grasonville
	Ground Storage Tanks	Stevensville Water Treatment Plant	208 Church St	Stevensville
	Ground Storage Tanks	Oyster Cove WTP – 2 tanks	3230 Main St	Grasonville
	Ground Storage Tanks	PS 1	3232 Main St	Grasonville
	Pump Stations	Pump Station 1	3232 Main St	Grasonville
	Pump Stations	Pump Station 2	1825 Sherman Dr	Chester
	Pump Stations	Pump Station 3	146 Romancoke Rd	Stevensville
	Pump Stations	Parks – Pump Station 4	301 Perrys Corner Rd	Grasonville
	Pump Stations	Pump Station 5	232 Bateau Dr	Stevensville
	Pump Stations	Pump Station 6	131 Golf Cart Dr	Grasonville
	Pump Stations	Pump Station 7	3 Greenwood Shls	Grasonville
	Pump Stations	Pump Station 8	40 Prospect Bay Dr W	Grasonville
	Pump Stations	Pump Station 9	308 Carriage Heath	Grasonville
	Pump Stations	Pump Station 10	439 Conor Dr	Stevensville
	Pump Stations	Pump Station 11	735 Moorings Cir	Stevensville
	Pump Stations	Pump Station 12	413 Castle Marina Rd	Chester
	Pump Stations	Pump Station 13	610 Warbler Way	Chester
	WTP	Thompson Creek WTP	610 Marion Quimby Dr	Stevensville
	WTP	Oyster Cove Water	3230 Main St	Grasonville

TABLE 2-8 CRITICAL FACILITIES & COMMUNITY LIFELINES MATRIX				
COMMUNITY LIFELINES	**FACILITY TYPE**	**NAME**	**ADDRESS**	**Town**
		Treatment Plant		
	WTP	CBBP Water Treatment Plant	232 Bateau Dr	Stevensville
	WTP	Bayside Water Treatment Plant	103 Tackle Cir	Chester
	WTP	Prospect Bay Water Treatment Plant	101 Golf Cart Dr	Grasonville
	WTP	Bridge Pointe Water Treatment Plant	9025 Bridgepointe Dr	Chester
	WTP	Grasonville Water Treatment Plant	5439 Main St	Grasonville
	WTP	Riverside Water Treatment Plant	206 Riverside Dr	Chester
	WTP	Stevensville Water Treatment Plant	208 Church St	Stevensville
	WTP	Queens Landing Water Treatment Plant	131 Queen Landing Dr	Chester
	WTP	Sudlersville Water Treatment Plant	701 Foxxtown Dr	Sudlersville
	WTP	Centreville Water Treatment Plant	333 Commerce St	Centreville
	Water Booster Pump Station	Stevensville Water Treatment Plant	208 Church St	Stevensville
	Water Booster Pump Station	Thompson Creek Rd Booster Pump Station	115 Thompson Creek Rd	Stevensville
	Water Tower	QAC Sanitary CBBP Water Tower	230 Bateau Dr	Stevensville
	Water Tower	Prospect Bay Water Tower	200 Golf Cart Dr	Grasonville
	Water Tower	Matapeake Water Tower	180 Marine Academy Dr	Stevensville
	Water Tower	Queens Landing Water Tower	101 Captains Way	Chester
	Water Tower	Four Seasons Water Tower	1707 Piney Creek Rd	Chester
	Water Tower	Centreville Water Tower #1	111 Powell Street	Centreville
	Water Tower	Centreville Water Tower #2	151 Comet Dr	Centreville
	Water Tower	Centreville Water Tower #3	500 Wexford Dr	Centreville
	Water Tower	Queenstown Water Tower	105 Wall St	Queenstown
	Water Tower	Queenstown Water Tower	441 Outlet Center Dr	Queenstown
	Water Tower	Sudlersville Water Tower	118 South Church St	Sudlersville
	Well House	Prospect Wellhouse #2 / Inactive	35 Greenwood SHLS	Grasonville
	Water Reuse	Centreville Water Reuse Area (Municipal)	751 Hope Rd	Centreville
	WWTP	Queenstown Sewage Treatment Plant	120 Skipjack Cove Ln	Queenstown
	WWTP	KNSG Sewage Treatment	310 Bateau Dr	Stevensville

TABLE 2-8 CRITICAL FACILITIES & COMMUNITY LIFELINES MATRIX				
COMMUNITY LIFELINES	**FACILITY TYPE**	**NAME**	**ADDRESS**	**Town**
		Plant		
	WWTP	Centreville Sewage Treatment Plant (Municipal)	116 Johnstown Lane	Centreville
	WWTP	Church Hill Sewage Treatment Plant (Municipal)	325 Water Way Dr	Church Hill
	WWTP	Sudlersville Wastewater Treatment Plant (Municipal)	575 Thunder Rd	Sudlersville
	WWTP	Town of Millington Sewage Treatment Plant (Municipal)	227 Sassafras St	Millington
	Sewage Station	Sewage Station	414 S Church St	Sudlersville
	Sewage Lift Station	Lift Station #8	257 Prospect Bay Dr W	Grasonville
	Sewage Lift Station	Lift Station #3	2 Prospect Bay Dr W	Grasonville
	Sewage Lift Station	Lift Station #5	66 Prospect Bay Dr W	Grasonville
	Sewage Lift Station	Lift Station #7	216 Prospect Bay Dr W	Grasonville
	Sewage Lift Station	Lift Station #1	345 Prospect Bay Dr W	Grasonville
	Sewage Lift Station	Lift Station #6	122 Prospect Bay Dr W	Grasonville
	Sewage Lift Station	Lift Station #9	205 Piney Point LNDG	Grasonville
	Sewage Lift Station	Lift Station	722 Del Rhodes Ave	Queenstown
	Sewage Lift Station	Lift Station	6501 Friel Rd	Queenstown
	Sewage Lift Station	Centreville Sewage Station	401 Harper Rd	Centreville
	Sewage Lift Station	Sudlersville Sewage Station	South Church St	Sudlersville
	Telecom Towers	TC129	100 Communications Dr	Centreville
	Telecom Towers	TC110	6008 Church Hill Road	Church Hill
	Telecom Towers	TC128	Parson Green Farm Ln	Church Hill
	Telecom Towers	TC101	140 Murdoch Florist Lane	Centreville
	Telecom Towers	TC147	3012 Barclay Road	Marydel
	Telecom Towers	TC149	Starr Rd	Queen Anne
	Telecom Towers	TC148	3020 Price Station Road	Centreville

TABLE 2-8 CRITICAL FACILITIES & COMMUNITY LIFELINES MATRIX				
COMMUNITY LIFELINES	**FACILITY TYPE**	**NAME**	**ADDRESS**	**Town**
	Telecom Towers	TC150	123 Damsontown Road	Queen Anne
	Telecom Towers	TC139	Sudlersville Rd	Sudlersville
	Telecom Towers	TC115 - Guyed	201 Gardners Purchase Lane	Chester
	Telecom Towers	TC106 – Guyed	201 Gardners Purchase Lane	Chester
	Telecom Towers	TC111 – Guyed	961 Bennett Point Road	Queenstown
	Telecom Towers	TC112 – Guyed	610 Burchard Sawmill Road	Chestertown
	Telecom Towers	TC113 – Guyed	115 Peters Corner Road	Millington
	Telecom Towers	TC103 – Guyed	Wyes Mills Rd	Queenstown
	Telecom Towers	TC104 – Guyed	319 Foreman Landing Road	Queenstown
	Telecom Towers	TC114 – Guyed	200 Foreman Landing Road	Queenstown
	Telecom Towers	TC119 – Guyed	760 Granny Branch Road	Church Hill
	Telecom Towers	TC133 – Guyed	513 Hall Rd	Sudlersville
	Telecom Towers	TC117 – Lattice	715 Shine Smith Road	Sudlersville
	Telecom Towers	TC105 – Lattice	201 Gardners Purchase Lane	Chester
	Telecom Towers	TC108 – Lattice	Business Pkwy	Stevensville
	Telecom Towers	TC109 – Lattice	1935 4h Park Road	Centreville
	Telecom Towers	TC127 – Lattice	Church Hill Rd	Centreville
	Telecom Towers	TC107 – Lattice	319 Foreman Landing Road	Queenstown
	Telecom Towers	TC118 – Lattice	725 Cedar Ln	Church Hill
	Telecom Towers	TC120 – Lattice	2812 Starr Road	Queen Anne
	Telecom Towers	TC137 – Lattice	Marine Academy Ln	Stevensville
	Telecom Towers	TC138 – Lattice	306 Marine Academy Ln	Stevensville
	Telecom Towers	TC140 – Lattice	209 Grange Hall Road	Queenstown
	Telecom Towers	TC141 – Lattice	Ocean Gateway	Wye Mills

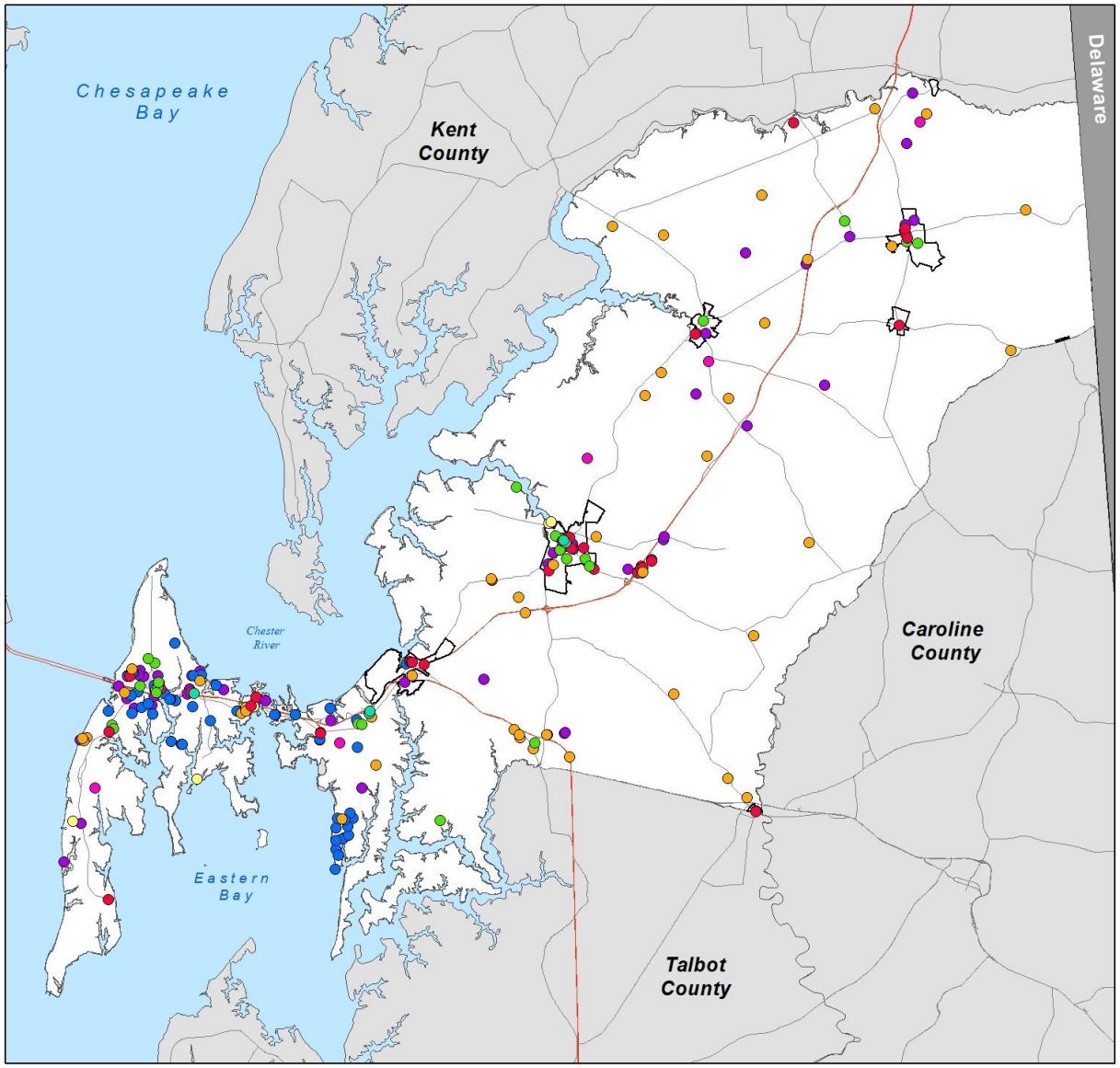
TABLE 2-8 CRITICAL FACILITIES & COMMUNITY LIFELINES MATRIX				
COMMUNITY LIFELINES	**FACILITY TYPE**	**NAME**	**ADDRESS**	**Town**
	Telecom Towers	TC145 – Lattice	3001 Starr Road	Queen Anne
	Telecom Towers	TC116 – Lattice	121 Needwood Farm Lane	Centreville
	Telecom Towers	TC152 – Monopole	304 Spring Landing Lane	Millington
	Telecom Towers	TC122 – Monopole	Main Street	Queenstown
	Telecom Towers	TC146 – Monopole	611 Main St	Stevensville
	Telecom Towers	TC153 – Monopole	1537 Peters Corner Road	Sudlersville
	Telecom Towers	TC154 – Monopole	200 Hambleton Creek Lane	Chestertown
	Telecom Towers	TC121 – Monopole	2311 Bloomingdale Road	Centreville
	Telecom Towers	TC155 – Monopole	Pier One Rd	Stevensville
	Telecom Towers	TC130 – Water Tower	509 Anchor Lane	Chester
	Telecom Towers	TC131 – Water Tower	180 Romancoke Road	Stevensville
	Telecom Towers	TC132 – Water Tower	Piney Neck Rd	Grasonville
	Telecom Towers	TC144 – Water Tower	151 Comet Dr	Centreville
	Telecom Towers	TC142 – Water Tower	7110 Main St	Queenstown
	Telecom Towers	TC143 – Water Tower	Friels Rd	Queenstown
	Telecom Towers	TC123 – Water Tower	Log Canoe Cir	Stevensville
	Airport	Bay Bridge Airport	202 Airport Road	Stevensville
	Airport	Kentmorr Airpark 3W3	114 Kentmorr Rd	Stevensville
	Transit	County Ride	104 Powell Street	Centreville
	Marinas	Centreville Landing and Marina	201 Front St	Centreville
	Marinas	Queenstown Dock	6906 2nd Ave	Queenstown
	Marinas	Queenstown Dock	1st Ave	Queenstown
	Marinas	Watermans Boat Basin	3000 Wharf Dr	Chester
	Marinas	Dominion Marina	Little Creek Rd	Chester
	Marinas	Centreville Wharf	Watson Rd	Centreville
	Fixed HazMat Storage Sites	AT&T Corp - Mdk140	209 Grange Rd	Queenstown
	Fixed HazMat Storage Sites	Bay Bridge Marina	357 Pier One Road	Stevensville

TABLE 2-8 CRITICAL FACILITIES & COMMUNITY LIFELINES MATRIX				
COMMUNITY LIFELINES	**FACILITY TYPE**	**NAME**	**ADDRESS**	**Town**
	Fixed HazMat Storage Sites	Sharp Energy - Centerville	225 Tidewater Dr.	Centerville
	Fixed HazMat Storage Sites	Sharp Energy - Kent Island High School	900 Love Point Rd.	Stevensville 21666
	Fixed HazMat Storage Sites	Sharp Energy - Queen Anne High School	125 Ruthsburg Road	Centerville
	Fixed HazMat Storage Sites	Sharp Energy - Zodiac of North America	540 Thompson Creek Rd	Stevensville
	Fixed HazMat Storage Sites	Sharp Energy - Church Hill Elementary School	631 Main St	Church Hill
	Fixed HazMat Storage Sites	Sharp Energy - Grasonville Elementary School	5435 Main Street	Grasonville
	Fixed HazMat Storage Sites	Sharp Energy - Sudlersville Elementary School	300 South Church Street	Sudlersville
	Fixed HazMat Storage Sites	Sharp Energy - Sudlersville Middle School	201 North Church Street	Sudlersville
	Fixed HazMat Storage Sites	Gibsons Grant	233 McGuckin Street	Chester
	Fixed HazMat Storage Sites	Ellendale	124 John Patrick Dr	Stevensville
	Fixed HazMat Storage Sites	Clariant Corporation - Masterbatches Division	3011 Millington Road	Millington
	Fixed HazMat Storage Sites	Armor Swift Eckrich Plant	1350 Bloomingdale Road	Queenstown
	Fixed HazMat Storage Sites	Queenstown Xtrafuels	4638 Ocean Gateway	Queenstown
	Fixed HazMat Storage Sites	Eastern Pre-Release Unit	700 Flat Iron Square Road	Church Hill
	Fixed HazMat Storage Sites	DPL - Centreville District Office	Route 213 & 18, 2600 Centreville Road	Centreville
	Fixed HazMat Storage Sites	Centreville Citgo #24407	426 S Commerce St	Centreville
	Fixed HazMat Storage Sites	Growmark Fs, LLC - Sudlersville	155 Dudleys Corner Road	Sudlersville
	Fixed HazMat Storage Sites	Growmark Fs, LLC-Centreville	1002 Hope Road	Centreville
	Fixed HazMat Storage Sites	Growmark Fs, LLC-Sudlersville Energy	805 Shine Smith Road	Sudlersville
	Fixed HazMat Storage Sites	Harbor Sales	1000 Harbor Court	Sudlersville
	Fixed HazMat Storage Sites	Harrells, Inc.	224-A Log Canoe Circle	Stevensville
	Fixed HazMat Storage Sites	PRS	107 Log Canoe Circle	Stevensville
	Fixed HazMat Storage Sites	Centreville	111 Safety Drive	Centreville
	Fixed HazMat Storage Sites	Stevensville Shop	334 State St	Stevensville

TABLE 2-8 CRITICAL FACILITIES & COMMUNITY LIFELINES MATRIX				
COMMUNITY LIFELINES	**FACILITY TYPE**	**NAME**	**ADDRESS**	**Town**
	Fixed HazMat Storage Sites	DNR - Matapeake	306 Marine Academy Drive	Stevensville
	Fixed HazMat Storage Sites	Mid-Atlantic Cooperative Solutions, Inc. Dba Aero Energy - Wye Mills	350 Grange Hall Road	Centreville
	Fixed HazMat Storage Sites	Nutrien Ag Solutions 755	1003 Hope Road	Centreville
	Fixed HazMat Storage Sites	Piney Narrows Yacht Haven	500 Piney Narrows Road	Chester
	Fixed HazMat Storage Sites	Perdue Agribusiness - Roberts Grain Elevator	133 Brierleys Mill Road	Church Hill
	Fixed HazMat Storage Sites	Piney Narrows Yacht Haven Condo Association	500 Piney Narrows Rd	Chester
	Fixed HazMat Storage Sites	PMD-Centreville	2543 Centreville Road	Centreville
	Fixed HazMat Storage Sites	Sudlersville Warehouse	324 Hackett Corner Rd	Sudlersville
	Fixed HazMat Storage Sites	Bluegrass Solar	176 Bowers Road	Chestertown
	Fixed HazMat Storage Sites	Queen Anne Marina, LLC	412 Congressional Drive	Stevensville
	Fixed HazMat Storage Sites	Bayside Water Treatment Plant	103 Tackle Circle	Chester
	Fixed HazMat Storage Sites	Kent Island Village Water Treatment Plant	1839 Anchorage Drive	Chester
	Fixed HazMat Storage Sites	Oyster Cove Water Treatment Plant	3232 Main Street	Grasonville
	Fixed HazMat Storage Sites	Grasonville Water Treatment Plant	5439 Main Street	Grasonville
	Fixed HazMat Storage Sites	Kent Narrows/Stevensville/ Grasonville Wastewater Treatment Plant	310 Bateau Drive / P.O. Box 10	Stevensville
	Fixed HazMat Storage Sites	Stevensville Water Treatment Plant	208 Church Street	Stevensville
	Fixed HazMat Storage Sites	Bridge Point Water Treatment Plant	9025 Bridgepoint Drive	Chester
	Fixed HazMat Storage Sites	Queens Landing Water Treatment Plant	131 Queens Landing Drive	Chester
	Fixed HazMat Storage Sites	Riverside Water Treatment Plant	206 Riverside Drive	Chester
	Fixed HazMat Storage Sites	Prospect Bay Wellhouse #2	Prospect Bay Drive West	Grasonville
	Fixed HazMat Storage Sites	Prospect Bay Wellhouse #1	Greenwood Shoals	Grasonville
	Fixed HazMat Storage Sites	Chesapeake Bay Business Park Water Treatment Plant	232 Bateau Drive	Stevensville
	Fixed HazMat Storage Sites	Thompson Creek Water Treatment Plant	610 Marion Quimby Drive	Stevensville

TABLE 2-8 CRITICAL FACILITIES & COMMUNITY LIFELINES MATRIX				
COMMUNITY LIFELINES	**FACILITY TYPE**	**NAME**	**ADDRESS**	**Town**
	Fixed HazMat Storage Sites	Bay Bridge Airport	202 Airport Road	Stevensville
	Fixed HazMat Storage Sites	Petroleum Equipment - Church Hill Hunt	207 Oakmount Avenue	Church Hill
	Fixed HazMat Storage Sites	Petroleum Equipment - Four Seasons	300 Castle Marina Road	Chester
	Fixed HazMat Storage Sites	SHM Narrows Point Marina	428 Kent Narrow Way North	Grasonville
	Fixed HazMat Storage Sites	Castle Marina Shell #426	101 Castle Marina Road	Chester
	Fixed HazMat Storage Sites	Thompson Creek Shell #433	401 Thompson Creek Road	Stevensville
	Fixed HazMat Storage Sites	Castle Marina	301 Tackle Circle	Chester
	Fixed HazMat Storage Sites	Suburban Propane - Centreville	423 Railroad Avenue	Centerville
	Fixed HazMat Storage Sites	Tri-Gas & Oil Co., Inc. (Grasonville)	216 VFW Avenue	Grasonville
	Fixed HazMat Storage Sites	Tri-Gas & Oil Co., Inc. (Queen Anne Grain)	32500 First Street	Queen Anne
	Fixed HazMat Storage Sites	Tri-Gas & Oil Co., Inc. - (Bostick Farm)	2 Massey Street	Price
	Fixed HazMat Storage Sites	University Of Maryland, Maryland Fire & Rescue Institute (MFRI) Upper Eastern Shore	601 Safety Drive	Centreville
	Fixed HazMat Storage Sites	Verizon - Centreville Central Office (Md37641)	121 Turpins Lane	Centreville
	Fixed HazMat Storage Sites	Verizon - Stevensville CDO (Md37810)	611 Main Street	Stevensville
	Fixed HazMat Storage Sites	Verizon Romancoke Ess (Md37303)	101 Kentmoor Rd	Stevensville
	Fixed HazMat Storage Sites	Verizon Sudlersville CDO (MD37880)	218 N CHURCH STREET	Sudlersville
	Fixed HazMat Storage Sites	Verizon Wireless - Island Drive (Id:5000137)	611 Main Street	Stevensville
	Fixed HazMat Storage Sites	Wise Oil & Fuel Inc	350 Grange Hall Road	Wye Mills

Critical Facilities by Community Lifelines



Legend

Community Lifelines

- Communications
- Energy
- Food, Hydration, Shelter
- Hazardous Materials
- Health and Medical
- Safety and Security
- Transportation
- Water Systems

- Municipalities
- Maryland Routes
- US Routes

0 2 4 8 Miles

N

Data Sources:

Queen Anne's County IT:
- GIS-Mapping Department

Map 2-1
Critical Facilities by Community Lifelines

2.5.1 ESSENTIAL FACILITIES

A special emphasis was placed on essential facilities by Queen Anne's County. A subset of critical facilities includes essential facilities. Essential facilities are those facilities that provide services to the community and should remain functional after a hazard event. Essential facilities include emergency operations centers (EOC), hospitals, police stations, fire stations and schools. In addition, mitigation projects featuring these facilities are considered specifically within FEMA's benefit-cost analysis tool, while all other facilities are included under a general facility category designated as "other." Mitigation projects featuring essential facilities have a high likelihood of resulting in a positive benefit-cost ration, resulting in grant funding and increased community resilience.

Figure 2-2

General Information							
Facility Type							
Name of Facility							
Physical Address							
Coordinates	X		Y				
Year Built		Material					
Multi-Story Structure	No		Yes	#of Floors?			
Hazard Information							
FEMA 100 yr. Floodplain	Yes		No				
Comments:							
Storm Surge Inundation Area	Yes		No				
Hurricane Category (1-4)	1	2	3	4			
Comments:							
Sea Level Inundation Area	2050		2100				
Comments:							
Generator	Yes		No		Adequately Sized?	Yes	No
Comments:							
Located along evacuation route?	Yes		No				
If so, name of route?							
Comments:							
Impact resistant glass?	Yes		No				
Comments:							
Antennae on facility?	Yes		No				
Comments:							
Flat roof?	Yes		No				
Comments:							
Wildland/Urban Interface	Yes		No				
Comments:							
Any past water deficiency issues? *Drought Susceptibility*	Yes		No				
Comments:							
Susceptible to Extreme Heat?	Yes		No				
Comments:							
Susceptible to Extreme Cold?	Yes		No				
Comments:							

Source: SP&D Essential Facility Hazard Information Form

These facilities were originally identified in the 2019 Plan and reviewed during the 2024 planning process. Essential facilities for the Queen Anne's County Hazard Mitigation Plan have been compiled and listed in the Table 2-9 and displayed on Map 2-2. In addition, essential facility data collection sheets were reviewed as part of this plan update process. These sheets included facility and multi-hazard specific information. One essential facility was added, Maryland Natural Resources Police, at 425 Piney Narrows Rd, in Chester. A total of 55 essential facility sheets are included in Appendix B.

Essential facilities denoted in blue text in Table 2-9 are new facilities included during the plan update process.

TABLE 2-9: ESSENTIAL FACILITES			
FACILITY TYPE	**FACILITY NAME**	**ADRESS**	**TOWN**
EOC	QAC Department of Emergency Services	100 Communications Drive	Centreville
Fire	Kent Island VFC #1	1610 Main St	Chester
Fire	Grasonville VFC #2	4128 Main St	Grasonville
Fire	Queenstown VFC #3	7110 Main St	Queenstown
Fire	Goodwill VFC #4	212 Broadway St	Centreville
Fire	Church Hill VFC #5	316 Main St	Church Hill
Fire	Sudlersville VFC #6	203 N Church St	Sudlersville
Fire	Crumpton VFC #7	300 3rd St	Millington
Fire	Queen Anne-Hillsboro VFC #8	13512 First St	Queen Anne
Fire	United Communities VFC #9	9406 Romancoke Rd	Stevensville
EMS	EMS Station 100	103 Davidson Rd	Stevensville
EMS	EMS Station 200	101 Medic Drive	Chester
EMS	EMS Station 300	7110 Main St	Queenstown
EMS	EMS Station 400	302 Safety Dr	Centreville
EMS	EMS Station 500	316 Main St	Church Hill
EMS	EMS Station 600	203 N Church St	Sudlersville
EMS	Grasonville Vol Ambulance Dept. #20	4132 Main St	Grasonville
Medical	QAC Department of Health	206 N Commerce Street	Centreville
Medical	QAC Department of Health Annex	205 N Liberty Street	Centreville
Medical	Shore Emergency Center Queenstown	115 Shoreway Drive	Queenstown
Medical	UM Shore Medical Pavilion	125 Shoreway Drive	Queenstown
Medical	AAMC Kent Island Pavilion	1630 Main Street	Chester
Police	Queen Anne's County Sheriff's Office HQ	505 Railroad Avenue	Centreville
Police	Maryland State Police - Barracks S	311 Safety Drive	Centreville
Police	Sheriff's Office - Sudlersville Substation	200 S Church Street	Sudlersville
Police	Centreville Police Department	420 N Commerce Street	Centreville
Police	Sheriff's Office - Kent Narrows Substation	425 Piney Narrows Road	Chester
Police	Maryland Natural Resources Police	425 Piney Narrows Rd	Chester
School-Private	The Gunston School	911 Gunston Road	Centreville
School-Private	Wye River Upper School	316 S Commerce Street	Centreville
School-Private	Lighthouse Christian Academy	931 Love Point Road	Stevensville
School-Private	Eastern Shore Jr. Academy	407 Dudley Corners Road	Sudlersville
School-Private	Shore Up Head Start	5441 Main Street	Grasonville
School-Private	Kiddie Academy of Kent Island	113 St. Claire Place	Stevensville
School-Public	Kennard Elementary School	420 Little Kidwell Avenue	Centreville
School-Public	Church Hill Elementary School	631 Main Street	Church Hill
School-Public	Anchor Points Academy	202 Chesterfield Avenue	Centreville
School-Public	Sudlersville Elementary School	300 S Church Street	Sudlersville
School-Public	Grasonville Elementary School	5435 Main Street	Grasonville
School-Public	*Bayside Elementary School	301 Church Street	Stevensville
School-Public	Queen Anne's County High School	125 Ruthsburg Road	Centreville
School-Public	Sudlersville Middle School	600 Charles Street	Sudlersville
School-Public	Centreville Elementary School	213 Homewood Avenue	Centreville
School-Public	Centreville Middle School	231 Ruthsburg Road	Centreville

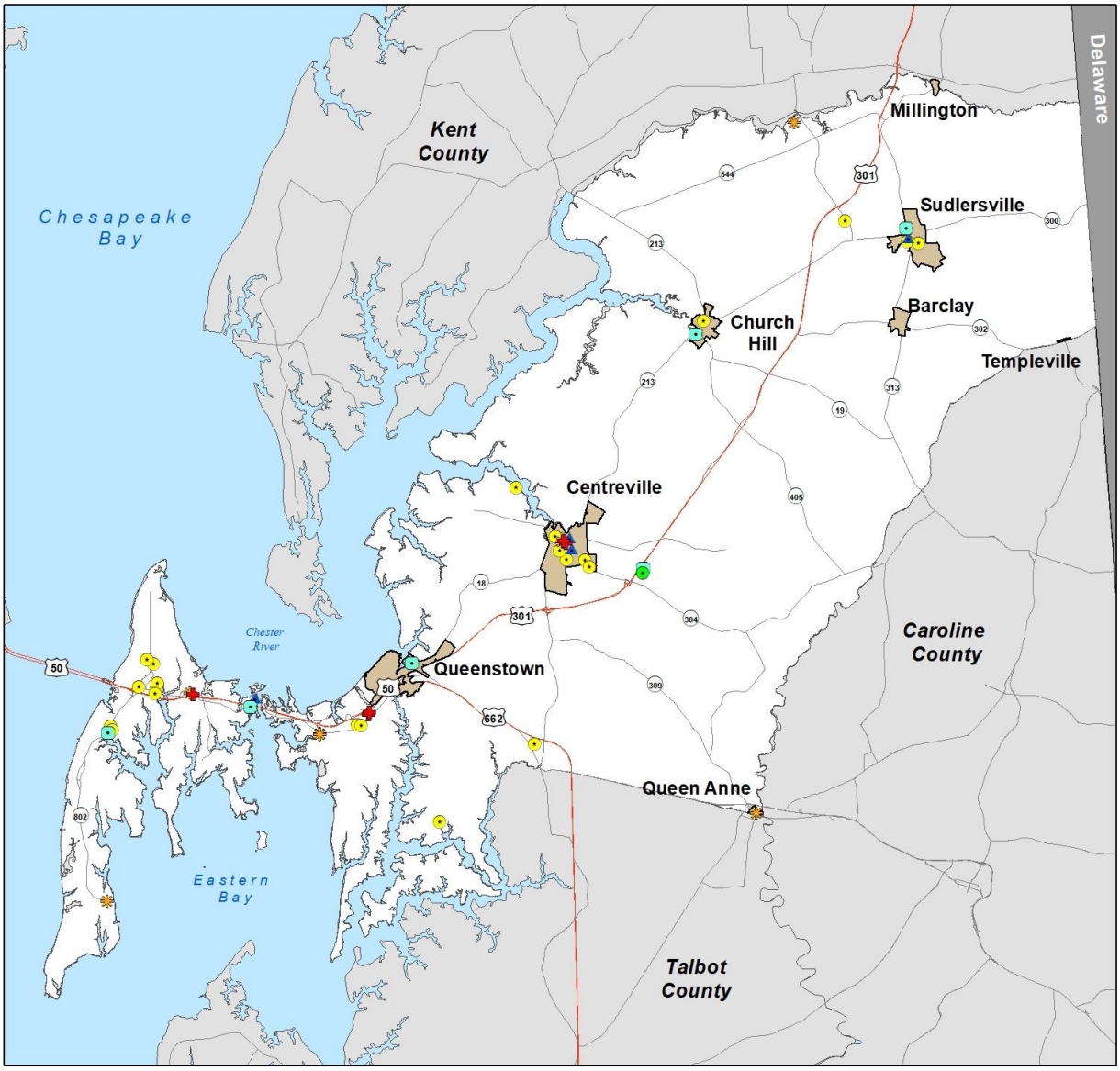
School-Public	*Wye Research & Education Center	124 Wye Narrows Drive	Queenstown
School-Public	Chesapeake College	1000 College Circle Drive	Queenstown
School-Public	*Stevensville Middle School	610 Main Street	Stevensville
School-Public	Kent Island Elementary School	110 Elementary Way	Stevensville
School-Public	Kent Island High School	900 Love Point Road	Stevensville
School-Public	**Matapeake Elementary School	651 Romancoke Road	Stevensville
School-Public	**Matapeake Middle School & Kent Island 9th Grade Annex	671 Romancoke Road	Stevensville

Source: Queen Anne's County Department of Emergency Services

**Designated Temporary Shelter*

***Designated Shelter*

Essential Facilities



Legend

Essential Facility Type

- EOC
- Fire
- EMS
- Medical
- Police
- School - Private
- School - Public
- Municipalities
- Maryland Routes
- US Routes

0 2 4 8 Miles

N

Data Sources:

Queen Anne's County IT:
- GIS-Mapping Department
- GIS Data Download

Map 2-2
Essential Facilities

2.6 Historic Properties

Plan Update Note

This section, Historic Properties, is new and satisfies Requirement 44 CFR § 201.6(c)(2)(ii), Element B2a from FEMA's Local Mitigation Planning Policy Guide.

New to the plan update, historic properties in Queen Anne's County were assessed for vulnerability to hazards that had a geographic extent and are included in hazard specific chapters. Specifically, the State's register of historic properties was assessed for properties within the County and its municipalities. A total of forty (40) properties in Queen Anne's County are registered in Maryland's National Register Properties. Table 2-9 provides the listing of historic properties assessed as part of the plan update. Map 2-3 depicts the location of historic properties. ID numbers in Table 2-10 correlate to the numbers on Map 2-3.

TABLE 2-10: HISTORIC PROPERTIES

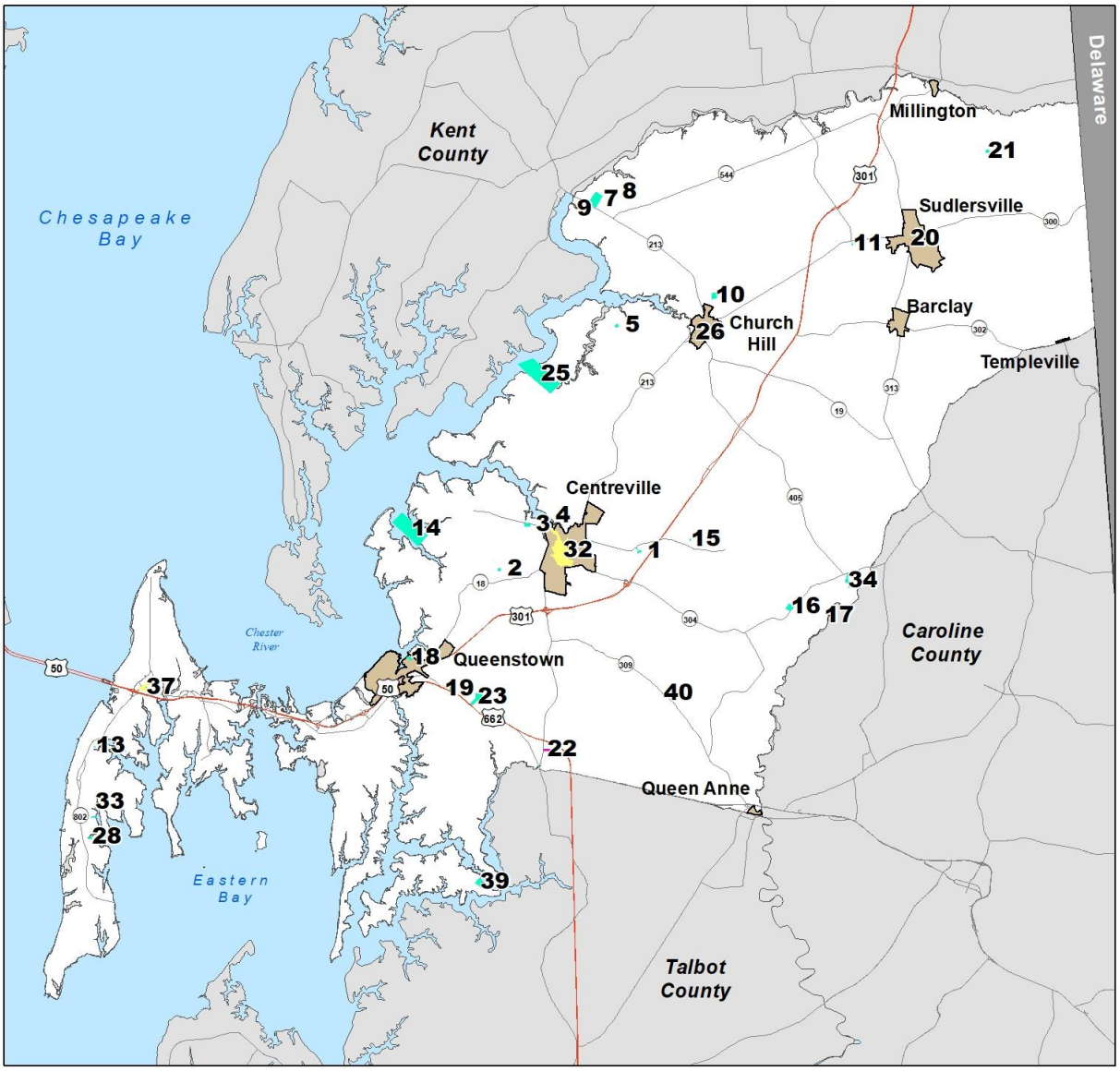
ID #	NAME	ALTERNATE NAME	NATIONAL REGISTER REFERENCE NUMBER	CATEGORY	DATE LISTED	NATIONAL REGISTER URL
1	Content	C.C. Harper Farm	86000256	Building	1986-02-13	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=947
2	Bachelor's Hope	Phares Morris Farm	84001855	Building	1984-05-03	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=795
3	Lexon	Burris-Brockmeyer Farm	90000726	Building	1990-05-04	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=1055
4	Captain's Houses		80001830	Building	1980-11-17	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=655
5	Kennersley		83002961	Building	1983-05-19	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=741
6	Captain John H. Ozmon Store		85000277	Building	1985-02-14	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=854
7	Chester Hall	Rye Hall	80001831	Building	1980-01-18	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=592
8	MYSTERY (log canoe)	Chesapeake Bay Sailing Log Canoe (MPD)	85002250	Object	1985-09-18	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=915
9	ELSWORTH (skipjack)	Chesapeake Bay Skipjack (MPD)	85001088	Object	1985-05-16	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=866
10	Bishopton		85002194	Building	1985-09-12	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=897
11	Dudley's Chapel		79003124	Building	1979-11-15	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=587
12	Centreville Armory	Maryland National Guard Armory (MPD)	85002666	Building	1985-09-25	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=927
13	Friendship		94000727	Building	1994-07-15	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=1120

ID #	NAME	ALTERNATE NAME	NATIONAL REGISTER REFERENCE NUMBER	CATEGORY	DATE LISTED	NATIONAL REGISTER URL
14	Reed's Creek Farm		75002106	Building	1975-07-07	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=317
15	Lansdowne	Upper Deale	84001858	Building	1984-06-07	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=803
16	Thomas House		76002150	Building	1976-05-13	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=378
17	Hawkins Pharsalia		84000458	Building	1984-12-20	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=842
18	Bowlingly		72001458	Building	1972-08-21	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=94
19	St. Peter's Church	St. Peter's Roman Catholic Church	80001833	Building	1980-03-10	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=600
20	St. Andrew's Episcopal Chapel	St. Andrew's Episcopal Church	84001853	Building	1984-09-07	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=826
21	John Embert Farm	Joseph's Lot	80001832	Building	1980-06-22	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=632
22	Wilton		77001506	Structure	1977-12-12	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=451
23	Bloomingdale	Mount Mill	72001457	Building	1972-10-18	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=100
24	Wye Mill	Old Wye Mill, Wye Grist Mill	85000717	Building	1985-04-09	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=862
25	Readbourne		73002134	Building	1973-04-11	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=157
26	St. Luke's Episcopal Church		77001505	Building	1977-11-23	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=446
27	Keating House		99001281	Building	1999-10-28	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=1227
28	Mattapax		98001498	Building	1998-12-10	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=1215
29	Jackson Collins House		00001503	Building	2000-12-13	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=1261
30	Churchill Theatre		00001051	Building	2000-09-08	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=1249
31	Female Seminary		03001266	Building	2003-12-10	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=1440
32	Centreville Historic District		04001218	District	2004-11-13	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=1459
33	Legg's Dependence	Long Creek Farm; William E. Porter Farm	03001116	Building	2003-11-08	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=1428
34	Stratton	Hortense Fleckenstein Farm; Solomon Scott Farm	03001294	Building	2003-12-18	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=1437

ID #	NAME	ALTERNATE NAME	NATIONAL REGISTER REFERENCE NUMBER	CATEGORY	DATE LISTED	NATIONAL REGISTER URL
35	Cray House		83002960	Building	1983-05-09	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=738
36	Stevensville Bank		85000020	Building	1985-01-03	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=849
37	Stevensville Historic District		86002333	District	1986-09-11	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=971
38	Christ Church		79003268	Building	1979-07-24	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=543
39	Wye Hall		15000759	Building	2015-11-02	https://apps.mht.maryland.gov/NR/NRDetail.aspx?NRID=1645
40	Starr Church	Old Starr Methodist Church	100009979	Building	2024-3-1	https://apps.mht.maryland.gov/nr/NRDetail.aspx?NRID=1739

The Queenstown Colonial Courthouse is not included on the National Historic Register; however, this structure is on the Maryland Historic Trust. Upon request from the Hazard Mitigation Planning Committee and the Town, this facility has been included in the plan update. The Courthouse is located at 100 Del Rhodes Ave, Queenstown, MD 21658.

Historic Properties



Legend

CATEGORY

- Building
- District
- Object
- Structure

- Municipalities
- Maryland Routes
- US Routes

Data Sources:

Maryland National Register Properties - Queen Anne's County

Queen Anne's County IT:
- GIS-Mapping Department
- GIS Data Download

N

0 2 4 8 Miles

Map 2-3
Historic Properties

2.7 Social Vulnerability

Social vulnerability is the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood.[xiv]

> ***Vulnerability is formally defined as "the characteristics of a person or group and their situation that influences their capacity to anticipate, cope with, resist, and recover from the impact of a natural hazard.***
>
> *Source: Ben Wisner et al., At Risk: Natural Hazards, People's Vulnerability, and Disasters, 2d ed. (London: Routledge, 2004*

The Center for Disease Control (CDC) Social Vulnerability Index (SVI) is a place-based index, database, and mapping tool that helps users identify and characterize communities that are less able to prepare for, respond to, and recover from public health crises.[xv] U.S. Census data was used to determine the social vulnerability for each census tract in Queen Anne's County. The SVI ranks each tract on sixteen (16) social factors, including poverty, lack of vehicle access, and crowded housing, and groups them into four (4) related themes.

The CDC developed a Social Vulnerability Index (SVI) to help local jurisdictions determine their level of vulnerability based on (16) social factors that are routinely utilized to measure social vulnerability. These factors include:

Socioeconomic Status

1. Below Poverty
2. Unemployed
3. Income
4. Housing Cost Burden
5. No High School Diploma
6. No Health Insurance

Household Characteristics

1. Aged 65 or Older
2. Aged 17 or Younger
3. Civilian with a Disability
4. Single-Parent Households
5. English language proficiency

Racial and Ethnic Minority Status

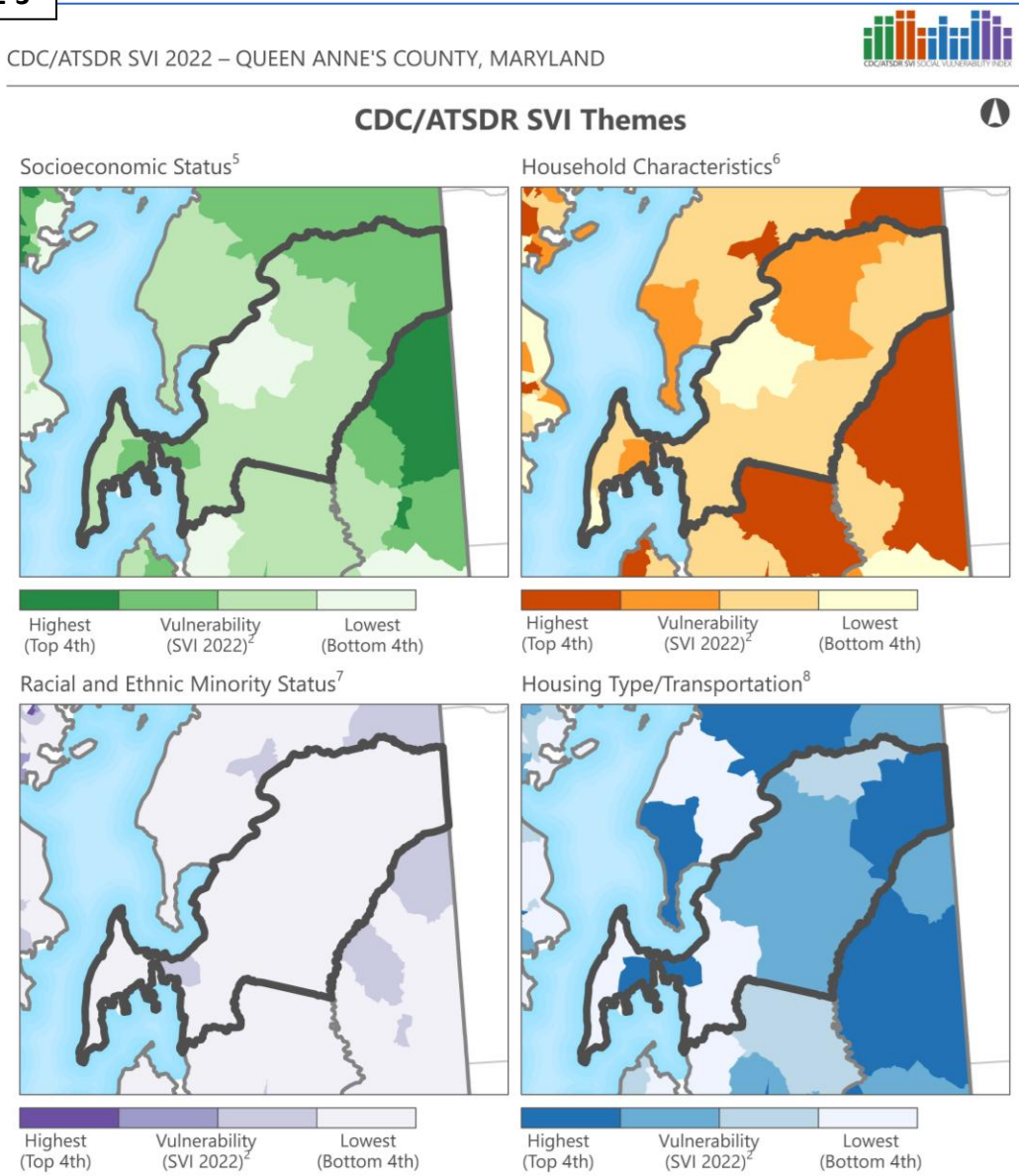
1. Hispanic or Latino (of any race)
2. Black and African American, Not Hispanic or Latino
3. American Indian and Alaska Native, Not Hispanic or Latino
4. Asian, Not Hispanic or Latino
5. Native Hawaiian and Other Pacific Islander, Not Hispanic or Latino
6. Two or More Races, Not Hispanic or Latino
7. Other Races, Not Hispanic or Latino)

Housing Type & Transportation

1. Multi-Unit Structures
2. Mobile Homes
3. Crowding
4. No Vehicle

The four (4) themes for Queen Anne's County are shown in Figure 2-3.

Figure 2-3

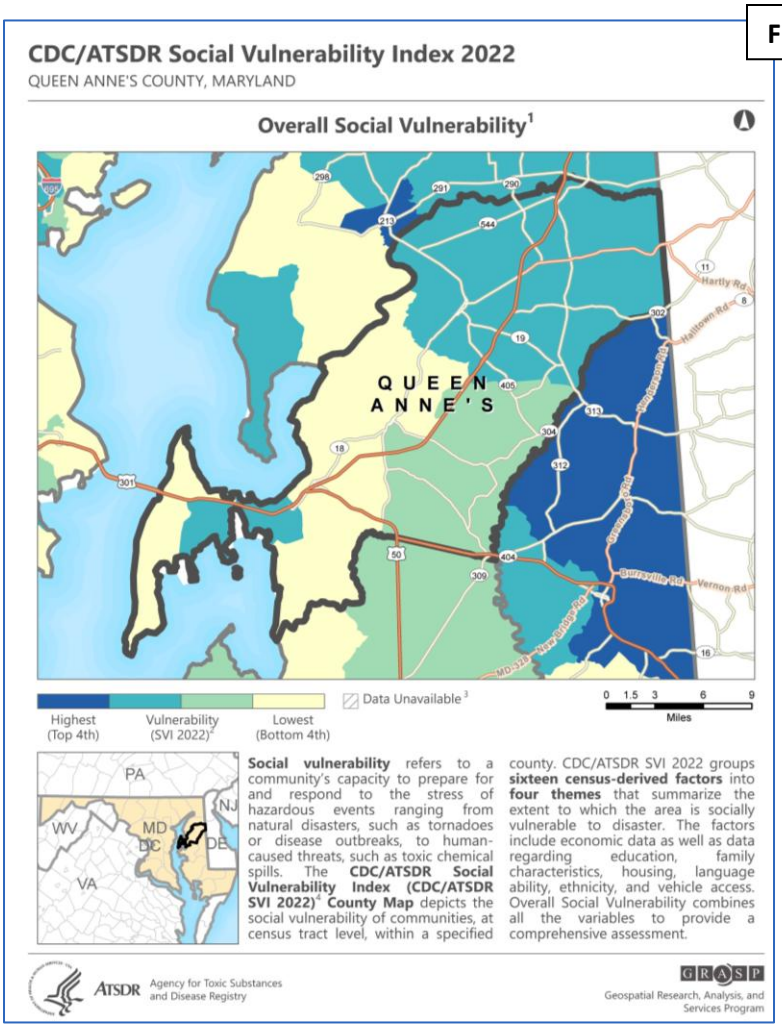


The SVI has been conducted for Queen Anne's County at the census tract level and is mapped on the following page. The darker blue census tracts in the overall map indicate areas of higher social vulnerability while the yellow tracts indicate relatively low social vulnerability. Measuring social vulnerability at the census tract level is meant to help guide further planning. Investigation at the neighborhood level is required to fully identify vulnerable populations.

As shown in Figure 2-4, there are no areas with the highest social vulnerability. Most of the Queen Anne's County unincorporated area is considered moderate-low (green) social vulnerability. Two (2) areas have a moderate social vulnerability (blue green) and are in the northeastern portion of the County and Kent Narrows/Gransonville. In addition, there are two (2) areas of the unincorporated portions of the county have low social vulnerability. These areas include a section of Kent Island, which includes Stevensville, and northwest of Centreville.

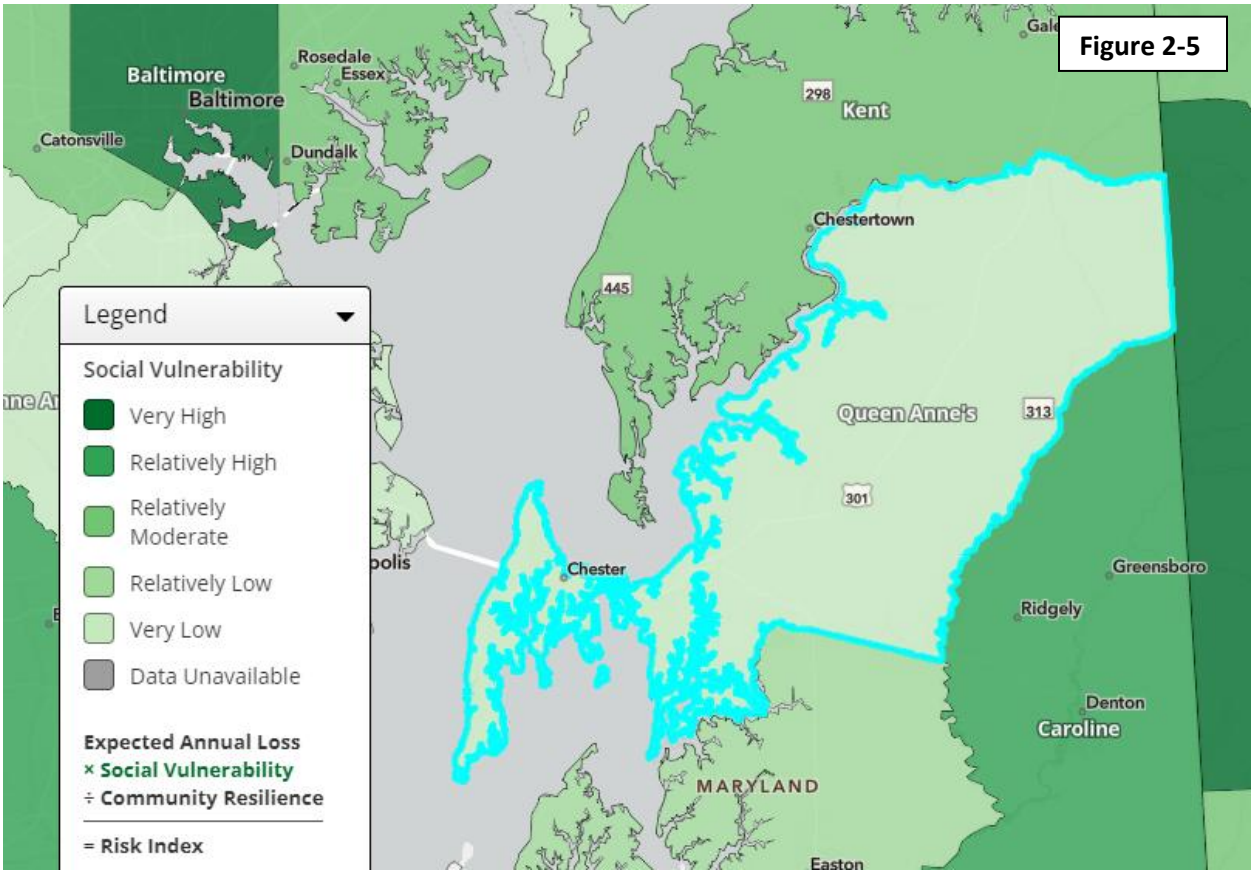
The Towns of Millington, Sudlersville, Barclay, and Templeville are within the moderate social vulnerability area. While the Towns of Queenstown, Church Hill, and Queen Anne have low (green) social vulnerability. The Town of Centerville is divided by two (2) census tracts that are considered low and moderate-low social vulnerbility.

Figure 2-4



The National Risk Index also provides social vulnerability for counties in the United States. As a consequence, enhancing risk component of the National Risk Index, a Social Vulnerability score and rating represent the relative level of a community's social vulnerability compared to all other communities at the same level. A community's Social Vulnerability score measures its national rank or percentile. A higher Social Vulnerability score results in a higher Risk Index score.[xvi]

The National Risk Index measured social vulnerability using the Social Vulnerability Index (SVI) published by the Centers for Disease Control (CDC). According to the National Risk Index, social groups in Queen Anne's County have a Very Low susceptibility to the adverse impacts of natural hazards when compared to the rest of the U.S. A total of 4% of U.S. counties have a lower Social Vulnerability, while 13% of counties in Maryland have a lower Social Vulnerability. Figure 2-5 depicts Queen Anne's County social vulnerability in relation to adjacent jurisdictions.



Source: National Risk Index – Queen Anne's County Social Vulnerability

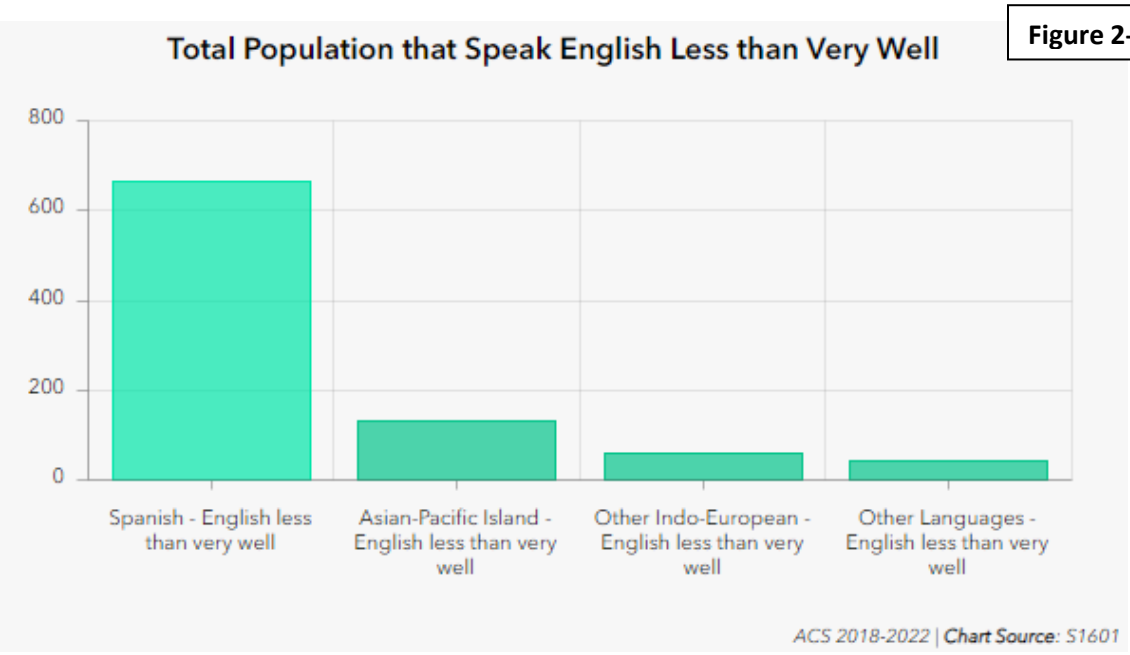
In February 2024, the US Census released the Community Resilience Estimates (CRE) program. This program provides an easily understood metric for how socially vulnerable every county and neighborhood (census tract) in the United States is to the impacts of disasters, such as hurricanes, floods, earthquakes, wildfires, and pandemics such as COVID-19. Modeled estimates are based on 10 resilience-related components of social vulnerability. These estimates are modeled using 2022 American Community Survey data (ACS) 1-year microdata, the Census Bureau's Population Estimates Program (PEP), and small area modeling techniques, and displays the number and percentage of residents living with 0 social vulnerability components (Low Social Vulnerability), 1-2 social vulnerability components (Moderate Social Vulnerability), and 3 or more social vulnerability components (High Social Vulnerability).[xvii]

Components of social vulnerability from the 2022 ACS include:

- Income to Poverty Ratio
- Single or Zero Caregiver Household
- Crowding
- Communication Barrier
- Households without Full-time, Year-round Employment
- Disability
- No Health Insurance
- Age 65+
- No Vehicle Access
- No Broadband Internet Access

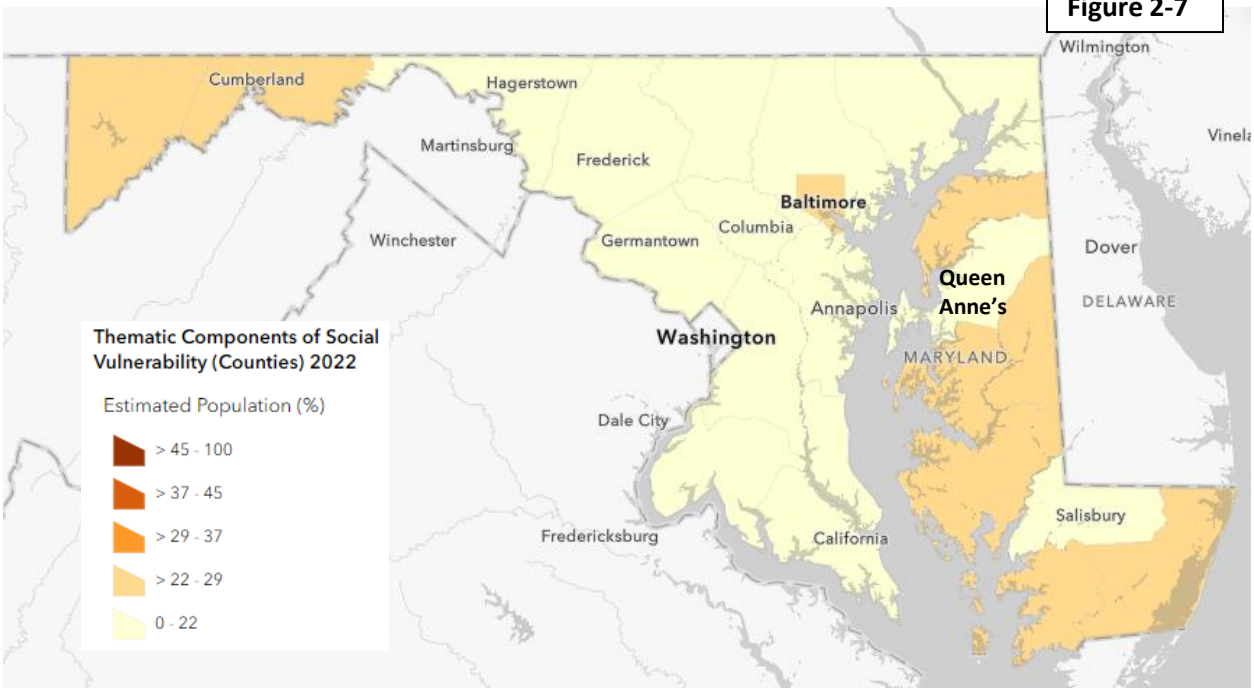
In reviewing 2022 Community Resilience Estimates for Equity, 7.9% of the households in Queen Anne's County are below poverty level, while 3.9% of the households in the County are without a vehicle. A total of 2,251 households (11.6%) are persons 65 years and older living alone. Households with a disability total 3,983 or 20.6%. According to the CRE, a minimum number of persons in the County speak English less than very well, Figure 2-6.

Figure 2-6



Regarding the categories of social vulnerability, 43.5% of Queen Anne's population does not have any components of social vulnerability, while 40.6% of the population has 1-2 social vulnerability components. Only 15.8% of the population has three (3) or more thematic components of social vulnerability. Figure 2-7 depicts Queen Anne's County with three (3) or more thematic components of social vulnerability compared to the rest of Maryland. Queen Anne's County is considered to have low social vulnerability.

Figure 2-7



Source: [2022 Community Resilience Estimates for Equity]

2.8 Development Trend Implications for Risk & Vulnerability

The following table summarizes these development trends for the County and its six (6) participating municipalities. It utilizes the definition of "changes in development" from the FEMA's Local Mitigation Planning Police Guide (2022c) and provides space for descriptions to briefly explain the reasoning for identified increases and decreases. The key for the table is as follows.

Changes have resulted in an Increase in vulnerability for the jurisdiction (>)

Changes have resulted in No Change in vulnerability for the jurisdiction (I)

There were no instances of a recognized decrease in vulnerability. The policy guide definitions appear in the table as follows.

Recent Development: For example, construction completed since the last plan was approved.

Potential Development: For example, development planned or under consideration by the jurisdiction.

General Trends: Conditions that may affect the risks and vulnerabilities of the jurisdictions (for example, climate change, declining populations or projected increases in population, or foreclosures).

Social Vulnerability: Shifts in the needs of underserved communities or gaps in social equity. This can also include changes in local policies, standards, codes, regulations, land use regulations, and other conditions.

TABLE 2-11: SUMMARY OF DEVELOPMENT TREND IMPLICATIONS FOR RISK AND VULNERABILITY

Development Change	Queen Anne's County	Barclay	Centreville	Church Hill	Millington	Queenstown	Sudlersville
FLOOD (RIVERINE, COASTAL, FLASH, URBAN FLOODING)							
Recent Development	>	|	|	|	|	|	|
Potential Development	>	|	>	|	>	|	|
General Trends	>	|	>	|	>	>	|
Social Vulnerability	>	|	>	|	>	>	|
TROPICAL SYSTEMS (HURRICANES, TROPICAL STORMS, NOR'EASTERS)							
Recent Development	>	|	|	|	|	|	|
Potential Development	>	|	|	|	>	|	|
General Trends	>	|	>	|	>	>	|
Social Vulnerability	>	|	>	|	>	>	|
SOIL MOVEMENT (COASTAL EROSION)							
Recent Development	Development trends have not caused increases or decreases in vulnerability to Soil Movement for the County or participating municipalities.						
Potential Development							
General Trends							
Social Vulnerability							
DROUGHT							
Recent Development	Development trends have not caused increases or decreases in vulnerability to drought for the County or participating municipalities.						
Potential Development							
General Trends							
Social Vulnerability							

Development Change	Queen Anne's County	Barclay	Centreville	Church Hill	Millington	Queenstown	Sudlersville
EXTREME TEMPERATURES							
Recent Development	Development trends have not caused increases or decreases in vulnerability to Extreme Temperatures for the County or participating municipalities.						
Potential Development							
General Trends							
Social Vulnerability							
SEVERE WINTER WEATHER							
Recent Development	Development trends have not caused increases or decreases in vulnerability to Severe Winter Weather for the County or participating municipalities.						
Potential Development							
General Trends							
Social Vulnerability							
SEA LEVEL CHANGE							
Recent Development	>	|	|	|	|	|	|
Potential Development	>	|	>	|	>	>	|
General Trends	>	|	>	|	>	>	|
Social Vulnerability	>	|	>	|	>	>	|
WILDFIRE							
Recent Development	|	|	|	|	|	|	|
Potential Development	|	|	|	|	|	|	|
General Trends	|	|	|	|	|	|	|
Social Vulnerability	|	|	|	|	|	|	|
THUNDERSTORMS (LIGHTNING, HAIL, STRONG WINDS)							
Recent Development	Development trends have not caused increases or decreases in vulnerability to thunderstorms for the County or participating municipalities.						
Potential Development							
General Trends							
Social Vulnerability							

Development Change	Queen Anne's County	Barclay	Centreville	Church Hill	Millington	Queenstown	Sudlersville
EARTHQUAKE							
Recent Development	Development trends have not caused increases or decreases in vulnerability to earthquake for the County or participating municipalities.						
Potential Development							
General Trends							
Social Vulnerability							
TORNADO							
Recent Development	|	|	|	|	|	|	|
Potential Development	>	>	>	>	>	>	>
General Trends	>	>	>	>	>	>	>
Social Vulnerability	>	>	>	>	>	>	>
DAM FAILURE							
Recent Development	Development trends have not caused increases or decreases in vulnerability to dam failure for the County or participating municipalities.						
Potential Development							
General Trends							
Social Vulnerability							

[i] 2022 Queen Anne's County Comprehensive Pla, Chapter 2, page 2-1
[ii] 2022 Queen Anne's County Comprehensive Pla, Chapter 2, page 2-2
[iii] 2022 Queen Anne's County Comprehensive Pla, Chapter 2, page 2-2
[iv] 2022 Queen Anne's County Comprehensive Pla, Chapter 2, page 2-4
[v] 2022 Queen Anne's County Comprehensive Pla, Chapter 2, page 10-7
[vi] 2022 Queen Anne's County Comprehensive Pla, Chapter 2, page 10-8
[vii] 2022 Queen Anne's County Comprehensive Pla, Chapter 2, page 10-10
[viii] 2022 Queen Anne's County Comprehensive Pla, Chapter 2, page 10-12
[ix] 2022 Queen Anne's County Comprehensive Pla, Chapter 2, page 10-14
[x] 2022 Queen Anne's County Comprehensive Pla, Chapter 2, page 10-118
[xi] FEMA – Critical Facility
[xii] FEMA – Community Lifeline
[xiii] FEMA – Community Lifeline
[xiv] National Risk Index – Social Vulnerability
[xv] CDC/ATSDR Social Vulnerability Index (SVI)
[xvi] FEMA National Risk Index – Social Vulnerability
[xvii] 2022 Community Resilience Estimates for Equity

Chapter 3 Flood Hazard



Source: Fox 5 News- "THANK YOU!" Soldiers help rescue driver in Kent Island

This chapter of the Plan describes an overall flood profile, risk, and vulnerability for Queen Anne's County and participating municipalities. During this plan update, new or changed plan components are shown in **bold blue** text below.

- 3.1 FLOOD
- 3.2 LOCATION AND GEOGRAPHIC EXTENT
  - 3.2.1 FEMA Flood Zones
  - **3.2.2 NFIP Requirements**
- 3.3 HISTORY OF PREVIOUS HAZARD EVENTS
- **3.4 PROBABILITY OF FUTURE OCCURRENCES**
- **3.5 EFFECTS OF FUTURE CONDITIONS**
- **3.6 CHANGES IN LAND DEVELOPMENT & FLOODING**
- 3.7 FLOOD VULNERABILITY
  - **3.7.1 Vulnerability and Impacts to People and the Environment**
  - **3.7.2 Vulnerability and Impacts Systems**
  - **3.7.3 Vulnerability and Impacts Community Activities**
  - **3.7.4 Vulnerability and Impacts to Structures**
  - **3.7.5 Vulnerability and Impacts to Historic Structures**

Note: The previous plan included hazard impact tables based on Emergency Management Accreditation Program requirements (EMAP). This information was expanded as part of this plan update within the vulnerability section.

Public Survey Results

- Survey participants indicated they were "somewhat concerned" with flood.
- 56% of the survey participants indicated they have been personally affected by flood.
- 14% of the survey participants have reduced flood risk to their home/business by floodproofing.

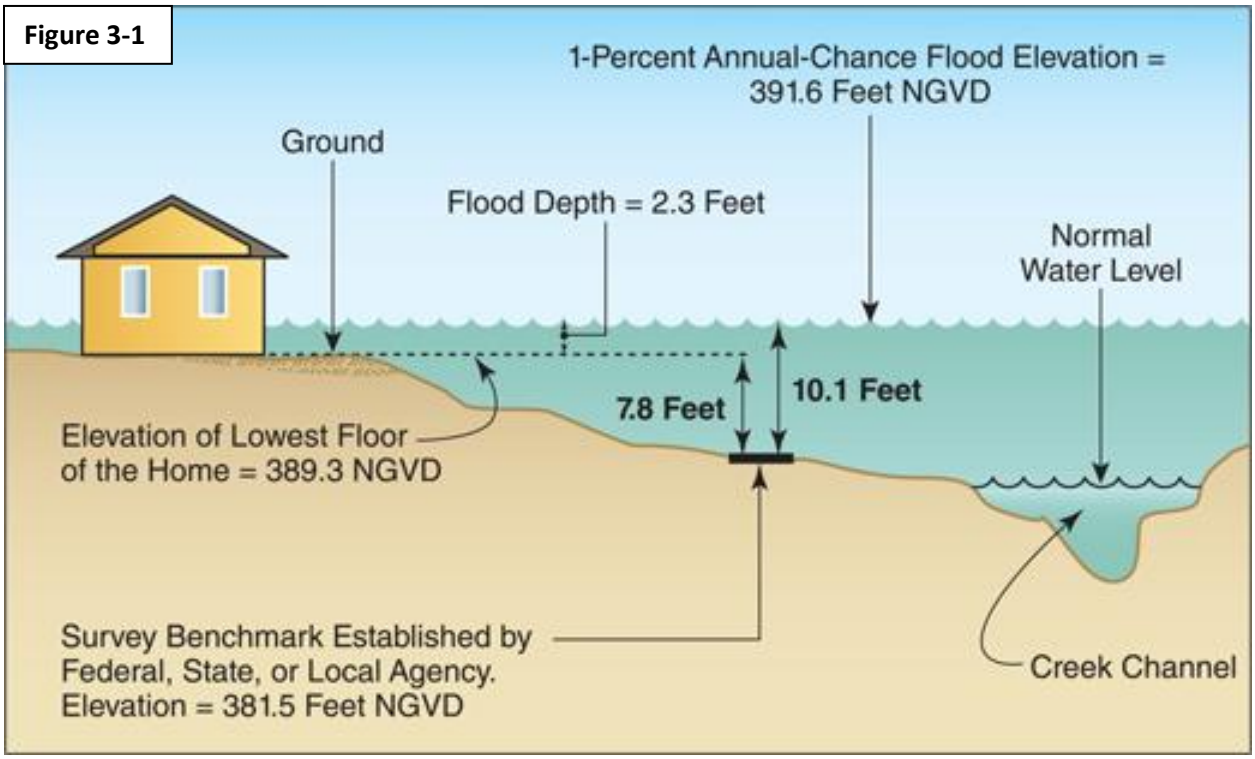
Chapter Updates

- All sections of the chapter were updated with new information, graphics, maps, and tables.
- The NFIP Requirement section is new to the chapter, formerly an appendix, and current NFIP data was included.
- Flood hazard history data was updated to include events that have occurred during this planning cycle.
- The flood vulnerability section in the previous 2019 Plan included impact tables, however the following subsections were added. The new subsections include narratives and were applicable, tables and maps.
  - Vulnerability and Impacts to People and the Environment,
  - Vulnerability and Impacts to Systems,
  - Vulnerability and Impacts to Community Activities,
  - Vulnerability and Impacts to Structures, and
  - Vulnerability and Impacts to Historic Resources.
- Social Equity and Vulnerability to the flood hazard was integrated into the chapter.
- Effects of Future Conditions is a new component included during the plan update.

3.1 Flood

A flood is a natural event for rivers and streams and occurs when a normally dry area is inundated with water. Excess water from snowmelt or rainfall accumulates and overflows onto the stream banks and adjacent floodplains. As illustrated in the figure below, floodplains are lowlands, adjacent to rivers, streams and creeks that are subject to recurring floods. Flash floods, usually resulting from heavy rains or rapid snowmelt, can flood areas not typically subject to flooding, including urban areas. Extreme cold temperatures can cause streams and rivers to freeze, causing ice jams and creating flood conditions.

Figure 3-1



Source: Image by FEMA via FEMA P-312. https://www.reducefloodrisk.org/flood-facts/

Floods are considered hazards when people and property are affected. Nationwide, hundreds of floods occur each year, making it one of the most common hazards in all 50 states and U.S. territories. In Maryland, flooding occurs commonly and can occur during any season of the year from a variety of sources. Most injuries and deaths from flooding happen when people are swept away by flood currents and most property damage results from inundation by sediment-filled water. Fast-moving water can wash buildings off their foundations and sweep vehicles downstream. Pipelines, bridges, and other infrastructure can be damaged when high water combines with flood debris. Basement flooding can cause extensive damage. Flooding can cause extensive damage to crop lands and bring about the loss of livestock. Several factors determine

Figure 3-2



Photo Source: https://www.qac.org/CivicAlerts.aspx?AID=641&ARC=811

the severity of floods, including rainfall intensity and duration, topography, and ground cover.

Queen Anne's County is affected by each of the flood types listed below. According to the 2014 Queen Anne's County Flood Insurance Study (FIS), the low lying, relatively undisturbed topography, high seasonal water tables, poor drainage and high runoff characteristics of the soils combine to provide a high flooding potential. When heavy rainfall and a high river discharge combine with storm tides, low lying areas adjacent to rivers and estuaries become inundated with saltwater.

River floodplains and coastal areas are the most susceptible to flooding, however, it is possible for flooding to occur in areas with unusually long periods of heavy rainfall. The (4) four types of flooding included within the flood hazard profile are described below.	
Riverine Flooding:	Originates from a body of water, typically a river, creek, or stream, as water levels rise onto normally dry land. Water from snowmelt, rainfall, freezing streams, ice flows, or a combination thereof, causes the river or stream to overflow its banks into adjacent floodplains. Winter flooding usually occurs when ice in the rivers creates dams or streams freeze from the bottom up during extreme cold spells. Spring flooding is usually the direct result of melting winter snowpacks, heavy spring rains, or a combination of the two.
Flash Flooding:	Occur anywhere when a large volume of water flows or melts over a short time period, usually from slow moving thunderstorms or rapid snowmelt. Because of the localized nature of flash floods, clear definitions of hazard areas do not exist. These types of floods often occur rapidly with significant impacts. Rapidly moving water, only a few inches deep can lift people off their feet, and only a depth of a foot or two, is needed to sweep cars away. Most flood deaths result from flash floods.
Urban Flooding:	The result of development and the ground's decreased ability to absorb excess water without adequate drainage systems in place. Typically, this type of flooding occurs when land uses change from fields or woodlands to roads and parking lots. Urbanization can increase runoff two to six times more than natural terrain. The flooding of developed areas may occur when the amount of water generated from rainfall and runoff exceeds a storm water system's capability to remove it.
Coastal Flooding:	Coastal flooding occurs when normally dry, low-lying land is flooded by seawater. The extent of coastal flooding is a function of the elevation inland floodwaters penetrate which is controlled by the topography of the coastal land exposed to flooding.

3.2 Location and Geographic Extent

Major drainage basins in the county provide drainage directly into the Chesapeake Bay. The northwestern portion of the county drains into the Chester River which flows west to the Chesapeake Bay. The eastern portion of the county drains into Tuckahoe Creek, a major tributary of the Choptank River. The southwestern portion of the county drains into the Wye River and Eastern Bay.[i]

The tidal surge affects the entire coastline of Chesapeake Bay and Eastern Bay including Crab Alley Bay, Prospect Bay, Wye River, and Wye East River and approximately 41 miles along Chester River from its mouth to Crumpton. The coastline of the Chesapeake Bay and Eastern Bay is more prone to damaging wave action during high wind events due to the significant fetch over which winds can operate. From the Chester River mouth further upstream, the fetch considerably shortens to be within the river channel. Coastal flooding and flooding on much of the Chester River are caused by high tides on the bay. Flooding in the interior of the county is caused by a combination of high river flows on the various streams and high tides from the Chesapeake Bay and the Chester River moving up the creeks.

The 2014 Queen Anne's County Flood Insurance Study discussed floodplains and flood issues for the following municipalities: Barclay, Centreville, Church Hill, Queen Anne, Queenstown, and Sudlersville. The Town of Millington was included 2014 Kent County Flood Insurance Study, while the Town of Templeville was discussed in the 2015 Caroline County Flood Insurance Study. Please note that as of the effective date of the Caroline County FIS and Queen Anne's County FIS, the Towns of Barclay, Sudlersville, and Templeville have no special flood hazard areas identified. In addition, the Town of Templeville participated in the Caroline County Hazard Mitigation Plan and the Town of Queen Anne participated in the Talbot County Hazard Mitigation Plan. Therefore, risk and vulnerability assessments were not included in this Chapter for these two (2) Towns.

The Town of Church Hills's southwestern portion of town limits intersections with Southeast Creek which drains into the Chester River. The town is subject to riverine flooding and flash flooding. Runoff from the Town of Centreville flows into the Corsica River which in turn flows into the Chester River. Gravel Run and Mill Stream Branch intersect the Town, subjecting it to riverine, flash, and coastal flooding. The Town of Queenstown drains into the Queenstown Creek and Little Queenstown Creek which flows west to the Chester River. Considering the Town is in close proximity to Chester River, it is exposed to coastal flooding. The Chester River is formed by the junction of Cypress Branch and Andover Branch, just upstream of Millington. The Town of Millington is impacted by coastal and riverine flooding.

The National Flood Insurance Program (NFIP) produces Flood Insurance Rate Maps (FIRM'S) nationwide. The FIRM is the official map of a community on which Federal Emergency Management Agency (FEMA) has delineated both the special hazard areas and the risk premium zones applicable to the community. The NFIP underwrites flood insurance coverage using the information from the FIRM and the associated Flood Insurance Study (FIS). Communities that adopt and enforce floodplain regulations that meet or exceed NFIP criteria are eligible for NFIP flood insurance. Buildings built in accordance with these regulations have a lower risk of flooding and can be insured at lower rates.

FEMA maps can be used to identify the expected spatial extent and elevation of flooding from a 1% and 0.2% annual chance flood event. Five of the eight municipalities in the County were determined to have special flood hazard areas (SFHAs), except for Barclay, Sudlersville and Templeville. An example of the information available through the FEMA Map Service Center can be viewed below.

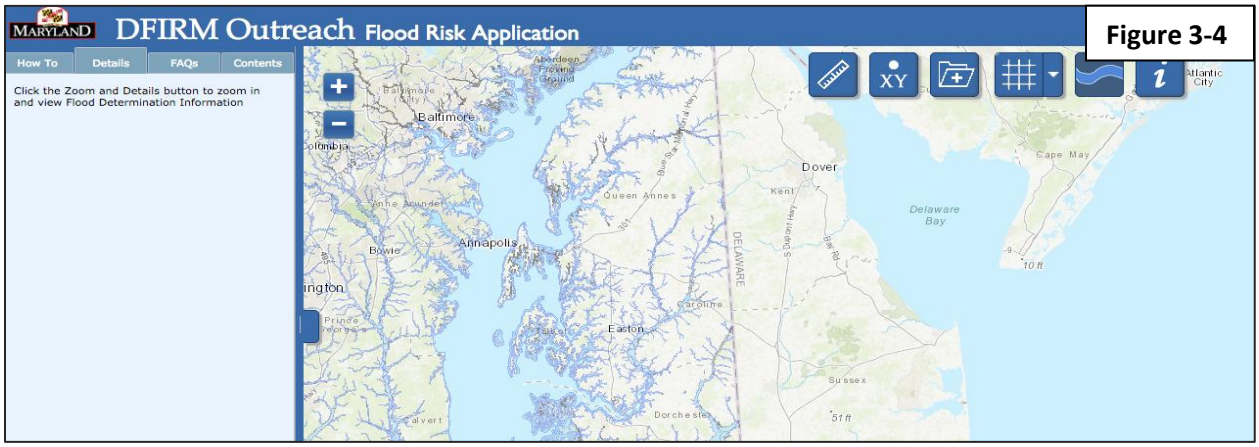
Figure 3-3



Source: FEMA Flood Map Service Center: Town of Centreville

An additional source of information for FEMA DFIRM's is through the Maryland Department of the Environment website at: http://www.mdfloodmaps.net.
Source: http://www.mdfloodmaps.net/dfirmimap/

Figure 3-4



3.2.1 FEMA FLOOD ZONES

Queen Anne's County is prone to various forms of flooding, therefore, the Digital Flood Insurance Rate Map (DFIRM) Database published by the Federal Emergency Management Agency (FEMA) for the county was utilized to depict flood risk areas. The DFIRM contains flood inundation areas that are depicted as flood zones. Flood zones include Zones A, AE, AO, VE, and X (shaded and un-shaded).

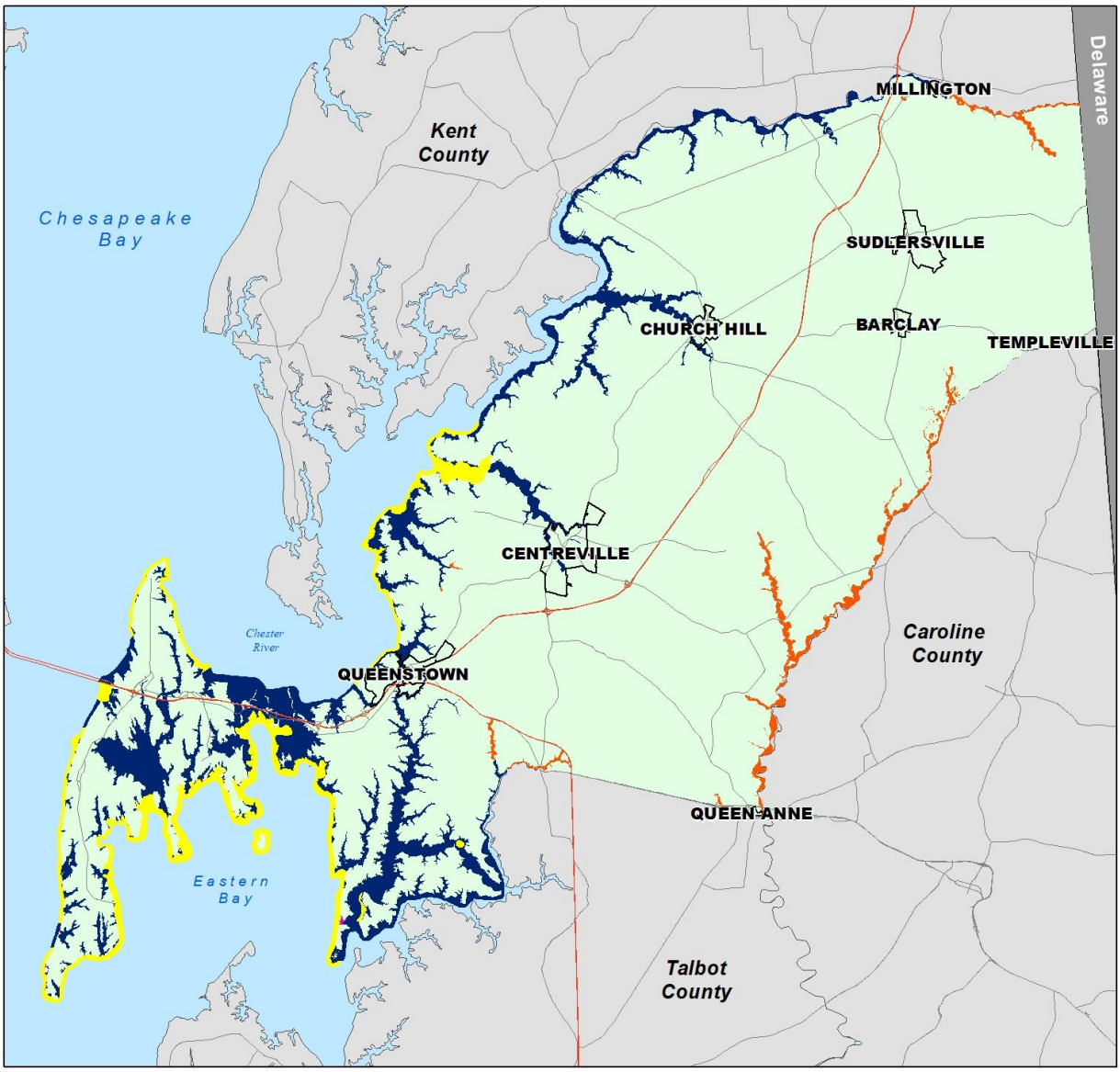
TABLE 3-1: FEMA FLOOD ZONES		
FLOOD ZONE		**DESCRIPTION**
SFHA-HIGH RISK AREAS		
1% Annual Chance Flood Event	A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
	AE	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses

TABLE 3-1: FEMA FLOOD ZONES		
FLOOD ZONE		**DESCRIPTION**
1% Annual Chance Flood Event cont.		are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
	AO	River or stream flood hazard area, and areas with a 1-percent or greater chance of swallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1-3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage.
	VE	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
MODERATE RISK AREAS		
0.2% Annual Chance Flood Event	X (Shaded) 500 yr.	Moderate flood area(s), shaded area(s) shown on FIRM, are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood.
MINIMUM RISK AREAS		
X (Unshaded)		The areas of minimal flood hazard, which are areas outside the SFHA and higher than the elevation of the 0.2 percent-annual-chance flood, are labeled Zone X (un-shaded).

Source: Federal Emergency Management Agency

Map 3-1 depicts FEMA Flood Zones countywide, while Maps 3-2 and 3-3 depicts municipal flood zones, for those municipalities that include FEMA mapped flood areas and those that do not.

FEMA Flood Zones



Legend

FEMA Flood Zones

- Zone A
- Zone AE
- Zone AO
- Zone VE
- Zone X

- Municipalities
- Maryland Routes
- US Routes

Data Sources:

FEMA DFIRM:
- Effective Date: 11/5/2014

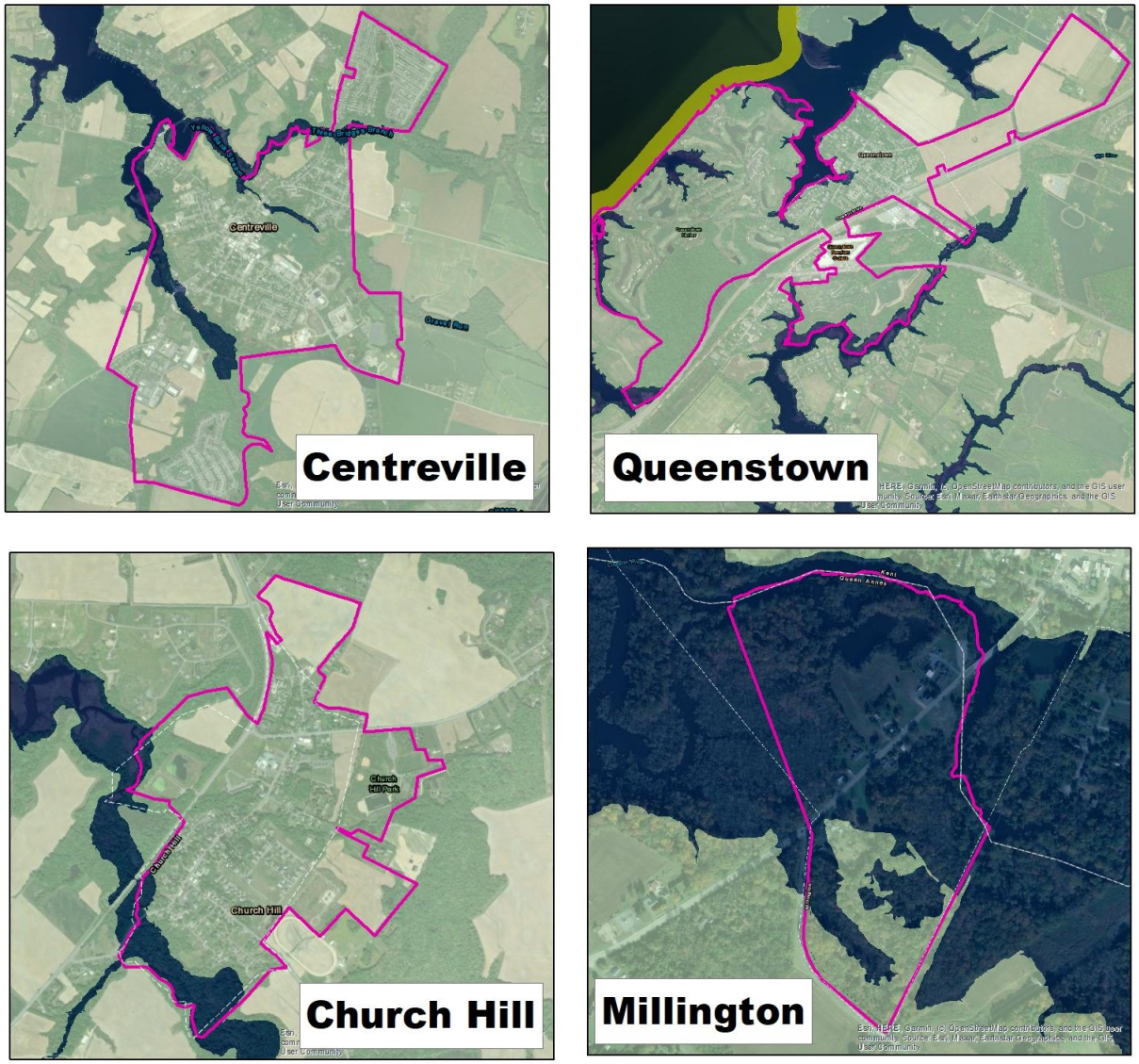
Queen Anne's County IT:
- GIS-Mapping Department
- GIS Data Download

N

0 2 4 8 Miles

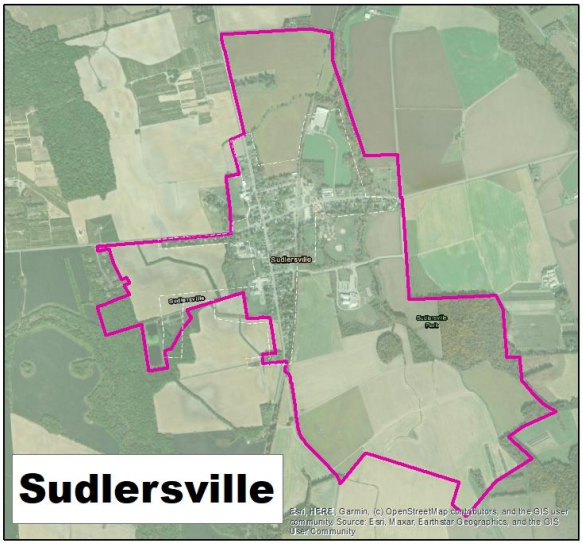
Map 3-1
FEMA FLOOD ZONES - COUNTY

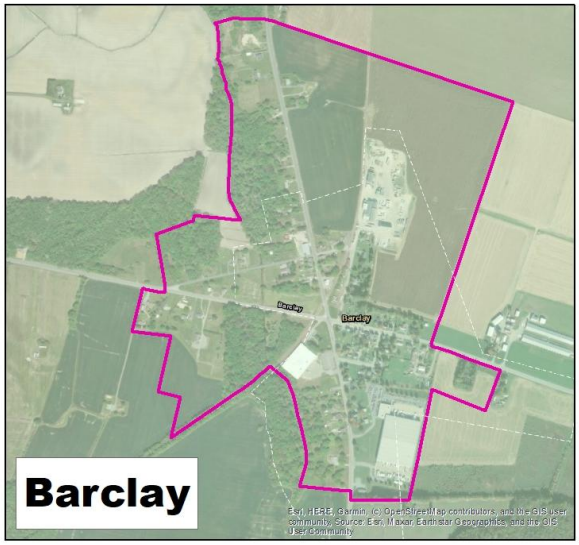
FEMA Flood Zones - Municipalities

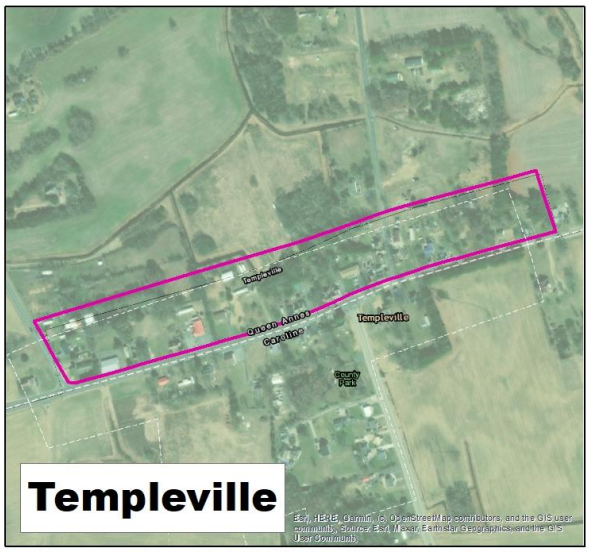


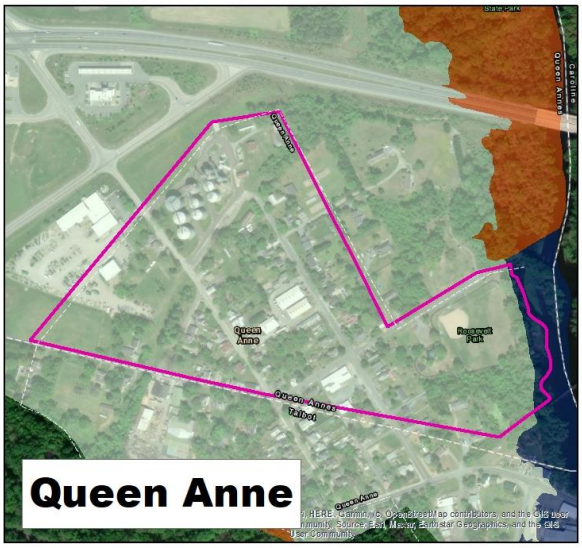
Map 3-2
FEMA FLOOD ZONES – MUNICIPALITIES

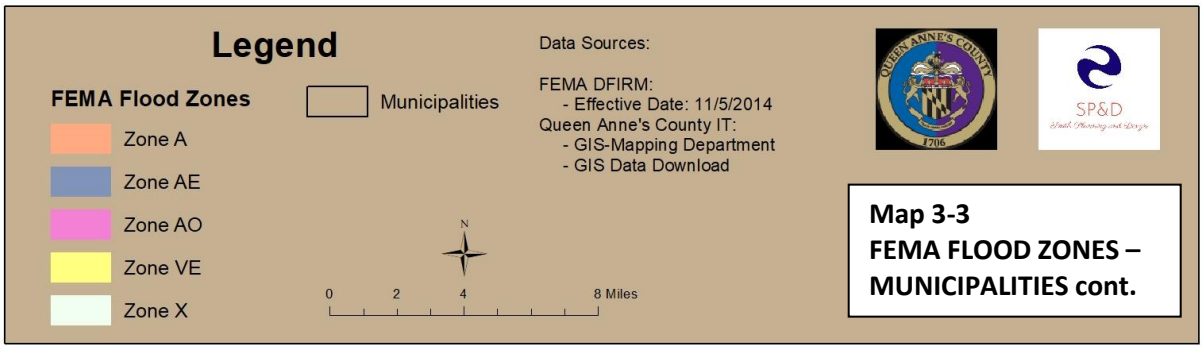
FEMA Flood Zones - Municipalities











Map 3-3
FEMA FLOOD ZONES – MUNICIPALITIES cont.

3.2.2 NFIP REQUIREMENTS

Plan Update Note

Previously Repetitive Loss and Severe Repetitive Loss Properties were addressed in Appendix A NFIP & CRS in the 2019 HMP. For this plan update, NFIP information has been brought forward into this chapter and updated with current data.

Communities can voluntarily participate in the National Flood Insurance Program (NFIP) by adopting and enforcing floodplain management ordinances to reduce future flood damage. By doing this, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in these communities. Queen Anne's County along with six municipalities participate in the NFIP. Both the Town of Sudlersville and Town of Templeville do not participate. However, as indicated on the data table below, neither of the towns include FEMA mapped flood areas. All the participating communities have updated floodplain ordinances.

TABLE 3-2: QUEEN ANNE'S COUNTY NFIP STATUS

COMMUNITY NAME	NFIP STATUS	SPECIAL FLOOD HAZARD AREA	COASTAL/ TIDAL	COASTAL BARRIER RESOURCE SYSTEM	UPDATED ORDINANCE	FREEBOARD
Town of Barclay	Participating	No	No	No	Yes/NSFHA	0
Town of Centreville	Participating	Yes	Yes	No	Yes/Tidal	2
Town of Church Hill	Participating	Yes	Yes	No	Yes/Tidal	2
Town of Millington	Participating	Yes	No	No	Yes/Nontidal	2
Town of Queen Anne	Participating	Yes	No	No	Yes/Nontidal	2
Town of Queenstown	Participating	Yes	Yes	No	Yes/Full MD Model Ordinance	2
Town of Sudlersville	Not Participating	No	No	No	No	0
Town of Templeville	Not Participating	No	No	No	No	0
Queen Anne's County (Unincorporated Area)	Participating	Yes	Yes	Yes CBRS- *Protection Area Restricted Development*	Yes/Full MD Model Ordinance	2

Source: Maryland Department of the Environment, Stormwater, Dam Safety, and Flood Management Program, data obtained August 7, 2024.

Table 3-3 provides current NFIP Insurance Report information for Queen Anne's County including

municipalities. As shown in the Table, the Town of Templeville is the only town that does not have any NFIP insured properties. There are no floodplains located within the current corporate boundaries of the Templeville and therefore it is not subjected to flooding. The Towns of Barclay and Sudlersville corporate limits do not contain any floodplains, however each town now has one flood insurance policy. In 2019, the Town of Millington did not have any flood insurance policies. According to the 2024 NFIP Policy & Claims Statistic, there are now eleven (11) policies within the Town. The Towns of Centreville and Church Hill had a minimal increase in policies, while the Town of Queenstown had a significant increase from 19 policies to 66. Policies in the unincorporated areas of the County decreased by about 1,000. The data within Table 3-3, is from FEMA's National Flood Insurance Program (NFIP), reflective of policies purchased through federally subsidized flood insurance, which does not include private flood insurance policies. In 2020, the Federal Housing Administration (FHA) proposed a rule that would allow homeowners to purchase private flood insurance for FHA-insured mortgages. This change allowed homeowners to choose between private flood insurance and the National Flood Insurance Program (NFIP). This change could account for the decrease in policies between 2019 and 2024, shown on the table. Private flood insurance data is not publicly available, and therefore, cannot be evaluated, which results in speculation specific to the decrease in the total number of flood insurance policies.

TABLE 3-3: QUEEN ANNE'S COUNTY NFIP INSURANCE REPORT

COMMUNITY NAME	2019 NUMBER OF POLICIES	2024 NUMBER OF POLICIES	TOTAL PREMIUM/ TOTAL PAID	TOTAL CLAIMS SINCE 1978	TOTAL PAID SINCE 1978
Town of Barclay	0	1	674	0	0
Town of Centreville	24	36	18,437	22	258,850.11
Town of Church Hill	1	4	2,108	0	0
Town of Millington	0	11	5,632	16	383,455.63
Town of Queen Anne	1	1	626	4	41,765.24
Town of Queenstown	19	66	31,174	26	392,555.13
Town of Sudlersville	0	1	660	0	0
Town of Templeville	0	0	0	0	0
Queen Anne's County (Unincorporated Area)	2,279	1,249	687,169	970	13,959,144.23

Source: FEMA Policy & Claim Statistics for Flood Insurance, as of June 21, 2024.

Note: Flood insurance is available to anyone in the County and even those structures outside of the 1% annual chance flood hazard area. Therefore, in some cases, the number of policies includes structures that are located outside of the 1% annual chance flood hazard area.

Considering the amount of flood insurance policies and the number of claims that have been reported, identifying areas of repetitive loss within a community is a good indicator to utilize in determining areas of high flood damage vulnerability. While flood damage is not necessarily limited to these areas, repetitive loss data provides location indicators for areas where structures are experiencing recurring and costly flooding damage.

FEMA defines a **repetitive loss property** as:

- A structure covered under an NFIP flood insurance policy that (1) has incurred flood-related damage on two occasions, in which the cost of repair, on average, equaled or exceeded 25% of the value of the structure at the time of each such flood event; and (2) at the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage. (44 CFR § 77.2(i))
- FEMA defines a severe **repetitive loss property** as:
  A structure that is covered under an NFIP flood insurance policy and has incurred flood-related damage (1) for which four or more separate claims have been made under flood insurance coverage, with the amount of each claim (including building and contents payments) exceeding $5,000 and with the cumulative amount of such claims payments exceeding $20,000; or (2) for which at least two separate flood insurance claims payments (building payments only) have been made, with cumulative amount of such claims exceeding the value of the insured structure. (44 CFR § 77.2(j))

Data from the previous 2019 plan stated, as of August 2018, there were thirty-five (35) repetitive loss properties listed located in Queen Anne's County. These properties consist of two (2) commercial, one (1) condo, and thirty-two (32) single-family structures. All properties were located within the unincorporated portions of the County, except for one (1) repetitive loss property that was located within the Town of Centreville.

As of June 21, 2024, thirty-five (35) repetitive loss properties were listed in Queen Anne's County. These properties consist of one (1) commercial, one (1) condo, and thirty-three (33) single-family structures. There are now four (4) severe repetitive loss properties located within Queen Anne's County. The severe repetitive loss properties consist of one (1) commercial and three (3) single family structures. All severe repetitive and repetitive loss properties are located in the unincorporated areas of the County, with the exception of one (1) repetitive loss property located in the Town of Centreville.

The Community Rating System (CRS) can be an important part of any town, city, or entire County with floodplains. According to FEMA, the CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum National Flood Insurance Program (NFIP) requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS:

- Reduce flood losses.
- Facilitate accurate insurance rating.
- Promote the awareness of flood insurance.

For CRS participating communities, flood insurance premium rates are discounted in increments of five percent. For example, a Class 1 community would receive a forty-five percent premium discount; while a Class 9 would receive a five percent discount (a Class 10 is not participating in the CRS and does not receive discounts). The CRS classes for local communities are based on 18 creditable activities, organized under four categories:

- Public Information
- Mapping and Regulations
- Flood Damage Reduction
- Flood Preparedness

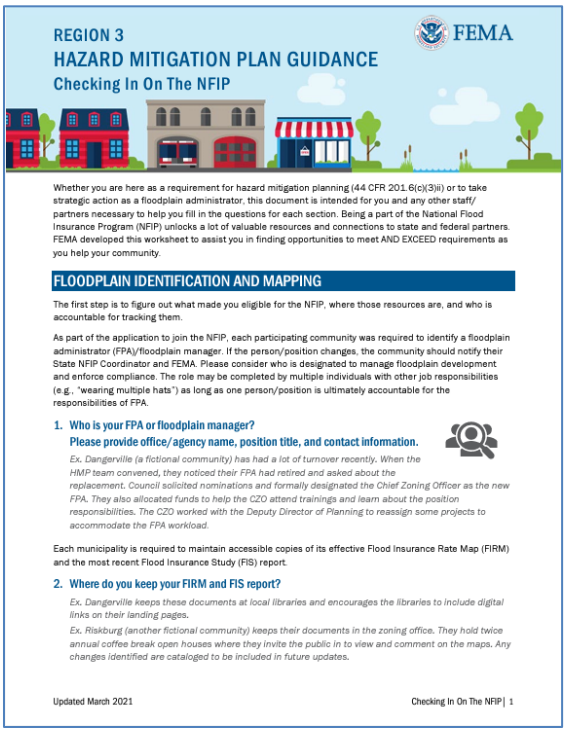
Currently, Queen Anne's has a CRS rating of a Class 10. Queen Anne's County residents do not benefit from a flood insurance discount. Completion of a CRS application detailing floodplain management and mitigation efforts could result in a rating adjustment. In addition, undertaking mitigation activities and projects, as specified in this planning document will give Queen Anne's County the opportunity to lower their CRS rating by added credit points.

Plan Update Note

As part of the plan update, FEMA's NFIP Worksheets were completed and discussed in this section. The completed worksheets have been included in Chapter 15 Community Capabilities.

On June 25, 2024, a small group topical meeting was held with Queen Anne's County Floodplain Manager and the Department of Emergency Services. During this meeting the FEMA Region 3 Questionnaire – Checking in on the NFIP questionnaire was discussed. The three areas of focus for this meeting and those identified on FEMA Region 3 Questionnaire – Checking in on the NFIP included:

- Floodplain Identification & Mapping,
- Floodplain Management, and
- Floodplain Insurance.



REGION 3
HAZARD MITIGATION PLAN GUIDANCE
Checking In On The NFIP

FEMA

Whether you are here as a requirement for hazard mitigation planning (44 CFR 201.6(c)(3)ii) or to take strategic action as a floodplain administrator, this document is intended for you and any other staff/ partners necessary to help you fill in the questions for each section. Being a part of the National Flood Insurance Program (NFIP) unlocks a lot of valuable resources and connections to state and federal partners. FEMA developed this worksheet to assist you in finding opportunities to meet AND EXCEED requirements as you help your community.

FLOODPLAIN IDENTIFICATION AND MAPPING

The first step is to figure out what made you eligible for the NFIP, where those resources are, and who is accountable for tracking them.

As part of the application to join the NFIP, each participating community was required to identify a floodplain administrator (FPA)/floodplain manager. If the person/position changes, the community should notify their State NFIP Coordinator and FEMA. Please consider who is designated to manage floodplain development and enforce compliance. The role may be completed by multiple individuals with other job responsibilities (e.g., "wearing multiple hats") as long as one person/position is ultimately accountable for the responsibilities of FPA.

1. Who is your FPA or floodplain manager?
   Please provide office/agency name, position title, and contact information.
   Ex. Dangerville (a fictional community) has had a lot of turnover recently. When the HMP team convened, they noticed their FPA had retired and asked about the replacement. Council solicited nominations and formally designated the Chief Zoning Officer as the new FPA. They also allocated funds to help the CZO attend trainings and learn about the position responsibilities. The CZO worked with the Deputy Director of Planning to reassign some projects to accommodate the FPA workload.

Each municipality is required to maintain accessible copies of its effective Flood Insurance Rate Map (FIRM) and the most recent Flood Insurance Study (FIS) report.

2. Where do you keep your FIRM and FIS report?
   Ex. Dangerville keeps these documents at local libraries and encourages the libraries to include digital links on their landing pages.
   Ex. Riskburg (another fictional community) keeps their documents in the zoning office. They hold twice annual coffee break open houses where they invite the public in to view and comment on the maps. Any changes identified are cataloged to be included in future updates.

Updated March 2021 Checking In On The NFIP| 1

As a result of the questionnaire review, gaps and recommendations were identified. This information was used to develop new mitigation action items for inclusion in the 2025 Plan Update. Two examples include:

- Integrate the County's Property Viewer on the Floodplain webpage.
- Provide the Queen Anne's County Flood Insurance Study on the Floodplain webpage.
- Conduct flood prevention outreach to property owners in and around the Special Flood Hazard Area.

The questionnaire asks the jurisdiction about the community rating system and if a Community Assistance Visit was conducted. The Floodplain Manager indicated that the County submitted a Letter of Interest for the Community Rating Program. This initiated a Community Assistance Visit (CAV) in 2018. The County is currently working on the 2020 CAV. The County is now addressing the remaining 8 corrective actions out of the 100 that were required. Once all corrective actions are satisfied, the County will proceed with the CRS application.

Municipal Community Assistance Visits (CAVs) are conducted for participating municipalities. In addition, the Maryland Department of the Environment, Stormwater, Dam Safety, and Flood Management Program, through FEMA's Community Assistance Programs also completes Community Assistance Contact (CAC) reports.

TABLE 3-4: MUNICIPAL COMMUNITY ASSISTANCE VISITS OR CONTACTS (CAVS OR CACS)	
PARTICIPATING NFIP COMMUNITY NAME	**MOST RECENCT CAV OR CAC DATE**
Town of Barclay	None- No SFHA
Town of Centreville	CAC- 6/10/2019
Town of Church Hill	CAC 3/16/2016
Town of Millington	CAC 4/12/2018
Town of Queen Anne	CAC 2/24/2022
Town of Queenstown	CAV 11/12/2020
Town of Sudlersville	None- No SFHA

3.3 History of Previous Hazard Events

According to the Queen Anne's County website, major floods in the Queen Anne's County area have occurred in 1933, 1954, 1955, 1960, 1972, 1999, 2003, 2008 and 2011. Few detailed records of historical flood damage are available, narratives for historic floods have been provided below. However, within the next section entitled "Flood Risk Data," available information gathered from the National Centers for Environmental Information for the time period of 1996 to 2024 has been presented, which includes flood event types, injuries, deaths, damages, and frequency. Both county-wide and municipal specific information is included.

August 1933
In August 1933, the "Great Storm of 1933" lashed the Eastern Shore of Maryland. Many trees and limbs were downed because of high winds. Flooding occurred, but no specific reports were available.

October 1954
In late October 1954, Hurricane Hazel caused extensive damage to Queen Anne's County. Damage estimates were placed at approximately $500,000. One hundred people were evacuated from Kent Narrows because of high storm tides. The storm tides in the **Towns of Centreville** and **Queenstown** were reported as the highest in history. The storm tide flooded the office of Valiants Fertilizer in Centreville. Two 18,000-gallon, empty oil tanks were overturned at the Thocar Oil Company by the high tide. Many boats were washed ashore by the high winds and tide.

August 1955
During August 1955, Hurricane Connie struck Queen Anne's County. Advance warning made it possible for residents to prepare their property against high water, drastically reducing property damages in comparison with Hurricane Hazel.

September 1960
In mid-September 1960, Hurricane Donna brought heavy rainfall which was responsible for extensive road washouts and flooding in the **Towns of Centreville**, **Queen Anne**, and **Queenstown**. The major road closings in the vicinity were: Route 213 just south of Church Hill, Route 305 at Tanyard Branch, Route 544 near Crumpton at Red Lion Branch, Route 213 over Mill Stream Branch in the **Town of Centreville**,

and Route 213 over Island Creek, north of Centreville, when a 31-foot crack in the concrete bridge occurred.

August 3-5, 1967
On August 3-5, 1967, locally heavy thunderstorms passed through Queen Anne's County and the **Town of Queen Anne**, resulting in moderate flooding. The greatest amount of rain recorded from those storms was 9.15 inches in 6 hours at nearby Goldsboro. Water was reportedly one foot deep in the main office of K.M.C. Foods in the **Town of Queen Anne**. Alternate Route 404 at the **Town of Queen Anne** was completely washed away leaving a gap 12 feet deep and 75 feet wide.

June 1972
Tropical Storm Agnes lashed the Chesapeake Bay region in late June 1972. The northern part of Queen Anne's County and the **Towns of Centreville**, **Queen Anne**, and **Queenstown** were the areas most affected by the storm. High water in the vicinity of **Centreville**, **Queen Anne**, and **Queenstown** closed roads on: Route 213 north of Church Hill, Route 19 between Church Hill and Route 301, Route 300 between Church Hill and Sudlersville and the Route 313 Bridge at the Town of Millington.
The high levels of freshwater and high coliform concentrations in the Bay forced state officials to place a ban on the harvesting of shellfish. This caused a severe economic hardship for Queen Anne's County watermen.

September 16, 1999
Hurricane Floyd battered the Maryland Eastern Shore on September 16, 1999, and brought with it torrential rains and damaging winds. The hurricane caused widespread flash flooding as storm totals averaged around ten inches, most of which fell in a twelve-hour period from the early morning through the afternoon on the 16th. The torrential downpours associated with Hurricane Floyd exceeded the 1-percent annual chance flood return period for most of the Eastern Shore. Hundreds of roads and bridges were closed. Hardest hit were homes in Sandfield just outside of Millington. The only railroad service into Queen Anne's County was suspended after flooding along the Chester River crippled the railroad's trestles. There were voluntary evacuations in low-lying areas and in some mobile home parks. Many roads were also closed on Miller's Island.

Queen Anne's County was one of the harder hit counties on the Eastern Shore by Floyd. Water rescues started at 10 a.m. EDT and continued all day. About 75 persons were evacuated to shelters. Fifty-five roads were closed during the height of the storm including major roadways such as U.S. Route 50 and Maryland State Routes 213, 291, 300, 304 and 313. Two 29-year-old men were injured when their pickup truck fell into a 30 foot by 30-foot hole on MD 304 near Centreville. Thirty-four roads were closed by either heavy flooding or minor to moderate damage. Twenty bridges or culverts were washed out or had substantial damage. All roads that were not badly damaged were reopened Saturday afternoon the 18th. All county roads were reopened by the 21st although eight bridges and three state roads were still closed. The number of bridge closings was down to six on October 2nd. In addition, fallen trees blocked about 70 roads throughout the county. Most of the damage occurred in the northern half of the county. The worst flood related property damage occurred on the **Queen Anne's side of Millington** along the Chester River. Forty homes were damaged, 15 of them in Sandtown had six-foot-high water marks on the first floor. Ten homes and several businesses along the Tuckahoe Creek in **Queen Anne** were badly flooded. Some persons were still displaced on October 9th. Other townships that also were hit hard by flooding were **Centreville**, and **Church Hill**. Another effect of Floyd was a boom in the mosquito population throughout the Middle Atlantic States.

September 18, 2003
On September 18, 2003, Tropical Storm Isabel caused a record-breaking tide and storm surge up the Chesapeake Bay, heavy rain and strong power outage producing winds. In Queen Anne's County, public and private damage was estimated at 37 million dollars. Thirty-seven homes were destroyed, 151 suffered major damage and 192 suffered minor damage. Most of the damage was caused by the tidal flooding, although four homes were damaged by fallen trees. The heavy rain did not coincide with the tidal flooding and occurred mainly from the afternoon of the 18th into the early morning of the 19th. There were no reports of stream related flooding due to the heavy rain. Because the heaviest rain with tropical systems often falls west of its storm track, the region was spared heavier rain. On the other hand, the strongest winds are often on the right side of the storm track. Winds gusted up to 58 mph in the bay and caused numerous trees, tree limbs and power lines to be knocked down. Storm totals included 2.14 inches in Stevensville.

October 7-8, 2005
On October 7-8, 2005, the combination of a very slow-moving cold front and copious moisture from the remnants of Tropical Storm Tammy produced very heavy rain across the Maryland Eastern Shore. This heavy rain helped propel the state of Maryland to its second wettest October on record since 1895. The monthly statewide average precipitation total of 7.97 inches was 4.59 inches wetter than normal and only 1976 (8.05 inches) was wetter. The slow movement and stalling coupled with an unstable air mass and tropical moisture associated with Tammy helped enhance the torrential downpours. The flooding would have been even worse if not for the unseasonably dry weather that preceded this event from the middle of August.

September 1, 2006
On September 1, 2006, the combination of the remnants of Tropical Storm Ernesto and a large high-pressure system over eastern Canada produced heavy rain and strong winds along the Maryland Eastern Shore. Rain moved into the area during the morning of the 1st and did not exit until around noon EDT on the 2nd. The heaviest rain took a long time to move north. In addition to the heavy rain, persistent east to northeast winds caused tree damage as the heavy rain loosened the root support and weighed down limbs. Strong winds started during the late morning on the 1st, peaked during the evening of the 1st and around midnight EDT on the 2nd and subsided before sunrise on the 2nd. Delmarva Power reported about 21,350 of its customers lost power on the 1st and 2nd. Actual storm totals included 2.50 inches in Stevensville. The low-pressure system that was Ernesto moved slowly north. Of greater importance, was a strong high-pressure system (greater than 1032 millibars) that remained over southeastern Canada and maintained the pressure gradient (difference) between it and the remnant low of Ernesto.

September 6, 2008
On September 6, 2008, Tropical Storm Hanna brought heavy rain, strong winds and some tidal flooding to the Eastern Shore during the day and into the evening of the 6th. Rain moved into the region during the morning and fell heavy at times from the late morning into the afternoon then ended during the evening. The eastbound lanes of the William Preston Lane Junior Memorial Bridge were closed during the morning of the 6th. It was reopened during the afternoon, but driving restrictions remained in place in both directions into the evening. The persistent strong winds knocked down several weak trees and limbs. This caused scattered power outages and a few road closures. Peak wind gusts included 49 mph in Stevensville. Precipitation totals included 1.80 inches in Church Hill.

January 25, 2010
Coastal flooding occurred on January 25, 2010, in Queen Anne's County. The strong south winds up Chesapeake Bay also caused tidal flooding during the afternoon of the 25th in Queen Anne's County. The afternoon high tide caused flooding in the Kent Narrows area of Queen Anne's County. Flooding occurred along Maryland State Route 18 and Wharf Road in Chester. At high tide both directions of Maryland State Route 18 near Dundee Avenue were closed. The same roadway was also closed near Love Point. The strong southerly flow and rain ended after its cold front moved through the Eastern Shore during the early afternoon.

August 27-28, 2011
During August 27 through August 28, 2011, Hurricane Irene produced heavy flooding rain, tropical storm force wind gusts and caused one wind related death across the Eastern Shore. Preliminary damage estimates were around three million dollars and approximately 85,000 homes and businesses lost power. Tropical storm force wind gusts overspread the Eastern Shore during the afternoon and early evening of the 27th and persisted into the afternoon of the 28th. Peak wind gusts averaged 50 to 60 mph. Event precipitation totals averaged 6 to 12 inches and caused widespread field and roadway flooding. Because the flash flooding and flooding blended into one, all flooding related county entries were combined into one under flood events. On August 25, Maryland Governor Martin O'Malley declared a state of emergency in preparation for Irene. In Queen Anne's County, in Queenstown, an 88-year-old woman was killed when a tree fell on a chimney, sending bricks through the glass roof of a sunroom where she had taken refuge since it had emergency power. Some tomato, corn, and cantaloupe crops were destroyed.

October 29, 2012
Hurricane Sandy, unofficially known as Superstorm Sandy, made landfall near Brigantine, New Jersey on October 29, 2012. It brought heavy rainfall and high speed of wind to Queen Anne's County, forcing officials to close Chesapeake Bay Bridge over the Chesapeake Bay and the Millard E. Tydings Memorial Bridge and Thomas J. Hatem Memorial Bridge over the Susquehanna River in the midday hours.

November 2012
The county was declared a Disaster Area in November of 2012, but no severe damage was reported.

August 12, 2014
On August 12, 2014, a slow-moving warm front and a low-pressure system that formed along it brought an enhanced convergence causing a storm producing heavy rainfall, severe thunderstorms, and flash flooding to Queen Anne's County. Precipitation totals ranged from 3 to 10 inches. The southern end of Kent Island received heavy amounts of precipitation with Kent Point Road needing to be closed due to flash flooding.

Plan Update Note

Hazard events that have occurred during this planning cycle have been added and Table 3-5 has been updated.

February 11, 2018
A stalled frontal boundary brought several periods of heavy rain to the eastern shore. Considerable flooding was reported on the northern half of Kent Island. Flooding was also reported on highway 19 between highway 213 and New Street which forced all lanes to close. In addition, flooding was reported at the intersections of highways 404 and 303 which also closed all respective lanes.

October 12, 2018

On the night of October 11th 3 to 5 inches of rain fell in parts of northeastern Maryland, southern New Jersey, central New Jersey, and Delaware. Due to this flooding ensued causing sections of Maryland Route 8 in Romancoke to close. In addition, sections of Main Street and Walnut Street in **Church Hill** were forced to close.

October 29, 2021

Strong high pressure in eastern Canada and slow-moving pressure approaching from the southeastern states resulted in a prolonged onshore flow along the middle Atlantic coast. Moderate tidal flooding occurred along the upper eastern shore of the Chesapeake Bay on the night of the 29th. This caused moderate flooding in the tidal areas of Queen Anne's County. Many roads were forced to close as a result and flood waters affected many homes and businesses. The tide gauge at Claiborne reached a level of 5.11 feet MLLW.

The severity of flooding in Queen Anne's County is determined by a few local factors, including river basin topography, precipitation patterns, recent soil moisture conditions, and groundcover/ vegetative state. Queen Anne's County and its municipalities have many streams and small tributaries that are highly susceptible to flooding. The properties in and near the identified floodplains of Queen Anne's County are subject to flooding events on an almost annual basis. Floodplain management, flood control structures, hazard mitigation, and flood relief funds are strategies that have reduced Queen Anne's County's annual flood damages.

According to National Centers for Environmental Information (NCEI) and local data, Queen Anne's County has been impacted by coastal floods, flash floods, riverine floods, and heavy rain events.

TABLE 3-5: FLOOD EVENT DATA				
COASTAL FLOOD – 1996-2024				
# OF EVENTS	**INJURIES**	**DEATHS**	**DAMAGES**	**FREQUENCY**
8	1	0	150.00K	0.30
FLASH FLOOD – 1998-2024				
# OF EVENTS	**INJURIES**	**DEATHS**	**DAMAGES**	**FREQUENCY**
32	2	0	4.610M	1.28
FLOOD – 2011-2024				
# OF EVENTS	**INJURIES**	**DEATHS**	**DAMAGES**	**FREQUENCY**
10	0	0	1.250M	0.83
HEAVY RAIN – 1996-2024				
# OF EVENTS	**INJURIES**	**DEATHS**	**DAMAGES**	**FREQUENCY**
140	0	0	3.00k	5.00

Source: National Centers for Environmental Information (NCEI), Events through April 2024.

3.4 Probability of Future Occurrences

Reported flood events, Table 3-5, over the past 28 years provide an acceptable framework for determining the future occurrence in terms of frequency for such events. The probability of the County and its municipalities experiencing a flood event can be difficult to quantify but based on historical record of 190 flood events since 1996. However, it can reasonably be assumed that flooding events from various sources and severity occur multiple times per year on average in Queen Anne's County. The likelihood of future flooding events is high, see Chapter 2, Table 2-6 Probability of Future Hazards.

3.5 Effects of Future Conditions

Both the increase in occurrences of flood events and severity of those events is expected as climate change continues. Increased frequency and intensity of rainfall are contributing to more severe flooding incidents. Intense downpours can swiftly lead to flash floods, causing rivers to breach their banks.

Plan Update Note

To satisfy FEMA Requirement 44 CFR § 201.6(c)(2)(i), this section, Future Condition has been included in the plan update as a new element.

Mitigation measures to reduce the climate impacts should be considered. Examples of mitigation actions that Queen Anne's could implement include[ii]:

- Implementing nature-based solutions—such as restoring coastal wetlands or oyster reefs—to reduce shoreline erosion.
- Upgrading stormwater infrastructure to account for heavier rainfall.
- Assessing climate risks to roads and public transit.
- Planning relocation from high-risk coastal areas.

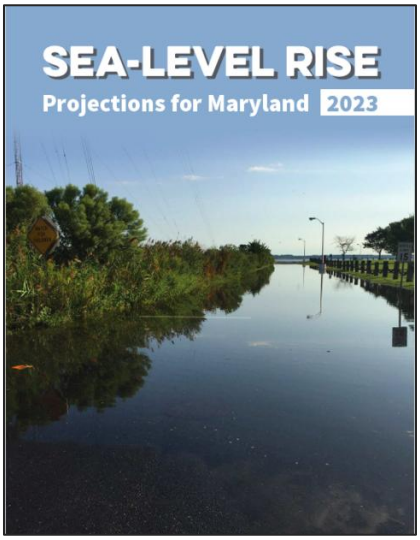
The Maryland Department of Environment's Advancing Stormwater Resiliency in Maryland (A-StoRM) Maryland's Stormwater Management Climate Change Action Plan FY 2021 Data states that flooding is a growing issue in Maryland. The increasing number of extreme rainfall events that produce intense precipitation will continue to lead to increase in flooding events. Mitigation is needed to lessen the impacts of flooding.

NOAA Atlas 14 contains precipitation frequency estimates with associated confidence limits for the United States and is accompanied by additional information such as temporal distributions and seasonality. The Atlas is divided into volumes based on geographic sections of the country. The Atlas is intended as the official documentation of precipitation frequency estimates and associated information for the United States.[iii] NOAA Atlas 14 Precipitation-Frequency Atlas of the United States, Volume 2 Version 3.0 provides precipitation frequency estimates for Maryland.

NOAA Atlas 14 Point Precipitation Frequency Estimates for the Centreville Station (Site ID: 18-1627), the Precipitation Frequency (PF) is projected to increase at each average recurrence interval (years) for each duration. For example, the five (5) minute duration at Year 1 is 0.349 inches and is projected to increase to 0.416 inches in Year 2. The PF doubles by Year 50 with a projected 0.676 inches. Reviewing the durations for each interval, projects continue to increase for the Centreville Station.

Sea-Level Rise Projections 2023 found that sea level along Maryland's shores will very likely rise a foot between 2000 and 2050—as much as it did over the whole of the last century—and could rise a foot and

a half. The sea-level rise that Maryland will experience during the first half of this century will be greater than that experienced during the whole of the last century. Whether the rise is that much or greater will largely be determined by how much and how soon global society is able to reduce its greenhouse gas emissions.



Beyond 2050, the level of sea-level rise Maryland would experience will depend on the rate of global warming resulting from greenhouse gas emissions. Earth's temperature is already on the verge of exceeding the threshold by which scientists say we can curb the impacts of global warming. While sea level is unlikely to rise more than 3 1/2 feet by the end of the century, it is only by achieving net-zero emissions that very rapid loss of ice on Antarctica and Greenland can be held in check.

3.6 Changes in Land Development & Flooding

Sea level rise also has the potential to change land development and is being considered by the County. To work toward mitigating risks of climate change, a workgroup was established to prioritize vulnerable social, environmental, and economic infrastructure assets that are considered essential to the County. This group continues to draft the County Climate Resilience Planning and Financing Study. From this study, resilience action strategies were outlined and prioritized. For the County to move forward and be more resilient regarding climate change, a funding mechanism is needed for implementation.[iv] In addition, both the 2019 Hazard Mitigation and this plan update include strategies to minimize the impacts from this hazard both today and tomorrow.

In terms of stormwater, since adoption of the 2010 Comprehensive Plan, Queen Anne's County was designated as a Phase II Municipal Separate Storm Sewer System (MS4) community. The County is required to restore 20% (or approximately 200 acres) of impervious area within the County's Urbanized Area that are untreated or are without modern day-maintained stormwater Best Management Practices (BMPs). Outfall inspections is another new layer of regulation brought on by the MS4 permit. In the coming years, the County will need to develop an outfall inspection program to monitor water quality at mapped outfalls throughout the County. The MS4 permit provides an opportunity for the County to stay informed of the latest innovations in stormwater controls and their corresponding estimates on pollution reduction to the Chesapeake Bay.[v]

BMPs are the primary method to control stormwater runoff. Stormwater BMPs are devices, practices, or methods that are used to manage stormwater runoff by controlling peak runoff rate, improving water quality, and managing runoff volume.

Source: Water Resource Center, Southwestern Pennsylvania Commission

The Towns of Barclay, Sudlersville, Templeville, and Queen Anne are not within the special flood hazard area therefore increased development in these areas would not be impacted by the flood hazard. However, these communities are impacted by stormwater flooding. Stormwater flooding could worsen in these communities if development is not done thoughtfully with stormwater best management practices. These towns, while small, recognize that they are part of the County's growth areas and therefore potential development could be prioritized towards these areas; however, development pressure is very low.

Centreville likely has the greatest development pressure as it is the County seat and its largest municipality. Centreville's growth area includes expanded greenbelt areas and the County's business park. These areas comprise approximately 2,010 acres to the east and southwest of the Town. These growth areas are, by design, away from the special flood hazard area.[vi]

Church Hill has proposed a growth area plan for the land around its boundaries to accommodate its growth forecast and to guide and direct development into compact, thoughtful patterns that reflect small town development patterns. The Plan anticipates that full build-out of the Town and its growth area will occur at some point well beyond the year 2030.[vii] Church Hill contains areas of SFHA as well as known nuisance flooding locations, as mapped in this chapter.

Millington is heavily within the SFHA, therefore future development would be impacted by the flood hazard. However, all the proposed growth areas in Millington are proposed for Kent County – no planned development changes are within Queen Anne's County.[viii]

Queenstown is very interested in future development via growth areas and annexation. Presently, the town's growth area includes approximately 810 acres to the east of the current town boundary.[ix] This drives development away from the SFHA. However, Queenstown has the largest number of NFIP policies in force in the County (Table 3-3). This is due to the town's location along the Chester River.

3.7 Flood Vulnerability

To describe the impacts of flood within Queen Anne's County and its participating municipalities, hazard vulnerability and impacts have been assessed and documented specific to people, systems, community activities, structures, and historic resources.

Plan Update Note

To satisfy Requirement 44 CFR SS 201.6(c)(2)(ii)), the vulnerability section of this chapter has been expanded upon to include additional community assets.

3.7.1 VULNERABILITY AND IMPACTS TO PEOPLE AND THE ENVIRONMENT

Flood vulnerability and impacts to people include, but are not limited to:

- Property damage caused by destruction of property and/or long-term mold/rot issues. Residents may be displaced or require temporary and long-term housing/sheltering.
- Floodwater brought in from coastal flooding is very dangerous due to its potential to contain disease causing bacteria. In addition, floodwaters may contain parasites, viruses, agricultural waste, chemicals, and raw sewage.

The displaced population is based on the inundation area. Individuals and households will be displaced from their homes when the home has suffered little or no damage either because they were evacuated (i.e., a warning was issued) or there is no physical access to the property because of flooded roadways. Those displaced persons using shelters will most likely be individuals with lower incomes and those who do not have family and friends within the immediate area. Consequently, modification factors for flood are based primarily on income. Age plays a secondary role in that there are some individuals who will seek shelter even though they have the financial means of finding their own shelter. These will usually be younger, less established families and elderly families.

Projected Shelter Needs from Flooding: The information below estimates the projected shelter needs for the county from the 1-percent-annual-chance flood event.

> *Hazus estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. Hazus also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 886 households will be displaced due to the flood. Displacement includes households evacuated from within, or very near, to the inundated area. Of these, 1,807 people (out of a total population of 47,798) will seek temporary shelter in public shelters.*[x]

Socially vulnerable groups tend to have more exposure to flooding, therefore are disproportionately impacted in the short and long terms. As depicted on Map 3-5, Queen Anne's County does not have any census tracts with high vulnerability (dark blue symbol in legend). The census tract containing the **Towns of Sudlersville and Barclay** are within the moderate (blue-green) social vulnerability, but are not subjected to the 1% annual chance flood hazard areas. However, the **Towns of Millington, Queenstown, and Centreville** do intersect with the 1% annual chance flood hazard areas and have moderate-low (green) social vulnerability.

Plan Update Note

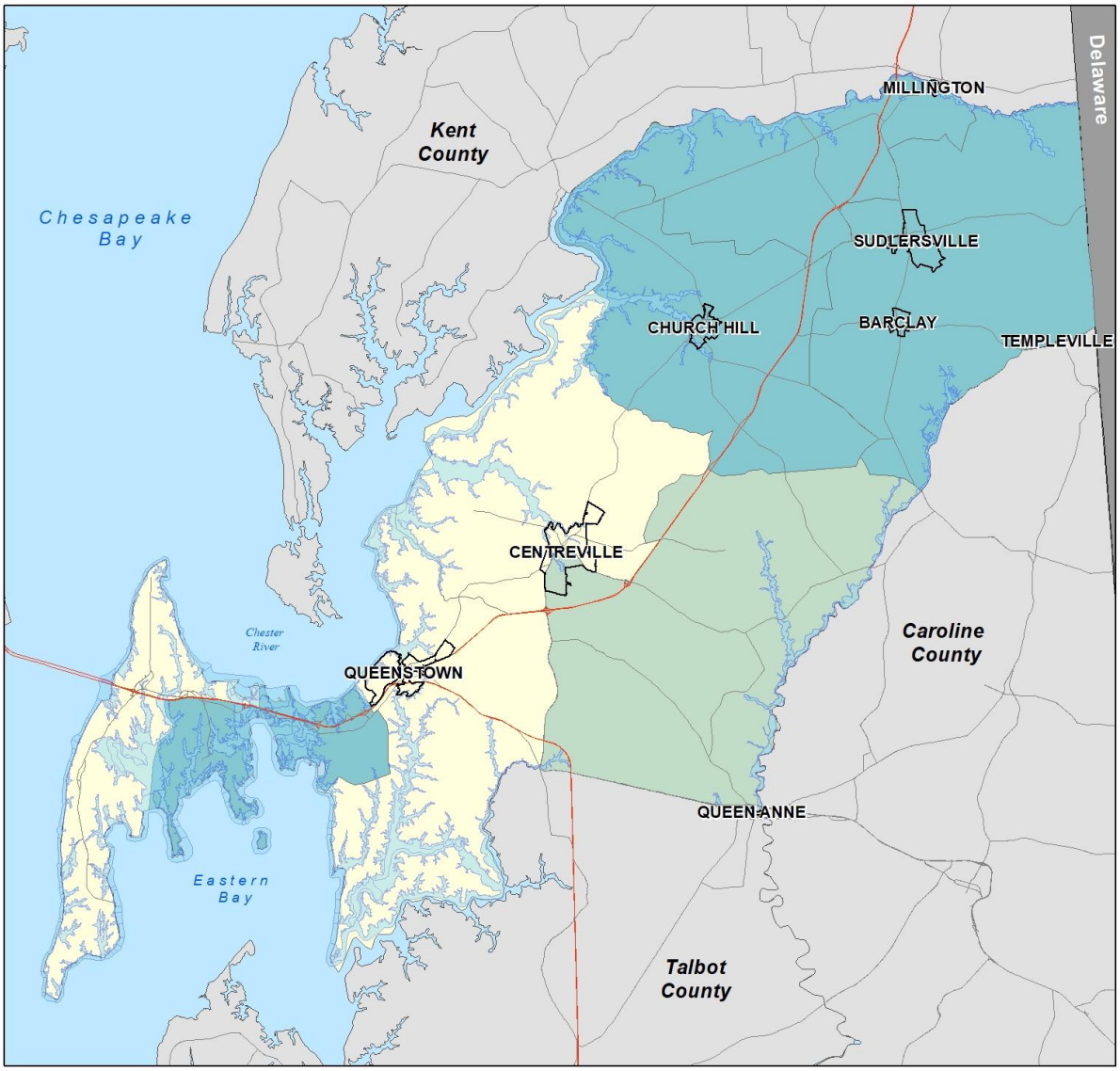
To satisfy FEMA Requirement 44 CFR § 201.6(c)(2)(ii), this section, Social Equity & Vulnerability has been included in the plan update as a new element.

The majority of the unincorporated areas of the County have moderate-low (green) social vulnerability, with the exception of Kent Island, which has moderate (blue-green) and low (yellow) social vulnerability and the area northwest of Centreville with low (yellow) social vulnerability; both subject to flooding. Kent Island consists of the following communities, Stevensville/Chester, Kent Narrows, and Grasonville and is subjected to flooding by the 1% annual chance flood hazard area. Stevensville/Chester is divided by census tracks that have low (yellow) and moderate-low (green) social vulnerability. Kent Narrows and Grasonville have moderate (blue-green) social vulnerability.

Considering Kent Narrows and Grasonville have moderate social vulnerability, this area could be a potential place to prioritize exposure reduction. This may include traditional land-altering structural approaches such as flood walls, detention basins, and green infrastructure, as well as nonstructural measures that remove people from risky areas like land use planning, buyouts, elevating buildings, and early warning systems.[xi] It is important to design mitigation projects that reduce disparities in protection, so that flood-exposed populations equitably reap mitigation opportunities and benefits.[xii]

In times of floods, it's crucial for people to have swift access to evacuation routes, emergency supplies, and medical care. Good transportation networks play a vital role in making this possible. They enable people to safely evacuate from flooded areas, ensure a steady supply of emergency essentials, and make it easier for individuals to reach medical services during and after the floods.[xiii] Therefore, Kent Island area, specifically Grasonville should be assessed to ensure all residents are the ability to evacuate when necessary, during flood event.

Social Vulnerability & 1% Annual Chance Flood Hazard Area



Legend

Queen Anne's County - 2022 SVI

- 0.00 - 0.25
- 0.250001 - 0.50
- 0.500001 - 0.75
- 0.750001 - 1.00
- 1% Annual Chance Flood Hazard Area

- Municipalities
- Maryland Routes
- US Routes

Data Sources:

FEMA DFIRM:
- Effective Date: 11/5/2014

CDC SVI - 2022

Queen Anne's County IT:
- GIS-Mapping Department
- GIS Data Download

N

0 2 4 8 Miles

Map 3-4
Social Vulnerability & Flood Hazard AreaCh

3.7.2 VULNERABILITY AND IMPACTS TO SYSTEMS

Flood vulnerability and impacts to systems include, but are not limited to:

- Coastal flooding has been known to create problems with utility services, such as power outages due to stress on power systems.
- Flooding has been known to create problems with utility services, such as power outages due to stress on power systems.
- Outages impact the availability of emergency and government services.
- Heavy rainfall and tidal inundation can overload a system's ability to function properly which leads to overflow and potential septic failures which presents a public health threat.
- Communication systems break down due to loss of power.

Critical facilities and community lifelines were assessed during this plan update to determine which, if any, are in a flood hazard area. Water Systems infrastructure located within flood hazard areas include ground storage tanks, pump stations, vacuum collection sites, and a water treatment plant, see Table 3-6. The fourteen (14) water system facility types located in flood hazard areas are below with their location. There are no water systems vulnerable to flooding within the municipalities.

- (2) Ground Storage Tanks – Kent Narrows
- (2) Pump Stations – Grasonville and Kent Narrows
- (9) Vacuum Collection Stations – Stevensville/Chester and Grasonville
- (1) Water Treatment Plant – Kent Narrows

Communication Systems infrastructure, specifically Telecom Towers located within flood hazard areas, see Table 3-6. The four (4) telecom towers within flood hazard areas are in the communities of Kent Narrows and Stevensville/Chester. There are no communication systems vulnerable to flooding within the municipalities.

The transportation system in Queen Anne's County and affected municipalities are disrupted and sometimes damaged due to flooding. The **Town of Millington** identified the area most at-risk to flooding as the southern portion of town along Sassafras Street (Route 313). Repetitive roadway flooding occurs along Sassafras Street, as well. This flooding results from storm surge events, excessive rain events, tropical storms/hurricanes, or lunar tidal effects. The Chester River overtops its stream banks during these types of events. The Town of Millington has utilized the FEMA Hazard Mitigation Assistance Grant Programs (HMGP) to acquire at-risk flood properties. Additional structures have been targeted for hazard mitigation projects and include properties south of the Chester River (those properties located in the Queen Anne's County section of the Town of Millington). Finally, the Town had identified the wastewater treatment plant as flood prone and in need of mitigation. In past flood events the wastewater treatment plant has been under water for several days. Since the previous plan, the Town has partnered with Kent County to relocate the WWTP. The parcel for the relocation has been identified and the project is in 75% design phase. The proposed completion date 2026.

The **Town of Centreville** has identified both the north and south ends of Commerce Street and Liberty Streets as flood prone. Tidal storm surge events flood these areas and require the detouring of vehicles. Sources of flooding include Three Bridges Branch, Gravel Run, and Millstream. The Town is in the process of purchasing 40 acres on South Commerce will be converted into a stormwater management system that will eliminate the flooding issue. In addition, the center of Town is subject to flooding from virtually every significant rainfall event. According to the Town, this flooding is due to the lack of a closed storm drain system and the loss of curb containment height due to the Maryland State Highway

Administration (SHA). SHA has paved over existing gutter pans.

Flood mitigation projects that the Town of Centreville engaged in June 2020 included coordination with SHA to alleviate a small but persistent drainage problem at the corner of Lawyer Row and Liberty Street. In addition, the Town has received a grant to remove the dam upstream of Route 213 in Gravel Run.

The **Town of Church Hill** has identified an area of flood concern on Main Street, both north and south. In terms of flood mitigation, the Town identified debris removal within stream channels as a potential project.

Maryland House Bill 1427 (2019), §3-1018(b) and (c) requires local jurisdiction that experiences nuisance flooding (NF) to develop a plan to address nuisance flooding. In April 2020, the Nuisance & Urban Flood Plan was completed. According to the Nuisance & Urban Flood Plan, Queen Anne's County, Maryland is experiencing flooding outside mapped floodplains with increasing frequency, including both nuisance and urban flooding. Therefore, the plan identified sources of nuisance and urban flooding in Queen Anne's County, analyzed these hazards, and provided actions to reduce flooding and increase community resiliency.

Plan Update Note

The Nuisance & Urban Flood Plan was completed in April 2020 following the development of the 2019 Hazard Mitigation Plan. As part of the plan update, information from the plan has been integrated into the Flood Chapter. An updated plan will be completed in 2026.

According to the Plan, nuisance flooding is associated with high tides that flow back through the stormwater system, increasing/raising the level of groundwater, and overtopping the banks and edge of waterways. Urban flooding is due to a variety of issues related to development: increased impervious surface, disruption of natural watershed flows and functions, undersized and aged stormwater infrastructure, and changing weather patterns which exacerbate the inadequacies of older stormwater systems and the fragmented watersheds.

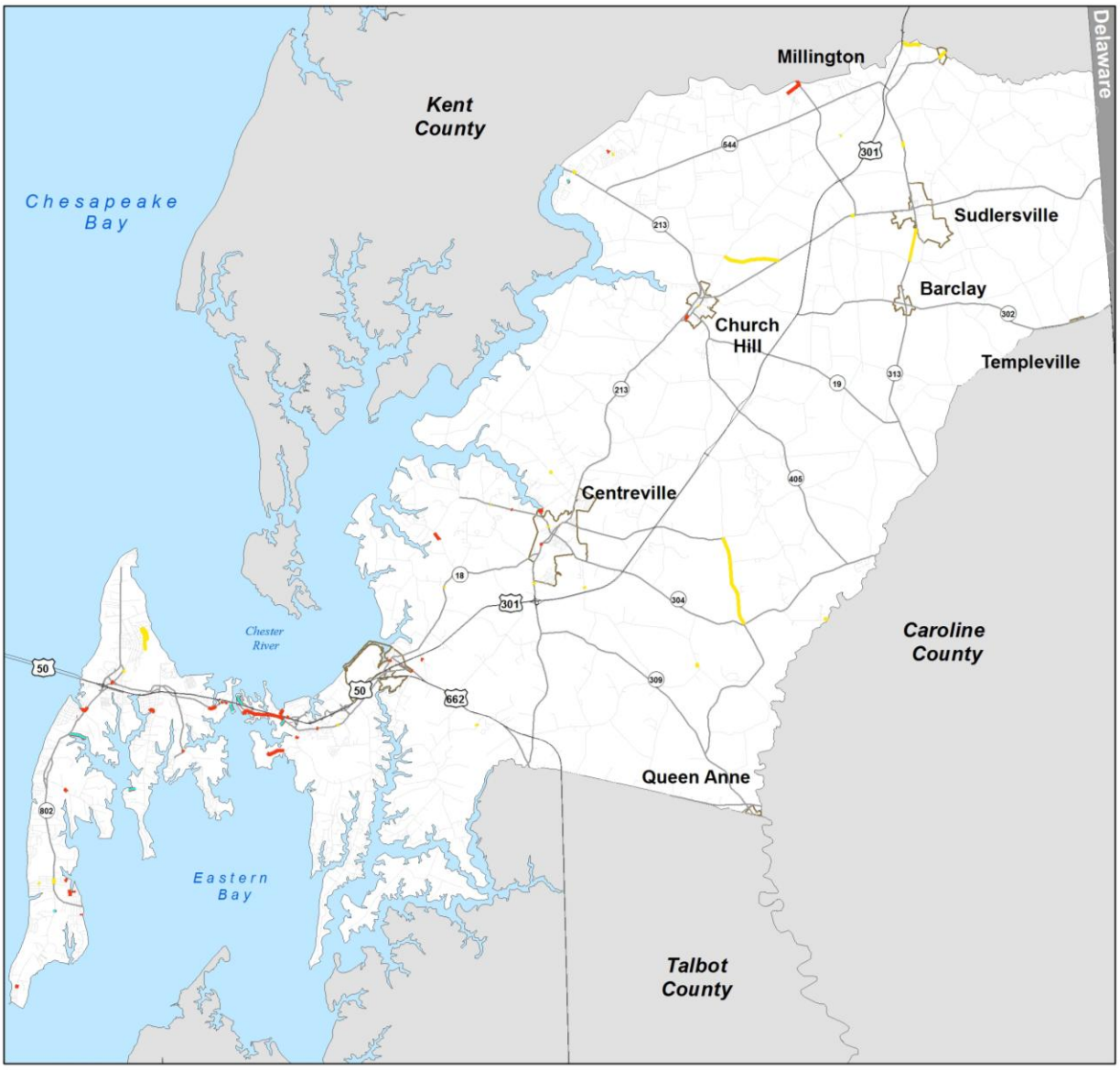
Flood location sites were identified through various mechanisms including fire district surveys, social media sources, and the 2019 Queen Anne's County Multi-Jurisdictional Hazard Mitigation Plan. As a result, a total of seventy (70) flood locations were identified; 42 nuisance flood locations and 28 urban flood locations. Seven (7) of the nuisance flood locations are the only ingress and egress from residential areas and ten (10) of the nuisance flood locations are evacuation routes. Figure 3-5 depicts the seventy (70) flood locations.

Nuisance and urban flood locations were further assessed to determine priority. Utilizing the depth of flooding at each location, sites with flood depths of 3 feet or greater were rated as "Priority" sites for mitigation. The following is the results of that assessment.

- Nuisance Flood Depth 3.0' and Greater and High Tide Susceptibility include:
  - 6 sites in Grasonville
  - 4 sites in Chester
  - 1 site in each located in Centreville, Stevensville, Church Hill, Chestertown, and Queenstown
- Urban Flood Depth 3.0' and Greater include:
  - 3 sites in Stevensville
  - 2 sites in Millington

Figure 3-5

Overall Nuisance & Urban Flood Locations



Legend

- Nuisance Flood Locations
- Urban Flood Locations
- Centerlines
- Maryland Routes
- US Routes
- Municipalities
- Queen Anne's County
- Surrounding Counties
- Surrounding States

There is a total of 70 nuisance and urban flood locations identified in Queen Anne's County.

- 42 Nuisance Flood Locations
- 28 Urban Flood Locations

Of the 42 nuisance flood locations, 7 locations are the only ingress/egress from residential areas. Additionally, 10 nuisance flood locations are evacuation routes.

Data Sources:

Queen Anne's County
2019 Hazard Mitigation Plan

Queen Anne's County IT:
- GIS-Mapping Department
- GIS Data Download

N

0 1 2 4 Miles

Identification of preparedness, response, and mitigation activities were the final steps taken in the planning process for identifying nuisance flood locations. Preparedness activities included monitoring NOAA tide gauges and public outreach, while response activities involved evacuation, sheltering activities, search and rescue, deployment of road barriers/road closures, and road closures. In terms of mitigation activities, ten (10) recommendations were provided as well as drainage improvement projects for four (4) flood locations. Mitigation recommendations will be reviewed for updates and inclusion in the Plan Update.

3.7.3 VULNERABILITY AND IMPACTS TO COMMUNITY ACTIVITIES

Activities that have value to the community could potentially be impacted by flood events. When these activities are delayed or cancelled, the economy of the community is affected. This is true of events in both Queen Anne's County and all its municipalities.

Vulnerability and impacts to community activities include, but are not limited to:

- The Historic Stevensville Art Market is a reoccurring event that happens monthly from April - November. Stevensville lies along the Chesapeake Bay making it a coastal town. Coastal flooding, flash flooding, and a heavy rain event could affect this event.
- The Sudlersville Peach Festival is an event for the community held at the beginning of August. The Town of Sudlersville is not located within FEMA's mapped flood areas, however a heavy rain event could cause disruptions or cancelations.
- The Historic Stevensville Classic Car Show is held in September. Coastal flooding, flash flooding, and a heavy rain event could affect this event.
- The Queen Anne's County Fair in Centreville, MD is held the second week in August. A riverine or heavy rain event could cause issues.
- The Bay Bridge Run held in November each year would be affected by flooding or a heavy rain event.
- The Queen Anne's County 4th of July Celebration is held at the Chesapeake Heritage & Visitor Center on Kent Island. Coastal flooding, flash flooding, and a heavy rain event could affect this event.
- The Annual Paint Stevensville event is held at the beginning of June. Coastal flooding, flash flooding, and a heavy rain event could affect this event.
- The Juneteenth festival is held in Centreville, MD with live music, vendors, a parade, and more for the community. A riverine or heavy rain event could cause issues.
- The Family Fun Festival is a free family friendly community event that is also held in June. A heavy rain event could affect this event.
- Bluegrass in the Blueberry Patch is a free event open to the public hosting live bluegrass music and blueberry picking that is held towards the end of June. A heavy rain event could affect this event.

3.7.4 VULNERABILITY AND IMPACTS TO STRUCTURES

Critical facilities and community lifelines were assessed to determine which, if any, are in a flood hazard area. As a result, a total of twenty-nine (29) critically facilities are at-risk to the 1-percent-annual-chance flood event. Potential depth of flooding from the 1-percent-annual-chance flood event for each facility has been provided for those facilities within FEMA Flood Zones AE and VE listed on Table 3-6. In addition, ten (10) facilities are located within the moderate risk or 500-year flood zone. All remaining facilities are in the minimal flood risk zone area. Facilities denoted in blue are new facilities identified as

at risk to flood during the plan update process. All critical facilities are displayed on Map 3-5.

TABLE 3-6: QUEEN ANNE'S COUNTY CRITICAL FACILITIES, COMMUNITY LIFELINES & FLOOD RISK

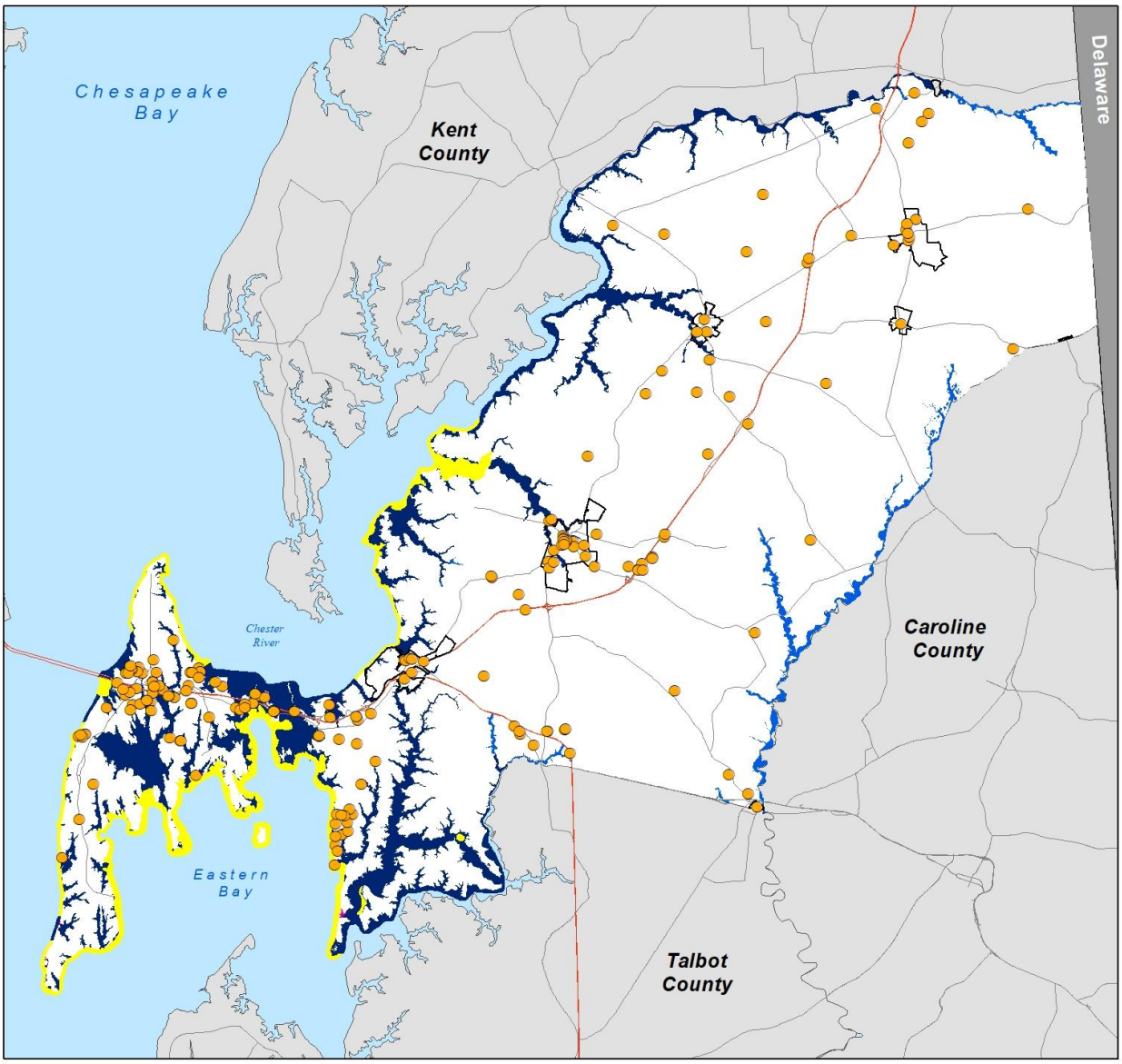
FLOOD ZONE AE & VE SPECIAL FLOOD HAZARD AREAS

Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.

COMMUNITY LIFELINE	FACILITY TYPE	FACILITY NAME	ADDRESS	FLOOD ZONE	FLOOD DEPTH
Hazardous Materials	Fixed HazMat Storage Sites	Castle Marina	301 Tackle Circle	AE	5
	Fixed HazMat Storage Sites	Centreville Citgo #24407	426 S Commerce St	AE	0.1
	Fixed HazMat Storage Sites	DNR - Matapeake	306 Marine Academy Drive	AE	2
	Fixed HazMat Storage Sites	Oyster Cove Water Treatment Plant	3232 Main Street	AE	0.5
	Fixed HazMat Storage Sites	Piney Narrows Yacht Haven	500 Piney Narrows Road	AE	0.5
	Fixed HazMat Storage Sites	Piney Narrows Yacht Haven Condo Association	500 Piney Narrows Rd	AE	0.5
	Fixed HazMat Storage Sites	SHM Narrows Point Marina	428 Kent Narrow Way North	AE	0.8
Water Systems	Ground Storage Tanks	Collection Station H	3232 Main St	AE	0.5
	Ground Storage Tanks	Pump Station 1	3232 Main St	AE	1.8
Transportation	Marinas	Centreville Landing and Marina	201 Front St	AE	5.1
	Marinas	Centreville Wharf	Watson Rd	AE	4.3
	Marinas	Dominion Marina	Little Creek Rd	VE	2.7
	Marinas	Queenstown Dock	6906 2nd Ave	AE	6
	Marinas	Watermans Boat Basin	3000 Wharf Dr	AE	6
Water Systems	Pump Stations	Parks – Pump Station 4	301 Perrys Corner Rd	AE	0.8
	Pump Stations	Pump Station 1	3232 Main St	AE	1.8
Communications	Telecom Towers	TC105 – Lattice	201 Gardners Purchase Lane	AE	2
	Telecom Towers	TC106 – Guyed	201 Gardners Purchase Lane	AE	2.3
	Telecom Towers	TC115 - Guyed	201 Gardners Purchase Lane	AE	1
Water Systems	Vacuum Collection Stations	Collection Station A	828 Main St	AE	2.4
	Vacuum Collection Stations	Collection Station B	746 Thompson Creek Rd	AE	3.2
	Vacuum Collection Stations	Collection Station F	625 Dominion Rd	AE	1.2
	Vacuum Collection Stations	Collection Station G	2510 Main St	AE	2.9

COMMUNITY LIFELINE	FACILITY TYPE	FACILITY NAME	ADDRESS	FLOOD ZONE	FLOOD DEPTH
Water Systems	Vacuum Collection Stations	Collection Station H	3232 Main St	AE	1.1
	Vacuum Collection Stations	Collection Station J	311 Long Point Rd	AE	0.5
	Vacuum Collection Stations	Collection Station Q	774 Kimberly Way	AE	3.4
	Vacuum Collection Stations	Collection Station R	301 Chenowith Dr	AE	1.3
	Vacuum Collection Stations	Parks - Collection Station K	301 Perrys Corner Rd	AE	0.5
	WTP	Oyster Cove Water Treatment Plant	3230 Main St	AE	0.5
Safety & Security	Police Station	Sheriff's Office – Kent Narrow Substation	425 Piney Narrows Rd	AE	1.7
	Police Station	Centreville Police Department	420 N Commerce St	AE	.05
X (SHADED) 0.2% OR 500 YR. Moderate risk flood area(s), shaded area(s) shown on FIRM, are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood.					
Hazardous Materials	Fixed HazMat Storage Sites	Kent Narrows/Stevensville/ Grasonville Wastewater Treatment Plant	310 Bateau Drive	X (Shaded)	
	Fixed HazMat Storage Sites	Thompson Creek Water Treatment Plant	610 Marion Quimby Drive	X (Shaded)	
	Fixed HazMat Storage Sites	Tri-Gas & Oil Co., Inc. (Grasonville)	216 VFW Avenue	X (Shaded)	
Water Systems	Ground Storage Tanks	Thompson Creek Water Treatment Plant	610 Marion Quimby Dr	X (Shaded)	
	Pump Stations	Pump Station 2	1825 Sherman Dr	X (Shaded)	
	Vacuum Collection Stations	Collection Station D	201 Benton Pleasure Rd	X (Shaded)	
COMMUNITY LIFELINE	**FACILITY TYPE**	**FACILITY NAME**	**ADDRESS**	**FLOOD ZONE**	
Water Systems	Vacuum Collection Stations	Collection Station L	617 Chester River Beach Rd	X (Shaded)	
	Vacuum Collection Stations	Collection Station C	1825 Sherman Dr	X (Shaded)	
	WTP	Thompson Creek Water Treatment Plant	610 Marion Quimby Dr	X (Shaded)	
Communications	Telecom Towers	TC108 – Lattice	Business Pkwy	X (Shaded)	

Critical Facilities & FEMA Flood Zones



Legend

FEMA Flood Zones

- Zone A
- Zone AE
- Zone AO
- Zone VE
- Zone X

- CriticalFacilities
- Municipalities
- Maryland Routes
- US Routes

Data Sources:

FEMA DFIRM:
- Effective Date: 11/5/2014

Queen Anne's County IT:
- GIS-Mapping Department
- GIS Data Download

N

0 2 4 8 Miles

Map 3-5 Queen Anne's County Critical Facilities & FEMA Flood Zones

A subset of critical facilities includes essential facilities. Essential facilities are those facilities that provide services to the community and should be functional after a flood. Essential facilities include emergency operations centers (EOC), hospitals, police stations, fire stations and schools. The damage for essential facilities is determined on a site-specific basis (i.e., the depth of flooding at the location of the facility). Potential flood losses for the 1-percent-annual-chance flood event were calculated using Hazus-MH, version 3.1, and included in Queen Anne's County Flood Risk Report.

These facilities are considered essential, as these facilities must remain operational to ensure community resiliency, how quickly the community can "bounce-back" following a hazard event. In addition, mitigation projects featuring these facilities are considered specifically within FEMA's benefit-cost analysis tool, while all other facilities are included under a general facility category designated as "other." Mitigation projects featuring essential facilities have a high likelihood of resulting in a positive benefit-cost ration, resulting in grant funding and increased community resilience.

According to the 2019 FRR, 50 essential facilities located within Queen Anne's County with a total estimated building value of $380,753,600. However, only two essential facilities are at-risk to the 1-percent-annual-chance flood event. Both facilities are police stations as displayed on Map 3-3.

- Sheriff's Office – Kent Narrow Substation
  - This facility is located between Kent Island Narrows and Piney Creek. The projected flood depth for this facility is 1.7 feet.
- Centreville Police Department
  - Gravel Run is located adjacent to the facility. The projected flood depth for this facility is 0.5 feet.

The combined riverine and coastal loss estimations for both police stations, Kent Narrows Substation and Centreville Police Stations are provided in Table 3-7.

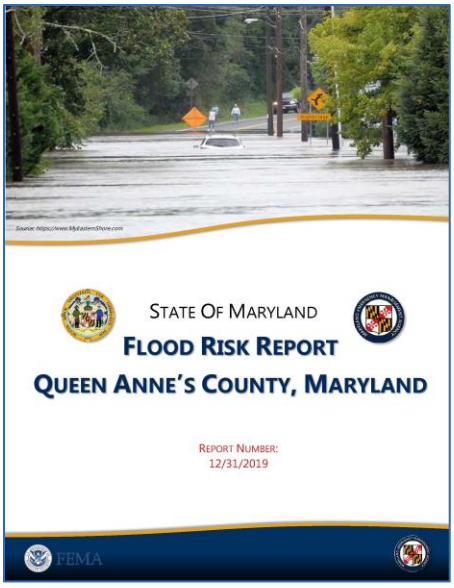


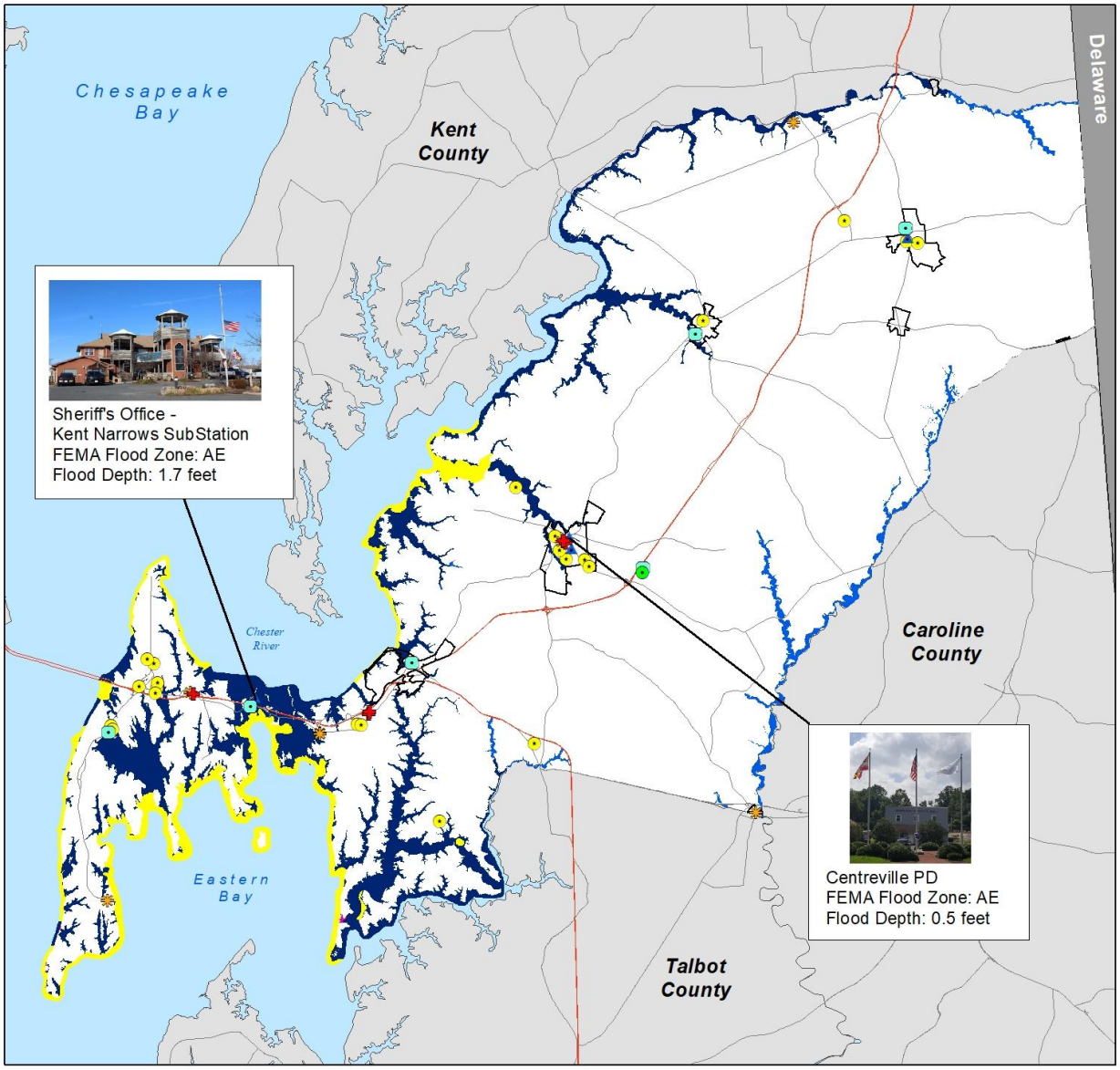
TABLE 3-7: QUEEN ANNE'S COUNTY, MARYLAND – ESSENTIAL FACILITIES ESTIMATED LOSS SUMMARY FOR THE 1% ANNUAL-CHANCE FLOOD (IN RIVERINE AND COASTAL AREAS)

FACILITY TYPE	TOTAL 1% DOLLAR LOSSES (BUILDING & CONTENT)	TOTAL BUILDING LOSS	BUILDING LOSS % OF TOTAL	TOTAL CONTENT LOSS	CONTENT LOSS % OF TOTAL
Police Stations	$48,736	$42,336	87%	$6,400	13%
Total	**$48,736**	**$42,336**	**N/A**	**$6,400**	**N/A**

Source: State of Maryland 2019 Flood Risk Report-Queen Anne's County, Maryland; December 31, 2019
Disclaimer: *Hazus does compute loss estimates for structures exposed to the minimum flood depths of 0.1 feet. However, structural and content loss are dependent upon foundation type and/or the First Flood Elevations (FFE). Therefore, structures exposed to the minimum flood depths of 0.1 feet may have content loss only or both structural or content loss or neither.*

Map 3-6 depicts both essential facilities at-risk to the 1% annual chance flood event (riverine and coastal.)

Essential Facilities & FEMA Flood Zones



Legend

Essential Facility Type
- EOC
- Fire
- EMS
- Medical
- Police
- School - Private
- School - Public

FEMA Flood Zones
- Zone A
- Zone AE
- Zone AO
- Zone VE
- Zone X

- Municipalities
- Maryland Routes
- US Routes

N

0 2 4 8 Miles

Data Sources:

FEMA DFIRM:
- Effective Date: 11/5/2014

Queen Anne's County IT:
- GIS-Mapping Department
- GIS Data Download

Map 3-6 Essential Facilities & FEMA Flood Zones

Plan Update Note

Estimated flood loss estimations from the 2015 FEMA Flood Risk Report-Queen Anne's County (QAC), MD Coastal Study were integrated into the 2019 Hazard Mitigation Plan. Within the past five (5) years, updated Flood Risk Reports (FFR) were developed for the State of Maryland and funded by FEMA through a grant to the Maryland Emergency Management Agency (MEMA). These reports were updated to include not only the coastal 1% annual chance flood impacts but also the riverine 1% annual chance flood impacts. As part of this plan update process, the 2019 Queen Anne's County Flood Risk Report has been integrated in the Flood Vulnerability section. Note- the 2019 Flood Risk Report was completed after the 2019 QAC Hazard Mitigation Plan was completed.

Through Risk MAP, FEMA provides communities with updated Flood Insurance Rate Maps (FIRMs) and Flood Insurance Studies (FISs) that focus on the probability of floods and that show where flooding may occur as well as the calculated 1% annual chance flood elevation. The 1% annual chance flood, also known as the base flood or formerly as the 100-year flood event, has a 1% chance of being equaled or exceeded in any given year. FEMA understands that flood risk is dynamic—that flooding does not stop at a line on a map—and as such, provides the following flood risk products:

- Flood Risk Report (FRR),
- Flood Risk Map (FRM) and,
- Flood Risk Database (FRD).

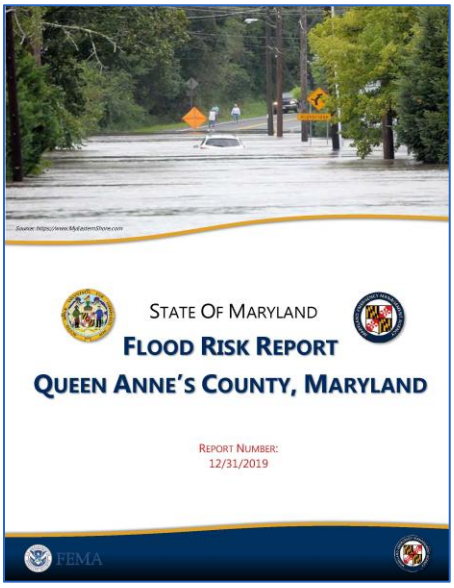
After the Flood Risk Project is complete, the data can be used in many ways to visualize and communicate flood risk within the Flood Risk Project and other outreach initiatives. The goal of this report is to help inform and enable communities to take action to reduce flood risk. Possible users of this report include:

- Local elected officials,
- Floodplain managers,
- Community planners,
- Emergency managers,
- Public works officials and,
- Others with special interests (e.g., watershed conservation groups, environmental awareness organizations, etc.)

The risk products may be used to:

- Update local hazard mitigation plans,
- Update community comprehensive plans,
- Update emergency operations and response plans,
- Develop hazard mitigation projects,
- Communicate flood risk and,
- Inform the modification of development standards.

Non-regulatory coastal flood risk products were previously developed in conjunction with the November 5, 2014, regulatory FIRM update. The 2015 FEMA Flood Risk Report-Queen Anne's County, MD Coastal Study was leveraged as part of the countywide assessment for the State of Maryland 2019 Flood Risk Report-Queen Anne's County, Maryland. The Flood Risk Report (FRR) provides flood risk data for the entire county as well as for each individual community. The 2019 FRR differs from the 2015 Flood Risk Report in that refined loss data results for both coastal and riverine areas of the County are included, as only coastal areas were analyzed in the previous 2015 version. The 2019 FFR was also expanded to include refined losses for both essential facilities and state assets. Loss estimations for **residential and commercial structures** are included in this report for coastal and riverine areas.



Plan Update Note

The following section has been updated by integrating information from the 2019 Flood Risk Report (FRR) for Queen Anne's County.

Tables 3-6 to 3-9 are new to the plan update to reflect new data provided in the 2019 FRR.

According to the 2019 FFR, to fully assess flood risk, the following sources of information were leveraged:

- New/revised engineering analyses (i.e., hydrologic, and hydraulic modeling), floodplain boundaries, and flood depths based on regulatory FIRM updates and published in the FEMA National Flood Hazard Layer.
- Maryland PropertyView – parcel-specific information containing assessed values, land use/occupancy categories, number of stories, etc. (as of February 2015), acquired through the Maryland Department of Planning.
- Building footprints, representing real-world locations for addressable structures, provided by Caroline County Planning and Codes - GIS Office.
- Hazus-MH Version 3.1 (2016) – Hazus is a nationally applicable standardized software suite that contains models for estimating potential losses from floods and other natural disasters.

Flood depth grids were created for all mapped 1% annual chance floodplains in the County, whereby flood depth is a function of the difference between the calculated water surface elevation (including overland wave propagation for coastal areas) and the ground. It was noted that separate flood depth grids were created for riverine and coastal flood hazards, as engineering analyses and regulatory FIRM updates for each study type were separately performed.

Information from the Flood Risk Report (FRR) has informed the mitigation strategies within the plan and will continue to be of use throughout the plan implementation process. Flood loss estimates provided in the FRR were developed using a FEMA flood loss estimation tool, Hazus (FEMA version 3.1 & 2.2).

Note: The Towns of Barclay, Church Hill, Millington, Queen Anne, Sudlersville, and Templeville were not included in this report since they had no User Defined Facilities (UDFs), and accordingly no estimated

flood loss for the 1-percent annual chance flood. Countywide results are provided in this section, with subsequent summaries for the Towns of Centreville and Queenstown.

The Queen Anne's County (Unincorporated Areas) flood risk analysis incorporates modeled floodplain boundaries and flood depths for the 1% annual chance flood event, along with User Defined Facilities (UDFs) developed from local parcel, assessor, and building footprint data. Note that minor differences between values in these tables may result from rounding and aggregation under different categories. Flood loss estimates for the 1% annual chance flood event were calculated using Hazus-MH, and the results are below in Table 3-8 and Map 3-7.

TABLE 3-8: QUEEN ANNE'S COUNTY (UNINCORPORATED AREAS) – ESTIMATED LOSSES BY OCCUPANCY TYPE FOR THE 1%-ANNUAL-CHANCE FLOOD (UDFS IN RIVERINE AND COASTAL AREAS)

TYPE	# OF IMPACTED BUILDINGS	INVENTORY ESTIMATED VALUE	% OF TOTAL	1% FLOOD DOLLAR LOSSES[1]	1% FLOOD PERCENT LOSS[2]
Residential Building & Contents	861	$231,100,000	80%	$12,100,000	5.0%
Riverine	172	$38,400,000	100%	$1,600,000	4.0%
Coastal	689	$192,700,000	76%	$10,500,000	5.0%
Commercial Building & Contents	118	$58,400,000	20%	$7,600,000	13.0%
Riverine	0	$0	0%	$0	0.0%
Coastal	118	$58,400,000	23%	$7,600,000	13.0%
Other Building & Contents	8	$800,000	0%	$40,000	5.0%
Riverine	0	$0	0%	$0	0.0%
Coastal	8	$800,000	0%	$40,000	5.0%
Total Building & Contents[3]	987	$290,300,000	100%	$19,740,000	7.0%
Business Disruption[4] (*Riverine)*	N/A	N/A	N/A	$0	N/A
Business Disruption[4] (*Coastal)*				$3,300,000	
TOTAL[5]	987	$290,300,000	100%	**$23,040,000**	8.0%

Source: State of Maryland 2019 Flood Risk Report-Queen Anne's County, Maryland; December 31, 2019

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.

[2]Percent Loss = Dollar Losses ÷ Estimated Value. Percentages are rounded to the nearest integer.

[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.

[5]Total = Total Building and Contents + Business Disruption

In addition, refined losses were also calculated for the communities of Town of Centreville and Town of Queenstown.

The Town of Centreville is in central Queen Anne's County. It consists of 2.74 square miles along State Highway 213. The primary flooding sources in the city are Mill Stream Branch, Yellow Branch Stream, Three Bridges Branch, and Gravel Run.

TABLE 3-9: TOWN OF CENTREVILLE – ESTIMATED LOSSES BY OCCUPANCY TYPE FOR THE 1%-ANNUAL-CHANCE FLOOD (UDFS IN RIVERINE AND COASTAL AREAS)

TYPE	# OF IMPACTED BUILDINGS	INVENTORY ESTIMATED VALUE	% OF TOTAL	1% FLOOD DOLLAR LOSSES[1]	1% FLOOD PERCENT LOSS[2]
Residential Building & Contents	12	$1,700,000	60%	$100,000	6.0%
Riverine	0	$0	0%	$0	0.0%
Coastal	12	$1,700,000	67%	$100,000	6.0%
Commercial Building & Contents	6	$1,100,000	39%	$30,000	3.0%
Riverine	1	$300,000	100%	$0	0.0%
Coastal	5	$800,000	32%	$30,000	4.0%
Other Building & Contents	1	$30,000	1%	$0	0.0%
Riverine	0	$0	0%	$0	0.0%
Coastal	1	$30,000	1%	$0	0.0%
Total Building & Contents[3]	19	$2,830,000	100%	$130,000	5.0%
Business Disruption[4] (*Riverine*)	N/A	N/A	N/A	$0	N/A
Business Disruption[4] (*Coastal*)				$20,000	
TOTAL[5]	**19**	**$2,830,000**	**100%**	**$150,000**	**5.0%**

Source: State of Maryland 2019 Flood Risk Report-Queen Anne's County, Maryland; December 31, 2019

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.

[2]Percent Loss = Dollar Losses ÷ Estimated Value. Percentages are rounded to the nearest integer.

[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.

[5]Total = Total Building and Contents + Business Disruption

The Town of Queenstown in southern Queen Anne's County. It consists of 1.69 square miles along US Highway 301. The primary flooding sources in the city are Queenstown Creek, Little Queenstown Creek, Chester River, Walsey Creek, and Wye River.

TABLE 3-10: TOWN OF QUEENSTOWN – ESTIMATED LOSSES BY OCCUPANCY TYPE FOR THE 1%-ANNUAL-CHANCE FLOOD (UDFS IN COASTAL AREAS)

TYPE	# OF IMPACTED BUILDINGS	INVENTORY ESTIMATED VALUE	% OF TOTAL	1% FLOOD DOLLAR LOSSES[1]	1% FLOOD PERCENT LOSS[2]
Residential Building & Contents	11	$1,700,000	100%	$200,000	12.0%
Commercial Building & Contents	0	$0	0%	$0	0.0%
Other Building & Contents	0	$0	0%	$0	0.0%
Total Building & Contents[3]	11	$1,700,000	100%	$200,000	12.0%
Business Disruption[4]	N/A	N/A	N/A	$0	N/A
TOTAL[5]	11	$1,700,000	100%	$200,000	12.0%

Source: State of Maryland 2019 Flood Risk Report-Queen Anne's County, Maryland; December 31, 2019

[1]Losses shown are rounded to nearest $10,000 for values under $100,000 and to the nearest $100,000 for values over $100,000.

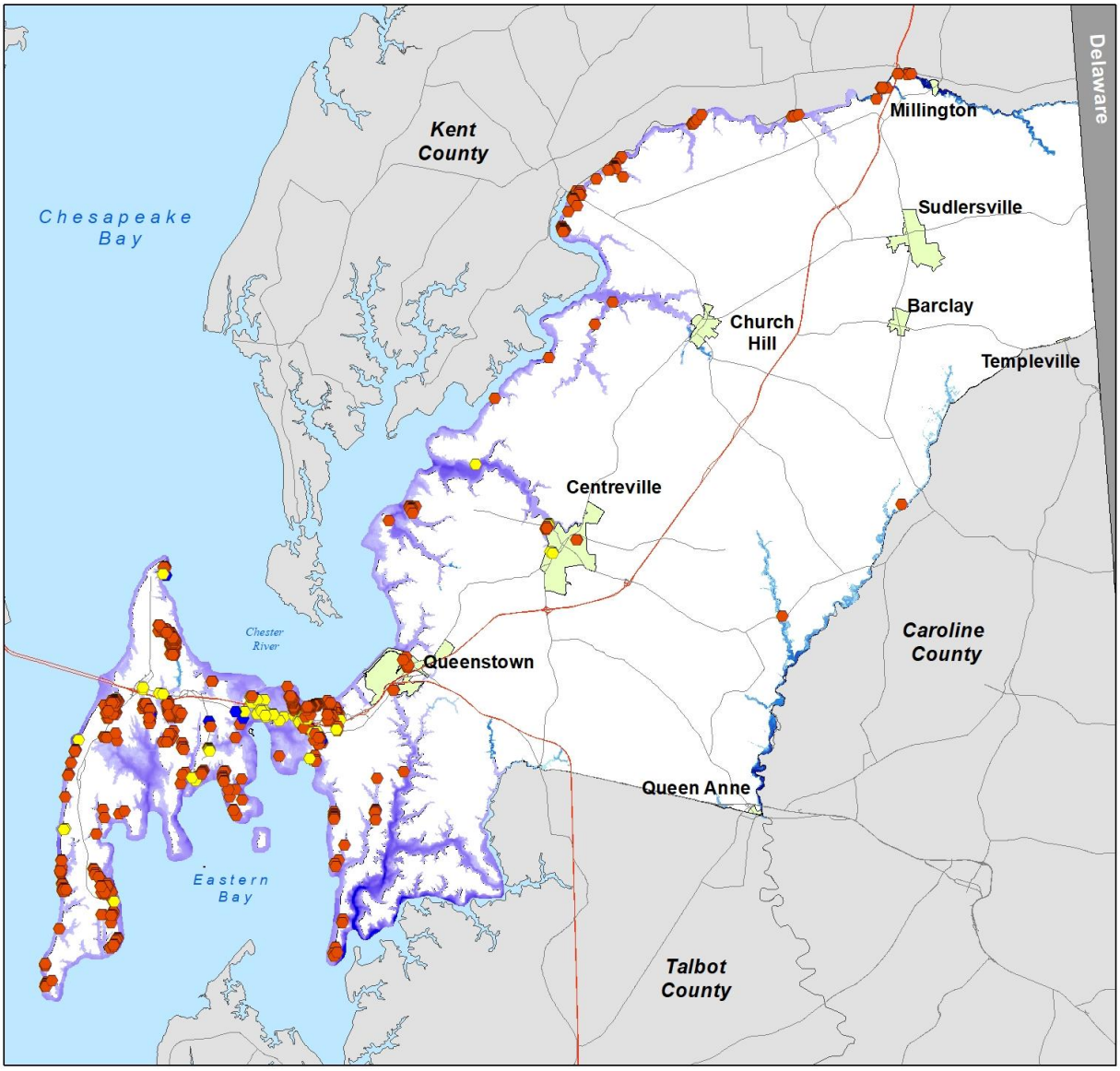
[2]Percent Loss = Dollar Losses ÷ Estimated Value. Percentages are rounded to the nearest integer.

[3]Total Building and Contents = Residential Building and Contents + Commercial Building and Contents + Other Building and Contents.

[4]Business Disruption = Inventory Loss + Relocation Cost + Income Loss + Rental Income Loss + Wage Loss + Direct Output Loss.

[5]Total = Total Building and Contents + Business Disruption

Structures At-Risk to Riverine & Coastal 1-Percent-Annual-Chance Flood Event



Legend

Riverine At-Risk Structures
Structure Type
- 1 Commercial
- 172 Residential

Riverine 1% Annual Chance Flood Hazard Area
Flood Depth
- High : 15.8 foot
- Low : 0.1 foot

Coastal At-Risk Structures
Structure Type
- 123 Commercial
- 9 Other
- 712 Residential

Coastal 1% Annual Chance Flood Hazard Area
Flood Depth
- High : 62.1 feet
- Low : 0.5 feet

- Municipalities
- Maryland Routes
- US Routes

Data Sources:

2019 FEMA Flood Risk Report/Database-
- Queen Anne's County, MD
December 31, 2019
Queen Anne's County IT:
- GIS-Mapping Department & Download

0 2 4 8 Miles

Map 3-7 Structures At-Risk

The Flood Risk Map (FRM) displays base data reflecting community boundaries, major roads, and streamlines; potential losses for the refined 1-percent-annual-chance Coastal Flood Risk Study; new Flood Risk Project Area; and graphics and text that promote access and usage of additional data available.

Places in the county that have a large amount of flood damage in a concentrated area have been defined as High-Risk Areas. They are created by grouping together adjacent Census Blocks with high flood loss estimations. The High-Risk Areas that should be noted in Queen Anne's County, based on data found in the report, are detailed below in Table 3-11, and shown on Figure 3-6.

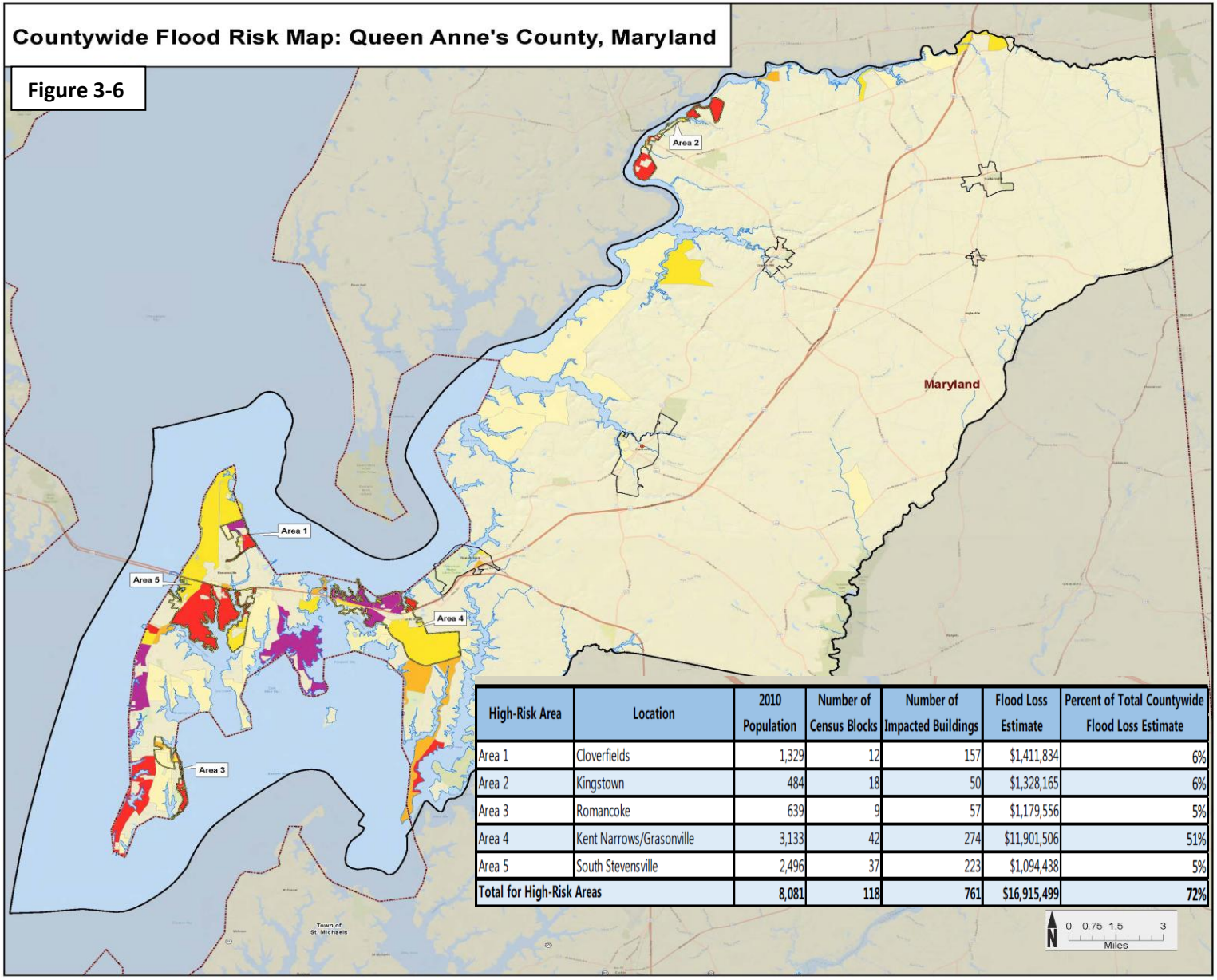
TABLE 3-11: QUEEN ANNE'S COUNTY, MARYLAND – HIGH-RISK AREAS

HIGH-RISK AREA	LOCATION	POPULATION	# OF CENSUS BLOCKS	# IMPACTED	FLOOD LOSS ESTIMATE	PERCENT OF TOTAL COUNTYWIDE FLOOD LOSS ESTIMATE
Area 1	Cloverfields	1,329	12	157	$1,411,834	6%
Area 2	Kingstown	484	18	50	$1,328,165	6%
Area 3	Romancoke	639	9	57	$1,179,556	5%
Area 4	Kent Narrows/ Grasonville	3,133	42	274	$11,901,506	51%
Area 5	South Stevensville	2,496	37	223	$1,094,438	5%
Total for High-Risk Areas		8,081	118	761	$16,915,499	72%

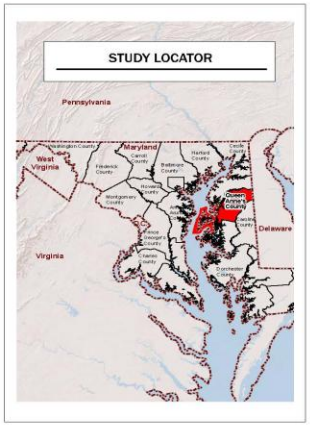
Source: State of Maryland 2019 Flood Risk Report-Queen Anne's County, Maryland; December 31, 2019

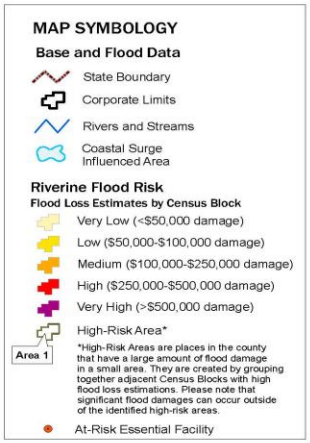
Countywide Flood Risk Map: Queen Anne's County, Maryland

Figure 3-6



High-Risk Area	Location	2010 Population	Number of Census Blocks	Number of Impacted Buildings	Flood Loss Estimate	Percent of Total Countywide Flood Loss Estimate
Area 1	Cloverfields	1,329	12	157	$1,411,834	6%
Area 2	Kingstown	484	18	50	$1,328,165	6%
Area 3	Romancoke	639	9	57	$1,179,556	5%
Area 4	Kent Narrows/Grasonville	3,133	42	274	$11,901,506	51%
Area 5	South Stevensville	2,496	37	223	$1,094,438	5%
Total for High-Risk Areas		**8,081**	**118**	**761**	**$16,915,499**	**72%**





Risk Mapping, Assessment, and Planning (Risk MAP)

Countywide Flood Risk Map (FRM)

Queen Anne's County and Incorporated Areas, MD

MARYLAND

FEMA

This Flood Risk Map has been prepared in conjunction with the Flood Risk Report and Flood Risk Database for Queen Anne's County, MD.

RELEASE DATE 12/31/2019

3.7.5 VULNERABILITY AND IMPACTS TO HISTORIC STRUCTURES

Plan Update Note

The previous 2019 Plan did not include historic structures. As part of this plan update, historic structures provided by Maryland's National Register Properties have been included and a flood vulnerability assess was conducted.

As part of FEMA's requirements to address the historic resources vulnerability, Maryland's National Register Properties listing for Queen's Anne County was assessed. A flood vulnerability assessment was conducted on a total of forty (40) historic structures. Results indicated that fourteen (14) historic structures are located within the 1% annual chance flood hazard area, Table 3-12.

TABLE 3-12: QUEEN ANNE'S COUNTY HISTORIC STRUCTURES & FLOOD RISK

NAME	ADDRESS	CATEGORY	FLOOD DEPTH
Captain's Houses	200-212 Corsica Street, Centreville	Building	1.2
Captain John H. Ozmon Store	114 Corsica Street, Centreville	Building	2.9
Chester Hall	Round Top Road & Church Hill Road (MD 213), Chestertown	Building	2.4
Friendship	Kent Point Road (MD 8), Stevensville	Building	3.2
Reed's Creek Farm	Wrights Neck Road, Centreville	Building	0.5
Bowlingly	111 Bowlingly Circle, Queenstown	Building	1.3
Readbourne	Lands End Road, Centreville	Building	3.4
Mattapax	Shipping Creek Road, Stevensville	Building	1.1
Legg's Dependence	200 Long Creek Court, Stevensville	Building	0.5
Stratton	3102 Ruthsburg Road (MD 304), Centreville	Building	0.5
Wye Hall	505 Wye Hall Drive, Queenstown	Building	1.8
Centreville Historic District	Centreville	District	0.5
Stevensville Historic District	Stevensville	District	1.8
Elsworth (skipjack)	Truslow Road, Chestertown	Object	0.8

Source: Maryland's National Register Properties – Queen Anne's County

Maryland Historic Trust's Flood Mitigation Guide: Maryland's Historic Structures provided mitigation measures for historic structures that are subjected to flooding. Hazard mitigation measures can range in complexity and cost. Examples of low-cost improvements include elevating utility and mechanical equipment. Higher-cost improvements examples include elevation, dry floodproofing, or relocation of the structure outside of the 1% annual chance flood hazard area, all of which can have a negative impact on the integrity of historic structures. A challenge associated with mitigating flood risk to a historic structure is the need to ensure that the structure does not lose its historic integrity. Maryland's Historic Trust's guide provides specific strategies such as floodproofing and elevating buildings that may be useful for property owners, however the Guide also discusses what communities can do before, during and after a flood to ensure historic preservation is an ongoing process with emergency management. The Maryland Historical Trust's (MHT) Architectural Survey Form for Hazard Mitigation Planning should be completed for the eleven (11) historic structures listed in Table 3-12. Use the findings in the form to develop appropriate flood mitigation measures that balance protection and preservation.

[i] 2015 Flood Insurance Study
[ii] The Fifth National Climate Assessment
[iii] "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 2, Version 3.0, G. M. Bonnin, D. Martin, B. Lin, T. Parzybok, M. Yekta, and D. Riley, NOAA, National Weather Service, Silver Spring, Maryland, 2006.
[iv] Queen Anne's County Planning Commission, Mayor and County Commissioners, Queen Anne's County, Maryland Comprehensive Plan, page 5-18, 2022
[v] Queen Anne's County Planning Commission, Mayor and County Commissioners, Queen Anne's County, Maryland Comprehensive Plan, page 5-22, 2022
[vi] Queen Anne's County Planning Commission, Mayor and County Commissioners, Queen Anne's County, Maryland Comprehensive Plan, page 10-8, 2022
[vii] Queen Anne's County Planning Commission, Mayor and County Commissioners, Queen Anne's County, Maryland Comprehensive Plan, page 10-10, 2022
[viii] Queen Anne's County Planning Commission, Mayor and County Commissioners, Queen Anne's County, Maryland Comprehensive Plan, page 10-12, 2022
[ix] Queen Anne's County Planning Commission, Mayor and County Commissioners, Queen Anne's County, Maryland Comprehensive Plan, page 10-16, 2022
[x] State of Maryland Flood Risk Report, Queen Anne's County, Report Numer: 12/31/2019
[xi] Flood exposure and social vulnerability in the United States
[xii] Flood exposure and social vulnerability in the United States
[xiii] Ismallianto Isia, Tony Hadibarata, Ratih Indri Hapsari, Muhammad Noor Hazwan Jusoh, Rajib Kumar Bhattacharjya, Noor Fifinatasha Shahedan,
Assessing social vulnerability to flood hazards: A case study of Sarawak's divisions, International Journal of Disaster Risk Reduction, Volume 97, 2023, 104052, ISSN 2212-4209,
https://doi.org/10.1016/j.ijdrr.2023.104052.
(https://www.sciencedirect.com/science/article/pii/S2212420923005320)

Chapter 4 Tropical Systems



Source: EasternShoreBrent - ISABEL COMES TO KENT NARROWS – 2003in

This chapter of the Plan describes an overall hurricane profile, risk, and vulnerability for Queen Anne's County and participating municipalities. During this plan update, new or changed plan components are shown in **bold blue** text below.

- 4.1 HURRICANE
- 4.2 LOCATION & GEOGRAPHIC EXTENT
- 4.3 HISTORY OF PREVIOUS HAZARD EVENTS
- **4.4 PROBABILITY OF FUTURE OCCCURRRENCES**
- **4.5 EFFECTS OF FURTURE CONDITIONS**
- **4.6 CHANGES IN LAND DEVELOPMENT & HURRICANES**
- 4.7 HURRICANE VULNERABILITY
  - **4.7.1 Vulnerability and Impacts to People and the Environment**
  - **4.7.2 Vulnerability and Impacts to Systems**
  - **4.7.3 Vulnerability and Impacts to Community Activities**
  - **4.7.4 Vulnerability and Impacts to Structures**
  - **4.7.5 Vulnerability and Impacts to Historic Structures**

Note: The previous plan included hazard impact tables based on Emergency Management Accreditation Program requirements (EMAP). This information was expanded as part of this plan update within the vulnerability section.

Public Survey Results

- Survey participants indicated they were "concerned" with hurricanes.
- 41% of the survey participants indicated they have been personally affected by hurricanes.
- 14% of the survey participants have reduced hurricane risk to their home/business by installing high impact windows or doors to withstand high winds.

Chapter Updates

- All sections of the chapter were updated with current information, graphics, maps, and tables.
- Tropical systems hazard history data was updated to include events that have occurred during this planning cycle.
- The vulnerability section in the previous 2019 Plan included impact tables, however the following subsections were added. The new subsections include narratives and were applicable, tables and maps.
  - Vulnerability and Impacts to People and the Environment,
  - Vulnerability and Impacts to Systems,
  - Vulnerability and Impacts to Community Activities,
  - Vulnerability and Impacts to Structures, and
  - Vulnerability and Impacts to Historic Resources.
- County and municipal changes in development were discussed in relation to hurricanes.

4.1 Hurricane

Coastal hazards take many forms ranging from storm systems like tropical storms, hurricanes and nor ‘easters that can cause storm surge inundation, heavy precipitation that may lead to flash flooding, and exacerbation of shoreline erosion to longer term hazards such as sea level rise.

Tropical cyclones, a general term for tropical storms and hurricanes, are low-pressure systems that usually form over the tropics. These storms are referred to as cyclones due to their rotation. Tropical cyclones are among the most powerful and destructive meteorological systems on earth. Their destructive phenomena include very high winds, heavy rain, lightning, tornadoes, and storm surge. As tropical storms move inland, they can cause severe flooding, downed trees and power lines, and structural damage.

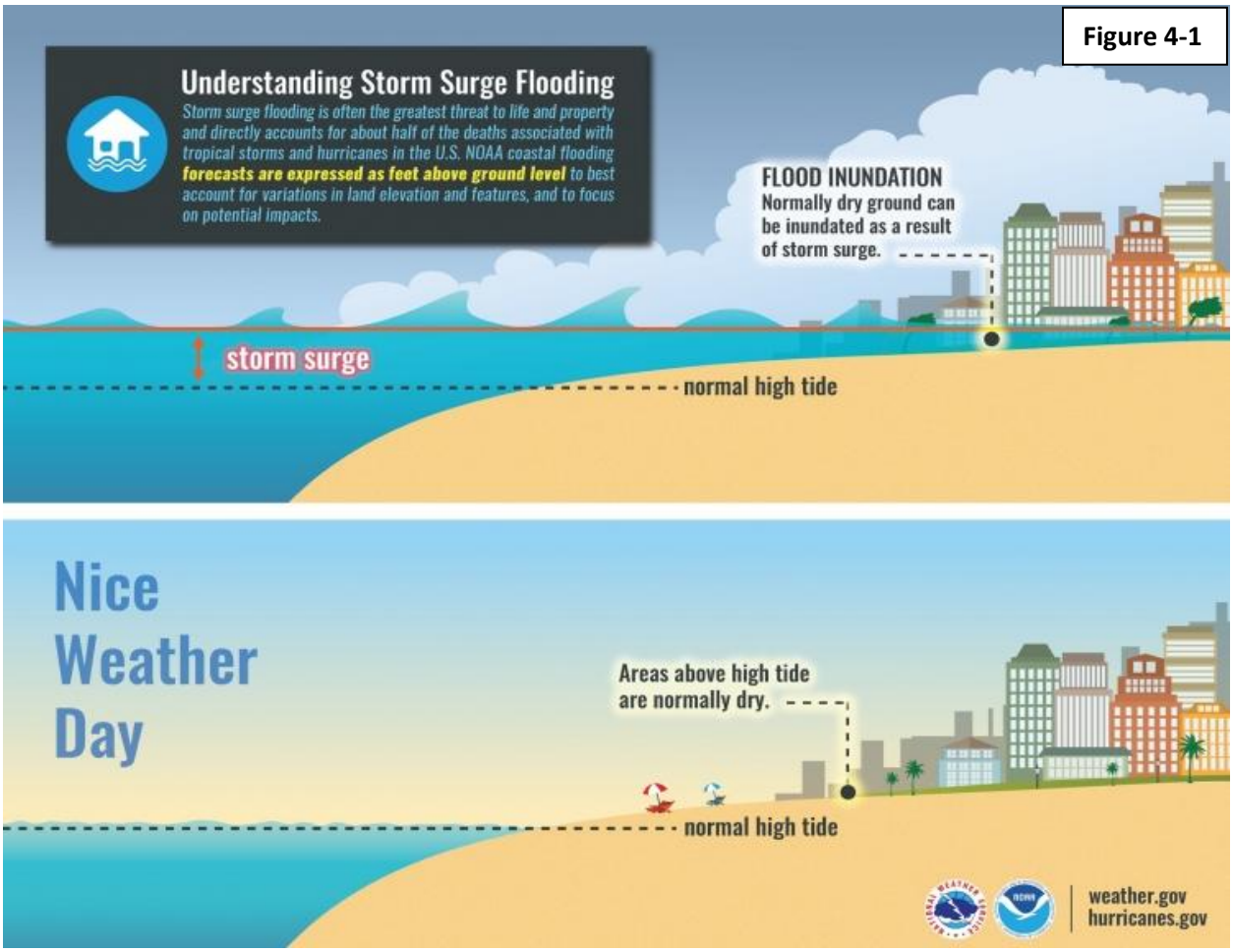
There are three categories of tropical cyclones:

- Tropical Depression: maximum sustained surface wind speed is less than39 mph;
- Tropical Storm: maximum sustained surface wind speed from 39-73 mph; and,
- Hurricane: maximum sustained surface wind speed exceeds 73 mph.

Once a tropical cyclone no longer has tropical characteristics it is then classified as an extra tropical system. Most Atlantic tropical cyclones begin as atmospheric —easterly waves that propagate off the coast of Africa and cross the tropical North Atlantic and Caribbean Sea. When a storm starts to move toward the north, the storm begins to leave the area where the easterly trade winds prevail and enters the temperate latitudes where the westerly winds dominate. This produces the eastward curving pattern of most tropical storms that pass through the Mid-Atlantic region. When the westerly steering winds are strong, it is easier to predict where a hurricane will go. When the steering winds become weak, the storm follows an erratic path that makes forecasting very difficult.

Hurricanes are categorized according to the Saffir-Simpson Hurricane Wind Scale with ratings determined by wind speed and central barometric pressure. Hurricane categories range from One through Five, with Category Five being the strongest (winds greater than 157 mph). A hurricane watch is issued when hurricane conditions could occur within the next 36 hours. A hurricane warning indicates that sustained winds of at least 74 mph are expected within 24 hours or less. The National Weather Service (NWS) National Hurricane Center defines June 1 through November 30 as the Atlantic hurricane season. September is typically the most active month for tropical cyclones in Maryland.

Tropical storms and hurricanes are accompanied by a storm surge, an abnormal local rise in sea level. The storm surge is caused by the difference in wind and barometric pressure between a tropical system and the environment outside the system. The result is that water is pushed onto a coastline. The height of the surge is measured as the deviation from mean sea level and can reach over 25 feet in extreme circumstances. The most devastating storm surges occur just to the right of the eye of a land falling hurricane. For coastal areas, the storm surge is typically the most dangerous and damaging aspect of the storm.



Source: [NOAA's The Dangers of Storm Surge and Flooding]

Howling winds associated with nor 'easters also have the potential to produce significant storm surge, like that of a Category 1 hurricane. In addition, these types of storms can also produce wind gusts to near hurricane force as well as flooding rain and crippling snowfall. The wintry impacts of nor 'easters are discussed in greater detail in Severe Winter Storms.

All of Queen Anne's County and its municipalities could be affected by a hurricane or a tropical storm. Since they can disrupt power and inundate roads, tropical storms can cause havoc in the entire community. The county's proximity to the Chesapeake Bay exposes it to significant storm surge with considerable potential for flooding.

4.2 Location & Geographic Extent

Hurricanes are rated for intensity by using the Saffir-Simpson Scale, which provides an estimate of the potential damage that a hurricane may cause. This scale is based upon both wind speed and surface pressure. Scale categories range from Category 1 to 5, with Category 1 having winds from 74-95 mph and pressure greater than 980 mb, while a Category 5 hurricane may have winds in excess of 157 mph and pressure of less than 920 mb. The table below depicts the five categories of hurricane strength.

TABLE 4-1: SAFFIR-SIMPSON HURRICANE WIND SCALE	
CATEGORY WIND SPEED	**EFFECTS**
Category 1 74-95 mph	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, and vinyl siding and gutters. Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
Category 2 96-110 mph	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
Category 3-Major 111-129 mph	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
Category 4-Major 130-156 mph	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted, and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possible months. Most of the area will be uninhabitable for weeks or months.
Category 5-Major >157 mph	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Source: NOAA National Hurricane Center

In addition to damaging wind, storm surge results from the passage of hurricanes and other related coastal storms. A storm surge is the rise in water level above the regular high tide caused by a severe storm such as a hurricane or nor 'easters. These storms bring rain and heavy wind, which drives larger waves and can blow water up the Chesapeake Bay, thus causing the rivers to rise. Storm surges can create extensive storm damage, erosion, and inundation of low-lying coastal areas.

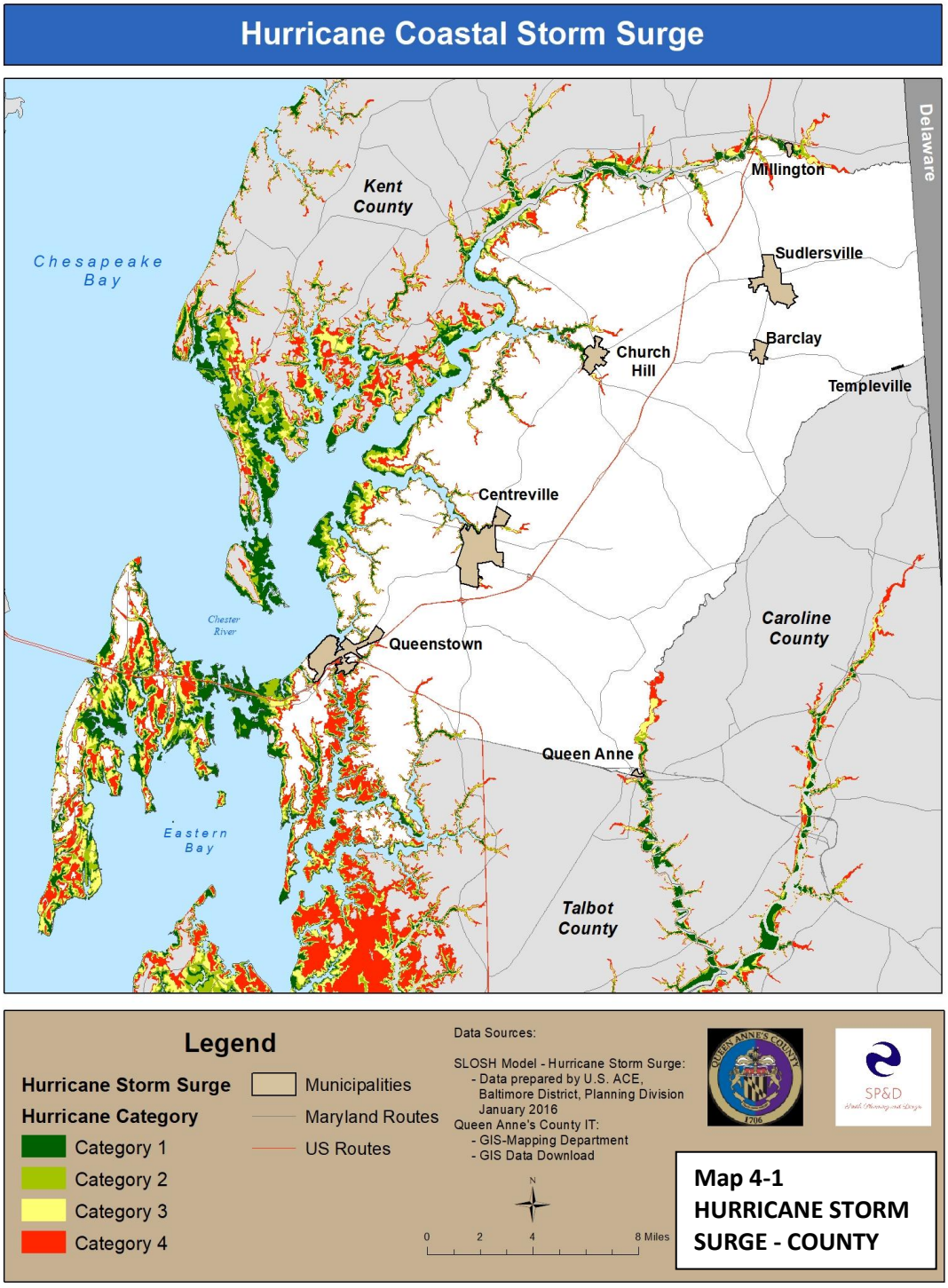
The Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model is used to evaluate the potential impact of storm surge. Emergency managers use data from SLOSH to identify at-risk populations and determine evacuation areas. Storm surges also affect tidal rivers and creeks, potentially increasing evacuation areas. The scale rates the intensity of hurricanes based on wind speed and barometric pressure measurements. The scale gives an indication of the potential flooding and wind damages associated with each hurricane category. While major hurricanes comprise only 20% of all tropical cyclones making landfall, they account for over 70% of the damage in the United States.

SLOSH stands or **S**ea, **L**ake, and **O**verland **S**urge from **H**urricanes. SLOSH is a computerized model developed by the National Weather Station (NWS) to estimate storm surge heights and winds resulting from historical, hypothetical, or predicted hurricanes. It is also the basis for hurricane evacuation studies.

In general, storm surge occurs where winds are blowing onshore. The highest surge tends to occur near the "radius of maximum winds," or where the strongest winds of the hurricane occur.

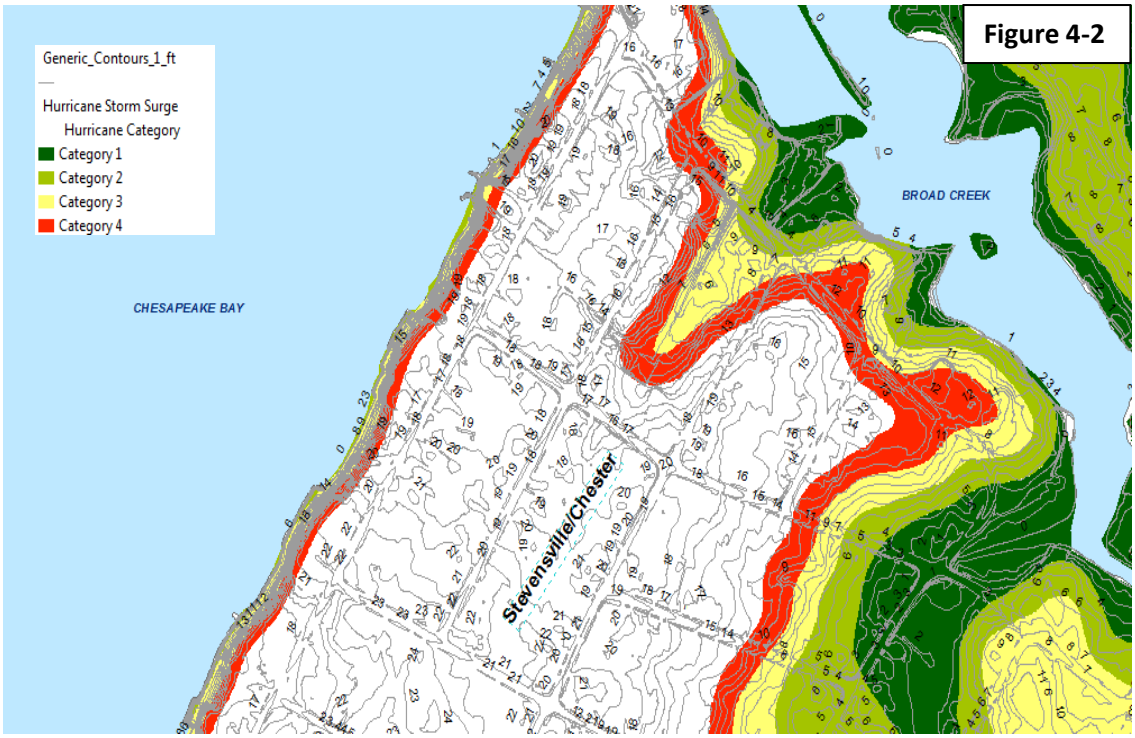
4.2.1 HURRICANE STORM SURGE

The storm surge hazard areas have been mapped to depict the risk from storm surge flooding associated with the passage of hurricanes and tropical storms. According to the National Weather Service (NWS), storm surge is water from the ocean that is pushed onshore by the force of the winds. Flooding from storm surge depends on many factors, such as the track, intensity, size, and forward speed of the tropical cyclone and the characteristics of the coastline where it comes ashore or passes nearby.



As illustrated on the Figure 4-2 below, elevation in the Stevensville/Chester communities begins at mean sea level and increases to 20 feet above mean sea level in certain areas. Elevation increases, such as this, account for the lack of uniformity in the storm surge risk areas shown on Map 4-2. These elevation variations account for storm surge inundating or not inundating the land area. Areas most susceptible to storm surge inundation are those areas shown in green, representing areas impacted by a Category 1 Hurricane, the most likely hurricane event to impact Maryland.

Figure 4-2



Source: SLOSH Model - Hurricane Storm Surge: Data prepared by U.S. ACE, Baltimore District, Planning Division January 2016 & Queen Anne's County IT: GIS-Mapping Department & GIS Data Download

4.3 History of Previous Hazard Occurrences

In September 1979, a major hurricane struck Queen Anne's County, resulting in property damage of over $2 million. On 16 September 1999, Hurricane Floyd hit Maryland and resulted in property damage worth approximately $200 million. Hurricane Floyd made landfall just east of Cape Fear, North Carolina, in the early morning hours of the 16th and moved north-northeast across extreme southeast Virginia to near Ocean City, Maryland. A total of 5 to 8 inches fell across Baltimore, Prince George's, and Queen Anne's Counties. The amount of damage that Anne Arundel, Calvert, Queen Anne's, Harford, and St. Mary's Counties received from the storm qualified them for FEMA disaster assistance. Tidal flooding was reported along the Chesapeake Bay. In Queen Anne's County, over 20 roads were closed by flooding. Several trees and power lines were downed, resulting in 5,000 power outages.

On 18 September 2003, Queen Anne's County was struck by Hurricane Isabel. Initially Isabel was identified as a Category 2 hurricane that turned into a tropical storm by the time it struck Queen Anne's County. Although the National Centers for Environmental Information lists only a few events for Queen Anne's County shown on Tables 4-2, 4-3, and 4-4, the county may have experienced some impacts by other hurricane and tropical storm events that have affected the State of Maryland.

These additional events are listed below:

August 27, 1667: Unnamed Hurricane
A strong hurricane ripped through the Mid-Atlantic region, causing 1667 to be known as "the Year of the Hurricane". A government report noted, "A mighty wind...destroyed four-fifths of (our) tobacco and corn and blew down in two hours fifteen thousand houses in Virginia and Maryland." Several separate accounts of the storm describe the great devastation. This was known as a benchmark storm for many generations.

October 15, 1954: Hurricane Hazel
Hurricane Hazel made landfall as a Category 4 hurricane near the North Carolina-South Carolina border on October 15. Hurricane-force gusts swept the eastern half of Maryland, while heavy rains pounded the west. Washington National Airport reported a record sustained wind of 78 mph with gusts up to 98 mph. Gusts near 100 mph were commonplace throughout the Chesapeake Bay region and on the Eastern Shore. Severe flooding occurred along the bay and its tidal tributaries, and flash flooding plagued western Maryland, where 3-6 inches of rain fell. Generally, less than 2 inches of rain fell in the eastern half of the state.

August 12 and 18, 1955: Hurricanes Connie and Diane
Hurricanes Connie and Diane both passed over Maryland as tropical storms within several days of each other, on Aug. 12 and 18, respectively. The rains from Connie set the stage for the devastating floods caused by Diane, which poured 10-20 inches of rain on the already-soaked region. Major flooding occurred in central Maryland, particularly along the Potomac River. Strong gales from Connie sunk the tour schooner Levin J. Marvel, about 20 miles south of its home port of Annapolis. Fourteen passengers drowned.

June 21-23, 1972: Hurricane Agnes
Hurricane Agnes moved through the Atlantic past Maryland as a tropical storm on June 21-23. Widespread and in some places record flooding wrought one of the state's most destructive natural disasters. In the tributaries on the north side of the Potomac River, from the Conococheague Creek at Fairview, Maryland down to Rock Creek at Washington, DC, floods more than the 100-year frequency level were observed. Many roads were closed, particularly in central Maryland, and thousands of evacuations occurred. The event proved to be an ecological calamity for the Chesapeake Bay. The damage in Maryland was more than $1.1 million, and there were 19 deaths.

July 13, 1996: Hurricane Bertha
Hurricane Bertha moved across the Lower Maryland Eastern Shore on July 13th. The highest sustained wind speed recorded was 23 mph at Salisbury, with gusts up to 63 mph at Ocean City. One confirmed tornado was spawned by the hurricane near Madison in Dorchester County. Numerous trees and power lines were blown down and resulted in scattered property damage and power outages. Rainfall amounts generally ranged from to 5.0 inches and caused some street flooding. Property damages of $100,000 and crop damages of $15,000 occurred.

September 6, 1996: Tropical Storm Fran
Spiral bands associated with Hurricane Fran affected the Lower Maryland Eastern Shore during Friday, September 6th. The highest sustained wind speed recorded was 22 mph at Salisbury with gusts of 35 mph. A storm surge of 4 to 6 feet inundated portions of the communities of: Taylors Island, Hoopers Island, and Madison in Dorchester County along the Chesapeake Bay. Many roads

were flooded with some homes receiving water damage at the time of high tide. Dorchester, Wicomico, Somerset, and Worcester counties were affected, and property damages reached $1 million. Storm winds channeled water up the Chesapeake Bay and its main tributaries, which became a small-scale storm surge, causing $1.6 million in property damages and $5,000 in crop damages in central Maryland.

October 8, 1996: Tropical Storm Josephine
Remnants of Tropical Storm Josephine moved quickly up the East Coast during Tuesday, October 8th, affecting the Lower Maryland Eastern Shore. The storm produced 1.5 to 3.5 inches of rain resulting in flooding of several roads. The storm caused $100,000 in damages.

September 16, 1999: Hurricane Floyd
Hurricane Floyd moved north-northeast across extreme southeast Virginia and reached Maryland near Ocean City by evening on the 16th. Hurricane Floyd was a Category 1 hurricane as it crossed the Wakefield WFO County warning area. The storm surge caused tides two to three feet above normal throughout central Maryland. Tropical storm force wind gusts occurred in the northwest quadrant of the storm over portions of the Lower Maryland Eastern Shore. Property damages of over $1 million and crop damages of $575,000 occurred.

September 18, 2003: Hurricane Isabel
Hurricane Isabel had been downgraded to a tropical storm by the time it reached Maryland, but it still caused significant damage in the state. Isabel's eye tracked well west of the bay, but the storm's 40 to 50 mph sustained winds pushed a bulge of water northward up the bay and its tributaries producing a record storm surge. The Maryland western shore counties of the Chesapeake Bay and along the tidal tributaries of the Potomac, Patuxent, Patapsco, and other smaller rivers experienced a storm surge that reached 5 to 9 feet above normal tides. Over 2000 people were evacuated from their homes. Many buildings were destroyed, and the Lower Maryland East Shore suffered the worst power outages in history. The storm caused one fatality, 200 injuries, $530 million in property damages, and $190,000 in crop damages. Counties affected include Anne Arundel, Calvert, Queen Anne's, Harford, Baltimore, Prince George's, and St. Mary's.

September 1, 2006: Tropical Storm Ernesto
Moderate coastal flooding occurred due to the storm surge from the remnants of Tropical Storm Ernesto. The tide crest at Annapolis was 3.56 MLLW late Friday. Property damage reached $50,000.

September 6, 2008: Tropical Storm Hanna
Tropical Storm Hanna brought heavy rain, strong winds and some tidal flooding to the Eastern Shore during the day and into the evening of the 6th. Maximum sustained winds reached 50 mph. Tree damage was sustained throughout much of the state, and many roads were closed due to trees down.

August 27, 2011: Hurricane Irene
Hurricane Irene, a Category One hurricane brought rain and heavy winds to Maryland. Sustained winds speed measured at nearly 85 mph. Tree damage, power outages, and road closures were sustained as were several deaths throughout Maryland and neighboring Virginia. Queen Anne's County was estimated at $509,000 with mandatory evacuations issued for the southern part of the county and flooding in the northern part of the county, with some homes inundated with six feet of

flood water. There was also one storm-related death in Queen Anne's County.

According to National Centers for Environmental Information (NCEI) and local data, Queen Anne's County has been impacted by 3 hurricanes/tropical storms, 1 storm surge event with significant reported damages from 2003-2017. In addition, no events were reported in 2018. Finally, NCEI has added high surf events to their dataset. One event has been reported for Queen Anne's County from 2017 to present.

Plan Update Note

Hazard events that have occurred during this planning cycle have been added while Tables 4-2 thru 4-4 have been updated.

August 21, 2016: High Surf
Thunderstorms developed near a triple point of a low-pressure system. These thunderstorms produced lightning and heavy rainfall as they moved through the region. Thunderstorm winds increased wave heights on the Chesapeake Bay. A rouge wave caused by these winds damaged a nearby pier and knocked down various trees and power lines.

August 4, 2020: Tropical Storm Isaias
Tropical Storm Isaias brought high winds, heavy rain, several tornadoes, and coastal flooding to the mid-Atlantic region, becoming the most impactful tropical cyclone to impact most of the region since Sandy in 2012. A 43-mph sustained wind was measured at a personal weather station near Grasonville. Several higher gusts were reported throughout the county along with reports of downed trees and power lines.

TABLE 4-2 TROPICAL STORM – 2003-2023				
# OF EVENTS	INJURIES	DEATHS	DAMAGES	FREQUENCY
4	0	1	550.00K	0.20

Source: National Centers for Environmental Information (NCEI), Events through December 2023

TABLE 4-3: STORM/SURGE TIDE – 2003-2023				
# OF EVENTS	INJURIES	DEATHS	DAMAGES	FREQUENCY
1	0	0	37.000M	0.5

Source: National Centers for Environmental Information (NCEI), Events through December 2023

TABLE 4-4: HIGH SURF – 2017-2023				
# OF EVENTS	INJURIES	DEATHS	DAMAGES	FREQUENCY
1	0	0	0	0.17

Source: National Centers for Environmental Information (NCEI), Events through December 2023

4.4 Probability of Future Occurrences

Although the National Centers for Environmental Information (NCEI) lists only a few events for Queen Anne's County shown on Tables 4-2, 4-3, and 4-4, the county may have experienced some limited unrecorded impacts by other hurricane and tropical storm events that have affected the State of Maryland. That being said, the likelihood of a hurricane resulting in impacts such as deaths, injuries, or and/or damages, based on the best available data, has a less than one 1% annual probability, as per Chapter 2, Tables 2-3 and 2-4.

4.5 Effects of Future Conditions

The May 2023, National Oceanic and Atmospheric Administration (NOAA), State of Science Fact Sheet, Atlantic Hurricanes and Climate Change conclusions have been extrapolated from the publication and included below.

Future Atlantic Hurricanes and Global Warming

A detectable greenhouse gas-induced change in historical observed Atlantic hurricane behavior would raise confidence in projected 21st century changes under various greenhouse gas-dominated global warming scenarios. However, since a highly confident attribution has not yet been established for Atlantic hurricanes, future projections rely mostly on climate models alone. This contrasts with the case for global and regional temperatures and sea-level rise-related impacts, where projections are relatively much more confident. Based on a survey of existing studies, with regards to future North Atlantic, Caribbean Sea, and Gulf of Mexico tropical storm and hurricane activity, a 2 ˚C (4 ˚F) global warming scenario would be expected to lead to the following:

- Storm inundation levels during hurricane surge events will increase due to sea level rise, anticipated to rise by about 2 to 3 ft (0.4 to 0.8 meters) by 2100. This sea level rise will contribute toward significantly more coastal destruction and increased economic damages.
- Rainfall rates within tropical storms and hurricanes are projected to increase by about 15%.
- Numbers of Atlantic hurricanes reaching Category 4 or 5 intensity are projected to increase about 10% but with large uncertainty and with some studies projecting a decrease.
- Total numbers of Atlantic tropical storms and hurricanes combined are projected to decrease by 15%, but with large uncertainty; a minority of studies project an increase.
- Strongest winds of tropical storms and hurricanes are projected to increase about 3%.
- Other aspects of Atlantic hurricanes – such as named storm formation location, tracks, and size – may also change, but there is little consensus in available projections.

4.6 Changes in Land Development & Hurricanes

In an effort to work toward mitigating risks of climate change, a workgroup was established to prioritize vulnerable social, environmental, and economic infrastructure assets that are considered essential to the County. This group continues to draft the County Climate Resilience Planning and Financing Study. From this study, resilience action strategies were outlined and prioritized. For the County to move forward and be more resilient regarding climate change, a funding mechanism is needed for implementation.

As shown on Map 4-1, the coastal areas of Queen Anne's County are most at-risk to the effects of hurricane storm surge. The Towns of **Millington**, **Centreville**, **Church Hill**, **Queenstown**, and **Queen Anne** are all suspectable to hurricane storm surge. Note, the Town of **Queen Anne** is included in the Talbot County Hazard Mitigation Plan. Keep in mind, a Category 1 hurricane is most likely to occur based on past occurrences, shown in dark green on Map 4-1. The Towns of **Barclay**, **Sudlersville**, and **Templeville** are not included in the hurricane storm surge risk areas.

Centreville likely has the greatest development pressure as it is the County seat and its largest municipality. Centreville's growth area includes expanded greenbelt areas and the County's business park. These areas comprise approximately 2,010 acres to the east and southwest of the Town. These growth areas are, by design, away from the mapped hurricane storm surge risk areas.[i]

Church Hill has proposed a growth area plan for the land around its boundaries to accommodate its growth forecast and to guide and direct development into compact, thoughtful patterns that reflect small town development patterns. The Plan anticipates that full build-out of the Town and its growth area will occur at some point well beyond the year 2030.[ii] Church Hill contains areas susceptible to hurricane storm surge.

Millington is susceptible on three sides to hurricane storm surge, therefore the likelihood of future development being potentially impacted by hurricane storm surge is particularly high, especially in the western portion, as this area is shown to be susceptible to hurricane Category 1 storm surge inundation, the most likely category of hurricane to impact Queen Anne's County. However, all the proposed growth areas in Millington are proposed for Kent County – no planned development changes are within Queen Anne's County.[iii]

Queenstown is very interested in future development via growth areas and annexation. Presently, the town's growth area includes approximately 810 acres to the east of the current town boundary.[iv] This drives development away from the hurricane storm surge risk areas.

4.7 Hurricane Vulnerability

To describe the impacts of hurricanes within Queen Anne's County and its participating municipalities, hazard vulnerability and impacts have been assessed and documented specific to people, systems, community activities, structures, and historic resources.

Plan Update Note

To satisfy Requirement 44 CFR SS 201.6(c)(2)(ii)), the vulnerability section of this chapter has been expanded upon to include additional community assets.

4.7.1 VULNERABILITY AND IMPACTS TO PEOPLE AND THE ENVIRONMENT

Hurricane vulnerability and impacts to people include, but are not limited to:

- Property damage caused by destruction of property and/or long-term mold/rot issues associated with hurricane storm surge. Residents may be displaced or require temporary and long-term housing/sheltering.
- Storm surge and coastal flooding is very dangerous due to its potential to contain disease causing bacteria. In addition, floodwaters may contain parasites, viruses, agricultural waste, chemicals, and raw sewage.

The displaced population is based on the inundation area. Individuals and households will be displaced from their homes when the home has suffered little or no damage either because they were evacuated (i.e., a warning was issued) or there is no physical access to the property because of flooded roadways. Those displaced persons using shelters will most likely be individuals with lower incomes and those who do not have family and friends within the immediate area. Consequently, modification factors for flood are based primarily on income. Age plays a secondary role in that there are some individuals who will seek shelter even though they have the financial means of finding their own shelter. These will usually be younger, less established families and elderly families.

In addition to the hurricane storm surge inundations areas depicted on Map 4-1, hurricane wind may impact the entire county and all participating municipalities.

Modifications to the Tropical Storm Isabel storm track were made to increase the impact to Queen Anne's County in the user defined storm analysis. These modifications included: alterations to the coordinates so the hurricane track was in closer proximity to Queen Anne's County and the severity of the storm was increased to a Category 1. Peak wind gusts for tropical storms are 55 mph, while peak gusts for the Category 1 storm are 95 mph. The following map depicts the peak wind gusts from the modified storm track used in the analysis. The wind speeds shown on this map are the estimated maximum 3-second gusts in open terrain at 10m above ground at the centroid of each census tract. Hazus estimates the number of households that are expected to be displaced from their homes. Due to the hurricane the number of displaced people that will require accommodations in temporary public shelters could be as many as 22 people. The model estimates 9 households to be displaced at 2.5 people per household.

All gusts are a type of wind. A gust is a sudden increase of the wind's speed that lasts no more than 20 seconds. This usually occurs when wind speeds reach a peak of at least 16 knots.

The entire county is at-risk to the hurricane hazard, however as shown on Map 4-2: HAZUS Hurricane Wind Model-Wind Speeds Peak Gusts, indicates that the Towns of Queenstown, Centreville, and Queen Anne are most at-risk, from a wind perspective. Note, the Town of Queen Anne participates in the Talbot County Hazard Mitigation Plan.

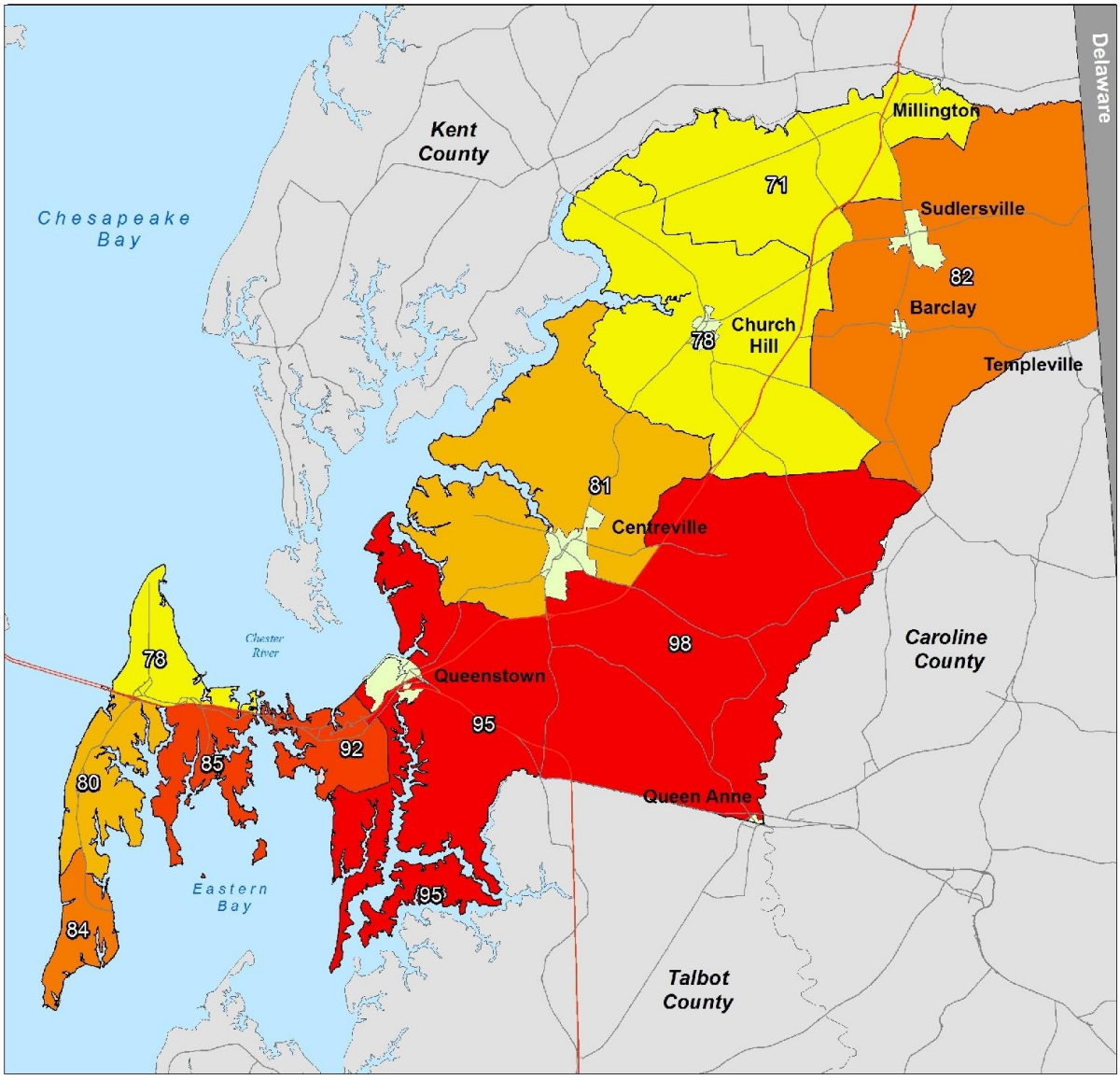
Socially vulnerable groups tend to have more exposure to hazard impacts, therefore are disproportionately impacted in the short and long terms. The Center for Disease Control CDC/ATSDR Social Vulnerability Index 2022, found that, Queen Anne's County does not have any census tracts with high vulnerability. The census tract containing the **Towns of Sudlersville and Barclay** are within the moderate (blue-green) social vulnerability, but are not within a hurricane storm surge risk area or the high risk hurrican wind area. However, the **Towns of Millington, Queenstown, and Centreville** do intersect hurricane storm surge risk area, however only the eastern portion of **Centreville** and then all of **Queenstown** is within the high risk hurricane wind area. Both **Centreville** and **Queenstown** are within the moderate-low (green) social vulnerability.

Plan Update Note

To satisfy FEMA Requirement 44 CFR § 201.6(c)(2)(ii), this section, Social Equity & Vulnerability has been included in the plan update as a new element.

The majority of the unincorporated areas of the County have moderate-low (green) social vulnerability, witht the exception of Kent Island, which has both moderate and low social vulnerability areas. Kent Island is susceptible to both hurricane storm surge and hurricane wind, Maps 4-1 and 4-2.

Hazus Hurricane Wind Model - Wind Speeds: Peak Gusts



Legend

Wind Speeds

Peak Gust (mph)

- 71.00 - 78.00
- 78.01 - 81.00
- 81.01 - 84.00
- 84.01 - 92.00
- 92.01 - 98.00

- Municipalities
- Maryland Routes
- US Routes

Data Sources:

FEMA Hazus Hurricane Model:
- Modified Hurricane Track
- Hurricane 1 Modeling

Queen Anne's County IT:
- GIS-Mapping Department
- GIS Data Download

N

0 2 4 8 Miles

Map 4-2
WIND SPEEDS: PEAK GUSTS - COUNTY

4.7.2 VULNERABILITY AND IMPACTS TO SYSTEMS

In times of storm surge, it's crucial for people to have swift access to evacuation routes, emergency supplies, and medical care. Good transportation networks play a vital role in making this possible. They enable people to safely evacuate from flooded areas, ensure a steady supply of emergency essentials, and make it easier for individuals to reach medical services during and after the floods.[v] Therefore, Kent Island area, specifically Grasonville should be assessed to ensure all residents are the ability to evacuate when necessary, during flood event.

Evacuation zones are designated as A (red), B (Yellow), or C (Blue). They are in place across coastal counties in Maryland as well as Prince George's County. In the event of a severe storm event, like a named tropical storm or a hurricane or other emergency, residents of one or more zones may be directed to evacuate depending on tides, storm intensity, path, and other factors. When an evacuation is ordered, evacuation zones determine when evacuation should take place. Having tiered evacuation zones decreases the possibility that roads will be overwhelmed with heavy traffic by spacing out the traffic load throughout the evacuation period. The Maryland Hurrican Evacuation Lookup Tool indicates U.S. Route 50, through Kent Island is a Evacuation Zone A area, while Grasonville is primarily an Evacuation Zone C area. The Town of Millington, and a portion of Route 301 is located in Evacuation Zone B area. The zones help citizens avoid unnecessary evacuation travel, thereby reducing highway congestion, easing overcrowding at local storm shelters, and boosting public safety.

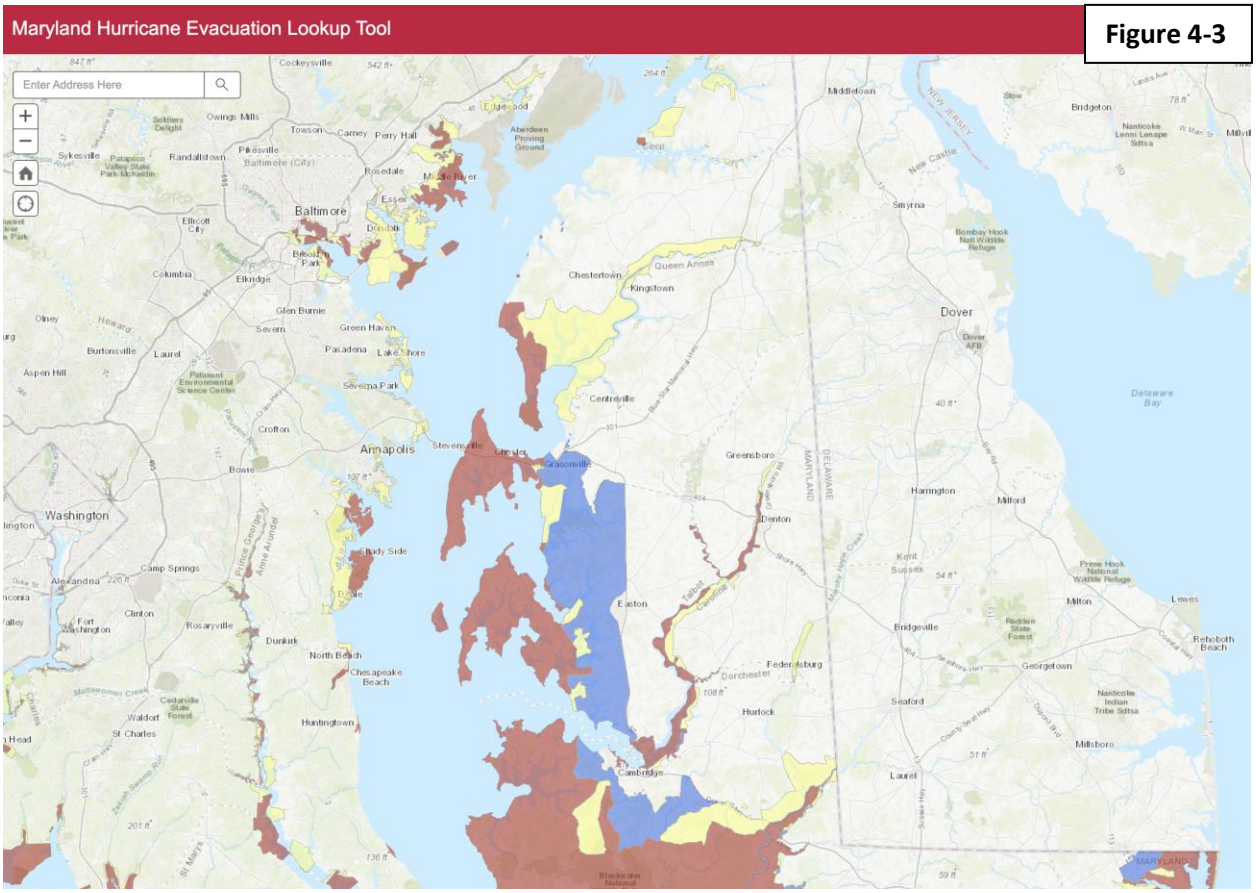


Figure 4-3

4.7.3 VULNERABILITY AND IMPACTS TO COMMUNITY ACTIVITIES

Activities that have value to the community could potentially be impacted by hurricane hazard events. When these activities are delayed or cancelled, the economy of the community is affected. This is true of events in both Queen Anne's County and all its municipalities.

Vulnerability and impacts to community activities include, but are not limited to:

- The Historic Stevensville Art Market is a reoccurring event that happens monthly from April - November. Stevensville lies along the Chesapeake Bay making it a coastal town. A hurricane event could cause flood which could affect this event.
- The Historic Stevensville Classic Car Show is held in September. A hurricane event could affect this event.
- The Queen Anne's County Fair in Centreville, MD is held the second week in August. A hurricane event could cause issues.
- The Bay Bridge Run held in November each year would be affected by a hurricane event.
- The Annual Paint Stevensville event is held at the beginning of June. Flooding caused by storm surge could affect this event.
- The Juneteenth festival is held in Centreville, MD with live music, vendors, a parade, and more for the community. A hurricane event could cause issues.
- The Family Fun Festival is a free family friendly community event that is also held in June. A hurricane event could affect this event.
- Bluegrass in the Blueberry Patch is a free event open to the public hosting live bluegrass music and blueberry picking that is held towards the end of June. A hurricane event could affect this event.

4.7.4 VULNERABILITY AND IMPACTS TO STRUCTURES

According to the Federal Emergency Management Agency (FEMA) the Hazus Hurricane Model makes use of an existing state-of-the-art wind field model, which has been calibrated and validated using full-scale hurricane data. The model incorporates sea surface temperature in the boundary layer analysis and calculates wind speed as a function of central pressure, translation speed and surface roughness. The Hazus Hurricane Model is an improvement over existing loss estimation models because it uses a wind hazard-load-damage-loss framework. The hurricane wind model addresses wind pressure, windborne debris, duration/fatigue, and rain. It includes the following features:

- A building classification system that depends on the characteristics of the building envelope and building frame.
- The capability to compute damage based on building classes and the effects of rain and progressive failure.
- The capability to compute damage to contents and building interior.
- The capability to estimate tree blow down and structure debris quantities.
- Loss estimates that include direct and indirect economic loss, shelter requirements and casualties.
- Modules that facilitate future assessment of mitigation, benefit-cost and building code issues.

As part of the plan update process, a Hazus Hurricane Model, was prepared for Queen Anne's County. It was determined that average wind speeds from both Hurricane Isabel and the July 2017 tornado would be incorporated into the model. Both of these events impacted Queen Anne's County resulting in damages. Note that Hurricane Isabel was downgraded to Tropical Storm Isabel by the time it reached

Maryland. Tropical Storm Isabel had wind speeds of approximately 58 mph, while the July 2017 tornado had approximate sustained wind speeds of 124 mph, resulting in an average sustained wind speed of 91 mph, equating to a Category 1 Hurricane. Using Queen Anne's County specific information, as referenced above, user defined information was incorporated into the model.

Hazus Hurricane Wind Model estimates that about 151 buildings will be at least moderately damaged. This is over 1% of the total number of buildings in the region. There are an estimated 7 buildings that will be completely destroyed. The total economic loss estimated for the hurricane is 60.2 million dollars, which represents 0.85 % of the total replacement value of the buildings within the study area.

TABLE 4-5: BUILDING DAMAGE BY COUNT BY GENERAL OCCUPANCY FOR HAZUS WIND ANALYSIS

OCCUPANCY TYPE	NUMBER OF BUILDINGS					
	NONE	MINOR	MODERATE	SEVERE	DESTROYED	TOTAL
Agriculture	153	10	2	1	0	167
Commercial	994	48	13	2	0	1,057
Education	35	2	0	0	0	37
Government	36	3	1	0	0	40
Industrial	364	18	4	1	0	387
Religion	79	4	1	0	0	84
Residential	17,785	1,255	117	3	7	19,167
TOTAL	**19,448**	**1,340**	**137**	**7**	**7**	**20,940**

Source: Hazus Hurricane Model developed by the Dept. of Homeland Security/FEMA, Smith Planning and Design

The eligible tree debris columns (Eligible Tree Weight and Eligible Tree Volume) provide estimates of the weight and volume of downed trees that would likely be collected and disposed of at public expense. The eligible tree debris estimates produced by the Hurricane Model tend to underestimate reported volumes of debris brought to landfills for some of the events that occurred in the past several years. The underestimate suggests that there are sources of vegetative and non-vegetative debris that are not modeled in Hazus.

For landfill estimation purposes, it is recommended that the Hazus debris volume estimate be treated as an approximate lower bound. Based on actual reported debris volumes, it is recommended that the Hazus results be multiplied by three to obtain an approximate upper bound estimate. It is also important to note that the Hurricane Model assumes a bulking factor of 10 cubic yards per ton of tree debris. If the debris is chipped prior to transport or disposal, a bulking factor of 4 is recommended.

The model estimates that a total of 138,878 tons of debris will be generated. Of the total amount, 125,104 tons (90%) is Other Tree Debris. Of the remaining 13,774 tons, Brick/Wood comprises 26% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads; it will require 146 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 10,113 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally, ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, un-compacted debris.

TABLE 4-6: DEBRIS GENERATION SUMMARY FOR HAZUS WIND ANALYSIS

DEBRIS TYPES	TOTAL (TONS)	PERCENTAGE OF TOTAL	TOTAL TRUCKLOADS

Brick/Wood	3,619	3%	145
Reinforced Concrete/Steel	42	0%	1
Eligible Tree Debris	10,113	7%	Depended upon amount collected and processed
Other Tree Debris	125,104	90%	
TOTAL	**138,878**	**100**	**146**

Source: Hurricane Model developed by the Dept. of Homeland Security/FEMA, Smith Planning and Design

In terms of flooding from storm surge depends on many factors, such as the track, intensity, size, and forward speed of the tropical cyclone and the characteristics of the coastline where it comes ashore or passes nearby. To satisfy Requirement 44 CFR § 201.6(c)(2)(ii), Element B2a from FEMA's Local Mitigation Planning Policy Guide, critical facilities were reviewed and updated. Appendix B - Table B-1 provides all **critical facility types** and associated community lifeline as well as vulnerability to hazards with a geographic extent. The following information has been extrapolated from Table B-1 and included below.

Community Lifeline – Safety and Security within Hurricane Storm Surge Areas by Category:

- QAC Chesapeake Heritage and Visitor Center – Category 1
- QAC Sanitary District HQ – Category 4
- QAC Fire Marshal – Category 3
- QAC Free Library, Kent Island Branch – Category 2

Community Lifeline – Water System within Hurricane Storm Surge Areas by Category:

- Vacuum Collection Stations A through R are all located in the Stevensville, Chester, and Grasonville Areas
- Pump Station 1 Grasonville – Category 1
- Thompson Creek Water Treatment Plant – Category 1
- Stevensville Water Treatment Plant – Category 3
- Pump Stations 1, 4, 5, 7, 8, 9, 10, 11
- Four Seasons Pump Station – Category 4
- Oyster Cove Water Treatment Plant – Category 1
- CBBP Water Treatment Plant – Category 4
- Bayside Water Treatment Plant – Category 4
- Kent Island Village Water Treatment Plant – Category 4
- Riverside Water Treatment Plant – Category 3
- Queens Landing Water Treatment Plant – Category 4
- Centreville Water Treatment Plant – Category 3
- QAC Sanitary CBBP Water Tower – Category 4
- Queens Landing Water Tower – Category 4
- Four Seasons Water Tower – Category 3
- Queenstown Sewage Treatment Plant – Category 3
- KNSG Sewage Treatment Plant – Category 4
- Town of Millington Sewage Treatment Plant (Municipal) – Category 2
- Lift Station #1, #5, #6, #7, #8, & #9

Community Lifeline – Telecom Towers within Hurricane Storm Surge Areas by Category:

- TC115 - Guyed in Chester – Category 1

- TC106 – Guyed in Chester – Category 1
- TC111 – Guyed in Queenstown – Category 4
- TC105 – Lattice in Chester – Category 1
- TC108 – Lattice in Stevensville- Category 2
- TC146 – Monopole in Stevensville – Category 4
- TC130 – Water Tower in Chester – Category 4

Community Lifeline – Transportation within Hurricane Storm Surge Areas by Category:

- Bay Bridge Airport – Category 4
- Kentmorr – Category 4

Community Lifeline – HazMat Fixed Storage Sites within Hurricane Storm Surge Areas by Category:

- Bay Bridge Marina – Category 3
- Sharp Energy - Kent Island High School - Category 4
- Sharp Energy - Zodiac of North America - Category 3
- Gibsons Grant - Category 3
- Ellendale - Category 4
- Centreville Citgo #24407 - Category 1
- Stevensville Shop - Category 4
- DNR - Matapeake - Category 3
- Piney Narrows Yacht Haven - Category 1
- Piney Narrows Yacht Haven Condo Association - Category 1
- Queen Anne Marina, LLC - Category 2
- Bayside Water Treatment Plant - Category 4
- Kent Island Village Water Treatment Plant - Category 4
- Oyster Cove Water Treatment Plant - Category 1
- Kent Narrows/Stevensville/ Grasonville Wastewater Treatment Plant - Category 2
- Stevensville Water Treatment Plant - Category 3
- Queens Landing Water Treatment Plant - Category 4
- Riverside Water Treatment Plant - Category 3
- Prospect Bay Wellhouse #2 - Category 3
- Prospect Bay Wellhouse #1 - Category 3
- Thompson Creek Water Treatment Plant - Category 1
- SHM Narrows Point Marina - Category 1
- Thompson Creek Shell #433- Category 4
- Castle Marina - Category 1
- Tri-Gas & Oil Co., Inc. (Grasonville) - Category 2
- Verizon - Stevensville CDO (Md37810) - Category 3
- Verizon Wireless - Island Drive (Id:5000137) - Category 3

A special emphasis was placed on essential facilities by Queen Anne's County. A subset of critical facilities includes essential facilities. Essential facilities are those facilities that provide services to the

community and should remain functional after a hazard event. Essential facilities include emergency operations centers (EOC), hospitals, police stations, fire stations and schools. In addition, mitigation projects featuring these facilities are considered specifically within FEMA's benefit-cost analysis tool, while all other facilities are included under a general facility category designated as "other." Mitigation projects featuring essential facilities have a high likelihood of resulting in a positive benefit-cost ration, resulting in grant funding and increased community resilience.

Essential facilities at-risk to hurricane storm surge have been identified during the plan update process. Two facilities are at-risk to the most likely hurricane storm event, a Category 1 Hurricane, the most likely hurricane category to impact Queen Anne's County. These facilities include:

- EMS Station 200 (Structure not flooded by Category 1 Hurricane, however the structure is surrounded by water); and,
- Sheriff's Office- Kent Narrows Substation (Projected flood depth of 1.2 feet of water at structure's lowest adjacent grade).

Table 4-7: Essential Facilities At-Risk to Hurricane Storm Surge indicates the category of hurricane storm surge projected to impact each facility, as well as the associated depth of flooding.

TABLE 4-7: ESSENTIAL FACILITES AT-RISK TO HURRICANE STORM SURGE

FACILITY TYPE	FACILITY NAME	STORM SURGE HURRICANE CATEGORY	PROJECTED FLOOD DEPTH (FEET)	GENERATOR YES/NO
COMMUNITY LIFELINE – SAFETY & SECURITY				
Fire	Grasonville VFC #2	2	< 1	YES
		3	3.2	
		4	6.7	
Fire	Grasonville Vol Ambulance Dept. #20	2	< 1	NO
		3	3.0	
		4	6.0	
Fire	Crumpton VFC #7	4	< 1	YES
Fire	United Communities VFC #9	2	Structure not flooded but surrounded	YES
		3	1.35	
		4	3.89	
Fire	Kent Island VFC #1	4	< 1	YES
Fire	EMS Station 200	1	Structure not flooded but surrounded	NO
		2	< 1	
		3	4.24	
		4	> 6	

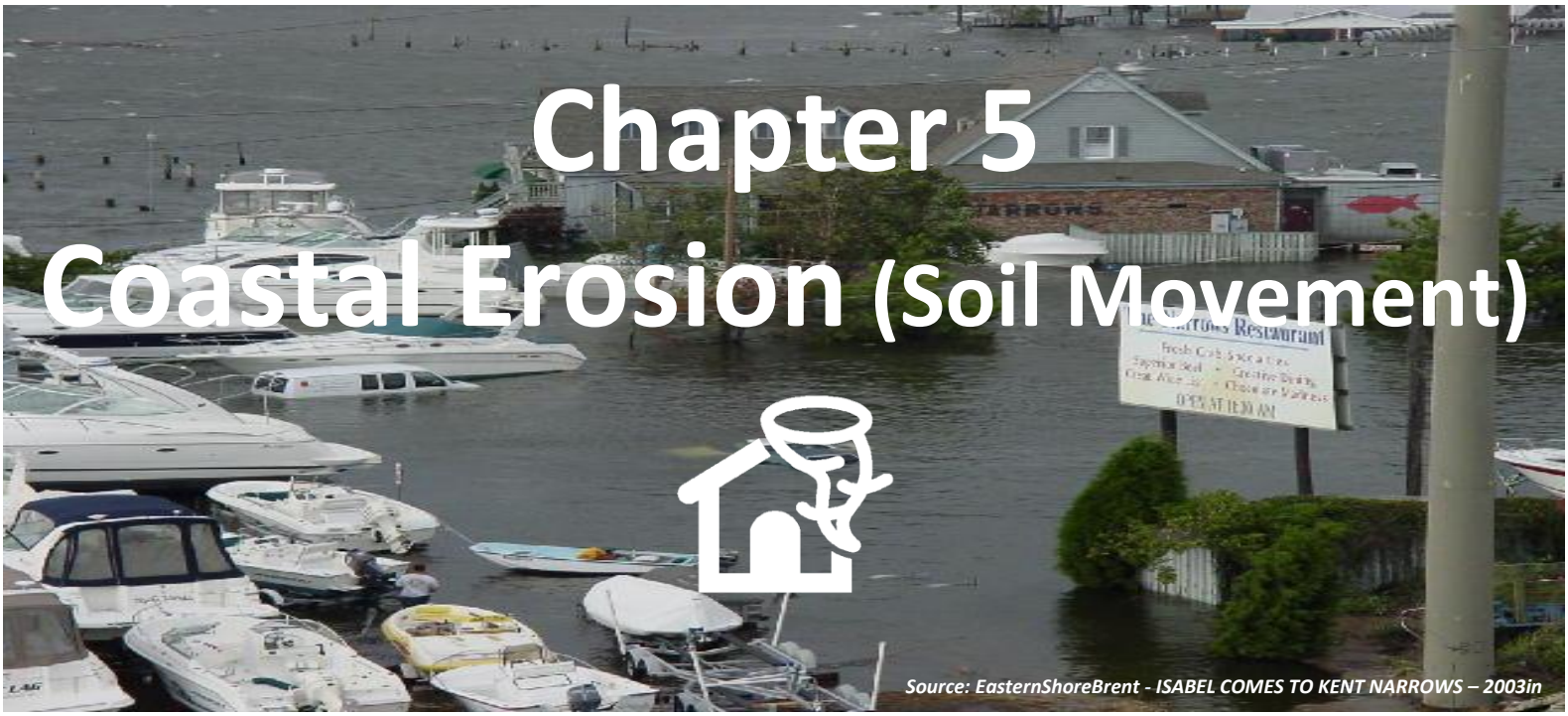
FACILITY TYPE	FACILITY NAME	STORM SURGE HURRICANE CATEGORY	PROJECTED FLOOD DEPTH (FEET)	GENERATOR YES/NO
Police	Sheriff's Office - Kent Narrows Substation	1	1.2	UNKNOWN
		2	4.3	
		3	6.1	
		4	9.5	
Police	Centreville Police Department	3	3.9	YES
		4	9.4	
COMMUNITY LIFELINE – HEALTH AND MEDICAL				
Medical	AAMC Kent Island Pavilion	4	< 1	YES
COMMUNITY LIFELINE – FOOD, HYDRATION, & SHELTER				
School-Public	Stevensville Middle School	4	< 1	YES
School-Public	Kent Island Elementary School	4	< 1	YES
School-Public	Kent Island High School	4	Structure not flooded but surrounded	YES
School-Public	Matapeake Elementary School	3	< 1	YES
		4	2.5	
School-Public	Matapeake Middle School & Kent Island 9th Grade Annex	3	< 1	YES
		4	3.0	

Source: Queen Anne's County Department of Emergency Service & SLOSH Model - Hurricane Storm Surge

4.7.5 VULNERABILITY AND IMPACTS TO HISTORIC STRUCTURES

High winds associated with hurricane can cause significant damage to historic buildings. The materials used in historic structures are often more vulnerable to weather-related damage. While the majority of historic structures listed on the Maryland's National Register Properties in Queen Anne's County are not included within hurricane storm surge areas, they would still be impacted to some degree by high winds. An area susceptible to both storm surge and high wind is Stevensville. Two historic properties located in Stevensville include Christ Church constructed in 1880 and Cray House constructed in the early 19th century. Finally, Queenstown is shown to be in high hurricane wind area, Map 4-2, and has some areas on hurricane storm surge risk, Map 4-1, indicating that historic structures in this area may be vulnerable to hurricane related damages. This includes Bloomington (Mount Hill), Bowlingly, St. Peter's Roman Catholic Church, and Wye Hall.

[i] Queen Anne's County Planning Commission, Mayor and County Commissioners, Queen Anne's County, Maryland Comprehensive Plan, page 10-8, 2022
[ii] Queen Anne's County Planning Commission, Mayor and County Commissioners, Queen Anne's County, Maryland Comprehensive Plan, page 10-10, 2022
[iii] Queen Anne's County Planning Commission, Mayor and County Commissioners, Queen Anne's County, Maryland Comprehensive Plan, page 10-12, 2022
[iv] Queen Anne's County Planning Commission, Mayor and County Commissioners, Queen Anne's County, Maryland Comprehensive Plan, page 10-16, 2022
[v] Ismallianto Isia, Tony Hadibarata, Ratih Indri Hapsari, Muhammad Noor Hazwan Jusoh, Rajib Kumar Bhattacharjya, Noor Fifinatasha Shahedan,
Assessing social vulnerability to flood hazards: A case study of Sarawak's divisions, International Journal of Disaster Risk Reduction, Volume 97, 2023, 104052, ISSN 2212-4209,
https://doi.org/10.1016/j.ijdrr.2023.104052.
(https://www.sciencedirect.com/science/article/pii/S2212420923005320)



Chapter 5
Coastal Erosion (Soil Movement)

Source: EasternShoreBrent - ISABEL COMES TO KENT NARROWS – 2003in

This chapter of the Plan describes an overall coastal erosion (soil movement) profile, risk, and vulnerability for Queen Anne's County and participating municipalities. During this plan update, new or changed plan components are shown in **bold blue** text below.

- 5.1 COASTAL EROSION
- 5.2 LOCATION & GEOGRAPHIC EXTENT
- 5.3 HISTORY OF PREVIOUS HAZARD OCCURRENCES
- **5.4 PROBABILITY OF FUTURE OCCURRENCES**
- **5.5 EFFECTS OF FUTURE CONDITIONS**
- **5.6 CHANGES IN LAND DEVELOPMENT & COASTAL EROSION**
- 5.7 COASTAL EROSION VULNERABILITY
  - **5.7.1 Vulnerability and Impacts to People and the Environment**
  - **5.7.2 Vulnerability and Impacts to Systems**
  - **5.7.3 Vulnerability and Impacts to Community Activities**
  - **5.7.4 Vulnerability and Impacts to Structures**
  - **5.7.5 Vulnerability and Impacts to Historic Structures**

Note: The previous plan included hazard impact tables based on Emergency Management Accreditation Program requirements (EMAP). This information was expanded as part of this plan update within the vulnerability section.

Public Survey

- Survey participants indicated they were "concerned" with coastal erosion.
- 41% of the survey participants indicated they have been personally affected by coastal erosion.
- Some survey participants have reduced coastal erosion risk to their home/business by installing protection structures.

Chapter Updates

- All sections of the chapter were updated with new information, graphics, maps, and tables.
- Coastal erosion hazard data was updated using the Maryland Coastal Atlas Online Mapping Tool and data descriptions.
- The vulnerability section in the previous 2019 Plan included impact tables, however the following subsections were added. The new subsections include narratives and where applicable, tables and maps.
  - Vulnerability and Impacts to People and the Environment,
  - Vulnerability and Impacts to Systems,
  - Vulnerability and Impacts to Community Activities,
  - Vulnerability and Impacts to Structures, and
  - Vulnerability and Impacts to Historic Resources.
- Social Equity and Vulnerability and Effects of Future Conditions were included to the coastal erosion chapter as part of the plan update.

5.1 Coastal Erosion

A side effect or sub-hazard of tropical storms is erosion. Erosion is a naturally occurring normal part of nature and occurs everywhere on earth. Erosion typically occurs when earth's surface is exposed to the impacts of rainfall or water causing sediment to be carried away by the water and deposited at a different location. Erosion also creates a chain reaction causing reduced stream capacity sometimes resulting in flooding and helps contribute to a decline in water quality which blocks sunlight and can destroy plant and animal species located in waterways.

Erosion can be grouped into two types of categories, geologic erosion, and accelerated erosion.

- **Geologic Erosion**, also known as natural erosion, is the action of wind, water, ice, and gravity in wearing away rock to form soil and shape the ground surface. This is a slow continuous process with the exception of stream/shore erosion and is often unnoticed. Geologic erosion accounts for 30% of all sediment in the United States each year.

- **Accelerated Erosion** is the process of speeding up erosion due to human activity. This human activity usually involves destroying or removing natural vegetation and altering the contour of the ground without providing surface protection. Accelerated erosion is reported to account for nearly 70% of all sediment generated in the United States. The primary causes of accelerated erosion are logging, construction, and mining.

Due to the different types of erosion, it is sometimes difficult to predict and is dependent upon many factors such as rain, wind, and human actions. Inland erosion is difficult to predict as it can happen anywhere. Areas of concern for inland erosion are hillsides, unprotected surfaces such as construction sites and areas where logging is occurring. These factors all contribute to the destabilization of the earth's surface by removing soil anchor points such as trees, root systems and grass. Considering the topography of Queen Anne's County and coastal location, coastal erosion is the focus of this hazard chapter.

5.2 Location & Geographic Extent

With over 7,000 miles of shoreline and about seventy percent of residents living within the coastal zone, Maryland is susceptible to flooding and erosion from tides, storms, and sea level rise.[i] As a coastal jurisdiction, Queen Anne's County shorelines are susceptible to erosion. Coastal Vulnerability Model was used to calculate a Shoreline Hazard Index for Maryland, representing the relative exposure of each segment to storm-induced erosion and flooding. Inputs to the model included 6 physical variables (geomorphology, elevation, sea level rise, wave power, storm surge height and erosion rates) and 5 habitat types (forest, marsh, dune, oyster reef and underwater grass).

Figure 5-1, a screenshot from the Maryland Coastal Atlas online mapping tool, depicts the results of the Coastal Vulnerability Model, the Shoreline Hazard Index, indicating relative exposure, expressed as High, Moderate, or Low to each segment. Two red circles have been added to figure, signifying areas of concentrated high exposure.

The Coastal Resiliency Assessment
Shoreline Hazard Index

High - Red
Moderate - Yellow
Low - Blue

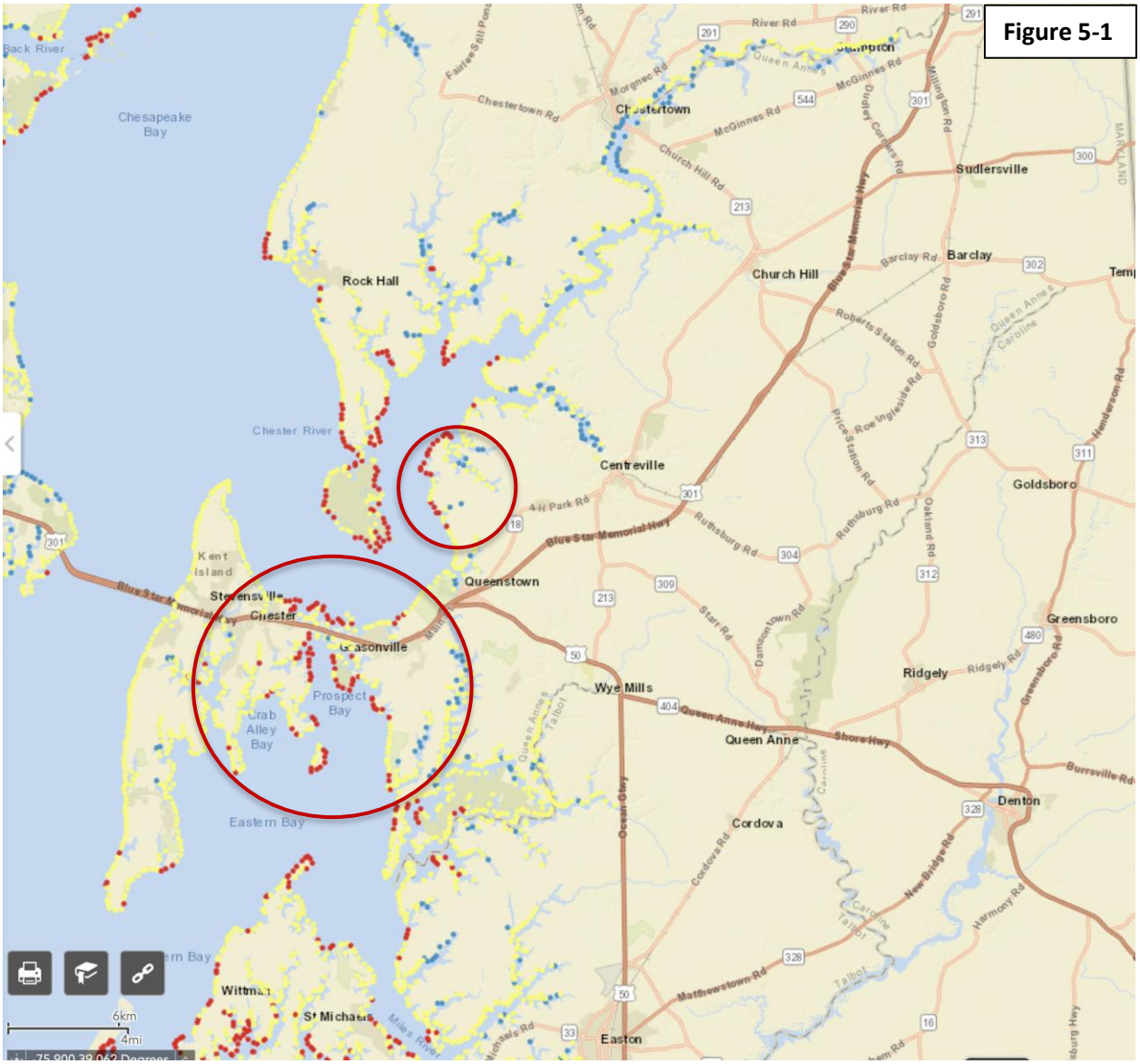


Figure 5-1

5.3 History of Previous Hazard Occurrences

This Legacy Historical Shorelines is a subset of the Maryland Historical Shorelines data set with 5 counties being excluded from the shorelines which are Anne Arundel, Baltimore, Calvert, Harford and Prince George's County. The remaining counties have these digital shoreline vectors which are used to overlay orthophoto base map raster of the Maryland shoreline and show historical shoreline locations in relation to the Rates of Change (ROC) erosion level transects data. Acquired as part of multi-year Shoreline Changes mapping project to show erosion and other shoreline shifts along Maryland's Chesapeake Bay and tidal tributaries.

Figure 5-2, a screenshot from the Maryland Coastal Atlas online mapping tool, depicts the results of the shoreline rates of change for historic shorelines by years. Note, Maryland has both 10 years and 30 years of Shoreline Erosion level data for five counties, Queen Anne's County is not one of the five. Therefore, the legacy historic shoreline was included for this plan update.

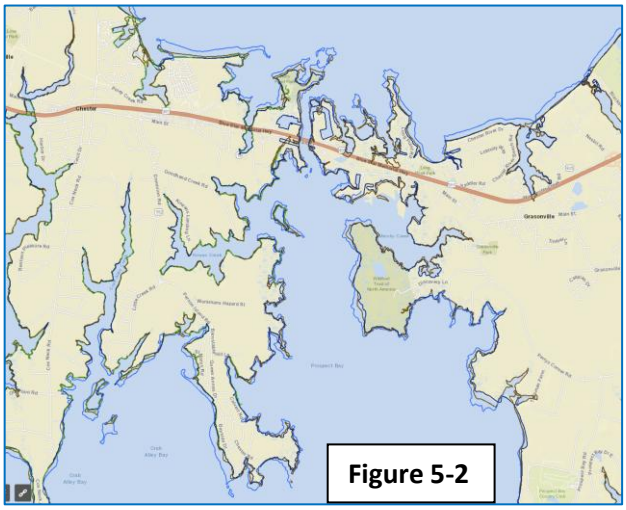


Figure 5-2

Shorelines along Stevensville, Chester, Grasonville has seen substantial shoreline erosion, see blue historic shoreline 1841-1861 for reference, Figure 5-3.

Figure 5-3



5.4 Probability of Future Occurrences

The traditional approach to counteracting coastal threats involves armoring the shoreline with bulkheads and other hardened structures to protect residents and infrastructure. Unfortunately, traditional approaches often increase the rate of erosion along adjacent shorelines and are very costly to replace once they fail.[ii] The probability of future coastal erosion is highly likely, however the rate at which shoreline erosion will occur is dependent upon the use of natural solutions and the conservation and restoration of coastal habitats.

5.5 Effects of Future Conditions

Coastal storm severity is expected to increase overtime, and sea levels are projected to continue to rise. The continuation of the traditional approach to counteracting coastal threats, which involves armoring the shoreline with bulkheads and other hardened structures to protect residents and infrastructure will not work long-term. Unfortunately, traditional approaches often increase the rate of erosion along adjacent shorelines. Therefore, a different approach to the protection of the shorelines involving conservation and restoration is warranted. Future conditions will be dictated by conservation and restoration efforts.

5.6 Changes in Land Development & Coastal Erosion

Forests, marshes, dunes, oyster reefs and underwater grasses can reduce erosion and flooding impacts for nearby coastal communities, especially when they exist in concert with each other. These habitats buffer communities from the full impacts of tides and storms. Their dynamic nature also allows for natural recovery following coastal hazard events. With that said, by in large, developed areas lack these habitat communities, and are subject to higher rates of coastal erosion. To regulate develop, manage land use and conserve natural resources on land in areas deemed critical, the Chesapeake Bay Critical Area Act was enacted. The Critical Area is all land and water areas within 1,000 feet of the tidal waters' edge or from the landward edge of adjacent tidal wetlands and the lands under them. Zoning Regulations on development activities in the Critical Area may be found in Queen Anne's County's Chapter 14:1 Critical Area Ordinance. Permits are required for construction projects, grading of land, including adding fill material and measures to control shore erosion, to cut or clear any vegetation, remove dead or dying trees (those posing an immediate threat may be removed however, with prior Planning and Zoning approval). Control of invasive plants may be conducted with prior Planning and Zoning approval. Maintenance of existing lawn and pruning of trees may be conducted without a permit.

Land within the Critical Area is classified as Resource Conservation Area (RCA), Limited Development Area (LDA), and Intensely Developed Area (IDA). These designations are based on land uses that existed on December 1, 1985, in the Chesapeake Bay Critical Area and on June 1, 2002, in the Atlantic Coastal Bays Critical Area. Property classified as RCA or LDA, are limited on the amount of total lot coverage permitted on a parcel. Generally, lot coverage is limited to no more than 15% of the total land area of the lot.

As previously discussed, overtime shoreline erosion has increased and is expected to continue in those areas shown on Figure 5-1 Shoreline Hazard Index. That being said, Maryland's Critical Area limits development, which mitigates future development. Therefore, changes in development affecting this hazard would be minimal, as the critical area is strictly enforced.

5.7 Coastal Erosion Vulnerability

To describe the impacts of coastal erosion to Queen Anne's County and its participating municipalities, hazard vulnerability and impacts have been assessed and documented specific to people, systems, community activities, structures, and historic resources. The following Towns are in a non-coastal area in the County and therefore are not affected by this hazard: **Sudlersville**, **Barclay**, and **Church Hill**.

Plan Update Note

To satisfy Requirement 44 CFR SS 201.6(c)(2)(ii)), the vulnerability section of this chapter has been expanded upon to include additional community assets.

5.7.1 VULNERABILITY AND IMPACTS TO PEOPLE AND THE ENVIRONMENT

According to the U.S. Climate Resilience Toolkit, coastal erosion is responsible for roughly $500 million per year in coastal property loss. More than 80,000 acres of coastal wetlands are lost every year. Erosion typically has a very localized limited direct impact on the county. However, when erosion does occur, the effects may be devastating to the localized area where it has occurred, along the shoreline. Generally, these damages occur infrequently in Queen Anne's County, however, during severe storms and flooding events, erosion can become devastating causing a large loss of shoreline or widespread damages from large amounts of soil being washed away. Areas of coastal erosion susceptibility are primarily within the unincorporated portions of Queen Anne's County, however small portions of **Queenstown** and **Centreville** are also susceptible, both are adjacent to low and moderate exposure areas, according to the Shoreline Hazard Index, shown on Figure 5-1.

The Gradient and Sediment Control Ordinance dictates all jurisdictions within the county must adhere to the soil stabilization guidelines upon initiating any construction project. This allows for a uniform approach to tackling and preventing erosion. While each erosion prevention technique is unique for the type of soil in the area, the plan allows for protective measures to be undertaken in order to prevent soil destabilization. Prior to building, Queen Anne's County Grading and Sediment Control Ordinance require strict guidelines to be followed including a strict permitting process as well as adherence to a soil/erosion conservation plan. Such plans include pre-determined run-off points to be created during the construction process, certain types of fill to be placed over the ground surface for construction roads and collection points for storm flow. Areas located near the Chesapeake Bay area are much more susceptible to erosion than areas located away from the river.

Plan Update Note

To satisfy FEMA Requirement 44 CFR § 201.6(c)(2)(ii), this section, Social Equity & Vulnerability has been included in the plan update as a new element.

A community's vulnerability to coastal erosion is based on its exposure, sensitivity, adaptive capacity, and people's ability to prepare for, respond to, and recover from an event – often referred to as social vulnerability. Vulnerability to impending coastal erosion is disproportionately higher among low-income communities. Recovery within these communities is also significantly more challenging due to their economic restraints. Infrastructure within these communities is particularly susceptible to the impacts of coastal erosion. Subpar building standards in order to create affordable housing within these communities leave many of its residents at a higher risk during natural disasters. Shoreline areas in Queen Anne's County tend to include the costliest real estate on average.

5.7.2 VULNERABILITY AND IMPACTS TO SYSTEMS

Queen Anne's County has had millions of dollars of damage from erosion over the years. Hurricane Isabel was a major contributor to coastal erosion along the county shoreline. Following the hurricane, the county had over $2 million worth of damage from erosion which blocked and backed up storm drains causing flooding in addition to coastal erosion caused by the storm surge. Roadways are also impacted by coastal erosion, particularly those vulnerable to projected sea level rise inundation, are highly susceptible.

5.7.3 VULNERABILITY AND IMPACTS TO STRUCTURES

In addition to stormwater systems, armored shorelines with bulkheads and other hardened structures to protect residents and infrastructure are vulnerable to coastal erosion. Because these hardened shoreline structures reflect wave energy, they alter the physical shoreline environment and natural sand movement patterns. Erosion or deposition of sediments up or downstream of the structure can occur and ultimately lead to destabilization of the shoreline.[iii]

One example of coastal erosion is the shoreline on both sides of Watson Road in **Centreville**, which has been impacted. Shoreline work around the Wharf has been completed, however the shoreline on the other side of Watson Road is continuing to erode. The Town is currently working on removing phragmites in this area.

The Town of **Millington** indicated that the areas surrounding the upper reach of Chester River have been cleared. The runoff from the clearings have created silt mud that is deposited into the river, raising the water level.

Numerous waterfront properties located in **Queenstown** lack shoreline stabilization. In addition, the Maryland Coastal Resiliency Assessment determined both the northern and southern portion of Kent Island predominantly on the windward side have very high erosion rates, see Figure 5-1.

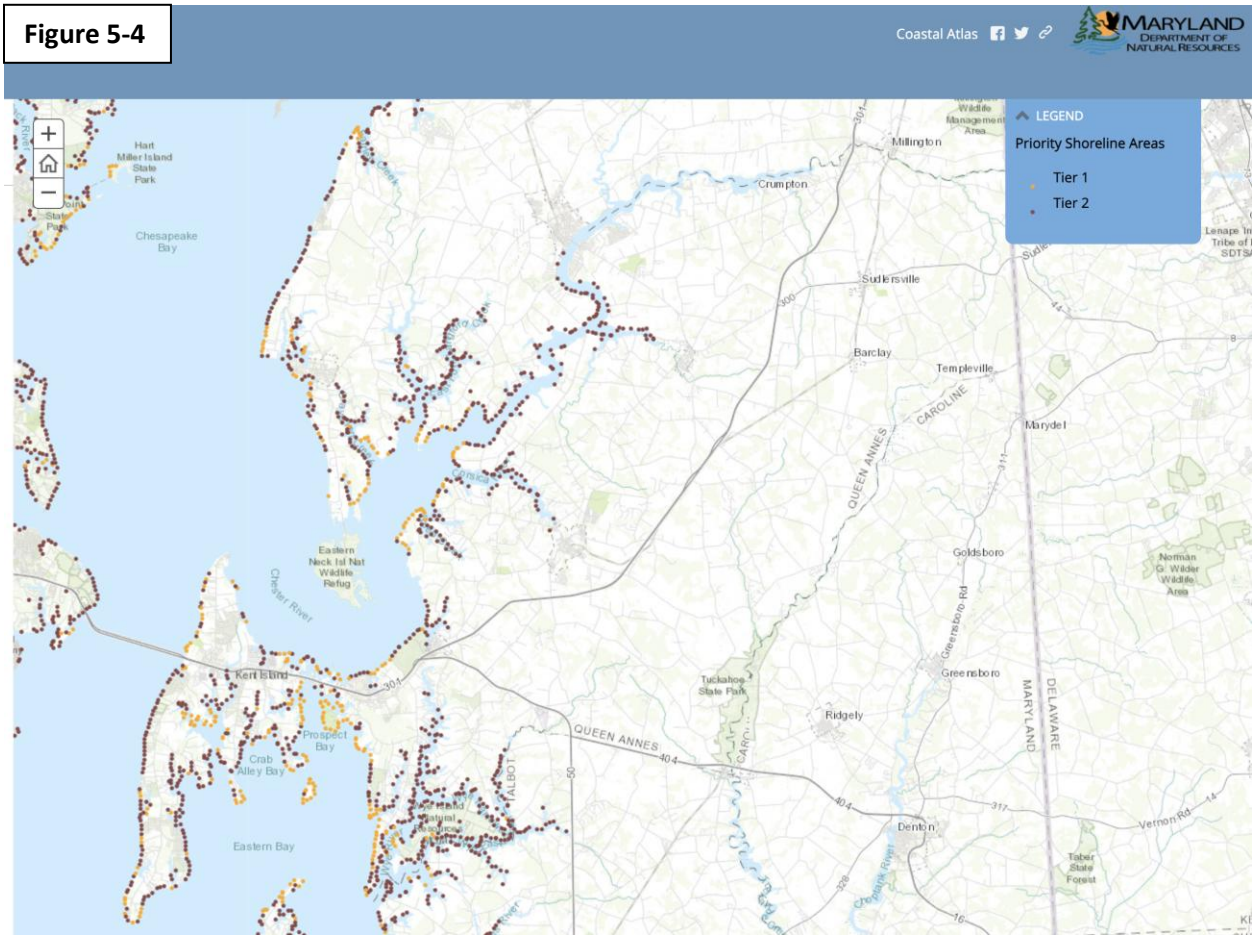
According to the Maryland Coastal Atlas ArcGIS StoryMap, forests, marshes, dunes, oyster reefs and underwater grasses can reduce erosion and flooding impacts for nearby coastal communities, especially when they exist in concert with each other. These habitats buffer communities from the full impacts of tides and storms. Their dynamic nature also allows for natural recovery following coastal hazard events.

Conservation and restoration of coastal habitats will better protect Maryland's low-lying rural and urban communities. Acknowledging the role nature plays in community resiliency, the Maryland Department of Natural Resources (DNR) partnered with The Nature Conservancy (TNC) to evaluate where habitats can best

Priority Shoreline Areas are those areas where protection and restoration of natural habitats has the greatest potential to reduce the coastal hazard risk faced by residential communities. Two tiers of priority were determined. **Tier 1 or High Priority** areas or **Tier 2 or Moderate Priority** areas
Tier 1 areas comprise 22% of the MD coastline and Tier 2 areas comprise an additional 40% of the MD coastline, see Figure 5-4.

Tier 1 priority shoreline areas where the habitat role in reducing shoreline hazard is currently high should be targeted for acquisition, easement, or other means of securing them from conversion to development. Tier 2 priority shoreline areas, all of which have no more than a moderate habitat role, will likely offer the greatest number of opportunities for restoration.

Figure 5-4



5.7.4 VULNERABILITY AND IMPACTS TO COMMUNITY ACTIVITIES

Activities that have value to the community could potentially be impacted by coastal erosion due to a coastal storm event, however due to the nature of this hazard, which occurs overtime, the likelihood of impacts would be more associated with the loss of high community value recreation areas, than an event. Matapeake Beach for example is located along the Chesapeake Bay in Stevensville. Matapeake Beach includes the county's only public swimming beach, an outdoor amphitheater, a family picnic area, and one-mile trail through the surrounding woods with views of the Bay Bridge. Loss of the beach area would impact the community. In addition, Ferry Point Park is susceptible to coastal erosion. The Queen Anne's County Parks Department is applying for grant funding to protect the arm of the park. If the arm of this park disappears, it could have devastating effects to the Kent Narrows area.

5.7.5 VULNERABILITY AND IMPACTS TO HISTORIC STRUCTURES

Coastal erosion and rising sea levels could result in impacts to Historic Structures. The Kent Island and Grasonville area are susceptible to both of these hazards. Historic structures in these areas include Chester Hall- Chestertown, Friendship- Stevensville, Matapak- Stevensville, Legg's

Dependence- Stevensville, Stevensville Historic District, and Elsworth (skipjack)- Chestertown.

[i] Maryland Resiliency Assessment, StoryMap
[ii] Maryland Resiliency Assessment, StoryMap, Coastal Resiliency
[iii] Living Shorelines VS. Hardened Shorelines by Elizabeth Hornstein

Report Citation: The Nature Conservancy, 2016. Maryland Coastal Resiliency Assessment. M.R. Canick, N. Carlozo and D. Foster. Bethesda, MD.

Cover Page Photo Credits: forest, marsh, dune - Maryland Department of Natural Resources; underwater grass – University of Maryland Center for Environmental Science/Cassie Gurbisz; oysters - Oyster Recovery Partnership.

Chapter 6 Drought



Source: BayTimes - Mid Shore drought worries continue despite this week's rain

This chapter profiles drought history, risk, and vulnerability for Queen Anne's County and participating municipalities. During this plan update, new or changed plan components are shown in bold text below.

- 6.1 DROUGHT
- 6.2 LOCATION AND GEOGRAPHIC EXTENT
  - 6.2.1 Standardized Precipitation Index (SPI)
- 6.3 HISTORY OF PREVIOUS HAZARD EVENTS
- **6.4 PROBABILITY OF FUTURE OCCURENCES**
- **6.5 EFFECTS OF FUTURE CONDITIONS**
- **6.6 CHANGES IN LAND DEVELOPMENT & DROUGHT**
- 6.7 DROUGHT VULNERABILITY
  - **6.7.1 Vulnerability and Impacts to People and the Environment**
  - **6.7.2 Vulnerability and Impacts to Systems**
  - **6.7.3 Vulnerability and Impacts to Community Activities**
  - **6.7.4 Vulnerability and Impacts to Structures**
  - **6.7.5 Vulnerability and Impacts to Historic Structures**

Note: The previous plan included hazard impact tables based on Emergency Management Accreditation Program requirements (EMAP). This information was expanded as part of this plan update within the vulnerability section.

Public Survey Results

- Survey participants indicated they were "somewhat concerned" with drought.
- 22% of the survey participants indicated they have been personally affected by drought.
- 18% of the survey participants have reduced drought risk to their home/business by Installed alternate power/water supply.

Chapter Updates

- All sections of the chapter were updated with new information, graphics, maps, and tables.
- Drought hazard history data was updated to include events that have occurred during this planning cycle.
- The vulnerability section was updated with the following new subsections:
  - Vulnerability and Impacts to People and the Environment,
  - Vulnerability and Impacts to Community Systems,
  - Vulnerability and Impacts to Community Activities,
  - Vulnerability and Impacts to Structures, and
  - Vulnerability and Impacts to Historic Resources.
- Information from the Water Resources Element of the 2022 Queen Anne's Comprehensive Plan was integrated into the chapter.

6.1 Drought

Drought is a normal part of virtually all climates, including areas with high and low average rainfall. Droughts are periods of time when natural or managed water systems do not provide enough water to meet established human and environmental uses because of natural shortfalls in precipitation or stream flow. Although maintaining water supplies for human use is an important aspect of drought management, drought can also have many other dramatic and detrimental effects on the environment and wildlife.

Droughts can be grouped into meteorological, hydrologic, agricultural, and/or socioeconomic. Representative definitions commonly used to describe the types of droughts are summarized below.

Meteorological drought is defined solely on the degrees of dryness, expressed as a departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.

Hydrologic drought is related to the effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.

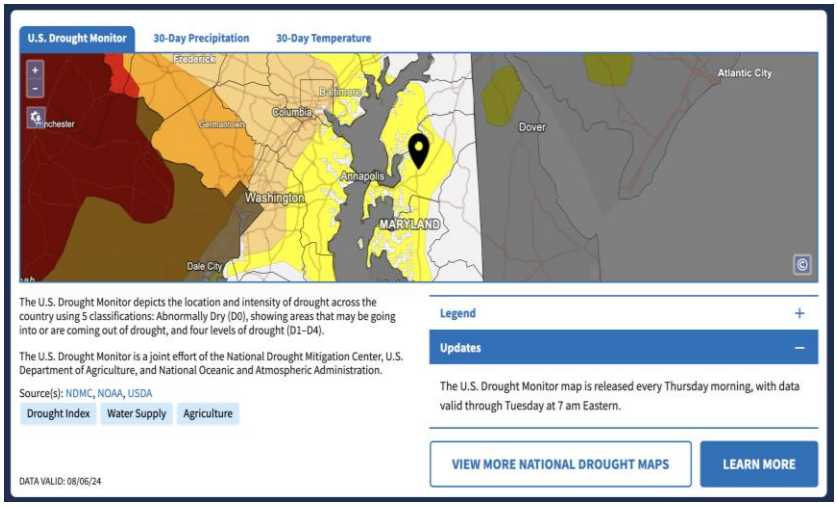
Agricultural drought is defined principally in terms of soil moisture deficiencies relative to water demands of plant life, usually crops.

Socioeconomic drought associates the supply and demand of economic goods or services with elements of meteorological, hydrologic, and agricultural drought. Socioeconomic drought occurs when the demand for water exceeds the supply as a result of a weather-related supply shortfall. The incidence of this type of drought can increase because of a change in the amount of rainfall, a change in societal demands for water (or vulnerability to water shortages), or both.

6.2 Location and Geographic Extent

Because drought is usually considered a regional hazard, it is not enhanced or analyzed by County-level mapping. All jurisdictions are assumed to have the same risk level within Queen Anne's County. Mapping of the current drought status is published by the National Integrated Drought Information System (NIDIS): U.S. Drought Portal which can be found online at: www.drought.gov.

Figure 6-1



Due to the nature of drought, all jurisdictions within Queen Anne's County are expected to be impacted equally due to drought conditions.

6.2.1 STANDARDIZED PRECIPITATION INDEX (SPI)

The Standardized Precipitation Index (SPI) is a drought index based on the probability of an observed precipitation deficit occurring over a given prior time period. The assessment periods considered range from 1 to 36 months. The variable time scale allows the SPI to describe drought conditions important for a range of meteorological, agricultural, and hydrological applications. For example, soil moisture conditions respond to precipitation deficits occurring on a relatively brief time scale, whereas groundwater, stream flow, and reservoir storage respond to precipitation deficits arising over many months.

In the 1960s Wayne Palmer developed the Palmer Drought Severity Index (PDSI), which uses temperature and rainfall information in a formula to determine dryness. It has become the semi-official drought index. The Palmer Index is most effective in determining long-term drought—a matter of several months—and is not as good with short-term forecasts (a matter of weeks). It uses a 0 as normal, and drought is shown in terms of minus numbers; for example, minus 2 is moderate drought, minus 3 is severe drought, and minus 4 is extreme drought.

TABLE 6-1: DROUGHT SEVERITY CLASSIFICATION

DROUGHT SEVERITY	RETURN PERIOD (YEARS)	DESCRIPTION OF POSSIBLE IMPACTS	DROUGHT MONITORING INDICES		
			Standardized Precipitation Index (SPI)	NDMC* Drought Category	Palmer Drought Index
Minor Drought	3 to 4	Going into drought; short-term dryness slowing growth of crops or pastures; fire risk above average. Coming out of drought; some lingering water deficits; pastures or crops not fully recovered.	-0.5 to -0.7	D0	-1.0 to -1.9
Moderate Drought	5 to 9	Some damage to crops or pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing, or imminent, voluntary water use restrictions requested.	-0.8 to -1.2	D1	-2.0 to -2.9
Severe Drought	10 to 17	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed	-1.3 to -1.5	D2	-3.0 to -3.9
Extreme Drought	18 to 43	Major crop and pasture losses; extreme fire danger; widespread water shortages or restrictions	-1.6 to -1.9	D3	-4.0 to -4.9
Exceptional Drought	44 +	Exceptional and widespread crop and pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells creating water emergencies	Less than -2	D4	-5.0 or less

Source: National Drought Mitigation Center

6.3 History of Previous Hazard Events

According to National Centers for Environmental Information (NCEI), Queen Anne's County has experienced 62 recorded drought events from 1997-2023.

TABLE 6-2: DROUGHT – 1997-2023

# OF EVENTS	INJURIES	DEATHS	DAMAGES	FREQUENCY
62	0	0	$2,083,000	2.38

Source: National Centers for Environmental Information (NCEI), Events through December 2023

The drought event that occurred June 1, 2016, through September 29, 2016, prompted the Small Business Administration to offer working capital loans, known as federal economic injury disaster loans. Maryland jurisdictions eligible included Caroline, Dorchester, Kent, Wicomico, and Queen Anne's counties.

According to Chapter 2, Table 2-1: Presidential Disaster and Emergency Declarations in Queen Anne's County, no Drought events have been declared.

6.4 Probability of Future Occurrences

Broadly, there is a need to benchmark our current understanding of drought in a changing climate. This would allow for more targeted research to build on the current state of science. It would include defining the drought-to-aridification continuum to help differentiate between drought, multidecadal drought, and aridification. There are also efforts needed to improve drought assessment at a national level based on current best practices internationally to account for non-stationarity and increase national level coordination.[i] However using past occurrence data, Chapter 2, Table 2 indicates future drought events are likely to occur.

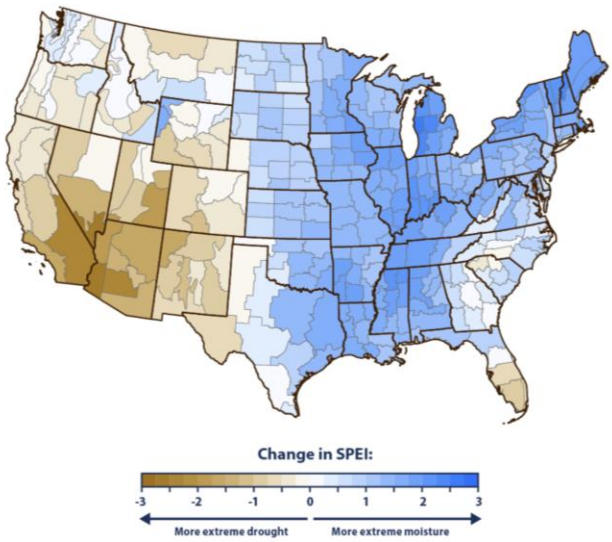
6.5 Effects of Future Conditions

Figure 6-2

As average temperatures have risen because of climate change, the Earth's water cycle has sped up through an increase in the rate of evaporation from the Earth's surface (including soil, lakes, and reservoirs) and transpiration from plants. An increase in evapotranspiration makes more water available in the air for precipitation, but contributes to drying over some land areas, leaving less moisture in the soil.[ii]

This map shows the total change in drought conditions across the contiguous 48 states, based on the long-term average rate of change in the five-year SPEI from 1900 to 2023. Data is displayed for small regions called climate divisions. Blue areas represent increased moisture; brown areas represent decreased moisture or drier conditions.

Figure 3. Average Change in Drought (Five-Year SPEI) in the Contiguous 48 States, 1900–2023



Data sources: Abatzoglou et al., 2017; Western Regional Climate Center, 2024. Map source: EPA Climate Indicators

6.6 Changes in Land Development & Drought

Adapting to climate change and managing changes in development and land use specific to drought include agricultural water management, resilient agricultural practices, and sustainable land use. Between 1973 and 2019, the County lost over 21,000 acres of agricultural land.[iii] However, Queen Anne's County has continued to be defined by its rural and agricultural setting, the water, and its natural habitats, which are among the most important in the nation. Also, Queen Anne's County is one of the

few counties in Maryland that has preserved approximately 43% of its total land area in some form of conservation.[iv] As climate resiliency plays an ever-increasing role in land use planning, it brings into sharp focus the need to direct growth to designated Growth Areas that can provide adequate public facilities and to preserve the finite resource of the County's tillable soil.[v]

Both Queen Anne's County and municipalities coordinate land use planning and growth management. Preserving agricultural lands outside Town Fringe areas is a guiding principle.[vi] The Town of Barclay has grown little over the past two decades.[vii] In fact, there has been a moratorium on development over the past five years. The Centreville Growth Area was previously expanded to include Greenbelt Areas.[viii] Church Hill's growth enhances the common good through its contributions to the continuation of a unified Town design, expansion of the Town's recreational network, and its focus on preservation of the natural environment.[ix] The Town of Millington's growth areas are all in Kent County.[x] The Town Queen Anne has no identified growth area.[xi] The Town Queenstown has identified growth areas. Approximately 180 acres of Queenstown's Growth Area are located in the Chesapeake Bay Critical Area and are designated Resource Conservation Areas (RCA). For these areas to be developed as planned, Critical Area Growth Allocation would be required. The Town's Plan highlights the critical need for interjurisdictional coordination and cooperation.[xii] Templeville is expected to remain a largely residential community with limited employment opportunities locally. Its crossroads nature will continue to provide convenient access to towns and areas east and west along MD 452 and MD 302. The areas around Templeville are expected to remain agriculturally oriented, due in large part to participation in agricultural preservation programs.[xiii] The Town of Sudlersville Comprehensive Plan noted that the Town has adequate land capacity within its corporate limits to accommodate expected growth over the next few decades. One of the core visions identified by the Town is to sensitively fit itself within the surrounding natural environment.[xiv] However, due to the agricultural land within the Town limits, Sudlersville would experience the effects of drought more acutely than those municipalities that are urbanized. Impacts include both financial and employment, as many farmers do not have insurance, according to the Town.

Drought's greatest impact on future development would possibly be to ground water resources. New water and sewer systems or significant wells and septic sites could use up more of the water available, particularly during periods of drought. Public water systems are monitored, but individual wells and septic systems are not as strictly regulated. Therefore, future development could have an impact on the drought vulnerabilities.

Taking precautions early during drought events is essential to ensure that health professionals and emergency managers are prepared to help the community mitigate damages in the event of an ongoing drought. Public outreach is also crucial to ensure that affected areas and communities can properly prepare for the impacts of a drought. It is also important to recognize the competing interest of agricultural irrigation and potable residential wells. Both draw from the same aquifer in the rural areas and the cone of depression caused by irrigation will impact adjacent residential wells.

6.7 Drought Vulnerability

There is no commonly accepted approach for assessing risk associated with droughts given the varying types and indices. Drought risk is based on a combination of the frequency, severity, and spatial extent (the physical nature of drought) and the degree to which a population or activity is vulnerable to the

effects of drought. The degree of Queen Anne's County's vulnerability to drought depends on the environmental and social characteristics of the region and is measured by its ability to anticipate, cope with, resist, and recover from drought.

6.7.1 VULNERABILITY AND IMPACTS TO PEOPLE & THE ENVIRONMENT

Examples of drought-induced social impacts include health-related low-flow problems (e.g., cross-connection contamination, diminished sewage flows, increased pollutant concentrations, and reduced firefighting capability due to low water supply – hydrants).

Social vulnerability considerations include:

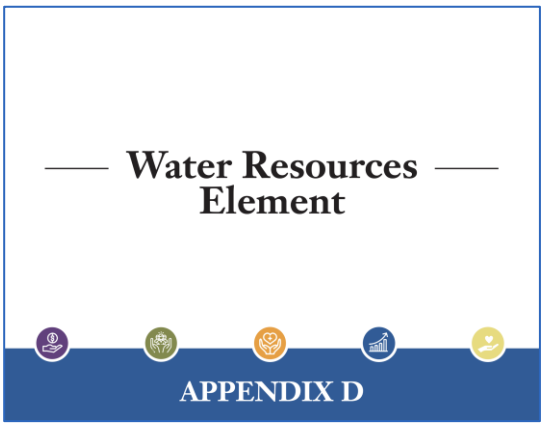
- Populations aged 65 and older and children aged 5 and younger are most at-risk during droughts. The highest socially vulnerable populations are located in the northeast portion of Queen Anne's County, including the Towns of Sudlersville, Barclay, and Templeville. In addition, the area (small census tract) just southwest of Queenstown is identified as a socially vulnerable area.
- Drought can reduce the water supply that serves not only households and businesses, but also at-risk populations.
- Drought often results in drier conditions, which can increase the risk of disease. For example, drier conditions can increase reproduction of a fungus found in soils and lead to the disease coccidioidomycosis, or Valley fever.
- Elderly populations are considered the most at risk during hazardous events because they require more time and are more likely to seek emergency medical attention that might not be as readily available.
- Drought and its economic consequences can lead to increased mental health impacts, including mood disorders, substance abuse, domestic violence, and suicide.
- Drought can lead to compromised food and nutrition production/upkeep.

Drought's impacts are largely associated with agriculture, farming, and ranching. Examples of drought-induced agricultural impacts include damage to crop quality; income loss for farmers due to reduced crop yields; reduced productivity of cropland (due to wind erosion, long-term loss of organic matter, etc.); insect infestation; plant disease; increased irrigation costs; costs of new or supplemental water resource development (wells, dams, pipelines); reduced productivity.

Environmental impacts are more likely at the interface of the human and natural world. The loss of crops or livestock due to drought can have far-reaching economic effects. Impacts associated with wildlife, fisheries, forests, and other fauna may result from drought events. Examples of drought-induced environment impacts include: loss of biodiversity of plants or wildlife; loss of trees from urban landscapes, shelterbelts, wooded conservation areas; reduction and degradation of fish and wildlife habitat; lack of feed and drinking water; greater mortality due to increased contact with agricultural producers, as animals seek food from farms and producers are less tolerant of the intrusion; disease; increased vulnerability to predation (from species concentrated near water); migration and concentration (loss of wildlife in some areas and too many wildlife in other areas); and increased stress to endangered species.

6.7.2 VULNERABILITY AND IMPACTS TO SYSTEMS

Impacts associated with surface or subsurface water supplies (i.e., reservoirs or aquifers), stream levels or stream flow, or navigation. Examples of drought-induced water/energy impacts include: lower water levels in reservoirs, lakes, and ponds; reduced flow from springs; reduced stream flow; loss of wetlands; estuarine impacts (e.g., changes in salinity levels); increased groundwater depletion, land subsidence, reduced recharge; water quality effects (e.g., salt concentration, increased water temperature, pH, dissolved oxygen, turbidity); revenue shortfalls and/or windfall profits; cost of water transport or transfer; cost of new or supplemental water resource development; and loss from impaired navigability of streams, rivers, and canals.



The Water Resources Element of the 2022 Queen Anne's Comprehensive Plan includes information on existing water supply, water supply issues, and identifies new goals related to water supply. Groundwater supplies are believed to be sufficient for existing and projected demand; however, limited groundwater withdrawal from the Aquia aquifer in Kent Island is necessary to reduce further brackish-water intrusion into the Aquia aquifer. Groundwater, drawn from the Aquia Greensand Formation (aquifer), is the sole source for potable water supplies in Centreville. According to the Queen Anne's County Comprehensive Water and Sewer Plan, this formation is the most important source of groundwater in Queen Anne's County, with several hundred wells, mostly on Kent Island and in the Grasonville and Queenstown areas. Shallow private wells in the Templeville area have experience elevated concentrations of nitrates.

In addition to those regional issues previously identified, the following is a listing of key County/Town issues associated with water supply.

- Limited detailed hydro-geologic studies
- Brackish water intrusion into the Aquia aquifer and future impacts of continued eastward migration
- Additional water treatment for deeper aquifer sources
- Increasing water storage capacity
- Agricultural irrigation impacts

Notable Water Resources Goals related to water supply include:

- Maintain safe and adequate drinking water supply to accommodate the needs of current and future populations of the County.
- Identify a variety of land management practices, best management practices and other tools and techniques that protect surface water and groundwater quality and quantity.
- Promote intergovernmental cooperation and coordination with respect to land use planning and implementation with the intent to minimize impacts on water resources.
- Educate and engage the general public in watershed conservation and stewardship.

Notable Water Resources Recommendations related to water supply include:

- Require the development and use of Water Supply Capacity Management Plans for each community water system to support new allocations or connections to the system and to prevent capacity over-allocation.
- Establish watershed or wellhead protection strategies for water supply sources.
- Develop a Water Protection Plan working collaboratively through interjurisdictional agreements between the County and the Towns for planning and implementation.
    - Tracking water-level declines of groundwater resources.
    - Continued monitoring and study to ensure an adequate supply of necessary water resources.
- Implement water conservation policies, guidelines, and regulations.
- Update the County's Comprehensive Water and Sewerage Plan consistent with any changes in land use within the 2021 Comprehensive Plan Update.

6.7.3 VULNERABILITY AND IMPACTS TO COMMUNITY ACTIVITIES

Loss of aesthetic values along with a reduction or modification of recreational activities may be an impact from drought, depending on the severity and duration of the hazard event. In addition, losses to manufacturers and sellers of recreational equipment and losses related to curtailed activities (hunting and fishing, bird watching, boating, etc.) affect both ecotourism and associated community activities. Water-based recreational resources are affected by drought conditions.

Activities that have value to the community could potentially be impacted by drought events, include:

- The Historic Stevensville Art Market is a reoccurring event that happens monthly from April - November.
- The Sudlersville Peach Festival is an event for the community held at the beginning of August.
- The Queen Anne's County Fair in Centreville, MD is held the second week in August.
- The Annual Paint Stevensville event is held at the beginning of June.
- The Juneteenth festival is held in Centreville, MD with live music, vendors, a parade, and more for the community.
- The Family Fun Festival is a free family friendly community event that is also held in June.
- Bluegrass in the Blueberry Patch is a free event open to the public hosting live bluegrass music and blueberry picking that is held towards the end of June.
- The 4th of July Celebration at Kent Narrows.

6.7.4 VULNERABILITY AND IMPACTS TO STRUCTURES

Drought typically does not have a direct impact on critical facilities or structures. However, possible losses/impacts to critical facilities include the loss of critical function due to low water supplies. Severe droughts can negatively affect drinking water supplies. Should a public water system be affected, the losses could total into the millions of dollars if outside water is shipped in. Private springs/wells could also dry up. Possible losses to infrastructure include the loss of potable water.

In the event that a drought affects the water available for public water systems or individual wells, the availability of clean drinking water could be compromised. This situation would require emergency actions and could possibly overwhelm the local government and financial resources.

In 2010, the U.S. Department of Agriculture reported that $1.1 million was awarded to Queen Anne's County through the Supplemental Revenue Assistance Payment (SURE) program. This program provides financial assistance for crop production and/or quality losses due to a natural disaster. Cropland is a valuable resource to Queen Anne's County and is vulnerable to drought conditions.

The following facilities are critical in supplying water to Queen Anne's County and all participating municipalities.

TABLE 6-3: CRITICAL FACILITIES & DROUGHT RISK

FACILITY TYPE	NAME	ADDRESS	Town
WTP	Thompson Creek Water Treatment Plant	610 Marion Quimby Dr	Stevensville
WTP	Oyster Cove Water Treatment Plant	3230 Main St	Grasonville
WTP	CBBP Water Treatment Plant	232 Bateau Dr	Stevensville
WTP	Bayside Water Treatment Plant	103 Tackle Cir	Chester
WTP	Prospect Bay Water Treatment Plant	101 Golf Cart Dr	Grasonville
WTP	Kent Island Village Water Treatment Plant	1839 Anchorage Dr	Chester
WTP	Bridge Pointe Water Treatment Plant	9025 Bridgepointe Dr	Chester
WTP	Grasonville Water Treatment Plant	5439 Main St	Grasonville
WTP	Riverside Water Treatment Plant	206 Riverside Dr	Chester
WTP	Stevensville Water Treatment Plant	208 Church St	Stevensville
WTP	Queens Landing Water Treatment Plant	131 Queen Landing Dr	Chester
WTP	Sudlersville Water Treatment Plant	701 Foxxtown Dr	Sudlersville
WTP	Centreville Water Treatment Plant	333 Commerce St	Centreville
Water Booster Pump Station	Stevensville Water Treatment Plant	208 Church St	Stevensville
Water Booster Pump Station	Thompson Creek Rd Booster Pump Station	115 Thompson Creek Rd	Stevensville
Water Tower	QAC Sanitary CBBP Water Tower	230 Bateau Dr	Stevensville
Water Tower	Prospect Bay Water Tower	200 Golf Cart Dr	Grasonville
Water Tower	Matapeake Water Tower	180 Marine Academy Dr	Stevensville
Water Tower	Queens Landing Water Tower	101 Captains Way	Chester
Water Tower	Four Seasons Water Tower	1707 Piney Creek Rd	Chester
Water Tower	Town of Centreville Water	151 Comet Dr	Centreville
Well House	Prospect Wellhouse #2 / Inactive	35 Greenwood SHLS	Grasonville
Water Reuse	Centreville Water Reuse Area (Municipal)	751 Hope Rd	Centreville

6.7.5 VULNERABILITY AND IMPACTS TO HISTORIC STRUCTURES

Drought typically does not have a direct impact on historic structures. Low water supplies could impact the aesthetic value of these properties specific to landscaping. Historic homes used for inns or vacation rentals may be adversely impacted. Historic properties on the National Register Listing are included below.[xv]

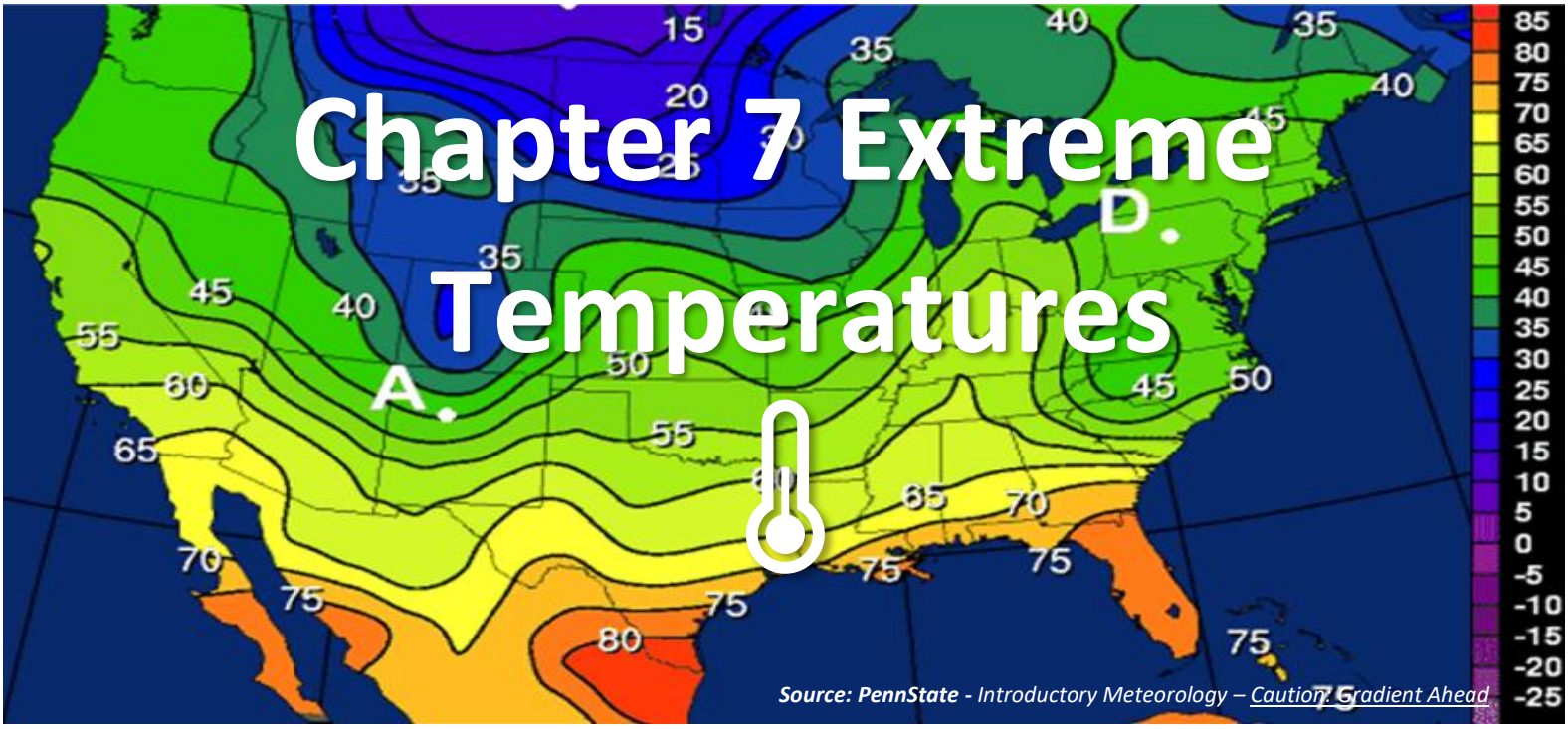
Figure 6-3

[illegible]	perty Name	Address	Community
QA-224	Bachelor's Hope (Phares Morris Farm)	201 Bachelors Hope Farm Ln	Centreville
QA-18	Bishopton	305 Pinder Hill Rd	Church Hill
QA-4	Bloomingdale (Mount Mill)	Bloomingdale Rd & Ocean Gateway	Queenstown
QA-7	Bowlingly	111 Bowlingly Cir	Queenstown
QA-201	Captain John H. Ozmon Store	114 Corsica St	Centreville
QA-541	Centreville Historic District	—	Centreville
QA-23	Chester Hall (Rye Hall)	Round Top Rd & Church Hill Rd	Chestertown
QA-457	Church Hill Theatre (Community Building)	103 Walnut St	Church Hill
QA-11	Content (C.C. Harper Farm)	842 Hope Rd	Centreville
QA-258	Female Seminary (Female School, 1876)	205-207 S Commerce St	Centreville
QA-163	Friendship	Kent Point Rd	Stevensville
QA-92	Hawkins Pharsalia (Franklin Gannon Farm)	Ruthsburg Rd	Centreville
QA-257	Jackson Collins House	201 S Commerce St	Centreville
QA-33	John Embert Farm	Baxter Rd	Sudlersville
QA-153	Keating House (Covington House)	208 S Liberty St	Centreville
QA-3	Kennersley	Southeast Creek Rd	Church Hill
QA-87	Lansdowne (Upper Deale)	Hope Rd	Centreville
QA-206	Legg's Dependence	200 Long Creek Ct	Stevensville
QA-107	Lexon (Burris-Brockmeyer Farm)	Corsica Neck Rd	Centreville
QA-422	Log Canoe	Round Top Rd	Chestertown
QA-165	Mattapex	Shipping Creek Rd	Stevensville
QA-5	Reed's Creek Farm	Wrights Neck Rd	Centreville
QA-179	St. Andrew's Episcopal Chapel	104 Maple Ave	Sudlersville
QA-51	St. Luke's Episcopal Church	Church Ln	Church Hill
QA-209	St. Peter's Roman Catholic Church	5319 Ocean Gateway	Queenstown
QA-264	Stevensville Bank	Love Point Rd	Stevensville
QA-463	Stevensville Historic District	—	Stevensville
QA-90	Stratton	3102 Ruthsburg Rd	Centreville
QA-8	Thomas House	2231 Ruthsburg Rd	Centreville
QA-124	Wye Hall	505 Wye Hall Dr	Queenstown

Source: Maryland Inventory of Historic Properties (MIHP)

[i] 2023 Drought Assessment in a Changing Climate: Focus Area-Benchmarking Our Understanding of Drought in a Changing Climate.
[ii] EPA Climate Change Indicators: Drought, https://www.epa.gov/climate-indicators/climate-change-indicators-drought
[iii] Queen Anne's County Comprehensive Plan, 2023, page 4-5.
[iv] https://www.qac.org/CivicAlerts.aspx?AID=2725.
[v] Queen Anne's County Comprehensive Plan, 2023, page 4-6.
[vi] Queen Anne's County Comprehensive Plan, 2023, page 10-2.
[vii] Queen Anne's County Comprehensive Plan, 2023, page 10-6.
[viii] Queen Anne's County Comprehensive Plan, 2023, page 10-8.
[ix] Queen Anne's County Comprehensive Plan, 2023, page 10-10.
[x] Queen Anne's County Comprehensive Plan, 2023, page 10-12.
[xi] Queen Anne's County Comprehensive Plan, 2023, page 10-14.
[xii] Queen Anne's County Comprehensive Plan, 2023, page 10-16.
[xiii] Queen Anne's County Comprehensive Plan, 2023, page 10-20.
[xiv] Queen Anne's County Comprehensive Plan, 2023, page 10-18.
[xv] Queen Anne's County Comprehensive Plan, 2023, page 7-7.

Chapter 7 Extreme Temperatures



This chapter of the Plan describes an overall extreme temperatures profile, risk, and vulnerability for Queen Anne's County and participating municipalities. During this plan update, new or changed plan components are shown in bold text below.

- 7.1 EXTREME TEMPERATURES
  - 7.1.1 Extreme Heat
  - 7.1.2 Extreme Cold
- 7.2 LOCATION & GEOGRAPHIC EXTENT
- 7.3 HISTORY OF PREVIOUS HAZARD EVENTS
- **7.4 PROBABILITY OF FUTURE OCCURRENCES**
- **7.5 EFFECTS OF FUTURE CONDITIONS**
- **7.6 CHANGES IN LAND DEVELOPMENT & EXTREME TEMPERATURES**
- 7.7 EXTREME TEMPERATURES VULNERABILITY
  - **7.7.1 Vulnerability and Impacts to People and the Environment**
  - **7.7.2 Vulnerability and Impacts to Systems**
  - **7.7.3 Vulnerability and Impacts to Community Activities**
  - **7.7.4 Vulnerability and Impacts to Structures**
  - **7.7.5 Vulnerability and Impacts to Historic Structures**

Note: The previous plan included hazard impact tables based on Emergency Management Accreditation Program requirements (EMAP). This information was expanded as part of this plan update within the vulnerability section.

Public Survey Results

- Survey participants indicated they were "somewhat concerned" with extreme temperatures.
- 36% of the survey participants indicated they have been personally affected by extreme temperatures.
- Some survey participants have reduced extreme temperatures risk to their home/business by installing alternate heat supply.

Chapter Updates

- All sections of the chapter were updated with new information, graphics, maps, and tables.
- Extreme temperatures hazard history data was updated to include events that have occurred during this planning cycle.
- The vulnerability section in the previous 2019 Plan included impact tables, however the following subsections were added. The new subsections include narratives and were applicable, tables and maps.
  - Vulnerability and Impacts to People and the Environment,
  - Vulnerability and Impacts to Systems,
  - Vulnerability and Impacts to Community Activities,
  - Vulnerability and Impacts to Structures, and
  - Vulnerability and Impacts to Historic Resources.
- Information from the National Climate Assessment was integrated in to the chapter.

7.1 Extreme Temperatures

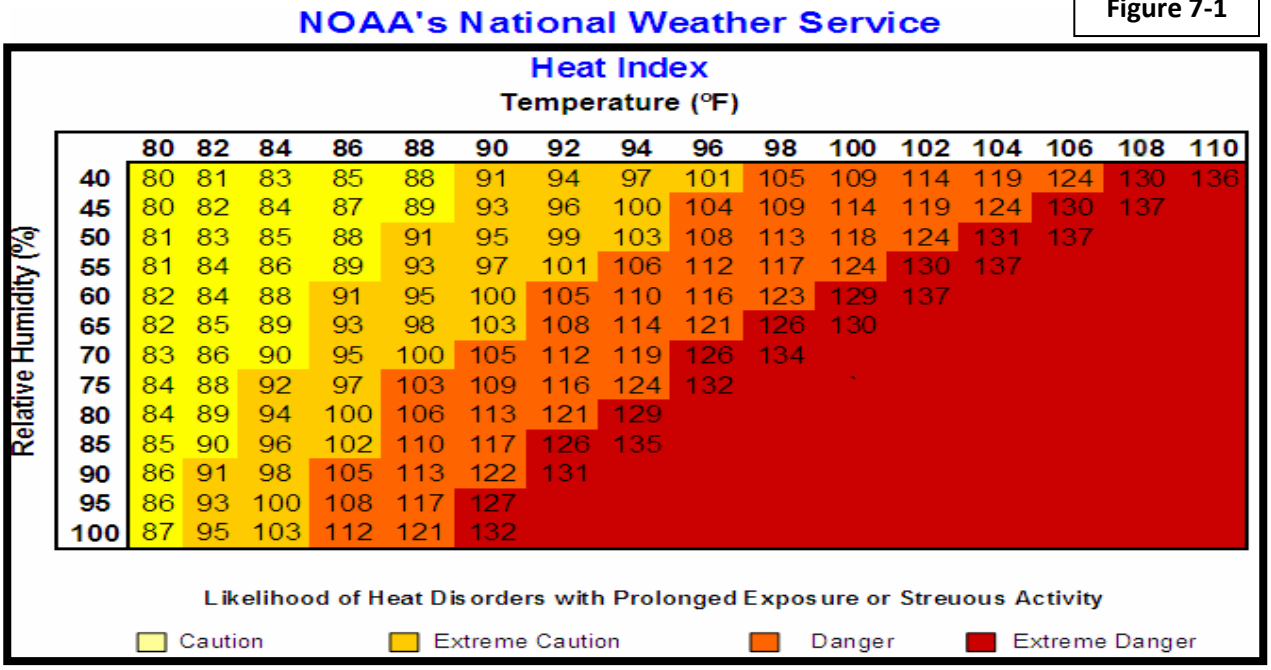
Temperature extremes can occur at almost any time of the year but are most prevalent in the summer and winter. Extreme temperatures can be dangerous due to the way that they affect individuals who are exposed to them.

7.1.1 EXTREME HEAT

Extreme heat is usually defined through a combination of temperature and humidity. The recorded extreme heat events have occurred from June through September.

Temperature advisories, watches and warnings are issued by the National Weather Service relating the above impacts to the range of temperatures typically experienced in Maryland. Exact thresholds vary across the State including Queen Anne's County, but in general *Heat Advisories* are issued when the heat index will be equal to or greater than 100°F, but less than 105°F, *Excessive Heat Warnings* are issued when heat indices will attain or exceed 105°F, and *Excessive Heat Watches*, are issued when there is a possibility that excessive heat warning criteria may be experienced within twelve to forty-eight hours (NOAA NWS).

Figure 7-1



Source: NOAA National Weather Service

The Heat Index is an important aspect to consider during the summer months. The heat index refers to how hot it "feels" outside. The heat index is based on air temperature and relative humidity. For example, an air temperature of 92°F with a humidity of 100% creates a heat index of 132°F, which is extremely dangerous. It should be noted that while anyone can experience heat related disorders, the two groups most vulnerable are those 65 years of age and older and those aged 17 or younger, especially small children and infants. The relationship between the heat index and heat disorders is described in Table 7-1.

TABLE 7-1: HEAT INDEX AND HEAT DISORDERS		
CLASSIFICATION	**HEAT INDEX (F)**	**POSSIBLE HEAT DISORDERS**
Extreme Danger	130 or Higher	Heatstroke/sunstroke highly likely with continued exposure.
Danger	105-130	Sunstroke, heat cramps or heat exhaustion likely and heatstroke possible with prolonged exposure and/or physical activity.
Extreme Caution	90-105	Sunstroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.
Caution	80-90	Fatigue possible with prolonged exposure and/or physical activity.

Source: NOAA National Weather Service

7.1.2 EXTREME COLD

What is considered an excessively cold temperature varies according to the normal climate for the region. Whenever temperatures drop decidedly below normal and wind speed increases, heat leaves the human body more rapidly, increasing the possibility of negative effects of these extreme cold temperatures. Frostbite can cause damage to body tissue which is a direct result of extreme cold.

Both frostbite and hyperthermia may result from exposure to extreme cold. Frostbite can occur in a human within 30 minutes with a wind chill of -20 Fahrenheit (F). Frostbite affects various areas of the body, specifically extremities like fingers, toes, ear lobes and the tip of the nose. Hypothermia is also a direct result of extreme cold. Hypothermia is brought on when the body temperature drops below 95 F. Hypothermia has the ability to kill, however those who survive hypothermia are likely to have chronic kidney, liver and pancreas issues. (National Weather Service, Stay Safe in the Extreme Cold (weather.gov)).

What constitutes extreme cold varies throughout the country. According to the Maryland Department of Health Extreme Cold Emergency Plan (2022 Version 1.0), an extreme cold event is defined as a weather condition with excessively low temperatures or a combination of cold temperatures and wind that has the potential to case cold-related illnesses or injuries. An extreme cold event is defined in hours, a day, or series of days when:

- The expected temperature or wind chill is forecasted to be approximately minus 5 degrees Fahrenheit or lower.
- Weather or environmental conditions are such that a high incidence of cold-related illnesses or injuries can reasonably be expected (Maryland Department of Health, 2023).

7.2 Location & Geographic Extent

Extreme temperature is not a hazard with a defined geographic boundary. All areas of Queen Anne's County including municipalities are susceptible to the effects of extreme heat and extreme cold. Higher elevations away from coastal areas tend to be a few degrees cooler, on average, than lower elevations.

7.3 History of Previous Hazard Events

According to National Centers for Environmental Information (NCEI), Queen Anne's County has experienced 16 excessive heat events from 2000-2024 and 59 heat events from 1996-2024.

TABLE 7-2: EXCESSIVE HEAT – 2000-2024				
# OF EVENTS	INJURIES	DEATHS	DAMAGES	FREQUENCY
17	0	0	0	0.70

Source: National Centers for Environmental Information (NCEI), Events through August 2024

TABLE 7-3: HEAT – 1996-2024				
# OF EVENTS	INJURIES	DEATHS	DAMAGES	FREQUENCY
59	1	1	0	2.61

Source: National Centers for Environmental Information (NCEI), Events through August 2024

According to the National Weather Service, an Excessive Heat Warning **means** that a prolonged period of dangerously hot temperatures will occur. The combination of hot temperatures and high humidity will combine to create a dangerous situation in which heat illnesses are likely. As an example, if the air temperature is 96°F and the relative humidity is 65%, the heat index--how hot it feels--is 121°F**.** The National Weather Service will initiate alert procedures when the Heat Index is expected to exceed 105°-110°F (depending on local climate) for at least 2 consecutive days. Whereas a Heat Advisory means that a period of hot temperatures is expected. The combination of hot temperatures and high humidity will combine to create a situation in which heat illnesses are possible.

Extreme Cold is a period of extremely low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined warning criteria (typical value around -350 F or colder). Period of low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined advisory (typical value is -180 F or colder) conditions.

According to National Centers for Environmental Information (NCEI), Queen Anne's County has experienced one extreme cold, and twenty-five cold/wind chill events, as detailed on Tables 7-4 and 7-5.

TABLE 7-4: EXTREME COLD/WIND CHILL – 2014-2024				
# OF EVENTS	INJURIES	DEATHS	DAMAGES	FREQUENCY
1	0	0	0	.1

Source: National Centers for Environmental Information (NCEI), Events through August 2024

TABLE 7-5: COLD/WIND CHILL – 1996-2024				
# OF EVENTS	INJURIES	DEATHS	DAMAGES	FREQUENCY
25	0	0	100.00K	.89

Source: National Centers for Environmental Information (NCEI), Events through August 2024

7.4 Probability of Future Occurrences

One of the most visible consequences of a warming world is an increase in the intensity and frequency of extreme weather events. The National Climate Assessment finds that the number of heat waves has increased in the United States, and the strength of these events has increased, too. If greenhouse gas emissions are not significantly curtailed, daily high and low temperatures will increase by at least 5 degrees F in most areas by mid-century, rising to 10 degrees F by late century. The National Climate Assessment estimates 20-30 more days over 90 degrees F in most areas by mid-century.

One less obvious consequence of global warming is also getting growing attention from scientists: a potential increase in the intensity and frequency of winter cold snaps in the northern hemisphere. Global warming makes extreme weather more extreme, and scientific studies are starting to provide proof that this also applies to extreme winter cold spells. Developing the best possible modelling tools is essential to predict the evolution of extreme weather events in the coming years so that we can be better prepared for them.[i]

7.5 Effects of Future Occurrences

Increasing populations and development typically do not directly worsen or change extreme temperatures. However, a growing population does rely on a greater number of public services, including utilities. During an extreme heat or cold event, extra strain can be placed on heating and cooling systems that are trying to compensate for the extreme temperatures. This can lead to blackouts and additional wear or damage to systems, which can be costly to repair.

Extreme heat conditions are expected to become more frequent and intense due to changing climate conditions. The need for more cooling centers is one major consideration in terms of future development to meet the needs of vulnerable populations. Populations vulnerable to extreme temperatures include children, older adults, pregnant women, those with medical conditions, and individuals working outdoors.

7.6 Changes in Land Development & Extreme Temperatures

According to the 2020 Census, Queen Anne's County had a population of 49,874 residents. This is a 4.3% increase from the 2010 Census population count of 47,798, but a notable 23.0% increase from the 2000 Census population count of 40,563. This equates to an average annual growth rate for the County of 1.04%.[ii] Population projections indicate an increase of 5% from 2020 to 2030.[iii]

Increasing populations and development typically do not directly worsen or change extreme temperatures. However, a growing population does rely on a greater number of public services, including utilities. During an extreme heat or cold event, extra strain can be placed on heating and cooling systems that are trying to compensate for the extreme temperatures. This can lead to blackouts and additional wear or damage to systems, which can be costly to repair.

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Although not as prevalent in Queen Anne's County, the heat island effects may be warranted in the future for the more developed areas, specifically in the growth areas and along US 50 with increased summer traffic and current development.

7.7 Extreme Temperatures Vulnerability

Extreme temperature is not a hazard with a defined geographic boundary. All areas of Queen Anne's County are susceptible to the effects of extreme heat and extreme cold. Higher elevations away from

coastal areas tend to be a few degrees cooler, on average, than lower elevations.

7.7.1 VULNERABILITY AND IMPACTS TO PEOPLE AND THE ENVIRONMENT

It is evident from past events that extreme heat is dangerous and can cause human related illnesses and death. As temperatures go up so do the number of people hospitalized for heat related illnesses. Therefore, it is important to understand how many people are exposed to such conditions, and how many buildings exist, where potential problems could arise should power be lost.

In terms of vulnerable population, people ages 65 and older are particularly susceptible to temperature extremes. According to Chapter 2, Section 2.7 Social Vulnerability, the northeastern portion of the County has a higher number of people 65 years of age and older. Both the Towns of Church Hill and Millington are within this area, shown on Figure 2-3, on page 2-34. Therefore, these areas should be targeted for public outreach on extreme heat and information on cooling centers, as well as extreme cold events and warming centers.

7.7.2 VULNERABILITY AND IMPACTS TO SYSTEMS

Transportation systems including roadways, runways, and railways may begin to buckle during excessive heat events. In addition, power lines become less efficient from overheating effects like drooping and load shedding capacity can be overwhelmed as transformers degrade or become damaged.

Extreme cold events with ice can increase road closures and significant car crash situations. Ice and freezing temperature can also cause:

- Frozen electrical equipment such as transformers, renewables like windmills and solar panels, and fuel pipelines can result in an inability to meet energy demands. In addition, power plants in warmer places often have pipes and equipment exposed to the air, which means cold temperatures can cause more damage.

7.7.3 VULNERABILITY AND IMPACTS TO COMMUNITY ACTIVITIES

Activities that have value to the community could potentially be impacted by extreme heat events, include:

- The Historic Stevensville Art Market is a reoccurring event that happens monthly from April - November.
- The Sudlersville Peach Festival is an event for the community held at the beginning of August.
- The Historic Stevensville Classic Car Show is held in September.
- The Queen Anne's County Fair in Centreville, MD is held in during the second week of August.
- The Annual Paint Stevensville event is held at the beginning of June.
- The Juneteenth festival is held in Centreville, MD with live music, vendors, a parade, and more for the community.
- The Family Fun Festival is a free family friendly community event that is also held in June.
- Bluegrass in the Blueberry Patch is a free event open to the public hosting live bluegrass music and blueberry picking that is held towards the end of June.
- The 4th of July Celebration at Kent Narrows.

Community activities are affected by severe winter weather. Cancelations of events are common. While community activities are primarily indoors during the winter months, particularly public-school sports and events, closure of facilities due to winter weather prompt immediate cancelation of after school activities and events.

The Emergency Medical Services (EMS) conducts a Winter Wellness Wonderland event, which in the past has been cancelled due to a winter weather event. The Towns of Barclay, Church Hill, Millington and Sudlersville indicated that they do not have winter community activities.

7.7.4 VULNERABILITY AND IMPACTS TO STRUCTURES

Extreme heat can cause damage to buildings or contents by overheating HVAC or air conditioning systems, contributing to jurisdictional losses. It is unlikely that an entire building would be impacted in an extreme heat event, though. Additionally, buildings of significant age may be more susceptible to temperature extremes. Facilities and their heating and cooling systems need to be maintained to ensure that they operate in appropriate conditions for people. Finally, concrete degradation from direct sunlight and heat can cause cracks, dimpling of the material, expansion within the structure which allows moisture to infiltrate and break down the stability of the foundation/support.

Temporary periods of extreme temperatures typically do not have significant environmental impact. However, prolonged periods of hot temperatures may be associated with drought conditions and can damage or destroy vegetation, dry up rivers and streams, and reduce water quality.

Extreme cold events with ice can increase the weight of tree branches up to 30 times and can add 500 pounds of extra weight causing stress failure. Downed trees can cause significant damages to structures.

7.7.5 VULNERABILITY AND IMPACTS TO HISTORIC STRUCTURES

Warmer temperatures could increase the frequency of freeze–thaw cycles, causing structural damage to masonry buildings, particularly historic structures. Temperature changes can alter the occurrence of thermoclastism, deteriorating buildings' facades. Thermoclastism is the process of physical weathering whereby the stresses set up when a rock is alternately heated and cooled become sufficient to cause failure. Changes in indoor temperature and humidity, causing mechanical degradation on the envelope of masonry buildings.[iv]

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[i] 5 March 2024, Author(s): Beatriz Monge-Sanz, *Global warming may be behind an increase in the frequency and intensity of cold spells, https://www.preventionweb.net/news/global-warming-may-be-behind-increase-frequency-and-intensity-cold-spells*

[ii] 2022 Queen Anne's Comprehensive Plan, Chapter 2 County Profile, p. 2-4.

[iii] 2022 Queen Anne's Comprehensive Plan, Chapter 2 County Profile, p. 2-6.

[iv] 04 May 202, Elena Sesana, Alexandre S. Gagnon, Chiara Ciantelli, JoAnn Cassar, John J. Hughes, Climate change impacts on cultural heritage: A literature review, https://doi.org/10.1002/wcc.710
Citations: 85

Chapter 8 Severe Winter Weather



Source: MdEasternShoreMD - First snow brings up to 6.5 inches to QA

This chapter of the Plan describes an overall severe winter weather profile, risk, and vulnerability for Queen Anne's County and participating municipalities. During this plan update, new or changed plan components are shown in bold text below.

- 8.1 SEVERE WINTER WEATHER
  - 8.1.1 Blizzards
  - 8.1.2 Heavy Snow
  - 8.1.3 Ice Storms
  - 8.1.4 Extreme Cold
- 8.2 LOCATION AND GREOGRAPHIC EXTENT
- 8.3 HISTORY OF PREVIOUS HAZARD EVENTS
- **8.4 PROBABILITY OF FUTURE OCCURENCES**
- **8.5 EFFECTS OF FUTURE CONDITIONS**
- **8.6 CHANGES IN LAND DEVELOPMENT & WINTER WEATHER**
- 8.7 SEVERE WINTER WEATHER VULNERABILITY
  - **8.7.1 Vulnerability and Impacts to People and the Environment**
  - **8.7.2 Vulnerability and Impacts to Systems**
  - **8.7.3 Vulnerability and Impacts to Community Activities**
  - **8.7.4 Vulnerability and Impacts to Structures**
  - **8.7.5 Vulnerability and Impacts to Historic Structures**

Note: The previous plan included hazard impact tables based on Emergency Management Accreditation Program requirements (EMAP). This information was expanded as part of this plan update within the vulnerability section.

Public Survey Results

- Survey participants indicated they were "somewhat concerned" with severe winter weather.
- 39% of the survey participants indicated they have been personally affected by severe winter weather.
- 18% of the survey participants have reduced severe winter weather risk to their home/business by installing alternative power supplies such as portable generators.

Chapter Updates

- All sections of the chapter were updated with new information, graphics, maps, and tables.
- Severe winter weather hazard history data was updated to include events that have occurred during this planning cycle.
- The vulnerability section in the previous 2019 Plan included impact tables, however the following subsections were added. The new subsections include narratives and were applicable, tables and maps.
  - Vulnerability and Impacts to People and the Environment,
  - Vulnerability and Impacts to Systems,
  - Vulnerability and Impacts to Community Activities,
  - Vulnerability and Impacts to Structures, and
  - Vulnerability and Impacts to Historic Resources.
- Social Equity and Vulnerability and Effects of Future Conditions were added to the chapter.
- Information from the 2022 Comprehensive Plan was integrated into this chapter.

8.1 Severe Winter Weather

Severe winter weather can result in the closing of primary and secondary roads, particularly in rural locations, loss of utility services, and depletion of oil heating supplies. Environmental impacts often include damage to shrubbery and trees due to heavy snow loading, ice build-up, and/or high winds, which can break limbs or even bring down large trees. Gradual melting of snow and ice provides excellent groundwater recharge; however, high temperatures following a heavy snowfall can cause rapid surface water runoff and severe flash flooding.

The State of Maryland has an extensive history of severe winter weather. In fact, Maryland has had seven Presidential Disaster and Emergency Declaration that included Queen Anne's County, with the earliest declaration in 1993 and the most recent in 2016. Maryland's most intense winter storms are oftentimes nor'easters. For nor'easters to occur in Maryland, an arctic air mass would be in place. While high pressure builds over New England, cold arctic air flows south from the high-pressure area. The dense cold air is unable to move west over the Appalachian Mountains; therefore, it funnels south down the valleys and along the Coastal Plain. Winds around the nor'easter's center can become intense. The strong northeast winds that track the East Coast and inland areas give the storm its name. The wind builds large waves that batter the coastline and sometimes pile water inland, causing major coastal flooding and severe beach erosion. Unlike hurricanes, which usually come and go within one tide cycle, the nor'easter can linger through several tides, each one piling more and more water on shore and into the bays while dragging more sand away from the beaches.

8.1.1 BLIZZARDS

Blizzards as defined by the National Weather Service (NWS) are a combination of sustained winds or frequent gusts of 35 mph or greater and visibilities of less than a quarter mile from falling or blowing snow for 3 hours or more. A blizzard, by definition, does not indicate heavy amounts of snow, although they can happen together. The falling or blowing snow usually creates large drifts from the strong winds. The reduced visibilities make travel, even on foot, particularly treacherous. The strong winds may also support dangerous wind chills. Ground blizzards can develop when strong winds lift snow off the ground and severely reduce visibilities.

8.1.2 HEAVY SNOW

Heavy snow, in large quantities, may fall during winter storms. Six inches or more in 12 hours or eight inches or more in 24 hours constitutes conditions that may significantly hamper travel or create hazardous conditions. The NWS issues warnings for such events. Smaller amounts can also make travel hazardous, but in most cases, only results in minor inconveniences. Heavy wet snow before the leaves falls from the trees in the fall or after the trees have leafed out in the spring may cause problems with broken tree branches and power outages.

8.1.3 ICE STORMS

Ice storms develop when a layer of warm (above freezing), moist air aloft coincides with a shallow cold (below freezing) pool of air at the surface. As snow falls into the warm layer of air, it melts to rain, and then freezes on contact when hitting the frozen ground or cold objects at the surface, creating a smooth layer of ice. This phenomenon is called freezing rain. Similarly, sleet occurs when the rain in the warm layer subsequently freezes into pellets while falling through a cold layer of air at or near the Earth's surface. Extended periods of freezing rain can lead to accumulations of ice on roadways, walkways, power lines, trees, and buildings. Almost any accumulation can make driving

and walking hazardous. Thick accumulations can bring down trees and power lines.

8.1.4 EXTREME COLD

Extreme cold, in extended periods, although infrequent, could occur throughout the winter months in Queen Anne's County. Heating systems compensate for the cold outside. Most people limit their time outside during extreme cold conditions, but common complaints usually include pipes freezing and cars refusing to start. When cold temperatures and wind combine, dangerous wind chills can develop. Wind chill is how cold it "feels" and is based on the rate of heat loss on exposed skin from wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature, and eventually, internal body temperature. Therefore, the wind makes it feel much colder than the actual temperature. For example, if the temperature is 0°F and the wind is blowing at 15 mph, the wind chill is -19°F. At this wind chill, exposed skin can freeze in 30 minutes. According to the NWS, wind chill does not affect inanimate objects.

8.2 Location and Geographic Extent

The science of meteorology and records of severe winter weather are not quite sophisticated enough to identify what areas of the county are at greater risk for damages. Therefore, all areas of the county including all participating municipalities are assumed to have the same winter weather risk countywide.

Figure 8-1



Source: https://www.myeasternshoremd.com/news/queen_annes_county/one-to-three-inches-of-snow-fall-on-queen-annes-county/article_7dabf91e-a701-50c8-90e2-8c4df3fc79b4.html

8.3 History of Previous Hazard Events

According to National Centers for Environmental Information (NCEI) and local data, Queen Anne's County has experienced various types of severe winter weather events, as detailed on Table 8-1.

TABLE 8-1: SEVERE WINTER WEATHER EVENTS				
BLIZZARD – 2010-2023				
# OF EVENTS	**INJURIES**	**DEATHS**	**DAMAGES**	**FREQUENCY**
1	0	0	0	0.08
FROST/FREEZE – 2007-2023				
# OF EVENTS	**INJURIES**	**DEATHS**	**DAMAGES**	**FREQUENCY**
1	0	0	0	0.06
HEAVY SNOW – 1996-2023				
# OF EVENTS	**INJURIES**	**DEATHS**	**DAMAGES**	**FREQUENCY**
24	0	0	0	0.89
SLEET – 1997-2023				
# OF EVENTS	**INJURIES**	**DEATHS**	**DAMAGES**	**FREQUENCY**
4	0	0	0	0.15
WINTER STORM – 1996-2023				
# OF EVENTS	**INJURIES**	**DEATHS**	**DAMAGES**	**FREQUENCY**
25	1	1	320.00K	0.93
WINTER WEATHER– 1996-2023				
# OF EVENTS	**INJURIES**	**DEATHS**	**DAMAGES**	**FREQUENCY**
82	0	0	0	3.04

Source: National Centers for Environmental Information (NCEI), Events through December 2023.

Notable severe winter weather historic occurrences are detailed below.

One example of a historic winter storm is the January 28th, 1969, storm. The 1969 winter storm was a devastating one, injuring 29 people as a result of an ice glaze. Another freezing rain/glaze event occurred on January 13th, 1971, and resulted in another 20 people injured. The "President's Day Storm" of 1979 resulted in almost 2 million dollars of property damage. This storm was considered the worst storm in 57 years to strike the Baltimore-Washington area. Snow depths from the storm were up to 26 inches in Maryland. At times, the snow was falling 2 to 3 inches an hour and the temperatures were in the single digits to teens.

Additionally, on February 10, 2010, blizzard conditions occurred at times during the late morning and the first half of the afternoon. Snowfall averaged around one foot with the highest amounts affecting Kent, Queen Anne's, Caroline, and Cecil Counties. Heavy snow clung to trees and high winds caused power outages across the Eastern Shore. Stevensville reported around 12.5 inches of accumulation. In total four Counties were affected by this winter storm and around $1M in damage was reported.

Finally, beginning January 22, 2016, and ending on January 24, 2016, a low-pressure system developed across the Gulf states before progressing along the Carolina coast into a major nor'easter, producing record snowfall in parts of Maryland. Wind gusts of up to 35 mph produced blizzard conditions as visibility dropped to a quarter of a mile or less in some aeras. Snowfall reports for Queen Anne's County included 16.0 inches in **Centreville**, 16.0 inches in Crumpton, 15 inches in Stevensville, and 12.0 inches in

Grasonville. A partial roof collapse occurred at the PRS Guitars factory on Log Canoe Circle in the Chesapeake Bay Business Park in Stevensville because of the heavy snow. Maryland Governor Larry Hogan declared a State of Emergency on Friday, January 22nd for the duration of the event. The Governor also requested a presidential disaster declaration. National Guard units were placed at firehouses throughout the upper eastern shore to help with storm-related issues during the event. **On March 4, 2016, President Obama declared several counties, including Queen Anne's, a federal disaster allowing federal funding for emergency work and repair of facilities damaged by the storm.**

In addition to winter storm events, extreme cold events occur in the winter months affecting Queen Anne's County. The NWS Wind Chill Temperatures (WCT) is based on the rate of heat loss from skin that is exposed to wind and cold temperatures. Hourly station data are obtained from the National Centers for Environmental Information's Integrated Surface Data (ISD) dataset. In this dataset observation times are Universal Time Coordinator (UTC), but maximum, minimum, and average wind chill temperatures are calculated for local standard time days. The mean base period is 1981-2010, and the "feel cold" threshold is defined as the 15th percentile of daily January and February values in this same period. As the wind increases, the body is cooled faster, causing skin temperature to drop below that of the ambient air. In short, WCT is what it "feels like."

8.4 Probability of Future Occurrences

The probability of future severe winter weather affecting Queen Anne's County, and all participating municipalities, is highly likely, see Tables 2.4 and 2.6 in Chapter 2.

Severe winter weather events are projected to become more frequent in the eastern United States, thereby Queen Anne's County and all participating municipalities should anticipate increases in future occurrences.

"Recent boreal winters have exhibited a large-scale seesaw temperature pattern characterized by an unusually warm Arctic and cold continents. Whether there is any physical link between Arctic variability and Northern Hemisphere (NH) extreme weather is an active area of research. Using a recently developed index of severe winter weather, we show that the occurrence of severe winter weather in the United States is significantly related to anomalies in pan-Arctic geopotential heights and temperatures. As the Arctic transitions from a relatively cold state to a warmer one, the frequency of severe winter weather in mid-latitudes increases through the transition. However, this relationship is strongest in the eastern US and mixed to even opposite along the western US. We also show that during mid-winter to late-winter of recent decades, when the Arctic warming trend is greatest and extends into the upper troposphere and lower stratosphere, severe winter weather—including both cold spells and heavy snows—became more frequent in the eastern United States."

*Source: *Cohen, J., Pfeiffer, K., & Francis, J. A. (2018). Warm arctic episodes linked with increased frequency of extreme winter weather in the United States. Nature Communications, 9(1), 869. [PDF]*
https://www.strategian.com/2020/12/13/extreme-weather-and-climate-change-the-connections-and-impacts/

8.5 Effects of Future Occurrences

An increase in the frequency of severe winter storms will potentially increase the number of vehicle accidents and instances of hypothermia and frostbite. In addition, the need for additional resources such as emergency services, roadway work for both pre-treatment and subsequent clearing of snow may stress the current capabilities of both Queen Anne's County and all participating municipalities (refer to Chapter 15 Community Capabilities). Finally, Queen Anne's County Citizen Alert Notification will assist Queen Anne's County and all participating municipalities in severe winter storm hazard warning and notification, as well as targeted safety messaging. The Town of Sudlersville uses their own notification system, Emergency Alert – Rave 911. In addition, the Town of Barclay uses mass emailing and posts to their bulletin board located outside of Town Hall. The Town of Centreville also uses email blasts for distributing notifications. Queenstown utilizes their Facebook page and Munilink to provide notices on hazard events. The Town of Church Hill relies on the Church Hill Volunteer Fire Company to post hazard notifications on their Facebook and Instagram pages. Finally, the Town of Millington also uses Facebook and their town website for notifying residents.

8.6 Changes in Land Development & Severe Winter Weather

Because severe winter storms are not limited to geographic boundaries or population groups, it is difficult to identify development and population trends that will impact this hazard in the future. Current land use and building codes incorporate standards that address and mitigate snow accumulation.

As the population of Queen Anne's County continues to grow, new development can increase vulnerability by increasing the number of assets exposed to the potential impacts of winter storms event. As discussed, all buildings are vulnerable to widespread utility disruptions, including loss of heat and electricity, as well as structure collapse or damage from downed trees. Generally, property owners and land developers should instead mitigate the impacts of winter storms by avoiding flat roofs and constructing to the most recent building code requirements for snow loading and insulation." This is consistent for Queen Anne's County and all participating municipalities.

In addition, adapting to climate change and managing changes in development and land use specific to severe winter weather tend towards consideration for agricultural affects. Queen Anne's County has continued to be defined by its rural and agricultural setting, the water, and its natural habitats, which are among the most important in the nation. Queen Anne's County is one of the few counties in Maryland that has preserved approximately 35% of its total land area in some form of conservation.[i] Currently, 84.7% or 201,526.8 acres of the County's land is zoned Agricultural (AG) or Countryside (CS).[ii]

Agricultural land use includes the growing of crops and grazing of livestock. Livestock in particular may be affected by severe winter weather. Helping to ensure the continued vitality of agriculture in Queen Anne's County may assist in mitigating the loss of future agricultural land. Mitigation in the form of public outreach and preparedness that the County and municipalities may undertake include outreach to farmers, such as the following:

Things that you can do to help stay ahead of weather and climate risk include:

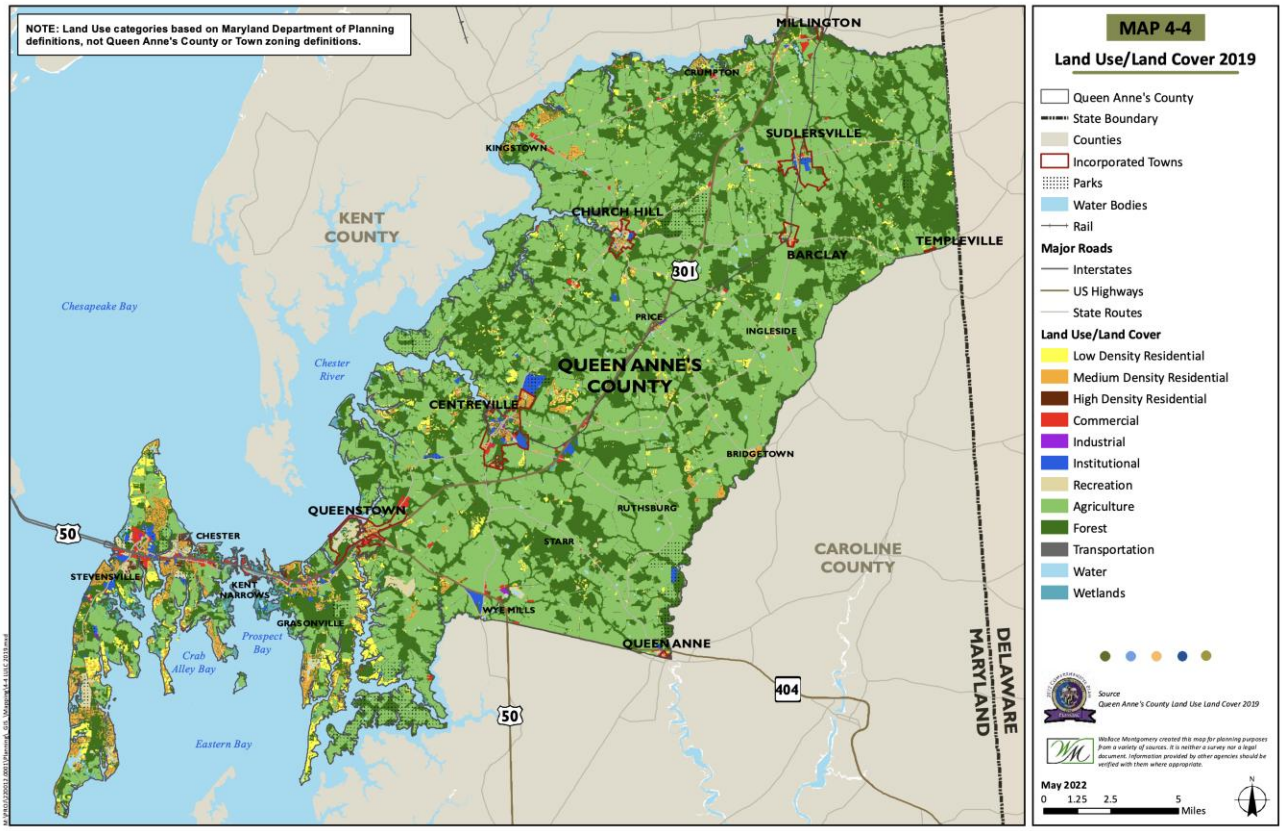
1. **Developing a weather preparedness plan.** Your plan should address your most likely weather hazards including things like drought, flooding, **blizzards**, high winds, and severe thunderstorms.

2. **Using weather forecasting and monitoring tools.** Many of these tools are available as apps on your smartphone. Many include valuable functions like live radar and local severe weather warnings.
3. **Implementing farming practices that mitigate risk.** No-till or minimum tillage can help sustain soils if high winds are a common severe weather threat. Crop seed varieties also can offer traits like drought or cold tolerance, helping mitigate those risks.
4. **Creating alternative and backup plans for crops and livestock.** If markets are available, alternative crops or livestock can help maintain the productivity of land even if it's changed by climate or weather.

Source: https://www.nationwide.com/lc/resources/farm-and-agribusiness/articles/severe-weather

Figure 8-2, Land Use/Land Cover 2019 from the Queen Anne's County Comprehensive provides a visual of the extent of agricultural land. As shown on the map, aside from the Towns of Sudlersville, and the northeast portion of the Town of Barclay, only small pockets of agricultural land exist in the remaining participating municipalities. Note the Town of Barclay has had moratorium on development for the past five years.

Figure 8-2



Source: 2022 Queen Anne's County Comprehensive Plan, Map 4-4, page 4-28.

8.7 Severe Winter Weather Vulnerability

Severe winter weather vulnerability includes impacts to people, the environment, systems, community activities, structures, and historic resources.

8.7.1 VULNERABILITY AND IMPACTS TO PEOPLE & THE ENVIRONMENT

Severe winter weather can cause community isolation and increase health risks. Risk to people from winter storm events include:

- Frostbite: A medical condition when the skin or body tissue is damaged from freezing. It's most common in parts of the body farthest from your heart that are exposed, such as fingers, toes, ears and nose.
- Hypothermia: A sickness when your body temperature drops below what is needed to be healthy and work properly. It is the opposite of heat stroke.
- Carbon Monoxide: Deaths related to carbon monoxide are highest during colder months due in part to an increased indoor use of gas-powered furnaces and alternative heating and cooking sources during power outages. Sources that produce carbon monoxide include portable generators, propane, gas-powered stoves and grills, and charcoal briquettes.

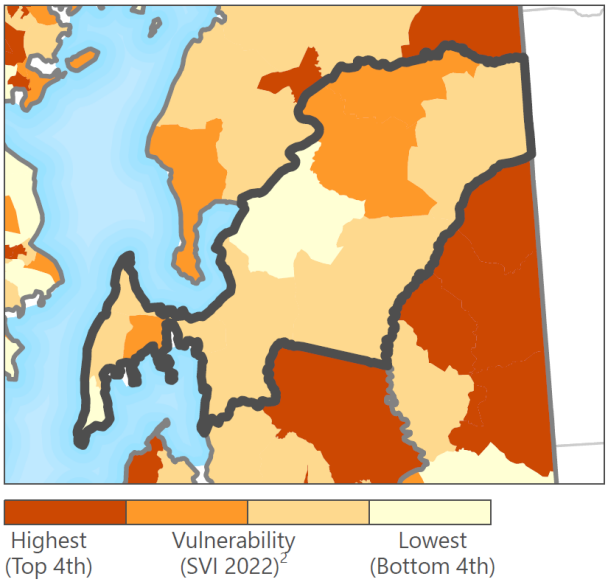
Social vulnerability considerations specific to severe winter weather include populations aged 65 and older. The aging population has an increased risk of injuries and death due to falls and from overexertion and/or hypothermia from attempts to clear snow. In addition, disabled people are also at-risk during and immediately after severe winter weather events due to potential isolation and because they are more likely to seek emergency medical attention that may not be as readily available. Finally, those lacking English proficiency are also vulnerable. The highest socially vulnerable populations shown on Center for Disease Control (CDC) Social Vulnerability Index (SVI) mapping based upon household characteristics are located in the northeast area of Queen Anne's County and the eastern portion of Kent Island as shown on Figure 8-3. Both the **Towns of Millington and Church Hill** are located within the bright orange area, indicating high social vulnerability shown on the map.

Household Characteristics include:

1. Aged 65 or Older
2. Aged 17 or Younger
3. Civilian with a Disability
4. Single-Parent Households
5. English language proficiency

Figure 8-3

Household Characteristics[6]



In addition, the high cost of fuel to heat residential homes can create a financial strain on populations with low or fixed incomes. In addition, low-income residents may not have access to housing, or their housing may be less able to withstand cold temperatures, such as, mobile homes and homes with poor insulation and heating supply. According to the most recent parcel data provided by Queen Anne's County GIS department, there are 399 parcels that contain a mobile home or mobile home park located throughout Queen Anne's County.

Environmental impacts form severe winter storm include tree damage, animal impacts, and pollutant contamination. Ice storms can cause trees to break or die, as ice can weigh up to 30 times more than a branch. Ice storms can cause livestock to slip and fall. In attention, cost of livestock maintenance rises,

as more food is consumed during severe winter weather events, especially those that include extreme cold temperatures. Finally, products used to remove ice can contaminate freshwater sources like rivers, streams, and creeks. It can also be difficult and expensive to remove once it's in the environment.

8.7.2 VULNERABILITY AND IMPACTS TO SYSTEMS

Communications and electrical power failure affect continuity of services, business continuity, and personal safety. A winter storm can adversely affect roadways and communications. Snow accumulation and frozen/slippery road surfaces also increases in the frequency and impact of traffic accidents for the general population, resulting in personal injuries. Also, the closing of secondary roads, particularly in rural locations, loss of utility services and depletion of oil heating supplies are all impacts from these events. The Department of Public Works-Roads Division maintains approximately 556 miles of roads and 32 bridges. To facilitate timely snow removal, the county is divided into 22 snowplow routes.



Source: https://www.qac.org/CivicAlerts.aspx?AID=446&ARC=558

Heavy accumulations of ice can bring down trees and topple utility poles and communication towers. Ice can disrupt communications and power for days while utility companies repair extensive damage. Table 8-2 details communication systems, Telecom Towers, which could be potentially impacted by a severe winter weather event.

TABLE 8-2 CRITICAL FACILITIES & COMMUNITY LIFELINES – TELECOM TOWERS

COMMUNITY LIFELINES	FACILITY TYPE	NAME	ADDRESS	Town
	Telecom Towers	TC129	100 Communications Dr	Centreville
	Telecom Towers	TC110	6008 Church Hill Road	Church Hill
	Telecom Towers	TC128	Parson Green Farm Ln	Church Hill
	Telecom Towers	TC101	140 Murdoch Florist Lane	Centreville
	Telecom Towers	TC147	3012 Barclay Road	Marydel
	Telecom Towers	TC149	Starr Rd	Queen Anne
	Telecom Towers	TC148	3020 Price Station Road	Centreville
	Telecom Towers	TC150	123 Damsontown Road	Queen Anne
	Telecom Towers	TC139	Sudlersville Rd	Sudlersville
	Telecom Towers	TC115 - Guyed	201 Gardners Purchase Lane	Chester
	Telecom Towers	TC106 – Guyed	201 Gardners Purchase Lane	Chester
	Telecom Towers	TC111 – Guyed	961 Bennett Point Road	Queenstown
	Telecom Towers	TC112 – Guyed	610 Burchard Sawmill Road	Chestertown
	Telecom Towers	TC113 – Guyed	115 Peters Corner Road	Millington
	Telecom Towers	TC103 – Guyed	Wyes Mills Rd	Queenstown

TABLE 8-2 CRITICAL FACILITIES & COMMUNITY LIFELINES – TELECOM TOWERS				
COMMUNITY LIFELINES	**FACILITY TYPE**	**NAME**	**ADDRESS**	**Town**
	Telecom Towers	TC104 – Guyed	319 Foreman Landing Road	Queenstown
	Telecom Towers	TC114 – Guyed	200 Foreman Landing Road	Queenstown
	Telecom Towers	TC119 – Guyed	760 Granny Branch Road	Church Hill
	Telecom Towers	TC133 – Guyed	513 Hall Rd	Sudlersville
	Telecom Towers	TC117 – Lattice	715 Shine Smith Road	Sudlersville
	Telecom Towers	TC105 – Lattice	201 Gardners Purchase Lane	Chester
	Telecom Towers	TC108 – Lattice	Business Pkwy	Stevensville
	Telecom Towers	TC109 – Lattice	1935 4h Park Road	Centreville
	Telecom Towers	TC127 – Lattice	Church Hill Rd	Centreville
	Telecom Towers	TC107 – Lattice	319 Foreman Landing Road	Queenstown
	Telecom Towers	TC118 – Lattice	725 Cedar Ln	Church Hill
	Telecom Towers	TC120 – Lattice	2812 Starr Road	Queen Anne
	Telecom Towers	TC137 – Lattice	Marine Academy Ln	Stevensville
	Telecom Towers	TC138 – Lattice	306 Marine Academy Ln	Stevensville
	Telecom Towers	TC140 – Lattice	209 Grange Hall Road	Queenstown
	Telecom Towers	TC141 – Lattice	Ocean Gateway	Wye Mills
	Telecom Towers	TC145 – Lattice	3001 Starr Road	Queen Anne
	Telecom Towers	TC116 – Lattice	121 Needwood Farm Lane	Centreville
	Telecom Towers	TC152 – Monopole	304 Spring Landing Lane	Millington
	Telecom Towers	TC122 – Monopole	Main Street	Queenstown
	Telecom Towers	TC146 – Monopole	611 Main St	Stevensville
	Telecom Towers	TC153 – Monopole	1537 Peters Corner Road	Sudlersville
	Telecom Towers	TC154 – Monopole	200 Hambleton Creek Lane	Chestertown
	Telecom Towers	TC121 – Monopole	2311 Bloomingdale Road	Centreville
	Telecom Towers	TC155 – Monopole	Pier One Rd	Stevensville
	Telecom Towers	TC130 – Water Tower	509 Anchor Lane	Chester
	Telecom Towers	TC131 – Water Tower	180 Romancoke Road	Stevensville
	Telecom Towers	TC132 – Water Tower	Piney Neck Rd	Grasonville
	Telecom Towers	TC144 – Water Tower	151 Comet Dr	Centreville
	Telecom Towers	TC142 – Water Tower	7110 Main St	Queenstown
	Telecom Towers	TC143 – Water Tower	Friels Rd	Queenstown
	Telecom Towers	TC123 – Water Tower	Log Canoe Cir	Stevensville

8.7.3 VULNERABILITY AND IMPACTS TO COMMUNITY ACTIVITIES



Community activities are affected by severe winter weather. Cancelations of events are common. While community activities are primarily indoors during the winter months, particularly public-school sports and events, closure of facilities due to winter weather prompt immediate cancelation of after school activities and events.

The Emergency Medical Services (EMS) conducts a Winter Wellness Wonderland event, which in the past has been cancelled due to a winter weather event. Both the Towns of Barclay, Church Hill, Millington, and Sudlersville indicated that they do not have winter community activities. The Town of Centreville holds the Christmas Parade on the first Friday of December. The Town of Queenstown conducts the Annual Christmas Tree Lighting event in December. A severe winter weather event would cause either event to be cancelled.

8.7.4 VULNERABILITY AND IMPACTS TO STRUCTURES

All structures and facilities located in Queen Anne's County can be considered at risk from severe winter weather. This includes 100 percent of the County's population and all buildings and infrastructure within the County. Damages primarily occur as a result of cold temperatures, and heavy snow or ice.

Most structures, including the county's essential and other critical facilities, should be able to provide adequate protection the structures could suffer damage from snow load on rooftops and large deposits of ice. Those facilities with back-up generators are better equipped to handle a severe weather situation should the power go out.

A timely forecast may not be able to mitigate the property loss but could reduce the casualties and associated injury. In severe winter storm events, buildings are vulnerable to widespread utility disruptions, including loss of heat and electricity, as well as building collapse or damage from downed trees.

Queen Anne's County Code

Chapter 16. Structural Design.
(a) 1607.10 Reduction in live loads. Add a new Subsection 1607.10.1.5. to read as follows: "1607.10.1.5. Exceptions. Live load reductions allowed by Section 1607.10 shall not apply to roofs."
(b) 1607.12.1.1 Minimum roof live loads. Add new paragraph to existing subsection as follows: "Roofs shall be designed for a minimum live load of 30 pounds per square foot or designed for the minimum snow load, whichever is greater."

The ground snow load for Queen Anne's County, Maryland is 25 pounds per square foot (psf).
For roofs, the minimum live load is 30 psf, or the minimum snow load, whichever is greater. For every inch of snow depth, one square foot of snow weighs 1.25 pounds. For example, a 20-inch snow depth on a roof could weigh up to 25 psf, which is close to Maryland's minimum roof load.

All essential facilities were assessed to determine which, if any, had installed generators, and, if so, were the generators installed adequately sized. Those facilities without generators lack continuity of operation and resiliency. As these facilities are essential and must remain operational to ensure continued community resiliency, these facilities have been prioritized for analysis and potential hazard mitigation actions and projects. As noted on Table 8-3, there are many essential facilities without emergency back-up power.

Roof geometry affects the ability of structure to shed snow. Simple roofs with steep slopes shed snow most easily. Roofs with geometric irregularities and obstructions collect snowdrifts in an unbalanced pattern. These roof geometries include flat roofs with parapets, stepped roofs, saw-tooth roofs, and roofs with obstructions such as equipment or chimneys.

Note: there are 17 essential facilities with flat roofs denoted on Table 8-3 and listed on 8-4.

TABLE 8-3: SEVERE WINTER WEATHER ESSENTIAL FACILITY VULNERABILITY					
FACILITY TYPE	**FACILITY NAME**	**TOWN**	**GENERTAOR?**	**ADEQUATELY SIZED?**	**FLAT ROOF?**
EOC	QAC Department of Emergency Services	Centreville	Yes	**No**	**Yes**
Fire	Queen Anne-Hillsboro VFC #8	Queen Anne	Yes	Yes	No
Fire	Queenstown VFC #3	Queenstown	Yes	**No**	No
Fire	Church Hill VFC #5	Church Hill	Yes	Yes	No
Fire	Sudlersville VFC #6	Sudlersville	Yes	Yes	No
Fire	Goodwill VFC #4	Centreville	Yes	Yes	**Yes**
Fire	EMS Station 100	Stevensville	**No**	N/A	No
Fire	EMS Station 400	Centreville	**No**	N/A	No
Fire	EMS Station 300	Queenstown	Yes	Yes	No
Fire	EMS Station 600	Sudlersville	Yes	Yes	No
Fire	EMS Station 500	Church Hill	Yes	Yes	No
Fire	Grasonville VFC #2	Grasonville	Yes	Yes	No
Fire	Grasonville Vol Ambulance Dept. #20	Grasonville	Yes	Yes	No
Fire	Crumpton VFC #7	Millington	Yes	Yes	No
Fire	United Communities VFC #9	Stevensville	Yes	Yes	No
Fire	Kent Island VFC #1	Chester	Yes	Yes	No
Fire	EMS Station 200	Chester	**No**	**N/A**	No
Medical	QAC Department of Health	Centreville	Yes	**No**	No
Medical	QAC Department of Health Annex	Centreville	**No**	**N/A**	**Yes**
Medical	Shore Emergency Center Queenstown	Queenstown	MISSING DATA	MISSING DATA	No
Medical	UM Shore Medical Pavilion	Queenstown	MISSING DATA	MISSING DATA	No
Medical	AAMC Kent Island Pavilion	Chester	Yes	Yes	No
Police	Queen Anne's County Sheriff's Office	Centreville	Yes	Yes	No
Police	Maryland State Police - Barracks S	Centreville	Yes	Yes	**Yes**
Police	Sheriff's Office - Sudlersville Substation	Sudlersville	MISSING DATA	MISSING DATA	No
Police	Centreville Police Department	Centreville	Yes	Yes	**Yes**
Police	Sheriff's Office - Kent Narrows Substation	Chester	MISSING DATA	MISSING DATA	No
School-Private	The Gunston School	Centreville	MISSING DATA	MISSING DATA	**Yes**
School-Private	Wye River Upper School	Centreville	MISSING DATA	MISSING DATA	**Yes**
School-Private	Lighthouse Christian Academy	Stevensville	MISSING DATA	MISSING DATA	No
School-Private	Eastern Shore Jr. Academy	Sudlersville	MISSING DATA	MISSING DATA	**Yes**
School-Private	Shore Up Head Start	Grasonville	MISSING DATA	MISSING DATA	**Yes**
School-Private	Kiddie Academy of Kent Island	Stevensville	MISSING DATA	MISSING DATA	No
School-Public	Kennard Elementary School	Centreville	Yes	Yes	**Yes**
School-Public	Church Hill Elementary School	Church Hill	Yes	Yes	No
School-Public	Anchor Points Academy	Centreville	Yes	Yes	No
School-Public	Sudlersville Elementary School	Sudlersville	**No**	N/A	No
School-Public	Grasonville Elementary School	Grasonville	Yes	Yes	No
School-Public	Bayside Elementary School	Stevensville	Yes	Yes	**Yes**
School-Public	Queen Anne's County High School	Centreville	**No**	N/A	**Yes**
School-Public	Sudlersville Middle School	Sudlersville	Yes	Yes	No
School-Public	Centreville Elementary School	Centreville	Yes	Yes	**Yes**
School-Public	Centreville Middle School	Centreville	Yes	Yes	No
School-Public	Wye Research & Education Center	Queenstown	Yes	Yes	**Yes**
School-Public	Chesapeake College	Queenstown	Yes	Yes	**Yes**
School-Public	Stevensville Middle School	Stevensville	Yes	Yes	No
School-Public	Kent Island Elementary School	Stevensville	Yes	Yes	**Yes**

FACILITY TYPE	FACILITY NAME	TOWN	GENERTAOR	ADEQUATELY SIZED	FLAT ROOF
School-Public	Kent Island High School	Stevensville	Yes	Yes	**Yes**
School-Public	Matapeake Elementary School	Stevensville	Yes	Yes	No
School-Public	Matapeake Middle School	Stevensville	Yes	Yes	No

Source: Essential Facility Vulnerability Survey-Hazard Mitigation Planning Committee

Essential facilities built prior to modern building codes and/or aging may be at-risk to potential roof damage and/or collapse due to snow loads. Those facilities with flat roofs and year built are listed on Table 8-4. These facilities may be at-risk and should be considered for potential mitigation, as appropriate.

TABLE 8-4: ESSENTIAL FACILITIES WITH FLAT ROOFS & YEAR BUILT

FACILITY TYPE	FACILITY NAME	TOWN	FLAT ROOF	YEAR BUILT
EOC	QAC Department of Emergency Services	Centreville	Yes	**1988**
Fire	Goodwill VFC #4	Centreville	Yes	**1946**
Medical	QAC Department of Health Annex	Centreville	Yes	**1979**
Police	Maryland State Police - Barracks S	Centreville	Yes	**1986**
Police	Centreville Police Department	Centreville	Yes	**1982**
School-Private	The Gunston School	Centreville	Yes	**1950**
School-Private	Wye River Upper School	Centreville	Yes	**1926**
School-Private	Eastern Shore Jr. Academy	Sudlersville	Yes	**1975**
School-Private	Shore Up Head Start	Grasonville	Yes	**1954**
School-Public	Kennard Elementary School	Centreville	Yes	**1952**
School-Public	Bayside Elementary School	Stevensville	Yes	**1991**
School-Public	Queen Anne's County High School	Centreville	Yes	**1978**
School-Public	Centreville Elementary School	Centreville	Yes	**1950**
School-Public	Wye Research & Education Center	Queenstown	Yes	**1991**
School-Public	Chesapeake College	Queenstown	Yes	**1979**
School-Public	Kent Island Elementary School	Stevensville	Yes	**1955**
School-Public	Kent Island High School	Stevensville	Yes	**1998**

Source: Essential Facility Vulnerability Survey-Hazard Mitigation Planning Committee

8.7.5 VULNERABILITY AND IMPACTS TO HISTORIC STRUCTURES

Considering that historic structures were built prior to modern building codes that include snow load requirements, all if not most historic structures are vulnerable, particularly those with roofs with geometric irregularities and obstructions collect snowdrifts in an unbalanced pattern. These roof geometries include flat roofs with parapets, stepped roofs, saw-tooth roofs, and roofs with obstructions such as equipment or chimneys.



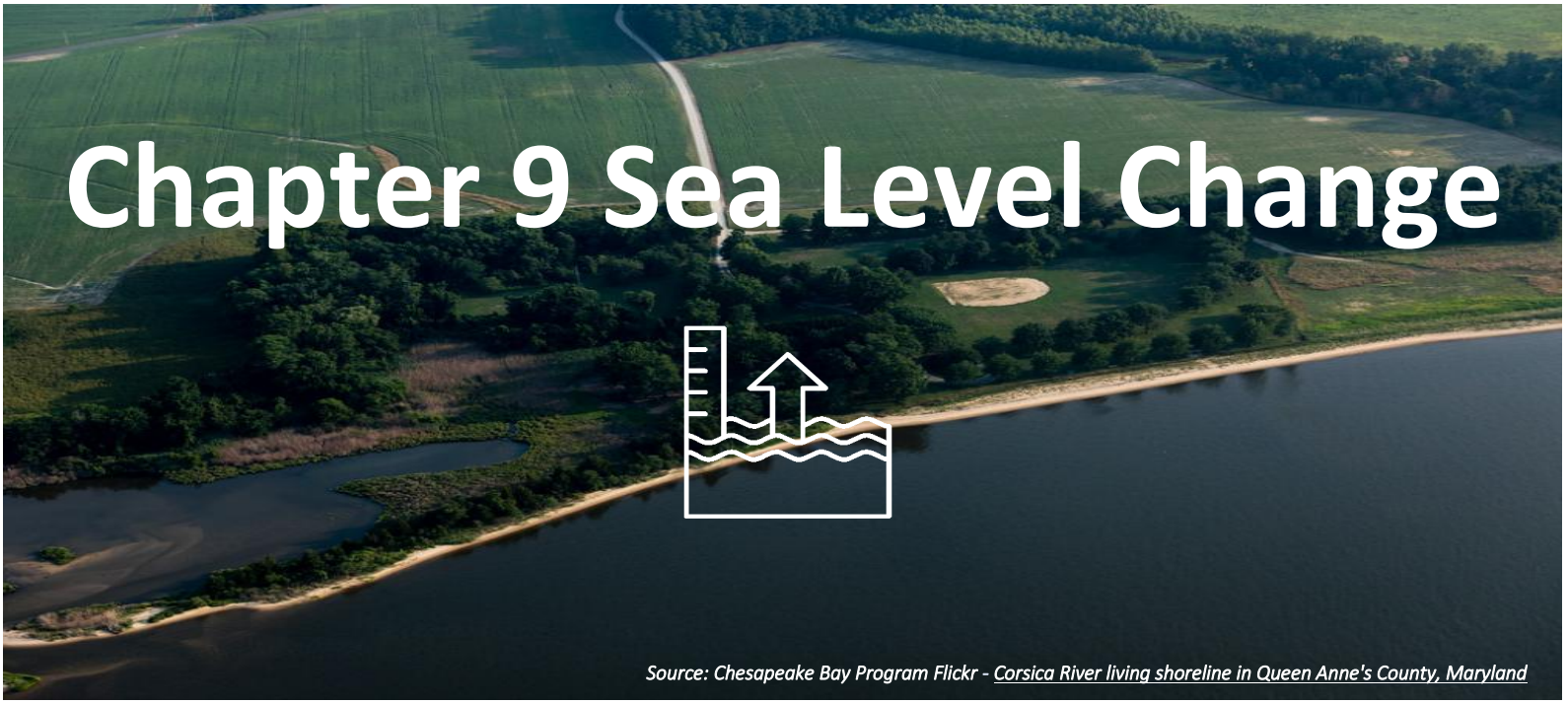
Figure 8-4

MIHP #	Property Name	Address	Community
QA-224	Bachelor's Hope (Phares Morris Farm)	201 Bachelors Hope Farm Ln	Centreville
QA-18	Bishopton	305 Pinder Hill Rd	Church Hill
QA-4	Bloomingdale (Mount Mill)	Bloomingdale Rd & Ocean Gateway	Queenstown
QA-7	Bowlingly	111 Bowlingly Cir	Queenstown
QA-201	Captain John H. Ozmon Store	114 Corsica St	Centreville
QA-541	Centreville Historic District	—	Centreville
QA-23	Chester Hall (Rye Hall)	Round Top Rd & Church Hill Rd	Chestertown
QA-457	Church Hill Theatre (Community Building)	103 Walnut St	Church Hill
QA-11	Content (C.C. Harper Farm)	842 Hope Rd	Centreville
QA-258	Female Seminary (Female School, 1876)	205-207 S Commerce St	Centreville
QA-163	Friendship	Kent Point Rd	Stevensville
QA-92	Hawkins Pharsalia (Franklin Gannon Farm)	Ruthsburg Rd	Centreville
QA-257	Jackson Collins House	201 S Commerce St	Centreville
QA-33	John Embert Farm	Baxter Rd	Sudlersville
QA-153	Keating House (Covington House)	208 S Liberty St	Centreville
QA-3	Kennersley	Southeast Creek Rd	Church Hill
QA-87	Lansdowne (Upper Deale)	Hope Rd	Centreville
QA-206	Legg's Dependence	200 Long Creek Ct	Stevensville
QA-107	Lexon (Burris-Brockmeyer Farm)	Corsica Neck Rd	Centreville
QA-422	Log Canoe	Round Top Rd	Chestertown
QA-165	Mattapex	Shipping Creek Rd	Stevensville
QA-5	Reed's Creek Farm	Wrights Neck Rd	Centreville
QA-179	St. Andrew's Episcopal Chapel	104 Maple Ave	Sudlersville
QA-51	St. Luke's Episcopal Church	Church Ln	Church Hill
QA-209	St. Peter's Roman Catholic Church	5319 Ocean Gateway	Queenstown
QA-264	Stevensville Bank	Love Point Rd	Stevensville
QA-463	Stevensville Historic District	—	Stevensville
QA-90	Stratton	3102 Ruthsburg Rd	Centreville
QA-8	Thomas House	2231 Ruthsburg Rd	Centreville
QA-124	Wye Hall	505 Wye Hall Dr	Queenstown

Source: Maryland Inventory of Historic Properties (MIHP)

[i] Queen Anne's County Comprehensive Plan, 2023, page 4-8.
[ii] Queen Anne's County Comprehensive Plan, 2023, page 4-11.

Chapter 9 Sea Level Change



Source: Chesapeake Bay Program Flickr - Corsica River living shoreline in Queen Anne's County, Maryland

This chapter of the Plan describes an overall sea level change profile, risk, and vulnerability for Queen Anne's County and participating municipalities. During this plan update, new or changed plan components are shown in **blue bold** text below.

- 9.1 SEA LEVEL
- 9.2 LOCATION & GEOGRAPHIC EXTENT
- **9.3 HISTORY OF PREVIOUS HAZARD EVENTS**
- **9.4 PROBABILITY OF FUTURE OCCURRENCES**
- **9.5 EFFECTS OF FUTURE CONDITIONS**
- **9.6 CHANGES IN LAND DEVELOPMENT & SEA LEVEL CHANGE**
- 9.7 SEA LEVEL CHANGE VULNERABILITY
  - **Vulnerability and Impacts to People and the Environment**
  - **Vulnerability and Impacts to Systems**
  - **Vulnerability and Impacts to Community Activates**
  - **Vulnerability and Impacts to Structure**
  - **Vulnerability and Impacts to Historic Structures**

Note: The previous plan included hazard impact tables based on Emergency Management Accreditation Program requirements (EMAP). This information was expanded as part of this plan update within the vulnerability section.

Public Survey Results

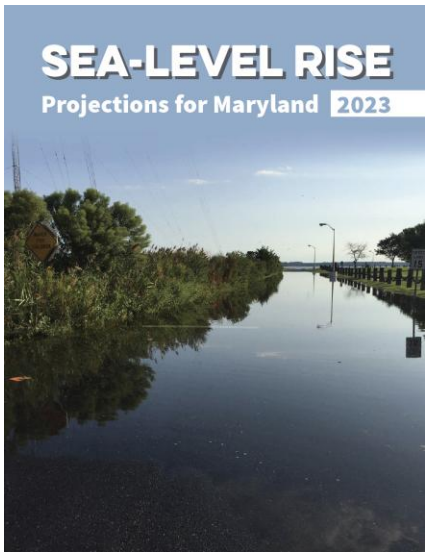
- Survey participants indicated they were "somewhat concerned" with sea level change.
- 15% of the survey participants indicated they have been personally affected by sea level change.
- 14% of the survey participants have reduced sea level change risk to their home/business by floodproofing.

Chapter Updates

- All sections of the chapter were updated with current information, graphics, maps, and tables.
- Both the 2023 Sea Level Projections for Maryland and Fifth Annual Climate Assessment were integrated into this chapter.
- The vulnerability section in the previous 2019 Plan included impact tables, however the following subsections were added. The new subsections include narratives and were applicable, tables and maps.
  - Vulnerability and Impacts to People and the Environment,
  - Vulnerability and Impacts to Systems,
  - Vulnerability and Impacts to Community Activities,
  - Vulnerability and Impacts to Structures, and
  - Vulnerability and Impacts to Historic Resources.
- Social Equity and Vulnerability to sea level change integrated into the chapter.
- Effects of Future Conditions was a new addition to the chapter.

9.1 Sea Level Change

Queen Anne's County is susceptible to Sea Level Change (SLC) given the 400 miles of coastline, low elevation, and structures located within low-lying land areas. Sea level changes near coastlines include tides. Tides are a type of wave caused by the gravitational effects of the sun and moon, along with the Earth's rotation. Changes in tides, resulted in higher tides, may begin to cause flooding in coastal zones that were previously unaffected. Between 1980 and 2019, sea levels near Queen Anne's County rose roughly 0.5 feet leading to more frequent and severe coastal flooding, and property damage.



According to Sea-level Rise Projections for Maryland 2023 publication, sea level has been rising at an increasing rate as a result of global warming. It will almost certainly rise as much in the first half of this century as it did during the entire last century. It could rise three or more times as much by the end of the century.

9.2 Location & Geographic Extent

MHHW- Mean Higher High Water (MHHW) is the average level of the highest tide for each day computed over a 19-year period.

Source: National Weather Service

The online mapping tools, NOAA's Coastal Flood Exposure Mapper and Sea Level Rise Viewer, are useful for geographic plotting of sea-level rise and is based on reliable elevation data. The tool creates a collection of user-defined maps that show the people, places, and natural resources exposed to coastal flooding. The maps can be saved, downloaded, or shared to communicate flood exposure and potential impacts. The Sea Level Rise Viewer shows sea level rise scenarios of 0 to 10 feet, which simulate a rise in water above the average of the highest high tides (called mean higher high water, or MHHW) for hydrologically connected areas. Areas that are hydrologically connected to the ocean are shown in shades of blue (darker blue = greater depth). Low-lying areas, displayed in green, are hydrologically "unconnected" areas that may also flood.

- Figure 9-1 depicts a 2 ft above MHHW of sea level rise countywide.
- Figure 9-2 depicts a 2 ft above MHHW of sea level rise for the Town of Centreville.
- Figure 9-3 depicts a 2 ft above MHHW of sea level rise for the Town of Queenstown.
- Figure 9-4 depicts a 2 ft above MHHW of sea level rise for the Town of Church Hill.
- Figure 9-5 depicts a 2 ft above MHHW of sea level rise for the Town of Millington.

The Towns of Sudlersville, Templeville, and Barclay are not in or near sea level risk areas.

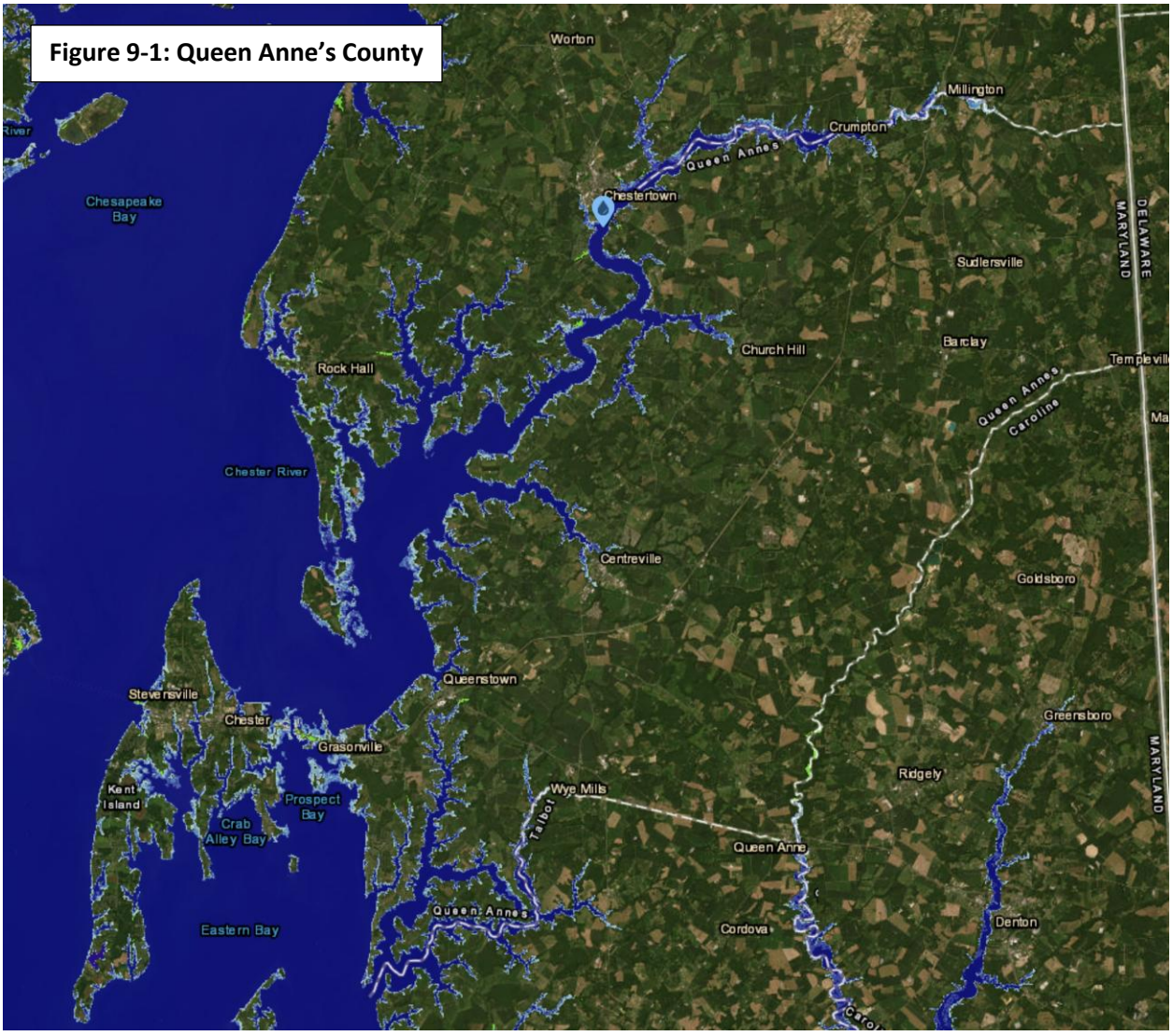


Figure 9-1: Queen Anne's County

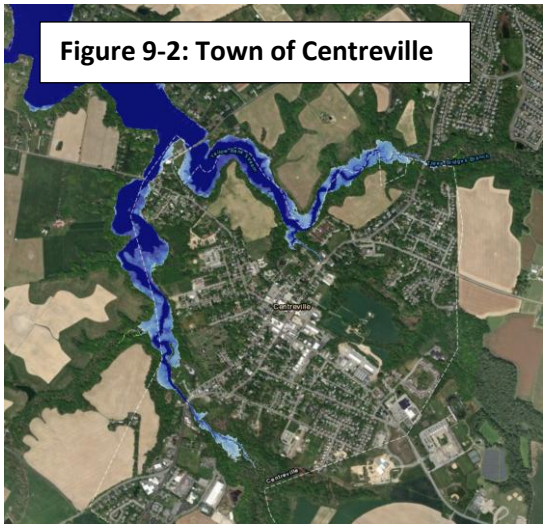


Figure 9-2: Town of Centreville

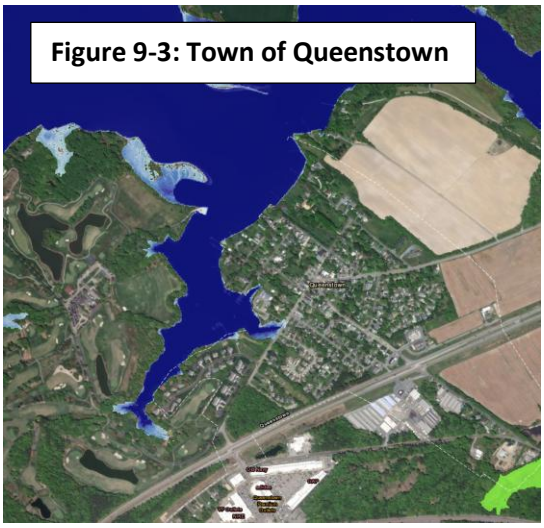


Figure 9-3: Town of Queenstown

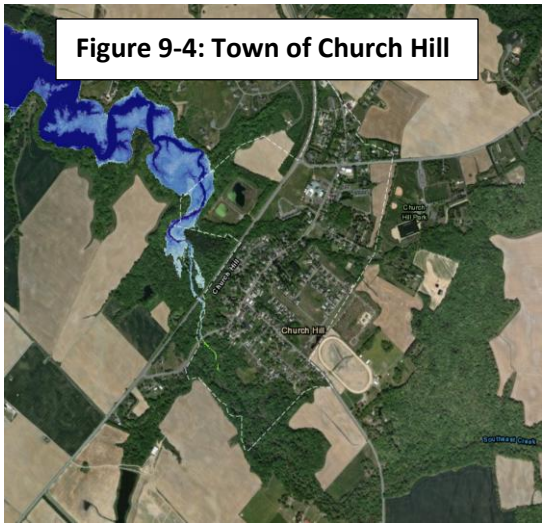


Figure 9-4: Town of Church Hill

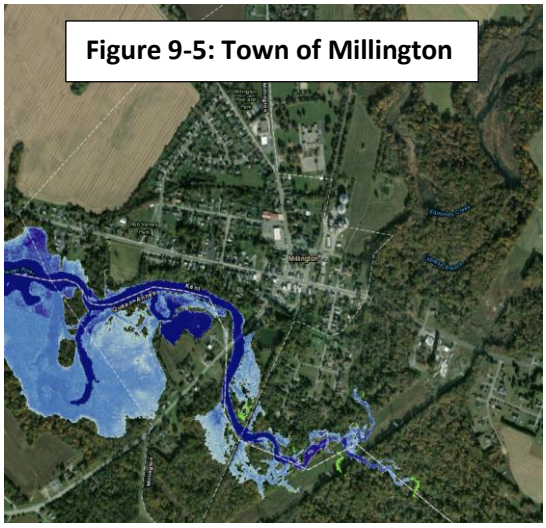


Figure 9-5: Town of Millington

9.3 History of Previous Hazard Events

The following information has been extrapolated from the Sea-level Rise Projections for Maryland 2023 publication.

Sea Level Continues to Rise Faster

Sea level is continuing to rise at faster rates both globally and in Maryland. Since 1993, satellites have measured rising sea-surface heights across the world's ocean, revealing global mean sea level rising at a rate of over 3.3 mm/yr since then. That rate is accelerating—it increased from 2.3 mm/yr over 1993–2002 to 4.7 mm/yr over 2013–2022.[i] One recent analysis estimated that mean sea level has been increasing by an average of 4.5 mm/yr or more since 1975 at tide gauge locations in Maryland's portion of the Chesapeake Bay (Figure 1).[ii] These rates are also accelerating. Greater acceleration over periods of around a decade can result from regional variations in ocean climate, but the longer-term trend in sea-level rise is largely a result of global warming.[iii] The challenge for this report is to robustly project the trends into the more distant future as the climate continues to change and global society struggles to limit warming.

- Figure 9-6: Variations and trends in monthly mean sea level from 1975 through 2021 measured at four Maryland tide gauges, showing the rates of sea level rise (SLR) and its acceleration.

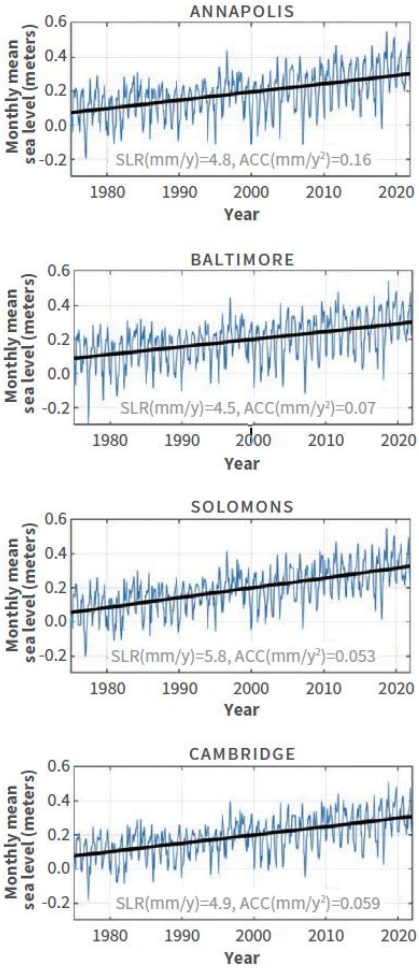
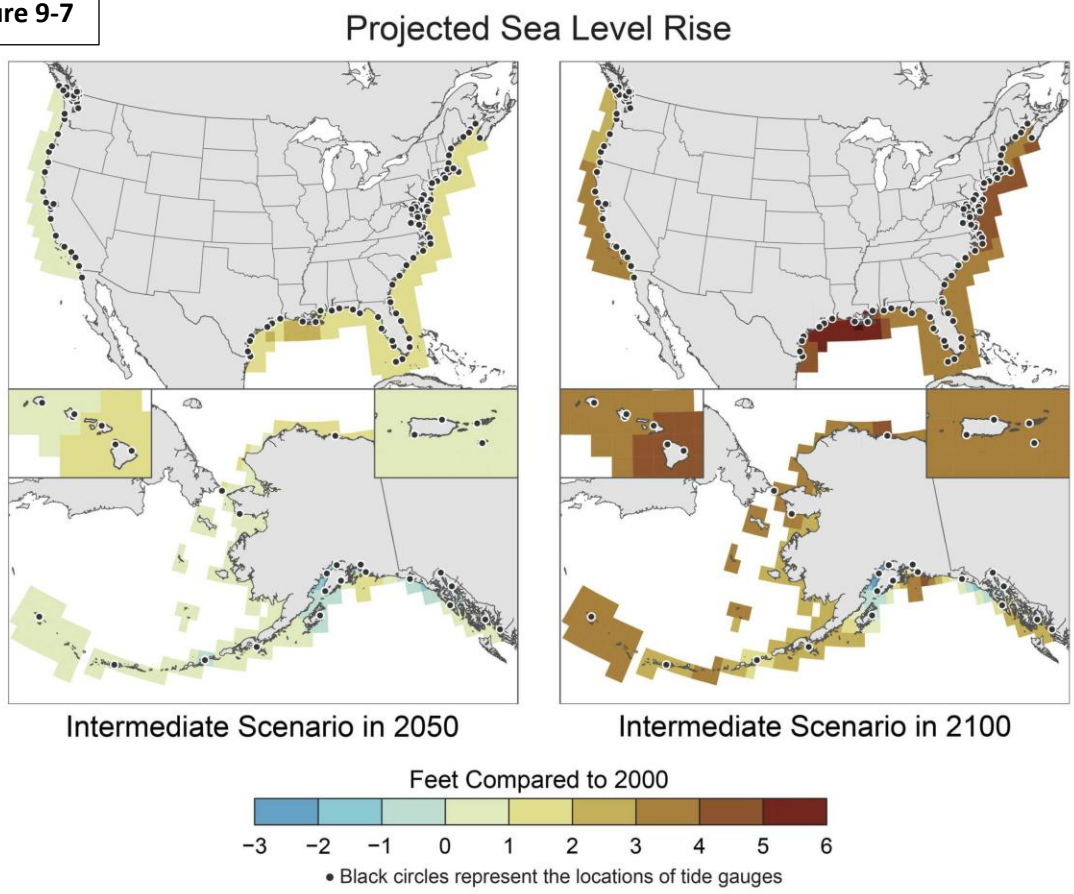


Figure 9-6

9.4 Probability of Future Occurrences

According to the Fifth Annual Climate Assessment, the annual average frequencies of minor, moderate, and major flooding are projected to increase more in the next 30 years (2020–2050) than they did in the past 30 years (1990–2020) regardless of any future worsening of storm events. In some Atlantic and Gulf Coast regions exposed to hurricanes, more severe and catastrophic coastal flood levels are possible and will become more likely as sea levels rise.

Figure 9-7



By 2050 and 2100 under the Intermediate sea level scenario, sea level rise is projected to be higher along the Atlantic versus the Pacific Coast and greatest along the western Gulf Coast.

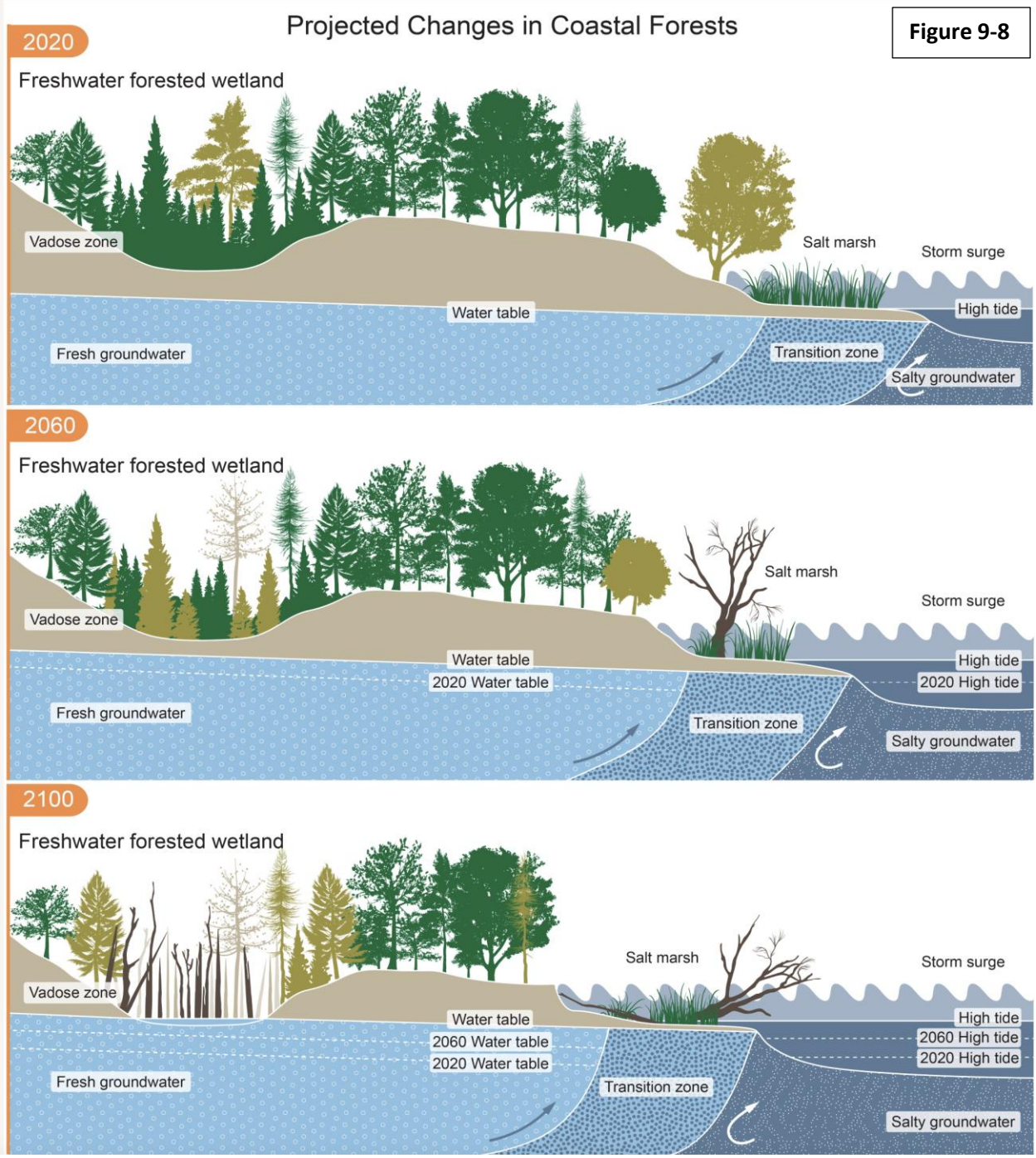
FIGURE 9.2. The figure shows relative sea level rise along the US coastlines under the Intermediate sea level scenario of the US Interagency Sea Level Rise Task Force[2] for 2050 (**left**) and 2100 (**right**). Relative sea level rise for the contiguous US is shown on the top, and for Alaska, Hawai'i (left insets), and Puerto Rico (right insets) on the bottom. The black dots along the coastline indicate tide-gauge locations used to characterize past SLR. Characterizing past (and future) SLR for Alaska and the US-Affiliated Pacific Islands is complicated due to tectonic effects that cause both uplift and subsidence. Figure credit: NOAA National Ocean Service.

9.5 Effects of Future Occurrences

According to the Fifth Annual Climate Assessment, sea level rise, tropical and extratropical cyclones, storm surges, and flooding are changing natural coastal wetlands and forests and the species that inhabit them. Coastal forests in the Northeast, such as the Lower Eastern Shore of Maryland and other areas of the Delmarva Peninsula, have been affected by saltwater intrusion and salinization of the soils. When coastal forests are invaded by salt water, they transform into tidal marshes, leaving behind standing dead trees, called ghost forests, and promoting the growth of *Phragmites australis*,

an invasive reed grass that provides less suitable habitats for fishes, crustaceans, and other invertebrates.

Figure 9-8: As sea level rises, the water table also rises; the vadose zone (which is between the ground surface and the groundwater table) becomes thinner, bringing the water table closer to the surface; and tidal flooding and storm surges reach farther inland, resulting in forest dieback and conversion of forested wetlands to standing-water wetlands. Over time, these changes result in permanent habitat shifts. *Image adapted from Sacatelli et al. 2020 and used in Fifth Annual Climate Assessment.*



9.6 Changes In Land Development & Sea Level Change

Sea level measured relative to land is called relative sea level. In coastal areas, sinking land, known as subsidence, leads to higher sea-level and increased flood risk. Sea level rise can cause change in habitat types or loss of habitat. Freshwater wetlands may experience dieback from saltwater intrusion, and salt marsh may convert to open water unless sedimentation and growth can keep pace and the natural systems have inland areas in which to migrate. If sea level rise outpaces natural coastal processes, beaches and dunes may eventually become submerged. Additional development near and along the shoreline would prove detrimental. Maryland's Chesapeake Bay Critical Areas Law identified the "Critical Area" as all land within 1,000 feet of the Mean High-Water Line of tidal waters or the landward edge of tidal wetlands and all waters of and lands under the Chesapeake Bay and its tributaries.

Zoning Regulations on development activities in the Critical Area may be found in Queen Anne's County's Chapter 14:1 Critical Area Ordinance.

The Critical Area Buffer consists of a minimum 100 feet landward from the Mean High-Water line of tidal waters, top of bank of tributary streams and tidal wetlands. The buffer may be expanded up to 300 feet to include any contiguous sensitive areas, highly erodible soils or steep slopes.

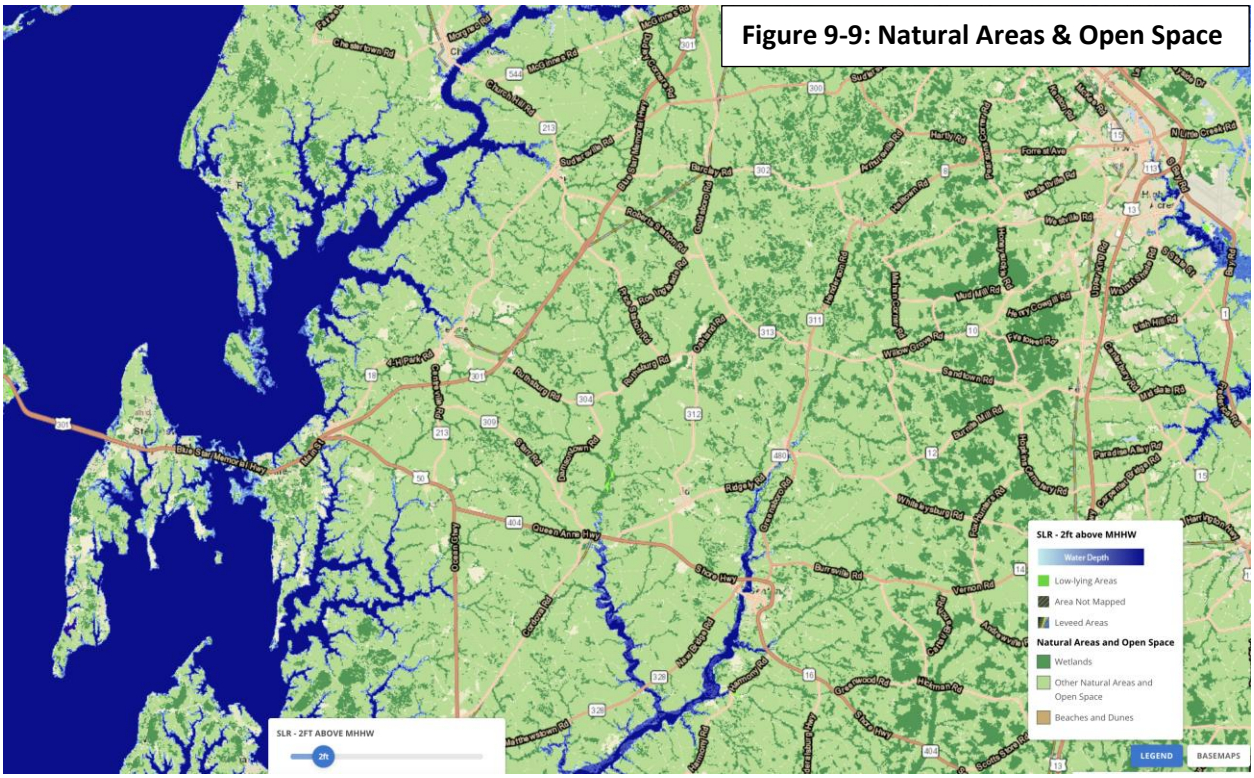
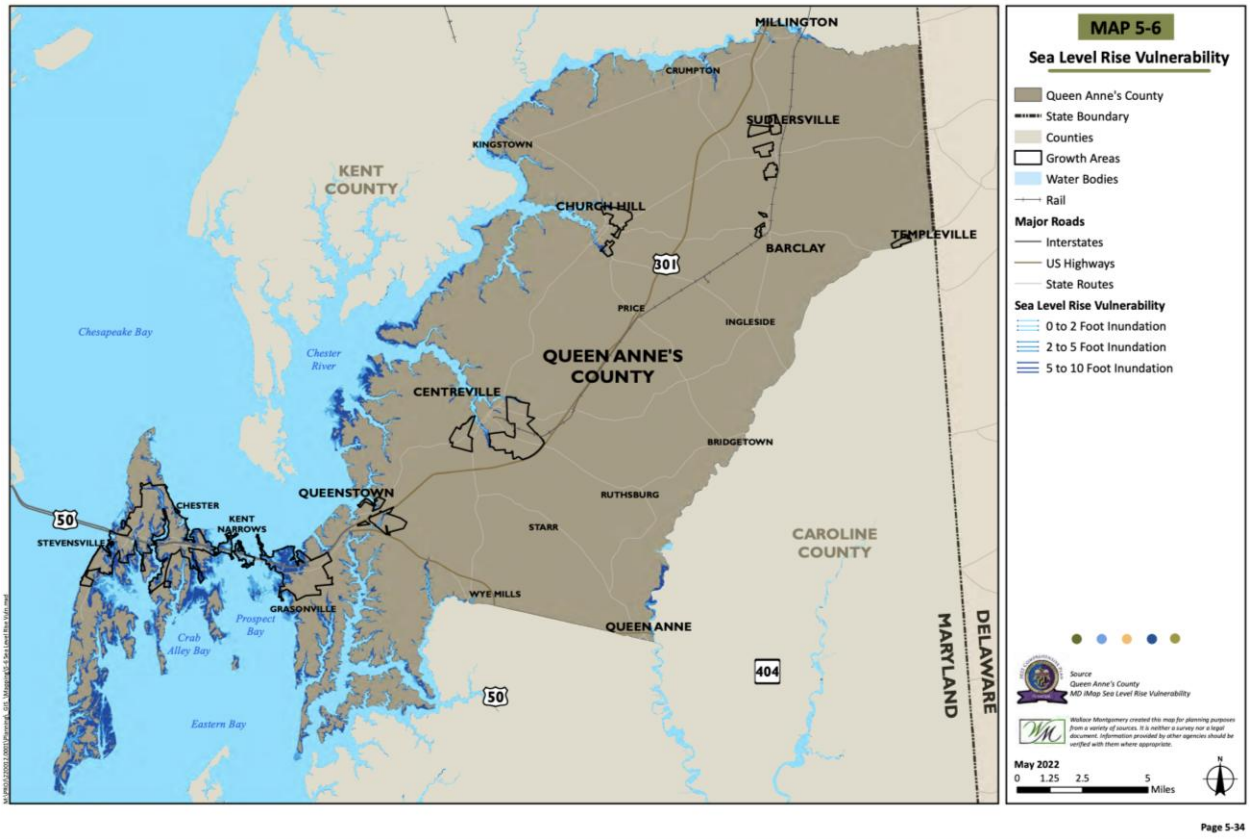


Figure 9-9: Natural Areas & Open Space

Source: NOAA's Coastal Flood Exposure Mapper

The Queen Anne's County Comprehensive Plan was adopted May 24, 2022. Chapter 5 - Environmental Resources has sections about hazard mitigation (5-13) and climate change (5-17). The community plans were incorporated into the comprehensive plan, Chapter 11 - Community Plans (section 11-14 is specific to climate change and sea level rise). Figure 9-10 provides sea level rise vulnerability information. The growth areas of Stevensville, Chester, Kent Narrows, and Grasonville are most vulnerable sea level rise.

Figure 9-10: 2022 Comprehensive Plan – Sea Level Rise Vulnerability



As mentioned earlier, sea level rise has accelerated and is projected to persist. However, due to Maryland's Critical Area regulations that restrict development, the potential for future construction is significantly reduced. Consequently, any changes in development impacting this hazard would be negligible, given the stringent enforcement of the Critical Area guidelines.

As the State of Maryland and Queen Anne's County continue to work on sea level rise mitigation and resilience, existing development will be affected as these types of projects are completed. In addition, the State developed the Maryland Coast Smart - Climate Ready Action Boundary (CRAB) Coastal - Flood Depth Grid to assist with communicate future risks.

9.7 Sea Level Change Vulnerability

Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan-March 2018

In July of 2014, the Maryland Smart Growth Sub Cabinet granted Queen Anne's County (QACO) a Priority Funding Area (PFA) exception to extend sewer service to nine (9) communities located on Southern Kent Island (SKI). The project will provide public sewer to more than 1,200 existing homes and more than 600 vacant lots to alleviate the significant public health and environmental concern caused by the existing/ failing septic systems penetrating groundwater. As a condition of the SKI project, the Maryland Smart Growth Sub Cabinet required a sea level rise and coastal vulnerability assessment to be prepared. The assessment entitled *Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan-March 2018* was prepared through the Coast Smart Communities Grant (CCG) administered by the

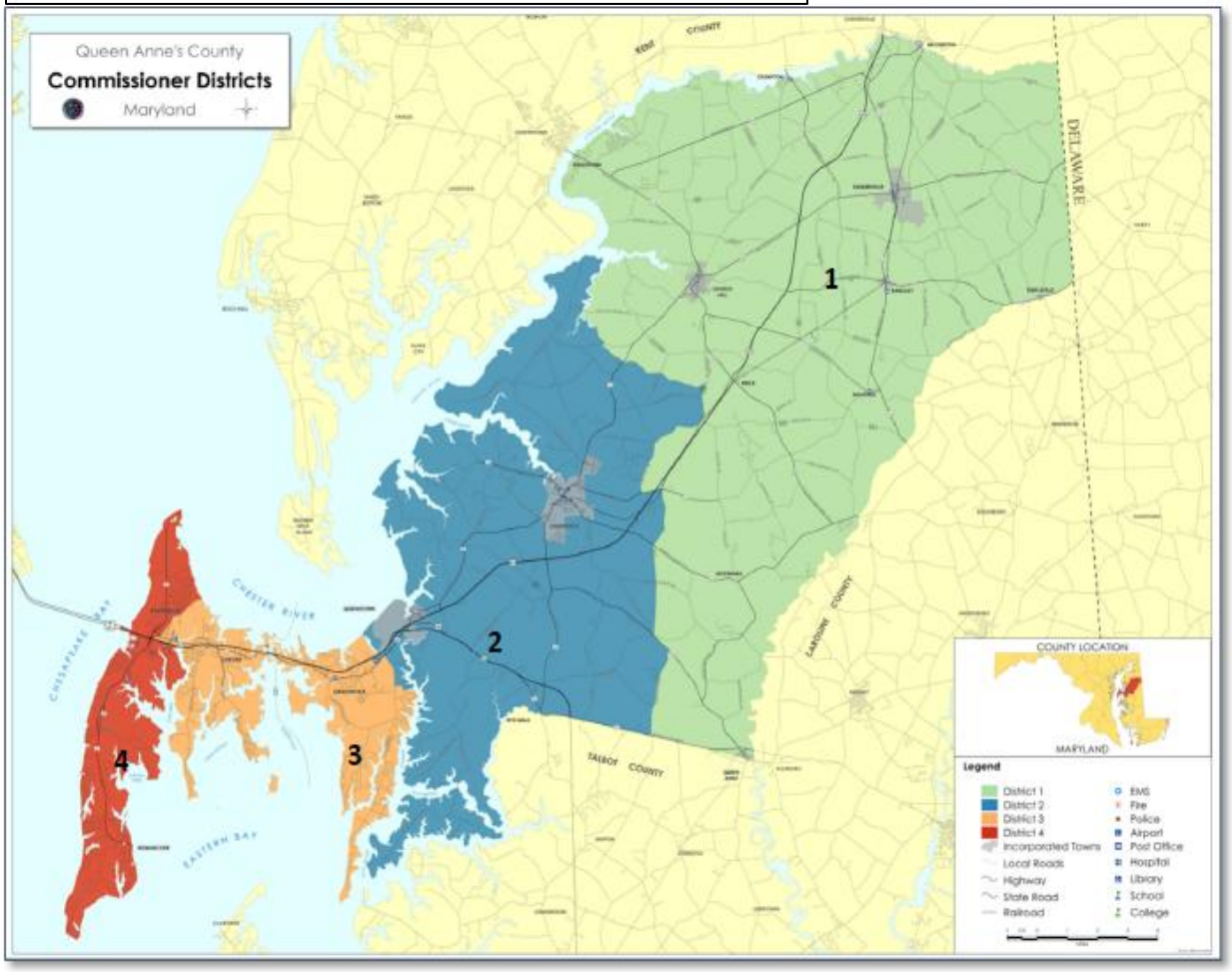
Maryland Department of Natural Resources (DNR). The objective of the assessment was to identify the impacts of SLR and coastal flooding, as well as build and/or plan the resiliency of the County to withstand sea level rise and future storms.

Following the completion of assessment, a climate resilience planning and finance study was a next step action identified. The Queen Anne's County 2019 Climate Resilience Planning and Financing Study was worked on but not completed during the 2019-2024 HMP planning cycle. This was a **2025 QAC HMP Identified Gap.** Therefore, a new mitigation action was developed.

SLR-3, Chapter 17 Mitigation Strategy - Finalize the County Climate Resilience Planning and Financing Study and contemplate the prioritization of resiliency projects and capital improvements.
For purposes of this vulnerability section, Information included in the *Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan-March 2018* has been included.

According to *Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan-March 2018,* four (4) study areas were identified and included for mapping purposes. The four (4) study areas match the County's Commissioner Districts (CCD) for ease of mapping (i.e., CCD 1 = Study Area 1, etc.). Figure 9-11 shows a map of the County's Commissioner Districts (from QACO Comprehensive Plan).

Figure 9-11: SLR Coastal Vulnerability Assessment Study



Study Area 1
Study Area 1 is in the north and east portions of the County covering approximately 213 square miles. Although this portion of the County is generally higher in elevation, tidally influenced coastline exists along reaches the Chester River, Island Creek, Southeast Creek, and Tuckahoe Creek. Of the total land area in Study Area 1, 0.5% and 0.8% is vulnerable to SLR of 2 feet and 4 feet respectively.

Study Area 2
Study Area 2 is in the central portion of the County covering approximately 113 square miles. Tidally influenced coastline exists along reaches of the Chester River, Wye River, and their tributaries. Of the total land area in Study Area 2, 2.5% and 3.7% is vulnerable to SLR of 2 feet and 4 feet respectively.

Study Area 3
Study Area 3 is located generally in the western portion of the County covering approximately 24 square miles. Tidally influenced coastline exists along reaches of the Chester River, Wye River, Eastern Bay, Prospect Bay, Crab Alley Bay, and their tributaries. Of the total land area in Study Area 3, 13.7% and 22.8% is vulnerable to SLR of 2 feet and 4 feet respectively.

Study Area 4
Study Area 4 is in the far west portion of the County. It includes the western portion of Kent Island and covers approximately 21 square miles. Tidally influenced coastline exists along reaches of the Chesapeake Bay, Chester River, Eastern Bay, and their tributaries. Of the total land area in Study Area 4, 11.1% and 18.9% is vulnerable to SLR of 2 feet and 4 feet respectively.

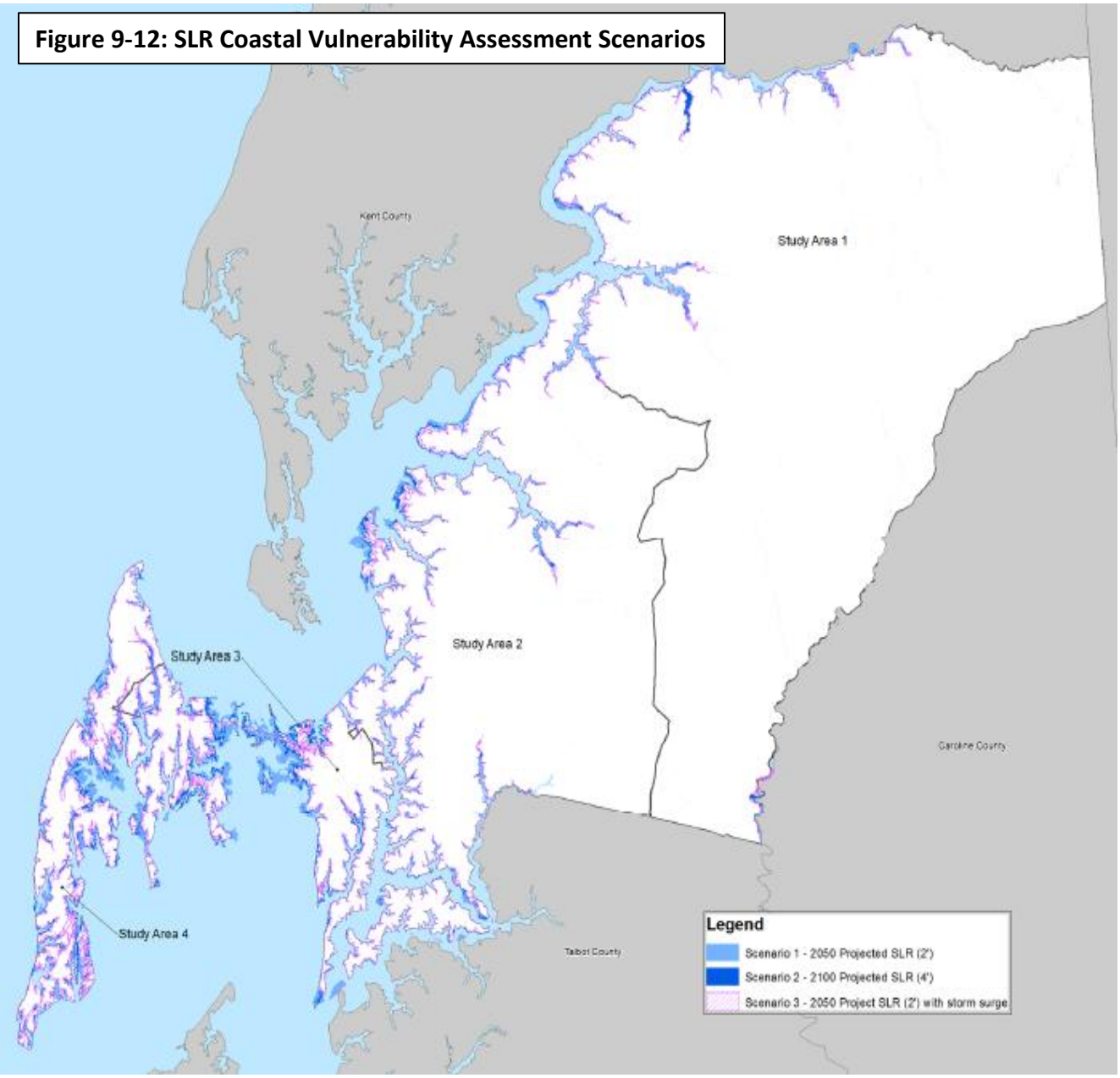
Three (3) SLR and storm surge scenarios were mapped to identify areas of vulnerability and risk in the County were utilized:

1. SLR of 2 feet plus Mean Higher High Water (MHHW)
2. SLR of 4 feet plus MHHW
3. SLR of 2 feet plus MHHW plus coastal storm surge

The three scenarios are displayed on Figure 9-12.

Between 2.6% and 4.1% of the County's land area could be impacted by a SLR of two feet (2') to four feet (4'), respectively and 6.3% of the County's land area could see increased temporary impacts by two feet of SLR plus coastal storm surge.

Figure 9-12: SLR Coastal Vulnerability Assessment Scenarios



Source: Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan-March 2018

9.7.1 VULNERABILITY AND IMPACTS TO PEOPLE AND THE ENVIRONMENT

Figure 9-13 summarizes the number and percent of private residential properties vulnerable to SLR & coastal storms.

Study Area	Total Number	Number Impacted[1] by Coastal Vulnerability Scenarios		Percent of Total Impacted[1] by Coastal Vulnerability Scenarios	
		Scenario 1	Scenario 2	Scenario 1	Scenario 2
1	5,082	407	438	8.0	8.6
2	4,304	398	454	9.2	10.5
3	5,688	1,509	1,839	25.2	30.7
4	45,942	1,412	2,001	23.8	33.7
Countywide	21,316	1,412	4,732	16.3	22.2

[1] Note that impacts may only represent a portion of the property

Figure 9-13

Source: Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan-March 2018

Note that the buildings dataset includes detached garages, sheds, and other out-buildings and multiple buildings may pertain to one parcel. Impacts to detached garages or other outbuildings were not considered to be residential impacts, only building that intersected address points with a residential classification were considered for residential building impacts. Additionally, the impacts shown in Figure 8-8 are based on lateral extents of the buildings and SLR and storm surge inundation scenarios to show vulnerability. Elevations of the first floor of the buildings are not available and have not been evaluated. Buildings built on piers, or otherwise elevated, may not be impacted by the SLR and coastal storm surge scenarios.

The areas of Stevensville, Chester, Kent Narrows, and Grasonville are most vulnerable sea level rise. In addition, the **Towns of Centreville, Church Hill, Queenstown,** and **Millington** are vulnerable to sea level rise. Socially vulnerable groups tend to have more exposure to flooding, therefore are disproportionately impacted in the short and long terms. As depicted on Map 3-5, Queen Anne's County does not have any census tracts with high vulnerability (dark blue symbol in legend). The census tract containing the **Towns of Sudlersville and Barclay** are within the moderate (blue-green) social vulnerability but are not vulnerable to sea level rise. However, the **Towns of Millington, Queenstown, Church Hill and Centreville** may be impacted by sea level rise and have moderate-low (green) social vulnerability.

The majority of the unincorporated areas of the County have moderate-low (green) social vulnerability, with the exception of Kent Island, which has moderate (blue-green) and low (yellow) social vulnerability. Kent Island consists of the following communities, Stevensville/Chester, Kent Narrows, and Grasonville and are all vulnerable to sea level rise. Stevensville/Chester is divided by census tracks that have low (yellow) and moderate-low (green) social vulnerability. Kent Narrows and Grasonville have moderate (blue-green) social vulnerability.

Considering Kent Narrows and Grasonville have moderate social vulnerability, this area could be a potential place to prioritize exposure reduction and climate change adaptation.

In addition, sea level change steadily is bringing more brackish water from Maryland's estuaries, tidal tributaries, and the ocean:

- on to the land;
- farther upstream; and
- farther inland underground into surficial groundwater aquifers.



Collectively, the increased salinity has already made some of Maryland's coastal farmland unusable and is altering the ecological landscape of Maryland's wetlands and coastal forests.[iv]

9.7.2 VULNERABILITY AND IMPACTS TO SYSTEMS

The identified evacuation routes within the County include Routes 8, 18, 19, 50, 213, 290, 300, 301, 302, 304, 309, 313, 405, 481, 544, and various connected local roads. The evacuation route dataset was obtained from the Maryland State Highway Administration (SHA).

Figure 9-14 provides a summary of impacted evacuation routes (both primary and secondary combined) by miles of roadway and percent of total resource. Evacuation route impacts are primarily located at bridges adjacent to tributaries of the Chester River as well as coastal waters of the Chesapeake Bay. It is difficult to determine the actual impacts to the bridge structures and roadway as the Light Detection and Ranging (LiDAR) data does not include bridge deck elevations.

Study Area	Total Miles	Miles Impacted by Coastal Vulnerability Scenarios		Percent of Total Impacted by Coastal Vulnerability Scenarios	
		Scenario 1	Scenario 2	Scenario 1	Scenario 2
1	139.6	0.22	0.25	0.16	0.18
2	69.7	0.02	0.14	0.03	0.20
3	27.8	1.02	3.06	3.67	11.02
4	21.3	0.12	0.73	0.56	3.43
Countywide	258.3	1.38	4.18	0.53	1.62

Figure 9-14

Source: Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan-March 2018

The following describe known impacts to evacuation routes based on roadway elevations not associated with bridges.

In Study Area 2 roadway impacts occur at MD 213 in the Town of Centreville where Scenario 2 inundates a portion of the roadway near the Mill Stream Branch crossing. MD 18 is inundated by both SLR scenarios in the Town of Queenstown near Thompson Avenue.

In Study Area 3 portions of MD 18 are impacted near Gravel Run Road in Scenario 2 and much of the roadway near the Kent Narrows and Cox Creek areas to varying stages in both Scenarios 1 and 2.

In Study Area 4 significant impacts to MD 8 occur in Scenario 2 near Broad Creek, effectively cutting off transportation to the southern portion of Kent Island. Route 8 is also impacted at Carter Creek and Holligans Snooze Inlet in Scenario 2.

9.7.3 VULNERABILITY AND IMPACTS TO COMMUNITY ACTIVITIES

Activities that have value to the community could potentially be impacted by flood events, which may affect a wider geographic extent or rise in flood depth due to sea level change. When these activities are delayed or cancelled, the economy of the community is affected. This is true of events in both Queen Anne's County and all its municipalities.

Vulnerability and impacts to community activities include, but are not limited to:

- The Historic Stevensville Art Market is a reoccurring event that happens monthly from April - November. Stevensville lies along the Chesapeake Bay making it a coastal town. This is a coastal area.
- The Historic Stevensville Classic Car Show is held in September. This is a coastal area.
- The Queen Anne's County Fair in Centreville, MD is held the second week of August.
- The Annual Paint Stevensville event is held at the beginning of June. This is a coastal area.
- The Juneteenth festival is held in Centreville, MD with live music, vendors, a parade, and more for the community.
- The Bay Bridge Run which is held in November.

9.7.4 VULNERABILITY AND IMPACTS TO STRUCTURES

Results of the SLR and Coastal Vulnerability Assessment indicated that inundation from SLR will affect a range of resources, including infrastructure, land use, and natural resources, as well as increase the risk to public safety. In addition to the three (3) SRL and storm surge scenarios mapped in the *Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan-March 2018,* a comprehensive list of assessed countywide resources and their associated impacted were provided, shown on Figures 9-15 & 9-16.

Emergency service facility data was obtained from QACO for the inclusion into the *Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan-March 2018*. There are no impacts to emergency service facility buildings or properties in Study Area 1.

In Study Area 2, the following facilities are affected:

- The Wye Research and Education Center property, which is designated as a temporary emergency shelter, is impacted by Scenarios 1 and 2; however, the building itself is not impacted by either SLR scenario.
- The Agriculture Center University of Maryland Research property, which is also designated as a temporary emergency shelter, is impacted by Scenarios 1 and 2; however, the impacts are in a wooded section of the property. The building itself is not impacted by either SLR scenario.

In Study Area 3, the following facilities are affected:

- QACO Sheriff Kent Narrows Substation property is impacted by Scenarios 1 and 2; however, the building itself is not impacted by either SLR scenario.

- EMS Station 200 property will be impacted by Scenarios 1 and 2 and the building will be impacted by Scenario 2. In addition, the entrance to the facility and several surrounding roads are impacted.
- The Stevensville Middle School property, which is designated as a temporary emergency shelter, is impacted by Scenarios 1 and 2; however, the building itself is not impacted by either SLR scenario.
- The Bayside School and Grasonville Senior Center properties, which are designated as temporary emergency shelters, are impacted by Scenario 2; however, the buildings are not impacted by either SLR scenario.

In Study Area 4, the following facilities are affected:

- EMS Station 100 property is impacted by Scenario 2; however, the station is located on a large, County-owned parcel and the impacts are not in the proximity of the building.
- The Matapeake Elementary School and Middle School properties, which are designated as emergency shelters, are impacted by Scenario 2; however, the building itself is not impacted by either SLR scenario and the property impacts are limited to the northern periphery of the property.

Figure 9-15

Resource	Units	Total Number Countywide	Number Impacted by Coastal Vulnerability Scenarios			Concern
			Scenario 1	Scenario 2	Scenario 3[2]	
Emergency Service Facilities	Properties[1]	52	5	9	18	High
Emergency Service Facilities	Buildings	52	0	1	5	High
Evacuation Routes	Miles	258.3	1.4	4.2	8.1	High
Roadways	Miles	1,077.4	3.6	22.7	62.0	Moderate
Schools	Properties[1]	38	1	4	9	Low
Schools	Buildings	38	0	0	0	Low
Wastewater Treatment Plants	Properties[1]	5	3	4	4	High
Sewer Stations	Stations	31	2	13	16	High
Water Treatment Plants	Properties[1]	11	1	3	3	Moderate
Fire Hydrants	Each	393	8	30	68	Low
Dams	Each	19	0	0	2	Low
Catch Basins	Each	652	18	56	113	High
Culverts	Each	784	76	142	272	High
Concrete Drains	Each	17,710	430	1,337	2,902	High
Storm Drains	Segment	345	8	17	51	High
Drop Inlets	Each	524	30	96	143	High
Manholes	Each	1,112	12	71	173	High
Pipes	Segment	117	4	11	28	High
Stormwater Ponds	Each	415	27	60	90	Moderate

Source: Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan-March 2018

Figure 9-16

Resource	Units	Total Number Countywide	Number Impacted by Coastal Vulnerability Scenarios			Concern
			Scenario 1	Scenario 2	Scenario 3[2]	
Sub Stations	Each	8	0	0	0	Low
Transformers	Each	8	0	0	0	Low
Lamp Posts	Each	1269	18	132	304	Moderate
Light Poles	Each	2625	76	214	423	Moderate
Traffic Signal Poles	Each	21	0	0	0	Low
Utility Poles	Each	18,303	277	807	1,589	Moderate
Utility Boxes	Each	378	2	22	63	Moderate
Telecommunication Towers	Each	47	2	3	4	High
Private Residential Property	Properties[1]	21,316	1,412	4,732	6,538	High
Private Residential Property	Buildings	19,553	64	990	2,785	High
Commercial Development	Properties[1]	2,429	709	854	1,064	High
Commercial Development	Buildings	1,642	36	96	192	High
NWI Wetlands	Acres	27,337	3,606	4,211	4,780	High
DNR Wetlands	Acres	55,446	6,794	8,351	9,601	High
Critical Area	Acres	4,034	507	822	1,256	High
Agricultural Land	Acres	181,040	2,998	4,739	7,258	High

[1] Property impacts may only represent a portion of the property

[2] Scenario 3 may only represent a temporary impact of certain resources without long-term impacts

Source: Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan-March 2018

9.7.5 VULNERABILITY AND IMPACTS TO HISTORIC STRUCTURES

A challenge associated with mitigating flood risk to a historic structure is the need to ensure that the structure does not lose its historic integrity. Maryland's Historic Trust's guide provides specific strategies such as floodproofing and elevating buildings that may be useful for property owners, however the Guide also discusses what communities can do before, during and after a flood to ensure historic preservation is an ongoing process with emergency management. The Maryland Historical Trust's (MHT) Architectural Survey Form for Hazard Mitigation Planning should be completed for the eleven (11) historic structures listed in Chapter 3, Table 3-12. Both current flood conditions and future increases in flood extent and depth due to sea level change should be evaluated. Use the findings in the form to develop appropriate flood mitigation measures and sea level change considerations that balance protection and preservation.

[i] Cazenave, A., & Moreira, L. (2022). Contemporary sea-level changes from global to local scales: A review. *Proceedings of the Royal Society A, 478,* 20220049. https:// doi.org/10.1098/rspa.2022.0049

[ii] Ezer, T. (2023). Sea level acceleration and variability in the Chesapeake Bay: Past trends, future projections, and spatial variations within the Bay. *Ocean Dynamics, 73*, 23–34. https://doi.org/10.1007/s10236-022-01536-6

[iii] Dangendorf, S., Hendricks, N., Sun, Q., Klink, J., Ezer, T., Frederikse, T., Calafat, F. M., Wahl, T., & Törnqvist, T. E. (2023). Acceleration of U.S. Southeast and Gulf coast sea-level rise amplified by internal climate variability. *Nature Communications, 14*, 1935. https://doi.org/10.1038/ s41467-023-37649-9

[iv] Maryland Department of Planning, "State of Maryland Plan to Adapt to Saltwater Intrusion and Salinization," Dubow, J and D.H. Cornwell, primary authors, D. Andreasen, A. Staley, K. Tully, K. Gedan, and R. Epanchin-Niell, contributing authors, 2019. Page 4. https://planning.maryland.gov/documents/ourwork/envr-planning/2019-1212-marylands-plan-to-adapt-to-saltwater-intrusion-and-salinization.pdf

Chapter 10 Wildfire



Source: commonsenseeasternshore - Wildfires — We Have Them in Maryland, Too

This chapter of the Plan describes an overall wildfire profile, risk, and vulnerability for Queen Anne's County and participating municipalities. During this plan update, new or changed plan components are shown in **bold blue** text below.

- 10.1 WILDFIRE
- 10.2 LOCATION & GEOGRAPHIC EXTENT
- 10.3 HISTORY OF PREVIOUS HAZARD EVENTS
- **10.4 PROBABILITY OF FUTURE OCCURENCES**
- **10.5 EFFECTS OF FUTURE CONDITIONS**
- **10.6 CHANGES IN LAND DEVELOPMENT & WILDFIRE**
- 10.7 WILDFIRE VULNERABILITY
  - **10.7.1 Vulnerability and Impacts to People and the Environment**
  - **10.7.2 Vulnerability and Impacts to Systems**
  - **10.7.3 Vulnerability and Impacts to Community Activities**
  - **10.7.4 Vulnerability and Impacts to Structures**
  - **10.7.5 Vulnerability and Impacts to Historic Structures**

Note: The previous plan included hazard impact tables based on Emergency Management Accreditation Program requirements (EMAP). This information was expanded as part of this plan update within the vulnerability section.

Public Survey Results

- Survey participants indicated they were "somewhat concerned" with wildfire.
- 7% of the survey participants indicated they have been personally affected by wildfire.
- 51% of the survey participants have reduced wildfire risk to their home/business by removing dead/drying trees and vegetation from around the home.

Chapter Updates

- All sections of the chapter were updated with new information, graphics, maps, and tables.
- Wildfire hazard history data was updated to include events that have occurred during this planning cycle.
- The vulnerability section in the previous 2019 Plan included impact tables, however the following subsections were added. The new subsections include narratives and were applicable, tables and maps.
  - Vulnerability and Impacts to People and the Environment,
  - Vulnerability and Impacts to Systems,
  - Vulnerability and Impacts to Community Activities,
  - Vulnerability and Impacts to Structures, and
  - Vulnerability and Impacts to Historic Resources.
- Social Equity and Vulnerability to wildfire hazard events were integrated.
- Data provided by the Maryland Department of Natural Resources was integrated into the chapter.

10.1 Wildfire

Wildfires are a common occurrence in Maryland. In an average year, the Maryland Forest Service responds to an average of 123 wildfires that burn more than 1,780 acres of forest, brush, and grasses. Fire departments respond to over 5,000 wildfire incidents per year.

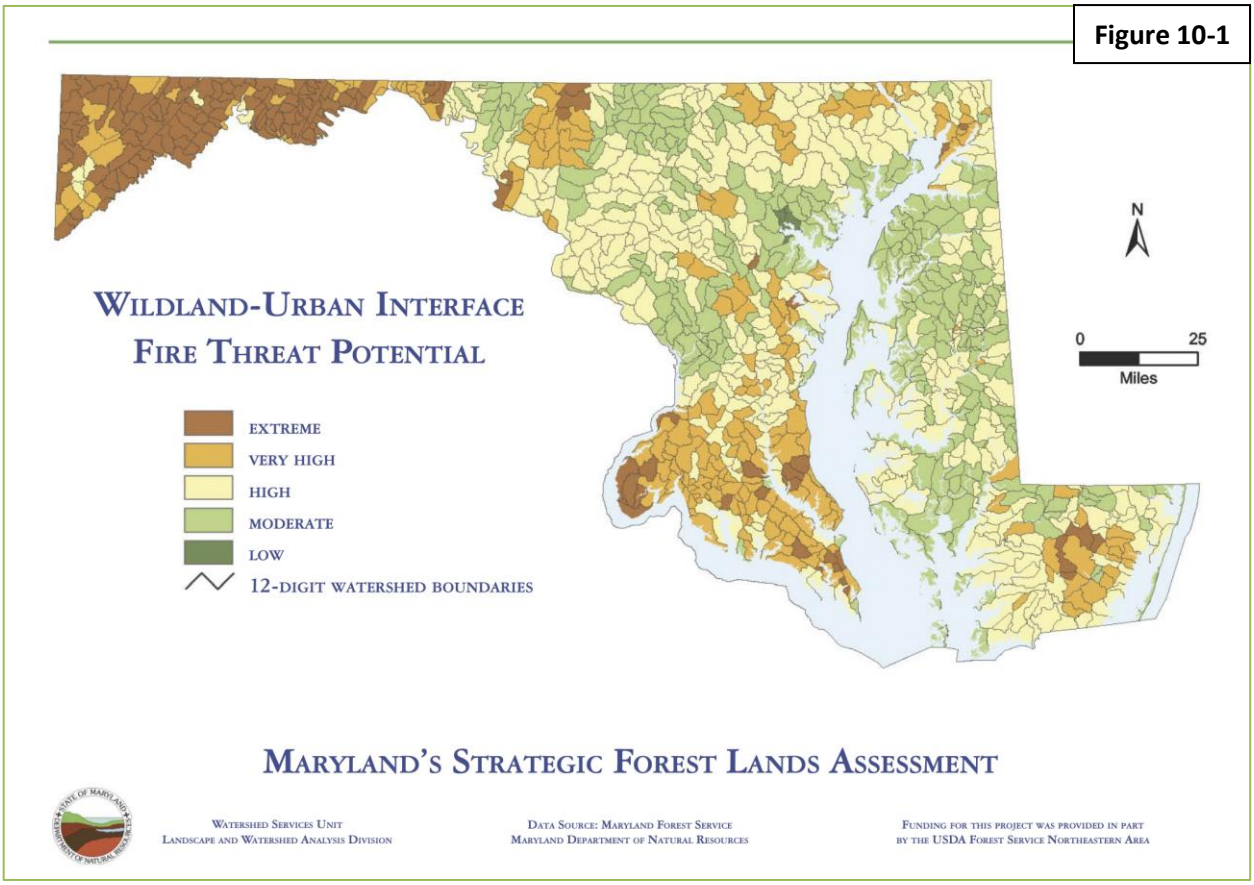
While some wildfires in Maryland can burn hundreds or even thousands of acres, most are smaller in size, burning less than 10 acres. Even these smaller wildfires can threaten lives, homes, other structures, and our natural resources. Each year hundreds of homes and structures are threatened, and dozens are damaged or destroyed by wildfires.

The Maryland Forest Service (MFS) is the primary fire control authority for fires affecting natural cover within the state. The Maryland Forest Service also assists local and rural fire companies that lack the resources needed to fight large wildfires.

10.2 Location & Geographic Extent

Maryland's Strategic Forest Lands Assessment is conducted by the Maryland Department of Natural Resources with financial assistance from the United States Department of Agriculture Forest Service and is composed of many types of vulnerability studies applying to the forests of Maryland. Figure 10-1 shows one of the studies conducted on wildland/urban interface fire threat potential. Areas of Queen Anne's County are shown to be in the moderate and high Wildland Urban Interface Fire Threat Potential

Figure 10-1



Source: Maryland's Strategic Forest Lands Assessment. Source: Maryland DNR Forest Service

As shown on Figure 10-1, the following municipalities are designate as either moderate or high wildland-urban interface fire threat potential.

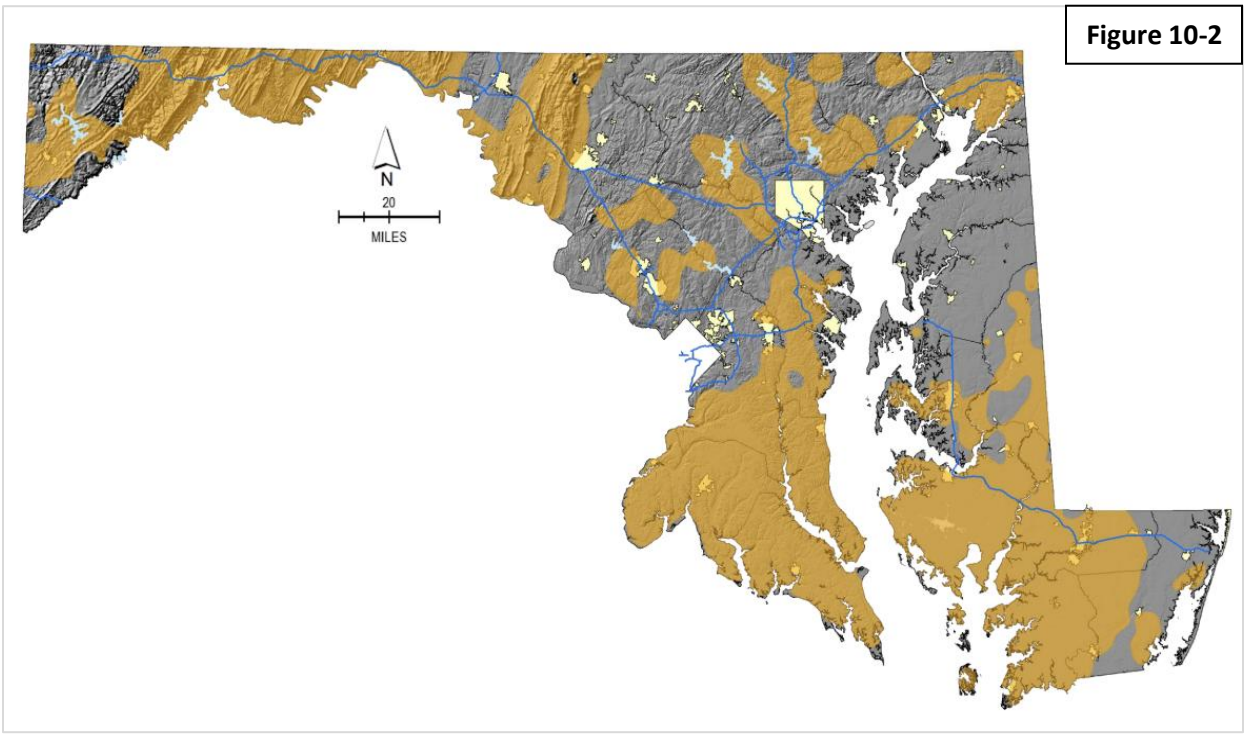
- Barclay - Moderate
- Sudlersville - Moderate
- Church Hill - Moderate
- Millington- High
- Centreville Northern Portion – Moderate and Southern Portion - High
- Queenstown – Moderate

Figure 10-1 represents only a single component of the greater "Protect Forests from Harm (PFFH) Wildfire Priority Map." Figure 10-2, which is part of the 2020 Forest Action Plan, highlights areas within Maryland where the following three conditions are met:

1. Wildfire is historically prevalent.
2. Wildfire has the potential to cause great harm to people and property.
3. Where fuels and other conditions can increase the likelihood and intensity of wildfire.

Queen Anne's County, including all its municipalities, are not within the wildfire priority area as depicted in orange in Figure 10-2, meaning they do not meet the three aforementioned qualifications. Full statewide results of the analysis are depicted in Figure 10-2.

Figure 10-2



Source: 2020 Forest Action Plan Part I: Forest Resource Assessment

Areas at the greatest risk to wildfire events are those where structures and other human development meet undeveloped wildland. This area is referred to as the Wildland-Urban Interface (WUI), which is characterized by an environment where fire can readily move between structural and vegetation fuels.

10.3 History of Previous Hazard Events

According to the Maryland Forest Service, Department of Natural Resources, the acreage burned by wildfires in Queen Anne's County has significantly decreased since the 2012 high of 81.6 acres. The only year that exceeded 2012 in acreage burned on Table 10-1, was 2001, at 97.7 acres burned.

TABLE 10-1: QUEEN ANNE'S COUNTY – WILDFIRE RESPONSE BY COUNTY MD DNR FOREST SERVICE FIRE STATS 2000-2022		
YEAR	**# OF INCIDENTS**	**ACRES**
2000	11	14.8
2001	24	97.7
2002	21	37.7
2003	3	9.6
2004	7	15.9
2005	12	54.8
2006	31	12.7
2007	31	25.7
2008	32	48.9
2009	21	26.6
2010	6	18.1
2011	1	0.2
2012	7	81.6
2013	4	1.7
2014	3	2.1
2015	2	6.9
2016	1	0.1
2017	5	1.5
2018	1	0.5
PLAN UPDATE		
2019	4	21.8
2020	1	1.5
2021	1	0.1
2022	4	5.5

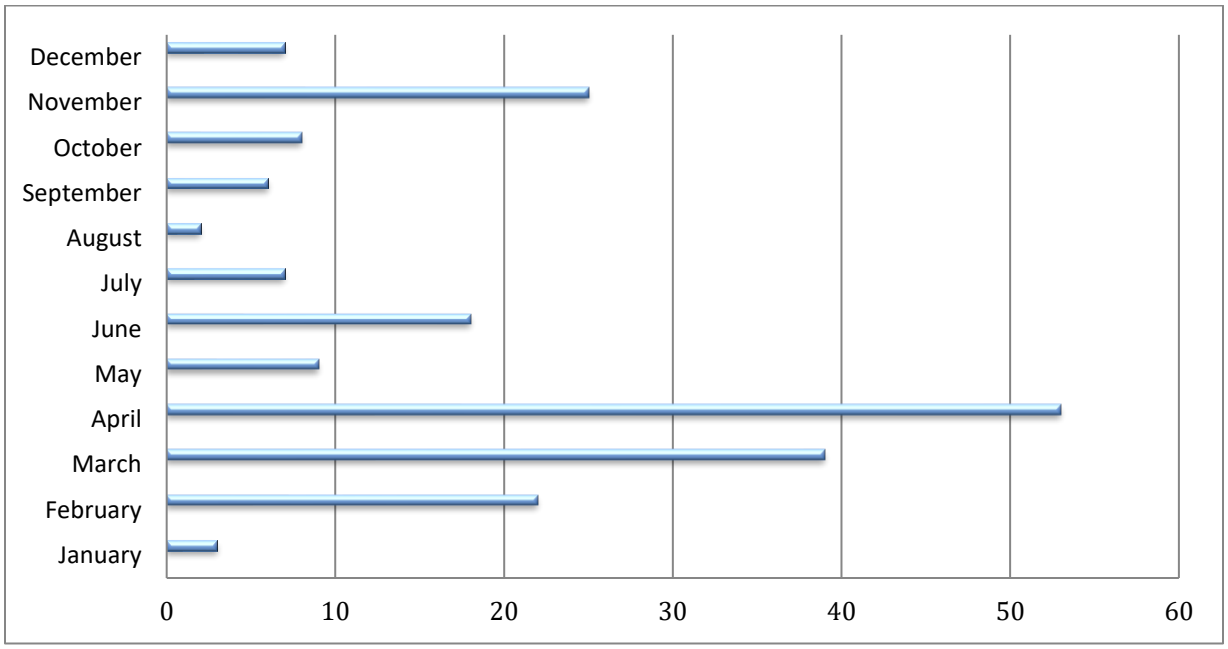
Source: Maryland Forest Service, Department of Natural Resources

10.4 Probability of Future Occurrences

As shown on the Table 10-1, the probability of future wildfires is likely, as one or more wildfires have occurred every year from 2000-2022. Queen Anne's County experiences an average of 11.3 wildfire events annually.

Wildfires occur in every month in Maryland, but peak in the spring and fall. During these seasons the leaves are off the deciduous trees, allowing sunlight and wind to reach the forest floor and dry the forest fuels. The relative humidity of the air is also drier and, combined with a breeze, creates the conditions for wildfires to spread rapidly.

TABLE 10-2: 2023 ANNUAL WILDLAND FIRE REPORT-WILDFIRES STARTS



Source: Maryland Department of Natural Resources; Maryland Forest Service

The only natural cause of wildfires is lightning, and this accounts for only 4% of the wildfire ignitions in Maryland. Humans caused the remaining 96% of wildfires. Maryland's leading cause of wildfires is improper debris or outdoor burning that ignites an average of 36% of the fires each year. Arson, the second leading cause, accounts for around 26% of ignitions. Other causes include equipment use, children playing with fire, smoking, campfires, railroads, and other miscellaneous ignitions from sources such as downed power lines, discarded ashes, and fireworks.

10.5 Effects of Future Conditions

Climate change is expected to play a role in increasing the frequency and intensity of wildfires across the United States and in Maryland. An article written for the New York Times, in which the article references a United Nations Report, suggests the following:

> "*In a moderate scenario for global warming, the likelihood of extreme, catastrophic fires could increase by up to a third by 2050 and up to 52 percent by 2100, the report estimates. If emissions are not curbed and the planet heats up more, wildfire risks could rise by up to 57 percent by the end of the century*."[i]

Queen Anne's County experiences an average of 11 wildfire events annually. Based on the moderate scenario for global warming, which predicts an increase in major wildfires of up to a third by 2050, Queen Anne's County's total annual wildfires could increase by 3.8 events per year, for a total of 15 wildfires annually.

The U.N. report urges governments to become even more proactive about wildfire hazards. Of every dollar spent in the United States on managing wildfires, almost 60 cents go toward immediate firefighting responses, according to research cited in the report. Much less is spent on reducing fire risks in advance and helping communities recover in ways that could make them more resilient.[ii]

10.6 Changes in Land Development & Wildfire

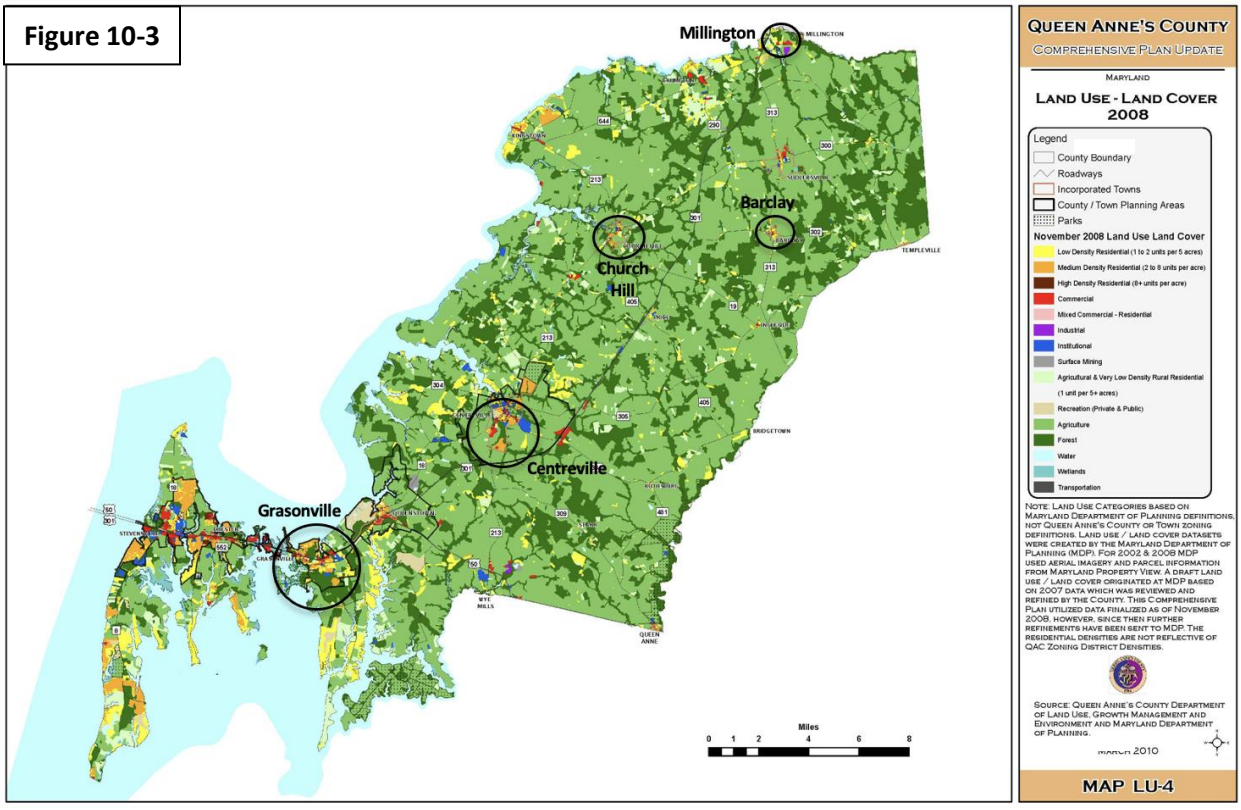
A wildfire is an even greater challenge when it threatens homes and other structures. The zone where homes are built in or near the forest is called the Wildland-Urban Interface (WUI). The number of homes built in the WUI in Maryland has increased dramatically in recent years.

As shown by Figure 10-1, there are areas in Queen Anne's County that are at both moderate and high wildfire risk; these areas are within the WUI. According to Figure 10-3, Existing Land Use/Land Cover from the 2022 Queen Anne's County Comprehensive Plan, 30.8% of the physical geography of the County is forested.[iii]

Areas within Queen Anne's County that indicate WUI include:

- Barclay
- Sudlersville
- Church Hill
- Millington
- Southern portion of Centreville; and,
- Grasonville area.

Figure 10-3

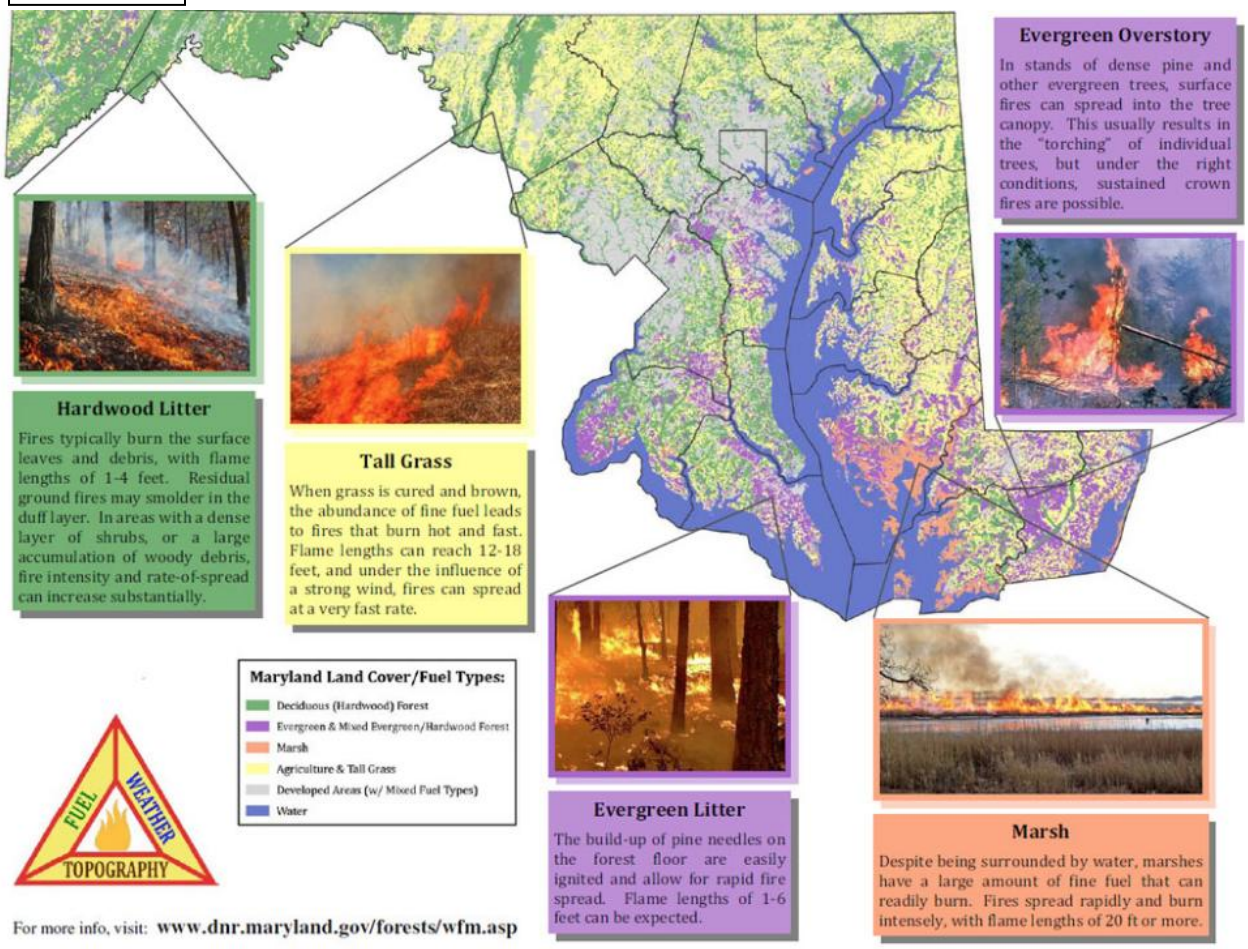


New developments should be carefully placed if not avoided entirely. Changes in development as per the Queen Anne' County Comprehensive Plan will be concentrated in and around existing development. Development along the urban wildland interface areas may face a higher risk to wildfire than those within the existing urbanized area. In general, future development near or along large areas of contiguous forest should be avoided to reduce wildfire risk. Additionally, development in areas that lack public water, and sewer should be heavily considered as the lack of public water access may create difficulties in extinguishing large fires.

10.7 Wildfire Vulnerability

Wildfires and brush fires have forced school closings, disrupted telephone services by burning fiber optic cables, damaged railroads and other infrastructure, and adversely affected tourism, outdoor recreation, and hunting. The likelihood of one of those fires attaining significant size and intensity is unpredictable and highly dependent on environmental conditions and firefighting response. Weather conditions, particularly drought events, increase the likelihood of wildfires occurring. Most wildfires in Maryland are surface fires, which burn fallen leaves, twigs, and debris on the ground. Under this fallen debris is often a layer of partially decomposed leaves and humus, called "duff." During dry periods, fires can burn underground in this duff layer, and be very difficult to extinguish, particularly drought events, increase the likelihood of wildfires occurring. Most wildfires in Maryland are surface fires, which burn fallen leaves, twigs, and debris on the ground. Under this fallen debris is often a layer of partially decomposed leaves and humus, called "duff." During dry periods, fires can burn underground in this duff layer, and be very difficult to extinguish. These duff fires can burn for weeks, or even months, and cause smoke issue.

Figure 10-4



Source: Maryland Forest Service; www.dnr.maryland.gov/forest/wfm.asp

The intensity of wildfires increases greatly in areas of dense fine fuels, such as grasses, or dense resinous fuels, such as mountain laurel shrubs or evergreen trees. Queen Anne's County has an abundance of tall

grass, a dense fine fuel.

10.7.1 VULNERABILITY AND IMPACTS TO PEOPLE AND THE ENVIRONMENT

Wildfires pose serious threats to human safety and property in rural and suburban areas. Wildfire impacts in Maryland are most commonly associated with the natural environment due to the high number of forested areas in the state. Common impacts to the environment include destruction of forested areas, loss of wildlife habitat, destruction of crops, and temporary poor air quality due to smoke generated by wildfire. They can destroy crops, timber resources, recreation areas, and habitat for wildlife. Wildfires are commonly perceived as hazards in the western part of the country; however, wildfires are a growing problem in the wildland/urban interface of the eastern United States, including Maryland and Queen Anne's County. Figure 10-1 identifies two municipalities designated as high wildland-urban interface fire threat potential, **Town of Centreville and the Town of Millington**.

Since 97% of wildfires are caused by people, wildfire ignitions are also more common in these Wildland-Urban Interface zones. Considering all factors, wildfires can be a significant threat in Maryland. Homes and other structures intermixed with wildland fuels are at risk, and WUI residents need to take actions to protect themselves and their property.



Source: Maryland Forest Service; www.dnr.maryland.gov/forest

Fires can extensively impact the economy of an affected area, especially the logging, recreation, and tourism industries, upon which many counties depend. Major direct costs associated with forest fires or wildfires include the salvage and removal of downed timber and debris and the restoration of the burned area. If burned-out woodlands and grasslands are not replanted quickly to prevent widespread soil erosion, then landslides, mudflows, and floods could result, compounding the damage.

Considerations for social vulnerability populations aged 65 and older, children aged 5 and younger, pregnant women, and those with additional medical or mobility needs are most at-risk for breathing issues associated with poor air quality due to smoke generated from wildfires. The fire itself can cause property damage and physical injury or even death, while smoke and ash can greatly impact those with pre-existing respiratory diseases or heart diseases. In addition, aging populations, and those with medical or mobility needs are considered the most at risk during hazardous events because they require more time and are more likely to seek emergency medical attention that might not be as readily available due to isolation and other various circumstances.

Plan Update Note

To satisfy FEMA Requirement 44 CFR § 201.6(c)(2)(ii), this section, Social Equity & Vulnerability has been included in the plan update as a new element.

Recently, beginning on June 7th, 2023, the air quality index in Queen Anne's County was at "moderate" levels and much of the northeastern United States was at "hazardous" levels, which triggered health warnings of emergency conditions. By the end of June, air quality alerts for the entirety of Maryland were at hazardous levels. The drop in air quality was not due to a local, or even regional, wildfire but rather due to massive wildfires in Eastern Canada. The smoke from these fires generated an orange smog-like haze that lowered air quality for multiple days in Queen Anne's County. The highest socially vulnerable populations are located in the northeast and southwest portions of Queen Anne's County.

10.7.2 VULNERABILITY AND IMPACTS TO SYSTEMS

Transportation and utility systems are very likely to be negatively impacted by a wildfire event. Wildfires can block transportation routes and cause traffic delays, which would slow emergency responders and members of the public. Roadways connect the community – any blockages would disrupt how people move throughout Queen Anne's County and its municipalities. Additionally, emergency response workers such as firefighters are also greatly impacted by injuries, burns and smoke inhalation, particularly at high concentrations. These injuries can make the emergency response system less effective and slow overall response times.

10.7.3 VULNERABILITY AND IMPACTS TO COMMUNITY ACTIVITIES

Activities that have value to the community could potentially be impacted by wildfire events. When these activities are delayed or cancelled, the economy of the community is affected. While wildfires occur in every month in Maryland, community events most likely to be impacted by wildfire occur would be those that occur in peak wildfire seasons, spring and fall.

- The Historic Stevensville Art Market is a reoccurring event that happens monthly from April - November.
- The Sudlersville Peach Festival is an event for the community held at the beginning of August.
- The Historic Stevensville Classic Car Show is held in September.
- The Queen Anne's County Fair in Centreville, which is held the second week of August.
- The Annual Paint Stevensville event is held at the beginning of June.
- The Juneteenth festival is held in Centreville, MD with live music, vendors, a parade, and more for the community.
- The Family Fun Festival is a free family friendly community event that is also held in June.
- Bluegrass in the Blueberry Patch is a free event open to the public hosting live bluegrass music and blueberry picking that is held towards the end of June.

10.7.4 VULNERABILITY AND IMPACTS TO STRUCTURES

All structures within the immediate area of a fire would be vulnerable, but older wooden structures would be more likely to suffer greater damage or be destroyed.

FEMA defines essential facilities through the Hazus manuals. The definition of essential facilities is consistent across each Hazus module and is as follows.

Essential facilities (EF) are those facilities that provide services to the community and should be functional after an event. Essential facilities include medical care facilities, fire stations, police stations, EOCs, and schools. Damage to essential facilities is determined on a site-specific basis. The purpose of the essential facility modules for each hazard (currently only Earthquake, Flood, and Hurricane) is to determine the expected loss of functionality for these critical facilities. The data required for the analysis

includes mapping of the essential facility occupancy class to a *specific building type, or a combination of essential facility building type and design level.* (Hazus 6.1 Inventory Technical Manual, Section 7.1)

In the 2021 Maryland State Hazard Mitigation Plan, MDEM defers the definition of critical (essential) facilities to FEMA's Hazus. All essential facilities were assessed to determine which, if any, were located in a wildland/urban interface area. Those facilities include medical care facilities, fire stations, police stations, EOCs, and schools on Table 10-3. Fifteen essential facilities (shown in bold) are considered vulnerable to wildfire, as they are located within the Wildland/Urban Interface.

TABLE 10-3: ESSENTIAL FACILITIES WILDFIRE VULNERABILITY

COMMUNITY LIFELINE	FACILITY NAME	ADRESS	TOWN	WILDLAND/URBAN INTERFACE
Safety & Security and Communications	**QAC Department of Emergency Services – EOC & 9-1-1**	**100 Communications Drive**	**Centreville**	**Yes**
Safety & Security	Queen Anne-Hillsboro VFC #8	13512 First Street	Queen Anne	No
Safety & Security	Queenstown VFC #3	7110 Main Street	Queenstown	No
Safety & Security	Church Hill VFC #5	316 Main Street	Church Hill	No
Safety & Security	Sudlersville VFC #6	203 N Church Street	Sudlersville	No
Safety & Security	Goodwill VFC #4	212 Broadway Street	Centreville	No
Safety & Security	EMS Station 100	103 Davidson Road	Stevensville	No
Safety & Security	EMS Station 400	302 Safety Drive	Centreville	No
Safety & Security	EMS Station 300	7110 Main Street	Queenstown	No
Safety & Security	EMS Station 600	203 N Church Street	Sudlersville	No
Safety & Security	EMS Station 500	316 Main Street	Church Hill	No
Safety & Security	**Grasonville VFC #2**	**4128 Main Street**	**Grasonville**	**Yes**
Safety & Security	**Grasonville Vol Ambulance Dept. #20**	**4132 Main Street**	**Grasonville**	**Yes**
Safety & Security	Crumpton VFC #7	300 3rd Street	Millington	No
Safety & Security	United Communities VFC #9	9406 Romancoke Road	Stevensville	No
Safety & Security	Kent Island VFC #1	1610 Main Street	Chester	No
Safety & Security	EMS Station 200	101 Medic Drive	Chester	No
Health and Medical	QAC Department of Health	206 N Commerce Street	Centreville	No
Health and Medical	QAC Department of Health Annex	205 N Liberty Street	Centreville	No
Health and Medical	Shore Emergency Center Queenstown	115 Shoreway Drive	Queenstown	No
Health and Medical	UM Shore Medical Pavilion	125 Shoreway Drive	Queenstown	No
Health and Medical	AAMC Kent Island Pavilion	1630 Main Street	Chester	No
Safety & Security	Queen Anne's County Sheriff's Office	505 Railroad Avenue	Centreville	No
Safety & Security	Maryland State Police - Barracks S	311 Safety Drive	Centreville	No
Safety & Security	Sheriff's Office - Sudlersville Substation	200 S Church Street	Sudlersville	No
Safety & Security	**Centreville Police Department**	**420 N Commerce Street**	**Centreville**	**Yes**
Safety & Security	Sheriff's Office - Kent Narrows Substation	425 Piney Narrows Road	Chester	No
School-Private	**The Gunston School**	**911 Gunston Road**	**Centreville**	**Yes**

TABLE 10-3: ESSENTIAL FACILITIES WILDFIRE VULNERABILITY				
COMMUNITY LIFELINE	**FACILITY NAME**	**ADRESS**	**TOWN**	**WILDLAND/URBAN INTERFACE**
School-Private	**Wye River Upper School**	**316 S Commerce Street**	**Centreville**	**Yes**
School-Private	**Lighthouse Christian Academy**	**931 Love Point Road**	**Stevensville**	**Yes**
School-Private	**Eastern Shore Jr. Academy**	**407 Dudley Corners Road**	**Sudlersville**	**Yes**
School-Private	Shore Up Head Start	5441 Main Street	Grasonville	No
School-Private	Kiddie Academy of Kent Island	113 St. Claire Place	Stevensville	No
School-Public	**Kennard Elementary School**	**420 Little Kidwell Avenue**	**Centreville**	**Yes**
School-Public	Church Hill Elementary School	631 Main Street	Church Hill	No
School-Public	**Anchor Points Academy**	**202 Chesterfield Avenue**	**Centreville**	**Yes**
School-Public	Sudlersville Elementary School	300 S Church Street	Sudlersville	No
School-Public	**Grasonville Elementary School**	**5435 Main Street**	**Grasonville**	**Yes**
School-Public	**Bayside Elementary School**	**301 Church Street**	**Stevensville**	**Yes**
School-Public	Queen Anne's County High School	125 Ruthsburg Road	Centreville	No
School-Public	Sudlersville Middle School	600 Charles Street	Sudlersville	No
School-Public	Centreville Elementary School	213 Homewood Avenue	Centreville	No
School-Public	**Centreville Middle School**	**231 Ruthsburg Road**	**Centreville**	**Yes**
School-Public	Wye Research & Education Center	124 Wye Narrows Drive	Queenstown	No
School-Public	Chesapeake College	1000 College Circle Drive	Queenstown	No
School-Public	Stevensville Middle School	610 Main Street	Stevensville	No
School-Public	**Kent Island Elementary School**	**110 Elementary Way**	**Stevensville**	**Yes**
School-Public	**Kent Island High School**	**900 Love Point Road**	**Stevensville**	**Yes**
School-Public	Matapeake Elementary School	651 Romancoke Road	Stevensville	No
School-Public	Matapeake Middle School & Kent Island 9th Grade Annex	671 Romancoke Road	Stevensville	No

Source: Queen Anne's County Essential Facility Database

10.7.5 VULNERABILITY AND IMPACTS TO HISTORIC STRUCTURES

Buildings are vulnerable to wildfires due to their proximity to vegetation, steep slopes, and dense neighborhoods. Wind-blown embers, direct flame contact, and radiant heat are the primary reasons homes burn during wildfires. To mitigate these risks, creating defensible space, replacing combustible materials, and covering openings with metal screens are essential strategies.

Protecting historic buildings from wildfires poses unique challenges, as it involves replacing existing materials with non-combustible ones while maintaining historic integrity. Historic significance is determined by the original materials, which contribute to the building's visual character and authenticity. Use of substitute materials must adhere to guidelines like those outlined in the NPS Preservation Brief 16, which allows for historically accurate yet fire-resistant replacements.[iv]

Existing historic structure in the Wildland/Urban Interface areas are particularly at-risk to wildfires. Figure 10-1 identifies two municipalities designated as high wildland-urban interface fire threat potential, **Town of Centreville and the Town of Millington**. Therefore, historic structures in and around these two municipalities are at a higher risk to wildfires.

[i] www.nytimes.com/2022/02/23/climate/climate-change-un-wildfire-report.html
[ii] www.unep.org/resources/report/spreading-wildfire-rising-threat-extraordinary-landscape-fires
[iii] 2022 Queen Anne's County Comprehensive Plan, Page 4-5, Table 4-2 Existing Land Use/Land Cover
[iv] https://www.henneberyeddy.com/2024/08/01/wildfire-resilience-for-existing-buildings/

Chapter 11 Thunderstorm (Lightning, Hail & Strong Winds)



Source: Patch - Severe Thunderstorm Watch Issued For 17 MD Counties: NWS

This chapter of the Plan describes an overall thunderstorm profile, risk, and vulnerability for Queen Anne's County and participating municipalities. During this plan update, new or changed plan components are shown in **bold blue** text below.

- 11.1 THUNDERSTORM
  - 11.1.1 Lightning
  - 11.1.2 Hail
  - 11.1.3 Strong Winds
- 11.2 LOCATION & GEOGRPAHIC EXTENT
- 11.3 HISTORY OF PREVIOUS HAZARD EVENTS
- **11.4 PROBABILITY OF FUTURE OCCURENCES**
- **11.5 EFFECTS OF FUTURE CONDITIONS**
- **11.6 CHANGES IN LAND DEVELOPMENT & THUNDERSTORM**
- 11.7 THUNDERSTORM VULNERABILITY
  - **11.7.1 Vulnerability and Impacts to People and the Environment**
  - **11.7.2 Vulnerability and Impacts to Systems**
  - **11.7.3 Vulnerability and Impacts to Community Activities**
  - **11.7.4 Vulnerability and Impacts to Structures**
  - **11.7.5 Vulnerability and Impacts to Historic Structures**

Note: The previous plan included hazard impact tables based on Emergency Management Accreditation Program requirements (EMAP). This information was expanded as part of this plan update within the vulnerability section.

Public Survey Results

- Survey participants indicated they were "somewhat concerned" with thunderstorm.
- 40% of the survey participants indicated they have been personally affected by thunderstorm.
- 51% of the survey participants have installed high impact windows or doors to withstand high winds.

Chapter Updates

- All sections of the chapter were updated with new information, graphics, maps, and tables.
- Thunderstorm hazard history data was updated to include events that have occurred during this planning cycle.
- The vulnerability section in the previous 2019 Plan included impact tables, however the following subsections were added. The new subsections include narratives and were applicable, tables and maps.
  - Vulnerability and Impacts to People and the Environment,
  - Vulnerability and Impacts to Systems,
  - Vulnerability and Impacts to Community Activities,
  - Vulnerability and Impacts to Structures, and
  - Vulnerability and Impacts to Historic Resources.
- Information from emPower was incorporated into the vulnerability section of the chapter.

11.1 Thunderstorm

Severe storms can occur during any season in Queen Anne's County. Thunderstorms, associated with lightning, hail, and strong winds can all be hazardous under the right conditions and locations. Large hail can damage crops, dent vehicles, break windows, and injure or kill livestock, pets, and people. The National Weather Service considers a thunderstorm severe if it produces hail at least 1 inch in diameter and/or winds that equal or exceed 58 miles an hour, and/or a tornado. Strong winds can take down trees, damage structures, tip high profile vehicles, and create high velocity flying debris. Of the estimated 100,000 thunderstorms that occur each year in the United States, about 10 percent are classified as severe. Every thunderstorm needs three basic components: (1) moisture to form clouds and rain (2) unstable air which is warm air that rises rapidly and (3) lift, which is a cold or warm front capable of lifting air to help form thunderstorms.



Source: https://www.nationwidechildrens.org/family-resources-education/700childrens/2019/06/summer-is-peak-time-for-thunderstorms

11.1.1 LIGHTNING

Lightning, although not considered severe by the National Weather Service definition, can accompany heavy rain during thunderstorms. Lightning develops when ice particles in a cloud move around, colliding with other particles. These collisions cause a separation of electrical charges. Positively charged ice particles rise to the top of the cloud and negatively charged ones fall to the middle and lower sections of the cloud. The negative charges at the base of the cloud attract positive charges at the surface of the Earth. Invisible to the human eye, the negatively charged area of the cloud sends a charge called a stepped leader toward the ground. Once it gets close enough, a channel develops between the cloud and the ground. Lightning is the electrical transfer through this channel. The channel rapidly heats to 50,000 degrees Fahrenheit and contains approximately 100 million electrical volts. The rapid expansion of the heated air causes thunder.

11.1.2 HAIL

Hail develops when a super cooled droplets collect a layer of ice and continue to grow, sustained by an updraft. Once a hail stone cannot be held up any longer by the updraft, it falls to the ground. Nationally, hailstorms cause nearly $1 billion in property and crop damage annually, as peak activity coincides with peak agricultural seasons. Severe hailstorms also cause considerable damage to buildings and automobiles, but rarely result in loss of life.



Source: www.businessinsider.com, Kevin Loria, Published on August 24, 2018

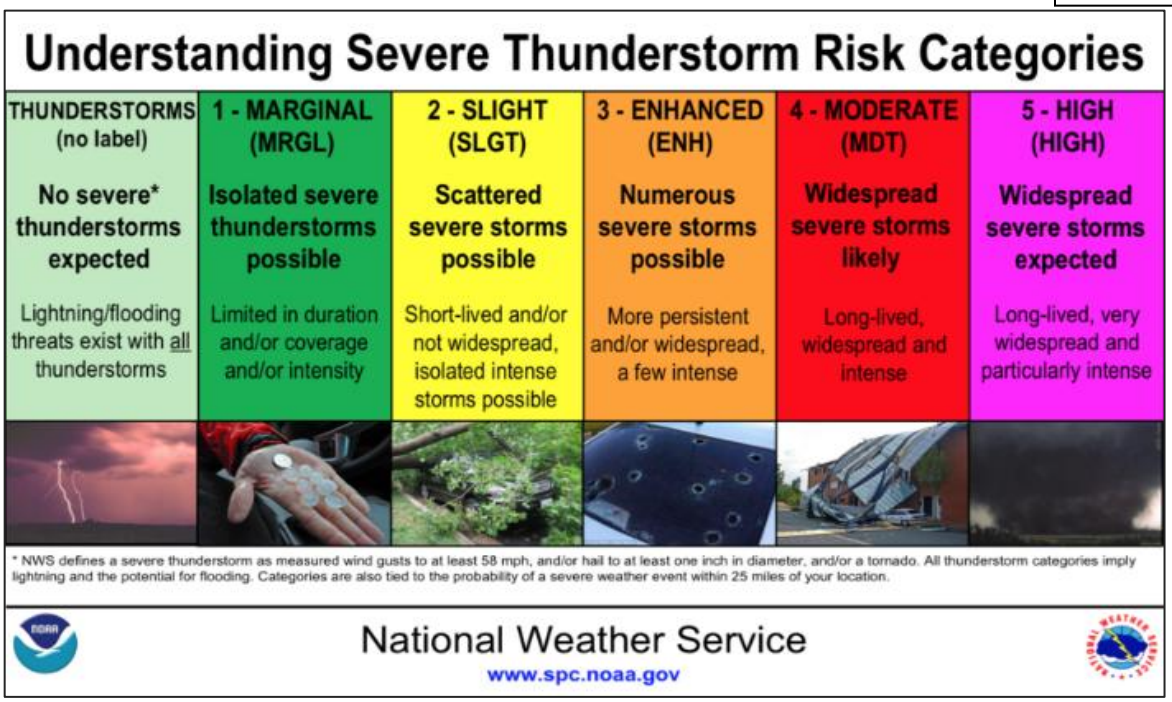
11.1.3 STRONG WINDS

Strong thunderstorm winds can come from a number of different processes. Most thunderstorm winds that cause damage at the ground are a result of outflow generated by a thunderstorm downdraft. Damaging winds are classified as those exceeding 50 knots.

11.2 Location & Geographic Extent

Thunderstorms affect relatively small areas when compared with hurricanes and winter storms. Despite their small size, all thunderstorms are dangerous. A typical thunderstorm is 15 miles in diameter and lasts an average of 30 minutes. The entire County and all participating municipalities are vulnerable to thunderstorm events. The National Weather Service categorizes thunderstorm severity as shown on the graphic below.

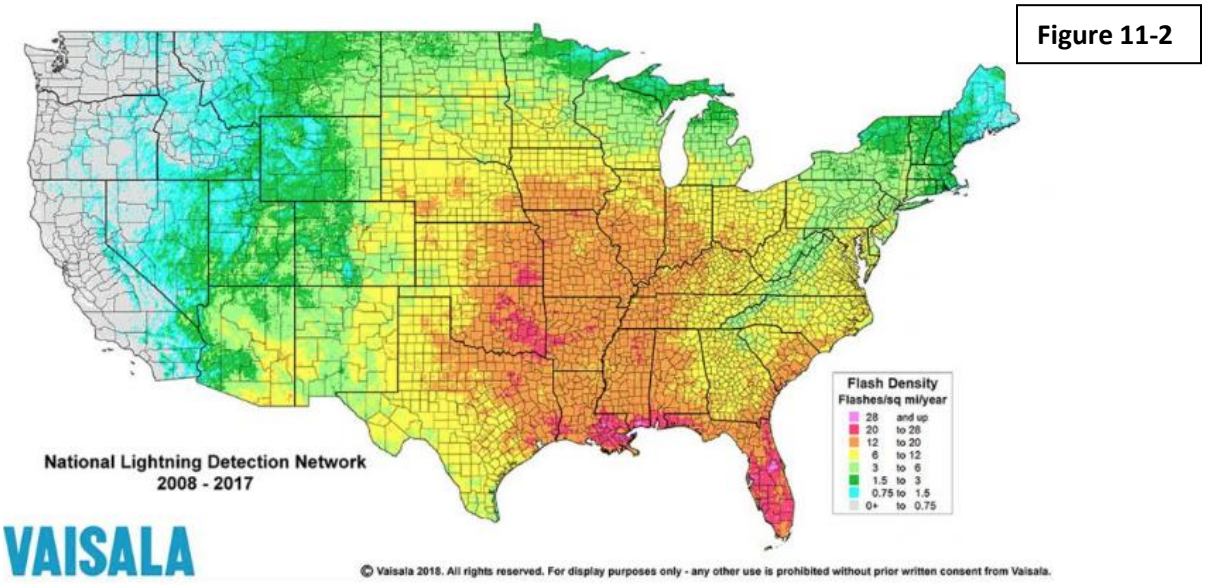
Figure 11-1



Source: NOAA-NWS Storm Prediction Center, www.spc.noaa.gov

The National Lightning Detection Network NLDN monitors all lightning activity across the U.S. Queen Anne's County is shown in yellow in Figure 11-2, indicating 6 to 12 flashes per square miles per year.

Figure 11-2



11.3 History of Previous Hazard Events

According to National Centers for Environmental Information (NCEI) and local data, Queen Anne's County has experienced 136 recorded thunderstorm events, 18 recorded hail events, and 9 recorded lightning events.

TABLE 11-1 THUNDERSTORM 1974-2023				
HAIL – 1984-2023				
# OF EVENTS	**INJURIES**	**DEATHS**	**DAMAGES**	**FREQUENCY**
20	0	0	0	0.51
THUNDERSTORM WIND – 1974-2023				
# OF EVENTS	**INJURIES**	**DEATHS**	**DAMAGES**	**FREQUENCY**
210	1	0	825.00K	4.29
LIGHTNING – 1999-2023				
# OF EVENTS	**INJURIES**	**DEATHS**	**DAMAGES**	**FREQUENCY**
10	0	0	73.51K	0.42

Source: National Centers for Environmental Information (NCEI), Events through December 2023.

The following includes some notable thunderstorm events that have occurred during this past planning cycle.

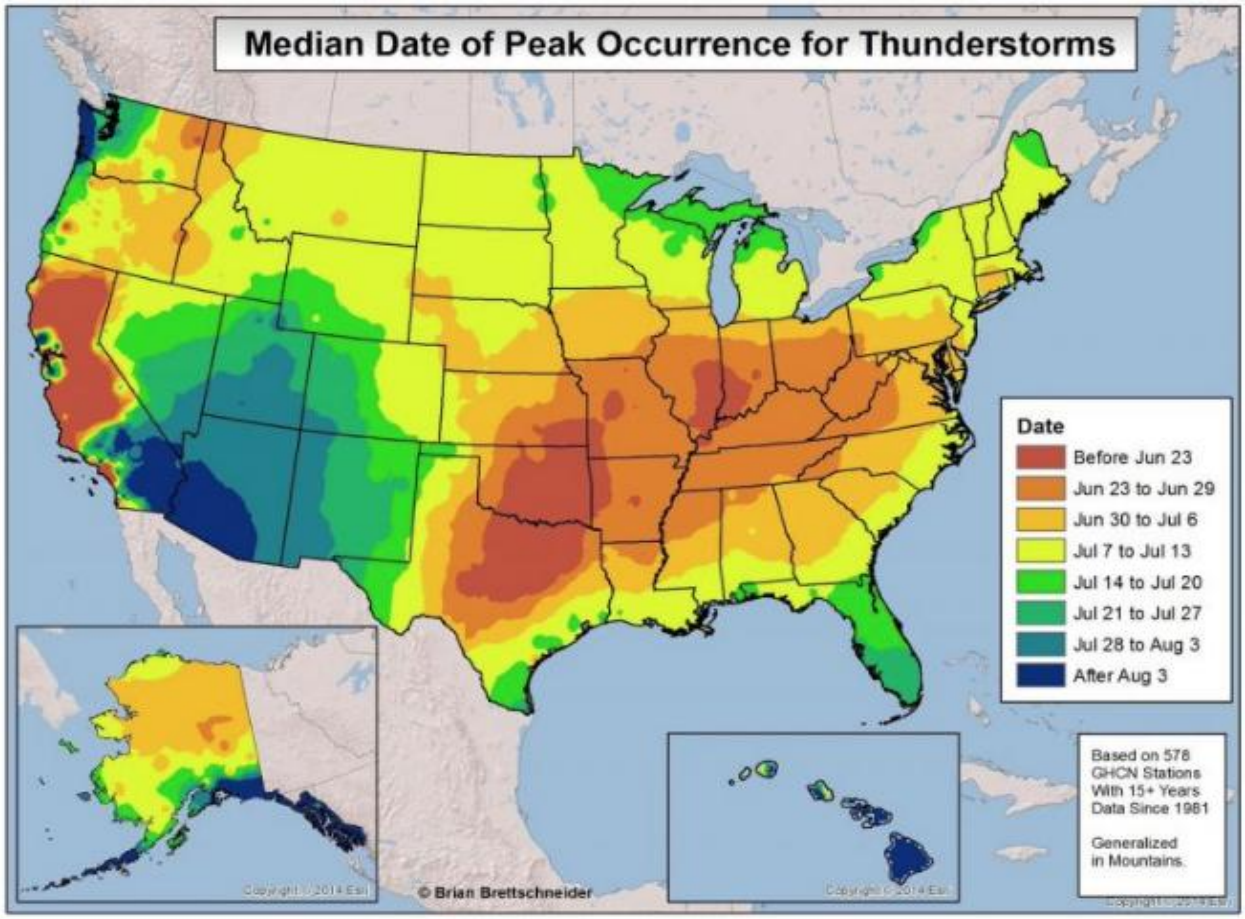
A structure fire occurred in Church Hill on Hallmark Farm Circle, with the suspected cause being a lightning strike that ignited the building during a thunderstorm event on June 4, 2020. Reported property damage estimated at $10K.

A strong cold front approached the mid-Atlantic coast on April 21, 2021. Ahead of the front, modest instability developed in a strongly sheared and strongly forced environment. This led to the development of convection along and ahead of the front as it moved through during the midafternoon hours. Scattered instances of hail and wind damage were reported.

Thunderstorm wind with a magnitude of 60 knots producing damaging gusts occurred on April 26, 2023. A strong cold front moved through, with widespread showers and thunderstorms moving through. Some severe storms produced damaging wind gusts on July 29, 2023.

11.4 Probability of Future Occurrences

Peak times of year for thunderstorm activity vary across the country. Figure 11-3 indicates that June 30 through July 6 is the peak thunderstorm occurrence for Maryland.



Map Courtesy of Dr. Brian Brettschneider/WRCC/Esri

Figure 11-3

11.5 Effects of Future Conditions

According to the Third National Climate Assessment, recent research has yielded insights into connections between global warming and the factors that cause tornados and severe thunderstorms (such as atmospheric instability and increases in wind speed and altitude). Although these relationships are still being explored, a recent study suggests a projected increase in the frequency of conditions favorable for severe thunderstorms.[i]

11.6 Changes in Land Development & Thunderstorms

All future structures and infrastructure built in Queen Anne's County will likely be exposed to thunderstorm events and may experience damage. The geographic extent of thunderstorm events is assumed to be uniform Countywide and in all municipalities; the location of development does not increase or reduce the risk necessarily. By adhering to building codes, Queen Anne's County and its municipalities can ensure that new development is built to current standards. Refer to Chapter 13 Community Capabilities, which includes current planning and regulations for Queen Anne's County and all participating municipalities.

11.7 Thunderstorm Vulnerability

All assets located in Queen Anne's County can be considered at risk from severe storms. This includes all of the County's population and all buildings and infrastructure within the County. Damages primarily occur as a result of high winds, lightning strikes, hail, and flooding. Most structures, including the County's critical facilities should be able to provide adequate protection from hail, but the structures could suffer broken windows and dented exteriors. In addition, damages from lightning strikes, lightning rods on structures and surge protection to incoming power may lessen the impacts. Those facilities with back-up generators are better equipped to handle a severe weather situation should the power go out.

11.7.1 VULNERABILITY AND IMPACTS TO PEOPLE AND THE ENVIRONMENT

Severe thunderstorms including hailstorms do not have particular impacts in any one geographical section of the County. All areas of the County and all municipalities are at-risk of severe thunderstorms.

Lightning may cause power outages and or fires. One of the notable hazard occurrences that occurred during this planning cycle included a lightning strike at a house in Church Hill that resulted in a fire. In addition, downed trees due to high winds and lightning may cause blockages to roadways or downed power lines.

Aging populations and people with disabilities are considered the most at risk during hazardous events because they require more time and are more likely to seek emergency medical attention that might not be as readily available due to isolation and other various circumstances. These populations are sometimes electricity dependent, which means they may use durable medical and assistive equipment (DME) and devices, and certain essential health care services to live independently in their homes. Local incidents, such as prolonged power outages, can rapidly thrust these individuals into life-threatening situations within hours or days. Stress and anxiety caused by thunderstorms and associated power outages can have psychological effects on individuals, particularly those that are electricity dependent.

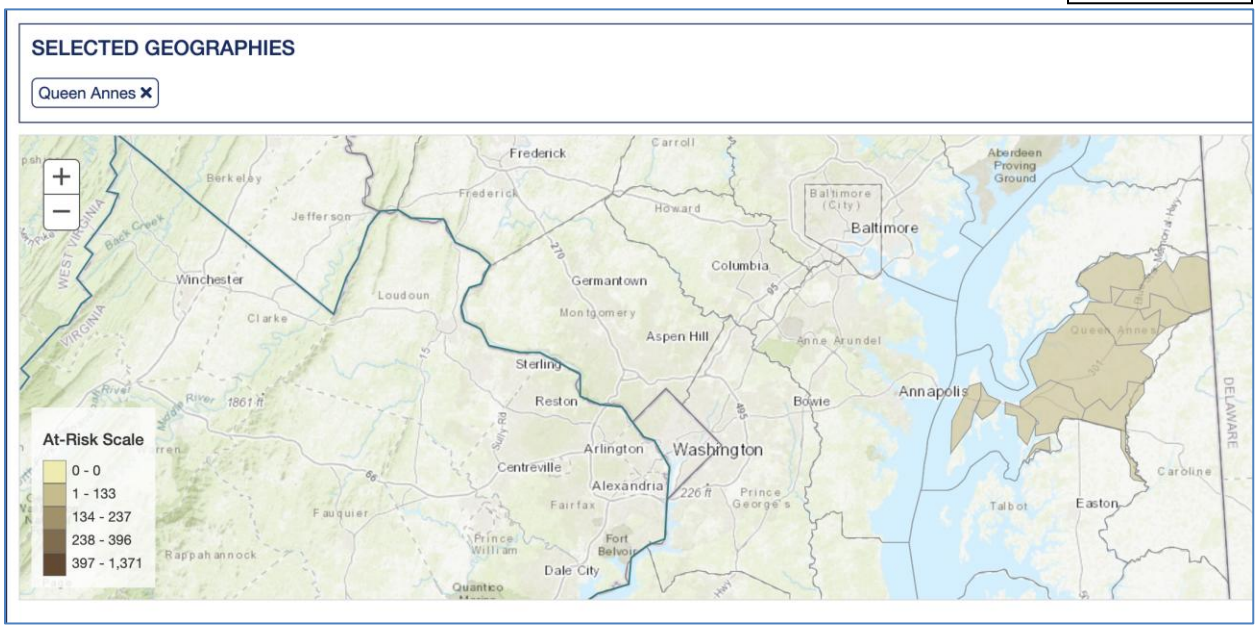
Plan Update Note

To satisfy FEMA Requirement 44 CFR § 201.6(c)(2)(ii), this section, Social Equity & Vulnerability has been included in the plan update as a new element.

Over 3 million Medicare beneficiaries rely on electricity dependent DME and devices to live independently in their homes, and some of those individuals also have health care service dependencies. The HHS emPOWER Map is updated monthly and displays the total number of Medicare

beneficiaries who have had an administrative claim for one or more types of electricity-dependent DME and devices, as well as at-risk combinations data for those who rely on a certain essential health care service(s) and any electricity-dependent DME and devices. Data in Figure 11-4 was collected in September 2024, and the associated data table by zip code, indicates that there are 10,137 at-risk beneficiaries for all zip codes, and a total of 359 at-risk beneficiaries for all zip codes.

Figure 11-4



Source: https://empowerprogram.hhs.gov/empowermap

Figure 11-5

Geographic Area	Beneficiaries	At-Risk Beneficiaries
21607	102	11
21617	2,479	107
21619	2,187	52
21623	418	11
21628	136	11
21638	1,180	33
21644	24	11
21657	281	11
21658	1,041	24
21666	2,980	76
21668	379	12

Source: https://empowerprogram.hhs.gov/empowermap

Participating municipalities within **Zip Codes** identified on Figure 11-5: 21607 Barclay, 21617 Centreville, 21623 Church Hill, 21651 Millington, 21658 Queenstown, 21668 Sudlersville

11.7.2 VULNERABILITY AND IMPACTS TO SYSTEMS

Power outages impact the availability of emergency and government services. Communication systems break down due to loss of power. Transportation systems may be disrupted due to thunderstorms. High winds caused by severe storms create the potential for hazardous debris and the uprooting of trees which cause harm to the environment, property, and may block roadways preventing emergency responders from reaching their destinations in time for rescue. Communication disruptions, road blockages, and power outages can slow down response times and coordination efforts. All systems located in Queen Anne's County can be considered at risk from thunderstorms. Facilities identified and categorized under communications and energy community lifelines are included in Chapter 2, Table 2-8 Critical Facilities & Community Lifeline Matrix.

11.7.3 VULNERABILITY AND IMPACTS TO COMMUNITY ACTIVITIES

Activities that have value to the community could potentially be impacted by thunderstorm and lightning events. When these activities are delayed or cancelled the economy of the community is affected. Below are examples of community activities that may be affected by thunderstorm events.

- The Historic Stevensville Art Market is a reoccurring event that happens monthly from April - November.
- The Sudlersville Peach Festival is an event for the community held at the beginning of August.
- The Historic Stevensville Classic Car Show is held in September.
- The Queen Anne's County Fair in Centreville, MD held the second week in August.
- The Bay Bridge Run held in November.
- The Annual Paint Stevensville event is held at the beginning of June.
- The Juneteenth festival is held in Centreville, MD with live music, vendors, a parade, and more for the community.
- Historic Stevensville Distance Festival in September.
- The Family Fun Festival is a free family friendly community event that is also held in June.
- Bluegrass in the Blueberry Patch is a free event open to the public hosting live bluegrass music and blueberry picking that is held towards the end of June.

11.7.4 VULNERABILITY AND IMPACTS TO STRUCTURES

Some critical facilities have communication antenna that are highly susceptible to high wind events and lightning strikes from severe thunderstorms. Lightning damage can be extensive and costly, especially to radio and antenna systems. Damage to communications systems may lead to disruption of emergency communications.

TABLE 11-2 CRITICAL FACILITIES & THUNDERSTORM & LIGHTNING

FACILITY TYPE	FACILITY NAME	ADRESS	TOWN	ANTENNA ON/AT FACILITY
Fire	Queen Anne-Hillsboro VFC #8	13512 First Street	Queen Anne	✓
Fire	Church Hill VFC #5	316 Main Street	Church Hill	✓
Fire	Sudlersville VFC #6	203 N Church Street	Sudlersville	✓

Fire	Goodwill VFC #4	212 Broadway Street t	Centreville	✓
Fire	EMS Station 600	203 N Church Street	Sudlersville	✓
Fire	EMS Station 500	316 Main Street	Church Hill	✓
Fire	Grasonville VFC #2	4128 Main Street	Grasonville	✓
Fire	Grasonville Vol Ambulance Dept. #20	4132 Main Street	Grasonville	✓
Fire	Crumpton VFC #7	300 3rd Street	Millington	✓
Fire	United Communities VFC #9	9406 Romancoke Road	Stevensville	✓
Fire	Kent Island VFC #1	1610 Main Street	Chester	✓
Police	Maryland State Police - Barracks S	311 Safety Drive	Centreville	✓
Police	Sheriff's Office - Sudlersville Substation	200 S Church Street	Sudlersville	✓

Source: Queen Anne's County Critical & Essential Facility Database

11.7.5 VULNERABILITY AND IMPACTS TO HISTORIC STRUCTURES

High winds, hail, and lightning can cause significant damage to historic buildings. The materials used in historic buildings are often more vulnerable to weather-related damage. Lightning strikes can cause fires, this is particularly devastating for historic wooden structures. While the majority of historic structures listed on the Maryland's National Register Properties in Queen Anne's County were constructed of brick, there are several wood frame properties. These properties include Christ Church, Cray House, St. Andrew's Episcopal Church, Starr Church, and Wye Mill.

Christ Church

Inventory No.: **QA-212**
Date Listed: **7/24/1979**
Location: **121 E. Main Street (MD 835), Stevensville, Queen Annes County**
Category: **Frame Building**
Period/Date of Construction: **1880**



Cray House

Inventory No.: **QA-259**
Date Listed: **5/9/1983**
Location: **109 Cockey Lane, Stevensville, Queen Annes County**
Category: **Building**
Period/Date of Construction: **Early 19th century**



St. Andrew's Episcopal Chapel

Inventory No.: **QA-179**
Other Name(s): **St. Andrew's Episcopal Church**
Date Listed: **9/7/1984**
Location: **104 Maple Avenue, Sudlersville, Queen Annes County**
Category: **Building**
Period/Date of Construction: **1878**
Architect/Builder: **Builder: Abraham J. Gadd**



Starr Church
Inventory No.: **QA-367**
Other Name(s): **Starr United Methodist Church, Richard Asbury M.E. Church, Old Starr Methodist Church**
Date Listed: **3/1/2024**
Location: **1504 Starr Road (MD 309), Centreville, Queen Annes County**
Category: **Building**
Period/Date of Construction: **1860-1929**
Boundary Description: **The boundaries are described among the Land Records of Queen Anne's County in Liber SM00567, folio 00771.**



Wye Mill
Inventory No.: **QA-462, T-51**
Other Name(s): **Old Wye Mill, Wye Grist Mill**
Date Listed: **4/9/1985**
Location: **Centreville Road (MD 213) & Wye Mills Road (MD 662), Centreville Road (MD 213) & Wye Mills Road (MD 662), Wye Mills, Queen Annes County, Talbot County**
Category: **Building**
Period/Date of Construction: **mid-18th century**



[i] Diffenbaugh, N. S., M. Scherer, and R. J. Trapp, 2013: Robust increases in severe thunderstorm environments in response to greenhouse forcing. Proceedings of the National Academy of Sciences, 110, 16361-16366, doi:10.1073/pnas.1307758110.

Chapter 12 Earthquake



Source: WBAL-TV 11 Baltimore – Do you remember where you were? Earthquake August 23, 2011

This chapter of the Plan describes an overall earthquake profile, risk, and vulnerability for Queen Anne's County and participating municipalities. During this plan update, new or changed plan components are shown in bold text below.

- 12.1 EARTHQUAKE
- 12.2 LOCATION AND GEOGRAPHIC EXTENT
- 12.3 HISTORY OF PREVIOUS HAZARD EVENTS
- **12.4 PROBABILITY OF FUTURE OCCURRENCES**
- **12.5 EFFECTS OF FUTURE CONDITIONS**
- **12.6 CHANGES IN LAND DEVELOPMENT & EARTHQUAKE**
- 12.7 EARTHQUAKE VULNERABILITY
  - **12.7.1 Vulnerability and Impacts to People and the Environment**
  - **12.7.2 Vulnerability and Impacts to Systems**
  - **12.7.3 Vulnerability and Impacts to Community Activities**
  - **12.7.4 Vulnerability and Impacts to Structures**
  - **12.7.5 Vulnerability and Impacts to Historic Structures**

Note: The previous plan included hazard impact tables based on Emergency Management Accreditation Program requirements (EMAP). This information was expanded as part of this plan update within the vulnerability section.

Public Survey Results

- Survey participants indicated they were "not concerned" with earthquake.
- 15% of the survey participants indicated they have been personally affected by earthquake.
- 70% of the survey participants have reduced earthquake risk to their home/business by purchasing homeowner/renter's insurance policies.

Chapter Updates

- All sections of the chapter were updated with new information, graphics, maps, and tables.
- The earthquake vulnerability section in the previous 2019 Plan included impact tables, however the following subsections were added. The new subsections include narratives and were applicable, tables and maps.
  - Vulnerability and Impacts to People and the Environment,
  - Vulnerability and Impacts to Systems,
  - Vulnerability and Impacts to Community Activities,
  - Vulnerability and Impacts to Structures, and
  - Vulnerability and Impacts to Historic Resources.
- Social Equity and Vulnerability to the earthquake hazard was integrated.
- USGS information was integrated throughout the chapter.

12.1 Earthquake

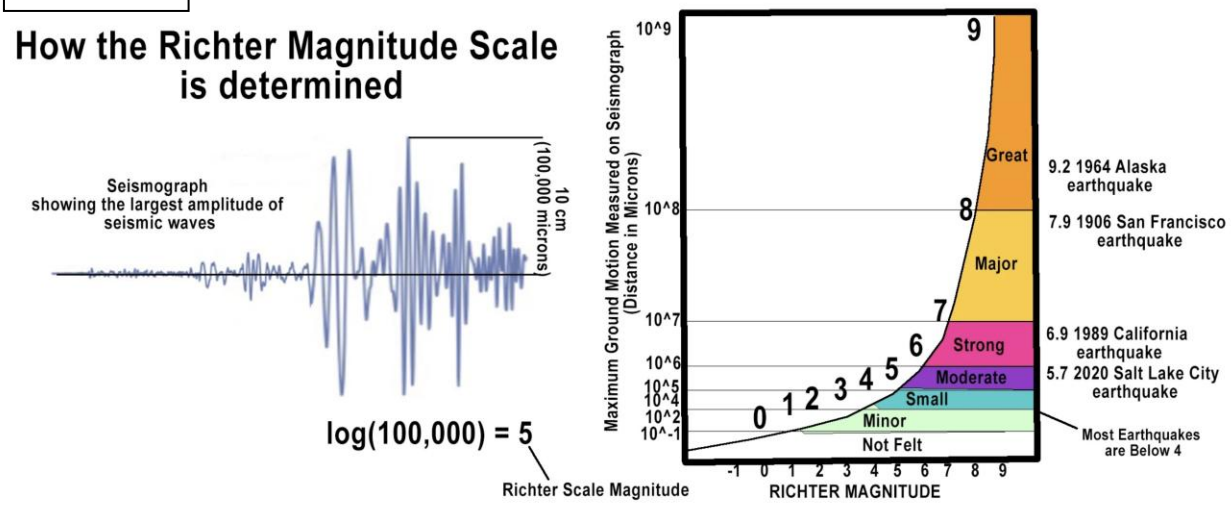
An earthquake is the motion or trembling of the ground produced by sudden displacement of rock usually within the upper 10-20 miles of the Earth's crust. Earthquakes result from crustal strain, volcanism, landslides, or the collapse of underground caverns. Earthquakes can affect hundreds of thousands of square miles, cause damage to property measured in the tens of billions of dollars, result in loss of life and injury to hundreds of thousands of persons and disrupt the social and economic functioning of the affected area.

Earthquake events can, and occasionally do, occur in Maryland, though of much less intensity than those that occur elsewhere in the region or on the west coast. Small magnitude and minimal economic damage of previous earthquake events have not warranted the need for considerable structural retrofits or similar mitigation programs in Maryland.

12.2 Location and Geographic Extent

Everyone is potentially at-risk to earthquake events from ground shaking. Regardless of the source of the earthquake, the associated energy travels in waves radiating outward from the point of release. When these waves travel along the surface, the ground shakes and rolls, fractures form, and water waves may be generated. Earthquakes generally last a matter of seconds, but the waves may travel for long distances and cause damage well after the initial shaking at the point of origin has subsided.

Figure 12-1



Source: https://www.geologyin.com/2015/01/using-richter-scale-to-measure.html

Richter Scale Magnitude Classification

The Richter scale is divided into the following magnitude categories:

- **Micro (less than 2.0):** Generally not felt but can be detected by seismographs.
- **Minor (2.0 to 2.9):** Often felt, but rarely causes damage.
- **Slight (3.0 to 3.9):** Noticeable shaking of indoor objects and rattling noises. Minor damage is possible.
- **Light (4.0 to 4.9):** Moderate shaking and rattling. Minor to moderate damage is possible.
- **Moderate (5.0 to 5.9):** Strong shaking and ground rolling. Moderate to severe damage is

possible.

- **Strong (6.0 to 6.9):** Severe shaking and ground rupture. Major damage is likely.
- **Major (7.0 to 7.9):** Very strong shaking and ground rupture. Widespread major damage is likely.
- **Great (8.0 or greater):** Devastating shaking and ground rupture. Catastrophic damage is likely.

Breaks in the crust associated with seismic activity are known as "faults" and are classified as either active or inactive. Faults may be expressed on the surface by sharp cliffs or scarps or may be buried below surface deposits.

"Foreshocks," minor releases of pressure or slippage, may occur months or minutes before the actual onset of the earthquake. "Aftershocks," which range from minor to major, may occur for months after the main earthquake. In some cases, strong aftershocks may cause significant additional damage, especially if the initial earthquake impacted emergency management and response functions or weakened structures.

Earthquake magnitude is often measured using the Richter Scale, which is a numerical scale for expressing the magnitude of an earthquake based on seismograph oscillations. The more destructive earthquakes typically have magnitudes between about 5.5 and 8.9; the scale is logarithmic and a difference of one represents an approximate thirtyfold difference in magnitude.

12.3 History of Previous Hazard Events

No earthquake epicenters have been recorded in Queen Anne's County since 1960. Figure 12-2 includes all earthquake epicenters recorded from 1974-2021 including zero magnitude earthquakes as they are still relevant. In the 48 years of data plotted on Figure 12-2 there were 17,612 earthquakes (about 367 events per year).

As shown, small red circles, indicate less magnitude earthquakes are near Maryland, however the region is not considered a higher hazard area. While earthquakes have affected Queen Anne's County, the impacts have been minimal. Data collected from 1758-2017 has been compiled and presented in Table 12-1.

Additionally, more recent events not listed in Table 12-1 took place on January 2, 2024 - a 2.3 magnitude earthquake hit west of Rockville, MD at 12:51 AM. The hypocenter was between 10 and 15 kilometers deep. While a second event occurred on June 5, 2024 - a 1.8 magnitude quake struck. Its epicenter was located in Spencerville, Montgomery County, and the shaking could be felt as far away as Calvert County and even into Delaware.

Plan Update Note

Seismic activity is unusual in Maryland, but several minor quakes have hit Maryland in the last decade.



Figure 12-2: Earthquakes in the Eastern United States

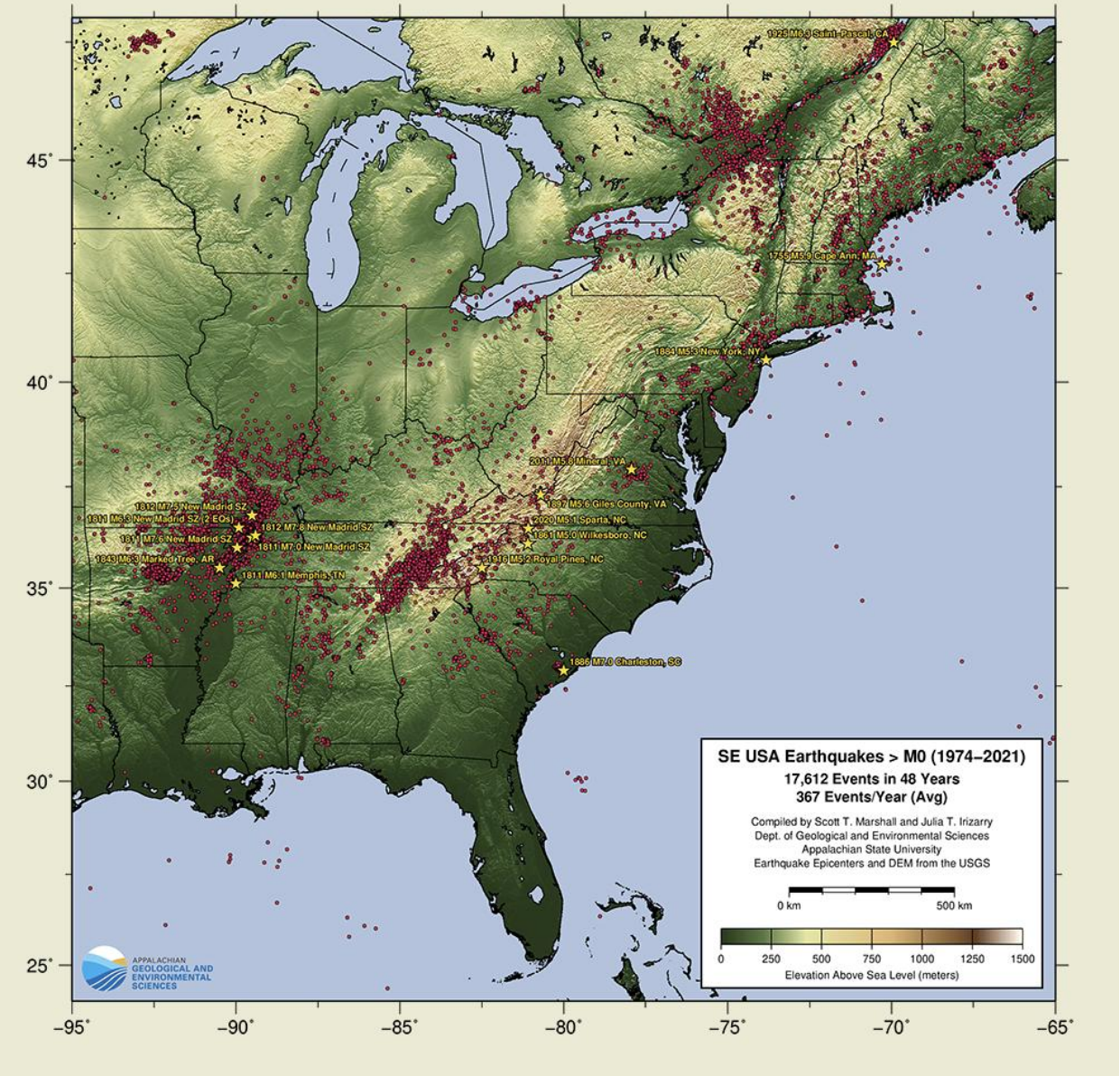


TABLE 12-1: EARTHQUAKE CHRONOLOGY OF MARYLAND - 1758-2017

NO.	DATE (UTC) [1] YEAR MO. DAY	TIME (UTC) 1 (HH:MM:SS)	EPICENTER [2]		GENERAL LOCATION	DEPTH (KM)	INTENSITY [3]	MAGNITUDE [4]
			N LAT (DEG.)	W LON (DEG.)				
1	1758 04 25	02:30	38.90	-76.50	Annapolis	...	V	(3.5, 3.7)
2	1828 02 24	...	38.90	-76.70	Bowie	...	...	...
3	1876 01 30	02:05	38.90	-76.50	Annapolis	...	...	...
4	1876 04 10	...	38.50	-76.60	Prince Frederick	...	III	(2.7)
5	1877 09 01	16:00	38.70	-76.80	Brandywine	...	III	(2.7)
6[5]	1815 01 04	08:005	39.57	-77.00	Westminster	...	IV-V	(3.1)
7	1883 03 11	23:57	39.50	-76.40	Fallston	...	IV	(3.1, 3.3)
8	1883 03 12	05:00	39.50	-76.40	Fallston	...	III	(2.7, 2.9)
9	1902 03 10	05:00	39.60	-77.20	Union Bridge	...	III	(2.7)
10	1902 03 11	10:30	39.60	-77.20	Union Bridge	...	III	(2.7)
11	1903 01 01	17:30	39.60	-77.20	Union Bridge	...	III	(2.7)
12	1903 01 01	22:45	39.60	-77.20	Union Bridge	...	II	(2.4)
13	1906 10 13	15:00	39.20	-76.70	Catonsville	...	III	(2.7)
14	1910 01 24	02:20	39.60	-77.00	Westminster	...	II	(2.4)
15	1910 04 24	02:	39.20	-76.70	Catonsville	...	III	(2.7)
16	1928 10 15	...	38.30	-75.10	Ocean City	...	IV	(2.7, 3.3)
17	1930 11 01	06:34	39.10	-76.50	Round Bay - Severna Park	...	IV	(3.1, 3.3)
18	1930 11 01	07:02	39.10	-76.50	Round Bay - Severna Park	...	III	(2.7)
19	1939 06 22	23:10	39.50	-76.60	Phoenix	...	III	(2.7)
20	1939 11 18	02:33	39.50	-76.60	Phoenix	...	IV	(3.1)
21	1939 11 26	05:20	39.50	-76.60	Phoenix	...	V	(3.5, 3.7)
22	1962 09 07	14:00	39.70	-78.20	Hancock	38	IV	(3.3)
23	1978 04 26	19:30	39.7	-78.24	Hancock	15	...	3.10
24	1986 05 23	17:48	38.69	-77.04	Accoceek - Piscataway	0.20	...	2.5
25	1990 01 13	20:48	39.36	-76.80	Randallstown (V), Eldersburg (IV), Ellicott City (IV), Granite (IV), Owings Mills (III)	3-5	V	2.6 2.5

NO.	DATE (UTC) [1] YEAR MO. DAY	TIME (UTC) 1 (HH:MM:SS)	EPICENTER [2]		GENERAL LOCATION	DEPTH (KM)	INTENSITY [3]	MAGNITUDE [4]
			N LAT (DEG.)	N LAT (DEG.)				
26	1990 04 04	16:15	39.35	-76.78	Granite - Randallstown - Baltimore	7.0 10.0	II	1.7
27	1991 09 28	11:28	39.36	-76.83	Granite - Randallstown	5.0	III	2.4
28	1993 03 10	14:32	39.2	-76.8	Columbia (IV) - Ellicott City (II) - Fulton (II)	5.0	II-IV	2.5
29	1993 03 12	00:54:00	39.19	-76.87	Columbia	5.0	II-III	2.0
30	1993 03 15	04:30	39.19	-76.87	Columbia - Laurel	0.9	III-V	2.7
31	1993 03 16	07:59:00	39.19	-76.87	Columbia	5.0	II-III	1.8
32	1993 03 16	16:59	39.19	-76.87	Columbia	5.0	II-III	1.8
33	1993 03 17	11:54	39.19	-76.87	Columbia	0.5	I-II	=/< 1.0
34	1993 03 19	05:50	39.19	-76.87	Columbia	0.5	I-II	1.0
35	1993 03 19	19:26	39.19	-76.87	Columbia	0.5	I	<1.0
36	1993 03 21	10:55	39.47	-76.30	Aberdeen - Bel Air	...	I-II	1.5
37	1993 03 22	10:26	39.19	-76.86	Columbia	0.5	not felt	about 0.0
38	1993 03 26	14:03	39.28	-76.82	Ellicott City near jct. US40 & 29	...	I-II	<1.5 (est.)
39	1993 04 04	17:32	39.19	-76.87	Columbia	0.5	I-III	1.5
40	1993 04 04	17:33	39.19	-76.87	Columbia	0.5	I-II	1.5
41	1993 04 08	09:10	39.19	-76.87	Columbia	0.5	I-II	1-1.5
42	1993 07 09	06:31	39.19	-76.87	Columbia	0.5 (est.)	II-III	1.9
43	1993 07 12	21:24	39.19	-76.87	Columbia	0.5 (est.)	III-IV	2.1
44	1993 10 28	06:00	39.25	-76.77	Ilchester - Ellicott City	...	IV	2.1
45	1993 10 28	06:01	39.25	-76.77	Ilchester - Ellicott City	...	IV	1.8
46*	1993 11 17	16:35	39.19	-76.87	Columbia	0.5 (est.)	III	1.7 (est.)
47*	1993 11 27	15:26	39.19	-76.87	Columbia	...	I-II	<1.5 (est.)
48*	1993 11 27	18:43	39.19	-76.87	Columbia	...	I-II	about 1.5 (est.)
49	1994 10 28	02:04	39.1	-76.60	Glen Burnie - Pasadena -Gambrills -Millersville	...	IV	2.7
50	1996 08 02	07:19	39.57	-76.08	Perryville	...	II-III	2.2
51	1996 10 17	11:43	39.7	-76.07	Rising Sun (epicenter may be in Pennsylvania)	5.4	IV	2.2, 2.3

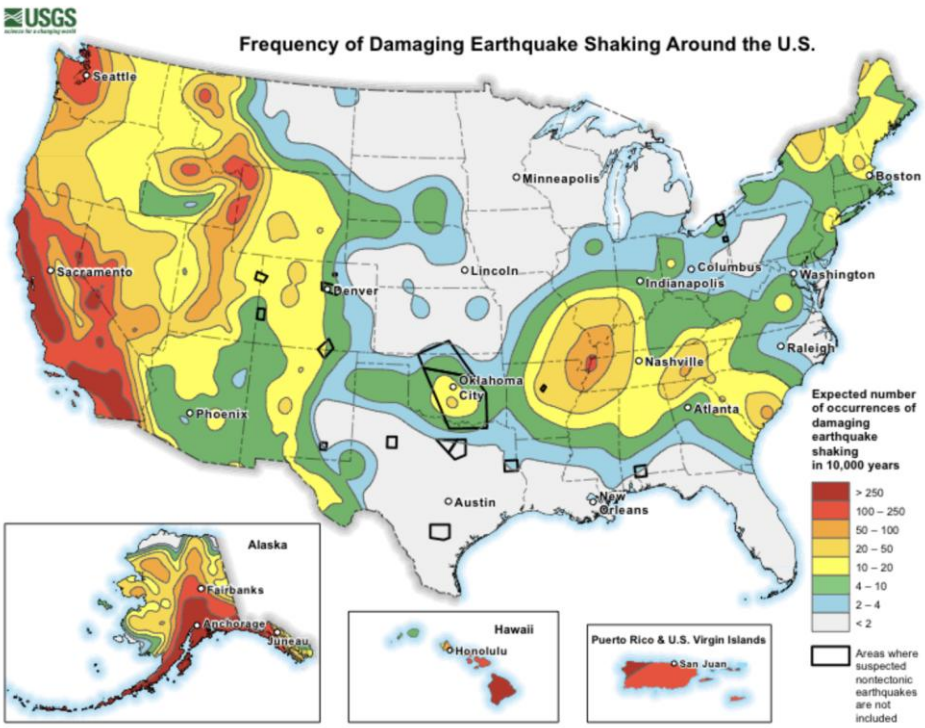
NO.	DATE (UTC) [1] YEAR MO. DAY	TIME (UTC) 1 (HH:MM:SS)	EPICENTER [2]		GENERAL LOCATION	DEPTH (KM)	INTENSITY [3]	MAGNITUDE [4]
			N LAT (DEG.)	N LAT (DEG.)				
52-54	1996 12 06	3 very small events in 35 min.	39.19	-76.87	Columbia	...	II	<1.5 (est.)
55-57	1996 12 14	3 very small events in 75 min.	39.19	-76.87	Columbia	...	II	<1.5 (est.)
586	1996 12 16	15:10	39.25	-76.77	Ilchester - Ellicott City	...	I	about 1 (est.)
59	1996 12 22	05:56	39.19	-76.87	Columbia	5	III	2.0, 2.3
60	2001 12 18	...	39.19	-76.84	Columbia nr US29-Md32	...	II	1.5-2.0 (est.)
61	2002 03 22	...	39.19	-76.84	Columbia nr US29-Md32	...	I	1-2 (est.)
62	2003 12 09	20:59:14	37.599	-77.900	28 miles west of Richmond in rural Powhatan County, VA	4.8	VI	4.5
63	2005 02 23	14:22:43	39.26	-76.58	SE Baltimore near Fort McHenry, Dundalk, Glen Burnie, Pasadena, Gambrills	...	VI	2.0-2.1
64	2008 12 27	05:04:34	40.114	-76.403	9 km (6 miles) W of Lancaster, PA.	4	IV	3.4
65	2009 07 01	13:44:43	39.64	-75.48	Southwestern New Jersey	5	III	2.8
66	2009 09 29	13:58:51	39.607	-76.342	7 km (4 miles) NNE (15°) from Bel Air North, MD	5	II	1.6
67	2010 07 16	09:04:47	39.17	-77.25	Potomac-Shenandoah Region, MD	5	V	3.4
68	2011 08 23	17:51:04	37.936	-77.933	8 km (5 miles) SSW (195°) from Mineral, VA	6	V-VI	5.8
69	2017 10 30	00:34:31	39.279	-77.051	Glenelg, Maryland	2	I	1.52
70	2017 11 11	15:55:44	39.261	-77.039	0.8 km (0.5 mi) ESE of Roxbury, Maryland	4	I	1.5

Source: (Data for 1758-1979 compiled primarily by the U.S. Geological Survey (USGS);1990-1993 data from Delaware Geological Survey (DGS), Lamont-Doherty Earth Observatory (LDEO), and USGS; 1996 to 2002 data from DGS, LDEO, Virginia Polytechnic Institute (VPI)., and Maryland Geological Survey.
NOTES:
** Probable, but not confirmed by seismographs in the region. Magnitude estimated from other events in the series.*
Time (UTC): Coordinated Universal Time. For the Eastern time zone, subtract 5 hours from UTC time for Eastern Standard Time, 4 hours for Eastern Daylight-Saving Time. For example: 1200 UTC (noon) = 0800, or 8:00 am EDT = 0700, or 7 am EST. Note that 00:00-04:59 UTC converts to 1800-23:59 of the previous day.

Epicenter, as calculated from seismograph stations =data and/or estimated by the Maryland Geological Survey on the basis of felt reports; 1962 marked the first instrumentally determined epicenter.
Except for event #6 in 1881 (see note 5 below), pre-instrumental (pre-1962) intensity estimates are earthquake catalogs published by various seismograph networks.
Except for event #6 in 1881 (see note 5 below) pre-instrumental magnitude estimates (shown in parentheses) by L. Seeber and J. Armbruster (Lamont Doherty Earth Observatory of Columbia University) and/or M. Chapman (Virginia Tech Seismological Observatory); magnitude estimates for a large number of pre-instrumental earthquakes in the region were derived using the region-specific relationships between felt area, maximum intensity and mb (Lg) magnitude developed by Sibol et al. (1987). Subsequent magnitudes are from instrumental measurements.
Event #6 has not been listed in any previously published earthquake list. A rather detailed account of this event appeared in the January 8, 1881 edition of the American Sentinel newspaper. Estimates of the epicenter and intensity have been made on the basis of the newspaper descriptions; magnitude estimates based on Sibol et al. (1987).
The Delaware Geological Survey states that this event may have been a sonic boom instead of an earthquake (S. Baxter, oral communications., Aug. 16, 2001).

12.4 Probability of Future Occurrences

Ground shaking is the most powerful predictor of damage from an earthquake. The **U.S. Geological Survey (USGS)** National Seismic Hazard Map shows the strength of ground shaking that has a 1 in 50 chance of being exceeded in a particular place in the lower 48 states over a period of 50 years. These maps are used in determining building seismic codes, insurance rates, and other public decisions. This map shows how many times earthquakes could cause damaging ground shaking in 10,000 years. But that does not mean the earthquakes are guaranteed to be far in the future. They could happen at any time, including today. Scientists look at earthquakes over a long time period to get a fuller picture of earthquake hazard. No one can predict earthquakes. USGS ShakeMaps show ground shaking in a single earthquake.[i]



The expected number of occurrences of **damaging earthquakes** in the area of Queen Anne's County shown on Figure 12-3, which indicates 2-4 in 10,000 years, or a very low probability of future occurrences.

Figure 12-3

12.5 Effects of Future Conditions

Many educational institutions conclude that earthquakes are not influenced by climate change, but that these shifting tectonic plates can have an impact on the climate over long periods of time. In short, while an earthquake may not do anything to the surrounding climate now – it could in the **future.**[ii]

In addition to this, stronger earthquakes have been linked to sizable changes in atmospheric pressure – which are often caused by hurricanes. These are known to result in "slow earthquakes", or "baby earthquakes" that do not feel as intense as a traditional earthquake does. However, it is important to note that changes in atmospheric pressure do not have a significant impact on the variation of earthquakes.

Climate change can also impact earthquakes as droughts can further deteriorate existing fault lines and pumping groundwater (often a precautionary measure taken during droughts) can put further pressure on the earth's crust.

Ultimately, climate change does not have an enormous impact on the severity or frequency of earthquakes – but there are a few correlating factors.[iii]

12.6 Changes in Land Development & Earthquakes

Most earthquake-related property damage, injuries, and fatalities are caused by the failure and collapse of structures due to ground shaking. The level of damage depends upon the amplitude and duration of the shaking —both of which are directly related to the earthquake size, its location and distance from the fault, and regional geology. Depicted below is a risk map showing the 2023 50-State update of the U.S. National Seismic Hazard Model (NSHM). This defines the potential for earthquake ground shaking for various probability levels across the U.S. Maryland is listed within the "low level of shaking" or green category. Due to the low risk of earthquake and minimal to low potential for shaking due to seismic activity, the need for seismic anchorage and bracing of non-structural components is not necessary. In consideration of this information, changes in development in Queen Anne's County and all its municipalities is not expected to affect earthquake risk or vulnerability.

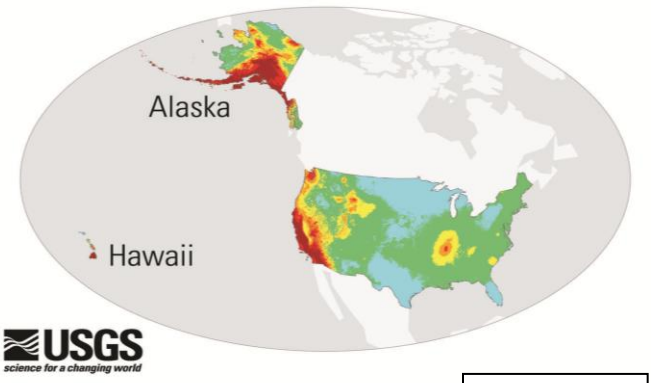


Figure 12-4

Source: https://www.usgs.gov/media/images/a-risk-map-50-state-nshm-2023-update-showing-greater-mmi6-chance-damaging-shaking

12.7 Earthquake Vulnerability

To describe the impacts of earthquakes within Queen Anne's County and its municipalities, hazard vulnerability and impacts have been assessed and documented specific to people, systems, community activities, structures, and historic resources.

12.7.1 VULNERABILITY AND IMPACTS TO PEOPLE AND THE ENVIRONMENT

Earthquake vulnerability and impacts to people include, but are not limited to:

- Property damage caused by destruction of property. Residents may be displaced or require temporary and long-term housing/sheltering.
- Building collapses caused by earthquakes can lead to serious injury or death.
- Earthquakes can cause fires or lead to coastal flooding.
- Environmental impacts include but are not limited to the potential for polluted air and water, the release of toxic dust into the air following the collapse of buildings (particularly older structures), broken water pipes, ruptured gas pipes, broken electrical lines, and hazardous material spills.

Note: While the impacts to people listed above are specific to earthquake vulnerability, due to the very low probability of damaging earthquakes in Maryland, the likelihood of these impacts being realized by Queen Anne's County and its municipalities are very low.

Socially vulnerable groups tend to have more exposure to hazards, therefore are disproportionately impacted. As discussed previously, Queen Anne's County does not have any census tracts with high vulnerability. However, the census tract containing the **Towns of Church Hill, Sudlersville and Barclay** are within the moderate (blue-green) social vulnerability, and the **Towns of Millington, Queenstown, and Centreville** have moderate-low (green) social vulnerability. The majority of the unincorporated areas of the County have moderate-low (green) social vulnerability, with the exception of Kent Island, which has moderate (blue-green) and low (yellow) social vulnerability and the area northwest of Centreville with low (yellow) social vulnerability. As with any hazard that had a potential to impact the county and its municipalities, considerations for socially vulnerable members of the community must be made. This is particularly true of public information announcements and disaster preparedness information.

12.7.2 VULNERABILITY AND IMPACTS TO SYSTEMS

Earthquake vulnerability and impacts to systems include, but are not limited to:

- Earthquakes can create problems with utility services, such as power outages due to stress on power systems.
- Earthquakes create the potential for hazardous debris and the uprooting of trees which cause harm to the environment, property, and may block roadways preventing emergency responders from reaching their destinations in time for rescue.
- Power outages impact the availability of emergency and government services.
- Tidal inundation from earthquakes can overload a system's ability to function properly which leads to overflow and potential septic failures which presents a public health threat.
- Communication systems break down due to loss of power.
- Transportation systems may be disrupted entirely due to earthquakes.

Note: While the impacts to systems listed above are specific to earthquake vulnerability, due to the very low probability of damaging earthquakes in Maryland, the likelihood of these impacts being realized by Queen Anne's County and its municipalities are very low.

12.7.3 VULNERABILITY AND IMPACTS TO COMMUNITY ACTIVITIES

Activities that have value to the community could potentially be impacted or disrupted by an earthquake event. This is true of events in both Queen Anne's County and all of its municipalities.

Vulnerability and impacts to community activities include, but are not limited to:

- The Historic Stevensville Art Market is a reoccurring event that happens monthly from April – November.
- The Sudlersville Peach Festival is an event for the community held at the beginning of August.
- The Historic Stevensville Classic Car Show is held in September.
- The Queen Anne's County Fair in Centreville, which is held the second week of August.
- The Bay Bridge Run held in November.
- The Annual Paint Stevensville event is held at the beginning of June.
- The Juneteenth festival is held in Centreville, MD with live music, vendors, a parade, and more for the community.
- The Family Fun Festival is a free family friendly community event that is also held in June.
- Bluegrass in the Blueberry Patch is a free event open to the public hosting live bluegrass music and blueberry picking that is held towards the end of June.
- The Queen Anne's County Senior Summit is held annually May.

12.7.4 VULNERABILITY AND IMPACTS TO STRUCTURES

The impacts to structures from an earthquake event are a low risk for Queen Anne's County and all its municipalities due to the very low probability of damaging earthquakes in Maryland. However, if located in a low level of shaking area both parapets and exterior unreinforced masonry walls may be considered for seismic retrofit. Another consideration is the continuity of operations issues that may arise from an earthquake. Emergency services and public safety officers may be cut off from entire streets or neighborhoods depending upon the extent of infrastructure damage, however as previously stated, Maryland is considered as having a very low probability of damaging earthquakes.

12.7.5 VULNERABILITY AND IMPACTS TO HISTORIC STRUCTURES

Plan Update Note

The previous 2019 Plan did not include historic structures. As part of this plan update, historic structures provided by Maryland's National Register Properties have been included and a flood vulnerability assess was conducted.

Structures within the City's historic districts will be most at risk of damage as they are less likely to have been designed and constructed to absorb swaying ground motions. Seismic retrofits may be considered for historic structures. However, these retrofits need to be balanced so as not to destroy a building's historic design elements. Also, due to the very low probability of damages from

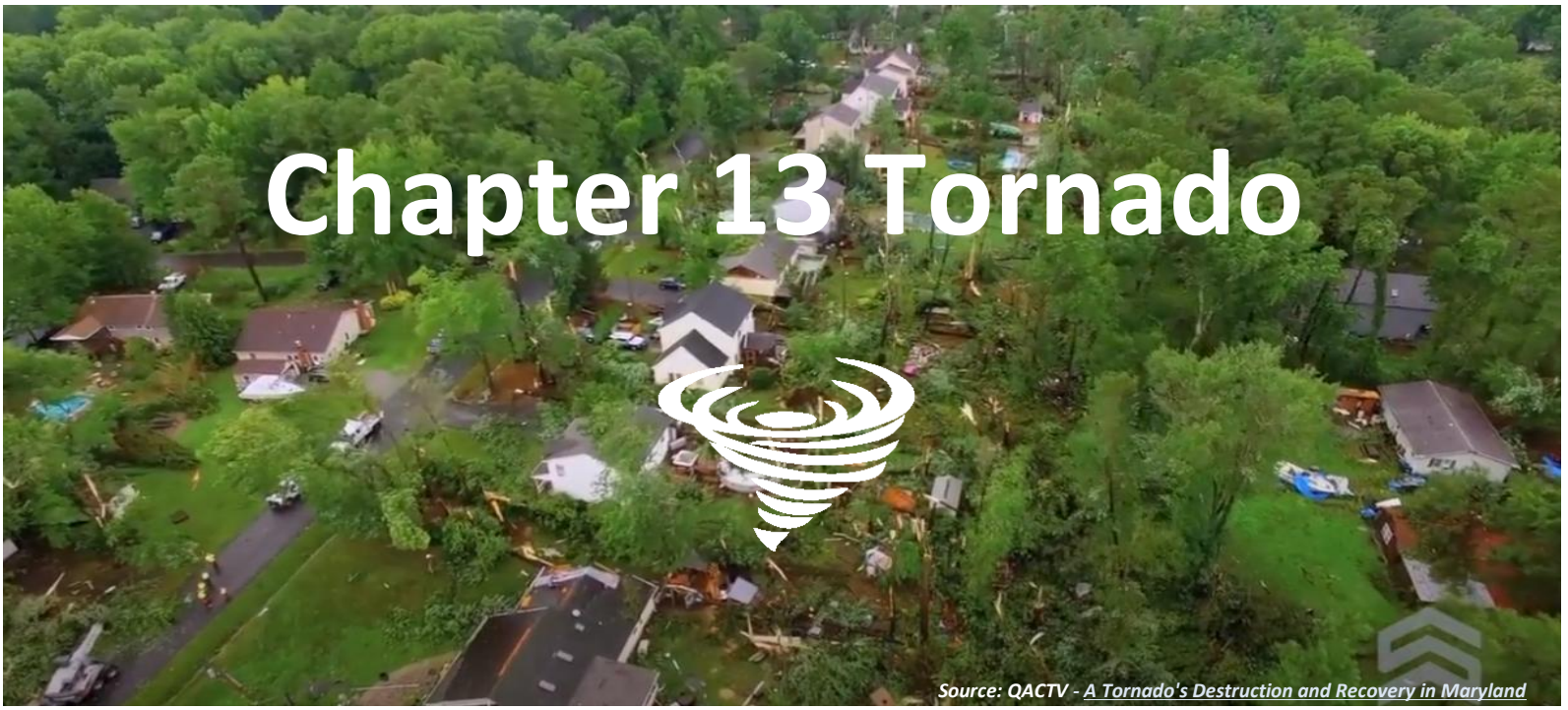
earthquakes in Maryland, the likelihood of these impacts being realized by Queen Anne's County and its municipalities are very low. The benefit cost analysis for these types of projects given the very low risk may prove less than cost effective.

[i] USGS- *Frequency of Earthquake Shaking Around the U.S.*, https://www.usgs.gov/media/images/frequency-damaging-earthquake-shaking-around-us

[ii] American University, *To the Point: What Causes Earthquakes, and Is Climate Change Involved*, *Professor of Environmental Science Stephen MacAvoy answers our question of the week,* by Patty Housman, February 17, 2023.

[iii] Does Climate Change Have an Impact on Earthquakes? https://greenly.earth/en-us/blog/ecology-news/does-climate-change-have-an-impact-on-earthquakes

Chapter 13 Tornado



This chapter profiles tornado history, risk, and vulnerability for Queen Anne's County and participating municipalities. During this plan update, new or changed plan components are shown in bold text below.

- 13.1 TORNADO
- 13.2 LOCATION AND GEOGRAPHIC EXTENT
- 13.3 HISTORY OF PREVIOUS HAZARD EVENTS
- **13.4 PROBABILITY OF FUTURE OCCURENCES**
- **13.5 EFFECTS OF FUTURE CONDITIONS**
- **13.6 CHANGES IN LAND DEVELOPMENT & TORNADO**
- 13.7 TORNADO VULNERABILITY
  - **13.7.1 Vulnerability and Impacts to People and the Environment**
  - **13.7.2 Vulnerability and Impacts to Systems**
  - **13.7.3 Vulnerability and Impacts to Community Activities**
  - **13.7.4 Vulnerability and Impacts to Structures**
  - **13.7.5 Vulnerability and Impacts to Historic Structures**

Note: The previous plan included hazard impact tables based on Emergency Management Accreditation Program requirements (EMAP). This information was expanded as part of this plan update within the vulnerability section.

Public Survey Results

- Survey participants indicated they were "somewhat concerned" with tornado.
- 21% of the survey participants indicated they have been personally affected by tornado.
- 11% of the survey participants have reduced tornado risk to their home/business by installing high impact windows or doors to withstand high winds.

Chapter Updates

- All sections of the chapter were updated with new information, graphics, maps, and tables.
- The flood vulnerability section in the previous 2019 Plan included impact tables, however the following subsections were added. The new subsections include narratives and were applicable, tables and maps.
  - Vulnerability and Impacts to People and the Environment,
  - Vulnerability and Impacts to Systems,
  - Vulnerability and Impacts to Community Activities,
  - Vulnerability and Impacts to Structures, and
  - Vulnerability and Impacts to Historic Resources.
- Social Equity and Vulnerability to the earthquake hazard was integrated.
- HHS emPower data was integrated into the vulnerability section.

13.1 Tornado

A tornado is a violently rotating funnel-shaped column of air that extends from a thunderstorm cloud toward the ground. Tornadoes can touch the ground with winds of over 300 mph. While relatively short-lived, tornadoes are intensely focused and are one of nature's most violent storms.

Service definitions of a tornado and associated terms:

- **Tornado** - A violently rotating column of air that is touching the ground.
- **Funnel cloud** - A rapidly rotating column of air that does not touch the ground.
- **Downburst** - A strong downdraft, initiated by a thunderstorm, which induces an outburst of straight-line winds on or near the ground. They may last anywhere from a few minutes in small-scale microbursts to periods of up to 20 minutes in larger, longer macro-bursts. Wind speeds in downbursts can reach 150 mph and, therefore, can result in damage similar to tornado damages.
- **Waterspouts** - Waterspouts are similar to tornadoes over water. Waterspouts are generally broken into two categories: fair weather waterspouts and tornadic waterspouts. Fair weather waterspouts usually form along dark flat bases of a line of developing cumulus clouds. This type of waterspout is generally not associated with thunderstorms whereas tornadic waterspouts develop in severe thunderstorms.

Tornadoes usually form from one of three types of thunderstorms:

- Squall-lines;
- Multi-cells; and
- Supercells.

Supercell thunderstorms are rotating storms containing what is known as a mesocyclone, or a rotating updraft (column of air) from which tornadoes sometimes form. Supercell thunderstorms have a greater potential than other thunderstorms for producing severe weather, including tornadoes.

Tornadoes can range from just several yards to over two miles in width. Tornadoes can destroy almost everything in their path. Although tornadoes normally travel on the ground for short distances, tornado tracks of 200 miles or more have been reported.

13.2 Location and Geographic Extent

Tornadoes are possible anywhere in the United States, but are most common in the central plains east of the Rocky Mountains and west of the Appalachians.[i] Tornadoes can range from just several yards to over two miles in width. Tornadoes can destroy almost everything in their path. Although tornadoes normally travel on the ground for short distances, tornado tracks of 200 miles or more have been reported. Tornadoes do not have a geographic extent, in that may impact any area of the county, including municipalities.

13.3 History of Previous Hazard Events

According to the National Centers for Environmental Information (NCEI), twelve tornado events have been recorded in Queen Anne's County. Both an injury and damages were reported within the database for this hazard. However, the most recent recorded event, July 24, 2017, provided additional damage totals.

TABLE 13-1: TORNADO – 1965-2023				
# OF EVENTS	INJURIES	DEATHS	DAMAGES ($)	FREQUENCY
12	1	0	$3,520,000	0.21

Source: National Centers for Environmental Information (NCEI), Events through December 2023

Queen Anne's County reported a total of 10 tornadoes in a 60-year timespan, as reported in the 2012 Hazard Mitigation Plan. However, the National Weather Service (NWS) confirmed that an EF-2 tornado touched down in Queen Anne's County during this planning cycle and EFO on August 4, 2020, bringing the total of events to 12. The paths of the tornado that have affected Queen Anne's County can be viewed at: Tornado Paths.

On June 1, 2012, an EF0 tornado struck Queen Anne's County. This storm did not cause any injuries or deaths, but did result in $100,000 in property damages. The tornado touched down in Queen Anne's County, northeast of Centreville around 8:30 p.m. EDT. The tornado began just north of Shellcross Farm Lane and tracked about 5 miles northeast to between Route 19 and Route 302 before dissipating, remaining on the west side of Route 301. Near the beginning of the tornado's path, in the 1200-block of White Marsh Road, the roof on one side of a large pole barn was torn off. Its debris was scattered for a quarter to a half-mile in all directions and damaged a nearby home. Minor to moderate structural damage also occurred to several homes, barns, and outbuildings along Granny Branch Road, Route 405, and Route 19. Damage to fencing and an overturned irrigation system was also observed along Route 405. In addition, numerous trees were either snapped or uprooted along the tornado's 5-mile-long path. The tornado's maximum path width was about 50 yards, with a maximum estimated wind speed of 80 mph. No injuries were reported.

On July 24, 2017, an EF-2 tornado touched down in Queen Anne's County. Emergency Management coordinated a multi-agency response, assisting with the initial emergency response through the recovery process. The tornado affected the communities of Stevensville, Chester, and Queenstown. Resulting in 233 properties damaged, 12 of those destroyed, 9,000 homes without power, 3.3 million dollars in private property losses and fortunately only one minor injury. Maximum winds were estimated at 125 mph.



Photo Source: Frank Tedesco/Atlantic

On August 4, 2020, a tornado touched down along Stagwell Road in Queenstown. Tropical storm Isaias brought high winds, heavy rain, several tornadoes, and coastal flooding to the mid-Atlantic region, becoming the most impactful tropical cyclone to impact most of the region since Sandy in 2012. The tornado took a distinct but narrow path in a corn field parallel to the road which is mostly east to west. The downed corn was in a circular pattern, and aerial footage over the corn field showed some downburst signatures on the right side of the tornado path. In addition to the cornfield

damage, sporadic tree damage occurred along Stagwell Road across from the corn field. The tornado looks to have lifted before it reached the Wye River as there was no additional visible damage north of this path. A tractor-trailer overturned along Route 301 about the time officials reported a possible tornado in that area, according to the sheriff's office.

Table 13-2 lists tornado events impacting Queen Anne's County.

TABLE 13-2: TORNADO EVENTS

DATE	MAGNITUDE	DEATH	INJURIES	PROPERTY DAMAGE ($)
8/1/1965	F1	0	0	5,000
7/30/1971	F2	0	0	5,000
3/21/1976	F2	0	0	50,000
3/14/1978	F1	0	0	5,000
8/28/1992	F0	0	0	0
4/16/1993	F1	0	0	0
7/27/1994	F0	0	0	0
11/26/1996	F1	0	0	50,000
5/19/2011	F0	0	0	5,000
6/1/2012	F0	0	0	100,000
7/24/2017	EF2	0	1	$3,300,000
8/4/2020	EF0	0	0	0
	TOTALS:	**0**	**0**	**$3,520,000**

Source: National Centers for Environmental Information (NCEI), Events through April 2018, & Queen Anne's County Commissioner's 2017 Year in Review, WBOC 2020 Article.

13.4 Probability of Future Occurrences

Due to the nature of storms, it is extremely difficult to predict future occurrences, but through identifying various indicators of weather systems, and tracking these indicators, it provides us with a crucial means of monitoring extreme weather. Understanding the historical frequency, duration, and spatial extent of high wind events assists in determining the likelihood and potential severity of future occurrences. The characteristics of past severe wind events provide benchmarks for projecting similar conditions into the future. The probability of Queen Anne's County and its municipalities experiencing a tornado hazard event can be difficult to quantify but based on historical record of 11 tornado events since 1965, it can reasonably be assumed that this type of event has occurred less than once per year, with an average frequency of 0.21. Based on past occurrence data future tornado events are less likely to occur than other hazard events.

13.5 Effects of Future Conditions

Climate change is expected to play a role in increasing the frequency and intensity of severe weather, including tornadoes, across the United States and in Maryland. Although tornadoes are more of a rare occurrence in Queen Anne's County, climate change poses a threat for a higher vulnerability across the country. In recent years there has been a reported increase in the number of observed tornadoes. In the 1970s there was an average of 858 tornadoes reported per year with an increase by almost 30% reported in the 90s[ii]. Scientists are unsure whether this is attributed to technological advances that allow us to spot and define tornadoes or if climate change has had a significant impact on its frequency. Research into climate change's impact on tornado events is relatively uncertain unlike other large-scale weather events such as hurricanes, floods, and rainstorms.

While research regarding climate change's impact on tornado frequency is uncertain, we do know that there is a direct link between climate and tornadoes. Studies are confident that there will be an increase in conditions that foster severe storms which in turn creates a basis for tornadoes to form.[iii] With the potential for future conditions to increase in Queen Anne's County, it is imperative for property owners and land developers to follow State mandated building codes and tie down techniques. Although we cannot definitively predict what the effect of climate change may have on tornadoes, we do know that we live in an increasingly warmer and wetter climate which effects a multitude of extreme weather events including tornadoes.

13.6 Changes in Land Development & Tornadoes

Any changes in land development, such as new development, may be impacted by tornadoes. As tornadoes do not have a geographic extent, relating growth areas to tornado vulnerability is not feasible. However, adherence to wind related building codes are essential.

13.7 Tornado Vulnerability

Due to the nature of tornado and other high wind events, all jurisdictions within Queen Anne's County are expected to be impacted equally.

Plan Update Note

To satisfy Requirement 44 CFR SS 201.6(c)(2)(ii)), the vulnerability section of this chapter has been expanded upon to include assets.

13.7.1 VULNERABILITY AND IMPACTS TO PEOPLE AND THE ENVIRONMENT

As discussed in other wind related hazard chapters, aging populations and people with disabilities are considered the most at risk during hazardous events because they require more time and are more likely to seek emergency medical attention that might not be as readily available due to isolation and other various circumstances. These populations are sometimes electricity dependent, which means they may use durable medical and assistive equipment (DME) and devices, and certain essential health care services to live independently in their homes. Local incidents, such as prolonged power outages, can rapidly thrust these individuals into life-threatening situations within hours or days. Stress and anxiety caused by thunderstorms and associated power outages can have psychological effects on individuals, particularly those that are electricity dependent.

Over 3 million Medicare beneficiaries rely on electricity dependent DME and devices to live independently in their homes, and some of those individuals also have health care service dependencies. The HHS emPOWER Map is updated monthly and displays the total number of Medicare beneficiaries who have had an administrative claim for one or more types of electricity-dependent DME and devices, as well as at-risk combinations data for those who rely on a certain essential health care service(s) and any electricity-dependent DME and devices.

Plan Update Note

To satisfy FEMA Requirement 44 CFR § 201.6(c)(2)(ii), this section, Social Equity & Vulnerability has been included in the plan update as a new element.

Figure 13-1

Geographic Area	Beneficiaries	At-Risk Beneficiaries
21607	102	11
21617	2,479	107
21619	2,187	52
21623	418	11
21628	136	11
21638	1,180	33
21644	24	11
21657	281	11
21658	1,041	24
21666	2,980	76
21668	379	12

Source: https://empowerprogram.hhs.gov/empowermap.
Note: Participating municipalities within zip codes identified in Figure 13-1 included 21601 Barclay, 21617 Centreville, 21623 Church Hill, 21651 Millington, 21658 Queenstown, and 21668 Sudlersville.

Tornadoes cause damage to the natural environment. Much of the flying debris generated during a tornado event is vegetation and tree limbs. Regular removal of dead tree limbs, especially along roadways, can help reduce the number of flying debris generated during a tornado or high wind event. Above ground fuel storage tanks can also be affected by a tornado causing contamination of the environment.

In addition, many essential facilities have communication antenna that are highly susceptible to high wind events.

TABLE 13-3: TORNADO WIND & FACILITIES WITH COMMUNICATION ANTENNA

FACILITY TYPE	FACILITY NAME	ADRESS	TOWN	ANTENNA ON/AT FACILITY
Fire	Queen Anne-Hillsboro VFC #8	13512 First Street	Queen Anne	✓
Fire	Church Hill VFC #5	316 Main Street	Church Hill	✓
Fire	Sudlersville VFC #6	203 N Church Street	Sudlersville	✓
Fire	Goodwill VFC #4	212 Broadway Street	Centreville	✓
Fire	EMS Station 600	203 N Church Street	Sudlersville	✓
Fire	EMS Station 500	316 Main Street	Church Hill	✓
Fire	Grasonville VFC #2	4128 Main Street	Grasonville	✓
Fire	Grasonville Vol Ambulance Dept. #20	4132 Main Street	Grasonville	✓
Fire	Crumpton VFC #7	300 3rd Street	Millington	✓
Fire	United Communities VFC #9	9406 Romancoke Road	Stevensville	✓
Fire	Kent Island VFC #1	1610 Main Street	Chester	✓
Police	Maryland State Police - Barracks S	311 Safety Drive	Centreville	✓
Police	Sheriff's Office - Sudlersville Substation	200 S Church Street	Sudlersville	✓

13.7.2 VULNERABILITY AND IMPACTS TO SYSTEMS

Power outages impact the availability of emergency and government services. Communication systems break down due to loss of power. Transportation systems may be disrupted due to tornadoes. High winds caused by severe storms create the potential for hazardous debris and the uprooting of trees which cause harm to the environment, property, and may block roadways preventing emergency responders from reaching their destinations in time for rescue. Communication disruptions, road blockages, and power outages can slow down response times and coordination efforts. All systems located in Queen Anne's County can be considered at risk from tornadoes. Facilities identified and categorized under communications and energy community lifelines are included in Chapter 2, Table 2-8 Critical Facilities & Community Lifeline Matrix.

13.7.3 VULNERABILITY AND IMPACTS TO COMMUNITY ACTIVITIES

As shown on Table 13-2 Tornado Events, historic tornadoes impacting Queen Anne's County occurred during the months of March through August, with the exception of one event, which occurred in the month of November. The following are examples of community activities that could be impacted by a tornado.

- The Historic Stevensville Art Market is a reoccurring event that happens monthly from April - November.
- The Sudlersville Peach Festival is an event for the community held at the beginning of August.
- The Historic Stevensville Classic Car Show is held in September.
- The Queen Anne's County Fair in Centreville, MD held in August.
- The Annual Paint Stevensville event is held at the beginning of June.
- The Juneteenth festival is held in Centreville, MD with live music, vendors, a parade, and more for the community.
- Historic Stevensville Distance Festival in September.
- The Family Fun Festival is a free family friendly community event that is also held in June.
- Bluegrass in the Blueberry Patch is a free event open to the public hosting live bluegrass music and blueberry picking that is held towards the end of June.

In addition, outdoor recreation events may be impacted, as tornado occurrences are more likely during warmer temperature months.

13.7.4 VULNERABILITY AND IMPACTS TO STRUCTURES

Previously, tornado damage was measured on the Fujita Scale, also called the F-Scale, named for Dr. Tetsuya Theodore Fujita. The operational Fujita scale ranges from an F0 to an F5. The strongest tornadoes observed to date have been F5 (winds between 261-318 mph). An Enhanced Fujita Scale (EF Scale) was developed and implemented operationally by the National Weather Service (NWS) in 2007.

The EF Scale was developed to better align tornado wind speeds with associated damages.

TABLE 13-4: ENHANCED FUJITA SCALE (EF-SCALE) CATEGORIES WITH ASSOCIATED WIND SPEEDS AND DESCRIPTION OF DAMAGES			
EF-SCALE NUMBER	**WIND SPEED (mph)**	**F-SCALE NUMBER**	**TYPE OF DAMAGE POSSIBLE**
EF0	65–85	F0-F1	Minor damage: Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e., those that remain in open fields) are always rated EF0.
EF1	86-110	F1	Moderate damage: Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111–135	F1-F2	Considerable damage: Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136–165	F2-F3	Severe damage: Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166–200	F3	Devastating damage: Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200	F3-F6	Extreme damage: Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (300 ft); steel reinforced concrete structure badly damaged; high-rise buildings have significant structural deformation.

Source: National Weather Service

The majority of tornadoes recorded in Queen Anne's County were rated as EF0 and EF1, with the exception of the 2017 recorded tornado, which was categorized as an EF2. As shown on Table 13-4, EF2 damages to structures are considerable and include: Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground. The July 17, 2024 tornado affected the communities of Stevensville, Chester and Queenstown. Resulting in 233 properties damaged, 12 of those destroyed, 9,000 homes without power, 3.3 million dollars in private property losses and fortunately only one minor injury. Maximum winds were estimated at 125 mph.

In consideration of the extreme damage to mobile homes, these structures are vulnerable to the high wind speeds produced by tornadoes. Mitigating tornado damage is difficult however maintaining state mandated building codes and tie down requirements for mobile homes while following a strict county warning system that is to be activated in the event of severe weather can help tremendouly. It is also crucial for people to have swift access to evacuation routes, emergency supplies, and medical care. Good transportation networks play a vital role in making this possible. They enable people to safely

evacuate from areas with impending severe weather, ensure a steady supply of emergency essentials, and make it easier for individuals to reach medical services during and after severe weather events.

13.7.5 VULNERABILITY AND IMPACTS TO HISTORIC STRUCTURES

High winds generated by tornadoes may cause significant damage to historic buildings. The materials used in historic buildings are often more vulnerable to weather-related damage. While the majority of historic structures listed on the Maryland's National Register Properties in Queen Anne's County were constructed of brick, there are several wood frame properties, which may be more susceptible to wind damage. These properties include Christ Church, Cray House, St. Andrew's Episcopal Church, Starr Church, and Wye Mill.

[i] National Weather Service, Tornadoes: Frequently Asked Questions About the Power of Nature, https://www.weather.gov/lmk/tornadoesfaq

[ii] *https://www.spc.noaa.gov/publications/mccarthy/tor30yrs.pdf*

[iii] *https://www.pnas.org/doi/full/10.1073/pnas.1307758110*

Chapter 14 Dam Failure



Source: Wye Mill Dam – Google Maps Streetview

Dam failure is a new chapter to the Plan update. The section describes an overall dam failure profile, risk, and vulnerability for Queen Anne's County and participating municipalities. During this plan update, new or changed plan components are shown in bold text below.

- **14.1 DAM FAILURE**
- **14.2 LOCATION AND GEOGRAPHIC EXTENT**
- **14.3 HISTORY OF PREVIOUS HAZARD EVENTS**
- **14.4 PROBABILITY OF FUTURE OCCURRENCES**
- **14.5 EFFECTS OF FUTURE CONDITIONS**
- **14.6 CHANGES IN LAND DEVELOPMENT & DAM FAILURE**
- **14.7 DAM FAILURE VULNERABILITY**
  - **14.4.1 Vulnerability and Impacts to People and the Environment**
  - **14.7.2 Vulnerability and Impacts to Systems**
  - **14.7.3 Vulnerability and Impacts to Community Activities**
  - **14.7.4 Vulnerability and Impacts to Structures**
  - **14.7.5 Vulnerability and Impacts to Historic Structures**

Note: The previous plan included hazard impact tables based on Emergency Management Accreditation Program requirements (EMAP). This information was expanded as part of this plan update within the vulnerability section.

Public Survey Results

- There are no high hazard dams in the county and therefore was not included in the public survey.

Chapter Updates

- All sections of the chapter are new.
- Dam failure hazard history data included events from the National Performance of Dams Program and Maryland Department of Environment Dam Safety Program.
- EAPs for the significant dams was integrated into the chapter.
- Regional coordination was conducted to obtain dam failure information.
- The dam failure vulnerability new subsections include narratives and were applicable, tables and maps.
  - Vulnerability and Impacts to People and the Environment,
  - Vulnerability and Impacts to Systems,
  - Vulnerability and Impacts to Community Activities,
  - Vulnerability and Impacts to Structures, and
  - Vulnerability and Impacts to Historic Resources.
- Social Equity and Vulnerability as well as Effects of Future Conditions to dam failure hazards was integrated into the chapter.

14.1 Dam Failure

Worldwide interest in dam and levee safety has risen significantly in recent years. Aging infrastructure, new hydrologic information, and population growth in floodplain areas downstream from dams and near levees has resulted in an increased emphasis on safety, operations, and maintenance.

Approximately 92,000 dams are listed in the National Inventory of Dams (NID), though tens of thousands more dams exist under state regulation throughout the country but are below threshold sizes to be included in the NID. Other owners include state and local authorities, public utilities, and federal agencies. The Code of Maryland Regulations (COMAR) defines a dam as any obstruction, wall, or embankment built to store or divert water, along with its abutments and appurtenant works. Dams provide benefits such as flood protection, power generation, drinking water, irrigation, and recreation. Failure of these structures results in an uncontrolled release of impounded water. While failures are relatively rare, immense damage and loss of life is possible in downstream communities when such events occur. Aging infrastructure, hydrologic, hydraulic, and geologic characteristics, population growth, and design and maintenance practices should be considered when assessing dam failure hazards.

Dam failures most often occur during or after a massive rainfall, flooding, or spring thaws, sometimes with little to no warning. Depending on the size of the water body where the dam is constructed, water contributions may come from distant upstream locations.

Dam failures can pose a serious threat to communities located downstream from major dams. The impact of a dam failure is dependent on dam and reservoir characteristics and the amount and distance of population, or assets located downstream. Catastrophic failures are characterized by the sudden, rapid, and uncontrolled release of impounded water or any other fluid or semi-fluid from a dammed impoundment or water body. Maryland uses three categories to classify dams: High, Significant, and Low hazards.

- **High Hazard Dam** failure is likely to result in the loss of human lives, extensive property damage, and will cause flooding on state roads or highways. In Maryland high hazard dams are referred to as “Category I”, and “Class C” ponds by the US Natural Resources Conservation Service (NRCS).
- **Significant Hazard Dam** failure could also result in the loss of lives, increase flood risks to roads and other major infrastructures. However, no more than 2 homes may be impacted, and less than six lives may be in jeopardy in order for a dam hazard to be significant. These forms of dam hazards are also referred to as “Category II” dams by the Code of Maryland Regulations (COMAR).
- **Low Hazard Dam** failure is unlikely to result in the loss of life; only minor damage to roadways and homes is expected. Low hazard dams are referred to as “Category III” by COMAR.

According to MDE Dam Safety Program, as of June 2024, Maryland has a total of 558 dams. The number of dams in each category are as follows:

- 108 High Hazard Dams
- 135 Significant Dams
- 315 Low Hazard Dams

Danger Reach is the area below a dam, which would flood because of dam failure. In the case of a "Danger Reach" the depth and width of flooding from a dam failure far exceeds the normal floodplain. Other dam failure types include the "Sunny Day" scenario, which dams fail on a sunny day, not during a storm. "Brim-Up" is another failure scenario, in which a reservoir is filled to the top of a dam, possibly because of a failed spillway, or during a Probable Maximum Flood (Maryland Department of Environment, 2017).

14.2 Location and Geographic Extent

A total eight (8) dams, three (3) significant and five (5) low hazard dams, are located within Queen Anne's County. There are no High Hazard Potential Dams (HHPD) located within Queen Anne's County. Furthermore, there are no high hazard potential dams in adjacent jurisdictions with inundation areas impacting Queen Anne's County. Table 14-1 lists dams identified in the National Inventory of Dams.

TABLE 14-1: QUEEN ANNE'S COUNTY DAMS – NATIONAL INVENTORY OF DAMS

DAM CLASSIFICATION	DAM NAME	DAM TYPE	PRIMARY PURPOSE	OWNER	EMERGENCY ACTION PLAN/LAST REVISION
Significant	Wye Mills Dam	Earth	Recreation, Flood Risk Reduction	MD DNR-Public Lands, Engineering & Constr-Eastern	Yes 4/21/2021
Significant	Ownings Farm Pond	Earth	Irrigation	Sam Owings	Yes 2/17/2022
Significant	Unicorn Branch Dam	Earth	Recreation	MD DNR-Public Lands, Engineering & Constr-Eastern	Yes 4/21/2021
Low	Dodd Farm Pond	Earth	Flood Risk Reduction	T. Willard Dodd, Jr	Not Required
Low	Mezick Farm Pond	Earth/Rockfill	Flood Risk Reduction, Other, Recreation, Water Supply	Edgar Sears	Not Required
Low	Tuckahoe State Park Dam (Crouse Mill Road)	Arch, Masonry	Recreation	MD DNR-Public Lands, Engineering & Constr-Eastern	Not Required
Low	Boxers Rest Farm Pond	Earth	No Available	Boxers Rest Farm	Not Required
Low	Foreman Branch Dam	Earth	Recreation	Bluestem Farms, Inc.	Not Required

Source: National Inventory of Dams – Queen Anne's County

In addition to the National Inventory of Dams, the Maryland Department of Environment (MDE) – Dam Safety Program identified additional dams located in Queen Anne's County. These dams are provided on Table 14-2.

TABLE 14-2: QUEEN ANNE'S COUNTY DAMS – MDE DAM SAFETY PROGRAM					
DAM CLASSIFICATION	**DAM NAME**	**DAM TYPE**	**PRIMARY PURPOSE**	**OWNER**	**EMERGENCY ACTION PLAN/LAST REVISION**
Low	Jones Lake Dam	Earth	Recreation, Irrigation	Jones Lake Corporation	Not Required
Low	Claiborne Gooch	Earth	Recreation	Jim Inglesby	Not Required

Source: MDE Dam Safety

Emergency Action Plan (EAP) is a formal document that describes procedures to minimize the risk of loss of life and property damage when potential emergency conditions threaten a Hazard Potential Category high or significant dam. Individuals and agencies are responsible for the execution of EAPS involving the dam owners, local government, emergency response agencies, and Maryland's Dam Safety Program. The dam owner is responsible for the safe operation, maintenance, and inspection of the dam and must prepare an EAP to conform to the law and guidelines established by Maryland's Department of the Environmental Dam Safety Program. The owner submits the EAP for review and approval by Maryland Department of Environment (MDE). Every EAP is tailored to site specific conditions, as well as the requirements of the owner, agency or organization that operates or regulates use of the dam, and to the emergency response organizations that will respond to the emergency.

The three (3) dams classified as significant hazard potential have an Emergency Action Plan (EAP). EAPs are required to establish procedures that warn the population at risk to reduce the potential for loss of life and property damage if a dam failure is imminent. The Dam Inspectors and Operator, Department of Emergency Services, and Maryland Dam Safety Program maintain these plans and assist in notification if a dam failure should occur. The locations of these dams are mapped on Figure 14-1. Additional information about the significant hazard potential dams is included on Table 14-3, below.

TABLE 14-3: SIGNIFICANT HAZARD POTENTIAL DAMS IN QUEEN ANNE'S COUNTY				
DAM NAME	**YEAR COMPLETED**	**DRAINAGE AREA (SQ MILES)**	**DAM CODITION - ASSESSMENT DATE**	**NEAREST CITY/TOWN**
Wye Mills Dam	1682 (modified in 1958)	10.2	Satisfactory - 4/15/2021	0.1 miles from Wye Mills
Ownings Farm Pond	1967	1.4	Satisfactory - 4/6/2021	1 mile from the Grove Subdivision
Unicorn Branch Dam	1964	20	Fair - 4/5/2021	1 mile from Unicorn

*Source: MDE Dam Safety Program Database & National Inventory of Dams, https://nid.sec.usace.army.mil/#/**

***Satisfactory** - No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the minimum applicable state or federal regulatory criteria or tolerable risk guidelines.*

***Fair** - No existing dam safety deficiencies are recognized for normal operating conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take further action. Note: Rare or extreme events are defined by the regulatory agency based on their minimum.*

***Poor** - A dam safety deficiency is recognized for normal operating conditions which may realistically occur. Remedial action is necessary. Poor may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Investigations and studies are necessary.*

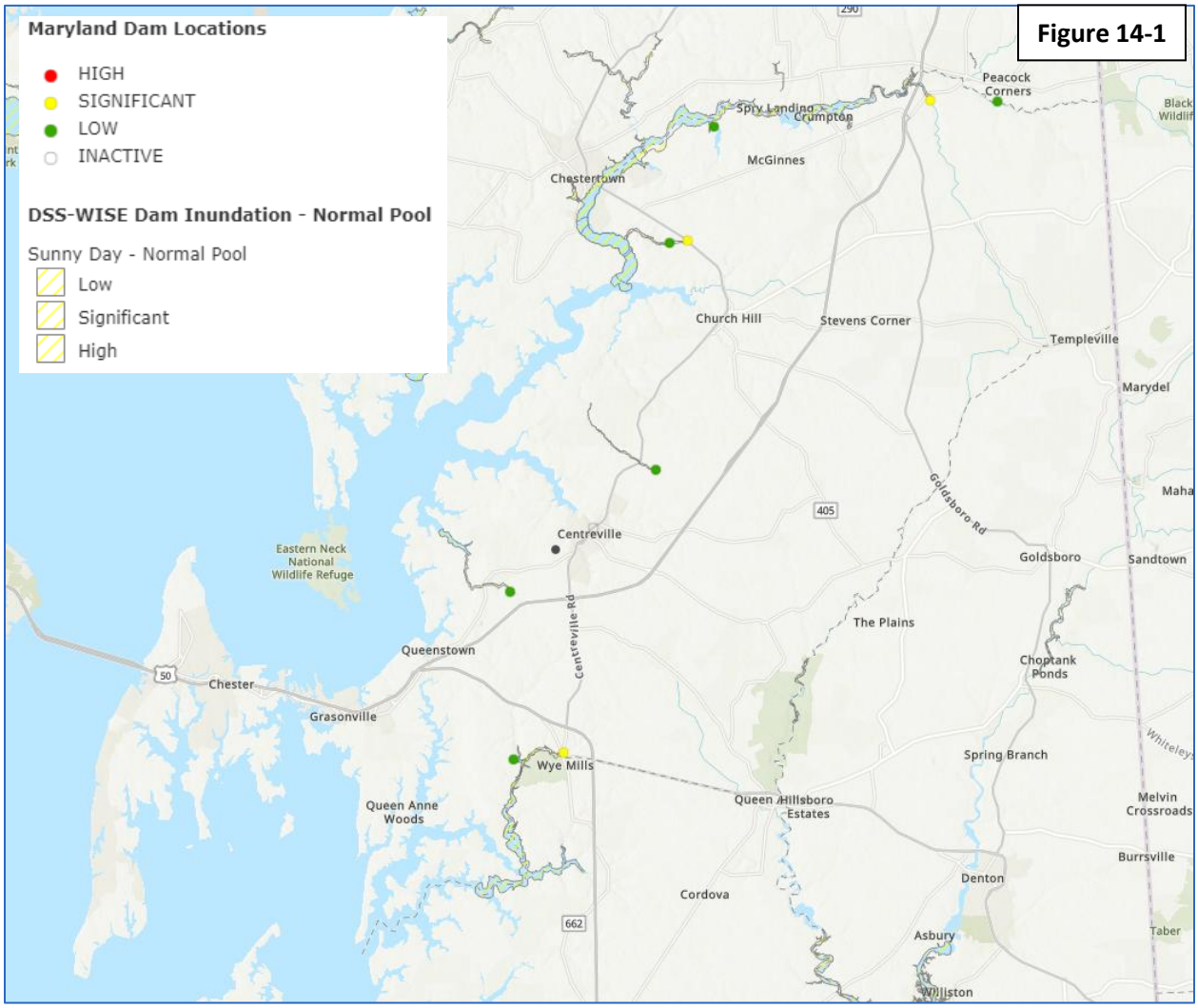


Figure 14-1

Source: [MDE Dam Safety]

Municipalities located within Queen Anne's County are not subject to dam failure. As depicted in Figure 14-1, no municipality is located near the identified dams or their inundation areas.

14.3 History of Previous Hazard Events

The worst dam failure in all the U.S. is the Johnstown Flood of 1889 in Pennsylvania. The notorious Johnstown Flood is one of America's most well-known disasters. The disaster occurred when an unusually large amount of rain fell over western Pennsylvania in May of 1889. Consequently, the earthen South Fork Dam breached on May 31, 1889, and released 20 million tons of water into the Conemaugh River Valley in Cambria County. As the water rushed through the valley it swept away part of the community of South Fork and the communities of Mineral Point, Woodvale, Franklin, East Conemaugh, and finally, Johnstown. The dam had been known to be leaking and gave way when it was overtopped by floodwaters. The narrow valley and the dense build-up along the Conemaugh floodplain downstream from the dam aggravated the flood catastrophe. When the flood was over, 16,000 people were homeless and 2,209 were dead.

No documentation could be found for dam failure in Queen Anne's County. However, the National Performance of Dams Program, which maintains a database of failures for all dams listed in the National Inventory of Dams, lists 57 dam-related incidents in the entire state of Maryland. These incidents are shown in Table 14-4 although most were relatively minor and caused little damage.

TABLE 14-4: PAST DAM INCIDENTS IN MARYLAND (NPDP, 2023)

DAM NAME	INCIDENT DATE	INCIDENT TYPE/DESCRIPTION	DAM TYPE
Camp Ritchie	1/1/1929	Piping	Earth
Stubbs	10/1/1929	Not Known	Earth
Big Millpond (Route 50)	2/25/1979	Undermining	---
Black Rock Estates Pond	4/21/1992	Inflow Flood - Hydrologic Event	---
Annapolis Mall SWM Pond	3/4/1993	Inflow Flood-Hydrologic Event	Earth
Conowingo	1/20/1996	Inflow Flood-Hydrologic Event	Concrete Gravity
Herrington Creek Dam	6/12/1996	Concrete Deterioration	Earth
St. Mary's River Watershed Site #1	2/4/1998	Inflow Flood-Hydrologic Event	Earth
Columbia LNG Secondary Dam	3/21/1998	Concrete Deterioration	Earth
Rolling Green Community Pond	2/11/1999	Piping	---
Lake Jenkins	5/7/1999	Inflow Flood-Hydrologic Event	Arch Masonry
Lake Lanahan	5/7/1999	Inflow Flood-Hydrologic Event	Earth
Frazers Dam	9/15/1999	Inflow Flood-Hydrologic Event	Earth
Nagels Mill Pond	9/15/1999	Piping	Earth
Redskins Stadium SWM Pond	9/16/1999	Inflow Flood-Hydrologic Event	Earth
Teels Lake Dam (2 events)	9/16/1999	Inflow Flood-Hydrologic Event	Earth
Coulbourn Mill Dam	9/16/1999	Inflow Flood-Hydrologic Event	Earth
Lake Bonnie	9/16/1999	Inflow Flood-Hydrologic Event	Earth
Mill Creek Dam	9/16/1999	Inflow Flood-Hydrologic Event	Earth
Owings Farm Pond	9/16/1999	Inflow Flood-Hydrologic Event	Earth
Scull Farm Pond	9/16/1999	Inflow Flood-Hydrologic Event	Earth

TABLE 14-4: PAST DAM INCIDENTS IN MARYLAND (NPDP, 2023)			
DAM NAME	**INCIDENT DATE**	**INCIDENT TYPE/DESCRIPTION**	**DAM TYPE**
St. Paul's Millpond	9/16/1999	Inflow Flood-Hydrologic Event	Earth
Big Millpond (Route 50)	9/16/1999	Inflow Flood-Hydrologic Event	---
Cabin Creek Mill Dam	9/16/1999	Inflow Flood-Hydrologic Event	Earth
Stubbs	9/16/1999	Inflow Flood-Hydrologic Event	Earth
Jones Lake Dam	9/16/1999	Inflow Flood-Hydrologic Event	Earth
Tuckahoe State Park Dam	9/16/1999	Inflow Flood-Hydrologic Event	Earth
Riley Mill Pond	9/16/1999	Inflow Flood-Hydrologic Event	Earth
Foreman Branch Dam	9/16/1999	Inflow Flood-Hydrologic Event	Earth
Sassafras Mill Dam	9/16/1999	Inflow Flood-Hydrologic Event	Earth
Pecks Branch Dam (Ashburton)	2/29/2000	Piping	Earth
Owings Farm Pond	9/16/2001	Inflow Flood-Hydrologic Event	Earth
Deal Island Wildlife Dam	9/1/2003	4500 linear feet of embankment partially breached during Hurricane Isabel	Earth
St Clair Farm Pond Dam	9/23/2003	Partial failure. Dam overtopped by about 1ft during 4-5" rainfall on Sept 22-23, 2003. Owner observed 4ft diameter sinkhole in crest & significant flow along CMP spillway pipe at top of dam.	Earth
Lake Jenkins Dam	11/19/2004	Dam severely damaged due to overtopping flows displacing masonry units.	Masonry Arch
Grand View Farms Dam	3/29/2006	Owner's engineer advises that CMP spillway has failed.10ft sinkhole in d.s. slope over pipe, significant leakage along outside of pipe. Riser is deteriorated.	Earth
Galestown Millpond Dam	6/25/2006	Dam breached in two locations following 10-15 inches of rain in 12 hours. Partially attributed to debris blocking spillway.	Earth
Mill Creek Dam	6/25/2006	Breached during rain event	Earth
Lake Needwood Dam	6/27/2006	Heavy rain pushed reservoir to record level. Heavy seepage on downstream slope near groin resulted in emergency drain/filter construction.	Earth
Conowingo	1/4/2010	Gate Operations	---
Social Security Woodlawn Dam	9/8/2011	Concrete chute spillway on earth embankment undermined, resulting in spillway damage and loss of embankment material.	Earth
Lake Minnetoska Dam	3/1/2012	Concrete chute spillway on earth embankment undermined and partially failed during rain event.	Masonry
Chadswood SWM Pond Dam	5/1/2014	CMP culverts failed (deterioration at invert) resulting in sinkholes and slumps on upstream slope.	Earth

TABLE 14-4: PAST DAM INCIDENTS IN MARYLAND (NPDP, 2023)			
DAM NAME	**INCIDENT DATE**	**INCIDENT TYPE/DESCRIPTION**	**DAM TYPE**
Guilford Reservoir	9/17/2015	Dam Safety personnel observed contractor excavating large hole in dam embankment near downstream toe. Unpermitted work was ordered stopped and hole backfilled.	Earth
Martin Farm Pond Dam	5/5/2016	CMP riser plugged with beaver debris triggered flow in emergency spillway. Upon investigation the CMP spillway barrel was found partially collapsed and deteriorated, and a very large amount of downstream embankment soils had been eroded away around the spillway. Owner subsequently made unauthorized excavation in embankment and removed riser, creating a partial uncontrolled release.	Earth
Riawalkin Pond Dam	6/28/2016	Five to 9 inches of rain (approx. 200 yr. storm) fell. Accelerated piping type erosion around deteriorated CMP spillway barrel. Downstream embankment and road on crest suffered sinkholes/erosion.	Earth
Barren Mill Pond Dam	7/14/2016	Heavy rain overnight in watershed combined with inability to operate millrace gates resulted in overtopping failure.	Earth
Guilford Reservoir	7/21/2016	During preconstruction activities contractor excavated long trench at downstream toe of dam. Soil heave from bottom of excavation created unstable ground conditions and cracking in dam embankment. Reservoir ordered drained.	Earth
Cranberry Branch Dam	9/14/2016	Ductile iron water supply pipe in earth embankment broke, scouring large hole at downstream toe of dam. Valve upstream of pipe break operated to shut off flow of water.	Earth
Riawalkin Pond Dam	9/29/2016	Dam overtopped after six-inch rainfall causing erosion of downstream embankment	Earth
Big Millpond Dam	9/30/2016	Dam failed after heavy rainfall event. No details known about failure mechanism.	Earth
Redington Lake Dam	12/19/2016	Sinkhole developed at dam crest in line with historic seepage location at downstream toe. Internal erosion assumed to be occurring. Reservoir lowered. Further investigations reveal likely cause of sinkhole is collapsed animal burrow.	Earth
Mill Pond Dam	7/7/2017	4.5 inches of rain in three hours caused failure of dam (unknown if overtopping or piping). Dam had previously failed and been	Earth

TABLE 14-4: PAST DAM INCIDENTS IN MARYLAND (NPDP, 2023)			
DAM NAME	**INCIDENT DATE**	**INCIDENT TYPE/DESCRIPTION**	**DAM TYPE**
		repaired without proper engineering or permits.	
Brighton Dam	9/1/2017	Contractor repairing/rehabilitating concrete spillway removed too much concrete. Spillway structural capacity inadequate due to amount of material removed.	Ambersen
Cascade Lake Dam	7/27/2018	Structure overtopped twice in a week resulting in severe erosion of embankment following 2 intense rainstorms	Earth/Masonry
2024 PLAN UPDATE			
Running Hare Vineyard Dam	8/4/2020	Structure overtopped and eroded downstream slope during TS Isaias	Earth
Volvo Dam	9/1/2021	Spillway plugged and structure overtopped after heavy rain from TS Ida	Earth

Source: *National Performance of Dams Program and MDE Dam Safety Permits Division Chief*

14.4 Probability of Future Occurrences

Provided that adequate engineering and maintenance measures are in place, high hazard dam failures are unlikely in Queen Anne's County. According to Risk Factor criteria, the probability of a dam failure occurring is unlikely (1 out of 4). The presence of structural integrity and inspection programs significantly reduces the potential for major dam failure events to occur, however the three (3) significant hazard potential dams identified on Table 14-3 are fifty years old, service life. Because of their age and possible future climate-influenced storms, in time the dams may need retrofitting work. For example, encroaching trees need to be removed from spillway areas and groin areas.

The construction, operation, maintenance, modification, and abandonment of dams is regulated and monitored by the Maryland Department of Environment Dam Safety. Dams are evaluated based on categories such as slope stability, undermining seepage, and spillway adequacy. The presence of structural integrity and inspection programs significantly reduces the potential for major dam failure events to occur.

Dam Emergency Action Plans (EAP) drafted in accordance with the Federal Guidelines for Dam Safety identify the risk related information include the inundation area and the time lapse between failure and flooding reaching specific destinations downstream. Queen Anne's County has the potential to be affected by dam failure, and therefore it is essential to have emergency planning procedures. The EAP for each of the three (3) significant hazard potential dams is reviewed and updated as needed.

14.5 Effects of Future Conditions

Changes in climate factors, such as extreme temperature variations and increased frequency of heavy precipitation, are likely to impact the various elements driving dam risks. A study on climate change impacts on dam safety explores how climate change may influence failure through common modes like overtopping, sliding, and internal erosion (piping). The structural behavior of concrete dams is directly affected by temperature and solar exposure. As average temperatures are expected to rise, this will place more stress on the components of concrete dams. Additionally, there is likely to be more

fluctuation in water storage in the reservoir, causing water levels to increase or decrease more frequently. This would lead to greater temperature peaks on the surface of the exposed concrete, resulting in additional mechanical stresses and making it more prone to failure from the reservoir water.

Similarly, the increasing variation in reservoir water levels may also adversely affect embankment dams (earth dams). Internal erosion occurs when water seeps through the dam, carrying soil away. Prolonged periods of reduced water levels during droughts will decrease soil moisture and increase vulnerability to internal erosion. Changes in soil moisture can also lead to a loss of vegetation cover. The loss of vegetation cover may alter the soil structure, making it more susceptible to internal erosion. Additionally, reduced vegetation cover will lower resistance to surface flow in the event of overtopping.

Adopting a comprehensive approach to address the influence of climate change on dam safety management is crucial. The effect of climate change on dam risk must be assessed through the integration of dam risk modeling that considers climate change impacts. Consulting dam engineering and safety experts throughout the process is essential. With this information, long-term investments can be planned more efficiently. More effective modeling may lead to better investments in rehabilitating damaged dams, thereby reducing future risks.

14.6 Changes in Land Development & Dam Failure

It is unlikely that future development (as guided by the County's 2022 Comprehensive Plan) in Queen Anne's County will change the risk or vulnerability associated with the dam failure hazard. It should be noted that all significant hazard potential dam inundation areas are outside of town/municipal limits, therefore future development as outlined in the Comprehensive Plan is unlikely to occur in these areas to any appreciable degree.

The County does not have any high hazard potential dams within its jurisdiction, however there are three significant hazard potential dams that are within the County which could have a negative impact on current or future development. Development within the inundation areas of Wye Mills Dam, Owings Farm Pond, and/or Unicorn Branch Dam would be impacted by a failure event. These inundation areas are shown on Figures 14-2, 14-3, and 14-4, respectively.

The Wye Mills dam inundation area is in the Northern portion of Wye Mills and follows the Wye East River and some undeveloped areas north of Wye Mills Community Lake along Wye Milles Road (Route 662). Much of the area within the inundation area is undeveloped floodplain and forested areas, but there are instances where development is adjacent or close enough to the floodplain to be impacted. The Wye Mill Mills area is not included as part of the County's future growth and development plan.

The Owings Farm Pond Dam is largely in a rural agricultural area, running northern-adjacent to Church Hill Road. The nearest and largest development being Bennet & Cohey Junk Yard, which is out of the inundation area for the dam. The Owings Farm Pond Dam area is not included as part of the County's future growth and development plan.

Finally, the Unicorn Branch Dam is located southwest of Millington near Route 301. The dam's EAP has not identified any structures within the dam's inundation area. However, there are several adjacent properties with structures that have the potential to be impacted from inundation in a particularly bad event. The Unicorn Branch Dam area is not included as part of the County's future growth and development plan.

Considering there are no dam inundation areas within or adjacent to the municipalities located within Queen Anne's County, development in the towns would not be subjected to dam failure, specifically the three (3) significant hazard potential dams. As depicted in Figure 14-1, no municipality is located near the identified dams or their inundation areas.

14.7 Dam Failure Vulnerability

The primary hazard surrounding dam failure is the swift, unpredictable flooding of those areas immediately downstream. While general inundation areas can be determined, it is often impossible to know exactly how and where water held back by a dam will flow during a rapid failure of the dam. Generally, there are three (3) types of dam failures: hydraulic, seepage, and structural.

- **Hydraulic Failure:** Hydraulic failures result from the uncontrolled flow of water over the dam, around and adjacent to the dam, and the erosive action of water on the dam and its foundation. Earthen dams are particularly vulnerable to hydraulic failure since earth erodes at relatively small velocities.
- **Seepage Failure:** All dams exhibit some seepage that must be controlled in velocity and amount. Seepage occurs both through the dam and the foundation. If uncontrolled, seepage can erode material from the foundation of an earthen dam to form a conduit through which water can pass. This passing of water often leads to a complete failure of the structure, known as piping.
- **Structural Failure:** Structural failures involve the rupture of the dam and/or its foundation. This is particularly a hazard for large dams and for dams built of low strength materials.

Dam failures generally result from a complex interrelationship of several failure modes. Uncontrolled seepage may weaken the soil and lead to a structural failure. Structural failure may shorten the seepage path and lead to a piping failure. Surface erosion may lead to structural or piping failures.

When assessing the impacts of dam failure, it's crucial to consider cascading hazards and effects. The term "hazard creep" or "risk creep" refers to the increased anticipated consequences of a failure due to infrastructure development around a dam, both upstream and downstream, which raises the risk to people and property. Dam failure can be a cascading result of other events like hurricanes, tropical storms, regional floods, or earthquakes. It can also trigger cascading impacts both downstream and upstream. For instance, overtopping or structural failure of a dam can lead to significant flooding and inundation downstream, potentially increasing erosion and causing sinkholes. Upstream impacts might occur from heavy rainfall events causing the dam to reach capacity, leading to flooding of structures or infrastructure, erosion along the dam's structure, and the formation of sinkholes.

Other hazards that can affect dams include drought and wildfire. Droughts can lower water levels both upstream and downstream of a dam, potentially leading to erosion of the dam's structure and reservoir. Additionally, if the dam supports agricultural activities, drought conditions could result in crop and product losses. Wildfires can damage the surfaces of dams and spillways, as well as nearby facilities and equipment, particularly in embankment dams. After a wildfire, the risk of erosion and flash flooding increases.

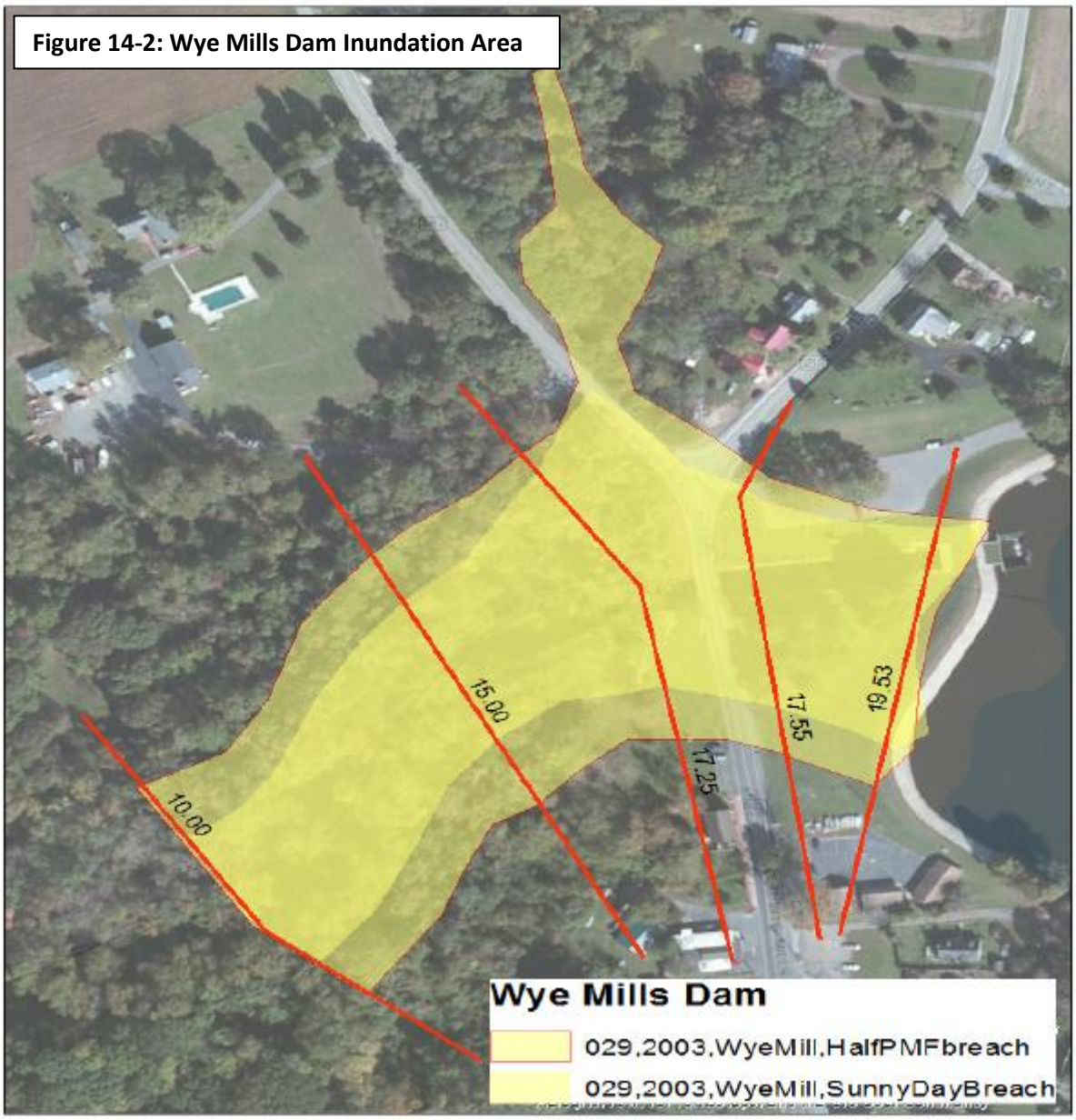
Maryland Dam Safety Program requires that each dam be evaluated for its hazard potential downstream. Hazard potential is not related to the structural integrity of a dam, but strictly to the potential or loss of life due to flooding. While the probability of a dam failure occurrence is generally low, the potential hazard is significant for the three (3) significant hazard potential dams.

Wye Mills Dam, MD Dam No. 29 Emergency Action Plan (EAP) details roles and responsibilities, the five-step EAP process, maintenance, and maps detailing the inundation area, which is the geographic area downstream of the dam that would be flooded by a breach of the dam or other large discharge. Figure 14-2 depicts the inundation areas for the Wye Mills Dam.

Both the Owings Farm Pond, MD Dam No. 175 EAP and Unicorn Lake, MD Dam No. 47 EAP include the same details as the Wye Mills Dam EAP. The breach inundation map for the Owings Farm Pond is depicted on Figure 14-3, while Figure 14-4 details Unicorn Lake inundation area.

The three (3) significant hazard potential dams are in the unincorporated areas of the county. The incorporated areas of the county are not vulnerable to dam failure due to the locations of the dams and their inundation areas.

Figure 14-2: Wye Mills Dam Inundation Area



Source: Wye Mills Dam EAP

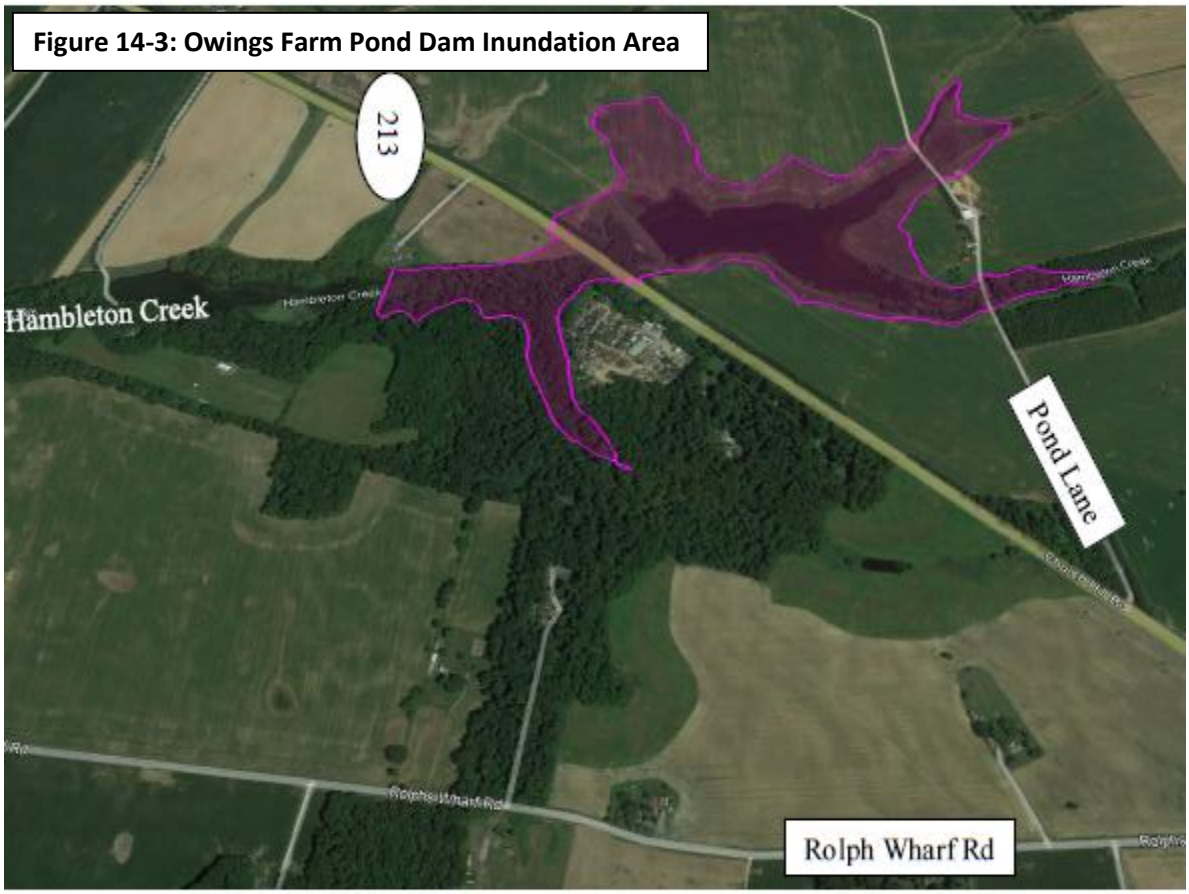


Figure 14-3: Owings Farm Pond Dam Inundation Area

Source: Owings Farm Dam EAP

Figure 14-4: Unicorn Branch Dam Inundation Area



Source: Unicorn Branch Dam EAP

As part of regional coordination, adjacent jurisdictions were asked to provide information on dams that may impact Queen Anne's County. Adjacent jurisdictions provided the following:

- Caroline County – Doug Jones, Emergency Management Division Chief, indicated that to the best of their knowledge, Caroline County does not have any dams that would impact Queen Anne's County.
- Kent County – Brian Pearsall, Emergency Planner, stated that Kent County does not have any dams that would impact Queen Anne's County.
- Talbot County – Geneva Schaffle, Emergency Management Division Chief, stated that the only dam that is near Talbot County's border is the Wye Mills Dam. This dam is considered to be in Queen Anne's County but has effects to Talbot County and their roads should there be a failure or inundation. Talbot County is listed on page 13 of the EAP regarding assisting with traffic should the dam failure impede on their roads.

The vulnerability assessment is further developed to include specific information related to people and the environment, systems, community activities, structures, and historic structures and provided on the following pages.

14.7.1 VULNERABILITY AND IMPACTS TO PEOPLE AND THE ENVIRONMENT

Dam failure leads to flooding downstream, which can cause death, injury, and illnesses relating to water-borne diseases and standing water. In addition, due to the flooding, people may have to evacuate and be displaced from their homes.

Wye Mills Dam, MD Dam No. 29 Emergency Action Plan (EAP) states a major flood caused by a sudden breach of the dam is estimated to inundate two (2) businesses. These businesses are located immediately downstream of the dam embankment on the side of Route 662 opposite the dam. The two (2) businesses include Wye Mills Granary, which is 250 feet downstream from the dam, and Maryland DNR Wildlife Office, located 200 feet downstream from the dam. Emergency Action Plans for Owings Farm Pond, MD Dam No. 175 and Unicorn Lake, MD Dam No. 47 indicate that no homes or businesses would be impacted if a major flood caused by a sudden breach of either dam occurred.

Old Wye Mill Granary has been in operation since 1682. This is a historic building that aided in centralizing settlement around the Wye Mills area. The granary is currently owned and operated by the Friends of Wye Mill. As a tourism and educational business, the Mill engages people of all ages, backgrounds, and interests in experiential learning about the social, geographic, economic, technological, and nutritional significance of grinding grain in a working, water-powered grist mill that has been operated at the site from the 1600s to the present day.



Source: The Old Wye Mills Granary, Est. 1682. https://www.oldwyemill.org/

The DNR office is a Wildlife & Heritage Service Regional Office, serving the Eastern Region consisting of Caroline, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico and Worcester Counties. These locations are minimally staffed and open by appointment only.

Socially vulnerable groups tend to have more exposure to hazards, therefore are disproportionately impacted. As discussed previously, Queen Anne's County does not have any census tracts with high vulnerability. However, the census tract containing the **Towns of Sudlersville and Barclay** are within the moderate (blue-green) social vulnerability, and the **Towns of Millington, Queenstown, and Centreville** have moderate-low (green) social vulnerability. The majority of the unincorporated areas of the County have moderate-low (green) social vulnerability, witht the exception of Kent Island, which has moderate (blue-green) and low (yellow) social vulnerability and the area northwest of Centreville with low (yellow) social vulnerability.

The followings dams are located in the moderate social vulnerability area, two (2) of which are classified as significant potential hazard dams (bold):

- Jones Lake Dam
- **Unicorn Branch Dam**
- Foreman Branch Dam
- **Owings Farm Pond**
- Boxers Rest Farm Pond

As with any hazard that had a potential to impact the county and its municipalities, considerations for socially vulnerable members of the community must be made. This is particularly true of public information announcements and disaster preparedness information.

From an economic perspective, the financial repercussions of a dam failure can be substantial. The recovery costs may extend beyond the immediate area, affecting neighboring regions as well. These costs could encompass repairs to flooded buildings, enhancements to damaged roads and infrastructure, and more. Businesses that are damaged or destroyed might face long-term closures, resulting in temporary or permanent job losses. Additionally, the expense of rehabilitating or repairing the dam itself is a significant economic burden. In farming communities, inundated agricultural lands could suffer damage, leading to a loss of functionality and inventory for agricultural businesses.

14.7.2 VULNERABILITY AND IMPACTS TO SYSTEMS

Wye Mills Dam, MD Dam No. 29 Emergency Action Plan (EAP) states a major flood caused by a sudden breach of the dam is estimated to inundate two (2) highways. MD Highway 662 and MD Highway 213 are both 250 feet downstream from the dam.

Owings Farm Pond, MD Dam No. 175 Emergency Action Plan (EAP) states a major flood caused by a sudden breach of the dam is estimated to inundate 1 highway. Church Hill Road (MD 213) is located 250 feet downstream from the dam.

Unicorn Lake Dam, MD Dam No. 47 Emergency Action Plan states that a major flood caused by a sudden breach of the dam is estimated to inundate two roads: MD Highway 313 and Groff Road. These roads are 1000 feet and 1500 feet downstream from the dam, respectively.

No critical facilities would be impacted by a failure of any of the three significant hazard dams in the County.

14.7.3 VULNERABILITY AND IMPACTS TO COMMUNITY ACTIVITIES

Due to the rural and mostly isolated locations of the three (3) significant potential hazard dams, no activities that have value to the county or municipalities would be impacted.

However, the failure of Wye Mills Dam is expected to impact the Wye Mills Granary. This business is an important historic asset to the community and provides educational opportunities about the history of agriculture in Maryland. The impact to this location would likely be in the form of economic losses caused by closure and damage to the building.

14.7.4 VULNERABILITY AND IMPACTS TO STRUCTURES

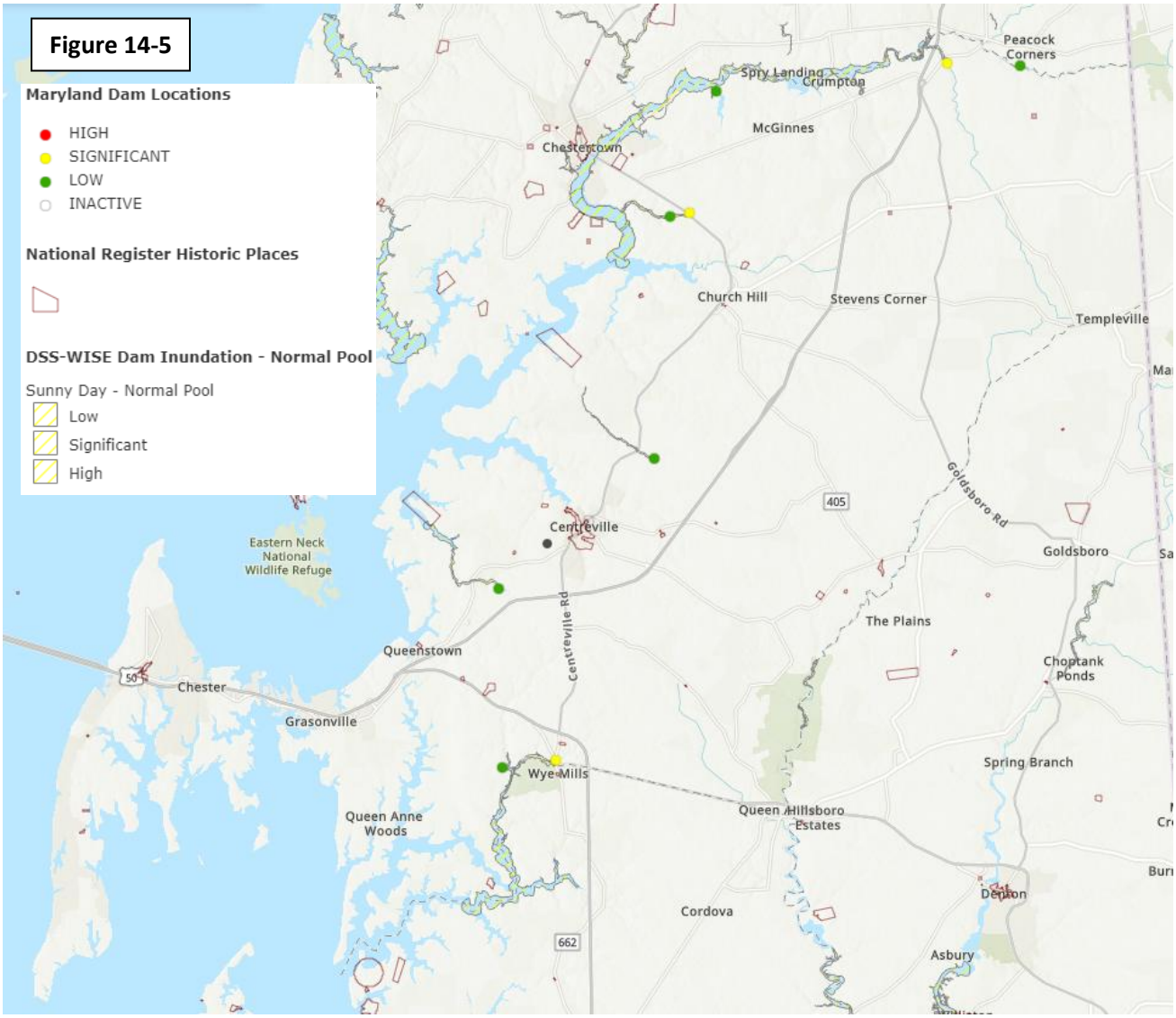
As previously mentioned, Wye Mills Dam EAP stated the two (2) businesses are located in the dam inundation area. These businesses are located immediately downstream of the dam embankment on the side of Route 662 opposite the dam. The two (2) businesses include Wye Mills Granary and Maryland DNR Wildlife Office.

The Wye Mills Granary structure is historic, having been established in 1682. Flood damage to this structure could cause irreparable harm to the structure, in part because the structure is historic and valuable to the community. The DNR Regional Office provides important services, but it is open by appointment only and is not considered historical. Damage to the property or structure would be a loss to the State and those served by the office in the region.

Emergency Action Plans for Owings Farm Pond and Unicorn Lake indicate that no homes or businesses are located within the inundation area of either dam.

14.7.5 VULNERABILITY AND IMPACTS TO HISTORIC STRUCTURES

Figure 14-5, following, depicts National Register Historic Places along with dam locations and associated dam inundation areas. The Old Wye Mill, on Maryland Route 662, is a museum identified on the Historic Register and is within the inundation area of Wye Mills Dam. The site is comprised of one building in fair condition, which has been altered over the years but kept consistent with its original design and purpose. Wye Mill is a small frame building - four bays long and two bays wide. Its gable roof, siding, and the foundation were renewed in 1953.



Source: Maryland Dam Inventory MDE

14.8 Dam Failure Mitigation Strategies

The entirety of the dam failure chapter was reviewed by the Hazard Mitigation Planning Committee and culminated in the development of a dam failure mitigation goal, associated objectives, and several mitigation actions to reduce long-term vulnerabilities from potential dam failure. Note, there are no high hazard dams in or that affect Queen Anne's County, however there are three (3) significant hazard dams. Included below are three (3) mitigation actions identified include notification, warning, and ongoing long-term outreach as property owners change overtime. The other mitigation action is specific to dams that will need evaluation and monitoring as they are either significant or high hazard potential dams and have exceeded their 50-year service life. All these actions prompt the building of partnerships with dam owners which may result in rehabilitation projects as the age of the dams continue to advance.

Goal: Minimize the impacts from dam failure to people, structures, systems, and community resources.

Objective #1: Ensure continuity of operations and increase community resiliency.
Objective #2: Ensure adequate public safety warning is available.

Mitigation Action #DF1: Host meeting to determine dam rehabilitation project specifications, time schedule, and funding source(s) for each significant hazard dam in the County.

Mitigation Action #DF-2: As a follow up to the 2022 Dam Safety Exercise, develop and conduct a HSEEP complaint drill or functional exercise evaluating notification and response capability(s).

Mitigation Action #DF-3: Add signage to the following roadway indicating they are within the inundation area for significant hazard dam.

Chapter 15
Community Capabilities

This chapter of the Plan describes how the existing authorities, policies, programs, funding and resources of Queen Anne's County and its participating municipalities are available to support the mitigation strategy. Capabilities are described in both narratives and tables throughout this chapter. During this plan update, FEMA Region 3 Hazard Mitigation Plan Guidance, Community Capability Assessment Worksheets were used in the development of this chapter and during planning meetings with both the Hazard Mitigation Planning Committee (HMPC) and participating municipalities. This chapter consists of the following subsections:

- 15.1 REVIEW OF PAST & CURRENT CAPABILITIES, GAPS, AND LIMITATIONS
- 15.2 COUNTY & MUNICIPAL PLANNING & REGULATORY
- 15.3 COUNTY & MUNICIPAL ADMINISTRATIVE & TECHNICAL
- 15.4 COUNTY & MUNICIPAL FINANCIAL
- 15.5 COUNTY & MUNICIPAL EDUCATION & OUTREACH
- 15.6 FLOOD HAZARD CAPABILITIES
  - 15.6.1 2014 Floodplain Ordinance
  - 15.6.2 Environmental Site Design (ESD)
  - 15.6.3 Maryland Community Rating System (CRS) Users Group
  - 15.6.4 Flood Insurance Information
  - 15.6.5 Floodplain Information
  - 15.6.6 Elevation Certificates
  - 15.6.7 County Flood Buy-out Listing
  - 15.6.8 Flood Mitigation Activities
  - 15.6.9 Municipal NFIP Community Information
  - 15.6.10 County NFIP Community Questionnaire
- 15.7 SOCIAL EQUITY & VULNERABILITY CAPABILITIES
  - 15.7.1 Mobile Integrated Community Health (MICH) Program
  - 15.7.2 Translations
  - 15.7.3 Broadband Connectivity
  - 15.7.4 Additional Assistance
- 15.8 MUTUAL AID
- 15.9 ESSENTIAL FACILITIES EMERGENCY BACK-UP POWER
- 15.10 CONCLUSIONS

Capabilities include authorities, policies, programs, staff, funding, and other resources available to accomplish mitigation and long-term vulnerability reduction. Many of these capabilities identified for Queen Anne's County are shared and/or support municipalities, as well.

15.1 Review of Past & Current Capabilities, Gaps, and Limitations

Assessing community capabilities is an essential part of the mitigation planning process. Gaps and limitations identified the 2019 Queen Anne's County Hazard Mitigation Plan (QAC HMP) resulted in a listing of gaps and recommended mitigation actions to expand on and improve existing policies and programs and are listed in the left-hand column in Table 15-1. Those gaps and recommended mitigation actions were reviewed during this plan update development process to determine what gaps and limitations still exist, and if so, what mitigation actions should be undertaken in the future to close these gaps and address outstanding limitations, which are detailed in grey, 2025 QAC HMP Identified Gap.

TABLE 15-1: REVIEW OF 2019 QAC HMP GAPS & MITIGATION ACTIONS, CURRENT CAPABILITIES, & NEW MITIGATION ACTIONS TO CLOSE CAPABILITY GAPS & LIMITATIONS

2019 Identified Gaps & Recommended Mitigation Action Items	**Capability gap addressed? Yes/No**	**Current Capability**
Include and reference the 2019 Queen Anne's County Hazard Mitigation Plan in existing and future planning documents, specifically updates to the County Comprehensive Plan, Municipal Growth Plans and the Water & Sewer Plan.	Yes	PlanQAC 2022 was adopted on May 24, 2022, as an update to the 2010 Comprehensive Plan. Included within the plan update: **Floodplain & Flood Hazards** 5-8 through 5-9, **Flood Insurance** 5-10, **Conservation Lands** 5-11 thru 5-12, **Hazard Mitigation** 5-13 thru 5-16, & **Climate Change** 5-17.
	Yes	2022 Towns of Centreville Comprehensive Plan and the 2023 Town of Millington Comprehensive Plan
	No	Plans that were not updated since the 2019 HMP: -2018 Town of Barclay Comprehensive Plan -2010 Town of Church Hill Comprehensive Plan -2017 Town of Queenstown Comprehensive Plan -2014 Town of Sudlersville Comprehensive Plan
2025 QAC HMP Identified Gap- Town Comprehensive Plans that were not updated and did not include Hazard Mitigation Planning listed above should reference and include hazard risk information and mapping from the 2025 Queen Anne's County Hazard Mitigation Plan in existing and future planning documents, specifically updates to their Comprehensive Plan and future growth management. **New Mitigation Action AH-1, Chapter 17 Mitigation Strategy**		
Review Hazard Areas of Concern identified in 2019 Queen Anne's County Hazard Mitigation Plan in relation to potential hazard overlay zones. These areas have been identified as "high-risk" and special consideration should be undertaken in terms of future growth and development.	Yes, however, no, specific to overlay zone	-The County's growth management strategy is to work with the towns to concentrate growth in their existing and new population centers, all while reassessing the Growth Areas and encouraging infill and redevelopment. The population growth would be accompanied by employment opportunities with the intent that cost effective public facilities and services will be provided to meet population needs, resulting in a reduction of traffic impacts, and reduction in the impacts on the environment with an emphasis on management and protection of water resources and **climate impact resiliency**. -Recommendation from page 5-25: To accommodate storm

		surges, nuisance flooding, rising sea levels, and climate change, prevent development in mapped flood zones and evaluate the appropriateness of going beyond FEMA requirements to consider additional restrictions based on projected sea level rise.
2025 QAC HMP Identified Gap- Include hazard overlay zones including additional restrictions based on projected sea level rise, going beyond FEMA requirements. **New Mitigation Action SLR-1, Chapter 17 Mitigation Strategy**		
Consider the transportation network in relation to hazards and evacuation within Community Facilities and Transportation chapters of the County Comprehensive Plan. Specifically flood related hazards and Sea Level Change.	No	This was not considered in Chapter 6 Transportation in PlanQAC 2022. This was not considered or identified in Town Comprehensive Plans.
2025 QAC HMP Identified Gap- Consider the transportation network in relation to hazards and evacuation within Community Facilities and Transportation chapters of the County Comprehensive Plan. Specifically flood related hazards and Sea Level Change. Integrate the QAC Nuisance Flood Plan which includes municipal roadways into both the county and municipal Comprehensive Plan updates, and other transportation planning documents. **New Mitigation Actions FL-1 & FL-2, Chapter 17 Mitigation Strategy**		
Review projects during the capital improvement planning process to determine which projects, if any, would encourage development in areas vulnerable to natural hazards. Specifically flood related hazards including Sea Level Change.	No	2019 County Climate Resilience Planning and Financing Study was not completed during the 2019-2024 HMP planning cycle.
2025 QAC HMP Identified Gap- Finalize the 2019 County Climate Resilience Planning and Financing Study and contemplate the prioritization of resiliency projects and capital improvements. **New Mitigation Action SLR-3, Chapter 17 Mitigation Strategy**		
Identify Open Space and/or Conservation area mitigation strategies for reducing areas of risk.	Yes	Both county and municipal comprehensive plans consider land for priority preservation, buffers, and tree planting.

Source: 2019 Queen Anne's County Comprehensive Plan, 2022 PlanQAC, 2022 Towns of Centreville Comprehensive Plan, 2023 Town of Millington Comprehensive Plan, 2018 Town of Barclay Comprehensive Plan, 2010 Town of Church Hill Comprehensive Plan, 2017 Town of Queenstown Comprehensive Plan, 2014 Town of Sudlersville Comprehensive Plan.

The following four (4) current capabilities areas for the County and participating municipalities were reviewed for this plan update.



PLANNING AND REGULATORY, ADMINISTRATIVE AND TECHNICAL, FINANCIAL, AND, EDUCATION AND OUTREACH.

Capability assessment tools were pre-populated for both the County and municipalities. These tools were sent to the HMPC for review and comment. During the HMPC Mid-Point meeting held on August 28, 2024, a self-assessment of capability areas for Queen Anne's County was completed. HMPC members were asked to state the County's degree of capability (limited, moderate, or high) for the four (4) capabilities areas listed above. Based on members perspective, results were:

- Planning and Regulatory Capability - High
- Administrative and Technical Capability - High
- Financial Capability - Moderate
- Public Education and Outreach Capability- Moderate/Limited (very small staff)

Municipalities reviewed and discussed their current capabilities during municipal meetings.

- Town of Barclay- September 12, 2024; 1:30-3:30 PM
- Town of Sudlersville- September 12, 2024; 10:00AM-12:00PM
- Town of Millington- September 19, 2024; 10:00AM-12:00PM
- Town of Church Hill- September 19, 2024; 1:30-3:30 PM
- Town of Centreville- September 24, 2024; 10:00AM-12:00PM
- Town of Queenstown- September 24, 2024; 1:30-3:30 PM

Municipal representatives were asked to state their municipality's degree of capability (limited, moderate, or high) for the four (4) capabilities areas listed above. Based on their municipal perspective, results were:

TABLE 15-2: MUNICIPAL DEGREE OF CAPABILITIES SELF-ASSESSMENT

Current Capability Area	Barclay	Centreville	Church Hill	Millington	Queenstown	Sudlersville
Planning and Regulatory	Limited	High	Moderate	Moderate	Moderate	Moderate
Administrative and Technical	Moderate	High	Limited	High	Moderate	Moderate
Financial	Limited	Moderate	Limited	Moderate	Moderate	Moderate
Public Education and Outreach	Limited	High	Limited	High	High	Moderate

For each of the four (4) current capabilities areas the County and municipalities were assessed for this plan update, using Region 3 Hazard Mitigation Plan Guidance Community Capability Assessment Worksheets.

15.2 COUNTY & MUNICIPAL PLANNING & REGULATORY

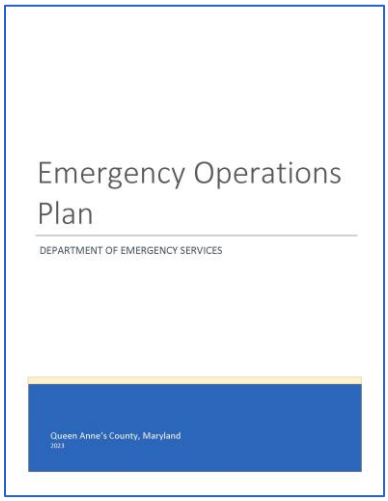
Planning and regulatory capabilities are plans, policies, codes, and ordinances that prevent and reduce the impacts of hazards. The planning and regulatory capabilities were assessed for the county and the six (6) participating municipalities, all of which exercise land use authority.

During the planning process, the county and each participating municipality provided additional planning and regulatory information, which is included on Tables 15-3 to 15-9, below. Following the review of the planning and regulatory capabilities, several all-hazard mitigation actions were identified during this plan update to close capability gaps and support the mitigation strategy include:

The following Towns have not included the hazard mitigation plan into their policies, codes, or comprehensive plans: Centreville, Church Hill, Queenstown, Barclay, and Millington.

In addition, Tables 15-3 to 15-9 provide information on existing building codes and land use and development ordinances per jurisdiction, along with date adopted, and comments.

New Action AH-1: Integrate the hazard mitigation plan into other plans, ordinances and programs that dictate land use decisions in the community, including Capital Improvement Programs, Master Plans, and Strategic Plans.



In 2023, the Queen Anne's County Department of Emergency Services (DES) updated the Emergency Operations Plan (EOP). The basic plan and emergency support functions were reformatted, and new information was integrated including community lifelines. A new component included in the updated was the Emergency Operations Center (EOC) Management Section. The EOC Management Section provides position specific responsibilities during the three phases of an incident. These details have been included on various checklists within this section and are specific to staff roles. Each checklist includes tasks organized into three phases: Activation, Operations, and Demobilization. The County Board of Commissioners adopted the plan in August 2023.

The Town of Millington had an Emergency Operations Plan (EOP) maintained in cooperation with the Volunteer Fire Department. The Town of Queenstown indicated that they follow the Queen Anne's County EOP. The Towns of Barclay, Centreville, Church Hill, and Sudlersville reported that they do not currently have an EOP. In an effort to close this capability gap, the Town of Centreville will seek assistance for the County to develop an Emergency Operations Plan (EOP) and a Continuity of Operations Plan. In addition, a new mitigation action was developed.

New Action AH-2: Development of a County-Municipal workshop to provide an overview of the roles of local government in emergency management.

In addition, Tables 15-3 to 15-9 provide information on existing building codes and land use and development ordinances per jurisdiction, along with date adopted, and comments.

TABLE 15-3: BARCLAY PLANNING & REGULATORY CAPABILITIES			
Tool/Program	**Status**		
	In Place (Y/N)	**Adopted or Updated (Year)**	**Under Development / Comments**
Hazard Mitigation Plan	Y	2019	QAC Multi-Jurisdictional HMP
Emergency Operations Plan	N		
Capital Improvement Plan	Y	Annual	Annual Budget
Continuity of Operations Plan	N		
Floodplain Management Ordinance	Y		No SFHA
Zoning Regulations	Y	2015	Zoning Ordinance Barclay, Maryland
Subdivision Regulations	Y	2015	
Comprehensive Plan	Y	2018	Barclay Community Plan
Stormwater Management Plan	N		
Natural Resource Protection Plan	N		
Parks and Recreation Plan	N		
Hazardous Waste Assessment	N		
Firewise Community	N		
Storm Ready	N		
Citizen Corps	N		
Building Code	Y	2015	
Note: The Town has had a building moratorium in place for the past 5 years. Therefore, no new development has occurred.			

TABLE 15-4: CENTREVILLE PLANNING & REGULATORY CAPABILITIES			
Tool/Program	**Status**		
	In Place (Y/N)	**Adopted or Updated (Year)**	**Under Development / Comments**
Hazard Mitigation Plan	Y	2019	QAC Multi-Jurisdictional HMP
Emergency Operations Plan	N		Interested in developing an EOP
Capital Improvement Plan	Y	Annual	Fiscal Year Budgets
Continuity of Operations Plan	N		Interested in developing a COOP
Floodplain Management Ordinance	Y	2014	Chapter 66 Floodplain Management
Zoning Regulations	Y	2022	Chapter 170 Zoning
Subdivision Regulations	Y	2020	Chapter 138 Subdivision Regulations
Comprehensive Plan	Y	2022	Town of Centreville Comprehensive Plan: 2040
Stormwater Management Plan	Y	2013	Chapter 132 Stormwater Management
Natural Resource Protection Plan	Y	1993	Chapter 69 Forest Conservation

TABLE 15-4: CENTREVILLE PLANNING & REGULATORY CAPABILITIES			
Tool/Program	**Status**		
	In Place (Y/N)	**Adopted or Updated (Year)**	**Under Development / Comments**
Parks and Recreation Plan	Y		Parks Master Plan
Hazardous Waste Assessment	N		
Firewise Community	N		
Storm Ready	N		
Citizen Corps	N		
Building Code	Y	2024	Chapter 28 Building Construction
Note: Centreville presently has no housing units in the development pipeline, which is to say there are no unbuilt housing developments with final plan or plat approval. However, the Providence Farm subdivision continues to build out and has less than 12 lots remaining.			

TABLE 15-5: CHURCH HILL PLANNING & REGULATORY CAPABILITIES			
Tool/Program	**Status**		
	In Place (Y/N)	**Adopted or Updated (Year)**	**Under Development / Comments**
Hazard Mitigation Plan	Y	2019	QAC Multi-Jurisdictional HMP
Emergency Operations Plan	N		
Capital Improvement Plan	Y	Annual	Yearly Budget
Continuity of Operations Plan	N		
Floodplain Management Ordinance	Y		Chapter 40 Floodplain Management
Zoning Regulations	Y		Chapter 75 Zoning
Subdivision Regulations	Y		Chapter 67 Subdivision
Comprehensive Plan	Y	2010	The Church Hill Comprehensive Plan
Stormwater Management Plan	Y		Chapter 62 Stormwater Management
Natural Resource Protection Plan	N		
Parks and Recreation Plan	N		
Hazardous Waste Assessment	N		
Firewise Community	N		
Storm Ready	N		
Citizen Corps	N		
Building Code	Y	2020	Chapter 27 Building Code
Note: The Town reported that no new development has occurred in the past five years.			

TABLE 15-6: MIILINGTON PLANNING & REGULATORY CAPABILITIES			
Tool/Program	**Status**		
	In Place (Y/N)	**Adopted or Updated (Year)**	**Under Development / Comments**
Hazard Mitigation Plan	Y	2019	QAC Multi-Jurisdictional HMP

TABLE 15-6: MIILINGTON PLANNING & REGULATORY CAPABILITIES			
Tool/Program	**Status**		
	In Place (Y/N)	**Adopted or Updated (Year)**	**Under Development / Comments**
Emergency Operations Plan	Y	2022	In Cooperation with VFD
Capital Improvement Plan	Y	Annual	Capital Budget
Continuity of Operations Plan	N		
Floodplain Management Ordinance	Y	2024	Chapter 34 Floodplains
Zoning Regulations	Y	2022	Chapter 80 Zoning Ordinance
Subdivision Regulations	Y	2024	Chapter 66 Subdivision of Land
Comprehensive Plan	Y	2023	Town Of Millington 2023 Comprehensive Plan
Stormwater Management Plan	Y	2024	Chapter 60 Stormwater Management
Natural Resource Protection Plan	N		
Parks and Recreation Plan	N		
Hazardous Waste Assessment	N		
Firewise Community	N		
Storm Ready	N		
Citizen Corps	N		
Building Code	Y	2006	Follows QAC Building Code – Updated when County Updates

TABLE 15-7: QUEENSTOWN PLANNING & REGULATORY CAPABILITIES			
Tool/Program	**Status**		
	In Place (Y/N)	**Adopted or Updated (Year)**	**Under Development / Comments**
Hazard Mitigation Plan	Y	2019	QAC Multi-Jurisdictional HMP
Emergency Operations Plan	N		Follows the County
Capital Improvement Plan	Y	Annual	Annual Budget
Continuity of Operations Plan	N		
Floodplain Management Ordinance	Y	2022	Chapter 19 Floodplain – Ordinance 14-04
Zoning Regulations	Y	2022	Queenstown Zoning Ordinance
Subdivision Regulations	Y	2013	Queenstown Subdivision Ordinance
Comprehensive Plan	Y	2019	2017 Comprehensive Plan Queenstown, Maryland – Revised 2019
Stormwater Management Plan	Y	2010	Stormwater Management Chapter Town Code Chapter 25
Natural Resource Protection Plan	Y	2013	Forest Conservation Chapter Town Code Chapter 26
Parks and Recreation Plan	Y	2021	Queenstown Trails Master Plan
Hazardous Waste Assessment	N		
Firewise Community	N		

TABLE 15-7: QUEENSTOWN PLANNING & REGULATORY CAPABILITIES			
Tool/Program	**Status**		
	In Place (Y/N)	**Adopted or Updated (Year)**	**Under Development / Comments**
Storm Ready	N		
Citizen Corps	N		
Building Code	Y	2022	Ordinance No. 22-04 (2021 IRC)

TABLE 15-8: SUDLERSVILLE PLANNING & REGULATORY CAPABILITIES			
Tool/Program	**Status**		
	In Place (Y/N)	**Adopted or Updated (Year)**	**Under Development / Comments**
Hazard Mitigation Plan	Y	2019	QAC Mult-Jurisdictional HMP
Emergency Operations Plan	N		
Capital Improvement Plan	Y	Annual	Yearly Budget
Continuity of Operations Plan	N		
Floodplain Management Ordinance	N		No SFHA with Town Limits
Zoning Regulations	Y	2016	2016 Sudlersville Zoning Ordinance
Subdivision Regulations	Y	2005	Town of Sudlersville Subdivision Regulations
Comprehensive Plan	Y	2014	2014 Sudlersville Comprehensive Plan
Stormwater Management Plan	Y	2016	Adopted by: Ordinance 005, 7/23/1984 Amended on: 1/6/2016, Ordinance 2015-04
Natural Resource Protection Plan	N		
Parks and Recreation Plan	N		
Hazardous Waste Assessment	N		
Firewise Community	N		
Storm Ready	N		
Citizen Corps	N		
Building Code	Y	2015	Building Construction and Building Code Adopted by: Ordinance 2002-03: 7/2/2002 Amended on: 12/5/2012, Ordinance 2012-03 Amended on: 10/7/2015, Ordinance 2015-03

TABLE 15-9: QUEEN ANNE'S COUNTY PLANNING & REGULATORY CAPABILITIES			
Tool/Program	**Status**		
	In Place (Y/N)	**Adopted or Updated (Year)**	**Under Development / Comments**
Hazard Mitigation Plan	Y	2019	QAC Mult-Jurisdictional HMP
Emergency Operations Plan	Y	2023	QAC Emergency Operations Plan
Capital Improvement Plan	Y	2024	Fiscal Year (FY) 2025 Capital Budget
Continuity of Operations Plan	Y	2020	Adoption was on hold due to COVID

TABLE 15-9: QUEEN ANNE'S COUNTY PLANNING & REGULATORY CAPABILITIES			
Tool/Program	**Status**		
	In Place (Y/N)	**Adopted or Updated (Year)**	**Under Development / Comments**
Floodplain Management Ordinance	Y	2014	Chapter 14:3 Floodplain Management
Zoning Regulations	Y	2024	Chapter 18:1 Zoning and Subdivision Regulations – in the process of updating
Subdivision Regulations	Y	2004	Chapter 18:1 Zoning and Subdivision Regulations
Comprehensive Plan	Y	2022	QAC Comprehensive Plan
Stormwater Management Plan	Y	2010	Chapter 14:4 Stormwater Management
Natural Resource Protection Plan	Y	2004	Chapter 18:2 Forest Conservation Act
Parks and Recreation Plan	Y	2022	Queen Anne's County 2022 Land Preservation, Parks & Recreation Plan
Hazardous Waste Assessment	Y	2014	Chapter 30 Hazardous Materials
Firewise Community	N		
Storm Ready	Y	Current	
Citizen Corps	N		
Building Code	Y	2024	2021 IBC & IRC

15.3 County & Municipal Administrative and Technical

Administrative and technical capabilities include boards, commissions, departments, staff, and consulting services, along with the related skills and tools, which can be used for mitigation planning and the implementation of specific mitigation actions.

During the planning process, the county and each participating municipality provided additional administrative and technical capability information, which is included on Tables 15-10 to 15-15, while Queen Anne's County administrative and technical capability information is included on Table 15-16.

Participants that do not have the ability or authority to expand and/or improve their capabilities, or have limited abilities, the following was identified by participating municipalities.

- The Town of Barclay has a staff of one.
- The Town of Centreville has limited staff.
- The Town of Church Hill has very limited staff.
- The Town of Millington has limited staff.
- The Town of Queenstown has limited staff.
- The Town of Sudlersville has very limited staff, Town Clerk only.

In addition, Tables 15-10 through 15-16 provide information on staffing and technical assistance.

TABLE 15-10: BARCLAY ADMINISTRATIVE & TECHNICAL				
Staff or Personnel Resource	**Yes**	**No**	**Department or Staff Member**	**Comments**
Land Use/Development Planning	Yes			Planning Commission
Engineering		No		
Emergency Manager		No		
Floodplain Manager	Yes		Town Manager	Virginia Albers
Staff with experience using Geographic Information Systems software		No		

TABLE 15-11: CENTREVILLE ADMINISTRATIVE & TECHNICAL				
Staff or Personnel Resource	**Yes**	**No**	**Department or Staff Member**	**Comments**
Land Use/Development Planning	Yes		1 Planner	Technical Advisory Committee
Engineering	No			Contractor when needed.
Emergency Manager		No		
Floodplain Manager	Yes		Town Manager	Carolyn Brinkley
Staff with experience using Geographic Information Systems software		No		

TABLE 15-12: CHURCH HILL ADMINISTRATIVE & TECHNICAL				
Staff or Personnel Resource	**Yes**	**No**	**Department or Staff Member**	**Comments**
Land Use/Development Planning	Yes			Planning Commission
Engineering		No		
Emergency Manager		No		
Floodplain Manager	Yes		Town Manager	Nancy Lindyberg
Staff with experience using Geographic Information Systems software		No		

TABLE 15-13: MILLINGTON ADMINISTRATIVE & TECHNICAL				
Staff or Personnel Resource	**Yes**	**No**	**Department or Staff Member**	**Comments**
Land Use/Development Planning	Yes		1	Planning Commission & Planning Consultant
Engineering	Yes		1	Contract w/ KC Technology
Emergency Manager		No	1	
Floodplain Manager	Yes		Town Manager	Jo Manning
Staff with experience using Geographic Information Systems software		No		

TABLE 15-14: QUEENSTOWN ADMINISTRATIVE & TECHNICAL				
Staff or Personnel Resource	**Yes**	**No**	**Department or Staff Member**	**Comments**
Land Use/Development Planning	Yes		Town Planner-Contractor	
Engineering	Yes		(2) Public works staff	Engineer- Contractor
Emergency Manager		No		
Floodplain Manager	Yes		Town Manager	Amy Moore
Staff with experience using Geographic Information Systems software		No		

TABLE 15-15: SUDLERSVILLE ADMINISTRATIVE & TECHNICAL				
Staff or Personnel Resource	**Yes**	**No**	**Department or Staff Member**	**Comments**
Land Use/Development Planning	Yes			Planning Commission
Engineering	Yes			Contractor, as needed
Emergency Manager		No		
Floodplain Manager		No		Does not participate in NFIP
Staff with experience using Geographic Information Systems software		No		

TABLE 15-16: QUEEN ANNE'S COUINTY ADMINISTRATIVE & TECHNICAL				
Staff or Personnel Resource	**Yes**	**No**	**Department or Staff Member**	**Comments**
Land Use/Development Planning	Yes		P&Z – 7 Staff Members	Planning & Zoning Staff
Engineering	Yes		DPW – 7 Staff Members	Public Works Staff
Emergency Manager	Yes		DES – 3 Staff	DES Staff specific to EM, See note on DESAC
Floodplain Manager	Yes		DPW – John Kling	
Staff with experience using Geographic Information Systems software	Yes		DIT – Tyler Pease, Sam Stanton	Geographical Information Systems Staff

Note: In addition, the Department of Emergency Services is served by the Advisory Council (DESAC) whose function is to advise the Department on matters of policy regarding the provision of emergency services within Queen Anne's County. In order to carry out this mission there are four standing committees: Law Enforcement, EMS and Public Health, Communications, and Public Information and Education. DESAC provides a forum for all public health and safety departments and agencies to discuss issues of mutual concern, as well as to advise the Department on how best to serve them.

15.4 County & Municipal Financial

Financial capabilities include access to or eligibility to use funding resources for hazard mitigation. During the planning process, the county and each participating municipality provided additional financial capability information.

Access to and eligibility to use funding resources are a top priority for the County and all participating municipalities. Grant matching funds are included within the Queen Anne's County's operating budget for approved hazard mitigation initiatives and projects. This maintains an ongoing hazard mitigation program at the local level. Following the review of the financial capabilities, mitigation actions identified during this plan update to close capability gaps and support the mitigation strategy.

Municipal grant writing staff or other fiscal staff reported by participating municipalities include:

- Town or Barclay – Brown Associates has been hired to assist with grants.
- Town of Centreville – (1) Finance Officer, (3) Finance Specialist, (1) grant writer
- Town of Church Hill – None
- Town of Millington – (1), however Town Manager, multiple roles
- Town of Queenstown – Town Manager works on finance and grants, no assigned staff for grants.
- Town of Sudlersville – no staff for grants. Town clerk works on fiscal, office of one.

Participants that do not have the ability or authority to expand and/or improve their capabilities, or have limited abilities, include:

- The Town of Church Hill lacks grant writing and fiscal staff and resources.
- The Town of Sudlersville lacks grant writing and fiscal staff and resources.

Currently, Queen Anne's has a rating of a Class 10, under the Community Rating System. While county residents are eligible to purchase federally back flood insurance under the National Flood Insurance Program (NFIP), residents do not benefit from a flood insurance discount.

New Action FL-4: Complete Community Rating System (CRS) application following Community Assistance Visit (CAV) close-out.

15.5 County & Municipal Education and Outreach

Education and outreach capabilities include programs and methods already in place that could be used to support implementation of mitigation actions and communicate hazard-related information.

During the planning process, the county and each participating municipality provided additional education and outreach capability information. Following the review of the education and outreach capabilities, mitigation actions identified during this plan update to close capability gaps and support the mitigation strategy include:

New Action AH-3: Implement a good policy and strategies for engaging our multicultural residents. Develop a workgroup including the QAC Department of Community Affairs- Communications Office, and Town Planners to develop a policy and procedures for translation, languages needed and discover the best way to engage those residents and how best to provide information.

Environmental Health recommended an education and outreach mitigation action to address flood-proof caps for wellheads if the property is in a flood zone(s) and ensuring that wellheads are at least 8 feet above base flood elevation.

New Action FL-6: Encourage homeowner wellhead protection in the floodplain.

An ongoing education and outreach capability is the QAC Community Emergency Response Team (CERT), which educates volunteers on disaster preparedness and basic disaster response skills. CERT members are taught based on nationally recognized guidelines and the material is adapted to conform to the hazards that could be faced within Queen Anne's County. CERT training teaches basic response skills ranging from fire safety, light search, and rescue to disaster psychology and how people typically react when disasters strike. In a disaster when Emergency Services personnel could be delayed in response, CERT members become the first to respond.

CERT training is spread out over seven days and is taught for 2-3 hours each day, usually in the evening. Training includes:

- disaster preparedness;
- fire suppression;
- basic medical operations;
- light search and rescue operations; disaster psychology;
- team organization; and,
- disaster simulation to test the knowledge and skills taught during the training.

Once the CERT training has been completed, members are given a backpack with the basic tools necessary to respond to a disaster. Queen Anne's County CERT members also can volunteer during numerous planned events throughout the year. The Symphony Village CERT is the largest team in Queen Anne's County. In addition, outreach initiatives advocating personal preparedness and mitigation continue, including teaching CERT curriculum in both county High Schools and at Stevensville Middle School. The County has implemented CERT Hybrid to expand access to the training. The Department has also been increasingly active with area businesses, organizations, and communities by attending community events and teaching community classes. Citizens in the county may sign up for CERT training through the CERT webpage.



In addition, Queen Anne's County Citizen Alert Notification System keeps its citizens informed about emergencies and other important community news. This system enables the county to provide critical information quickly in a variety of situations, such as severe weather, unexpected road closures, missing persons and evacuations of buildings or neighborhoods. The alert notification system will enable its citizens to receive time-sensitive messages wherever specified, such home, mobile or business phones, email address, text messages and more.



In addition to the citizen alert notification system, the county utilized social media platforms such as X, Facebook, Instagram, Nextdoor and YouTube to keep citizens informed of critical information for personal and public safety.

The County is going to begin a Neighborhood/Community Program. This program was active until the pandemic, COVID-19. The Department of Emergency Services (DES) planned to initiate this program again in the summer 2024. The program involves DES providing hazard information to communities/

neighborhoods throughout the County. DES plans to target specific groups or vulnerable populations through this program.

Other forms of outreach and notification used include:

- The Town of Barclay has an email listing that is used to provide emergency notifications. A new website has been developed for the Town and will be utilized as well for providing hazard related information. A bulletin board located at the Town Center that is also used to provide information.

15.6 Flood Hazard Capabilities

Flooding is a high-risk hazard for Queen Anne's County. As such, additional capabilities, activities, and completion of the Region 3 Hazard Mitigation Plan Guidance Checking in on the NFIP – Community Worksheets have been included in this chapter.

15.6.1 2014 FLOODPLAIN ORDINANCE

Adopted by the Board of County Commissioners of Queen Anne's County September 9, 2014, by Ord. No. 14-12. [1] Amendments noted where applicable. Floodplain Ordinance can be found on-line at: https://ecode360.com/7136065

In addition, the County currently regulates outside the Special Flood Hazard Area (SFHA) on specific occasions. If a structure's lowest grade elevation is lower than the SFHA elevation, the structure would be regulated and require flood insurance.

15.6.2 ENVIRONMENTAL SITE DESIGN (ESD)

As described by the Queen Anne's County Department of Public Works, when it rains, a portion of that water soaks into the ground, and a portion runs off. Stormwater management is all about reducing the amount of runoff through three principles:

- slow it down;
- spread it out; and,
- and soak it in.

Designers have an array of stormwater practices at their disposal to achieve these goals and integrate them into a construction project. This process is referred to as "*Environmental Site Design*" (ESD). Queen Anne's County has applied updated Environmental Design Standards to help mitigate impacts of flooding to the county.

15.6.3 MARYLAND COMMUNITY RATING SYSTEM (CRS) AND CRS USERS GROUP

The County is interested in participating in the Community Rating System (CRS). A Letter of Interest was submitted on October 9, 2018, which initiated the Community Assistance Visit. Once all required corrective actions are satisfied and the County receives an approved CAV, the County will proceed with their CRS application. County staff regularly attend the quarterly Maryland CRS Users Group meetings. Best practices and lessons learned across the State of Maryland are highlighted at the meeting.

15.6.4 FLOOD INSURANCE INFORMATION

Information pertaining to flood insurance and the National Flood Insurance Program is available on the County's Floodplain webpage. The County point of contact for assistance is listed, along with a direct

telephone number and the extension. Various resources and website links are listed as follows:

1. FEMA Flood Map Service Center
2. DFIRM Outreach Program
3. Flood Smart
4. Ready.gov
5. Brochure: Protect Your Home from Flooding- Low Cost Projects You Can Do Yourself
6. Association of State Floodplain Managers -
7. QAC Property Viewer - Mapping tool that allows user to zoom into a property. At the top of the screen click on "I want to ..." and pick search criteria. To see floodplain for property, click on "Layers" icon (bottom of screen), in Layers list check Environmental, then Floodplain.
8. Homeowner's Guide to Elevation Certificates
9. Queen Anne's County - Department of Emergency Services
10. Queen Anne's County Chamber of Commerce

Note: The Queen Anne's County Chamber of Commerce provides information for local insurance companies.

15.6.5 FLOODPLAIN INFORMATION

The Floodplain Information webpage provides additional information to the public about floodplains. Information includes:

- Building in a Flood Zone - Information regarding building within a flood zone.
- Functions of a Flood Zone - Information and resources regarding natural and beneficial functions of a flood zone.
- QAC Flood History - Historical timeline of flood events in Queen Anne's County
- Vulnerability Assessment Study - Sea Level Rise and Coastal Storm Surge Vulnerability Assessment Study Performed
- Flood Insurance Study, 2014

15.6.6 ELEVATION CERTIFICATES

The part of the Floodplain site provides elevation certificates in alphabetical order by street name; followed by house number then building permit number (if available).

15.6.7 COUNTY FLOOD BUY-OUT LISTING

In the previous planning process, the county was maintaining a listing of potential flood acquisition properties. However, the County does not have a potential flood acquisition listing currently. No properties had been acquired in the past five (5) years. Although the Department of Emergency Services is now working to acquire a severe repetitive loss property.

15.6.8 FLOOD MITIGATION ACTIVITIES

The following are current mitigation activities:

- Cloverfields Neighborhood Flood Mitigation Project Scoping
    - The Cloverfields is a coastal neighborhood on the north end of Kent Island between the mouth of Chester River and the Chesapeake Bay. The entire neighborhood drains into the Cox Creek, which is the lowest lying point in the neighborhood. The Cloverfields neighborhood has 5 documented repetitive loss properties along Cox Creek and over 106 'flood prone' residences. This project scoping activity is within Mitigation Action 19, which is outlined in Chapter 15 of the 2019 Queen Anne's County Multi-Hazard

Mitigation Plan. The primary activity for this project is to develop or conduct engineering, environmental, feasibility and/or benefit cost analyses for flood mitigation/prevention.

- Chester River Beach Project
  - This area has experienced several losses and over 100 claims due to nuisance flooding. This is a pending project since it is not included in this year's budget for the County. The Floodplain Manager expects to have further information in the next year.
- The Department of Public Works raised a section of Old Point Road in Chester in 2022 due to tidal water topping the roadway monthly.

15.6.9 MUNICIPAL NFIP COMMUNITY INFORMATION

NFIP community information is included Tables 15-17 through 15-19.

TABLE 15-17: QUEEN ANNE'S COUNTY NFIP REPORT

COMMUNITY NAME	NFIP STATUS	SPECIAL FLOOD HAZARD AREA	COASTAL/ TIDAL	COASTAL BARRIER RESOURCE SYSTEM	UPDATED ORDINANCE	FREE-BOARD	FIRM ADOPTION DATE
Town of Barclay	Participating	No	No	No	Yes/NSFHA	0	7/16/2014
Town of Centreville	Participating	Yes	Yes	No	Yes/Tidal	2 feet	9/18/2014
Town of Church Hill	Participating	Yes	Yes	No	Yes/Tidal	2 feet	9/15/2014
Town of Millington	Participating	Yes	No	No	Yes/Nontidal	2	4/8/2014
Town of Queenstown	Participating	Yes	Yes	No	Yes/Full MD Model Ordinance	2	10/22/2014

Source: FEMA Flood Insurance Report

TABLE 15-18: QUEEN ANNE'S COUNTY NFIP INSURANCE REPORT

COMMUNITY NAME	2019 # OF POLICIES	2024 # OF POLICIES	TOTAL PREMIUM/ TOTAL PAID	TOTAL CLAIMS SINCE 1978	TOTAL PAID SINCE 1978
Town of Barclay	0	1	674	0	0
Town of Centreville	24	36	18,437	22	$258,850.11
Town of Church Hill	1	4	2,108	0	0
Town of Millington	0	11	5,632	16	383,455.63
Town of Queenstown	19	66	31,174	26	392,555.13
Town of Sudlersville	0	1	660	0	0

Source: FEMA Policy & Claim Statistics for Flood Insurance, as of June 21, 2024.

TABLE 15-19: MUNICIPAL COMMUNITY ASSISTANCE VISITS OR CONTACTS (CAVS OR CACS)

PARTICIPATING NFIP COMMUNITY NAME	MOST RECENCT CAV OR CAC DATE
Town of Centreville	CAC- 6/10/2019
Town of Church Hill	CAC- 3/16/2016
Town of Millington	CAC 4/12/2018
Town of Queenstown	CAV 11/12/2020

NFIP participating communities administer their Substantial Improvement/Substantial Damage (SI/SD) provisions in accordance with their adopted floodplain management ordinance. The Towns of Barclay, Centreville, Church Hill, Millington, and Queenstown all utilize the Maryland Model Floodplain Ordinance as the basis for their adopted FPO. The specific language with the model ordinance that addresses SI/SD is as follows:

Substantial Damage: Damage of any origin sustained by a building or structure whereby the cost of restoring the building or structure to its before damaged condition would equal or exceed 50 percent of the market value of the building or structure before the damage occurred. Also used as "substantially damaged" structures. [Note: See "Substantial Improvement/Substantial Damage Desk Reference" (FEMA P-758).]

Substantial Improvement: Any reconstruction, rehabilitation, addition, or other improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the building or structure before the start of construction of the improvement. The term includes structures which have incurred substantial damage, regardless of the actual repair work performed. The term does not, however, include either:

(1) Any project for improvement of a building or structure to correct existing violations of State or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official prior to submission of an application for a permit and which are the minimum necessary to assure safe living conditions; or
(2) Any alteration of a historic structure, provided that the alteration will not preclude the structure's continued designation as a historic structure

Section 3.2(M): Administer the requirements related to proposed work on existing buildings:

(1) Make determinations as to whether buildings and structures that are located in flood hazard areas and that are damaged by any cause have been substantially damaged.
(2) Make reasonable efforts to notify owners of substantially damaged structures of the need to obtain a permit to repair, rehabilitate, or reconstruct, and prohibit the non-compliant repair of substantially damaged buildings except for temporary emergency protective measures necessary to secure a property or stabilize a building or structure to prevent additional damage.

Section 3.5(A)(12): For proposed work on existing buildings, structure, and manufactured homes, including any improvement, addition, repairs, alterations, rehabilitation, or reconstruction, sufficient information to determine if the work constitutes substantial improvement or repair of substantial damage, including but not limited to:

(a) If the existing building or structure was constructed after [DATE OF REGULAR PROGRAM ENTRY], evidence that the work will not alter any aspect of the building or structure that was required for compliance with the floodplain management requirements in effect at the time the building or structure was permitted.
(b) If the proposed work is a horizontal addition, a description of the addition and whether it will be independently supported or structurally connected to the base building and the nature of all other modifications to the base building, if any.

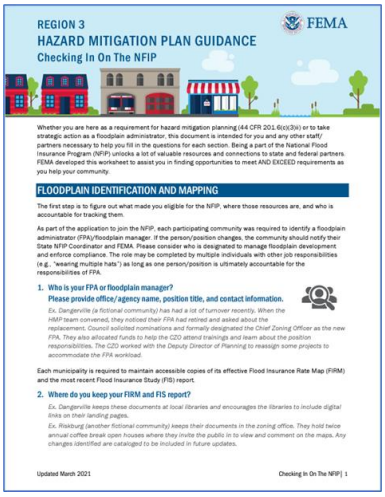
(c) Documentation of the market value of the building or structure before the improvement or, if the work is repair of damage, before the damage occurred.

(d) Documentation of the actual cash value of all proposed work, including the actual cash value of all work necessary to repair and restore damage to the before-damaged condition, regardless of the amount of work that will be performed. The value of work performed by the owner or volunteers shall be valued at market labor rates; the value of donated or discounted materials shall be valued at market rates.

15.6.10 COUNTY NFIP COMMUNITY QUESTIONNAIRE

As part of the Plan update, Region 3 Hazard Mitigation Plan Guidance Checking in on the NFIP – Community Worksheets were completed by Queen Anne's County's Floodplain Administer. These worksheets demonstrate the County's capabilities related to floodplain identification and mapping, floodplain management, and flood insurance. As a result of the questionnaire review, gaps and recommendations were identified and provided in the next steps.

Note: this information is required during the Hazard Mitigation Plan update process, 44 CFR 201.6(c)(3) ii.


REGION 3
FEMA
HAZARD MITIGATION PLAN GUIDANCE
Checking In On The NFIP

Whether you are here as a requirement for hazard mitigation planning (44 CFR 201.6(c)(3)ii) or to take strategic action as a floodplain administrator, this document is intended for you and any other staff/ partners necessary to help you fill in the questions for each section. Being a part of the National Flood Insurance Program (NFIP) unlocks a lot of valuable resources and connections to state and federal partners. FEMA developed this worksheet to assist you in finding opportunities to meet AND EXCEED requirements as you help your community.

FLOODPLAIN IDENTIFICATION AND MAPPING

The first step is to figure out what made you eligible for the NFIP, where those resources are, and who is accountable for tracking them.

As part of the application to join the NFIP, each participating community was required to identify a floodplain administrator (FPA)/floodplain manager. If the person/position changes, the community should notify their State NFIP Coordinator and FEMA. Please consider who is designated to manage floodplain development and enforce compliance. The role may be completed by multiple individuals with other job responsibilities (e.g., "wearing multiple hats") as long as one person/position is ultimately accountable for the responsibilities of FPA.

1. Who is your FPA or floodplain manager?
Please provide office/agency name, position title, and contact information.

Ex. Dangerville (a fictional community) has had a lot of turnover recently. When the HMP team convened, they noticed their FPA had retired and asked about the replacement. Council solicited nominations and formally designated the Chief Zoning Officer as the new FPA. They also allocated funds to help the CZO attend trainings and learn about the position responsibilities. The CZO worked with the Deputy Director of Planning to reassign some projects to accommodate the FPA workload.

Each municipality is required to maintain accessible copies of its effective Flood Insurance Rate Map (FIRM) and the most recent Flood Insurance Study (FIS) report.

2. Where do you keep your FIRM and FIS report?

Ex. Dangerville keeps these documents at local libraries and encourages the libraries to include digital links on their landing pages.

Ex. Riskburg (another fictional community) keeps their documents in the zoning office. They hold twice annual coffee break open houses where they invite the public in to view and comment on the maps. Any changes identified are cataloged to be included in future updates.

Updated March 2021

Checking In On The NFIP | 1

TABLE 15-20: FLOODPLAIN IDENTIFICATION & MAPPING

1. Who is your FPA or floodplain manager? Please provide office/agency name, position title, and contact information.	Mr. John Kling, Floodplain Administrator 410-758-0925 Ext. 4168 jkling@qac.org
2. Where do you keep your FIRM and FIS report?	Hard copies of the FIRM, FIS, & LOMCs are available in the Queen Anne's County Department of Public Works.
3. Has your community adopted the most recent FIRM? When was the adoption? Where is that information stored? Has your community updated the floodplain ordinance language to include the current FIRM and FIS?	Queen Anne's County, Maryland most recent effective FEMA FIRM, November 5, 2014, was adopted by the Board of County Commissioners of Queen Anne's County on 9-9-2014 by Ord. No. 14-12. The Queen Anne's County Floodplain Management Ordinance language follows the current FIRM and Flood Insurance Study (FIS). Hard copies are available for review in the County's Department of Public Works Office and the Floodplain website: https://ecode360.com/7136065.
4. Does your jurisdiction support requests for map updates?	Yes. Queen Anne's County reviews and may provide support for Letters of Map Change (LOMC) applications.
5. Is there a specific agency/department responsible for compiling these updates and tracking LOMCs?	Queen Anne's County Floodplain Administrator tracks and compiles updates for LOMC's.

TABLE 15-20: FLOODPLAIN IDENTIFICATION & MAPPING	
6. Do you collect updated technical or scientific data and modeling? How do you share this with FEMA?	Yes. Queen Anne's County collects and reviews technical and/or scientific modeling data when applicable. Copies are provided to FEMA during the LOMC process. Data impacting mapping must be submitted to FEMA within 6 months of collection.
7. Does your jurisdiction aid with local floodplain determinations? If yes, specify how.	Yes. Queen Anne's County may assist homeowners and potential applicants in determining if their property is located within or near the SFHA by providing mapping resources and information, both lateral and vertical determination information. https://ecode360.com/7136271#7136255
8. Do the people/agencies responsible for using these tools in your community have the access they need? Which tools does your community rely on?	Yes. Queen Anne's County utilizes multiple tools for NFIP information dissemination and education, including the County website (https://www.qac.org/379/Flood), floodplain management personnel, and other tools such as www.mdfloodmaps.com and www.floodsmart.gov. The Floodplain webpage also provides additional resources: https://www.qac.org/471/Resources.
Floodplain management requires that you understand the mapping and data side when working with the public.	

TABLE 15-21: FLOODPLAIN MANAGEMENT	
1. Does your jurisdiction issue permits for all proposed development in the SFHA? What office/position is responsible?	Yes. The Queen Anne's County Department of Planning and Zoning is responsible for permit issuance within the SFHA.
2. Does your jurisdiction require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres? If so, what department or office is responsible?	Yes. *In special flood hazard areas of nontidal waters of the state. Subdivision proposals shall be laid out such that proposed building pads are located outside of the special flood hazard area and any portion of platted lots that include land areas that are below the base flood elevation shall be used for other purposes, deed restricted, or otherwise protected to preserve it as open space.* § 14:3-26 Subdivision proposals and development proposals. The Floodplain Administrator is responsible.

TABLE 15-21: FLOODPLAIN MANAGEMENT	
3. How does your community identify substantially improved structures? When do they intervene?	The Queen Anne's County's *SI/SD Administrative Procedures for Development in the Special Flood Hazard Area* document details how the County will identify substantially improved structures. Substantial Damage Inspections are required by locally adopted regulations, usually found in the building codes, which require the Community's Floodplain Administrator to determine whether a structure is damaged more than 50% of its market value. These SD inspections are required to occur on all structures in the Special Flood Hazard Area (SFHA) and occur when any damage happens. Floodplain Administrator also reviews permit applications for development in the floodplain and determines if the proposed work constitutes a Substantial Improvement. The County has a method for determining market value and cost of improvement, determining cost of damage/repair. *All new construction or substantial improvements within special flood hazard areas and local flood hazard areas shall comply with the standards set forth in the Floodplain Management Ordinance. See: Floodplain Management Ordinance.* https://www.qac.org/815/Building-in-a-Flood-Zone
4. Does your community have a coordinated process to determine substantial damage and to permit repair and improvement? Does the jurisdiction conduct substantial damage assessments in the SFHA? Does your community have a plan for who will conduct substantial damage assessments and a procedure for assessment?	Yes. *The Floodplain Administrator will identify where flood damage has occurred throughout the County's identified SFHA. There are a variety of distinct post-disaster assessments/inspections other than SD, and other teams should be coordinated as needed. For example, the Department of Emergency Services (DES) will conduct Preliminary Disaster Assessments (PDA's) for the purposes of disaster declaration. These assessments are not substantial damage determinations but can be used by the County to identify damaged areas.* *Source: SI/SD Administrative Procedures for Development in the Special Flood Hazard Area*
5. Does your jurisdiction require Elevation Certificates for new or substantially improved structures? If yes, how is it documented and which office/agency/department is responsible?	Yes. Applicants for construction within the SFHA must submit an Elevation Certificate prepared by a licensed engineer or surveyor. The Floodplain Manager reviews the applications and certificates. *After you finish building in a FEMA-regulated floodplain or local flood hazard area—but before anyone moves in or uses the building—you must complete an Elevation Certificate (FEMA Form 086-0-33). The Elevation Certificate form must be completed by a Maryland licensed land surveyor or registered civil engineer. An Elevation Certificate is necessary before you can receive*

TABLE 15-21: FLOODPLAIN MANAGEMENT	
	a Certificate of Occupancy. https://www.qac.org/815/Building-in-a-Flood-Zone
6. How does the jurisdiction enforce the floodplain ordinance sections? How does the jurisdiction address SI/SD violations?	The Queen Anne's County Floodplain Administer conducts inspections of properties, structures, and utilities for compliance with the ordinance and can issue violations, stop work orders, and penalties. The Department of Planning & Zoning addresses SI/SD violations by issuing a notice of violation. Violations are issues due to the lack of necessary permits.
7. Has your jurisdiction had a Community Assistance Visit? If so, were any corrective actions required?	The County submitted a Letter of Interest for the Community Rating Program. This initiated a Community Assistance Visit (CAV) in 2018. The County is currently working on the 2020 CAV. The County is now addressing the remaining 8 corrective actions out of the 100 that were required.
8. Does your jurisdiction have or is considering higher ordinance standards than the NFIP? Please describe the higher standards and where they are documented.	All new or substantially improved structures shall have the lowest floor elevated to or above the flood protection elevation. The Queen Anne's County Flood Protection Elevation is the base flood elevation plus two (2) feet of freeboard. No additional regulations are planned at this time.
9. Are any local officials/departments in your community interested in additional training? What topics relate most to your community?	Yes. Queen Anne's County personnel are always interested in additional training in reviewing and administering the requirements of the NFIP. Staff sign up for all State NFIIP training. All Tech and Engineers as well as permitters have completed the basic floodplain training.
Floodplain management reduces flood risk and protects floodplain health.	

TABLE 15-22: FLOODPLAIN INSURANCE	
1. How does the jurisdiction educate community members about the availability and value of flood insurance?	Queen Anne's County personnel and/or the Floodplain Manager educates the community and property owners regarding the value of flood insurance through the County Website: https://www.qac.org/844/Flood-Insurance, and/or direct contact with property owners within the SFHA. Queen Anne's County Chamber of Commerce provides information for local insurance companies.
2. Does the jurisdiction inform community property owners about changes to the FIRM that would impact their insurance rates?	Yes. Queen Anne's County Floodplain Manager notifies property owners within the SFHA regarding changes to the FIRM through press releases, public service announcements, and where applicable, direct mailing correspondence.
3. How does the jurisdiction provide general assistance to community members regarding insurance issues?	The Floodplain Manager and Queen Anne's County personnel are available to advise, assist and answer any questions of community members regarding the NFIP program and/or floodplain regulations.
4. Does the jurisdiction keep track of the number of residential and non-residential structures in the SFHA? How many structures are in the SFHA in your community?	Yes. A GIS database containing the number of residential and non-residential structures is maintained by the GIS Coordinator (P&Z). According to the FEMA CIS NFIP Insurance Report, there are 1,249 NFIP policies within the County.
5. Does the jurisdiction have any levees or levee systems in its jurisdiction?	No. Queen Anne's County has no levee systems within its jurisdiction according to the USACE national levee database.
6. Is the levee or levee system certified and accredited?	N/A
7. Is the levee or levee system a Provisionally Accredited Levee (PAL)?	N/A
8. Is the levee or levee system part of the USACE Rehabilitation and Inspection Program?	N/A
9. Does your community have any Major Dams or High Hazard Dams, and if so, have you applied for FEMA's High Hazard Potential Dam grant?	Queen Anne's County has 10 total dams, 3 of which are classified as Significant Hazard Potential according to the National Inventory of Dams. There are no high hazard potential dams in the County. Source: National Dam Inventory & MDE Dam Safety
Flood risk communication to the public is vital for a community to be truly resilient.	

A new mitigation action item was added during this planning process following the review of **FEMA Region 3 Review of Community NFIP Questionnaire.**

New Action FL-4: Complete Community Rating System (CRS) application following Community Assistance Visit (CAV) close-out. This action includes a listing of activities the QAC may engage in to earn points for CRS, which were identified for completion based on the completion of Tables 15-20 through 15-22.

15.7 Social Equity & Vulnerability Capabilities

15.7.1 MOBILE INTEGRATED COMMUNITY HEALTH (MICH) PROGRAM

The MICH program was the first Mobile Integrated Health (MIH) program in Maryland and is in its 10th operational year. Currently, there are 13 MIH programs across Maryland, with three more jurisdictions in the planning stages.

The MICH program tackled medication adherence issues by incorporating telehealth, which includes a comprehensive medication review conducted by a hospital pharmacist at The University of Maryland Shore Medical Center at Easton. The program also addressed substance abuse problems by involving peer recovery specialists during home visits as needed. Additionally, it introduced training for diabetes educators, lifestyle management, and on-the-spot HgA1c testing for diabetic patients. The program's holistic approach has decreased unnecessary emergency department visits and hospital readmissions.

As a pioneering program, the MICH has faced challenges in securing continuous funding and resources to maintain and expand services. The program has also experienced challenges due to limited senior housing availability, transportation resources, and barriers to adequate mental health services. Additional issues encountered:

- Funding and Grants: Continuous funding from government, healthcare organizations, or philanthropic sources to ensure sustainability and expansion.
- Training Programs: Investment in training for health professionals involved in the MICH program to stay current with telehealth advancements and patient care strategies.
- Community Engagement: Support from community leaders and organizations to help identify and connect vulnerable residents to the program, facilitating greater access and impact.

Below is an overview of the Mobile Integrated Community Health (MICH) program.

Explanation of What the Team Does:
The Mobile Integrated Community Health (MICH) program in Queen Anne's County, Maryland, is designed to enhance healthcare delivery to vulnerable residents. The team, consisting of a community health nurse from the Department of Health and a paramedic from the Department of Emergency Services, conducts thorough home visits. The team utilizes evidence-based tools and assessments during the home visit to identify unmet needs. Each patient participates in a tele-visit with a pharmacist from Shore Health who performs a complete medication reconciliation. This comprehensive approach allows for a deep understanding of each participant's situation, enabling the team to develop tailored solutions, often linking patients with necessary healthcare and social services.

Who You Serve:
MICH primarily serves individuals in the community who are considered to be at rising or high risk. EMS clinicians or other healthcare providers typically identify these patients due to their above-average healthcare system use. These patients tend to struggle with issues such as having multiple chronic conditions or comorbidities, social vulnerabilities, unsafe living conditions, inconsistent medication adherence, and untreated or undertreated mental health conditions.

How You Provide Services:

The MICH program accepts referrals for patients aged 18 and above from neighboring hospital systems (Luminis Health and Shore Regional Health Systems), Emergency Medical Services, primary care physician offices, visiting nurse agencies, and various programs within the local health department. The MICH program delivers services through home visits, telemedicine, collaborative partnerships, innovations in patient care, and a strong emphasis on preventive health strategies. This comprehensive and integrated approach aims to enhance health outcomes for vulnerable residents while reducing the burden on the healthcare system.

15.7.2 TRANSLATIONS

QAC Health Department distributes information in multiple languages, primarily Spanish. In addition, the Health Department has translators as part of the staff who assist with language barriers but also review documents for appropriate translation prior to distribution.

The Department of Emergency Services does not have a translator for education and outreach. This creates issues when conducting classes or distributing hazard specific information to populations with a language barrier. The Language Line has been utilized, however due to different carriers and cell phone coverage or radio connectivity in the rural areas, the line is not always reliable. DES works has been using the “phone a friend” method when a language barrier is encountered.

However, in October 2024, the Department of Emergency Services partnered with Convey911 to enhance multilingual communications for emergency response. This will enhance emergency communication with non-English-speaking residents by providing real-time translation services in over 300 languages. Convey911’s platform ensures seamless and accurate communication during critical moments, allowing emergency responders to overcome language barriers and deliver timely assistance to callers. In addition to translating voice communications, Convey911 offers text-to-911 translation and integrates with RapidSOS location software, ensuring both precise communication and accurate caller location information during emergencies. By integrating Convey911’s advanced voice and text translation technology, along with RapidSOS location capabilities, Queen Anne’s County and neighboring counties will be able to facilitate more accurate and efficient communication between dispatchers and non-English-speaking callers, ultimately improving response times and outcomes across the region.

As a result of the language barrier gap, a mitigation action to develop strategies for engaging multicultural residents was discussed during the Mitigation Solutions Workshop and has been included in the Chapter 17, Action AH-3.

New Action AH-3: Implement a good policy and strategies for engaging our multicultural residents.

Develop a workgroup including the QAC Department of Community Affairs- Communications Office, and Town Planners to develop a policy and procedures for translation, languages needed and discover the best way to engage those residents and how best to provide information.

15.7.3 BROADBAND CONNECTIVITY

The County’s Office of Technology is currently working with the State on broadband connectivity, which will provide broadband to underserved populations. Before this initiative, a lot of homes in the county did not have internet, but now have the option. The Middle Mile Grant was just approved to assist in providing fiber in front of homes, while the Long Driveway Grants, which is in process, provides internet directly to homes.

The State of Maryland published its initial plans for Broadband Equity, Access, and Deployment (BEAD) and Digital Equity programs. The State began a challenge process which allows internet service providers, units of local government, and non-profit organizations in Maryland to challenge the accuracy of existing broadband maps. This will assist with ensuring maps accurately reflect broadband availability and speeds across the state. According to the State, this endeavor is critical for directing the federal BEAD program funds where they are needed most.

Table 15-23 provides the number of homes that now have access to Broadband. Additionally, numerous homes were provided access to broadband service from the County's Long Driveway Program that started in July of 2023. To date, 42 homes are now served by that program.

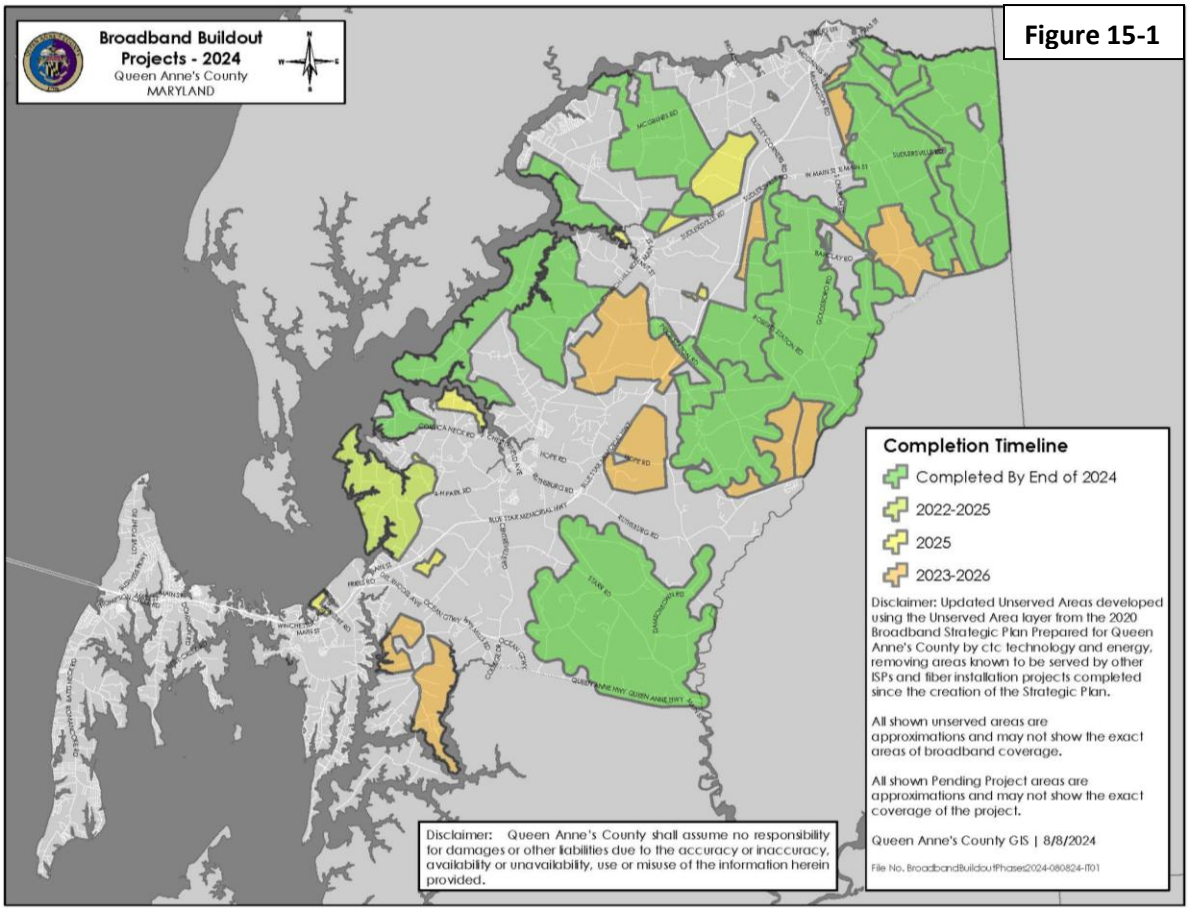
TABLE 15-23: BROADBAND BUILDOUT PROJECT

Project Phase	Address Count – Homes with Access
Completed By End of 2024	2140
2022-2025	80
2025	105
2023-2026	305

Source: QAC Information Technology Department

Figure 15-1 shows the County's accomplishments over the past few years regarding Broadband access.

Figure 15-1



15.7.4 ADDITIONAL SERVICES

- Starting in 2023, the Queen Anne's County transit became free to ride. The number of riders has doubled within the past year.
- The Local Management Board obtained grant funding in order to provide over 2,000 laptops to low-income families.
- Make A Difference Day - The event targets low-income families and will be held November 2, 2024, at the Sudlersville Middle School.
- Department of Emergency Services
    - Meets with groups that are 55 years and older across the county. Symphony Village in Centerville is an example of a community where the staff meets monthly to discuss resiliency.
    - Conduct hazard lessons at the middle and high schools.
- Department of Community Services
    - Targets many populations using QACTVH, radio, mailing newsletters, and emailing newsletters.

Following the review of existing capabilities, two new mitigation actions were identified for inclusion in Chapter 17 Mitigation Strategies.

New Action ET-1: Ensure all residents, especially those that are most susceptible to the effects of extreme temperatures, notably the northern portion of the county, have information regarding services the county provides during an extreme heat or cold event. Promote the availability of warming and cooling centers and their locations.

New Action SWW-1: Establish emergency agreements with private utilities to encourage private utilities to participate with the County and municipalities in coordinated disaster response. In consideration of vulnerable populations, prioritize these areas for power restoration.

15.8 Mutual Aid

The County has mutual aid agreements with surrounding jurisdictions and has also developed working relationships with its volunteer fire and ambulance community as well as many other departments within County government. The county also has agreements to coordinate mitigation activities with private utility companies, and with private transportation companies, for rail transportation Hazmat events. In addition, the Maryland Emergency Management Assistance Compact (MEMAC) is a statewide mutual aid system within Maryland that allows any jurisdiction in Maryland to request and receive assets from another Maryland jurisdiction. All of the requesting procedures, and financial and liability issues are worked out through MEMAC ahead of time. When an incident surpasses the response capabilities of a local jurisdiction, the local jurisdiction may request state-level support through the Maryland Joint Operation Center and/or State Emergency Operations Center. Finally, if the needed assets are not available within the State or have been exhausted, and the Governor has declared a state of emergency, then MDEM can reach out to other states through the Emergency Management Assistance Compact (EMAC). Emergency Management Assistance Compact works in a similar manner to facilitate the sharing of resources within the region, but not on a state-to-state basis.

15.9 Essential Facilities Emergency Back-Up Power

All water and wastewater treatment facilities as well as pump stations have emergency back-up power generators. Most essential facilities within the county have emergency back-up power generators. The following essential facilities were identified in the 2019 plan for needing a generator: Health Department Annex, EMS Station 100, EMS Station 200, EMS Station 400, and Centreville Police Department (CPD).

Installation of a generator at the Health Department was complete aside from some non-critical circuits in the clinic. Generators were also installed at EMS Stations 100 and 400. Grant funding was applied to purchase a generator for the Centreville Police Department in 2019, however it was denied due to the station being in a floodplain. Therefore, the Town of Centreville utilized the Town's funds to purchase the generator for the station. EMS Stations 100 and 200 are both in flood zones. EMS Station 200 historically is evacuated by DES personnel when flooding occurs. There are no plans for a backup generator at this station.

Additionally, the EOC (Department of Emergency Services Building), Queenstown Volunteer Fire Department (VFD) #3 and EMS Station 300, and Health Department-Main Building were identified in the 2019 Plan as having inadequate generators. Since the previous plan, the EOC now has an adequate generator. In 2020, the Health Department's emergency generator capacity was upgraded during the COVID-19 Pandemic. The Queenstown VFD/Station 300 is in the planning phase of building a new firehouse. A larger generator will be included in the planning process.

New Action SWW-2: Review listing of essential facilities that detail generator capability, included in Chapter 8, Table 8-3. Prioritize those facilities without generators or those with undersized for new generators or replacements. In addition, participating municipalities indicated that generators were needed for the following facilities: Queenstown pump stations, Sudlersville Town Hall, Millington Town Hall, and the Millington Water Treatment Plant.

15.10 Conclusions

The review of existing capabilities conducted during this planning process led to the identification of both county and municipal capability gaps. These gaps were further assessed and integrated in the mitigation strategy development. Various new mitigation actions were developed to close these gaps and/or enhance existing capabilities for both the county and participating municipalities. Twelve new mitigation actions that address capability gaps were included throughout this chapter and are identified further in Chapter 17 Mitigation Strategy.

Limitations to expand capabilities were identified by the County and municipalities focused on availability of staff resources and funding.

Chapter 16
Mitigation Status Report

This chapter of the Plan provides information on mitigation strategies from the previous 2019 plan.

- 16.1 MITIGATION STATUS UPDATE PROCESS
- 16.2 2019-2023 MITIGATION STATUS RESULTS
- 16.3 2019-2023 MITIGATION STATUS TABLE
- 16.4 2019-2023 MUNICIPAL MITIGATION STATUS TABLE

16.1 Mitigation Status Update Process

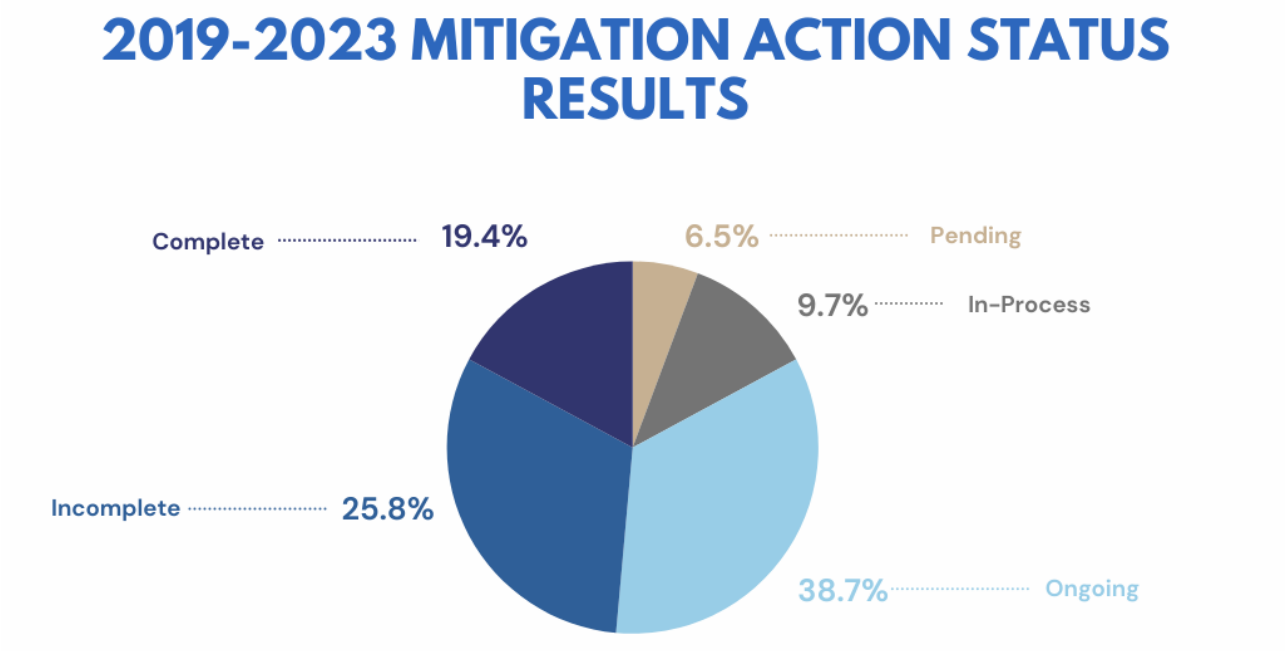
During the development of the 2019 Queen Anne's County Hazard Mitigation Plan (HMP), mitigation actions were developed by members of the Hazard Mitigation Planning Committee (HMPC) and by participating municipalities. These action items were then prioritized and those rated as a "high priority" were further developed into nine projects. Table 16-1 includes mitigation actions slated for implementation during the 2019-2023 planning cycle. In order to obtain status updates for inclusion on Table 16-1, members of the HMPC were sent status update requests for information. The mitigation action along with corresponding status update is included. Those actions that were associated with one of the nine projects are noted in the table. In addition, many of the actions were applicable to departments and agencies, however some of the actions specifically identified one or more municipal entity(s), as indicated under the "responsible entity" column.

Table 16-2 includes municipal specific mitigation action items. Those municipalities participating in this plan update provided mitigation action status information during a virtual hazard mitigation planning meeting as part of the plan update process.

16.2 2019-2023 Mitigation Status Results

Results indicated that of the thirty-five (35) mitigation actions, ten (10) have been completed or are in progress, and eleven (11) are ongoing, while twelve (12) remain incomplete as shown on the chart below. Two (2) of the mitigation actions are pending.

Figure 16-1



16.3 2019-2023 Mitigation Status Table

A mitigation status table was prepared and completed during this planning process. Each 2019 mitigation action status update provides details and indicates whether the mitigation action is complete, incomplete, ongoing, in progress, or pending.

TABLE 16.1: 2019-2023 MITIGATION ACTIONS STATUS				
Previous Action				**Responsible Entity(s)**
1. Conduct new hazard mitigation & resiliency public outreach initiative using CERT Teams and area businesses.				Emergency Services
Complete	**Incomplete**	✓ **Ongoing**	**In-Process**	**Pending**
DES-Emergency Management Associate: Ongoing. Outreach initiatives advocating personal preparedness and mitigation continue, including teaching CERT curriculum in both county High Schools and at Stevensville Middle School. The County has implemented CERT Hybrid to expand access to the training. The Department has also been increasingly active with area businesses, organizations, and communities by attending community events and teaching community classes. **Included in Priority Project 1: Hazard Mitigation & Resiliency Public Outreach**				
2. Create warning, guidelines, and protocols for vulnerable populations in coordination with the Department Emergency Services.				QAC Department of Health, Social Services
Complete	**Incomplete**	✓ **Ongoing**	**In-Process**	**Pending**
QAC Department of Health: Ongoing. Especially during the COVID-19 Pandemic, DOH worked closely with the County PIO to share information with community partners and the general public to keep them informed of rapidly changing health and medical guidelines regarding isolation and quarantine, testing, vaccination, emergency declarations, closures, etc. The DOH is required to review and revise as needed the Risk Communications Plan and any templates created for various incident scenarios impacting public health. **Included in Priority Project 2: Vulnerable Populations Warnings, Guidelines & Protocols**				
3. Finalize Debris Management Plan and incorporate debris generation Hazus (wind & flood) results.				Emergency Services
Complete	**Incomplete**	**Ongoing**	✓ **In-Process**	**Pending**
DES-Emergency Management Associate: In-Process. Update to the Debris Management Plan is in progress. **Included in Priority Project 3: Plan Integration**				
4. Establish emergency agreements with private utilities and transportation companies.				Emergency Services
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC DES: Incomplete. The Department of Public Works role within the Debris Management Plan will be to establish emergency agreements with private utilities and transportation companies. **Included in Priority Project 4: Emergency Agreements**				

Previous Action				Responsible Entity(s)
5. Emergency back-up power- Install generators at the following essential facilities: Health Department Annex, EMS Station 100, EMS Station 200, EMS Station 400, and Centreville Police Department (CPD).				Public Works, Emergency Services, QAC Department of Health, Centreville Police Dept.
✓ **Complete**	**Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC DPW: Complete. The Health Department is complete aside from some non-critical circuits in the clinic. EMS 400 is complete. **QAC Department of Health: Complete.** The health department received and has currently and emergency generator at the 206 N. Commerce St. location. **Centreville Police Department: Complete.** **QAC DES: Complete.** EMS Stations 100 and 200 are both in flood zones. EMS Station 200 historically is evacuated by DES personnel when flooding occurs. There are no plans for a backup generator at this station. EMS Station 100 does have a generator currently. **Included in Priority Project 5: Essential Facilities - Generators**				
6. Upgrade undersized generators at the following essential facilities: ○ EOC –Dept. of Emergency Services Building ○ Queenstown Volunteer Fire Dept. #3 and EMS Station 300 ○ Health Department-Main Building				Public Works, Emergency Services, QAC Department of Health, Queenstown VFD
✓ **Complete**	**Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC DPW: Complete. EOC is adequately generated. Health Department has been upgraded notwithstanding issues mentioned in Mitigation Action Item 5. **QAC Department of Health: Complete.** In 2020, the health department's emergency generator capacity was expanded to allow for additional receptacles to be used during the COVID-19 Pandemic. **QAC DES: Complete.** DES EOC, & HD have sizable generators. Queenstown VFD/300 (same location) has an adequate generator. Note: Queenstown VFD/300 is in the planning phase of building a new firehouse. A larger generator will be included in that planning process. **Included in Priority Project 5: Essential Facilities - Generators**				
7. Southern Kent Island Sanitary Improvement Project-slated for completion.				Public Works
Complete	**Incomplete**	✓ **Ongoing**	**In-Process**	**Pending**
QAC DPW: Ongoing. Phases 1 and 2 are 100% complete, Phase 3 is 33% complete, and Phase 4 is 5%. Completion date is 2027. **Included in Priority Project 6: Sanitary Improvement**				
8. Main waterline connection in Kent Island and Grasonville – loss of essential service.				Public Works
Complete	**Incomplete**	**Ongoing**	**In-Process**	✓ **Pending**
QAC DPW: Pending. RFP for design is pending, funding remains uncertain. **Included in Priority Project 6: Sanitary Improvement**				

Previous Action				Responsible Entity(s)
9. Add new and/or replace datum markers in high-risk flood areas.				Public Works
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC DPW: Incomplete. **Included in Priority Project 7: High-Risk Flood Areas**				
10. Review and where necessary revise and update local floodplain ordinances in conjunction with the development of the 2019 CRS application.				Public Works
Complete	**Incomplete**	✓ **Ongoing**	**In-Process**	**Pending**
QAC DPW: Ongoing. The 2019 CRS application is pending the completion of the required Community Assistance Visit (CAV). **Included in Priority Project 8: National Flood Insurance Program (NFIP) & Community Rating Systems (CRS)**				
11. Individual departments should review their capital improvements to determine if they are in vulnerable areas. Potential worksheet to fill out by department for each project.				All Depts.
Complete	**Incomplete**	✓ **Ongoing**	**In-Process**	**Pending**
QAC BOE: Ongoing. Security vestibules are being installed at two schools. **QAC DPW: Ongoing.** **Centreville Police Department: Incomplete.** **QAC Planning & Zoning: Ongoing.** Environmental Resources, Strategy 2.3, page 5-26 and WRE (Table 1-19, page AD-42): Finalize the 2019 County Climate Resilience Planning and Financing Study and contemplate the prioritization of resiliency projects and capital improvements. **Included in Priority Project 3: Plan Integration**				
12. Update Comprehensive Plan and community plans to include hazard mitigation, including sea level change and coastal hazards.				Planning & Zoning
✓ **Complete**	**Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC P&Z: Complete. The comprehensive plan was adopted May 24, 2022. Chapter 5 - Environmental Resources has sections about hazard mitigation (5-13) and climate change (5-17). The community plans were incorporated into the comprehensive plan, Chapter 11 (section 11-14 is specific to climate change and sea level rise). Map 5-6 provides sea level rise vulnerability information. **Included in Priority Project 3: Plan Integration**				

Previous Action				Responsible Entity(s)
13. Consider the transportation network in relation to hazards and evacuation within **Section 8.0 – Community Facilities and Transportation** of the County Comprehensive Plan. Specifically flood related hazards and Sea Level Change **(Include Millington)**.				Planning & Zoning
Complete	**Incomplete**	✓ **Ongoing**	**In-Process**	**Pending**
QAC P&Z: Ongoing. Chapter 5 Goal 5-2 Strategy 2 Recommendation 1, 2 and 3 - To a degree have relevance to this topic (page 5-26). The 2016 Sea level rise and coastal vulnerability assessment plan and the 2019 County Climate Resilience Planning and Financing Study guide the protection of infrastructure from the impacts of climate change. This is indicated on page 11-14 of the Comprehensive Plan. The 2019 Climate Resilience Planning and Financing Plan outlines specific strategies that guide the protection of a valuable infrastructure from the impacts of climate change (see Land Use Strategy 2.8 and 2.11, page 4-22; Environment, page 5-18, 5-26; Community Plans, page 11-14; and WRE, page AD-42). **Included in Priority Project 3: Plan Integration**				
14. Modify Capital Improvement project planning to determine projects that include hazard mitigation.				Finance
Complete	**Incomplete**	**Ongoing**	✓ **In-Process**	**Pending**
QAC Department of Finance: In-Process. The Finance Office is updating capital budgeting processes to include earmarking projects with hazard mitigation efforts in the upcoming FY2026 budget cycle. **Included in Priority Project 3: Plan Integration**				
15. Modify Capital Improvement funding to prioritize projects that are in high-risk areas.				All Departments
Complete	**Incomplete**	✓ **Ongoing**	**In-Process**	**Pending**
QAC BOE: Ongoing. **QAC DPW: Ongoing.** **Centreville Police Department: Incomplete.** **QAC P&Z: Ongoing.** Environmental Resources, Strategy 2.3, page 5-26 and WRE (Table 1-19, page AD-42): Finalize the 2019 County Climate Resilience Planning and Financing Study and contemplate the prioritization of resiliency projects and capital improvements. **Included in Priority Project 3: Plan Integration**				

Previous Action				Responsible Entity(s)
16. Identify open space & conservation area mitigation strategies to reduce risk, specifically in high-risk flood hazard(s) areas.				Planning & Zoning & IT/GIS
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC P&Z: Incomplete. The Comprehensive Plan notes that open space and conservation does help to mitigate flooding hazards. WRE, see Stormwater recommendation found on page AD-7: Utilize open space and land preservation programs to provide water protection measures. **Included in Priority Project 7: High-Risk Flood Areas**				
17. Conduct annual outreach project targeted to properties within the designated RLP Areas.				Emergency Services & Public Works
Complete	**Incomplete**	**Ongoing**	**In-Process**	✓ **Pending**
QAC DPW: Pending. This will be required once the County achieves CRS status. **Included in Priority Project 8: National Flood Insurance Program (NFIP) & Community Rating Systems (CRS)**				
18. Distribute annual mitigation & resiliency outreach material annually using various media to reach multiple demographic groups.				Emergency Services
✓ **Complete**	**Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC DES: Complete. DES pushes both mitigation and resiliency education and notifications through multiple social media outlets and QAC local TV channels. DES uses social media platforms such as X, Facebook, Instagram, Nextdoor and YouTube. **Included in Priority Project 1: Hazard Mitigation & Resiliency Public Outreach**				
19. Prioritize for mitigation Repetitive Loss Properties (RPL) and those properties within the designated RLP Areas.				Emergency Services & Public Works
Complete	**Incomplete**	✓ **Ongoing**	**In-Process**	**Pending**
QAC DPW: Ongoing. DES takes the lead on these projects, DPW only assists with technical data. **QAC DES: Ongoing.** DES will be submitting a Notice of Interest for the acquisition of a Severe Repetitive Loss Property. **Included in Priority Project 1: Hazard Mitigation & Resiliency Public Outreach**				

Previous Action				Responsible Entity(s)
20. Integrate Hazus (wind) results and FEMA Coastal Risk Map Study for potential shelter needs into Emergency Operation Plan-ESF #6 Mass Care & Sheltering.				Emergency Service, QAC Department of Health, Social Services
✓ **Complete**	**Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC Department of Health: Complete. ESF #6 Section of the county EOP was reviewed/revised and adopted in August 2023. FEMA Hazus Flood and Hurricane model information was included in the revision.				
21. Develop a Sea Level Change and Evacuation Route(s) Study.				Emergency Services
Complete	**Incomplete**	**Ongoing**	✓ **In-Process**	**Pending**
QAC DES: In-Process. Maryland Department of Emergency Management (MDEM) is developing a sea level rise study, which will be participating in the planning process.				
22. Install a generator for the Department of Public Works' main facility.				Public Works
Complete	**Incomplete**	✓ **Ongoing**	**In-Process**	**Pending**
QAC DPW: Ongoing. The main facility has been partially generated since 1974.				
23. Update 2014 Floodplain Management Ordinance-Refer to information on Sea Level Change. *Note: 2016 Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan proposes raising freeboard requirement from 2 feet to 4 feet above Base Flood Elevation (BFE) based on SLR 2050 and 2100 projections.* (If we use 2050 projections, then we should use 2' not 4')				Public Works - Floodplain Manager
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC Floodplain Manager: The County has no plans on updating the ordinance due to sea level change currently. **QAC P&Z: In-Process.** This Code falls under the purview of DPW; however, P&Z supports this update to the Floodplain Ordinance. See Environmental Resources, page 5-10: the County applied to FEMA for participation in its Community Rating System (CRS), which is a flood insurance discount program that rewards higher regulatory standards, public outreach, emergency preparedness, and open space preservation to reduce flooding risk and increase resiliency. Application completion is expected in Fall 2024.				

Previous Action				Responsible Entity(s)
24. Creation of special districts with restrictive zoning in high hazard vulnerability areas.				Public Works - Floodplain Manager
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC P&Z: Incomplete. The county is in the process of updating the zoning code. If such as district were to be created it would be during the update. While the County has not undertaken this task, the 2022 Comp Plan includes this policy direction in the WRE, page AD-42: During new development project review, contemplate the 2016 Sea Level Rise and Coastal Vulnerability Assessment Plan, which identified key vulnerable resources.				
25. Modify setback requirements for tidal wetlands.				Public Works - Floodplain Manager
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC P&Z: Incomplete. Setbacks for tidal wetlands are 100ft. There have been no modifications.				
26. Develop a FEMA – approved and adopted Flood Mitigation Plan that complies with the requirements of 44 CFR Part 78.				Emergency Services & Public Works
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC DPW: In-process. **QAC DES: Incomplete.**				
27. Initiate countywide Firewise Program in coordination with volunteer fire departments.				Emergency Services
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC DES: Incomplete.				
28. Additional salt storage facilities at remote areas of County, specifically two (2) more in the North Kent Island area.				Public Works
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC DPW: Incomplete. DPW believes the intent was for North County, not North Kent Island. There has been no progress on this action item.				
29. Water system pipe breaks- potential area identified along Route 18 from Kent Narrows to Stevensville.				Public Works
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC DPW: Incomplete. DPW believes this is referring to sewer transmission mains. There has been no progress on this action item.				

Previous Action				Responsible Entity(s)
30. Obtain funding to purchase four (4) Mobile Message Sign Boards for the County.				Public Works
Complete	**Incomplete**	✓ **Ongoing**	**In-Process**	**Pending**
QAC DPW: Ongoing. Five (5) used ones were bought during Covid but three (3) are in disrepair.				
31. Obtain funding to purchase and install Weather Stations and pavement sensors at: • Matapeake • DES • Sudlersville				Public Works
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC DPW: Incomplete. It was never envisioned County would install its own pavement sensors; the intent was to access SHA data, but the request was denied. DES and MEMA are in the process of installing a Mesonet weather station somewhere in the County. **QAC DES: Incomplete.** The county does have MESONET. QAC is one of only three on the Eastern Shore. QAC was informed by their MDEM liaison that up to 4 stations may be installed in the County. https://weather.umd.edu/mdmesonet/?station=wyemills				
32. Install a new Water Treatment Plant at the Four Seasons.				Public Works
✓ **Complete**	**Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC DPW: Complete. The plant is now online.				
33. Review projects during the capital improvement planning process to determine which projects, if any, would encourage development in areas vulnerable to natural hazards. Specifically flood related hazards including Sea Level Change.				All Depts.
Complete	**Incomplete**	**Ongoing**	✓ **In-Process**	✓ **Pending**
QAC BOE: Pending. **QAC DPW: In-Process.** **Centreville Police Department: Incomplete.** **QAC P&Z: Ongoing.** Environmental Resources, Strategy 2.3, page 5-26 and WRE (Table 1-19, page AD-42): Finalize the 2019 County Climate Resilience Planning and Financing Study and contemplate the prioritization of resiliency projects and capital improvements.				
34. Adopt green building codes for commercial & residential structures.				Planning & Zoning
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
QAC P&Z: Incomplete. The County follows the current editions of the International Building Code (IBC) and International Residential Code (IRC).				

Previous Action				Responsible Entity(s)
35. Conduct Flood Insurance training for real estate and insurance agencies.				Emergency Services & Public Works
Complete	**Incomplete**	✓ **Ongoing**	**In-Process**	**Pending**
QAC DPW: Ongoing.				

16.4 2019-2023 Municipal Mitigation Status Table

Mitigation action items on pages 16-4 through 16-11 include municipalities, specifically action items #5, #6, #12, #13, and #31. In addition to the action items provided in Table 16-2, each municipality developed mitigation action item(s) specific to their town.

TABLE 16.2: 2019-2023 MUNICIPAL MITIGATION ACTIONS STATUS				
Previous Action				**Responsible Town(s)**
Review and update flood buy-out listing, adding (2) properties in the Millington Area. (Information obtained from the Town of Millington)				Town of Millington
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
2024 Status Update: The property on Lime Landing has a Millington address, however, is outside of town limits.				
Relocate or retrofit flood prone Millington Wastewater Treatment Plant. WWTP has been flooded numerous times.				Town of Millington
Complete	**Incomplete**	**Ongoing**	✓ **In-Process**	**Pending**
2024 Status Update: Millington has partnered with Kent County to complete this project. The project is at 75% design phase and a parcel has been identified for the relocation. The project is proposed to be completed in 2026. The current location of the WWTP will be converted to a grinder pump station.				
Remove stream channel debris. Southeast Creek causing back-up of water resulting in flooding.				Town of Church Hill
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
2024 Status Update: Incomplete.				
Extend MD SHA close system storm drain in Commerce Street to eliminate flooding on private property and roadway.				Town of Centreville
Complete	**Incomplete**	**Ongoing**	✓ **In-Process**	**Pending**
2024 Status Update: The town is in process of buying the SHA property on Commerce Street. The property will be designated program open space. The town will have a stormwater system installed on the property. This will eliminate the flooding issues.				

Previous Action				Responsible Town(s)
Coordinate with MD SHA to reprofile both Liberty and Commerce Streets with a reduced crown and uniform cross-slope to permit the recovery of former curb containment heights.				Town of Centreville
✓ **Complete**	**Incomplete**	**Ongoing**	**In-Process**	**Pending**
2024 Status Update: This was completed when Liberty and Commerce Streets were updated, and SHA repaved the area.				
Coordinate with MD DNR and MD SHA to implement water quality best management practice for Commerce Street drainage to reduce the flows leading to Millstream.				Town of Centreville
Complete	**Incomplete**	**Ongoing**	✓ **In-Process**	**Pending**
2024 Status Update: The town is in process of buying the SHA property on Commerce Street. The property will be designated program open space. The town will have a stormwater system installed on the property. This will eliminate the flooding issues.				
Upgrade Wharf Pumping Station-Incomplete mitigation action items from 2012.				Town of Centreville
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
2024 Status Update: Incomplete.				
Flooding of Trap Hill Ditch causes septic tank overflows in the Town of Barclay. Work with the Town of Sudlersville to extend sewer service area using the Sudlersville Water Treatment facility. *Please Note: Town of Barclay has imposed a building moratorium within town limits until sewer facility/septic issues are resolved.*				Town of Barclay & Town of Sudlersville
✓ **Complete**	**Incomplete**	**Ongoing**	**In-Process**	**Pending**
2024 Status Update: This project was completed in the summer of 2024.				
Install emergency generator at Town Office, which may be used as a shelter facility.				Town of Queenstown
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
2024 Status Update: Incomplete.				
Purchase mobile message sign board for hazard warning and notification.				Town of Queenstown
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
2024 Status Update: Incomplete.				

Chapter 17
New Mitigation Strategies & Implementation

This chapter of the Plan provides information on new mitigation strategies developed during the plan development.

- 17.1 MITIGATION STRATEGY BACKGROUND
  - 17.1.1 Summation Capabilities Assessment, Identified Gaps & Limitations, and New Mitigation Actions
  - 17.1.2 NFIP & Continued Compliance
  - 17.1.3 Mitigation Status Report
- 17.2 MITIGATION STRATEGY DEVELOPMENT
  - 17.2.1 Mitigation Solutions Workshop Materials
  - 17.2.2 Goals & Objectives
  - 17.2.3 Mitigation Actions & Prioritization
  - 17.2.4 Municipal Mitigation Actions & Prioritization
- 17.3 MITIGATION ACTIONS
- 17.4 IMPLEMENTATION & PLAN MAINTENANCE
- NEW HAZARD SPECIFIC MITIGATION ACTION TABLES
- POTENTIAL FUNDING SOURCES

17.1 Mitigation Strategy Background

According to the 2022 FEMA Local Mitigation Policy Guide, the mitigation strategy serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The Stafford Act directs local mitigation plans to describe hazard mitigation actions and establish a strategy to implement those actions. Therefore, all other requirements for a local mitigation plan lead to and support the mitigation strategy as a means to reduce risk and vulnerabilities over the long term.

The mitigation strategy includes the development of goals and prioritized hazard mitigation actions. Goals are long-term policy statements and global visions that support the mitigation strategy. A critical step in the development of specific hazard mitigation actions and projects is assessing existing authorities, policies, programs, and resources and capabilities to use or modify local tools to reduce losses and vulnerability from profiled hazards.

In the plan update, goals and actions are either reaffirmed or updated based on current conditions, including the completion of hazard mitigation initiatives, an updated or new risk assessment, or changes in state or local priorities.

17.1.1 SUMMATION OF CAPABILITIES ASSESSMENT, IDENTIFIED GAPS & LIMITATIONS, AND NEW MITIGATION ACTIONS

Chapter 15 Community Capabilities describes how the existing authorities, policies, programs, funding and resources of Queen Anne's County (QAC) and its participating municipalities are available to support the mitigation strategy. Information gathered from QAC, and all participating municipalities was integrated throughout the chapter. Within that chapter, the 2019 Queen Anne's County Hazard Mitigation Plan capability gaps and mitigation actions identified were reviewed to determine if the identified gap was addressed, see Table 15-1. For those capability gaps not addressed during the previous planning cycle, new 2025 Mitigation Actions were identified.

In addition, four (4) current capabilities areas for the County and participating municipalities were reviewed for this plan update. This included existing authorities, policies, programs, funding and resources available to support the mitigation strategy. Capability areas included:

- Planning and Regulatory Capability
- Administrative and Technical Capability
- Financial Capability
- Public Education and Outreach Capability

Existing building codes and land use and development ordinances or regulations were specifically addressed in the review of county and municipal planning and regulatory capabilities. In addition, social equity and vulnerability capabilities were added during this plan update. The review of existing capabilities conducted during this planning process led to the identification of both county and municipal capability gaps. These gaps were further assessed and have been included in this chapter. Various new mitigation actions were developed to close these gaps and/or enhance existing capabilities for both the county and participating municipalities. Twelve new mitigation actions that address capability gaps were included throughout this chapter and are identified further in this Mitigation Strategy.

Limitations to expand capabilities were identified by the County and municipalities focused on availability of staff resources and funding.

17.1.2 NFIP & CONTINUED COMPLIANCE

Participation in the National Flood Insurance Program (NFIP) and continued compliance with NFIP requirements are addressed in both Chapter 3 Flood and Chapter 15 Community Capabilities. Information is included within Chapter 3, 3.2.2 NFIP Requirements, and in Chapter 15, Flood Hazard Capabilities, pages 15-16 through 15-23. Specific NFIP community municipal information is included Tables 15-17 through 15-19, while Queen Anne's County specific information is included on Tables 15-20 through 15-22. Queen Anne's County, and NFIP participating communities including the Towns of Barclay, Centreville, Church Hill, Queenstown, and Millington are in compliance with the NFIP.

17.1.3 MITIGATION STATUS REPORT

Chapter 16 Mitigation Status report provides information on mitigation strategies from the previous 2019 Queen Anne's County Hazard Mitigation Plan. Specifically, changes in priorities and the status of previous county and municipal mitigation actions. Results indicated that of the thirty-five (35) mitigation actions, ten (10) have been completed or are in progress, and twelve (12) are ongoing, while eleven (11) remain incomplete as shown on the chart below. Two (2) of the mitigation actions are pending.

Completed actions are listed below with the high priority mitigation actions identified in red.

- Action Item #5: Emergency back-up power- Install generators at the following essential facilities: Health Department Annex, EMS Station 100, EMS Station 200, EMS Station 400, and Centreville Police Department (CPD).
- Action Item #6: Upgrade undersized generators at the following essential facilities:
    - EOC –Dept. of Emergency Services Building
    - Queenstown Volunteer Fire Dept. #3 and EMS Station 300
    - Health Department-Main Building
- Action Item #12: Update Comprehensive Plan and community plans to include hazard mitigation, including sea level change and coastal hazards.
- Action Item #18: Distribute annual mitigation & resiliency outreach material annually using various media to reach multiple demographic groups.
- Action Item #20: Integrate Hazus (wind) results and FEMA Coastal Risk Map Study for potential shelter needs into Emergency Operation Plan-ESF #6 Mass Care & Sheltering.
- Action Item #32: Install a new Water Treatment Plant at the Four Seasons.

Information gathered during the status update process further informed the mitigation actions developed in this chapter. The eleven (11) incomplete actions identified as relevant were carried over for consideration during the Mitigation Solutions Workshop and included in the 2025 Mitigation Actions.

17.2 Mitigation Strategy Development



The Mitigation Solution Workshop, held on October 10, 2024, provided an opportunity for the Hazard Mitigation Planning Committee (HMPC) members and municipal representatives to discuss and develop mitigation strategies for implementation over the next five-year planning cycle. The in-person workshop was held at the Queen Anne's County Library – Kent Island Branch. The workshop provided an opportunity to develop strategies that are both cost-effective and appropriate for mitigating the impacts from hazards identified in the plan. HMPC and municipal participation in this three-hour workshop was essential to ensure that mitigation goals, objectives, and actions were developed and considered by

mitigation actions varied and robust stakeholder involvement. Goals and considerations for the workshop were outlined and included the following discussion points.

- FEMA policy guide indicates that the County and each participating municipality should identify a minimum of (1) mitigation action for each hazard profiled, and ideally (2) per hazard, as recommended by FEMA Region 3.
- Workshop participants were informed that a comprehensive range of actions should be considered specifically addressing vulnerabilities identified in HMP.
- Finally, workshop participants were urged to be mindful that the range of actions considered should include mitigation actions that benefit underserved communities and socially vulnerable populations.

All members of Queen Anne's County's HMPC along with municipal representatives were invited to the Mitigation Solutions Workshop, see Mitigation Solutions Workshop meeting notes in the Appendix for a listing of those in attendance. HMPC members and municipal representatives, including those who were unable to attend were provided the meeting notes for their review and comment on October 21, 2024.

17.2.1 MITIGATION SOLUTIONS WORKSHOP MATERIALS

Workshop materials were explained and made available for participant use throughout the duration of the workshop. Materials included mitigation action fillable worksheets. These fillable worksheets included mitigation actions that were identified over the course of the planning process. This included those actions identified by HMPC members and municipalities for carry-over from the previous plan and those submitted as "new" during the review and comment of various working draft hazard chapters. Each of the mitigation action fillable worksheets included pre-populated information such as the proposed mitigation action, background information, and references. Selected pages from the plan, including narrative, maps, and tables, along with other reference materials were paper clipped to the worksheets. Having relevant information readily available, enabled participants to quickly refer to specific information, particularly the risk and vulnerability analysis information, to further inform their group discussion. In addition, participants were provided with worksheets to include any new mitigation actions that were not previously captured. This process provided all participating jurisdictions an opportunity to reflect on changes in community priorities, either omitting incomplete actions, making modifications to those actions, or developing new mitigation actions.

17.2.2 GOALS & OBJECTIVES

Each of the mitigation action fillable worksheets included Goals & Objectives for review, comment, and modification, as needed. Results of the workshop included a mitigation goals, objectives, and actions for each hazard profiled in the plan. In addition, an All-Hazards mitigation goal, objectives, and actions were added, specific to participating municipalities.

New Mitigation Ideas- HMPC and participating municipalities were provided working draft hazard chapters for review and comment throughout the plan development, along with the review and comment form that accompanied each working draft hazard chapter, a new mitigation ideas form was included.

17.2.3 MITIGATION ACTIONS & PRIORITIZATION

New mitigation actions were identified throughout the planning process. The Mitigation Solutions Workshop was a collaborative discussion-based workshop which resulted in the development of detailed hazard specific mitigation actions. Following the workshop, HMPC members were asked to review hazard specific mitigation actions developed and provide

modifications, as needed. In addition, HMPC Members and municipal representatives were given another opportunity to provide additional mitigation actions. Comments received were integrated into the hazard specific mitigation tables, as applicable. Following the review and comment of the mitigation actions period, an online prioritization survey was distributed to all HMPC members. Results of the survey were tabulated, see Summary of Mitigation Actions for Queen's Anne County and Participating Municipalities, Table 17-2. High priority mitigation actions, shown in red bold text.

17.2.4 MUNICIPAL PARTICIPATION & PRIORITIZATION

Efforts for ensuring that each participating municipality identified one or more mitigation actions for each hazard addressed in the risk assessment and that that those actions identified were achievable and reduce the risks identified in the risk assessment were undertaken and achieved. Mitigation action ideas were discussed and reviewed during municipal meetings held prior to the Mitigation Solutions Workshop, see Table 17-1: Mitigation Strategies Municipal Participation.

Representatives from the Towns of Queenstown and Centreville attended the October 21, 2024, Mitigation Solutions Workshop. Following the workshop, each municipality received email communications, with municipal specific information. All participating municipalities reviewed hazard specific mitigation actions identified for their jurisdiction. Finally, each municipality prioritized mitigation actions using the following criteria for consideration.

- Do you think there would be community acceptance/general support for this mitigation action?
- Do you think implementation of this mitigation action will enhance the health and safety of the community?
- Do you think the County and/or the Town will be able to sufficiently staff and/or provide technical support to implement this mitigation action?
- Do you think the benefits of this mitigation action will exceed the likely costs?
- Do you think the maintenance requirements for this option will be affordable and not provide an undue burden on the Town?
- Is this project consistent with environment goals?

TABLE 17-1: MITIGATION STRATEGIES MUNICIPAL PARTICIPATION

PLAN ELEMENTS	Town of Barclay	Town of Centreville	Town of Church Hill	Town of Millington	Town of Queenstown	Town of Sudlersville
Mitigation Strategy Status & Changes	Municipal Meeting: 9/12/2024	Municipal Meeting: 9/24/2024	Municipal Meeting: 9/19/2024	Municipal Meeting: 9/19/2024	Municipal Meeting: 9/24/2024	Municipal Meeting: 9/12/2024
Mitigation Strategy Actions & Priorities	Municipal Meeting: 9/12/2024 Review of Action Items Sent: 10/21/2024 Review & Prioritization Sent: 10/25/2024 Prioritization	Municipal Meeting: 9/24/2024 Mitigation Workshop: 10/10/2024 Review of Action Items Sent: 10/21/2024 Review & Prioritization	Municipal Meeting: 9/19/2024 Review of Action Items Sent: 10/21/2024 Review & Prioritization Sent: 10/25/2024 Prioritization	Municipal Meeting: 9/19/2024 Review of Action Items Sent: 10/21/2024 Review & Prioritization Sent: 10/25/2024 Prioritization	Municipal Meeting: 9/24/2024 Mitigation Workshop: 10/10/2024 Review of Action Items Sent: 10/21/2024 Review & Prioritization	Municipal Meeting: 9/12/2024 Review of Action Items Sent: 10/21/2024 Review & Prioritization Sent: 10/25/2024

	Completed: 12/10/2024	Sent: 10/25/2024 Prioritization Completed: 10/10/2024	Completed: 11/7/2024	Completed:	Sent: 10/25/2024 Prioritization Completed: 10/10/2024	Prioritization Completed:

Summary of Mitigation Actions for Queen's Anne County and Participating Municipalities, Table 17-2 indicates the high priority mitigation actions, shown in red bold text.

17.3 Mitigation Actions

Mitigation actions developed for this plan update are applicable to one or more jurisdictions. Each hazard specific mitigation table has a column that identifies the jurisdiction associated with that particular mitigation action. Table 17-2 provides a summary of mitigation actions for Queen Anne's County and all participating jurisdictions, per hazard. As each hazard specific mitigation action has various types of associated information, including goals, objectives, background, responsible entity, timeframe, and potential funding sources, mitigation action tables in their entirety are included at the end of this chapter.

TABLE 17-2: SUMMARY OF MITIGATION ACTIONS FOR QUEEN ANNE'S COUNTY & PARTICIPATING MUNICIPALITIES

Natural Hazards	Jurisdiction						
	County	Barclay	Centreville	Church Hill	Millington	Queenstown	Sudlersville
	Mitigation Action						
Flooding: Riverine, Coastal, Flash, Nuisance	FL-1 FL-2 FL-3 FL-4 FL-5 FL-6	No Floodplain within Town limits.	FL-1 FL-3 FL-5	FL-1	FL-1 FL-5	FL-1 FL-5	No Floodplain within Town limits.
Tropical System: Hurricanes, Tropical Storms, Nor'easters	H-1 H-2	H-1	H-1 H-2	H-1 H-2	H-1	H-1 H-2	H-1
Sea Level Change	SLR-1 SLR-2 SLR-3 SLR-4	Not impacted by coastal, tidal flooding or SLR.	SLR-1 SLR-2 SLR-4	SLR-1 SLR-4	SLR-1 SLR-2 SLR-4	SLR-1 SLR-2 SLR-4	Not impacted by coastal, tidal flooding or SLR.
Soil Movement: Coastal Erosion	SM-1 SM-2	Not impacted by coastal erosion.	SM-1 SM-2	SM-2	SM-2	SM-2	Not impacted by coastal erosion.
Drought	D-1 D-2 D-3 D-4	D-1 D-3 D-4	D-1 D-2 D-3 D-4	D-1 D-3 D-4	D-1 D-3 D-4	D-1 D-3 D-4	D-1 D-2 D-3 D-4
Severe Winter Weather	SWW-1 SWW-2 SWW-3 SWW-4	SWW-1	SWW-1 SWW-2	SWW-1 SWW-2	SWW-1 SWW-2 SWW-3	SWW-2	SWW-3 SWW-4
Extreme	ET-1	ET-1	ET-1	ET-1	ET-1	ET-1	ET-1

Temperatures	ET-2						
Wildfire	WF-1 WF-2	WF-2	WF-2	WF-2	WF-2	WF-2	WF-2
Thunderstorms: Lightning, Hail, Strong Winds	T-1 T-2	T-1	T-1	T-1	T-1	T-1	T-1 T-2
Earthquake	E-1 E-2	E-1 E-2	E-1 E-2	E-1 E-2	E-1 E-2	E-1 E-2	E-1 E-2
Tornado	TO-1 TO-2 TO-3	TO-1 TO-3	TO-1 TO-2 TO-3	TO-1 TO-2 TO-3	TO-1 TO-3	TO-1 TO-3	TO-1 TO-3
Dam Failure	DF-1 DF-2 DF-3						
All Hazards	AH-2 AH-3	AH-1 AH-2 AH-3	AH-1 AH-2 AH-3	AH-1 AH-2 AH-3	AH-1 AH-2 AH-3	AH-1 AH-2 AH-3	AH-2 AH-3

17.4 Implementation & Plan Maintenance

This Plan document serves as a road map for evaluating hazards, identifying resources and capabilities, selecting appropriate actions, and developing and implementing mitigation measures to eliminate or reduce future impacts from those hazards. The implementation and completion of mitigation actions will protect the health, safety, and welfare of the County's residents. Implementation of the plan is a critical component of strengthening the resilience of and continued vitality of Queen Anne's County. Each of the hazard specific mitigation actions tables identify who is responsible for administering each action, along with the action's potential funding sources and expected time frames for completion.

Note: An extensive listing of potential funding sources available to assist in the implementation has been included at the end of this chapter for reference.

Implementation challenges identified by both Queen Anne's County and participating municipalities include:

- Political climate,
- Competitive grants – long process and difficult at times to find local match, and
- Municipalities – staff and local funding availability.

Plan maintenance means keeping the plan accurate, current, and relevant over the five-year approval period. It includes monitoring, evaluating, and updating the plan – and generally keeping the planning process active. Plan maintenance is critical to ensure participants use the plan to continually reduce hazard risk. Monitoring, evaluating, and updating the plan are critical to maintaining its relevance. Effective implementation of mitigation actions pave the way for continued momentum in the planning process and provides direction for the future.

The Department of Emergency Services (DES) has been designated as the main entity responsible for maintaining and monitoring the plan. DES will continue to work with stakeholders including municipalities during the next five-year planning cycle. DES will oversee the progress made on the

implementation of the identified mitigation actions and update the plan, as needed, to reflect changing conditions. DES will therefore serve as the focal point for coordinating countywide hazard mitigation efforts in cooperation with participating municipalities. All participating municipalities stated that they will conduct an annual review with their respective Town Councils.

The Department of Emergency Services (DES) in cooperation with community stakeholders will involve the public during the evaluation and update of the plan, as appropriate, through annual public education activities, public workshops, and public hearings. The County's website will serve as a means of communication by providing information specific to hazard mitigation and preparedness initiatives. At a minimum the plan will be evaluated annually, which will include an assessment to determine the effectiveness of the plan at achieving its stated purpose and goals. This will include the distribution of a mitigation action status update information form. The results will be compiled into one annual tracking report. The FEMA Region 3: Conducting Annual Hazard Mitigation Plan Reviews Checklist will be utilized to conduct annual updates.

As demonstrated in Chapter 15 Capability Assessment, Queen Anne's County and participating municipalities have demonstrated the integration of their previous hazard mitigation plan's data, information, and hazard mitigation goals and actions into other planning mechanisms. That tradition will continue moving forward, as updates to municipal comprehensive plans, the Queen Anne's County Nuisance Flood Plan, and the finalization of the Climate Resilience Planning and Finance Study are all slated for completion during this next five-year planning cycle. Examples include mitigation actions AH-1 and AH-2 both of which focus on plan integration including policies and codes, as well as enhanced coordination.

Primary Hazard: All Hazards

Goal: Improve communications, planning, and coordination between the County and its municipalities.
Objective #1: Ensure continuity of operations and increase community resiliency.
Objective #2: Ensure that municipal representatives are well trained regarding natural hazard and appropriate prevention and mitigation activities and improve communications between the municipality and DES-Emergency Management.

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project AH-1	Local Planning & Regulations	3-5 years	Town – Staff Time $10-20K	Town – Annual Budget	County Dept. Heads, Town Planners, Town Attorneys	Safety and Security	* Translate to Spanish Printed Copies	Queenstown, Centreville, Church Hill, Millington Barclay
	Action: Integrate the hazard mitigation plan into other plans, ordinances and programs that dictate land use decisions in the community, including Capital Improvement Programs, Master Plans, and Strategic Plans.							
	Background and/or Plan Reference: The following Towns have not included the hazard mitigation plan into their policies, codes, or comprehensive plans: Centreville, Church Hill, Queenstown, Barclay, and Millington.							

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project AH-2	Education & Awareness Programs	1-2 years	County – Staff Time Town – Staff Time $1,000	County – Annual Budget Town – Annual Budget	County Dept. Heads, Town Planners, Town Attorney	Safety and Security	N/A	County, Queenstown, Centreville, Church Hill, Sudlersville, Millington, Barclay
	Action: Development of a County-Municipal workshop to provide an overview of the roles of local government in emergency management.							
	Background and/or Plan Reference: FEMA staff could be invited to present information from the Local Elected and Appointed Officials Guide: Roles and Resources in Emergency Management or other relevant guides. The Town of Centreville seeks assistance for the County to develop an Emergency Operations Plan and a Continuity of Operations Plan.							

NEW HAZARD SPECIFIC MITIGATION ACTION ITEMS

TABLE 17-3: PRIMARY HAZARD - FLOOD								
Goal: Minimize the impacts from flood to people, structures, systems, and community resources. **Objective #1:** Reduce the vulnerability of life and property within the County to flooding. **Objective #2:** Reduce the vulnerability of county and municipal roads and other infrastructure to the impacts of flooding. **Objective #3:** Ensure continuity of operations and increase community resiliency. **Objective #4:** Conduct targeted public outreach campaigns that include weather and climate risk preparedness and mitigation. **Objective #5:** Ensure that essential services and infrastructure are maintained during emergencies or disasters.								
	Action Type	**Implementation Schedule**	**Estimated Cost**	**Potential Funding**	**Lead**	**Community Lifeline**	**Social Vulnerability**	**Jurisdiction(s)**
Project FL-1	Structure & Infrastructure Projects, Education & Awareness Programs	3-5 years	County – Staff Time, Towns – Staff Time $500K	Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) Program, Surface Transportation Block Grant Program (STBG), RAISE Discretionary Grant program, FEMA Building Resilient Infrastructure and Communities	QAC Department of Public Works, Consultant	Transportation	* Multi-Language, Visual, Pictorial	County, Millington, Church Hill, Centreville, Queenstown
	Action: Review prioritized repetitive roadway flooding locations identified in the Queen Anne's County Nuisance & Urban Flood Plan and develop concept design with budget for these locations. Include these locations in the capital improvement plan and seek grant funding.							

<table>
<tr><td></td><td colspan="8">Background and/or Plan Reference:
A total of seventy (70) flood locations were identified; 42 nuisance flood locations and 28 urban flood locations. Seven (7) of the nuisance flood locations are the only ingress and egress from residential areas and ten (10) of the nuisance flood locations are evacuation routes. Utilizing the depth of flooding at each location, sites with flood depths of 3 feet or greater were rated as “Priority” sites for mitigation. A total of 11 nuisance and 5 urban flood locations were determined as priority sites. Chapter 3, page 3-25, Map Overall Nuisance and Flood Locations, page 3-26, and Nuisance Flood Plan</td></tr>
<tr><td colspan="9"></td></tr>
<tr><td rowspan="4">Project FL-2</td><td>Action Type</td><td>Implementation Schedule</td><td>Estimated Cost</td><td>Potential Funding</td><td>Lead</td><td>Community Lifeline</td><td>Social Vulnerability</td><td>Jurisdiction(s)</td></tr>
<tr><td>Structure & Infrastructure Projects</td><td>3-5 years</td><td>County – Staff Time $200K</td><td>FEMA BRIC Direct Technical Assistance, Continuing Authorities Program (CAP), Flood Mitigation Assistance Grant Program (FMA)</td><td>QAC Department of Public Works, QAC Department of Emergency Services</td><td>Safety and Security</td><td>* Major employment for county, Elderly, Homeowners in Grasonville</td><td>County</td></tr>
<tr><td colspan="8">Action: Apply for technical assistance grant funding. Identify potential mitigation measures along with concept design(s) for Kent Narrows/Grasonville high-risk area.</td></tr>
<tr><td colspan="8">Background and/or Plan Reference:
There are a significant number of older businesses, County and State-owned properties, and residences that are significantly impacted by tidal flooding. The time frame should be applied for a scoping/planning grant within the next 5 years; 2027 Fiscal year as an application date, which would make a 2026 NOI. Kent Narrows has moderate (blue-green) social vulnerability; Chapter 2, Figure 2-4. Considering Kent Narrows and Grasonville have moderate social vulnerability, this area could be a potential place to prioritize exposure reduction. This may include traditional land-altering structural approaches such as flood walls, detention basins, and green infrastructure, as well as nonstructural measures that remove people from risky areas like land use planning, buyouts, elevating buildings, and early warning systems. It is important to design mitigation projects that reduce disparities in protection, so that flood-exposed populations equitably reap mitigation opportunities and benefits. (Chapter 3, page 3-22) In addition, the Flood Risk Report identified Kent Narrows/Grasonville as a high-risk area with a total of</td></tr>
</table>

<table>
<tr><td></td><td colspan="8">274 building being impacted by the 1% annual chance flood hazard area, which would comprise 51% of the County's total flood loss estimate. Chapter 3, page 3-39 and Figure 3-4, page 3-40

Kent Narrows and Grasonville should be assessed to ensure all residents have the ability to evacuate when necessary, during flood event. Chapter 3, page 3-22</td></tr>
<tr><td colspan="9"></td></tr>
<tr><td rowspan="3">Project FL-3</td><td>Action Type</td><td>Implementation Schedule</td><td>Estimated Cost</td><td>Potential Funding</td><td>Lead</td><td>Community Lifeline</td><td>Social Vulnerability</td><td>Jurisdiction(s)</td></tr>
<tr><td>Natural Systems Protection</td><td>3-5 years</td><td>County – Staff Time
Town – Staff Time
$1M</td><td>FEMA Hazard Mitigation Grant Program, FEMA Increased Cost of Compliance, FEMA Building Resilient Infrastructure and Communities</td><td>QAC Department of Emergency Services, QAC Department of Public Works, Town of Centreville</td><td>Safety and Security</td><td>*</td><td>County, Centreville</td></tr>
<tr><td colspan="8">Action: Acquire, elevate or floodproof structures in identified severe loss and repetitive loss properties throughout Queen Anne’s County.</td></tr>
<tr><td></td><td colspan="8">Background and/or Plan Reference:
As of June 21, 2024, thirty-five (35) repetitive loss properties and four (4) severe repetitive loss properties located within Queen Anne’s County. All severe repetitive and repetitive loss properties are located in the unincorporated areas of the County, with the exception of one (1) repetitive loss property located in the Town of Centreville. Chapter 3, pages 3-11 to 3-12

The Repetitive Loss Property and Severe Repetitive Loss Property listing provided by FEMA in June 2024, could also be used to develop flood prevention information brochures, and disseminate to these properties via mailers.

Properties within the northeastern portion of the County, which has a higher socially vulnerable population, should be prioritized. Chapter 2, Section 2.7 Social Vulnerability, Figure 2-4, on page 2-35</td></tr>
</table>

Project FL-4	**Action Type**	**Implementation Schedule**	**Estimated Cost**	**Potential Funding**	**Lead**	**Community Lifeline**	**Social Vulnerability**	**Jurisdiction(s)**
	Education & Awareness Programs, Local Planning & Regulations	1-2 years	County – Staff Time, $50K	County – Annual Budget	QAC Dept. of Community Affairs – Comms Office, QAC Department of Public Works	Safety and Security	N/A	County
	Action: Complete Community Rating System (CRS) application following Community Assistance Visit (CAV) close-out.							
	Background and/or Plan Reference: For CRS participating communities, flood insurance premium rates are discounted in increments of five percent. The CRS classes for local communities are based on 18 creditable activities, organized under four categories: Public Information, Mapping and Regulations, Flood Damage Reduction, Flood Preparedness. Currently, Queen Anne's has a CRS rating of a Class 10. Queen Anne's County residents do not benefit from a flood insurance discount. Completion of a CRS application detailing floodplain management and mitigation efforts could result in a rating adjustment. **Chapter 3, page 3-12** Once the CRS application process is finished, the following activities could be completed to earn CRS points: • Promote flood insurance to all property owners that are in the Special Flood Hazard Area or adjacent to. **CRS Activity 370 (Flood Insurance Promotion)** - Assessing flood insurance coverage in the community and implementing a plan to promote flood insurance. • Educate the public on who is vulnerable to flood and provide flood prevention measures. Data from the Flood Risk Report could be utilized to target properties at risk to the 1% annual chance flood event. A total of 987 buildings in the unincorporated areas of the county were determined to be at risk, while 19 buildings were at risk in Centreville and 11 buildings in Queenstown. **Chapter 3, pages 3-33 to 3-35 and Map 3-7, page 3-38** **CRS Activity 360 (Flood Protection Assistance)** - Advising property owners and renters about how to protect buildings from flooding and publicizing that service. • Develop GIS database for current elevation certificates. Once developed, included information on the County's Property Viewer. The CRS requires participating communities to maintain elevation certificates, which provides an additional 38 points. **CRS Activity 310 (Elevation Certificates)** - Maintaining construction certificates and making them available to the public. • Integrate the County's Property Viewer on the Floodplain webpage.							

	CRS Activity 320 (Map Information Service) - Providing Flood Insurance Rate Maps (FIRMS) and other map information and publicizing that service. • Provide the Queen Anne's County Flood Insurance Study on the Floodplain webpage. **CRS Activity 350 (Flood Protection Information)** - Maintaining a community public library and/or website that contains flood-related information.							
	Action Type	**Implementation Schedule**	**Estimated Cost**	**Potential Funding**	**Lead**	**Community Lifeline**	**Social Vulnerability**	**Jurisdiction(s)**
Project FL-5	Structure & Infrastructure Projects	3-5 years	County – Staff Time Town – Staff Time $200K	FEMA Building Resilient Infrastructure and Communities, FEMA Hazard Mitigation Grant Program, Historic Preservation: Repair and Restoration of Disaster-Damaged Historic Properties, U.S Economic Development Administration, Public Works and Development Facilities	QAC Department of Public Works, QAC Department of Emergency Services, Towns		N/A	County, Millington, Queenstown, Centreville

				County – Annual Budget				

Action: Develop projects and seek funding for facilities identified in the flood vulnerability assessment. Use a contracted engineer to develop a prioritized list for projects.

Background and/or Plan Reference:

A total of fourteen (14) water system facility types and four (4) telecom towners located within the 1% annual chance flood inundation area.

- (2) Ground Storage Tanks – Kent Narrows
- (2) Pump Stations – Grasonville and Kent Narrows
- (9) Vacuum Collection Stations – Stevensville/Chester and Grasonville
- Water Treatment Plant – Kent Narrows
- (4) Telecom Towers – Kent Narrows and Stevensville/Chester

Chapter 3, Table 3-6, and Map 3-30.

Twenty-nine (29) critically facilities that are at-risk to the 1% annual chance flood event. Flood depths for each facility is provided in **Table 3-6, pages 3-28 and 3-29, Map 3-5, page 3-30**. Prioritization could be based on facilities with a depth of flood greater than 2.5 feet.

Two (2) essential facilities are at-risk to the 1% annual chance flood event. Both facilities are police stations, Sheriff's Office - Kent Narrow Substation (flood depth of 1.7 feet) and Centreville Police Department (flood depth of 0.5). Mitigation measures or relocation should be considered for these essential facilities. Mitigation projects featuring essential facilities have a high likelihood of resulting in a positive benefit-cost ration, resulting in grant funding and increased community resilience. **Chapter 3, page 3-31 and Map 3-6, page 3-32**

The *Maryland Historic Trust's Flood Mitigation Guide: Maryland's Historic Structures* should be used to determine appropriate mitigation measures for the eleven (11) historic structures as 1% annual chance flood hazard. Prioritize structures with a flood depth greater 2 feet, listed on **Table 3-12, page 3-41**. The Town of Millington is concerned about future conditions impacting Old Mill, a historic structure within town limits. The Town of Queenstown is concerned about the Colonial Courthouse, which is owned by the Town, being impacted by hazard events.

The Town of Centreville is concerned about the following facilities: North Pump Station, South Pump Station, and Wharf Lane Pump Station. The Town of Queenstown is concerned about the pump station at Del Rhodes, a well at Del Rhodes, and WWTP EQ Tank.

The Towns of Barclay and Sudlersville have no special flood hazard areas and therefore would not be impacted by this hazard.

Project FL-6	**Action Type**	**Implementation Schedule**	**Estimated Cost**	**Potential Funding**	**Lead**	**Community Lifeline**	**Social Vulnerability**	**Jurisdiction(s)**
	Education & Awareness Programs	1-2 years	County – Staff Time $20K	County – Annual Budget	Department of Health		N/A	County
	Action: Encourage homeowner wellhead protection in the floodplain.							
	Background and/or Plan Reference: Recommended by Environmental Health • Flood-proof caps for wellheads if the property is in a flood zone(s). • Wellhead should be 8 feet about the floodplain.							

TABLE 17-4: PRIMARY HAZARD - TROPICAL SYSTEMS (HURRICANE)

Goal: Minimize the impacts from hurricanes to people, structures, systems, and community resources.
Objective #1: Conduct targeted public outreach campaigns that include weather and climate risk preparedness and mitigation.
Objective #2: Enforce regulations and complete inspections to ensure the safety of people and structures from high wind hazards.
Note: Flood-related mitigation actions are included within Chapter 3: Flood.

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project H-1	Education & Awareness Programs	1-2 years then Ongoing	County – Staff Time Towns – Staff Time $50K	County – Annual Budget Town – Annual Budget	QAC Department of Emergency Services, QAC Planning & Zoning, QAC Community Affairs, Department of Health, QAC Dept of Public Works		* Translation, Accessible Language, Disabled	County, Barclay, Church Hill, Centreville, Millington, Queenstown, Sudlersville

Action: Collaborate with both the County and municipalities to educate property owners on tree removal and trimming to prevent power outages during a high wind event, resulting from tornado, thunderstorms, and **hurricane hazards**. Educate the public about securing debris, propane tanks, yard items, or stored objects that may otherwise be swept away, damaged, or pose a hazard during a hurricane.

Background and/or Plan Reference: Hurricane wind can uproot trees and cause significant damage to trees and other infrastructure. Tornadoes can damage homes, including crushing them with large trees. Tornadoes can rip down power lines. Downed tree or weak/dead tree located near power lines and transformers can take out power to entire communities. Ensuring that trees are trimmed properly, and new trees are planted away from electric lines are key to minimizes power outages from high wind events, like tornados.

For the last 30 years, research on multiple storms across the Northeastern U.S. has pointed to trees "as the leading cause of outages." There is ample evidence that Utility Vegetation Management programs improve reliability and cut the system average interruption frequency index (SAIFI). For example, a University of Connecticut statewide study comparing 13 years of pruning using an enhanced tree pruning program versus nearby untreated rights-of-way found "ETT-treated conductors had storm outage rates that were 0.07 to 0.36 outages/km/year lower

	than untreated conductors or 35% to 180% lower than the service area's average annual outage rate for untreated conductors." Vulnerable populations, particularly those reliant on medical equipment are at-risk during power outages. Power outages caused by widespread disasters, like a tornado, often have longer restoration times than those caused by equipment failure or an incident at one specific location. Over 3 million Medicare beneficiaries rely on electricity-dependent durable medical and assistive equipment (DME) and devices to live independently in their homes, and some of those individuals also have health care service dependencies. Severe weather and other emergencies, especially those with prolonged power outages, can be life-threatening for these individuals. The HHS emPOWER Map is regularly updated and displays the total number of Medicare beneficiaries who have had an administrative claim for one or more types of electricity-dependent durable medical and assistive equipment (DME) and devices, as well as at-risk combinations data for those who rely on a certain essential health care service(s) and any electricity-dependent DME and devices. Data was collected in September 2024, by zip code, and indicates that there are 10,137 at-risk beneficiaries for all zip codes in Queen Anne's County, and a total of 359 at-risk beneficiaries for all zip codes. Participating municipalities within Zip Codes identified on the map include: 21607 Barclay, 21617 Centreville, 21623 Church Hill, 21651 Millington, 21658 Queenstown, 21668 Sudlersville

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project H-2	Local Planning & Regulations, Education & Awareness Programs	3-5 years	County – Staff Time Town – Staff Time	Small Business Administration (SBA) Pre-disaster Mitigation Loan Program County – Annual Budget Town – Annual Budget	QAC Planning & Zoning, Town Planners and Attorneys	Safety and Security	*	County, Church Hill, Centreville, Queenstown

Action: Require tie-downs with anchors and ground anchors appropriate for the soil type for manufactured homes. Complete inspections to ensure that tie-downs with anchors and ground anchors are properly installed. Prioritize older homes.

Background and/or Plan Reference: According to the most recent parcel data provided by Queen Anne's County GIS department, there are 399 parcels that contain a mobile home or mobile home park located throughout Queen Anne's County. The Town of Church Hill contains a mobile home park with 5 mobile homes. Outreach materials such as FEMA's Protecting Manufactured Homes from Floods and Other Hazards should be distributed to these residents.

QAC is located hurricane susceptible region in wind zone II. Wind Zone II –160 mph.

See HB 538 which requires manufactured/modular/mobile homes be permitted on any zone single family dwellings are permitted. Effective 01/2025.



TABLE 17-5: PRIMARY HAZARD - SEA LEVEL CHANGE

Goal: Minimize the impacts from sea level rise to people, structures, systems, and community resources.
Objective #1: Ensure that current planning and land use regulations consider sea level rise and future conditions.
Objective #2: Ensure continuity of operations and increase community resiliency.
Objective #3: Conduct targeted public outreach campaigns that include weather and climate risk preparedness and mitigation.
Objective #4: Undertake recommended adaptation strategies outlined in the QAC Sea Level and Coastal Vulnerability Assessment and Implementation Plan.

Project SLR-1

Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Local Planning & Regulations	3-5 years	County – Staff Time Town – Staff Time $5K	County – Annual Budget Town – Annual Budget	QAC Dept of Public Works, County Commissioners Town Planners and Attorneys	Safety and Security	* Translated to Spanish	County, Centreville, Church Hill, Queenstown, Millington

Action: Update 2014 Floodplain Management Ordinance and develop Coastal Floodplain Overlay in consideration of increasing storm severity and sea level rise. Use New 2025 State of Maryland Model Floodplain Ordinance when published to help guide this effort.

Background and/or Plan Reference: CoastSmart Climate Ready Action Boundary (CRAB) provides each county a freeboard depth grid representing the depth of flood waters above the existing ground elevation given a 1-,2- or 3-foot increase in water level. Essentially the CRAB Depth Grid represents current conditions with potential future conditions. Utilizing the CRAB model for coastal BFE plus 3-foot, a total of 4,193 buildings are projected to be impacted. Note: 2016 Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan proposes raising freeboard requirement from 2 feet to 4 feet above Base Flood Elevation (BFE) based on SLR 2050 and 2100 projections. (If we use 2050 projections, then we should use 2' not 4') CRS Activity 410 (Floodplain Mapping) - Developing regulatory maps for areas not mapped by FEMA or flood mapping based on future conditions, detailed topography, or other standards CRS Activity 430 (Higher Regulatory Standards) - Regulations that exceed the NFIP's minimum criteria for floodplain management.

Note: The 2014 Queen Anne's County Flood Insurance Study discussed floodplains and flood issues for the following municipalities: Barclay, Centreville, Church Creek, Queen Anne, Queenstown, and Sudlersville. The Town of Millington was included 2014 Kent County Flood Insurance Study, while the Town of Templeville was discussed in the 2015 Caroline County Flood Insurance Study. Please note that as of the effective date of the Caroline County FIS and Queen Anne's County FIS, the Towns of Barclay, Sudlersville, and Templeville have no special flood hazard areas identified. In addition, the Town of Templeville participated in the Caroline County Hazard Mitigation Plan and the Town of Queen Anne participated in the Talbot County Hazard Mitigation Plan.

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project SLR-2	Structure & Infrastructure Projects	3-5 years	County – Staff Time Town – Staff Time $200K	Silver Jackets Program – Technical Assistance, FEMA Building Resilient Infrastructure and Communities	QAC Dept of Public Works QAC Dept of Emergency Services, MD Dept of Natural Resources	Safety and Security	N/A	County, Centreville, Queenstown, Millington
	Action: Determine mitigation measures for critical facilities that are located within the projected 2050 Sea Level Rise inundation area.							
	Background and/or Plan Reference: The following critical facilities that are located within the projected 2050 Sea Level Rise inundation area. Fixed HazMat Storage Site - Castle Marina, 301 Tackle Circle, Chester; QAC Sheriff's Office HQ - 505 Railroad Ave, Centreville; Sheriff's Office – (Kent Narrows) Substation, 425 Piney Narrows Rd, Chester; Maryland Natural Resources Police, 425 Piney Narrows Rd, Chester. The Town of Centreville is concerned about the following facilities: North Pump Station, South Pump Station, and Wharf Lane Pump Station. The Town of Queenstown is concerned about the pump station at Del Rhodes, a well at Del Rhodes, and WWTP EQ Tank. Appendix B							

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project SLR-3	Local Planning & Regulations	3-5 years	County – Staff Time $500K	FEMA BRIC Direct Technical Assistance, Continuing Authorities Program (CAP), Silver Jackets Program – Technical Assistance	DES, DPW/SHA, Planning & Zoning	Safety and Security	N/A	County
	Action: Review the prioritized adaptation strategies from the Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan. Adaptive strategies identified include timeframe, therefore integrate those strategies that are likely to be undertaken during this next 5-year planning cycle.							
	Background and/or Plan Reference: Adaptive strategies identified in the **Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan** included: short-term, mid-term and long-term. Short-term action strategies address the immediate needs of the County to build resiliency and protect against SLR and coastal flooding. These are typically strategies to either provide temporary protection of resources or planning activities for more permanent protection. Short-term action strategies should include evaluation of regulatory changes for development, flood proofing of existing resources, incorporation of SLR in planning for future capital projects, and continued efforts to build adaptive capacity. Medium-term action strategies begin to implement short-term planning studies and increase the level of protection in the County. Long-term strategies aim to create more permanent solutions and resiliency to achieve lasting protection throughout the County. Actions identified as a High Priority in the **County Climate Resilience Planning and Financing Study** included: • Elevate and protect MD 18 Bridge across Cox Creek - area identified as vulnerable to sea level rise: key connectivity feature in a growth area of the County. • Elevate sections of road MD 8/MD18 to provide safe and consistent access to communities. • Enact standards which incorporate storm surge models and upgrade infrastructure accordingly. Area specified- Kent Island and Kent Narrows Intensive Growth							

<table>
<tr><td></td><td colspan="8">

- Protect (elevate/dry floodproof) and/or relocate various collections – pump stations (Bay City, Thompson Creek, Kent Narrows, Grasonville)
- Limit development in the Critical Area and continue county acquisition of lands in critical area.

Chapter 9 Sea Level Change, Sea Level Rise and Coastal Vulnerability Assessment and Implementation Plan, County Climate Resilience Planning and Financing Study

</td></tr>
<tr><td colspan="9"></td></tr>
<tr><td rowspan="4">Project SLR-4</td><td>Action Type</td><td>Implementation Schedule</td><td>Estimated Cost</td><td>Potential Funding</td><td>Lead</td><td>Community Lifeline</td><td>Social Vulnerability</td><td>Jurisdiction(s)</td></tr>
<tr><td>Education & Awareness Programs</td><td>3-5 years</td><td>County – Staff Time
Town – Staff Time
$25K</td><td>County – Annual Budget
Town – Annual Budget</td><td>QAC Dept of Emergency Services, QAC Dept of Community Affairs, QAC Dept of Community Services</td><td>Safety and Security</td><td>*</td><td>County, Church Hill, Centreville, Queenstown, Millington</td></tr>
<tr><td colspan="8">Action: Conduct public outreach and education sessions of sea level rise projections and adaptative strategies.</td></tr>
<tr><td colspan="8">Background and/or Plan Reference: Consider vulnerable populations and sea level rise projections. Targeted outreach efforts should include future conditions and risk.

Sea level rise is a climate change threat that disproportionately affects disadvantaged populations, such as those with lower incomes, older populations, racial minorities, and renters. These groups have fewer resources and less ability to adapt to the effects of climate change.</td></tr>
<tr><td colspan="9"></td></tr>
</table>

TABLE 17-6: PRIMARY HAZARD - SOIL MOVEMENT (COASTAL EROSION)								
Goal: Minimize the impacts from soil movement to people, structures, systems, and community resources. **Objective #1:** Increase nature-based mitigation and resilience solutions. **Objective #2:** Conduct targeted public outreach campaigns that include weather and climate risk preparedness and mitigation.								
	Action Type	**Imp. Schedule**	**Estimated Cost**	**Potential Funding**	**Lead**	**Community Lifeline**	**Social Vulnerability**	**Jurisdiction(s)**
Project SM-1	Structure & Infrastructure Projects, Natural Systems Protection	3-5 years	County – Staff Time Town – Staff Time $2M	NOAA Coastal and Marine Habitat Restoration Grants, National Coastal Resilience Fund, FEMA Building Resilient Infrastructure and Communities	QAC Dept of Public Works, Town Engineer, Maryland Department of Environment, MD Dept of Natural Resources		N/A	County, Centreville
	Action: Implement riparian habitat reinstatement or revegetation on Watson Road, opposite side of the Wharf. Proper bank stabilization has been completed around the shoreline at the Wharf however the shoreline on the opposite side of Watson Road has not.							
	Background and/or Plan Reference: The shoreline on both sides of Watson Road in Centreville have been impacted by shoreline erosion. Shoreline work around the Wharf has been completed, however the shoreline on the other side of Watson Road is continuing to erode. The Town is currently working on removing phragmites in this area. Centreville has completed final phragmites spraying and currently working on the shoreline stabilization plan and identify a contractor.							



Riparian habitat reinstatement, or riparian restoration, is the process of restoring degraded riparian areas to their natural state. Riparian areas can be restored by planting native vegetation or replanting trees. Other shoreline stabilization methods include a living shoreline or hardened structures such as bulkheads or revetments.

The following Towns are in a non-coastal area in the County and therefore are not affected by this hazard: Sudlersville, Barclay, and Church Hill.

	Action Type	Imp. Schedule	Est. Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project SM-2	Education & Awareness Programs	1-2 years	County – Staff Time Town – Staff Time $20K	County – Annual Budget Town – Annual Budget	Maryland Department of Environment, QAC Dept of Community Affairs, QAC Planning & Zoning, Town Planners	Safety and Security	* Translate to Spanish	County, Queenstown, Centreville, Millington, Church Hill
	Action: Increase awareness of erosion hazards by providing a brochure describing risk and potential mitigation techniques to property owners.							
	Background and/or Plan Reference: During the Centreville municipal meeting, property owners on the right side of Watson Road and around to Carter Farm were identified for being at risk to shoreline erosion. The Town of Millington indicated that the areas surrounding the upper reach of Chester River have been cleared. The runoff from the clearings have created silt mud that is deposited into the river, raising the water level. Numerous waterfront properties located in Queenstown lack shoreline stabilization. In addition, the Maryland Coastal Resiliency Assessment determined both the northern and southern portion of Kent Island predominantly on the windward side have very high erosion rates; **Figure 5-1**. The following Towns are in a non-coastal area in the County and therefore are not affected by this hazard: Sudlersville, Barclay, and Church Hill.							

TABLE 17-7: PRIMARY HAZARD - DROUGHT

Goal: Minimize the impacts from drought to people, structures, systems, and community resources.
Objective #1: Ensure that essential services and infrastructure are maintained during emergencies or disasters.
Objective #2: Conduct targeted public outreach campaigns that include weather and climate risk preparedness and mitigation.
Objective #3: Continue to update plans and regulations that mitigate hazard risk.

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project D-1	Education & Awareness Programs, Local Planning & Regulations	1-2 years	County – Staff Time Town – Staff Time $1,000	County – Annual Budget Town – Annual Budget	Environmental Health, Town Staff, Maryland Department of Agriculture	Safety and Security	* Translate to Spanish	County, Barclay, Centreville, Church Hill, Millington, Queenstown, Sudlersville

Action: Conduct public outreach during a drought event to ensure that affected areas and communities can properly prepare for the impacts. Provide information on drought mitigation best practices for both residential and commercial properties.

Background and/or Plan Reference: Taking precautions early during drought events is essential to ensure that health professionals and emergency managers are prepared to help the community mitigate damages in the event of an ongoing drought. It is also important to recognize the competing interest of agricultural irrigation and potable residential wells. Both draw from the same aquifer in the rural areas and the cone of depression caused by irrigation will impact adjacent residential wells. **Chapter 6, page 6-5**

Both the **Towns of Millington and Church Hill** are located within the bright orange area, indicating high social vulnerability in terms of household characteristics (age 65 and older, 17 and younger, civilian with a disability, single parent household, and English language proficiency).

Xeriscaping is the practice of landscaping with minimal use of water. Incorporating drought tolerant or xeriscape practices into landscape to reduces dependence on irrigation. Include this information on the county website and social media campaigns. Also, promote the use of permeable driveways and surfaces to reduce runoff and promote groundwater recharge.

<table>
<tr><td rowspan="3">Project D-2</td><td>Action Type</td><td>Implementation Schedule</td><td>Estimated Cost</td><td>Potential Funding</td><td>Lead</td><td>Community Lifeline</td><td>Social Vulnerability</td><td>Jurisdiction(s)</td></tr>
<tr><td>Education & Awareness Programs</td><td>Ongoing</td><td>County – Staff Time
Town – Staff Time
$1,000</td><td>County – Annual Budget
Town – Annual Budget</td><td>Environmental Health, Town Staff, Maryland Department of Agriculture, University of Maryland Extension, USDA</td><td> 
</td><td>N/A</td><td>County, Sudlersville, Centreville</td></tr>
<tr><td colspan="8">Action: Provide information to farmers on the multiple insurance opportunities available, which assist farmers with losses due to adverse weather conditions, such as the Noninsured Disaster Assistance Program (NAP) and Federal Crop Insurance Program (FCIP).</td></tr>
<tr><td colspan="9">Background and/or Plan Reference: Drought's impacts are largely associated with agriculture, farming, and ranching. Examples of drought-induced agricultural impacts include damage to crop quality; income loss for farmers due to reduced crop yields; reduced productivity of cropland (due to wind erosion, long-term loss of organic matter, etc.); insect infestation; plant disease; increased irrigation costs; costs of new or supplemental water resource development (wells, dams, pipelines); reduced productivity. Chapter 6, page 6-6

The Noninsured Crop Disaster Assistance Program (NAP) provides benefits to producers of commercial agricultural products for which multi-peril crop insurance coverage is not available. NAP is designed to reduce financial losses when natural disasters cause catastrophic reduction in production. NAP provides coverage that is very similar to that provided by CAT policies available through crop insurance agents. NAP coverage is available through your local USDA Farm Service Agency office. To purchase NAP coverage, you pay a fee of $250 per crop per county (with fees capped at $750 per producer per county, but not to exceed a total of $1,875 for producers growing crops in multiple counties). Sign up deadlines for NAP vary by crop; contact your local FSA office for more information.

Another insurance coverage available is the Federal Crop Insurance Program (FCIP). This insurance program offers farmers the opportunity to purchase insurance coverage against financial losses caused by a wide variety of perils, including certain adverse growing and market conditions. (Source: Federal Crop Insurance: A Primer, 2021)

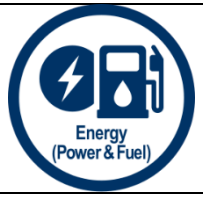
Currently, two (2) farms within the Town of Centreville – Carter Farm and Turpins Farm – would benefit from this information.</td></tr>
</table>

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project D-3	Local Planning & Regulations	Ongoing	County – Staff Time Town – Staff Time $5,000	County – Annual Budget Town – Annual Budget	County, Town Staff, Maryland Department of Environment		*	County, Barclay, Centreville, Church Hill, Millington, Queenstown, Sudlersville
	Action: Require the development and use of Water Supply Capacity Management Plans for each community water system to support new allocations or connections to the system and to prevent capacity over-allocation.							
	Background and/or Plan Reference: Water Resources Element of the 2022 Queen Anne's Comprehensive Plan, Appendix D and **Chapter 6, pages 6-7, and 6-8**							

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project D-4	Local Planning & Regulations	Ongoing	County – Staff Time Town – Staff Time $5,000	County – Annual Budget Town – Annual Budget	County, Town Staff, Maryland Department of Environment		*	County, Barclay, Centreville, Church Hill, Millington, Queenstown, Sudlersville
	Action: Develop a Water Protection Plan working collaboratively through interjurisdictional agreements between the County and the Towns for planning and implementation.							
	Background and/or Plan Reference: -Tracking water-level declines of groundwater resources. -Continued monitoring and study to ensure an adequate supply of necessary water resources. Water Resources Element of the 2022 Queen Anne's Comprehensive Plan, Appendix D and **Chapter 6, pages 6-7, and 6-8**							

TABLE 17-8: PRIMARY HAZARD - SEVERE WINTER WEATHER

Goal: Minimize the impacts from severe winter weather to people, structures, systems, and community resources.
Objective #1: Ensure that essential services and infrastructure are maintained during emergencies or disasters.
Objective #2: Ensure continuity of operations and increase community resiliency.
Objective #3: Conduct targeted public outreach campaigns that include weather and climate risk preparedness and mitigation.

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project SWW-1	Education & Awareness Programs, Local Planning & Regulations	Ongoing	County – Staff Time Towns – Staff Time	County – Annual Budget Town – Annual Budget	QAC Dept of Emergency Services, Town Planners		* Elderly (Symphony Village & Corsica Hills)	County, Millington, Church Hill, Centreville, Barclay

Action: *Establish emergency agreements with private utilities to encourage private utilities to participate with the County and municipalities in coordinated disaster response.* In consideration of vulnerable populations, prioritize these areas for power restoration.

Background and/or Plan Reference: Winter storms can cause communication disruptions, including power outages and radio blackouts. Heavy accumulations of ice can bring down trees and topple utility poles and communication towers. Ice can disrupt communications and power for days while utility companies repair extensive damage. **Chapter 8 Severe Winter Storms, Table 8-2 on page 8-9** details communication systems, Telecom Towers, which could be potentially impacted by a severe winter weather event. Utilize this table as a reference to aid in the determination of companies in which the establishment of an emergency agreement is advisable.

The aging population has an increased risk of injuries and death due to falls and from overexertion and/or hypothermia from attempts to clear snow. In addition, disabled people are also at-risk during and immediately after severe winter weather events due to potential isolation and because they are more likely to seek emergency medical attention that may not be as readily available. Finally, those lacking English proficiency are also vulnerable. Both the **Towns of Millington and Church Hill** are located within the bright orange area, indicating high social vulnerability in terms of household characteristics (age 65 and older, 17 and younger, civilian with a disability, single parent household, and English language proficiency). See **Chapter 8 Severe Winter Storms, Figure 8-3.**

Age 55 and above living facilities are in the Town of Centreville: Symphony Village & Corsica Hills.

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project SWW-2	Structure & Infrastructure Projects	1-2 years	County – Staff Time Town – Staff Time $200-300K	FEMA Hazard Mitigation Grant Program	QAC Dept of Public Works, Board of Education, Town Planners	Safety and Security	* School children, Elderly, Disabled	County, Millington, Church Hill, Centreville, Queenstown
	Action: Review listing of essential facilities and associated generator capability on Table 8-3. Prioritize those facilities without generators or those with undersized for new generators or replacements.							
	Background and/or Plan Reference: All essential facilities, a subset of critical facilities, were assessed to determine which, if any, had installed generators, and, if so, were the generators installed adequately sized. Those facilities without generators lack continuity of operation and resiliency. As these facilities are essential and must remain operational to ensure continued community resiliency, these facilities have been prioritized for analysis and potential hazard mitigation actions and projects. As noted on **Table 8-3, pages 8-13 and 8-14** there are many essential facilities without emergency back-up power. This includes facilities in both the County and in Towns. The continuity of operation of these facilities are indicative of community resiliency, the ability to "bounce back" and move from the response phase of an incident to recovery in a timely and efficient manner. Vulnerable populations, particularly those with access and functional needs are reliant on these facilities and the services they offer. In addition, the following Towns identified a generator need at their Town Halls and/or pump stations: **Queenstown Pump Stations, Sudlersville Town Hall, and Millington Town Hall**. The **Town of Millington** also indicated the Water Treatment Plant (WTP) needs a generator.							

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project SWW-3	Structure & Infrastructure Projects	Ongoing	Project Dependent	Community Development Block Grants / States Program, FEMA Building Resilient Infrastructure and Communities	QAC Dept of Public Works, Board of Education	Safety and Security	* School children, Elderly, Disabled	County, Sudlersville, Millington
	Action: Complete appropriate structural retrofits of existing building to improve the integrity of the building envelope and roof systems for critical facilities built prior to 1965.							
	Background and/or Plan Reference: Roof geometry affects the ability of structure to shed snow. Roofs with geometric irregularities and obstructions collect snowdrifts in an unbalanced pattern. Critical facilities built prior to modern building codes and/or aging may be at-risk to potential roof damage and/or collapse due to snow loads. Critical facilities with flat roofs and year built are listed on **Table 8-4, page 8-14 of Chapter 8 Severe Winter Storms.**							

<table>
<tr><td rowspan="3">Project SWW-4</td><td>Action Type</td><td>Implementation Schedule</td><td>Estimated Cost</td><td>Potential Funding</td><td>Lead</td><td>Community Lifeline</td><td>Social Vulnerability</td><td>Jurisdiction(s)</td></tr>
<tr><td>Education & Awareness Programs</td><td>Ongoing</td><td>County – Staff Time
Towns – Staff Time
$1,000</td><td>County – Annual Budget
Town – Annual Budget</td><td>Health, Town Staff, Maryland Department of Agriculture, University of Maryland Extension, USDA</td><td> 
</td><td>N/A</td><td>County, Sudlersville</td></tr>
<tr><td colspan="8">Action: Conduct public outreach to farmers located in the county and municipalities specific to severe weather.</td></tr>
<tr><td colspan="9">Background and/or Plan Reference: Queen Anne’s County is one of the few counties in Maryland that has preserved approximately 35% of its total land area in some form of conservation. Currently, 84.7% or 201,526.8 acres of the County’s land is zoned Agricultural (AG) or Countryside (CS). Agricultural land use includes the growing of crops and grazing of livestock. Livestock in particular may be affected by severe winter weather. Helping to ensure the continued vitality of agriculture in Queen Anne’s County may assist in mitigating the loss of future agricultural land. public outreach and preparedness that the County and municipalities may undertake include outreach to farmers, such as the following:
Things that you can do to help stay ahead of weather and climate risk include:
1. Developing a weather preparedness plan. Your plan should address your most likely weather hazards including things like drought, flooding, blizzards, high winds, and severe thunderstorms.
2. Using weather forecasting and monitoring tools. Many of these tools are available as apps on your smartphone. Many include valuable functions like live radar and local severe weather warnings.
3. Implementing farming practices that mitigate risk. No-till or minimum tillage can help sustain soils if high winds are a common severe weather threat. Crop seed varieties also can offer traits like drought or cold tolerance, helping mitigate those risks.
4. Creating alternative and backup plans for crops and livestock. If markets are available, alternative crops or livestock can help maintain the productivity of land even if it’s changed by climate or weather. Chapter 8 Severe Winter Storms, pages 8-6 and 8-7, Figure 8-2</td></tr>
</table>

TABLE 17-9: PRIMARY HAZARD - EXTREME TEMPERATURES

Goal: Minimize the impacts from extreme temperatures to people, structures, systems, and community resources.
Objective #1: Conduct targeted public outreach campaigns that include weather and climate risk preparedness and mitigation.
Objective #2: Ensure continuity of operations and increase community resiliency.

Project ET-1

Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Education & Awareness Programs, Local Planning & Regulations	Ongoing	County – Staff Time Town – Staff Time	County – Annual Budget Town – Annual Budget	QAC Department of Community Services, QAC Department of Emergency Services	Safety and Security	* Elderly, Disabled, Low Income	County, Queenstown, Centreville, Church Hill, Sudlersville, Millington, Barclay

Action: Ensure all residents, especially those that are most susceptible to the effects of extreme temperatures, notably the northern portion of the county, have information regarding services the county provides during an extreme heat or cold event. Promote the availability of warming and cooling centers and their locations.

Background and/or Plan Reference: In terms of vulnerable population, people ages 65 and older are particularly susceptible to temperature extremes.

a) Ensure that vulnerable populations are aware of warming and cooling centers are available by targeting vulnerable pops with flyers or mailers.
b) Coordinate with County and Municipal departments and partners who already work with vulnerable populations in the realm of health.
c) Educate on personal preparedness and safety measures taken during a hazard event.

According to **Chapter 2, Section 2.7 Social Vulnerability**, the northeastern portion of the County has a higher number of people 65 years of age and older. Both the Towns of Church Hill and Millington are within this area, shown on **Figure 2-3, on page 2-34. Chapter 7, page 7-5**

Measures should be taken to ensure vulnerable populations are adequately protected from the impacts of extreme temperatures. Creating a database to track those individuals at high risk of death, such as the elderly, or homeless would assist with targeting these populations. The Department of Health Office of Preparedness is drafting a plan on the use of the newly availably refined emPower data. The office can distribute specific data to DES as needed. However, if more identifiable data is needed, a new process for data access is being developed. This includes data use agreement and specific data needed. This information allows DES to target specific vulnerable populations. **Social Equity**

	and Social Vulnerability Small Group Meeting Notes							
Project ET-2	**Action Type**	**Implementation Schedule**	**Estimated Cost**	**Potential Funding**	**Lead**	**Community Lifeline**	**Social Vulnerability**	**Jurisdiction(s)**
	Structure & Infrastructure Projects	Ongoing	County – Staff Time	County – Annual Budget	QAC Department of Public Works		* Elderly, Disabled, Low Income	County
	Action: Maintain facilities and their heating and cooling systems to ensure that they operate in appropriate conditions for people.							
	Background and/or Plan Reference: Extreme heat can cause damage to buildings or contents by overheating HVAC or air conditioning systems, contributing to jurisdictional losses. It is unlikely that an entire building would be impacted in an extreme heat event, though. Additionally, buildings of significant age may be more susceptible to temperature extremes. **Chapter 7, page 7-7**							

TABLE 17-10: PRIMARY HAZARD - WILDFIRE

Goal: Minimize the impacts from wildfire to people, structures, systems, and community resources.
Objective #1: Ensure continuity of operations and increase community resiliency.
Objective #2: Conduct targeted public outreach campaigns that include weather and climate risk preparedness and mitigation.

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project WF-1	Education & Awareness Programs	Ongoing	County – Staff Time $10K	County – Annual Budget, Firewise Maryland Services	Firewise Maryland Program, QAC Community Affairs – Comms Office, QAC Fire & EMS Commission, QAC Dept of Emergency Services	Safety and Security	*	County
	Action: *Initiate Community Firewise program in coordination with Fire & EMS Commission*. This includes the following volunteer fire departments: Queenstown VFC #3 in the Town of Queenstown; Goodwill VFC #4 in the Town of Centreville; Church Hill VFC #5 in the Town of Church Hill; Sudlersville VFC #6 in the Town of Sudlersville; and Crumpton VFC #7 in the community of Crumpton.							
	Background and/or Plan Reference: Wildfires and brush fires have forced school closings, disrupted telephone services by burning fiber optic cables, damaged railroads, and other infrastructure, and adversely affected tourism, outdoor recreation, and hunting. Firewise communities are those that have taken appropriate measures to become more resistant to wildfire structural damage. According to Maryland Department of Natural Resources - Forest Service, the increasing threat of wildfires to life and property and the continual spread of the population and the wildland urban interface areas throughout the state puts a strain on the local and state resources to suppress wildland fires. The Firewise Maryland Program is a free service that aims to reduce the risk of wildfires in Maryland by providing education and outreach, and by helping communities plan for wildfire protection. The program offers a variety of services, which includes becoming a nationally recognized Firewise Community.							

<table>
<tr><td></td><td colspan="8">Depending upon location of wildland-urban interface, vulnerable populations are particularly at-risk. Refer to Firewise Maryland and Firewise USA Program Toolkit</td></tr>
<tr><td colspan="9"></td></tr>
<tr><td rowspan="3">Project WF-2</td><td>Action Type</td><td>Implementation Schedule</td><td>Estimated Cost</td><td>Potential Funding</td><td>Lead</td><td>Community Lifeline</td><td>Social Vulnerability</td><td>Jurisdiction(s)</td></tr>
<tr><td>Education & Awareness Programs, Local Planning & Regulations</td><td>1-2 years</td><td>County – Staff Time
Towns – Staff Time
$50K</td><td>County – Annual Budget
Town – Annual Budget,
Firewise Maryland Services</td><td>Firewise Maryland Program, QAC Fire & EMS Commission, QAC Dept of Emergency Services, Town Planners</td><td>Safety and Security</td><td>*</td><td>County, Barclay, Queenstown, Centreville, Church Hill, Sudlersville, Millington</td></tr>
<tr><td colspan="8">Action: Host annual urban-wildfire interface mitigation events in several areas of the county in cooperation with municipalities. This would include chipper day, community cutting/thinning projects, general landscape clean-up, creation of defensible space around a public structure or in a park. North County event which includes Millington, Sudlersville, Barclay, Church Hill and a South County event which includes Centreville and Queenstown.</td></tr>
<tr><td colspan="8">Background and/or Plan Reference: A wildfire is an even greater challenge when it threatens homes and other structures. The zone where homes are built in or near the forest is called the Wildland-Urban Interface (WUI). The number of homes built in the WUI in Maryland has increased dramatically in recent years. A Wildland–Urban Interface (WUI) is a zone of transition between wildland and human development. Areas within Queen Anne’s County that indicate WUI include:
• Barclay
• Sudlersville
• Church Hill
• Millington
• Southern portion of Centreville; and,
• Grasonville area.
Depending upon location of wildland-urban interface, vulnerable populations are particularly at-risk.</td></tr>
</table>

<table>
<tr><th colspan="9">TABLE 17-11: PRIMARY HAZARD - THUNDERSTORM (INCLUDING LIGHTNING, HAIL, AND STRONG WINDS)</th></tr>
<tr><td colspan="9">Goal: Minimize the impacts from thunderstorms to people, structures, systems, and community resources.
Objective #1: Ensure that essential services and infrastructure are maintained during emergencies or disasters.
Objective #2: Ensure continuity of operations and increase community resiliency.
Objective #3: Conduct targeted public outreach campaigns that include weather and climate risk preparedness and mitigation.</td></tr>
<tr><td rowspan="3">Project T-1</td><td>Action Type</td><td>Implementation Schedule</td><td>Estimated Cost</td><td>Potential Funding</td><td>Lead</td><td>Community Lifeline</td><td>Social Vulnerability</td><td>Jurisdiction(s)</td></tr>
<tr><td>Structure & Infrastructure Projects</td><td>3-5 years</td><td>$5-10K</td><td>County – Annual Budget
Town – Annual Budget</td><td>QAC Dept of Public Works, Communication Providers, Private Property Owners, Town Engineers</td><td>Safety and Security</td><td>N/A</td><td>County, Barclay, Centreville, Church Hill, Queenstown, Millington, Sudlersville</td></tr>
<tr><td colspan="8">Action: Install lightning protection devices, such as lightning rods and grounding, on communications infrastructure and other critical facilities.</td></tr>
<tr><td colspan="9">Background and/or Plan Reference: Table 11-2, page 11-8, provides listing of facilities that include an antenna on or at the facility.

Vulnerable populations, particularly those with access and functional needs are reliant on these facilities and the services they offer.

In addition, town halls located in Barclay, Centreville, Church Hill, Queenstown, Millington, and Sudlersville were identified for electrical surge protectors and/or lightning rods.</td></tr>
</table>

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project T-2	Structure & Infrastructure Projects	1-2 years	$5K	CSW-Facility and Community Improvements Details, FEMA Hazard Mitigation Grant Program	QAC Dept of Emergency Services, QAC Dept of Public Works	Communications	*	County, Sudlersville
	Action: Work with the Maryland Department of Emergency Management (MDEM) to establish Mesonet sites throughout the County.							
	Background and/or Plan Reference: The Maryland Mesonet's mission is to design, build, and operate a network of high-quality, closely spaced, rapid-sampling weather monitoring and data collection systems across the state to advance emergency preparedness, the accuracy of regional weather forecasts, and expedite disaster assessment and recovery. Each Mesonet site will measure air temperature, atmospheric pressure, relative humidity, wind speed and direction, solar radiation, rainfall, snow depth, and soil moisture and temperature at five depths, most at 1-minute intervals. The measurements are sent to data servers at the University of Maryland using cellular transmission. The automatic quality-controlled observations are transmitted in near real-time to the National Weather Service and simultaneously available to emergency management personnel and Maryland citizens from the Mesonet website. Mesonet data will advance community risk assessment and emergency preparedness for impending extreme weather, improve regional weather forecasts by providing more accurate initial states for prediction models, and expedite post-event analysis for disaster declaration and recovery. Advanced warning and notification as well as risk information should inform public outreach and targeted outreach to vulnerable populations. Potential Mesonet sites identified include: Matapeake, Department of Emergency Services, and Sudlersville.							

TABLE 17-12: PRIMARY HAZARD - EARTHQUAKE								
Goal: Minimize the impacts from earthquake to people, structures, systems, and community resources. *Note: earthquake is considered a low-risk hazard in both Queen Anne's County Hazard Mitigation Plan and the 2021 State of Maryland hazard Mitigation Plan.* **Objective #1:** Ensure that essential services and infrastructure are maintained during emergencies or disasters. **Objective #2:** Ensure continuity of operations and increase community resiliency.								
	Action Type	**Implementation Schedule**	**Estimated Cost**	**Potential Funding**	**Lead**	**Community Lifeline**	**Social Vulnerability**	**Jurisdiction(s)**
Project E-1	Structure & Infrastructure Projects	Ongoing	Project Dependent	FEMA Hazard Mitigation Grant Program, National Highway Performance Program	QAC Dept of Public Works, Town Engineers, Delmarva Power, Choptank Electric		* Age, Disability, Institutional Settings	County, Barclay, Centreville, Church Hill, Millington, Queenstown, Sudlersville
	Action: Bury and protect vulnerable critical infrastructure, such as power lines, to lessen potential failures during hazard events.							
	Background and/or Plan Reference: This action applies to various hazards such as: Tornado, Severe Winter Storm, Tropical Systems, **Earthquake**, and Thunderstorm. *Note: earthquake is considered a low-risk hazard in both Queen Anne's County Hazard Mitigation and the 2021 State of Maryland hazard Mitigation Plan. Cost- benefit analysis would not be positive for mitigation project for earthquake hazard alone.*							

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project E-2	Structure & Infrastructure Projects	3-5 years	County – Staff Time Towns – Staff Time	County – Annual Budget Town – Annual Budget	QAC GIS Dept, QAC Dept of Planning & Zoning, Town Staff		N/A	County, Barclay, Centreville, Church Hill, Millington, Queenstown, Sudlersville
	Action: Develop an inventory of un-reinforced masonry structures and develop appropriate mitigation action items to reduce the impacts of seismic events.							
	Background and/or Plan Reference: *Note: earthquake is considered a low-risk hazard in both Queen Anne's County Hazard Mitigation Plan and the 2021 State of Maryland hazard Mitigation Plan. Cost- benefit analysis would not be positive for mitigation project.*							

TABLE 17-13: PRIMARY HAZARD - TORNADO

Goal: Minimize the impacts from tornados to people, structures, systems, and community resources.

Objective #1: Conduct targeted public outreach campaigns that include weather and climate risk preparedness and mitigation.

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project TO-1	Education & Awareness Programs, Local Planning & Regulations	Ongoing	County – Staff Time Towns – Staff Time $50K	County – Annual Budget Town – Annual Budget	QAC Dept of Community Affairs – Comms Office Delmarva Power, Choptank Electric, Town Planners	Safety and Security	* Elderly, Disabled, Translate to Spanish	County, Barclay, Church Hill, Centreville, Millington, Queenstown, Sudlersville

Action: Collaborate with both the County and municipalities to educate property owners on tree removal and trimming to prevent power outages during a high wind event, resulting from **tornado**, thunderstorms, and hurricane hazards.

Background and/or Plan Reference: Tornadoes can uproot trees and cause significant damage to trees and other infrastructure. Tornadoes can damage homes, including crushing them with large trees. Tornadoes can rip down power lines. Downed tree or weak/dead tree located near power lines and transformers can take out power to entire communities. Ensuring that trees are trimmed properly, and new trees are planted away from electric lines are key to minimizes power outages from high wind events, like tornados.

For the last 30 years, research on multiple storms across the Northeastern U.S. has pointed to trees "as the leading cause of outages." There is ample evidence that Utility Vegetation Management programs improve reliability and cut the system average interruption frequency index (SAIFI). For example, a University of Connecticut statewide study comparing 13 years of pruning using an enhanced tree pruning program versus nearby untreated rights-of-way found "ETT-treated conductors had storm outage rates that were 0.07 to 0.36 outages/km/year lower than untreated conductors or 35% to 180% lower than the service area's average annual outage rate for untreated conductors."

Vulnerable populations, particularly those reliant on medical equipment are at-risk during power outages. Power outages caused by widespread disasters, like a tornado, often have longer restoration times than those caused by equipment failure or an incident at one specific location. Over 3 million Medicare beneficiaries rely on electricity-dependent durable medical and assistive equipment (DME) and devices to live independently in their homes, and some of those individuals also have health care service dependencies. Severe weather and other emergencies, especially those with prolonged power outages, can be life-threatening for these individuals. The HHS emPOWER Map is

<table>
<tr><td></td><td colspan="8">regularly updated and displays the total number of Medicare beneficiaries who have had an administrative claim for one or more types of electricity-dependent durable medical and assistive equipment (DME) and devices, as well as at-risk combinations data for those who rely on a certain essential health care service(s) and any electricity-dependent DME and devices. Data was collected in September 2024, by zip code, and indicates that there are 10,137 at-risk beneficiaries for all zip codes in Queen Anne's County, and a total of 359 at-risk beneficiaries for all zip codes. Participating municipalities within Zip Codes identified on the map include: 21607 Barclay, 21617 Centreville, 21623 Church Hill, 21651 Millington, 21658 Queenstown, 21668 Sudlersville</td></tr>
<tr><td colspan="9"></td></tr>
<tr><td rowspan="3">Project TO-2</td><td>Action Type</td><td>Implementation Schedule</td><td>Estimated Cost</td><td>Potential Funding</td><td>Lead</td><td>Community Lifeline</td><td>Social Vulnerability</td><td>Jurisdiction(s)</td></tr>
<tr><td>Education & Awareness Programs</td><td>Ongoing</td><td>County – Staff Time
Towns – Staff Time
$5K</td><td>County – Annual Budget
Town – Annual Budget</td><td>QAC Dept of Community Affairs – Comms Office, QAC Department of Emergency Services, Town Planners</td><td>Safety and Security</td><td>*
Mobile Home Residents, Low Income</td><td>County, Church Hill, Centreville</td></tr>
<tr><td colspan="8">Action: Provide outreach materials to the mobile homes located in the County, Church Hill, and Centreville.
Background and/or Plan Reference: According to the most recent parcel data provided by Queen Anne's County GIS department, there are 399 parcels that contain a mobile home or mobile home park located throughout Queen Anne's County. The Town of Church Hill contains a mobile home park with 5 mobile homes and a small mobile home park is located on Hammond Street in Centreville. Outreach materials such as FEMA's Protecting Manufactured Homes from Floods and Other Hazards should be distributed to these residents. Chapter 13 Tornado</td></tr>
<tr><td colspan="9"></td></tr>
</table>

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project TO-3	Education & Awareness Programs	Ongoing	County – Staff Time Towns – Staff Time $5K	County – Annual Budget Town – Annual Budget	QAC Dept of Community Affairs – Comms Office QAC Dept of Community Services - Aging, QAC Dept of Emergency Services, Town Planners	Safety and Security	* Elderly, Disabled, Low Income	County, Barclay, Church Hill, Centreville, Millington, Queenstown, Sudlersville
	Action: Provide education and awareness on home safety for tornados.							
	Background and/or Plan Reference: Chapter 13 Tornado							

TABLE 17-14: PRIMARY HAZARD - DAM FAILURE

Goal: Minimize the impacts from dam failure to people, structures, systems, and community resources.
Objective #1: Ensure continuity of operations and increase community resiliency.
Objective #2: Ensure adequate public safety warning is available.

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project DF-1	Education & Awareness Programs	1-2 years	County – Staff Time $1,500	County – Annual Budget, Dam Owner(s)	Department of Emergency Services, Department of Public Works, MDE Dam Safety Program, Private Dam Owner, Department of Natural Resources		N/A	County

Action: Host meeting to determine dam rehabilitation project specifications, time schedule, and funding source(s) for each significant hazard dam in the County.

Background and/or Plan Reference:

MD No. 29 NID NO. MD00029 Wye Mills Dam.

- Built: 1682
- Modified: 1958
- Owner: MD DNR
- Hazard Classification: Significant
- Normal Surface Area: 62 acres
- Maximum Storage: 1,224 acre-feet
- Existing Condition: Deteriorating Concrete, Wet Area Left Downstream Toe

MD No. 47 NID NO. MD000747 Unicorn Branch Dam.

- Built: 1964
- Modified: 1996
- Owner: MD DNR
- Hazard Classification: Significant
- Normal Surface Area: 48 acres
- Maximum Storage: 539 acre-feet
- Existing Condition: Wet Area Downstream Toe, Crack Spillway Training Wall

MD No. 175 NID NO. MD00175 Owings Farm Pond Dam.

- Built: 1967
- Modified: 1987
- Owner: Hambleton Creek Farm, Incorporated
- Hazard Classification: Significant
- Normal Surface Area: 18 acres
- Maximum Storage: 98 acre-feet
- Existing Condition: Wet Area Downstream Left Abutment, Animal Burrows

The following Towns are not located in dam inundation areas and therefore are not affected by this hazard: Sudlersville, Barclay, Centreville, Millington, Queenstown, and Church Hill.

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project DF-2	Education & Awareness Programs, Local Planning & Regulations	3-5 years	County – Staff Time $50K	National Dam Safety Program (NDSP) State Assistance Grant Program thru MDE Dam Safety Program	Department of Emergency Services	Safety and Security	*	County
	Action: As a follow up to the 2022 Dam Safety Exercise, develop and conduct a HSEEP complaint drill or functional exercise evaluating notification and response capability(s).							

<table>
<tr><td></td><td colspan="8">Background and/or Plan Reference:
HSEEP complaint drill or functional exercises include:
• Exercise Planning Meeting(s)
• Exercise Design & Development
• Exercise Evaluation
• Exercise After Action Report & Implementation Plan

*Include testing hazard warning and notification capability to vulnerable population in drill or functional exercise.

The following Towns are not located in dam inundation areas and therefore are not affected by this hazard: Sudlersville, Barclay, Centreville, Millington, Queenstown, and Church Hill.</td></tr>
<tr><td colspan="9"></td></tr>
<tr><td rowspan="4">Project DF-3</td><td>Action Type</td><td>Implementation Schedule</td><td>Estimated Cost</td><td>Potential Funding</td><td>Lead</td><td>Community Lifeline</td><td>Social Vulnerability</td><td>Jurisdiction(s)</td></tr>
<tr><td>Structure & Infrastructure Projects</td><td>3-5 years</td><td>$6,000</td><td>Safe Streets and Roads for All (SS4A) Grant Program</td><td>Department of Emergency Services, State Highway Administration</td><td>Transportation</td><td>N/A</td><td>County</td></tr>
<tr><td colspan="8">Action: Add signage to the following roadway indicating they are within the inundation area for significant hazard dam.</td></tr>
<tr><td colspan="8">Background and/or Plan Reference:
Specifically, Unicorn Branch Dam along Groff Road and MD Route 313. During the Dam Safety and Exercise held in 2022, this area was identified.

The following Towns are not located in dam inundation areas and therefore are not affected by this hazard: Sudlersville, Barclay, Centreville, Millington, Queenstown, and Church Hill.</td></tr>
<tr><td colspan="9"></td></tr>
</table>

TABLE 17-15: PRIMARY HAZARD - ALL HAZARDS								
Goal: Improve communications, planning, and coordination between the County and its municipalities. **Objective #1:** Ensure continuity of operations and increase community resiliency. **Objective #2:** Ensure that municipal representatives are well trained regarding natural hazard and appropriate prevention and mitigation activities and improve communications between the municipality and DES-Emergency Management.								
Project AH-1	**Action Type**	**Implementation Schedule**	**Estimated Cost**	**Potential Funding**	**Lead**	**Community Lifeline**	**Social Vulnerability**	**Jurisdiction(s)**
	Local Planning & Regulations	3-5 years	Town – Staff Time $10-20K	Town – Annual Budget	County Dept. Heads, Town Planners, Town Attorneys	Safety and Security	* Translate to Spanish Printed Copies	Queenstown, Centreville, Church Hill, Millington Barclay
	Action: Integrate the hazard mitigation plan into other plans, ordinances and programs that dictate land use decisions in the community, including Capital Improvement Programs, Master Plans, and Strategic Plans.							
	Background and/or Plan Reference: The following Towns have not included the hazard mitigation plan into their policies, codes, or comprehensive plans: Centreville, Church Hill, Queenstown, Barclay, and Millington.							
Project AH-2	**Action Type**	**Implementation Schedule**	**Estimated Cost**	**Potential Funding**	**Lead**	**Community Lifeline**	**Social Vulnerability**	**Jurisdiction(s)**
	Education & Awareness Programs	1-2 years	County – Staff Time Town – Staff Time $1,000	County – Annual Budget Town – Annual Budget	County Dept. Heads, Town Planners, Town Attorney	Safety and Security	N/A	County, Queenstown, Centreville, Church Hill, Sudlersville, Millington, Barclay
	Action: Development of a County-Municipal workshop to provide an overview of the roles of local government in emergency management.							
	Background and/or Plan Reference: FEMA staff could be invited to present information from the Local Elected and Appointed Officials Guide: Roles and Resources in Emergency Management or other relevant guides. The Town of Centreville seeks assistance for the County to develop an Emergency Operations Plan and a Continuity of Operations Plan.							

	Action Type	Implementation Schedule	Estimated Cost	Potential Funding	Lead	Community Lifeline	Social Vulnerability	Jurisdiction(s)
Project AH-3	Local Planning & Regulations, Education & Awareness Programs	1-2 years	County – Staff Time Town – Staff Time	County – Annual Budget Town – Annual Budget	QAC Dept. of Community Affairs – Comms Office, Town Planners	Safety and Security	*	County, Queenstown, Centreville, Church Hill, Sudlersville, Millington, Barclay
	Action: Implement a good policy and strategies for engaging our multicultural residents.							
	Background and/or Plan Reference: Develop a workgroup that would plan to develop a policy and procedures for translation, languages needed, and discover the best way to engage those residents and how best to provide information.							

FEDERAL & STATE GRANT FUNDING SOURCES

The following is a list of Federal and State Grants that may assist in implementing local All Hazard Mitigation Plans. This information is subject to change at any time; contact the federal or state agency for current grant status. (Last Updated: November 2024)

Additional funding resources include:

- Navigating Federal Funding for Green Infrastructure and Nature-Based Solutions
- Maryland Resiliency Partnership: Database of Grants

TABLE 17-16: FEDERAL & STATE GRANT FUNDING

GRANT PROGRAM NAME	ADDRESS AND TELEPHONE CONTACT INFORMATION	ELIGIBLE ACTIVITIES	FEDERAL, STATE AND LOCAL COST SHARE REQUIREMENTS	OTHER PROGRAM CHARACTERISTICS	GRANT APPLICATION DUE DATE
Federal Emergency Management Agency, Hazard Mitigation Grant Program (HMGP)	Maryland Department of Emergency Management 5401 Rue Saint Lo Drive Reisterstown, MD 21136	All Hazards Mitigation Planning. Acquisition, relocation, elevation and flood-proofing of flood-prone insured properties, flood mitigation planning, wind retrofit, stormwater improvements, education and awareness.	Federal - 75% Non-Federal - 25%	Local governments must follow the NFIP when a proposed project is located within the 100-year floodplain, also known as the Special Flood Hazard Area (SFHA). Projects must be cost effective, environmentally sound and solve problems. Repetitive loss properties are a high priority.	After a Presidential Disaster Declaration
Federal Emergency Management Agency, Building Resilient Infrastructure and Communities (BRIC)	Maryland Department of Emergency Management 5401 Rue Saint Lo Drive Reisterstown, MD 21136	BRIC funds may be used for: Capability and Capacity Building (C&CB) Activities, Mitigation Projects, and Management Costs.	Federal - 75% Non-Federal - 25% Economically Disadvantaged Rural Communities (EDRC) are eligible for an increase in funding up to 90% federal cost share/10% non-federal cost share. FEMA provides 100% federal cost share funding for management costs.	Projects must: Be cost-effective, Reduce or eliminate risk and damage from future natural hazards, Meet either of the two latest published editions of relevant consensus-based codes, specifications, and standards, Align with the applicable hazard mitigation plan, Meet all environmental and historic preservation (EHP) requirements.	Annual- Spring/Summer
Federal Emergency Management Agency, Flood Mitigation Assistance Program (FMA)	Maryland Department of Emergency Management 5401 Rue Saint Lo Drive Reisterstown, MD 21136	Assist States and communities to implement measures that reduce or eliminate the long- term risk of flood damage to buildings, manufactured homes, and other structures insured under the National Flood Insurance Program.	RL: Federal - 90% Non-Federal - 10% SRL: Federal - 100% Non-Federal - 0%	Available once a Flood Mitigation Plan has been developed and approved by FEMA.	Annual- Spring/Summer
National Flood Insurance Program (NFIP)	Maryland Department of Emergency Management 5401 Rue Saint Lo Drive Reisterstown, MD 21136	Provides financial protection by enabling persons to purchase insurance against floods, mudslide or flood related erosion.	Varies	Includes Federally backed insurance against flooding, available to individuals and businesses that participate in the NFIP.	Anytime
Increased Cost of Compliance	Maryland Department of Emergency Management 5401 Rue Saint Lo Drive Reisterstown, MD 21136	ICC coverage provides payment to help cover the cost of mitigation activities that will reduce the risk of future flood damage to a building. If a Flood Insurance Policy Holder suffers a flood loss and is declared to be substantially or repetitively damaged, ICC will pay up to 30,000 to bring the building into compliance with State or community floodplain management laws or ordinances. Usually this means elevating or relocating the building so that it is above the base flood elevation (BFE).	Varies	Once the local jurisdiction determines the building is substantially or repetitively damaged, the policy holder can contact an insurance agent to file an ICC claim. When applicable, based on provisions in the 2015 HMA Guidance, up to $30,000 of ICC funding can be used towards the non-federal share for a Hazard Mitigation Assistance (HMA) project.	Anytime
U.S. Economic Development Administration,	U.S. Department of Commerce Economic Development Administration Curtis Center, 601	Improvements and reconstruction of public facilities after a disaster or industry closing. Research studies designed to facilitate economic	Federal - 50%-70% Local- 30%-50%	Documenting economic distress, job impact and proposing a project that is consistent with a Comprehensive Economic Development Strategy are	Anytime

GRANT PROGRAM NAME	ADDRESS AND TELEPHONE CONTACT INFORMATION	ELIGIBLE ACTIVITIES	FEDERAL, STATE AND LOCAL COST SHARE REQUIREMENTS	OTHER PROGRAM CHARACTERISTICS	GRANT APPLICATION DUE DATE
Economic Adjustment Program	Walnut Street, Ste 140 South Philadelphia, PA 19106-3323 215-597-4603	development.		important funding selection criteria.	
U.S Economic Development Administration, Public Works and Development Facilities	U.S. Department of Commerce Economic Development Administration Curtis Center, 601 Walnut Street, Ste 140 South Philadelphia, PA 19106-3323 215-597-4603	Water and sewer, Industrial access roads, rail spurs, port improvements technological and related infrastructure	Federal - 50%-70% Local- 30%-50%	Documenting economic distress, job impact and projects that is consistency with a Comprehensive Economic Development Strategy are important funding selection criteria.	Quarterly Basis
Small Business Administration (SBA) Pre-disaster Mitigation Loan Program	James Rivera, Office of Disaster Assistance, Small Business Administration, 409 3rd Street, SW, STE 6050 Washington, DC 20416 202-205-6734	Activities done for the purpose of protecting real and personal property against disaster related damage.	No information	The mitigation measures must protect property or contents from damage that may be caused by future disasters and must conform to the priorities and goals of the state or local government's mitigation plan.	
Community Development Block Grants / States Program	U.S Department of Housing and Urban Development, Office of Block Grant Assistance, 451 7th Street SW., Washington, DC 20410-7000 202- 708-1112	Used for long-term recovery needs, such as: rehabilitation residential and commercial building; homeownership assistance, including down-payment assistance and interest rate subsidies; building new replacement housing; code enforcement; acquiring, construction, or reconstructing public facilities.	No information	Citizen participation procedures must be followed. At least 70 percent of funds must be used for activities that principally benefit persons of low and moderate income. Formula grants to States for non-entitlement communities.	After a Presidential Disaster Declaration
Fire Suppression Assistance Program	Infrastructure Division, Response and Recovery Directorate, FEMA, 500 C Street SW., Washington DC 20024 202-646-2500	Provides real-time assistance for the suppression of any fire on public (non- Federal) or privately owned forest or grassland that threatens to become a major disaster.	Federal - 70% Local - 30%	The State must first meet annual floor cost (if percent of average fiscal year fire costs) on a single declared fire. After the State's out-of- pocket expenses exceed twice the average fiscal year costs, funds are made available for 100 percent of all costs for each declared fire.	Funds from President's Disaster Relief Fund for use in a designated emergency or major disaster area.
Historic Preservation: Repair and Restoration of Disaster- Damaged Historic Properties	Infrastructure Division, Response and Recovery Directorate, FEMA, 500 C Street SW., Washington DC 20024 202-646-4621	To evaluate the effects of repairs to, restoration of, or mitigation hazards to disaster-damaged historic structures working in concert with the requirements of the Stafford Act.	Federal - 75% Local - 25%	Eligible to State and local governments, and any political subdivision of a State. Also, eligible are private non-profit organizations that operate educational, utility, emergency, or medical facilities.	After a Presidential Disaster Declaration
Transportation: Emergency Relief Program	Federal Transit Authority, FHWA, DOT, 1200 New Jersey Avenue Washington, DC 20590 202-366-4043	Provides aid for the repair of Federal-aid roads and roads on Federal lands.	Federal - 100%	Application is submitted by the State department of transportation for damages to Federal-aid highway routes, and by the applicable Federal agency for damages to roads on Federal lands.	After serious damage to Federal-aid roads or roads on Federal lands caused by a natural disaster or by catastrophic failure.
Animals: Emergency Haying and Grazing	Emergency and Non-insured Assistance Programs, FSA, USDA, 1400 Independence	To help livestock producers in approved counties when the growth and yield of hay and pasture have been substantially reduced because of a widespread natural disaster.	No information	Assistance is provided by the Secretary of Agriculture to harvest hay or graze cropland, or other commercial use of forage devoted to the Conservation Reserve Program (CRP0 in response to a drought or other similar	Anytime

GRANT PROGRAM NAME	ADDRESS AND TELEPHONE CONTACT INFORMATION	ELIGIBLE ACTIVITIES	FEDERAL, STATE AND LOCAL COST SHARE REQUIREMENTS	OTHER PROGRAM CHARACTERISTICS	GRANT APPLICATION DUE DATE
	Ave, SW, Washington, DC 20013 202-720-4053			emergency.	
Emergency Watershed Protection Program	Natural Resources Conservation Service 1400 Independence Avenue, SW Washington, DC 20250	Implementing emergency recovery measures for runoff retardation and erosion prevention to relieve imminent hazards to life and property created by a natural disaster that causes a sudden impairment of a watershed.	Federal - 75% Local - 25%	It cannot fund operation and maintenance work or repair private or public transportation facilities or utilities. The work cannot adversely affect downstream water rights and funds cannot be used to install measures not essential to the reduction of hazards.	TBD
Watershed Protection and Flood Prevention Program	Natural Resources Conservation Service 1400 Independence Avenue, SW Washington, DC 20250	To provide technical and financial assistance in carrying out works of improvement to protect, develop, and utilize the land and water resources in watersheds.	Varies due to project type.	Watershed area must not exceed 250,000 acres. Capacity of a single structure is limited to 25,000 acre-feet of total capacity and 12,500 acre- feet of floodwater detention capacity.	TBD
Watershed Surveys and Planning	Natural Resources Conservation Service 1400 Independence Avenue, SW Washington, DC 20250	To provide planning assistance to Federal, State, and local agencies for the development of coordinated water and related programs in watersheds and river basins. Emphasis is on flood damage reduction, erosion control, water conservation, preservation of wetlands and water quality improvements.	No information	These watershed plans form the basis for installing needed works of improvement and include estimated benefits and costs, cost- sharing, operation and maintenance arrangements, and other information necessary to justify the need for Federal assistance in carrying out the plan.	Anytime
Emergency Advance Measures for Flood Prevention	USACE 441 G Street, NW, Washington DC 20314 202-761-0011	To perform activities prior to flooding or flood fight that would assist in protecting against loss of life and damages to property due to flooding.	No information	There must be an immediate threat of unusual flooding present before advance measures can be considered. Any work performed under this program will be temporary in nature and must have a favorable benefit cost ratio.	Governor of State must request assistance
Emergency Streambank and Shoreline Protection	USACE 441 G Street, NW, Washington DC 20314 202-761-0011	Authorizes the construction of emergency streambank protection measures to prevent damage to highways, bridge approaches, municipal water supply systems, sewage disposal plants, and other essential public works facilities endangered by floods or storms due to bank erosion.	No information	Churches, hospitals, schools, and other non- profit service facilities may also be protected under this program. This authority does not apply to privately-owned property or structures.	TBD
Small Flood Control Projects	USACE 441 G Street, NW, Washington DC 20314 202-761-0011	Authorizes the construction of small flood control projects that have not already been specifically authorized by Congress.	No information	There are two general categories of projects: structural and nonstructural. Structural projects may include levees, floodwalls, diversion channels, pumping plants, and bridge modifications. Nonstructural projects have little or no effect on water surface elevations, and may include flood proofing, the relocation of structures, and flood warning systems.	TBD
Flood: Emergency Advance Measures for Flood Prevention	USACE 441 G Street, NW, Washington DC 20314 202-761-0011	To mitigate, before an event, the potential loss of life and damages to property due to floods.	No information	Assistance may consist of temporary levees, channel cleaning, preparation for abnormal snowpacks, etc.	Governor of State must request assistance
Continuing Authorities Program (CAP)	USACE 441 G Street, NW, Washington DC 20314	Initiates a short reconnaissance effort to determine Federal interest in proceeding. If there	Federal - 65% Local - 35%	A local sponsor must identify the problem and request assistance. Small flood control projects are also	Anytime

GRANT PROGRAM NAME	ADDRESS AND TELEPHONE CONTACT INFORMATION	ELIGIBLE ACTIVITIES	FEDERAL, STATE AND LOCAL COST SHARE REQUIREMENTS	OTHER PROGRAM CHARACTERISTICS	GRANT APPLICATION DUE DATE
	202-761-0011	is interest, a feasibility study is performed.		available.	
Hazardous Materials: State Access to the Oil Spill Liability Trust Fund	Director, USCG National Pollution Funds Center, U.S. Coast Guard Stop 7605. 2703 Martin Luther King Jr. Avenue, SE Washington, DC 20593-7605 202-795-6000	To encourage greater State participation in response to actual or threatened discharges of oil.	No information	Eligible to States and U.S. Trust Territories and possessions.	Anytime
Emergency Management Assistance (EMA)	Maryland Emergency Management Agency 5401 Rue Saint Lo Drive Reisterstown, MD 21136	Funds may be used for salaries, travel expenses, and other administrative cost essential to the day-to-day operations of State and Local emergency management agencies. Program also includes management processes that ensure coordinated planning, accountability for progress, and trained qualified staffing.	Federal - 50%	EMA funded activities may include specific mitigation management efforts not otherwise eligible for Federal funding. Management Assistance program funds may not be used for construction, repairs, equipment, materials or physical operations required for damage mitigation projects for public or private buildings, roads, bridges, or other facilities.	Anytime
Maryland Program Open Space	Department of Natural Resources 580 Taylor Ave. Annapolis, MD 21401 410-260-8445	Local provides financial and technical assistance to local subdivisions for the planning, acquisition, and/or development of recreation land or open space areas.	A local governing body may use up to $25,000 annually from its 100% (Acquisition) money to fund planning projects that update the Local Land Preservation and Recreation Plans.	Acquires outdoor recreation and open space areas for public use Administers funds made available to local communities for open and recreational space by the Outdoor Recreation Land Loan of 1969 and from the Land and Water Conservation Fund of the National Park Service, U.S. Department of the Interior.	July 1st
Maryland Recreational Trails Program	Maryland Scenic Byways/Recreational Trails Program* Office of Planning & Preliminary Engineering State Highway Administration 707 N Calvert Street Baltimore, MD 21201 (p) 410.545.8637 (f) 410.209-5012 tmaxwell@sha.state.md.us	Maintenance and restoration of existing recreational trail; Development and rehabilitation of trailside facilities and trail linkages; Purchase and lease of trail construction equipment; Construction of new trails; Acquisition of easements or property for recreational trails or recreational trail corridors; and Implementation of interpretive/educational programs to promote intrinsic qualities, safety, and environmental protection, as those objectives relate to the use of recreational trails.	Administered by the State Highway Administration (SHA), this program matches federal funds with local funds or in-kind contributions to implement trail projects. Projects can be sponsored by a county or municipal government, a private non-profit agency, a community group or an individual (non-governmental agencies must secure an appropriate government agency as a co-sponsor). Federal funds administered by the State Highway Administration are available for up to 80% of the project cost, matched by at least 20% funding from the project sponsor. Matching funds must be committed and documented in the local jurisdiction's budget. A	Projects must meet state and federal environmental regulatory requirements (NEPA, MEPA, Section 106, Section 4(f)). SHA will aid the project sponsor to acquire these approvals.	July 1st

GRANT PROGRAM NAME	ADDRESS AND TELEPHONE CONTACT INFORMATION	ELIGIBLE ACTIVITIES	FEDERAL, STATE AND LOCAL COST SHARE REQUIREMENTS	OTHER PROGRAM CHARACTERISTICS	GRANT APPLICATION DUE DATE
			Memorandum of Understanding outlining funding and project implementation responsibilities will be prepared by SHA and signed by all parties before the project funds are released.		
CoastSmart Communities Grant Program	Maryland Department of Natural Resources Chesapeake and Coastal Service (p) 410.260.8718 (f) 410.260.8739 sasha.land@maryland.gov	Municipalities and counties in the coastal zone are eligible to apply for and receive funds: Anne Arundel, Baltimore, Calvert, Caroline, Cecil, Charles, Dorchester, Harford, Kent, Prince George's, Queen Anne's, St. Mary's, Somerset, Talbot, Wicomico, and Worcester counties and Baltimore City. Funding for a one- year project that contributes to understanding, planning for, or implementing planning and outreach measures to address coastal hazard issues.	Up to $75,000 annually	Track A can fund flood vulnerability and risk assessments, updates to planning documents (e.g. hazard mitigation plans, zoning ordinances, building codes, floodplain ordinances, comprehensive plans), education and outreach campaigns and materials, applications to FEMA's Community Rating System in concert with other task outcomes, support for adopting an updated plan and integrating the plan into day-to-day existing planning processes that reduce overall flood risk due to tidal events or stormwater and rain events.	TBD
Green Infrastructure Resiliency Grant Program	Maryland Department of Natural Resources Chesapeake and Coastal Service (p) 410.260.8799 (f) 410.260.8739 (e) megan.granato@maryland.gov	Municipalities and counties within the Maryland portion of the Chesapeake Bay watershed are eligible to apply for and receive funds. Please note that projects proposed in Cecil, Garrett and Worcester counties must be located within the portions of those counties that are within the watershed to be eligible. Funding for one year for Phase 1 and Phase 2 projects and up to 2 years for Phase 3 projects that will assess stormwater management needs associated with localized flooding and design or construct targeted green infrastructure practices to address those needs.	Up to $100,000 per project	Track B can fund watershed assessments that focus on determining local flood risks and how green infrastructure can be used to address those risks, site or watershed-level green infrastructure implementation plans, and green infrastructure project designs. This track can also fund construction of green infrastructure projects. To apply for construction funding, all applicable permit preapplication meetings must be complete.	TBD
Maryland Community Parks and Playgrounds Program	Department of Natural Resources 580 Taylor Ave. Annapolis, MD 21401 410-260-8445	1. Development of new parks 2. Rehabilitation of existing parks 3. Expansion or improvement of existing parks 4. Purchase and installation of playground equipment 5. Development of environmentally oriented parks and recreation projects 6. Development of new trails or extension of existing trails 7. Creation of access points to water recreation resources 8. Acquisition of land to create new parks.	The source of funds for this program is primarily State General Obligation Bonds, which may be authorized on an annual basis. The Community Parks and Playgrounds Program provides funding to incorporated municipalities and Baltimore City. Grants may be for up to 100% of the project cost and are selected on a competitive basis. Each applicant will be limited to one (1) Grant Proposal	The Department of Natural Resources works to provide opportunities for Marylanders, especially our children, to experience nature. The DNR has developed a web site www.dnr.state.md.us/cin/NPS/index.asp that provides information about Nature Play Spaces. Nature Play Spaces are one of the many types of public recreation projects eligible for consideration for Community Parks and Playgrounds grant funding. While land acquisition costs may be considered for project funding, the highest priority will be placed on capital costs associated with park development and improvement.	TBD

GRANT PROGRAM NAME	ADDRESS AND TELEPHONE CONTACT INFORMATION	ELIGIBLE ACTIVITIES	FEDERAL, STATE AND LOCAL COST SHARE REQUIREMENTS	OTHER PROGRAM CHARACTERISTICS	GRANT APPLICATION DUE DATE
			List submission package, which may contain several prioritized projects, per award cycle.		

Appendix A
HMPC Meeting Notes

This Appendix includes meeting notes from the Hazard Mitigation Planning Committee (HMPC) meetings and topical small group meetings. Meeting notes are in the following order:

- HMPC Kickoff Meeting Notes
- HMPC Midpoint Meeting Notes
- HMPC Mitigation Solutions Workshop Notes
- Floodplain Manager Meeting Notes
- Social Equity & Vulnerability Meeting Notes

Queen Anne's County Hazard Mitigation Plan Update
Hazard Mitigation Planning Committee
Kickoff Meeting
May 9, 2024, 2:00 - 3:00 PM

All members of Queen Anne's County's Hazard Mitigation Planning Committee (HMPC) were invited to the Plan Update Kick-off Meeting. A full listing of the HMPC members will be included in the plan update. All HMPC members will receive a copy of these notes. The following members were in attendance:

Name	Organization/Department	Position/Title
Lt. Charles Harris	Centreville Police Department	Lieutenant
Brian Pearsall	Kent County Department of Emergency Services	Emergency Planner
Lt. Liz Tyler	Natural Resources Police	Lieutenant
Sgt. Maria Bassaro	Office of the Sheriff in Queen Anne's County	Sargent
Megan DelGaudio	Queen Anne's County Information Technology	Manager
Rob Gunter	Queen Anne's County Planning & Zoning	Development Review Principal Planner
Dawn Starkey	Town of Queen Anne	Clerk & Treasurer
Beth Copp	Queen Anne's County Department of Health	Public Health Emergency Planner
Joseph Seborowski	Anne Arundel County Office of Emergency Management	Senior Emergency Planner
Major Dwayne Boardman	Office of the Sheriff in Queen Anne's County	Major
Amy Moredock	Queen Anne's County Planning & Zoning	Director
Amy Moore	Town of Queenstown	Town Manager
Dr. Paul Rickert	University of Maryland Extension	Director
Lori Morris	Queen Anne's County DES	Assistant Chief of Special Operations
Scott Haas	Queen Anne's County DES	Director
Debi Hopkins	Queen Anne's County DES	Emergency Planner
Mike Watson	Queen Anne's County Parks and Recreation	Chief of Park Operations
Lt. Tim Howell	MDTA Police	Bay Bridge Detachment Commander
Sierra Thomas	FBI	Victim Services
Steve Chandlee	Queen Anne's County Parks and Recreation	Director
Sam Stanton	Queen Anne's County Information Technology	GIS Coordinator
Nate Hoxter	Town of Queen Anne	Commissioner
Shane Moore	Queen Anne's County Department of Public Works	Chief Roads Engineer
Annie Richards	ShoreRivers	Chester Riverkeeper
Sid Pinder	Queen Anne's County Public Schools	Chief Operating Officer
Alan Quimby	Queen Anne's County Department of Public Works	Director
Tony Riggi	Queen Anne's County Soil Conservation	District Manager
Tim Harvey	FBI	Victim Services
Jeff Rank	Queen Anne's County Department of Budget & Finance	Director
Autumn Brown	FBI	Supervisory Special Agent
Warren Wright	QAC Drug Free Coalition	Member
Michele King	SP&D	Planner
Virginia Smith	SP&D	Principal

Agenda

- HMP Overview
- HMPC, Municipal & Public Participation
- Group Activity- Hazard Perspective
- Next Steps

Hazard Mitigation

Hazard Mitigation is any action taken to permanently reduce or eliminate long-term risk to people and their property from the effects of hazards.

The purpose of the Hazard Mitigation Plan is to prevent or reduce loss of life and injury as well as limit damage costs from various hazards through the development of mitigation methods which lessen or eliminate future damage.

HMP Overview

What is a Hazard Mitigation Plan and why do it? The Plan is a community-driven, living document that communities use to reduce their vulnerability to hazards. Counties must have a plan to maintain access to mitigation grants. These grants can augment local mitigation activities already being accomplished and can leverage other funding sources (state grants and other federal issued grants).

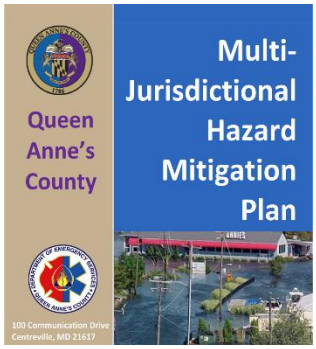
FEMA's requirements include:

- FEMA requires hazard mitigation plans to be updated every five (5) years.
- Jurisdictions are required to develop and maintain a FEMA approved and locally adopted Hazard Mitigation Plan.
- Stakeholder, public, and regional collaboration, and engagement is required throughout all stages of the plan development process to be approved by MDEM & FEMA.
- For municipalities to be covered under the Queen Anne's County HMP, they must participate throughout the planning process.

The **new** State and Local Mitigation Planning Policy Guide went into effect April 19, 2023. Major changes are the inclusion of and focus on social equity and climate change. These topics were addressed in the 2019 plan; however, they will be further emphasized in the plan update.

The Plan review is conducted by both MDEM and FEMA. MDEM has up to 30 days to complete their review, while FEMA has up to 45 days to complete.

For those HMPC members who would like to view the 2019 Queen Anne's Multi-Jurisdictional Hazard Mitigation Plan, please visit the DES Hazard Mitigation webpage at: https://www.qac.org/1328/Hazard-Mitigation.



HMPC, Municipal & Public Participation

The Hazard Mitigation Planning Committee (HMPC) consists of a broad cross-section of the community, who will be responsible for guiding the direction of the plan. For this plan update, the HMPC has been expanded to include additional departments, agencies, and organizations. HMPC members will participate in surveys, meetings, and a mitigation solution workshop. These activities are coordinated throughout the planning process. The HMPC will also be responsible for reviewing the plan in working draft sections and a cohesive draft copy of the plan upon completion.

What does it mean to be a HMPC member?



Small group topical meetings will be held throughout the plan update, as well. Regular scheduled HMPC meetings will be held periodically. The draft schedule for HMPC meetings is as follows:

- Kick-Off: May 9th - 1 hour
- Midpoint Meeting: August - 2 hours
- Mitigation Solutions Workshop: TBD – 3 to 4 hours

Members interested and/or identified to participate in the Threat Identification and Risk Assessment (THIRA) section update will be contacted via email to attend THIRA specific meetings. The THIRA kickoff meeting will be held June 4, 2024.

Please note, it is important that HMPC members attend meetings and provide input on the plan as it is updated. Group HMPC and targeted emails will be distributed.

HMPC members may have public outreach initiatives that pair well with hazard mitigation, resilience, and preparedness. Department of Emergency Services requests that members provide details of these public outreach initiatives for collaboration and documentation (e.g., agenda, brief description of the meeting and how the Hazard Mitigation Plan Update process was discussed).

The Public Survey has been launched on the Department of Emergency Management's Hazard Mitigation webpage and is currently available for members of the public to complete. The link to this survey will remain active on the website for the length of the project.

- Link: https://www.surveymonkey.com/r/ZV2V7TX
- Below is the ready-made social media post and QR Code. SP&D requests that HMPC members to post/share the public survey on their department/agency/organization's approved social media.
- As mentioned during the meeting, if you post the survey on your social media, please email mking@smitp-d.com.
- To date, around 60 public surveys have been completed.



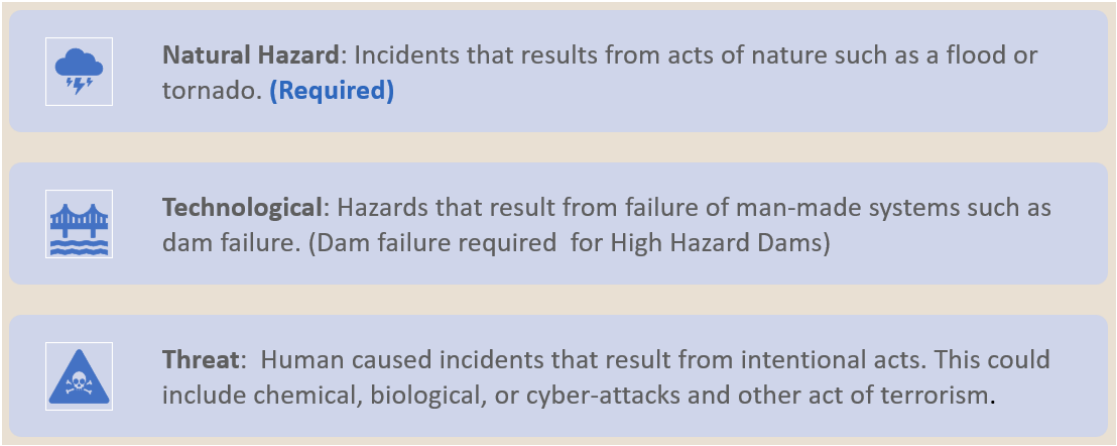
SP&D is requesting photos, data, and ideas from HMPC members as they relate to hazard mitigation and/or natural hazard events in Queen Anne's County and its municipalities. We are utilizing the National Centers for Environmental Information Storm Events Database (NCEI) to gather historical hazard event data and determine risk. However, this database may not cover every event having occurred in the County. Therefore, as you are reviewing hazard chapters, please take note of any missing storm events that we should include (within the last 5 years).

Municipal participation will include updates from each of the eight (8) municipalities. Representative(s) from each municipality must participate throughout the plan update process. In addition, each municipality will also have to identify mitigation action items for each hazard. Documentation of their participation must be included in the plan, thereby ensuring municipal eligibility under the County plan. Each eligible municipality will need to adopt the plan at the end of the process.

In regard to public participation, the public will be given an opportunity to comment on the plan and provide input via an online survey. A press releases has been published on the County's website, encouraging the public to participate in the survey and the planning process. Plan update material will also be posted to the Department of Emergency Management's Hazard Mitigation webpage for public review.

Group Activity- Hazard Perspective

Definitions for natural hazards, technological, and threat hazards were reviewed to HMPC members.



Natural hazards identified in the previous 2019 Plan were reviewed during the meeting. An interactive exercise was conducted during the meeting to obtain a local perspective on hazards and their frequency of occurrence, particularly during this past planning cycle. Meeting attendees were asked to add their answers to the "chat" and provided comments on any hazards during this exercise. Each hazard was presented, and committee members provided one of the following answers to rate the frequency of occurrence, magnitude, and geographic extent: (I) Increase, (D) Decrease, or (NC) No Change.

Natural hazards from the previous 2019 Plan were discussed first. Results of the group exercise are as follows:

NATURAL HAZARDS	HMPC PERSPECTIVE (I) INCREASE, (D) DECREASE, OR (NC) NO CHANGE
Flooding: *Riverine, Coastal, Flash, Nuisance*	I
Tropical System: *Hurricanes, Tropical Storms, Nor'easters*	NC
Sea Level Change	I
Soil Movement: *Land subsidence & coastal erosion*	NC
Drought	NC
Severe Winter Weather	D
Extreme Temperatures	NC
Wildfire	NC
Thunderstorms: *Lightning, hail, strong winds*	NC
Earthquake	NC
Tornado	NC

Please note, Queen Anne's County does not contain High Hazard Dams. There are no High Hazard Dams in adjacent jurisdictions. However, members did indicate that a beaver dam is causing issues on a State roadway in North County.
Technological hazards and threats included in the Threat Identification and Risk Assessment (THIRA) appendix of the plan were reviewed next. Results from that exercise are below.

Technological Hazards & Threats	HMPC Perspective (I) Increase, (D) Decrease, or (NC) No Change
Transportation (Congestion & Accidents)	I
Terrorism	NC
Active Assailant	NC
Cyber Attack	I
Hazardous Materials	I

HMPC members were asked to provide mitigation related activity or action their agency, department, or organization participated in during this past planning cycle. Members provided the following information:

- Queen Anne's County Department of Health
  - Public Health Disaster Activation, Response, and Recovery – Covid.
- Queen Anne's County Department of Emergency Services
  - Mitigation Grants - Cloverfields, Generator.
  - Active Threat - Planning and training. Multi-agency collaboration. The purchasing of equipment.
  - Community Education (ALOT) we also hired a meteorologist to help push weather info.
  - Worked with OCC to do Opioid education and Narcan training.
  - Traffic - Ramp Closures this summer to help emergency response.
- Queen Anne's County Department of Planning & Zoning
  - 2022 Comprehensive Plan update integrated SLR and HMP plans. This plan supports the HMP and mitigation and resilience projects and initiatives.
  - Planning and Zoning are participating in a 1_Climate Pollution Reduction Grant (CRPG) with the Baltimore Metropolitan Council (BMC).
  - Climate Resilience Planning and Financing - QAC Workgroup has completed Planning and will work on Financing next.
- University of Maryland Extension
  - PPE obtained, such as masks and hand sanitizer.
- Town of Queen Anne
  - Purchased virtual meeting equipment.

Next Steps

- Fillable PDF Mitigation Status Update Form
- Virtual THIRA Kickoff Meeting – June 4, 2024, 10:00 AM
- Small topical meeting(s)
  - Floodplain Management
  - Social Vulnerability & Equity
  - Municipal Coordination
- Capability Assessment Update
- HMPC Meeting #2 – August 2024

Group HMPC and targeted emails will be distributed.

Queen Anne's County Hazard Mitigation Plan Update
Hazard Mitigation Planning Committee
Meeting #2
August 28, 2024, 2:00 - 3:00 PM

All members of Queen Anne's County's Hazard Mitigation Planning Committee (HMPC) were invited to the Plan Update Meeting #2. A full listing of the HMPC members will be included in the plan update. All HMPC members will receive a copy of these notes. The following members were in attendance:

Name	Organization/Department	Position/Title
Alan Quimby	Queen Anne's County Department of Public Works	Director
Amy Moore	Town of Queenstown	Town Manager
Amy Moredock	Queen Anne's County Planning & Zoning	Director
Annie Sparks	QAC Department of Community Services	Aging and Transportation
Barbara Duncan	Public Safety Chesapeake College	Director
Beth Copp	QAC Department of Health	Public Health Emergency Planner
Beth Malasky	QAC Department of Community Affairs	Public Information Manager
Bill Hildebrand	Maryland Department of Emergency Management	Liaison Officer
Brian Pearsall	Kent County Department of Emergency Services	Emergency Planner
Brian Riley	QAC Information Technology	Director
Carolyn Brinkley	Town of Centreville	Town Manager
Cathy Willis	QAC Department of Community Services	Director
Debi Hopkins	QAC Department of Emergency Services	Emergency Planner
Jeff Morgan	QAC Department of Emergency Services	Fire Marshal
Jody Simmons	Department of Social Services	Child Welfare
Kip Matthews	Town of Centreville	Director of Public Works
Lori Morris	QAC Department of Emergency Services	Assistant Chief of Special Operations
Marcia Barben	Maryland Department of Emergency Management	Hazard Mitigation Project Officer
Megan DelGaudio	QAC Information Technology	IT Manager
Paul Rickert	University of Maryland Extension	Director
Paul Schlotterbeck	Kent Island VFD	QAC HazMat
Phil English	QAC Department of Emergency Services	Asst. Chief of Communications
Sam Stanton	Queen Anne's County Information Technology	GIS Coordinator
Scott Haas	QAC Department of Emergency Services	Director
Steve Chandlee	Queen Anne's County Parks and Recreation	Director
Steve Cohoon	QAC Department of Public Works	Public Facilities Planner
Warren Wright	QAC Drug Free Coalition	Member
Michele King	SP&D	Planner
Virginia Smith	SP&D	Principal

Agenda

- Project Update
  - Small Group Meetings
  - Preliminary Survey Results
  - Mitigation Status Report

  - Municipal Input
  - Working Draft Chapters
- Capability Assessment
- Next Steps

HMP Overview

For those HMPC members who were unable to attend the kickoff meeting a brief overview of the hazard mitigation planning process and the purpose of plan was provided.

FEAM grant funding was obtained by QAC Department of Emergency Services to update the plan. FEMA requires hazard mitigation plans to be updated every five (5) years. Jurisdictions are required to develop and maintain a FEMA approved and locally adopted Hazard Mitigation Plan.

Keep in mind, municipalities must participate throughout the planning process to be covered under the Queen Anne's County HMP.

For those HMPC members who would like to view the 2019 Queen Anne's Multi-Jurisdictional Hazard Mitigation Plan, please visit the DES Hazard Mitigation webpage at: https://www.qac.org/1328/Hazard-Mitigation.

Hazard Mitigation

Hazard Mitigation is any action taken to permanently reduce or eliminate long-term risk to people and their property from the effects of hazards.

The purpose of the Hazard Mitigation Plan is to prevent or reduce loss of life and injury as well as limit damage costs from various hazards through the development of mitigation methods which lessen or eliminate future damage.

Small Group Meetings

Following the initial HMPC, two (2) small group topical meeting were held. Meeting notes from both meetings will be included in the Appendix of the Hazard Mitigation Plan update.

- Floodplain Management – June 25, 2024
- Social Equity & Vulnerability – August 6, 2024

Floodplain Management Meeting

During the Floodplain Management meeting, the NFIP Community Questionnaire was completed for the County and provided to the Floodplain Manager for review. An assessment of 2019 HMP Floodplain Management Capabilities were reviewed, and new capabilities were discussed. As a result of the meeting, new mitigation ideas were developed for the Mitigation Solutions Workshop.

Social Equity & Vulnerability Meeting

As part of the FEMA's State and Local Mitigation Planning Policy Guide, representatives of nonprofit organizations, including community-based organizations, that work directly with and/or provide support to underserved communities and socially vulnerable populations, among others should have an opportunity to be involved in the planning process. As part of the plan update process, stakeholders were identified to engage and to provide input in the plan update. To that end, a social equity and vulnerability meeting was held.

- Take aways from the meeting included a recommendation to offer the public survey in both English

and Spanish. Beth Copp from the MD Department of Health offered to have her staff translate the survey into Spanish.

- English Version - https://www.surveymonkey.com/r/ZV2V7TX
- Spanish Version - https://es.surveymonkey.com/r/QGQVGF9

In addition, considering the members of the county who do not have access and/or use of online services, representatives from the Department of Health and Department of Community Services offered to locations for public survey stations throughout the county. In addition, the Housing Authority offered to distribute the public survey at lower income fixed rent facilities.

- Survey stations will be available at:
  - The four (4) senior centers.
  - The Commission on Aging Event: Senior Citizen Town Hall on September 19th. It will be at the Grasonville Senior Center, 4802 Main Street from 1-3PM.
  - The Department of Social Services facility.

Finally, the Department of Emergency Services has delivered the survey stations materials to each of these locations.

Preliminary Public Survey Results

The Public Survey has been launched on the Department of Emergency Management's Hazard Mitigation webpage and is currently available for members of the public to complete. The link to this survey will remain active on the website for the length of the project.

Queen Anne's County developed a press release and social media posts about the plan update and public survey. Social media posts promoting the public survey will continue throughout the planning process by Queen Anne's County Department of Community Affairs.


County News

Posted on: May 2, 2024

Queen Anne's County Seeks Public Input on Hazard Mitigation Plan

Over the years, Queen Anne's County has faced various hazards, prompting proactive measures aimed at reducing risks and future losses. The Department of Emergency Services in Queen Anne's County is inviting public input on the Hazard Mitigation Plan. This plan identifies potential hazards and outlines projects designed to mitigate or prevent damage before disasters strike.

Input from residents, community members, workers, and business owners is crucial to the success of the County's hazard mitigation initiatives. There are several ways to participate:

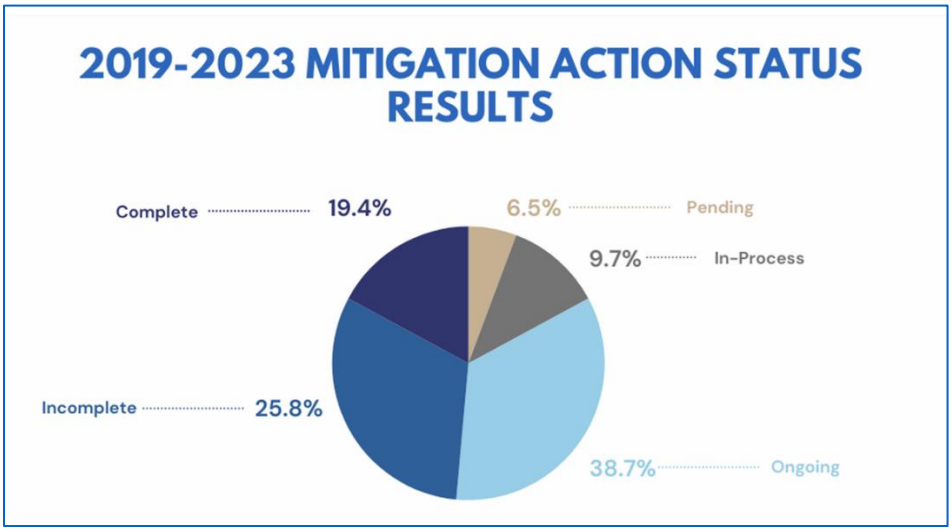


To date, 90 members of the public have participated in the public survey. Over 90% of the participants are residents of the County and are primarily in the age range of 45-64 years of age. The Hazard Mitigation Planning Committee (HMPC) will be updated continuously with public survey updates.

Keep in mind, QAC DES is requesting that HMPC members and municipal representatives post and/or repost hazard mitigation related information.

Mitigation Status Report

Chapter 16 Mitigation Action Status Report was provided to HMPC members for review and comment on August 16, 2024. The report has also been uploaded to the Department of Emergency Management's Hazard Mitigation webpage. Results indicated that of the thirty-five (35) mitigation actions, ten (10) have been completed or are in progress, and twelve (12) are ongoing, while eleven (11) remain incomplete as shown on the chart below. Two (2) of the mitigation actions are pending.



Complete actions are listed below with the high priority mitigation actions are identified in red.

- Action Item #5: Emergency back-up power- Install generators at the following essential facilities: Health Department Annex, EMS Station 100, EMS Station 200, EMS Station 400, and Centreville Police Department (CPD).
- Action Item #6: Upgrade undersized generators at the following essential facilities:
    - EOC –Dept. of Emergency Services Building
    - Queenstown Volunteer Fire Dept. #3 and EMS Station 300
    - Health Department-Main Building
- Action Item #12: Update Comprehensive Plan and community plans to include hazard mitigation, including sea level change and coastal hazards.
- Action Item #18: Distribute annual mitigation & resiliency outreach material annually using various media to reach multiple demographic groups.
- Action Item #20: Integrate Hazus (wind) results and FEMA Coastal Risk Map Study for potential shelter needs into Emergency Operation Plan-ESF #6 Mass Care & Sheltering.
- Action Item #32: Install a new Water Treatment Plant at the Four Seasons.

The completion of the Mitigation Status Report not only informs what was accomplished during the previous planning cycle, but also provides a jumping off point moving forward. Incomplete actions will be reviewed to determine which, if any, should be carried over for potential inclusion in this plan update. Those that are carried over will be discussed and further refined during the Mitigation Solutions Workshop.

Municipal Input

Municipalities that are participating in the Queen Anne's County Hazard Mitigation Plan update include:

- Barclay
- Centreville
- Church Hill
- Millington
- Queenstown
- Sudlersville

The Town of Queen Anne participated in and adopted the 2022 Talbot County Hazard Mitigation Plan and the Town of Templeville participated in the 2024 Caroline County Hazard Mitigation Plan. These towns are invited and encouraged to participate in the Queen Anne's County planning process.

As part of the FEMA's State and Local Mitigation Planning Policy Guide, municipal participation must be documented throughout the plan development process. A municipal tracking sheets have been developed to document participation. The tracking sheets include:

- Meetings Attended & Interviews
- Public Outreach Activities
- Documentation of Planning Process & Municipal Involvement

Working Draft Chapters

Working draft chapters will be distributed throughout plan update process for HMPC review and comment as well as municipal review and comment. Chapter 3 Flood and Chapter 6 were distributed to HMPC members for review and comment. A Review & Comment Form was provided with the chapters for members to provide feedback on each chapter. Working draft chapters will be uploaded to Department of Emergency Management's Hazard Mitigation webpage throughout plan update process for public review and comment, as well. When the plan is completed, a cohesive Draft HMP will be distributed to the HMPC members and uploaded to Hazard Mitigation webpage, providing additional opportunity for review and comment.

Mitigation Actions

In addition to the review and comment form provided along with working draft chapters, a Mitigation Action Form was also provided. Ideas for mitigation actions are oftentimes generated during the review of hazard specific chapters. Particularly, the vulnerability sections. Review of working draft chapters provides an opportunity for the collection of hazard specific mitigation action ideas. HMPC members were requested to use the form while reviewing the hazard specific chapters.

Note: The County and each municipality must have mitigation action(s) for each profiled hazard. Also, we must be mindful that the range of actions considered

Mitigation Actions

It is important for all actions considered to be documented, be as specific as possible, and be clearly linked to the vulnerabilities and impacts identified in the plan. This includes actions for alleviating data deficiencies or building up capabilities related to mitigation implementation. Documenting all ideas provides a record of what actions were considered, and why. Additionally, this creates a list of actions that can be reconsidered as conditions change.

should include mitigation actions that benefit underserved communities and socially vulnerable populations.

Capabilities

The following four (4) current capabilities areas for the County and municipalities will be reviewed. Keep in mind, this applies to both County and participating municipalities.



PLANNING AND REGULATORY, | ADMINISTRATIVE AND TECHNICAL, | FINANCIAL, AND, | EDUCATION AND OUTREACH. | (COUNTY & MUNICIPALITIES)

Several capability assessment tools will be pre-populated for the County and sent to the HMPC for review and comment. The same process will occur with each municipality. During the meeting a self-assessment of capability for Queen Anne's County was completed. Members were asked to state the County's degree of capability (limited, moderate, or high) for the four (4) capabilities areas listed above. Based on members perspective, results were:

- Planning and Regulatory Capability - High
- Administrative and Technical Capability - High
- Financial Capability - Moderate
- Public Education and Outreach Capability- Moderate/Limited (very small staff)

Municipalities will be requested to report their current capabilities via a municipal survey (provided via mail and digitally) and during municipal meetings. These capabilities are included in the HMP by jurisdiction and are categorized by the following topic areas: Planning and Regulatory, Administrative and Technical, Financial, and Education and Outreach. SP&D is also offering municipal specific virtual meetings to assist with the collection of information and to answer questions. A Doodle Poll was distributed to all municipalities to assist with scheduling. The Towns of Queenstown, Millington, and Centreville have participated in poll and meeting invitation will be sent.

Next Steps

- Working Draft Hazard Chapters Distribution
- Review and Comment Forms (HMPC, Municipalities, and Public)
- Capability Assessment Review & Comments
- Capability Assessment Results
- Municipal Meetings
- Collection of Mitigation Action Ideas
- In-Person Mitigation Solution Workshop – October 10, 2024

Group HMPC and targeted emails will be distributed.

Queen Anne's County Hazard Mitigation Plan Update
Mitigation Solutions Workshop
October 10, 2024, 1:00 - 4:00 PM

All members of Queen Anne's County's Hazard Mitigation Planning Committee (HMPC) were invited to the Mitigation Solutions Workshop. A full listing of the HMPC members will be included in the plan update. All HMPC members will receive a copy of these notes. The following members were in attendance:

Name	Organization/Department	Position/Title
Aaron Horney	Town of Queenstown	Clerk & Treasurer
Amy Moore	Town of Queenstown	Town Manager
Annie Sparks	QAC Department of Community Services	Aging and Transportation
Beth Copp	QAC Department of Health	Public Health Emergency Planner
Beth Malasky	QAC Department of Community Affairs	Public Information Manager
Brendan Foard	MDTA Police	Corporal
Carolyn Brinkley	Town of Centreville	Town Manager
Cathy Willis	QAC Department of Community Services	Director
Corey Tosten	MD Natural Resources Police	Lieutenant
Debi Hopkins	QAC Department of Emergency Services	Emergency Planner
Geneva Schaffle	Talbot County Department of Emergency Services	Emergency Planner
John Kling	QAC Department of Public Works	Floodplain Manager
John Meyers	QAC Sheriff's Office	Lieutenant
Kip Matthews	Town of Centreville	Director of Public Works
Lisa Phillips	Public Safety Chesapeake College	Assistant Director
Lori Morris	QAC Department of Emergency Services	Assistant Chief of Special Operations
Marcia Barben	Maryland Department of Emergency Management	Hazard Mitigation Project Officer
Mike Clark	LMB, Housing, Housing Authority	Director
Rob Gunter	QAC Planning & Zoning	Development Review Principal Planner
Steve Cohoon	QAC Department of Public Works	Public Facilities Planner
Vivian Swinson	QAC Planning & Zoning	Zoning Administrator
Zach Yerkie	QAC Department of Emergency Services	Asst. Chief of Emergency Medical Services
Michele King	SP&D	Planner
Virginia Smith	SP&D	Principal

Agenda

- Project Update
  - Preliminary Public Survey Results
  - Municipal Input
  - Mitigation Status Report
- Workshop
- Next Steps

HMP Overview

For those HMPC members who were unable to attend the previous meetings, a brief overview of the hazard mitigation planning process and the purpose of plan was provided.

FEMA grant funding was obtained by QAC Department of Emergency Services to update the plan. FEMA requires hazard mitigation plans to be updated every five (5) years. Jurisdictions are required to develop and maintain a FEMA approved and locally adopted Hazard Mitigation Plan.

Keep in mind, municipalities must participate throughout the planning process to be covered under the Queen Anne's County HMP.

For those HMPC members who would like to view the 2019 Queen Anne's Multi-Jurisdictional Hazard Mitigation Plan, please visit the DES Hazard Mitigation webpage at: https://www.qac.org/1328/Hazard-Mitigation.

Hazard Mitigation

Hazard Mitigation is any action taken to permanently reduce or eliminate long-term risk to people and their property from the effects of hazards.

The purpose of the Hazard Mitigation Plan is to prevent or reduce loss of life and injury as well as limit damage costs from various hazards through the development of mitigation methods which lessen or eliminate future damage.

Preliminary Public Survey Results

The Public Survey has been launched on the Department of Emergency Management's Hazard Mitigation webpage and is currently available for members of the public to complete. The link to this survey will remain active on the website for the length of the project.

Queen Anne's County developed a press release and social media posts about the plan update and public survey. Social media posts promoting the public survey will continue throughout the planning process by Queen Anne's County Department of Community Affairs. Hard copy stations were located throughout the County.

To date, 181 members of the public have participated in the public survey. Over 90% of the participants are residents of the County and over 60% do not have flood insurance. Over 70% of the participants indicated that their mortgage does not require it, however, almost 20% stated that flood insurance is too expensive. Participants indicated the following mitigation project types should be focused on to reduce disruptions of services and strengthen the community.

- Work on improving the damage resistance of utilities (electricity, communications, water/sewer, etc.)
- Retrofit and strengthen essential facilities such as police, fire, emergency medical services, hospitals, schools, etc.
- Retrofit infrastructure, such as elevating roadways and improving drainage systems
- Inform property owners of ways they can mitigate damage to their property.

Open ended responses included:

- Creating a mass casualty/fallback staging area for the county.
- Stop approving new developments on Kent Island.

- Stop building large communities.
- Inventory existing municipal and utility vulnerabilities and plan to protect or relocate those facilities.
- Huge supporter of buyouts. As a FEMA mitigation analyst this county is building way too much in flood zones and what should be protected wetlands. There needs to be more focus on nature-based solutions.
- Support natures process and do not increase building in hazardous areas.
- When a structure is damaged beyond repair in a high-risk area, do not allow the owner to rebuild.
- Stop building on Kent Island overcrowded.

Keep in mind, QAC DES is requesting that HMPC members and municipal representatives post and/or repost hazard mitigation related information.

Municipal Input

As part of the FEMA's State and Local Mitigation Planning Policy Guide, municipal participation must be documented throughout the plan development process. Therefore, Michele King (SP&D) and Debbie Hopkins (QAC DES) met with each participating municipality to obtain necessary information for inclusion in the plan update.

- Barclay
- Centreville
- Church Hill
- Millington
- Queenstown
- Sudlersville

The Town of Queen Anne participated in and adopted the 2022 Talbot County Hazard Mitigation Plan and the Town of Templeville participated in the 2024 Caroline County Hazard Mitigation Plan. These towns are invited and encouraged to participate in the Queen Anne's County planning process.

Mitigation Status Report

Results indicated that of the thirty-five (35) mitigation actions, ten (10) have been completed or are in progress, and twelve (12) are ongoing, while eleven (11) remain incomplete as shown on the chart below. Two (2) of the mitigation actions are pending.

Completed actions are listed below with the high priority mitigation actions identified in red.

- Action Item #5: Emergency back-up power- Install generators at the following essential facilities: Health Department Annex, EMS Station 100, EMS Station 200, EMS Station 400, and Centreville Police Department (CPD).
- Action Item #6: Upgrade undersized generators at the following essential facilities:
    - EOC –Dept. of Emergency Services Building
    - Queenstown Volunteer Fire Dept. #3 and EMS Station 300
    - Health Department-Main Building
- Action Item #12: Update Comprehensive Plan and community plans to include hazard mitigation,

including sea level change and coastal hazards.

- Action Item #18: Distribute annual mitigation & resiliency outreach material annually using various media to reach multiple demographic groups.
- Action Item #20: Integrate Hazus (wind) results and FEMA Coastal Risk Map Study for potential shelter needs into Emergency Operation Plan-ESF #6 Mass Care & Sheltering.
- Action Item #32: Install a new Water Treatment Plant at the Four Seasons.

The eleven (11) incomplete actions were reviewed to determine which actions should be carried over for potential inclusion in this plan update. Those that were carried over were discussed during this Workshop.

Hazard Mitigation Solutions Workshop

Goals & Considerations for the Workshop

FEMA policy guide indicates that the County and each participating municipality should identify a minimum of (1) mitigation action for each hazard profiled, and ideally (2) per hazard, as recommended by FEMA Region 3. Workshop participants were informed that a comprehensive range of actions should be considered specifically addressing vulnerabilities identified in HMP. Finally, workshop participants were urged to be mindful that the range of actions considered should include mitigation actions that benefit underserved communities and socially vulnerable populations.

A **mitigation action** is a measure, project, plan or activity proposed to reduce current and future vulnerabilities described in the risk assessment.

Groups

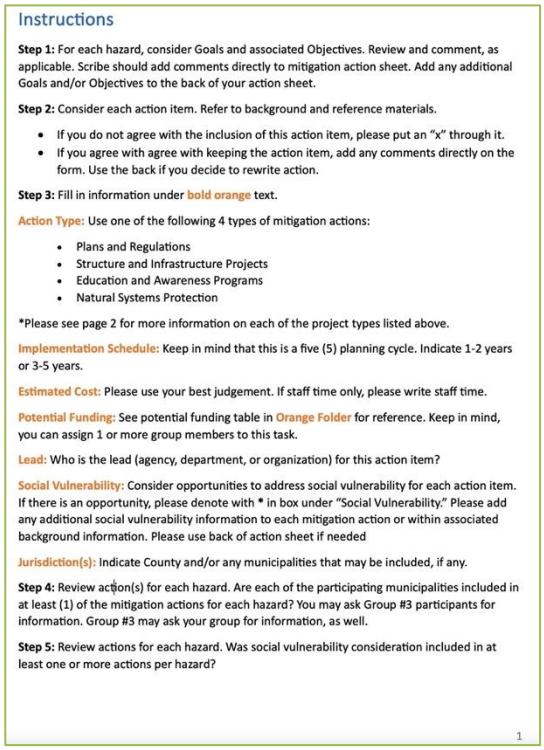
Participants were asked to work in groups for the duration of the workshop. Each group and each municipality selected a scribe and a speaker for the report out portion of the workshop.

Mitigation Workshop

Workshop materials were explained and made available for participant use throughout the duration of the workshop. Materials included mitigation action fillable worksheets. These fillable worksheets included mitigation actions that were identified over the course of the planning process. This included those actions identified by the HMPC for carry-over from the previous plan and those submitted as "new" during the review and comment of various working draft hazard chapters. Each of the mitigation action fillable worksheets included pre-populated information such as the proposed mitigation action, background information, and references. Selected pages from the plan, including narrative, maps, and tables, along with other reference materials were paper clipped to the worksheets. Having relevant information readily available, enabled participants to quickly refer to specific information, particularly the vulnerability analysis information, to further inform their group discussion. In addition, participants were provided with worksheets to include any new mitigation actions that were not previously captured.

New Mitigation Ideas- HMPC members were provided working draft chapters as they were developed for review and comment. Along with the review and comment form that accompanied each working draft hazard chapter, a new mitigation ideas form was included.

Instruction sheets were provided to further explain the "Steps" each group should undertake. Each group was instructed to start with just one hazard, which were included in separate hazard folders. Workshop participants worked diligently over the course of several hours to develop robust mitigation actions.



Instructions

Step 1: For each hazard, consider Goals and associated Objectives. Review and comment, as applicable. Scribe should add comments directly to mitigation action sheet. Add any additional Goals and/or Objectives to the back of your action sheet.

Step 2: Consider each action item. Refer to background and reference materials.

- If you do not agree with the inclusion of this action item, please put an "x" through it.
- If you agree with agree with keeping the action item, add any comments directly on the form. Use the back if you decide to rewrite action.

Step 3: Fill in information under **bold orange** text.

Action Type: Use one of the following 4 types of mitigation actions:

- Plans and Regulations
- Structure and Infrastructure Projects
- Education and Awareness Programs
- Natural Systems Protection

*Please see page 2 for more information on each of the project types listed above.

Implementation Schedule: Keep in mind that this is a five (5) planning cycle. Indicate 1-2 years or 3-5 years.

Estimated Cost: Please use your best judgement. If staff time only, please write staff time.

Potential Funding: See potential funding table in **Orange Folder** for reference. Keep in mind, you can assign 1 or more group members to this task.

Lead: Who is the lead (agency, department, or organization) for this action item?

Social Vulnerability: Consider opportunities to address social vulnerability for each action item. If there is an opportunity, please denote with * in box under "Social Vulnerability." Please add any additional social vulnerability information to each mitigation action or within associated background information. Please use back of action sheet if needed

Jurisdiction(s): Indicate County and/or any municipalities that may be included, if any.

Step 4: Review action(s) for each hazard. Are each of the participating municipalities included in at least (1) of the mitigation actions for each hazard? You may ask Group #3 participants for information. Group #3 may ask your group for information, as well.

Step 5: Review actions for each hazard. Was social vulnerability consideration included in at least one or more actions per hazard?

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Results of the workshop included a mitigation action for each hazard profiled in the plan, which included both the County and participating municipalities.

In addition, each group along with municipal representatives provided a report out to the entire group. Report outs included answers to the following three questions:

1. What hazards did your group address during the workshop?
2. What actions did you group determine were the highest priority and/or resonated the most with your group (top 3-5)? Provide any additional information your group feels is important on each priority action to inform the other workshop participants who were not in your group.
3. What was the most challenging part and best part of the workshop?

Mitigation actions completed during the workshop will be distributed to all HMPC members along with these meeting notes.

Next Steps

- Distribution of Meeting Notes
- Review and Comment of New Mitigation Actions & Prioritization
- Cohesive Draft Plan for HMPC Review & Comment
- Draft HMP for Public Review & Comment
- Draft HMP for MDEM Review & Comment
- Draft HMP for FEMA Review & Comment
- Final Draft for FEMA Submittal
- FEMA Approved Pending Adoption (APA) Letter
- Final Draft for HMP Public Review & Comment (formal public comment period, part of Plan Adoption)
- Final HMP for County & Town Adoption
- Submit County & Town Adoption Documentation to FEMA

Queen Anne's County Hazard Mitigation Plan Update
Floodplain Manager Small Group Meeting
June 25, 2024, 10:00 – 11:30 AM

Queen Anne's County's Hazard Mitigation Planning Committee (HMPC) members John Kling, Floodplain Manager, and Lori Morris, DES Assistant Chief of Special Operations attended the Floodplain Manager's small group meeting with Michele King, SP&D, facilitating. This meeting was specific to the unincorporated areas of Queen Anne's County. Municipal meetings will be held separately. *Note: The following municipalities, Queen Anne and Templeville, who have territory within two separate counties, participate in and have adopted the Talbot County and Caroline County Hazard Mitigation Plans, respectively.*

Agenda

- NFIP Community Questionnaire Review
- Additional Capability Questions
- Assessment of 2019 HMP Floodplain Management Capability
- New Mitigation Ideas
- Next Steps

NFIP Community Questionnaire Review

The three areas of focus for this meeting and those identified on FEMA Region 3 Questionnaire – Checking in on the NFIP included:

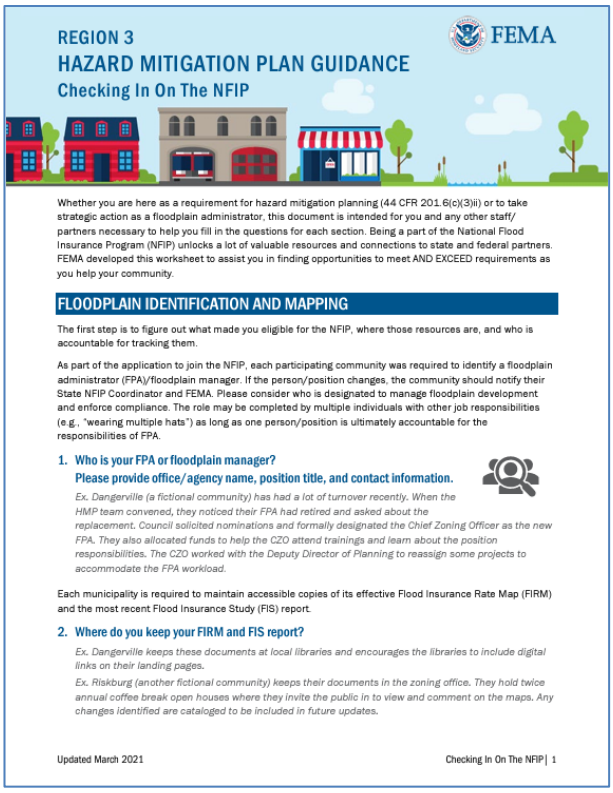
- Floodplain Identification & Mapping,
- Floodplain Management, and
- Floodplain Insurance.

To help facilitate the meeting discussion, SP&D completed the draft Queen Anne's County, Maryland NFIP Community Questionnaire. During this portion of the meeting, the questionnaire was reviewed for accuracy and additional information was gathered. The updated questionnaire is included following the meeting notes for review.

Note: this information is required during the Hazard Mitigation Plan update process, 44 CFR 201.6(c)(3) ii.

As a result of the questionnaire review, gaps and recommendations were identified. This information will be used to develop new mitigation action items for inclusion in the 2025 QAC HMP. Two examples include:

- Integrate the County's Property Viewer on the Floodplain webpage.
- Provide the Queen Anne's County Flood Insurance Study on the Floodplain webpage.



REGION 3
HAZARD MITIGATION PLAN GUIDANCE
Checking In On The NFIP

FEMA

Whether you are here as a requirement for hazard mitigation planning (44 CFR 201.6(c)(3)ii) or to take strategic action as a floodplain administrator, this document is intended for you and any other staff/ partners necessary to help you fill in the questions for each section. Being a part of the National Flood Insurance Program (NFIP) unlocks a lot of valuable resources and connections to state and federal partners. FEMA developed this worksheet to assist you in finding opportunities to meet AND EXCEED requirements as you help your community.

FLOODPLAIN IDENTIFICATION AND MAPPING

The first step is to figure out what made you eligible for the NFIP, where those resources are, and who is accountable for tracking them.

As part of the application to join the NFIP, each participating community was required to identify a floodplain administrator (FPA)/floodplain manager. If the person/position changes, the community should notify their State NFIP Coordinator and FEMA. Please consider who is designated to manage floodplain development and enforce compliance. The role may be completed by multiple individuals with other job responsibilities (e.g., "wearing multiple hats") as long as one person/position is ultimately accountable for the responsibilities of FPA.

1. Who is your FPA or floodplain manager?
Please provide office/ agency name, position title, and contact information.

Ex. Dangerville (a fictional community) has had a lot of turnover recently. When the HMP team convened, they noticed their FPA had retired and asked about the replacement. Council solicited nominations and formally designated the Chief Zoning Officer as the new FPA. They also allocated funds to help the CZO attend trainings and learn about the position responsibilities. The CZO worked with the Deputy Director of Planning to reassign some projects to accommodate the FPA workload.

Each municipality is required to maintain accessible copies of its effective Flood Insurance Rate Map (FIRM) and the most recent Flood Insurance Study (FIS) report.

2. Where do you keep your FIRM and FIS report?

Ex. Dangerville keeps these documents at local libraries and encourages the libraries to include digital links on their landing pages.

Ex. Riskburg (another fictional community) keeps their documents in the zoning office. They hold twice annual coffee break open houses where they invite the public in to view and comment on the maps. Any changes identified are cataloged to be included in future updates.

Updated March 2021

Checking In On The NFIP | 1

Additional Capability Questions

SP&D asked additional questions of the Floodplain Manager, during the meeting, not included on the NFIP questionnaire. Questions and answer are provided below.

Question 1: Does the County plan to participate in the Community Rating System? (Currently a Community Rating of 10)

- The County is interested in the participate in the Community Rating System (CRS). A Letter of Interest was submitted on October 9, 2018, which initiated the Community Assistance Visit. Once all required corrective actions are satisfied and the County receives an approved CAV, the County will proceed with their CRS application.

Question 2: New RLP data has been requested. Does the County send mailings or social media outreach to provide flood prevention information to current RLP listing?

- The County does not currently send flood prevent information to current RLPs. Per request, this will become a new mitigation action item for inclusion in the HMP update.
    - Potential new action item: Utilizing the Repetitive Loss Property and Severe Repetitive Loss Property listing provided by FEMA in June 2024, develop flood prevention information brochures, and disseminate to these properties via mailers.

Question 3: The Floodplain website provides elevation certificates. Is there GIS data associated with the elevation certificates?

- No, the County does not have a GIS database for current elevation certificates.

Question 4: Do you plan to regulate outside the Special Flood Hazard Area? Take in account the 0.2% annual chance flood geographic extent or future conditions, such as sea level rise?

- The County currently regulates outside the Special Flood Hazard Area (SFHA) on specific occasions. If a structure's lowest grade elevation is lower the SFHA elevation, the structure would be regulated and require flood insurance.

Question 5: Does the County conduct floodplain management for any of the municipalities?

- The County does not have land use authority within the eight (8) incorporated towns. The county does not issue floodplain permits for of the towns.

  Note: The following municipalities, Queen Anne and Templeville, who have territory within two separate counties, participate in and have adopted the Talbot County and Caroline County Hazard Mitigation Plans, respectively.

Question 6: Has your department undertaken any hazard mitigation activities and /or projects since the completion of the last hazard mitigation plan, which was completed and adopted in 2019.

- Cloverfields Neighborhood Flood Mitigation Project Scoping
    - The Cloverfields is a coastal neighborhood on

Hazard Mitigation

Hazard Mitigation is any action taken to permanently reduce or eliminate long-term risk to people and their property from the effects of hazards.

the north end of Kent Island between the mouth of Chester River and the Chesapeake Bay. The entire neighborhood drains into the Cox Creek, which is the lowest lying point in the neighborhood. The Cloverfields neighborhood has 5 documented repetitive loss properties along Cox Creek and over 106 'flood prone' residences. This project scoping activity is within Mitigation Action 19, which is outlined in Chapter 15 of the 2019 Queen Anne's County Multi-Hazard Mitigation Plan. The primary activity for this project is to develop or conduct engineering, environmental, feasibility and/or benefit cost analyses for flood mitigation/prevention.

- Chester River Beach Project
    - This area has experienced several losses and over 100 claims due to nuisance flooding. This is a pending project since it is not included in this year budget for the County. The Floodplain Manager expects to have further information in the next year.
- The Department of Public Works raised a section of Old Point Road in Chester two years ago due to tidal water toping the roadway monthly.
- The Department of Emergency Services (DES) met with State Highway Administration (SHA) to review local projects. Projects were prioritized and SHA worked to resolve the issues.
- The Department of Emergency Services submitted a grant application in 2018 for a generator at EMS Station 400. This location is also the Headquarters for EMS. Grant funding was received however the project was stalled due to Covid 19. DES will be closing out on this project this year.

Question 7: Is any floodplain management outreach targeted to specific groups or vulnerable populations?

- No, floodplain management outreach is not sent to specific groups currently.
- The County is going to begin Neighborhood/Community Program. This program was active until the pandemic, Covid 19. The Department of Emergency Services (DES) plans to initiate this program again this summer. The program involves DES providing hazard information to communities/neighborhoods throughout the County.

Assessment of 2019 HMP Floodplain Management Capability

Floodplain management capabilities identified in the 2019 Hazard Mitigation Plan were reviewed during this meeting.

- *Training for both real estate and insurance agents in Queen Anne's County has been conducted periodically. The most recent training occurred within the planning cycle.*
    - Does the County still participate in these trainings? When was the last training? Upcoming training?
        - The County does participate in these trainings when the State makes them available. The County is always available to provide trainings when requested.
- *County staff regularly attend the quarterly Maryland CRS Users Group meetings. Best practices and lessons learned across the State of Maryland are highlighted at the meeting.*
    - Do you still attend these meetings? When was the last meeting? Upcoming meeting?

        - The Maryland Department of Environment NFIP Coordinator organizes these meetings, however due to staff change over, these meetings have been on hold. No upcoming meetings have been established.

- *The county maintains a listing of potential flood acquisition properties.*
    - Does the County still maintain this listing? How many properties have been acquired within the past 5 years? Any acquisition projects planned for the next 5 years?
        - The County does not have a potential flood acquisition listing currently. No properties have been acquired in the past five (5) years. Currently DES is working to acquire a severe repetitive loss property.
- *The Kent Island Water Tower elevation project was completed in the fall of 2018.*
    - Any elevations projects planned for the next 5 years?
        - No elevations have been completed in the past five (5) years and no elevations projects are proposed for the next five (5) years.
- *In March 2018, the Sea Level Rise (SLR) and Coastal Vulnerability Assessment and Implementation Plan was completed. According to the article titled Study on Sea Level Rise Assesses Impacts on Queen Anne's, the study provides impacts and recommendation for future planning purposes.*
    - Any projects completed based on the recommendations within the plan?
        - Michele King will provide Mr. Kling the recommendations from the plan for further review.

New Mitigation Ideas

The last item discussed during the meeting was new mitigation ideas.

- What floodplain management actions do you plan to undertake in the next five years?
    - The Floodplain Manager will be conducting outreach to the properties involved in the Chester River Beach Project. A scoping project to determine issues and potential solutions at this location will be the first step. A larger grant is necessary for the Chester River Beach Project. This will be a new mitigation action item for inclusion in the plan update.
    - Once issues are determined for the Cloverfields Neighborhood Flood Mitigation Project, DES will apply for additional grants to complete mitigation measures.
- Flood insurance brochures (FIB): Does the County already have this or interested in this as a new action item?
    - The County does not currently do this and is interested in providing mailers to properties in the floodplain on flood mitigation measures.
- Is there a flood exercise or drill planned within the next five years? Can we add this as an action item in the HMP? The exercise/drill must be HSEEP compliant and include an AAR/IP.

    - Following up with DES.

- Understand community impact of Risk 2.0 and share information with public subsequent mitigation measures.
    - By request, the following action items will be added to the plan update.
        - Promote flood insurance to all property owners that are in the Special Flood Hazard Area or adjacent to.
        - Educate the public on who is vulnerable to flood and provide flood prevention measures.
- Collect 5 years of data with NFP to identify areas at greatest/most frequent risk of flooding and proposed CIP project to assist with mitigation.
    - This action will be included in the plan update.
- Utilizing the Repetitive Loss Property and Severe Repetitive Loss Property listing provided by FEMA in June 2024, develop flood prevention information brochures, and disseminate to these properties via mailers.
- Develop GIS database for current elevation certificates.
- Complete CRS application following CAV close-out.
- Integrate the County's Property Viewer on the Floodplain webpage.
- Provide the Queen Anne's County Flood Insurance Study on the Floodplain webpage.
- The County is going to begin Neighborhood/Community Program. This program was active until the pandemic, Covid 19. The Department of Emergency Services (DES) plans to initiate this program again this summer. The program involves DES providing hazard information to communities/neighborhoods throughout the County. This is a current capability. Could this be expanded to include other specific information on floodplain management and flood insurance? Consider at the Mitigation Solution Workshop.

Next Steps

- Update NFIP Worksheet
- Update Appendix A NFIP & CRS with new RLP and NFIP data
- Revise mapping
- Update Capabilities
- Send all material to Floodplain Manager for review.

Queen Anne's County, Maryland NFIP Community Questionnaire

FLOODPLAIN IDENTIFICATION & MAPPING

1. Who is your FPA or floodplain manager? Please provide office/agency name, position title, and contact information.	Mr. John Kling, Floodplain Administrator 410-758-0925 Ext. 4168 jkling@qac.org
2. Where do you keep your FIRM and FIS report?	Hard copies of the FIRM, FIS, & LOMCs are available in the Queen Anne's County Department of Public Works.
3. Has your community adopted the most recent FIRM? When was the adoption? Where is that information stored? Has your community updated the floodplain ordinance language to include the current FIRM and FIS?	Queen Anne's County, Maryland most recent effective FEMA FIRM, November 5, 2014, was adopted by the Board of County Commissioners of Queen Anne's County on 9-9-2014 by Ord. No. 14-12. The Queen Anne's County Floodplain Management Ordinance language follows the current FIRM and Flood Insurance Study (FIS). Hard copies are available for review in the County's Department of Public Works Office and the Floodplain website: https://ecode360.com/7136065.
4. Does your jurisdiction support requests for map updates?	Yes. Queen Anne's County reviews and may provide support for Letters of Map Change (LOMC) applications.
5. Is there a specific agency/department responsible for compiling these updates and tracking LOMCs?	Queen Anne's County Floodplain Administrator tracks and compiles updates for LOMC's.
6. Do you collect updated technical or scientific data and modeling? How do you share this with FEMA?	Yes. Queen Anne's County collects and reviews technical and/or scientific modeling data when applicable. Copies are provided to FEMA during the LOMC process. Data impacting mapping must be submitted to FEMA within 6 months of collection.
7. Does your jurisdiction aid with local floodplain determinations? If yes, specify how.	Yes. Queen Anne's County may assist homeowners and potential applicants in determining if their property is located within or near the SFHA by providing mapping resources and information, both lateral and vertical determination information. https://ecode360.com/7136271#7136255
8. Do the people/agencies responsible for using these tools in your community have the access they need? Which tools does your community rely on?	Yes. Queen Anne's County utilizes multiple tools for NFIP information dissemination and education, including the County website (https://www.qac.org/379/Flood), floodplain management personnel, and other tools such as www.mdfloodmaps.com and www.floodsmart.gov. The Floodplain webpage also provides additional resources: https://www.qac.org/471/Resources.
Floodplain management requires that you understand the mapping and data side when working with the public.	

FLOODPLAIN MANAGEMENT

1. Does your jurisdiction issue permits for all proposed development in the SFHA? What office/position is responsible?	Yes. The Queen Anne's County Department of Planning and Zoning is responsible for permit issuance within the SFHA.
2. Does your jurisdiction require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres? If so, what department or office is responsible?	Yes. *In special flood hazard areas of nontidal waters of the state. Subdivision proposals shall be laid out such that proposed building pads are located outside of the special flood hazard area and any portion of platted lots that include land areas that are below the base flood elevation shall be used for other purposes, deed restricted, or otherwise protected to preserve it as open space.* § 14:3-26 Subdivision proposals and development proposals. The Floodplain Administrator is responsible.
3. How does your community identify substantially improved structures? When do they intervene?	The Queen Anne's County's *SI/SD Administrative Procedures for Development in the Special Flood Hazard Area* document details how the County will identify substantially improved structures. Substantial Damage Inspections are required by locally adopted regulations, usually found in the building codes, that require the Community's Floodplain Administrator to determine whether a structure is damaged more than 50% of its market value. These SD inspections are required to occur on all structures in the Special Flood Hazard Area (SFHA) and occur when any damage happens. Floodplain Administrator also reviews permit applications for development in the floodplain and determines if the proposed work constitutes a Substantial Improvement. The County has a method for determining market value and cost of improvement, determining cost of damage/repair. *All new construction or substantial improvements within special flood hazard areas and local flood hazard areas shall comply with the standards set forth in the Floodplain Management Ordinance. See: Floodplain Management Ordinance.* https://www.qac.org/815/Building-in-a-Flood-Zone
4. Does your community have a coordinated process to determine substantial damage and to permit repair and improvement? Does the jurisdiction conduct substantial damage assessments in the SFHA? Does your community have a plan for who will conduct substantial damage assessments and a procedure for assessment?	Yes. *The Floodplain Administrator will identify where flood damage has occurred throughout the County's identified SFHA. There are a variety of distinct post-disaster assessments/inspections other than SD, and other teams should be coordinated as needed. For example, the Department of Emergency Services (DES) will conduct Preliminary Disaster Assessments (PDA's) for the purposes of disaster declaration. These assessments are not substantial damage determinations but can be used by the County to identify damaged areas.*

	Source: SI/SD Administrative Procedures for Development in the Special Flood Hazard Area
5. Does your jurisdiction require Elevation Certificates for new or substantially improved structures? If yes, how is it documented and which office/agency/department is responsible?	Yes. Applicants for construction within the SFHA must submit an Elevation Certificate prepared by a licensed engineer or surveyor. The Floodplain Manager reviews the applications and certificates. *After you finish building in a FEMA-regulated floodplain or local flood hazard area—but before anyone moves in or uses the building—you must complete an Elevation Certificate (FEMA Form 086-0-33). The Elevation Certificate form must be completed by a Maryland licensed land surveyor or registered civil engineer. An Elevation Certificate is necessary before you can receive a Certificate of Occupancy.* https://www.qac.org/815/Building-in-a-Flood-Zone
6. How does the jurisdiction enforce the floodplain ordinance sections? How does the jurisdiction address SI/SD violations?	The Queen Anne's County Floodplain Administer conducts inspections of properties, structures, and utilities for compliance with the ordinance and can issue violations, stop work orders, and penalties. The Department of Planning & Zoning addresses SI/SD violations by issuing a notice of violation. Violations are issues due to the lack of necessary permits.
7. Has your jurisdiction had a Community Assistance Visit? If so, were any corrective actions required?	The County submitted a Letter of Interest for the Community Rating Program. This initiated a Community Assistance Visit (CAV) in 2018. The County is currently working on the 2020 CAV. The County is now addressing the remaining 8 corrective actions out of the 100 that were required.
8. Does your jurisdiction have or is considering higher ordinance standards than the NFIP? Please describe the higher standards and where they are documented.	All new or substantially improved structures shall have the lowest floor elevated to or above the flood protection elevation. The Queen Anne's County Flood Protection Elevation is the base flood elevation plus two (2) feet of freeboard. No additional regulations are planned at this time.
9. Are any local officials/departments in your community interested in additional training? What topics relate most to your community?	Yes. Queen Anne's County personnel are always interested in additional training in reviewing and administering the requirements of the NFIP. Staff sign up for all State NFIIP training. All Tech and Engineers as well as permitters have completed the basic floodplain training.
Floodplain management reduces flood risk and protects floodplain health.	

FLOODPLAIN INSURANCE

1. How does the jurisdiction educate community members about the availability and value of flood insurance?	Queen Anne's County personnel and/or the Floodplain Manager educates the community and property owners regarding the value of flood insurance through the County Website: https://www.qac.org/844/Flood-Insurance, and/or direct contact with property owners within the SFHA. Queen Anne's County Chamber of Commerce provides information for local insurance companies.
2. Does the jurisdiction inform community property owners about changes to the FIRM that would impact their insurance rates?	Yes. Queen Anne's County Floodplain Manager notifies property owners within the SFHA regarding changes to the FIRM through press releases, public service announcements, and where applicable, direct mailing correspondence.
3. How does the jurisdiction provide general assistance to community members regarding insurance issues?	The Floodplain Manager and Queen Anne's County personnel are available to advise, assist and answer any questions of community members regarding the NFIP program and/or floodplain regulations.
4. Does the jurisdiction keep track of the number of residential and non-residential structures in the SFHA? How many structures are in the SFHA in your community?	Yes. A GIS database containing the number of residential and non-residential structures is maintained by the GIS Coordinator (P&Z). According to the June 21, 2024, FEMA CIS NFIP Insurance Report, there are 1,369 NFIP policies within the County.
5. Does the jurisdiction have any levees or levee systems in its jurisdiction?	No. Queen Anne's County has no levee systems within its jurisdiction according to the USACE national levee database.
6. Is the levee or levee system certified and accredited?	N/A
7. Is the levee or levee system a Provisionally Accredited Levee (PAL)?	N/A
8. Is the levee or levee system part of the USACE Rehabilitation and Inspection Program?	N/A
9. Does your community have any Major Dams or High Hazard Dams, and if so, have you applied for FEMA's High Hazard Potential Dam grant?	Queen Anne's County has 10 total dams, 3 of which are classified as Significant Hazard Potential according to the National Inventory of Dams. There are no high hazard potential dams in the County. *Source: National Dam Inventory & MDE Dam Safety*
Flood risk communication to the public is vital for a community to be truly resilient.	

NEXT STEPS

- What are your short- and long-term action items?
  - Integrate the County's web viewer into the Floodplain webpage.
  - Provide the Flood Insurance Study on the Floodplain webpage.
  - Conduct flood prevention outreach to property owners in and around the Special Flood Hazard Area.

Queen Anne's County Hazard Mitigation Plan Update
Social Equity & Vulnerability Small Group Meeting
August 6, 2024, 2:00 – 3:30 PM

The following Queen Anne's County's Hazard Mitigation Planning Committee (HMPC) members attended the Social Equity and Social Vulnerability small group meeting.

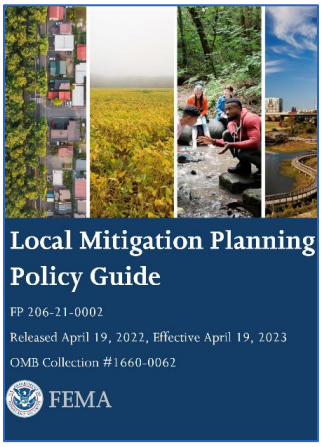
Name	Organization/Department	Position/Title
Megan DelGaudio	Queen Anne's County Information Technology	Manager
Beth Copp	Queen Anne's County Department of Health	Public Health Emergency Planner
Susan Coppage	QAC Dept. of Social Services	Director
Brian Riley	Queen Anne's County Information Technology	Director
Cathy Willis	QAC Dept. of Community Services	Director
Annie Sparks	QAC Dept. of Community Services	Aging & Transportation
Mike Clark	QAC Dept. of Community Services	Executive Director of Housing & Family
Lori Morris	Queen Anne's County Dept. of Emergency Services	Assistant Chief of Special Operations
Debi Hopkins	Queen Anne's County Dept. of Emergency Services	Emergency Planner
Michele King	SP&D	Planner
Virginia Smith	SP&D	Principal

Agenda

- FEMA Hazard Mitigation – 2023 Local Plan Policy Guidance
- Social Equity & Social Vulnerability Overview
- Discussion Questions
- New Mitigation Action Ideas

FEMA Hazard Mitigation – 2023 Local Plan Policy Guidance

In recent updates to FEMA's Local Mitigation Planning Policy Guide, emphasis has been placed equity considerations for underserved communities and socially vulnerable populations. These considerations have been intertwined throughout the hazard mitigation plan elements.



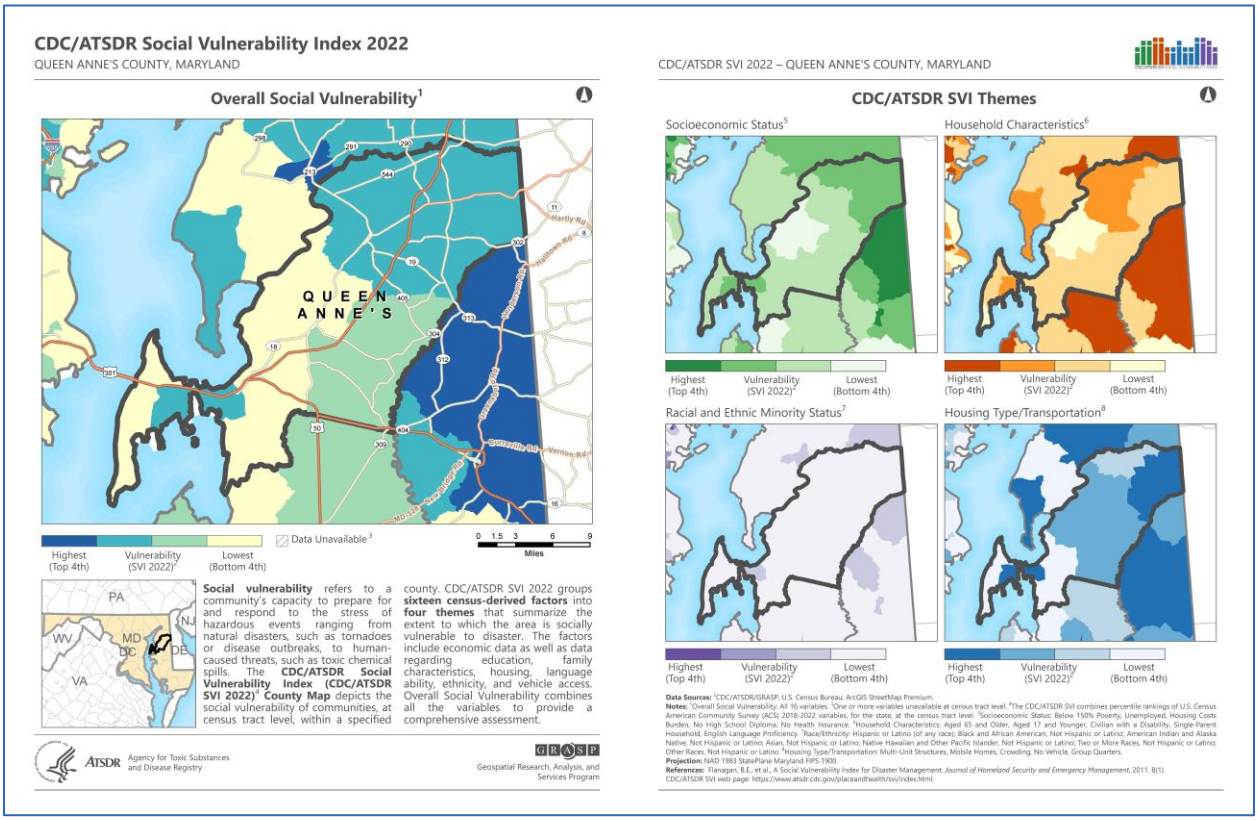
- **Planning Process:** When communities create their mitigation plans (which are crucial for disaster risk reduction), they now need to consider the unique needs of underserved communities. This means involving diverse voices, understanding local context, and ensuring that everyone's concerns are heard.
- **Risk Assessments:** These assessments should consider social vulnerability. It's not just about physical risks like floods or earthquakes; it's also about who is most affected. By considering factors like income, access to resources, and historical disparities, we can better tailor our mitigation efforts.
- **Mitigation Strategy:** This element focuses on addressing vulnerabilities. Whether it's improving infrastructure, enhancing community resilience, or providing targeted assistance, the goal is to reduce risk while promoting equity.

Social Equity & Social Vulnerability Overview

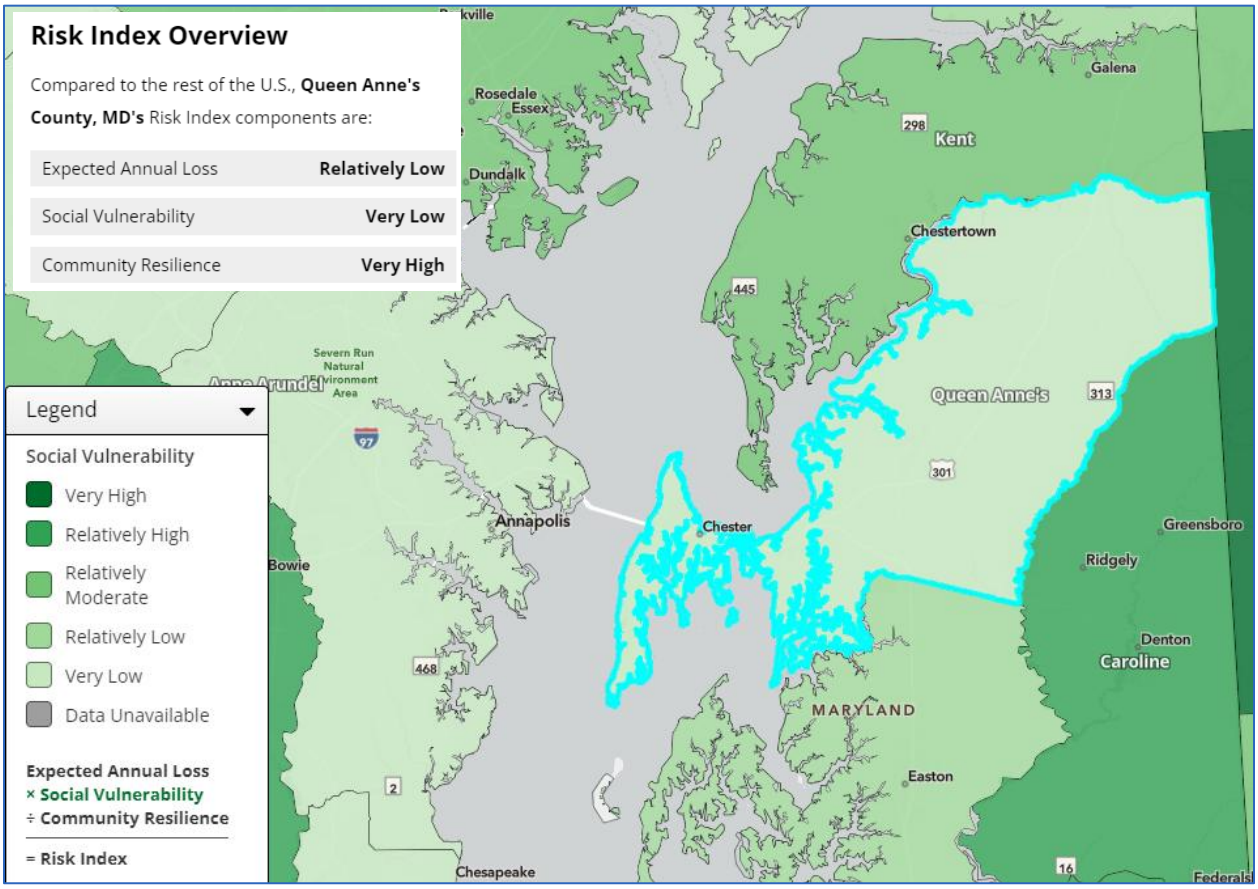
FEMA defines **social equity** as the consistent and systematic fair, just and impartial treatment of all individuals. To ensure that the planning process and outcomes of the local mitigation plan benefit the equity must be central in its development.

Equity is not just an important principle; it is essential to reducing risk to the whole community, particularly for those who face barriers to accessing assistance and for populations that are disproportionately affected by disasters. The whole community includes individuals and communities, the private and nonprofit sectors, faith-based organizations, and all levels of government (regional/metropolitan, state, local, tribal, territorial, insular area and federal). The mitigation plan is an opportunity to counter some of those barriers and intentionally plan for reducing the risk of all communities.

Social vulnerability refers to the potential for loss or harm that individuals or social groups face due to their specific characteristics, such as socioeconomic status, age, disability, or ethnicity. During the meeting, the Center for Disease Control's 2022 Queen Anne's Social Vulnerability Index was reviewed. According to the CDC, Queen Anne's County's overall Social Vulnerability score is 0. 087, which indicates a low level of vulnerability.



In addition, the National Risk Index for Queen Anne's County was discussed. The National Risk Index determined Queen Anne's County to have very low social vulnerability compared to the rest of the United States.



Discussion Questions

The following discussion questions were reviewed during the meeting. Questions and answers are provided below.

Question 1: Has your department, agency, or organization observed shifts in the needs of underserved communities or gaps in social equity?

- The County's Office of Technology is currently working with the State on broadband connectivity, which will provide broadband to underserved populations. Before this initiative, a lot of homes in the county did not have internet, but now have the option. The Middle Mile Grant was just approved to assist in providing fiber in front of homes, while the Long Driveway Grants, which is in process, provides internet directly to homes.
- The State of Maryland published its initial plans for Broadband Equity, Access, and Deployment (BEAD) and Digital Equity programs. The State began a challenge process which allows internet service providers, units of local government, and non-profit organizations in Maryland to challenge the accuracy of existing broadband maps. This will assist with ensuring maps accurately reflect broadband availability and speeds across the state. According to the State, this endeavor critical for directing the federal BEAD program funds where they are needed most.
- Meagan DelGaudio will provide a map depicting areas in the county that now have internet access since 2020.

- Increase in population aged 65 years and older has resulted in challenges due to increased reliance on technology, which is sometimes difficult for our aging population.
- QAC Health Department distributes information in multiple languages, primarily Spanish. In addition, the Health Department has translators as part of the staff who assist with language barriers but also review documents for appropriate translation prior to distribution.
- The Department of Emergency Services does not have a translator. This creates issues when conducting classes or distributing hazard specific information to populations with a language barrier. The Language Line has been utilized, however due to different carriers and cell phone coverage or radio connectivity in the rural areas, the line is not always reliable. DES works has been using the "phone a friend" method when a language barrier is encountered.

Public Survey

- In consideration of members of the county who do not have access and/or use of online services, SP&D suggested survey stations for the public survey. Beth Copp indicated her staff would translate the survey into Spanish. This allows the public survey to be distributed to these socially vulnerable populations.
- Survey stations will be available at:
    - The four (4) senior centers.
    - The Commission on Aging event is to be held at the Centreville Town Hall in September.
    - The Department of Social Services facility.
    - The Department of Health.
- The Housing Authority will distribute the public survey at each apartment and to other lower income fixed rent facilities.
- SP&D will deliver survey station materials to the County on August 20, 2024.

Make A Difference Day

- The event targets low-income families and will be held November 2, 2024, at the Sudlersville Middle School.
- The Department of Emergency Services will have a station at the event. Hazard related handouts, including Spanish handouts, will be sought for distribution during the event.

Question 2: Do you know of locations/areas of particular social vulnerability concern?

- The group indicated that North County is an area of particular social vulnerability concern. This coincides with the CDC's Social Vulnerability Index map, which identified this area having a higher socially vulnerable population.

Question 3: Is there a specific organization that works directly with vulnerable populations? Particularly, those not represented today.

- Haven Ministries
- Mid Shore Behavioral Health- Mid Shore Roundtable on Homelessness

Question 4: Has your department, agency, or organization included social equity and/or vulnerability in any of your planning or services provided since the previous HMP?

- Starting in 2023, the Queen Anne's County transit became free to ride. The number of riders has

doubled within the past year.

- The Department of Emergency Services and the Health Department joined to create the Mobile Integrated Community Health Program. This program works with the elderly and have grown since Covid. Debi Hopkins will provide an overview of the past 5 years.
- The Department of Social Services technology capabilities have increased since Covid. Staff can now work remotely and still have access to the client database.
- The Local Management Board obtained grant funding in order to provide over 2,000 laptops to low-income families.

Question 5: Do you currently target group(s) with public outreach materials? How – methods of dissemination.

- Department of Emergency Services
  - Meets with groups that are 55 years and older across the county. Symphony Village in Centerville is an example of a community the staff meets with monthly to discuss resiliency.
  - Utilize videos, YouTube, social media, and weather alerting systems to disseminate information.
  - Conduct hazard lessons at the middle and high schools.
- Department of Community Services
  - Targets many populations using QACTVH, radio, mailing newsletters, and emailing newsletters.

New Mitigation Ideas

The last item discussed during the meeting was new mitigation ideas. Possible new ideas are as follows.

- For health-related outreach, the Health Department conducts direct contact with specific groups, such as large employers and churches to assist with providing information to populations with a language barrier. The Health Department has a listing of businesses that have limited English speaking employees. There may be opportunities for expansion or collaboration. Discuss at the in-person Mitigation Solutions Workshop in September 2024.
- Promote tree planting at the neighborhood level. Distribute information on Maryland's 5 million trees Initiative (5MT). Consider social equity when prioritizing neighborhood outreach. Prioritize those properties within socially vulnerable Census Tracts.
  - Discuss this action item with Department of Parks and Recreation.
- Currently CERT is one (1) large organization. Within the next five (5) years, DES would like to develop response teams that are targeted at specific areas.
- Convey 9-1-1 contract is in the works which will assist the county to disseminate emergency communications, including language translation solutions via text, video, and voice. However, publications are not provided with this service. Additional services to provide publications will need to be sought.
- The County uses Everbridge currently and within the next five (5) years, DES would like to separate

out targeted populations that are conditioned based such as electric depended. This would allow direct emergency notifications to these vulnerable populations.

- The Department of Health Office of Preparedness is drafting a plan on the use of the newly availably refined emPower data. The office can distribute specific data to DES as needed. However, if more identifiable data is needed, a new process for data access is being developed. This includes data use agreement and specific data needed. This information allows DES to target specific vulnerable populations.

Next Steps

- Distribute meeting notes for review.
- Incorporate new capabilities into the capabilities chapter.
- Refine proposed action items for inclusion in the Mitigation Workshop.

Appendix B
Critical Facilities & Community Lifelines

This Appendix provides information Critical Facilities and Community Lifelines analyzed for vulnerability within the Plan. Essential facilities, a subsection of the critical facilities is included in this appendix as well. Matrix tables for both critical and essential facilities provide the results of the vulnerability assessment for each facility.

- Critical Facilities & Community Lifelines
- Essential Facilities

Critical Facilities & Community Lifelines

To satisfy Requirement 44 CFR § 201.6(c)(2)(ii), Element B2a from FEMA's Local Mitigation Planning Policy Guide, critical facilities were reviewed and updated. Table B-1 provides all critical facility types and associated community lifeline as well as vulnerability to hazards with a geographic extent.

The following table, Critical Facilities & Community Lifelines Matrix, provides the composite of information obtained for the plan update. This matrix should be viewed in a large format and printed on ledger paper, 11X17.

TABLE B-1: CRITICAL FACILITIES & COMMUNITY LIFELINES MATRIX

COMMUNITY LIFELINES	FACILITY TYPE	NAME	ADDRESS	CITY & ZIP CODE	FLOOD ZONE	FLOOD DEPTH	HURRICANE STORM SURGE	SLR 2050	SLR 2100
Safety and Security	Government	QAC Chesapeake Heritage and Visitor Center	425 Piney Narrows Road	Chester, 21619	AE	1.8	Yes (CAT 1)	No	Yes
	Government	QAC Animal Control	201 Clay Dr	Queenstown, 21658	X (Unshaded)	-	No	No	No
	Government	QAC Board of Education Warehouse	305 Ruthsburg Road	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Detention Center	500 Little Hut Dr	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Planning and Zoning	160 Coursevall Dr	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Department of Aging - Kramer Center	104 Powell St	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Sanitary District HQ	310 Bateau Dr	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 4)	No	No
	Government	QAC Health Department - Nielson Center	205 N Liberty St	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Public Works	100 Communications Dr	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Parks and Landings	1935 4h Park Road	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	Queen Anne' s County Board of Elections	204 N Commerce St	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Vincit Building	110 Vincit St	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Arts Council	206 S Commerce St	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Health Department	206 N Commerce St	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Liberty Building & QAC States Attorney Office	107 N Liberty St	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC - Board of Education New Building	115 Vincit St	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Circuit Court	200 N Commerce St	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Community Partnership for Children and Families	320 Pennsylvania	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Department of Parks and Recreation	1945 4-H Park Rd	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Fire Marshal	210 White Pine	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 3)	No	No
	Government	QAC Historic Courthouse	100 Courthouse Sq	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Housing Authority	205 E Water St, Unit 100	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Public Works	312 Safety Dr	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	QAC Soil Conservation District Shop	3002 Church Hill	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	Maryland State Highway Administration District 2	311 Safety Dr	Centreville, 21617	X (Unshaded)	-	No	No	No
	Government	Maryland Fire and Rescue Institute - Region 4	601 Safety Dr	Centreville, 21617	X (Unshaded)	-	No	No	No
	Town Hall	Church Hill Town Hall	324 Main St	Church Hill, 21623	X (Unshaded)	-	No	No	No
	Town Hall	Centreville Town Hall	101 Lawyers Row	Centreville, 21617	X (Unshaded)	-	No	No	No
	Town Hall	Queenstown Town Hall	7013 Main St	Queenstown, 21658	X (Unshaded)	-	No	No	No
	Town Hall	Barclay Town Hall	1602 Barclay Road	Barclay, 21607	X (Unshaded)	-	No	No	No
	Town Hall	Sudlersville Town Hall	200 S Church St	Sudlersville, 21668	X (Unshaded)	-	No	No	No
	Library	QAC Free Library - Kent Island Branch	200 Library Cir	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 2)	No	No
	Library	QAC Free Library - Centreville Branch	121 S Commerce St	Centreville, 21617	X (Unshaded)	-	No	No	No
	Library	Sudlersville Memorial Library	105 W Main St	Sudlersville, 21668	X (Unshaded)	-	No	No	No
	Transfer Station	Church Hill Transfer Station	110 Price Station Road	Church Hill, 21623	X (Unshaded)	-	No	No	No
	Transfer Station	Batts Neck Transfer Station	422 Batts Neck Road	Stevensville, 21666	X (Unshaded)	-	No	No	No

COMMUNITY LIFELINES	FACILITY TYPE	NAME	ADDRESS	CITY & ZIP CODE	FLOOD ZONE	FLOOD DEPTH	HURRICANE STORM SURGE	SLR 2050	SLR 2100
	Transfer Station	Grasonville Transfer Station	401 Gravel Run Road	Grasonville, 21638	X (Unshaded)	-	No	No	No
	Transfer Station	Centreville Transfer Station	401 Harper Road	Centreville, 21617	X (Unshaded)	-	No	No	No
	Transfer Station	Glanding Transfer Station	223 Glanding Road	Millington, 21651	X (Unshaded)	-	No	No	No
	Vacuum Collection Stations	Collection Station A	828 Main St	Stevensville, 21666	AE	2.4	Yes (CAT 1)	No	Yes
	Vacuum Collection Stations	Collection Station B	746 Thompson Creek Rd	Stevensville, 21666	AE	3.2	Yes (CAT 1)	No	Yes
	Vacuum Collection Stations	Collection Station C	1825 Sherman Dr	Chester, 21619	X (Shaded)	-	Yes (CAT 2)	No	Yes
	Vacuum Collection Stations	Collection Station D	201 Benton Pleasure Rd	Chester, 21619	X (Shaded)	-	Yes (CAT 1)	No	Yes
	Vacuum Collection Stations	Collection Station E	105 Tackle Cir	Chester, 21619	X (Unshaded)	-	Yes (CAT 4)	No	No
	Vacuum Collection Stations	Collection Station F	625 Dominion Rd	Chester, 21619	AE	1.2	Yes (CAT 1)	No	Yes
	Vacuum Collection Stations	Collection Station G	2510 Main St	Chester, 21619	AE	2.9	Yes (CAT 1)	No	Yes
	Vacuum Collection Stations	Collection Station H	3232 Main St	Grasonville, 21638	AE	1.1	Yes (CAT 1)	No	Yes
	Vacuum Collection Stations	Collection Station J	311 Long Point Rd	Grasonville, 21638	AE	0.5	Yes (CAT 1)	No	No
	Vacuum Collection Stations	Parks - Collection Station K	301 Perrys Corner Rd	Grasonville, 21638	AE	0.5	Yes (CAT 1)	No	Yes
	Vacuum Collection Stations	Collection Station L	617 Chester River Beach Rd	Grasonville, 21638	X (Shaded)	-	Yes (CAT 2)	No	Yes
	Vacuum Collection Stations	Collection Station M	600 Grasonville Cemetery Rd	Grasonville, 21638	X (Unshaded)	-	No	No	No
	Vacuum Collection Stations	Collection Station Q	774 Kimberly Way	Stevensville, 21666	AE	3.4	Yes (CAT 1)	No	Yes
	Vacuum Collection Stations	Collection Station R	301 Chenowith Dr	Stevensville, 21666	AE	1.3	Yes (CAT 1)	No	Yes
	Vacuum Collection Stations	Collection Station H	3232 Main St	Grasonville, 21638	AE	0.5	Yes (CAT 1)	No	Yes
	Ground Storage Tanks	Pump Station 1	3232 Main St	Grasonville, 21638	AE	1.8	Yes (CAT 1)	No	Yes
	Ground Storage Tanks	Thompson Creek Water Treatment Plant	610 Marion Quimby Dr	Stevensville, 21666	X (Shaded)	-	Yes (CAT 1)	No	No
	Ground Storage Tanks	Bridge Pointe Water Treatment Plant	9025 Bridgepointe Dr	Chester, 21619	X (Unshaded)	-	No	No	No
	Ground Storage Tanks	Grasonville Water Treatment Plant	5439 Main St	Grasonville, 21638	X (Unshaded)	-	No	No	No
	Ground Storage Tanks	Stevensville Water Treatment Plant	208 Church St	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 3)	No	No
	Ground Storage Tanks	Oyster Cove WTP – 2 tanks	3230 Main St	Grasonville, 21638	AE	0.5	Yes (CAT 1)	No	Yes
	Ground Storage Tanks	PS 1	3232 Main St	Grasonville, 21638	AE	1.8	Yes (CAT 1)	No	Yes
	Pump Stations	Pump Station 1	3232 Main St	Grasonville, 21638	AE	1.8	Yes (CAT 1)	No	Yes
	Pump Stations	Pump Station 2	1825 Sherman Dr	Chester, 21619	X (Shaded)	-	Yes (CAT 1)	No	Yes
	Pump Stations	Pump Station 3	146 Romancoke Rd	Stevensville, 21666	X (Unshaded)	-	No	No	No
	Pump Stations	Parks – Pump Station 4	301 Perrys Corner Rd	Grasonville, 21638	AE	0.8	Yes (CAT 1)	No	Yes
	Pump Stations	Pump Station 5	232 Bateau Dr	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 4)	No	No
	Pump Stations	Pump Station 6	131 Golf Cart Dr	Grasonville, 21638	X (Unshaded)	-	No	No	No
	Pump Stations	Pump Station 7	3 Greenwood Shls	Grasonville, 21638	X (Unshaded)	-	Yes (CAT 3)	No	No
	Pump Stations	Pump Station 8	40 Prospect Bay Dr W	Grasonville, 21638	X (Unshaded)	-	Yes (CAT 2)	No	No
	Pump Stations	Pump Station 9	308 Carriage Heath	Grasonville, 21638	X (Unshaded)	-	Yes (CAT 4)	No	No
	Pump Stations	Pump Station 10	439 Conor Dr	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 3)	No	No

COMMUNITY LIFELINES	FACILITY TYPE	NAME	ADDRESS	CITY & ZIP CODE	FLOOD ZONE	FLOOD DEPTH	HURRICANE STORM SURGE	SLR 2050	SLR 2100
	Pump Stations	Pump Station 11	735 Moorings Cir	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 2)	No	No
	Pump Stations	Pump Station 12	413 Castle Marina Rd	Chester, 21619	X (Unshaded)	-	Yes (CAT 4)	No	No
	Pump Stations	Pump Station 12	610 Warbler Way	Chester, 21619		-	No	No	No
	WTP	Thompson Creek Water Treatment Plant	610 Marion Quimby Dr	Stevensville, 21666	X (Shaded)	-	Yes (CAT 1)	No	No
	WTP	Oyster Cove Water Treatment Plant	3230 Main St	Grasonville, 21638	AE	0.5	Yes (CAT 1)	No	Yes
	WTP	CBBP Water Treatment Plant	232 Bateau Dr	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 4)	No	No
	WTP	Bayside Water Treatment Plant	103 Tackle Cir	Chester, 21619	X (Unshaded)	-	Yes (CAT 4)	No	No
	WTP	Prospect Bay Water Treatment Plant	101 Golf Cart Dr	Grasonville, 21638	X (Unshaded)	-	No	No	No
	WTP	Bridge Pointe Water Treatment Plant	9025 Bridgepointe Dr	Chester, 21619	X (Unshaded)	-	No	No	No
	WTP	Grasonville Water Treatment Plant	5439 Main St	Grasonville, 21638	X (Unshaded)	-	No	No	No
	WTP	Riverside Water Treatment Plant	206 Riverside Dr	Chester, 21619	X (Unshaded)	-	Yes (CAT 3)	No	No
	WTP	Stevensville Water Treatment Plant	208 Church St	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 3)	No	No
	WTP	Queens Landing Water Treatment Plant	131 Queen Landing Dr	Chester, 21619	X (Unshaded)	-	Yes (CAT 4)	No	No
	WTP	Sudlersville Water Treatment Plant	701 Foxxtown Dr	Sudlersville, 21668	X (Unshaded)	-	No	No	No
	WTP	Centreville Water Treatment Plant	333 Commerce St	Centreville, 21617	X (Unshaded)	-	Yes (CAT 3)	No	No
	Water Booster Pump Station	Stevensville Water Treatment Plant	208 Church St	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 3)	No	No
	Water Booster Pump Station	Thompson Creek Rd Booster Pump Station	115 Thompson Creek Rd	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 4)	No	No
	Water Tower	QAC Sanitary CBBP Water Tower	230 Bateau Dr	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 4)	No	No
	Water Tower	Prospect Bay Water Tower	200 Golf Cart Dr	Grasonville, 21638	X (Unshaded)	-	No	No	No
	Water Tower	Matapeake Water Tower	180 Marine Academy Dr	Stevensville, 21666	X (Unshaded)	-	No	No	No
	Water Tower	Queens Landing Water Tower	101 Captains Way	Chester, 21619	X (Unshaded)	-	Yes (CAT 4)	No	No
	Water Tower	Four Seasons Water Tower	1707 Piney Creek Rd	Chester, 21619	X (Unshaded)	-	Yes (CAT 3)	No	No
	Water Tower	Centreville Water Tower #1	111 Powell Street	Centreville, 21617	X (Unshaded)	-	No	No	No
	Water Tower	Centreville Water Tower #2	151 Comet Dr	Centreville, 21617	X (Unshaded)	-	No	No	No
	Water Tower	Centreville Water Tower #3	500 Wexford Dr	Centreville, 21617	X (Unshaded)	-	No	No	No
	Water Tower	Queenstown Water Tower	105 Wall St	Queenstown, 21658	X (Unshaded)	-	No	No	No
	Water Tower	Queenstown Water Tower	441 Outlet Center Dr	Queenstown, 21658	X (Unshaded)	-	No	No	No
	Water Tower	Sudlersville Water Tower	118 South Church St	Sudlersville, 21668	X (Unshaded)	-	No	No	No
	Well House	Prospect Wellhouse #2 / Inactive	35 Greenwood SHLS	Grasonville, 21638	X (Unshaded)	-	Yes (CAT 2)	No	No
	Water Reuse	Centreville Water Reuse Area (Municipal)	751 Hope Rd	Centreville, 21617	X (Unshaded)	-	No	No	No
	WWTP	Queenstown Sewage Treatment Plant	120 Skipjack Cove Ln	Queenstown, 21658	X (Unshaded)	-	Yes (CAT 3)	No	No
	WWTP	KNSG Sewage Treatment Plant	310 Bateau Dr	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 4)	No	No
	WWTP	Centreville Sewage Treatment Plant (Municipal)	116 Johnstown Lane	Centreville, 21617	X (Unshaded)	-	No	No	No
	WWTP	Church Hill Sewage Treatment Plant (Municipal)	325 Water Way Dr	Church Hill, 21623	X (Unshaded)	-	No	No	No
	WWTP	Sudlersville Wastewater Treatment Plant (Municipal)	575 Thunder Rd	Sudlersville, 21668	X (Unshaded)	-	No	No	No
	WWTP	Town of Millington Sewage Treatment Plant (Municipal)	227 Sassafras St	Millington, 21651	X (Unshaded)	-	Yes (CAT 2)	No	No

COMMUNITY LIFELINES	FACILITY TYPE	NAME	ADDRESS	CITY & ZIP CODE	FLOOD ZONE	FLOOD DEPTH	HURRICANE STORM SURGE	SLR 2050	SLR 2100
	Sewage Station	Sewage Station	414 S Church St	Sudlersville, 21668	X (Unshaded)	-	No	No	No
	Sewage Lift Station	Lift Station #8	257 Prospect Bay Dr W	Grasonville, 21638	X (Unshaded)	-	Yes (CAT 1)	No	No
	Sewage Lift Station	Lift Station #3	2 Prospect Bay Dr W	Grasonville, 21638	X (Unshaded)	-	No	No	No
	Sewage Lift Station	Lift Station #5	66 Prospect Bay Dr W	Grasonville, 21638	X (Unshaded)	-	Yes (CAT 4)	No	No
	Sewage Lift Station	Lift Station #7	216 Prospect Bay Dr W	Grasonville, 21638	X (Unshaded)	-	Yes (CAT 3)	No	No
	Sewage Lift Station	Lift Station #1	345 Prospect Bay Dr W	Grasonville, 21638	X (Unshaded)	-	Yes (CAT 4)	No	No
	Sewage Lift Station	Lift Station #6	122 Prospect Bay Dr W	Grasonville, 21638	X (Unshaded)	-	Yes (CAT 4)	No	No
	Sewage Lift Station	Lift Station #9	205 Piney Point LNDG	Grasonville, 21638	X (Unshaded)	-	Yes (CAT 3)	No	No
	Sewage Lift Station	Lift Station	722 Del Rhodes Ave	Queenstown, 21658	X (Unshaded)	-	Yes (CAT 4)	No	No
	Sewage Lift Station	Lift Station	6501 Friel Rd	Queenstown, 21658	X (Unshaded)		No	No	No
	Sewage Lift Station	Centreville Sewage Station	401 Harper Rd	Centreville, 21617	X (Unshaded)		No	No	No
	Sewage Lift Station	Sudlersville Sewage Station	South Church St	Sudlersville, 21668	X (Unshaded)		No	No	No
	Telecom Towers	TC129	100 Communications Dr	Centreville, 21617	X (Unshaded)	-	No	No	No
	Telecom Towers	TC110	6008 Church Hill Road	Church Hill, 21623	X (Unshaded)	-	No	No	No
	Telecom Towers	TC128	Parson Green Farm Ln	Church Hill, 21623	X (Unshaded)	-	No	No	No
	Telecom Towers	TC101	140 Murdoch Florist Lane	Centreville, 21617	X (Unshaded)	-	No	No	No
	Telecom Towers	TC147	3012 Barclay Road	Marydel, 21649	X (Unshaded)	-	No	No	No
	Telecom Towers	TC149	Starr Rd	Queen Anne, 21657	X (Unshaded)	-	No	No	No
	Telecom Towers	TC148	3020 Price Station Road	Centreville, 21617	X (Unshaded)	-	No	No	No
	Telecom Towers	TC150	123 Damsontown Road	Queen Anne, 21657	X (Unshaded)	-	No	No	No
	Telecom Towers	TC139	Sudlersville Rd	Sudlersville, 21668	X (Unshaded)	-	No	No	No
	Telecom Towers	TC115 - Guyed	201 Gardners Purchase Lane	Chester, 21619	AE	1.0	Yes (CAT 1)	No	Yes
	Telecom Towers	TC106 – Guyed	201 Gardners Purchase Lane	Chester, 21619	AE	2.3	Yes (CAT 1)	No	Yes
	Telecom Towers	TC111 – Guyed	961 Bennett Point Road	Queenstown, 21658	X (Unshaded)	-	Yes (CAT 4)	No	No
	Telecom Towers	TC112 – Guyed	610 Burchard Sawmill Road	Chestertown, 21620	X (Unshaded)	-	No	No	No
	Telecom Towers	TC113 – Guyed	115 Peters Corner Road	Millington, 21651	X (Unshaded)	-	No	No	No
	Telecom Towers	TC103 – Guyed	Wyes Mills Rd	Queenstown, 21658	X (Unshaded)	-	No	No	No
	Telecom Towers	TC104 – Guyed	319 Foreman Landing Road	Queenstown, 21658	X (Unshaded)	-	No	No	No
	Telecom Towers	TC114 – Guyed	200 Foreman Landing Road	Queenstown, 21658	X (Unshaded)	-	No	No	No
	Telecom Towers	TC119 – Guyed	760 Granny Branch Road	Church Hill, 21623	X (Unshaded)	-	No	No	No
	Telecom Towers	TC133 – Guyed	513 Hall Rd	Sudlersville, 21668	X (Unshaded)	-	No	No	No
	Telecom Towers	TC117 – Lattice	715 Shine Smith Road	Sudlersville, 21668	X (Unshaded)	-	No	No	No
	Telecom Towers	TC105 – Lattice	201 Gardners Purchase Lane	Chester, 21619	AE	2.0	Yes (CAT 1)	No	Yes
	Telecom Towers	TC108 – Lattice	Business Pkwy	Stevensville, 21666	X (Shaded)	-	Yes (CAT 2)	No	Yes
	Telecom Towers	TC109 – Lattice	1935 4h Park Road	Centreville, 21617	X (Unshaded)	-	No	No	No
	Telecom Towers	TC127 – Lattice	Church Hill Rd	Centreville, 21617	X (Unshaded)	-	No	No	No
	Telecom Towers	TC107 – Lattice	319 Foreman Landing Road	Queenstown, 21658	X (Unshaded)	-	No	No	No
	Telecom Towers	TC118 – Lattice	725 Cedar Ln	Church Hill, 21623	X (Unshaded)	-	No	No	No

COMMUNITY LIFELINES	FACILITY TYPE	NAME	ADDRESS	CITY & ZIP CODE	FLOOD ZONE	FLOOD DEPTH	HURRICANE STORM SURGE	SLR 2050	SLR 2100
	Telecom Towers	TC120 – Lattice	2812 Starr Road	Queen Anne, 21657	X (Unshaded)	-	No	No	No
	Telecom Towers	TC137 – Lattice	Marine Academy Ln	Stevensville, 21666	X (Unshaded)	-	No	No	No
	Telecom Towers	TC138 – Lattice	306 Marine Academy Ln	Stevensville, 21666	X (Unshaded)	-	No	No	No
	Telecom Towers	TC140 – Lattice	209 Grange Hall Road	Queenstown, 21658	X (Unshaded)	-	No	No	No
	Telecom Towers	TC141 – Lattice	Ocean Gateway	Wye Mills, 21679	X (Unshaded)	-	No	No	No
	Telecom Towers	TC145 – Lattice	3001 Starr Road	Queen Anne, 21657	X (Unshaded)	-	No	No	No
	Telecom Towers	TC116 – Lattice	121 Needwood Farm Lane	Centreville, 21617	X (Unshaded)	-	No	No	No
	Telecom Towers	TC152 – Monopole	304 Spring Landing Lane	Millington, 21651	X (Unshaded)	-	No	No	No
	Telecom Towers	TC122 – Monopole	Main Street	Queenstown, 21658	X (Unshaded)	-	No	No	No
	Telecom Towers	TC146 – Monopole	611 Main St	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 4)	No	No
	Telecom Towers	TC153 – Monopole	1537 Peters Corner Road	Sudlersville, 21668	X (Unshaded)	-	No	No	No
	Telecom Towers	TC154 – Monopole	200 Hambleton Creek Lane	Chestertown, 21620	X (Unshaded)	-	No	No	No
	Telecom Towers	TC121 – Monopole	2311 Bloomingdale Road	Centreville, 21617	X (Unshaded)	-	No	No	No
	Telecom Towers	TC155 – Monopole	Pier One Rd	Stevensville, 21666	X (Unshaded)	-	No	No	No
	Telecom Towers		509 Anchor Lane	Chester, 21619	X (Unshaded)	-	Yes (CAT 4)	No	No
	Telecom Towers	TC131 – Water Tower	180 Romancoke Road	Stevensville, 21666	X (Unshaded)	-	No	No	No
	Telecom Towers	TC132 – Water Tower	Piney Neck Rd	Grasonville, 21638	X (Unshaded)	-	No	No	No
	Telecom Towers	TC144 – Water Tower	151 Comet Dr	Centreville, 21617	X (Unshaded)	-	No	No	No
	Telecom Towers	TC142 – Water Tower	7110 Main St	Queenstown, 21658	X (Unshaded)	-	No	No	No
	Telecom Towers	TC143 – Water Tower	Friels Rd	Queenstown, 21658	X (Unshaded)	-	No	No	No
	Telecom Towers	TC123 – Water Tower	Log Canoe Circle	Stevensville, 21666	X (Unshaded)	-	No	No	No
	Airport	Bay Bridge Airport	202 Airport Road	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 4)	No	No
	Airport	Kentmorr Airpark 3W3	114 Kentmorr Rd	Stevensville, 21666	X (Unshaded)	-	Yes (CAT 4)	No	No
	Transit	County Ride	104 Powell Street	Centreville, 21617	X (Unshaded)	-	No	No	No
	Marinas	Centreville Landing and Marina	201 Front St	Centreville, 21617	AE	5.1	Yes (CAT 1)	Yes	Yes
	Marinas	Queenstown Dock	6906 2nd Ave & 1St Ave	Queenstown, 21658	AE	6.0	Yes (CAT 1)	Yes	Yes
	Marinas	Watermans Boat Basin	3000 Wharf Dr	Chester, 21619	AE	6.0	Yes (CAT 1)	Yes	Yes
	Marinas	Dominion Marina	Little Creek Rd	Chester, 21619	VE	2.7	Yes (CAT 1)	Yes	Yes
	Marinas	Centreville Wharf	Watson Rd	Centreville, 21617	AE	4.3	Yes (CAT 1)	Yes	Yes
	Fixed HazMat Storage Sites	AT&T Corp - Mdk140	209 Grange Rd	Queenstown 21658	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Bay Bridge Marina	357 Pier One Road	Stevensville 21666	X (Unshaded)	-	Yes (CAT 3)	No	No
	Fixed HazMat Storage Sites	Sharp Energy - Centerville	225 Tidewater Dr.	Centerville 21617	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Sharp Energy - Kent Island High School	900 Love Point Rd.	Stevensville 21666	X (Unshaded)	-	Yes (CAT 4)	No	No
	Fixed HazMat Storage Sites	Sharp Energy - Queen Anne High School	125 Ruthsburg Road	Centerville 21617	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Sharp Energy - Zodiac of North America	540 Thompson Creek Rd	Stevensville 21666	X (Unshaded)	-	Yes (CAT 3)	No	No
	Fixed HazMat Storage Sites	Sharp Energy - Church Hill Elementary School	631 Main St	Church Hill 21623	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Sharp Energy - Grasonville Elementary School	5435 Main Street	Grasonville 21638	X (Unshaded)	-	No	No	No

COMMUNITY LIFELINES	FACILITY TYPE	NAME	ADDRESS	CITY & ZIP CODE	FLOOD ZONE	FLOOD DEPTH	HURRICANE STORM SURGE	SLR 2050	SLR 2100
	Fixed HazMat Storage Sites	Sharp Energy - Sudlersville Elementary School	300 South Church Street	Sudlersville 21668	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Sharp Energy - Sudlersville Middle School	201 North Church Street	Sudlersville 21668	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Gibsons Grant	233 McGuckin Street	Chester 21619	X (Unshaded)	-	Yes (CAT 4)	No	No
	Fixed HazMat Storage Sites	Ellendale	124 John Patrick Dr	Stevensville 21666	X (Unshaded)	-	Yes (CAT 3)	No	No
	Fixed HazMat Storage Sites	Clariant Corporation - Masterbatches Division	3011 Millington Road	Millington 21651	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Armor Swift Eckrich Plant	1350 Bloomingdale Road	Queenstown 21658	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Queenstown Xtrafuels	4638 Ocean Gateway	Queenstown 21658	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Eastern Pre-Release Unit	700 Flat Iron Square Road	Church Hill 21623	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	DPL - Centreville District Office	Route 213 & 18, 2600 Centreville Road	Centreville 21617	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Centreville Citgo #24407	426 S Commerce St	Centreville 21617	AE	0.1	Yes (CAT 1)	No	Yes
	Fixed HazMat Storage Sites	Growmark Fs, LLC - Sudlersville	155 Dudleys Corner Road	Sudlersville 21668	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Growmark Fs, LLC-Centreville	1002 Hope Road	Centreville 21617	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Growmark Fs, LLC-Sudlersville Energy	805 Shine Smith Road	Sudlersville 21668	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Harbor Sales	1000 Harbor Court	Sudlersville 21668	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Harrells, Inc.	224-A Log Canoe Circle	Stevensville 21666	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	PRS	107 Log Canoe Circle	Stevensville 21666	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Centreville	111 Safety Drive	Centreville 21617	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Stevensville Shop	334 State St	Stevensville 21666	X (Unshaded)	-	Yes (CAT 4)	No	No
	Fixed HazMat Storage Sites	DNR - Matapeake	306 Marine Academy Drive	Stevensville 21666	AE	2.0	Yes (CAT 3)	No	No
	Fixed HazMat Storage Sites	Mid-Atlantic Cooperative Solutions, Inc. Dba Aero Energy - Wye Mills	350 Grange Hall Road	Centreville 21617	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Nutrien Ag Solutions 755	1003 Hope Road	Centreville 21617	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Piney Narrows Yacht Haven	500 Piney Narrows Road	Chester 21619	AE	0.5	Yes (CAT 1)	No	Yes
	Fixed HazMat Storage Sites	Perdue Agribusiness - Roberts Grain Elevator	133 Brierleys Mill Road	Church Hill 21623	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Piney Narrows Yacht Haven Condo Association	500 Piney Narrows Rd	Chester 21619	AE	0.5	Yes (CAT 1)	No	Yes
	Fixed HazMat Storage Sites	PMD-Centreville	2543 Centreville Road	Centreville 21617	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Sudlersville Warehouse	324 Hackett Corner Rd	Sudlersville 21688	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Bluegrass Solar	176 Bowers Road	Chestertown 21620	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Queen Anne Marina, LLC	412 Congressional Drive	Stevensville 21666	X (Unshaded)	-	Yes (CAT 2)	No	Yes
	Fixed HazMat Storage Sites	Bayside Water Treatment Plant	103 Tackle Circle	Chester 21619	X (Unshaded)	-	Yes (CAT 4)	No	No
	Fixed HazMat Storage Sites	Kent Island Village Water Treatment Plant	1839 Anchorage Drive	Chester 21619	X (Unshaded)	-	Yes (CAT 4)	No	No
	Fixed HazMat Storage Sites	Oyster Cove Water Treatment Plant	3232 Main Street	Grasonville 21638	AE	0.5	Yes (CAT 1)	No	Yes
	Fixed HazMat Storage Sites	Grasonville Water Treatment Plant	5439 Main Street	Grasonville 21638	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Kent Narrows/Stevensville/ Grasonville Wastewater Treatment Plant	310 Bateau Drive / P.O. Box 10	Stevensville 21666	X (Shaded)	-	Yes (CAT 2)	No	No
	Fixed HazMat Storage Sites	Stevensville Water Treatment Plant	208 Church Street	Stevensville 21666	X (Unshaded)	-	Yes (CAT 3)	No	No
	Fixed HazMat Storage Sites	Bridge Point Water Treatment Plant	9025 Bridgepoint Drive	Chester 21619	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Queens Landing Water Treatment Plant	131 Queens Landing Drive	Chester 21619	X (Unshaded)	-	Yes (CAT 4)	No	No

COMMUNITY LIFELINES	FACILITY TYPE	NAME	ADDRESS	CITY & ZIP CODE	FLOOD ZONE	FLOOD DEPTH	HURRICANE STORM SURGE	SLR 2050	SLR 2100
	Fixed HazMat Storage Sites	Riverside Water Treatment Plant	206 Riverside Drive	Chester 21619	X (Unshaded)	-	Yes (CAT 3)	No	No
	Fixed HazMat Storage Sites	Prospect Bay Wellhouse #2	Prospect Bay Drive West	Grasonville 21658	X (Unshaded)	-	Yes (CAT 3)	No	No
	Fixed HazMat Storage Sites	Prospect Bay Wellhouse #1	Greenwood Shoals	Grasonville 21638	X (Unshaded)	-	Yes (CAT 3)	No	No
	Fixed HazMat Storage Sites	Chesapeake Bay Business Park Water Treatment Plant	232 Bateau Drive	Stevensville 21666	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Thompson Creek Water Treatment Plant	610 Marion Quimby Drive	Stevensville 21666	X (Shaded)	-	Yes (CAT 1)	No	Yes
	Fixed HazMat Storage Sites	Bay Bridge Airport	202 Airport Road	Stevensville 21666	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Petroleum Equipment - Church Hill Hunt	207 Oakmount Avenue	Church Hill 21623	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Petroleum Equipment - Four Seasons	300 Castle Marina Road	Chester 21619	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	SHM Narrows Point Marina	428 Kent Narrow Way North	Grasonville 21638	AE	0.8	Yes (CAT 1)	No	Yes
	Fixed HazMat Storage Sites	Castle Marina Shell #426	101 Castle Marina Road	Chester 21619	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Thompson Creek Shell #433	401 Thompson Creek Road	Stevensville 21666	X (Unshaded)	-	Yes (CAT 4)	No	No
	Fixed HazMat Storage Sites	Castle Marina	301 Tackle Circle	Chester 21619	AE	5.0	Yes (CAT 1)	Yes	Yes
	Fixed HazMat Storage Sites	Suburban Propane - Centreville	423 Railroad Avenue	Centerville 21617	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Tri-Gas & Oil Co., Inc. (Grasonville)	216 VFW Avenue	Grasonville 21638	X (Shaded)	-	Yes (CAT 2)	No	Yes
	Fixed HazMat Storage Sites	Tri-Gas & Oil Co., Inc. (Queen Anne Grain)	32500 First Street	Queen Anne 21657	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Tri-Gas & Oil Co., Inc. - (Bostick Farm)	2 Massey Street	Price 21656	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	University Of Maryland, Maryland Fire & Rescue Institute (MFRI) Upper Eastern Shore	601 Safety Drive	Centreville 21617	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Verizon - Centreville Central Office (Md37641)	121 Turpins Lane	Centreville 21617	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Verizon - Stevensville CDO (Md37810)	611 Main Street	Stevensville 21666	X (Unshaded)	-	Yes (CAT 3)	No	No
	Fixed HazMat Storage Sites	Verizon Romancoke Ess (Md37303)	101 Kentmoor Rd	Stevensville 21666	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Verizon Sudlersville CDO (MD37880)	218 N CHURCH STREET	Sudlersville 21668	X (Unshaded)	-	No	No	No
	Fixed HazMat Storage Sites	Verizon Wireless - Island Drive (Id:5000137)	611 Main Street	Stevensville 21666	X (Unshaded)	-	Yes (CAT 3)	No	No
	Fixed HazMat Storage Sites	Wise Oil & Fuel Inc	350 Grange Hall Road	Wye Mills 21679	X (Unshaded)	-	No	No	No

Essential Facilities

A special emphasis was placed on essential facilities by Queen Anne's County. A subset of critical facilities includes essential facilities. Essential facilities are those facilities that provide services to the community and should remain functional after a hazard event. Essential facilities include emergency operations centers (EOC), hospitals, police stations, fire stations and schools. In addition, mitigation projects featuring these facilities are considered specifically within FEMA's benefit-cost analysis tool, while all other facilities are included under a general facility category designated as "other." Mitigation projects featuring essential facilities have a high likelihood of resulting in a positive benefit-cost ration, resulting in grant funding and increased community resilience.

The following table, Essential Facilities Matrix, provides the composite of information obtained from each data collection sheet developed in 2019. This matrix should be viewed in a large format and printed on ledger paper, 11X17.

TABLE B-2: ESSENTIAL FACILITIES MATRIX

COMMUNITY LIFELINE	NAME	ADDRESS	CITY	ZIP CODE	FEMA 100 YR FLOOD-PLAIN	STORM SURGE	SLR	GENERATOR	ADEQUATELY SIZED GENERATOR	EVAC ROUTE	IMPACT RESISTANT GLASS	ANTENNA ON/AT FACILITY	FLAT ROOF	WILDLAND/ URBAN INTERFACE	WATER DEFICIENCY ISSUES	EXTREME HEAT	EXTREME COLD	PREVIOUS DAMAGE
	EOC																	
	Department of Emergency Services	100 Communications Dr	Centreville	21617	No	No	No	Yes	No	Rt 301 N	No	Yes	Yes	Yes	No	No	No	Yes
	QAC DES Support Services Building	211 Safety Dr	Centreville	21617	No	No	No	Yes	Yes	Rt 301 N	No	No	No	Yes	No	No	No	No
	Fire Stations																	
	Kent Island VFC #1	1610 Main St	Chester	21619	No	Yes	No	Yes	Yes	Rt 18	No	No	No	No	No	No	No	No
	Grasonville VFC #2	4128 Main St	Grasonville	21638	No	Yes	No	Yes	Yes	Rt 18	No	Yes	No	Yes	No	No	No	No
	Queenstown VFC #3	7110 Main St	Queenstown	21658	No	No	No	Yes	No	Rt 18	No	No	No	No	No	No	No	No
	Goodwill VFC #4	212 Broadway St	Centreville	21617	No	No	No	Yes	Yes	Rt 213/ Rt 304	No	No	Yes	No	No	No	No	No
	Church Hill VFC #5	316 Main St	Church Hill	21623	No	No	No	Yes	Yes	Rt 19	No	Yes	No	No	No	No	No	No
	Sudlersville VFC #6	203 N Church St	Sudlersville	21668	No	No	No	Yes	Yes	Rt 313	No	No	No	No	No	No	No	No
	Crumpton VFC #7	300 3rd St	Millington	21651	No	Yes	No	Yes	Yes	No	No	No	No	No	No	No	No	Yes
	Queen Anne-Hillsboro VFC #8	13512 First St	Queen Anne	21657	No	No	No	No	N/A	Rt 303	No	Yes	No	No	No	No	No	No
	United Communities VFC #9	9406 Romancoke Rd	Stevensville	21666	No	Yes	No	Yes	Yes	Rt 18	No	Yes	No	No	No	No	No	No
	EMS Stations																	
	EMS Station 100	103 Davidson Rd	Stevensville	21666	No	No	No	Yes	Yes	Rt 8	No	No	No	No	No	No	No	No
	EMS Station 200	101 Medic Drive	Chester	21619	No	Yes	2050	No	N/A	Rt 50	No	No	No	No	No	No	No	Yes
	EMS Station 300	7110 Main St	Queenstown	21658	No	No	No	Yes	No	Rt 18	No	No	No	No	No	No	No	No
	EMS Station 400	302 Safety Dr	Centreville	21617	No	No	No	Yes	Yes	Rt 301 N	No	No	No	No	No	No	No	No
	EMS Station 500	316 Main St	Church Hill	21623	No	No	No	Yes	Yes	Rt 19	No	Yes	No	No	No	No	No	No
	EMS Station 600	203 N Church St	Sudlersville	21668	No	No	No	Yes	Yes	Rt 313	No	No	No	No	No	No	No	No
	Grasonville Vol Ambulance Dept. #20	4132 Main St	Grasonville	21638	No	Yes	No	No	N/A	Rt 18	No	No	No	Yes	No	No	No	No
	Police Stations																	
	QAC Sheriff's Office HQ	505 Railroad Ave	Centreville	21617	No	No	No	Yes	Yes	Rt 304	No	No	No	Yes	No	No	No	No
	Sheriff's Office – N (Sudlersville) Substation	200 S Church St	Sudlersville	21668	No	No	No	-	-	No	-	No	No	No	-	-	-	-
	Sheriff's Office – S (Kent Narrows) Substation	425 Piney Narrows Rd	Chester	21619	Yes	Yes	2100	-	-	No	-	No	No	No	-	-	-	-
	Centreville Police Department	420 N Commerce St	Centreville	21617	Yes	Yes	No	Yes	Yes	Rt 213	No	No	Yes	Yes	No	No	No	No
	Maryland State Police - Barracks S	311 Safety Dr	Centreville	21617	No	No	No	Yes	Yes	Rt 301	Yes	Yes	Yes	No	No	No	No	No
	Maryland Natural Resources Police	425 Piney Narrows Rd	Chester	21619	Yes	Yes	2100	-	-	No	-	No	No	No	-	-	-	-

COMMUNITY LIFELINE	NAME	ADDRESS	CITY	ZIP CODE	FEMA 100 YR FLOOD-PLAIN	STORM SURGE	SLR	GENERATOR	ADEQUATELY SIZED GENERATOR	EVAC ROUTE	IMPACT RESISTANT GLASS	ANTENNA ON/AT FACILITY	FLAT ROOF	WILDLAND/ URBAN INTERFACE	WATER DEFICIENCY ISSUES	EXTREME HEAT	EXTREME COLD	PREVIOUS DAMAGE
	Hospitals/Medical																	
	QAC Department of Health	206 N Commerce St	Centreville	21617	No	No	No	Yes	No	Rt 213	No	Yes	Yes	No	No	No	No	No
	QAC Department of Health Annex	205 N Liberty St	Centreville	21617	No	No	No	No	N/A	Rt 213	No	No	No	No	No	No	No	No
	Shore Emergency Center Queenstown	115 Shoreway Dr	Queenstown	21658	No	No	No	Yes	Yes	Rt 50	-	No	Yes	No	-	-	-	-
	UM Shore Medical Pavilion	125 Shoreway Dr	Queenstown	21658	No	No	No	Yes	Yes	Rt 50	-	No	No	No	-	-	-	-
	AAMC Kent Island Pavilion	1630 Main St	Chester	21619	No	Yes	No	Yes	Yes	Rt 18	-	No	No	No	-	-	-	-
	Schools																	
	Anchor Points Academy (Public)	202 Chesterfield Ave	Centreville	21617	No	No	No	Yes	Yes	Rt 304	No	No	No	Yes	No	No	-	N/A
	Bayside Elementary School (Public)	301 Church St	Stevensville	21666	No	No	No	Yes	Yes	No	No	No	Yes	Yes	No	No	No	N/A
	Centreville Elementary School (Public)	213 Homewood Ave	Centreville	21617	No	No	No	Yes	Yes	Rt 304	Yes	No	Yes	Yes	No	No	No	N/A
	Centreville Middle School (Public)	231 Ruthsburg Rd	Centreville	21617	No	No	No	Yes	Yes	Rt 304	No	No	Yes	No	No	No	No	N/A
	Church Hill Elementary School (Public)	631 Main St	Church Hill	21623	No	No	No	Yes	Yes	Rt 219	No	No	No	No	No	No	No	N/A
	Grasonville Elementary School (Public)	5435 Main St	Grasonville	21638	No	No	No	Yes	Yes	Rt 18	No	No	No	Yes	No	No	No	N/A
	Kennard Elementary School (Public)	420 Little Kidwell Ave	Centreville	21617	No	No	No	Yes	Yes	No	No	No	Yes	Yes	No	No	No	N/A
	Kent Island Elementary School (Public)	110 Elementary Way	Stevensville	21666	No	Yes	No	Yes	Yes	Rt 18	No	No	Yes	Yes	No	No	No	N/A
	Kent Island High School (Public)	900 Love Point Road	Stevensville	21666	No	Yes	No	Yes	Yes	Rt 18	No	No	Yes	Yes	No	No	No	N/A
	Matapeake Elementary School (Public)	651 Romancoke Rd	Stevensville	21666	No	Yes	No	Yes	Yes	Rt 8	No	No	No	No	No	No	No	N/A
	Matapeake Middle School & Kent Island 9th Grade Annex (Public)	671 Romancoke Rd	Stevensville	21666	No	Yes	No	Yes	Yes	Rt 8	No	No	No	No	No	No	No	N/A
	QAC High School (Public)	125 Ruthsburg Rd	Centreville	21617	No	No	No	No	N/A	Rt 304	No	No	Yes	No	No	No	No	N/A
	Stevensville Middle School (Public)	610 Main St	Stevensville	21666	No	Yes	No	Yes	Yes	Rt 18	No	No	Yes	No	No	No	No	N/A
	Sudlersville Elementary School (Public)	300 S Church St	Sudlersville	21668	No	No	No	No	No	Rt 313	No	No	No	No	No	No	No	N/A
	Sudlersville Middle school (Public)	600 Charles St	Sudlersville	21668	No	No	No	Yes	Yes	Rt 313	No	No	No	No	No	No	No	N/A

COMMUNITY LIFELINE	NAME	ADDRESS	CITY	ZIP CODE	FEMA 100 YR FLOOD -PLAIN	STORM SURGE	SLR	GENERATOR	ADEQUATELY SIZED GENERATOR	EVAC ROUTE	IMPACT RESISTANT GLASS	ANTENNA ON/AT FACILITY	FLAT ROOF	WILDLAND/ URBAN INTERFACE	WATER DEFICIENCY ISSUES	EXTREME HEAT	EXTREME COLD	PREVIOUS DAMAGE
	Wye River Upper School (Private)	316 S Commerce St	Centreville	21617	No	No	No	-	-	Rt 213	-	No	Yes	Yes	-	-	-	-
	Eastern Shore Jr. Academy (Private)	407 Dudley Corners Rd	Sudlersville	21668	No	No	No	-	-	Rt 209	-	No	Yes	Yes	-	-	-	-
Food, Hydration, Shelter	The Gunston School (Private)	911 Gunston Rd	Centreville	21617	No	No	No	-	-	No	-	No	Yes	Yes	-	-	No	-
	Lighthouse Christian Academy (Private)	931 Love Point Rd	Stevensville	21666	No	No	No	-	-	Rt 18	-	No	No	Yes	-	-	Rt 18	-
	Shore Up Head Start (Private)	5441 Main Street	Grasonville	21638	No	No	No	-	-	Rt 18	-	No	Yes	No	-	-	Rt 18	-
	Kiddie Academy of Kent Island (Private)	113 St. Claire Place	Stevensville	21666	No	Yes	No	-	-	Rt 18	-	-	No	No	-	-	Rt 18	-
	Wye Research & Education Center (Public)	124 Wye Narrows Dr	Queenstown	21658	No	No	No	-	-	No	-	No	No	No	-	-	No	-
	Chesapeake College (Public)	1000 College Circle Dr	Queenstown	21658	No	No	No	-	-	Rt 213	-	No	Yes	No	-	-	Rt 213	-

Appendix C
Municipal Participation

This Appendix provides documentation showing each municipality's participation during the plan update process. The following is included:

- Council of Government (COG) Meeting Agenda
- Council of Government (COG) Meeting Minutes
- Municipal Hazard Perspective Forms
- Municipal Meeting Notes

Queen Anne's County Council of Governments
Town of Queenstown
Queenstown Town Hall
7013 Main Street
Queenstown, MD 21658

March 13, 2024

MEETING AGENDA

6:30 p.m.	Light Dinner
7:00-7:05 p.m.	Call to Order Roll Call of Governments Introduction of Attendees, Designate Voting Representative Approval of January 10, 2024 Minutes
7:05-7:20 p.m.	American Red Cross of Delmarva Theresa Young, Executive Director
7:20-7:40 p.m.	Queen Anne's County Hazard Mitigation Scott Haas, Director Lori Morris, Assistant Chief Special Operations
7:40-8:00 p.m.	Adequate Public Facilities Ordinance (APFO) & Regional Hospital Todd Mohn, County Administrator
8:00-8:20 p.m.	Discussion of Current Topics of Interest
8:20-8:30 p.m.	Old Business
8:30-8:40 p.m.	New Business
8:40-8:50 p.m.	Press and Public comments
8:50-9:00 p.m.	Discussion of Next Meeting Date and Location
9:00 p.m.	Adjourn

Queen Anne's County Council of Governments
Town of Queenstown
Queenstown Town Hall
7013 Main Street
Queenstown, MD 21658

March 13, 2024

MINUTES

Commissioner Rhodes called the meeting to order at 7:04 p.m., March 13, 2024.

Those present were:

Charlie Rhodes	Virginia Albers	Scott Haas
Amy Moore	Theresa Young	Jack Wilson
Aaron Horney	Geoff Searle	Todd Mohn
Robin McKinney	Lori Morris	

Dinner was provided by the Town of Queenstown.

Commissioner Rhodes conducted roll call of the town voting members. The following were present:

Millington –
Sudlersville –
Templeville –
Barclay – Robin McKinney
Church Hill – Charlie Rhodes
Queen Anne –
Centreville – Jeff Kiel
Queenstown – Amy Moore / Aaron Horney
Queen Anne's County – Jack Wilson / Todd Mohn

On a motion by Council Member Kiel, seconded by Commissioner McKinney, the Council unanimously agreed to accept the minutes of the January 10, 2024 meeting.

AMERICAN RED CROSS OF DELMARVA – THERESA YOUNG, EXECUTIVE DIRECTOR

- Ms. Young stated that Neil Young is the Community Volunteer Leader for the Queen Anne's County area and Geoff Searle is the representative for Easton/Talbot County but is available to help in QAC as well.
- The American Red Cross assists families through feeding and sheltering when disasters happen.
- They aided 40 families in Queen Anne's County the previous year by providing 57 services to these families.
- They also provide hands only CPR and can come out to communities to teach.
- The phone number to call is 1-800-REDCROSS.
- Chief Haas stated that any of the towns can contact QAC Dispatch and they can contact the Red Cross on their behalf.
- Ms. Young stated that house fires also do not need to be a total loss for the Red Cross to help. If it is a kitchen fire, they can help with food; if someone lost their glasses, they could help with a replacement.

- To contact Theresa Young directly, call 302-943-4150 as she is the Executive Director as well as the Elected Official Liaison.

QUEEN ANNE'S COUNTY HAZARD MITIGATION – SCOTT HAAS, DIRECTOR; LORI MORRIS, ASSISTANT CHIEF SPECIAL OPERATIONS

- Chief Haas stated that every five (5) years they are required to update the Hazard Mitigation Plan (HMP) and received a grant to hire a contractor to aide them again this year.
- Assistant Chief Morris stated that the HMP sets up programs/projects over the next five (5) years and if they are not included in the Plan, they are not eligible for grants. It is also a federal requirement to have an HMP.

TODD MOHN, QUEEN ANNE'S COUNTY ADMINISTRATOR

TAX SET OFF

- Mr. Mohn distributed the tax rates for the FY2025 tax differential. He stated a hearing is scheduled for April 9th with the County Commissioners, which is required by law to hold.

REGIONAL HOSPITAL

- Mr. Mohn reported that a new regional hospital will be constructed in Easton by the airport. This will be a $500 million project with 145 beds. The QAC Commissioners authorized at $5 million contribution which came from monies received through Developers Rights & Responsibility Agreements (DRRA).
- The regional hospital is projected to be open by 2028 and the target date to begin construction is January 2025.

ADEQUATE PUBLIC FACILITIES ORDINANCE (APFO)

- Mr. Mohn stated QAC has an APFO which does not cover municipalities. If any towns are interested in implementing their own, they can follow the County's or write their own individual ordinance. The APFO covers water, sewer, parks, and streets.

REGIONAL DETENTION CENTER

- The Board of Public Works transferred the Eastern Pre-Release facility in Church Hill to the County. It is intended to break ground in 2026.

DISCUSSION OF CURRENT TOPICS OF INTEREST:

Millington: No report

Sudlersville: No report

Templeville: No report

Barclay:

- The sewer project is 79% complete.
- There is a public meeting scheduled for May 15th to discuss the public sewer project.

Church Hill:

- The builder for Church Hill Hunt has sold 17 homes/lots in the past 2 weeks.
- The Town has been working with the subdivision regarding the responsibility for the stormwater pond. There is no HOA and the Town met with residents who will be taxed to pay for the maintenance of the stormwater pond.

- The original intent for ARPA funds was to pay for an engineer to design a new wastewater treatment plant. MDE came back and stated Church Hill does not qualify for money and no need to upgrade the plant at this time. The remaining ARPA funds will be used to make upgrades to the current plant.
- Received a call to place a cannabis factory in Church Hill. There was discussion regarding House Bill 805 and House Bill 537. Church Hill is looking at adopting the County's ordinance related to cannabis.

Queen Anne: No report

Centreville:
- Begin budget work sessions the following evening (March 14th)
- Carter Farm has reintroduced their project for review.
- Bob Karen, owner of Providence Farm at Centreville (formerly Pete Scheaffer) property submitted a request to annex the property adjacent to the County's property where the YMCA, Vincit Building, and Board of Education are currently located.
- GTI is working on a filtration system to mitigate the odor during harvesting times.
- Working on purchasing the property located across from Citgo owned by MDOT with the help of QAC for Program Open Space funds.

Queenstown:
- Selected an engineer for the lead service line inventory.
- Wheatlands is underway and are still working on a DRRA.
- Applied for money to complete I&I work – hoping that ARPA will cover.
- Comcast has come through to run wires and Talkie is coming in as well.

QUEEN ANNE'S COUNTY
- Continue to work on the landfill issue and working with Caroline County, who has until 2030, and QAC is scheduled for 2031.
- QAC is submitting supplemental funding to Congressman Harris's office to help with funding the rehabilitation of the Whitsitt Center to turn into a youth crisis center and to all the youth to be treated.
- They broke ground on the new Board of Education building.
- Working on the FY2025 budget.
- SDAT sent out assessments with incorrect information in the amount of about $250 million. This was a spreadsheet error at the Department of Budget & Management.
- Jack Wilson is soon to be President of the Maryland Association of Counties (MACO).

OLD BUSINESS
- None reported

NEW BUSINESS
- Commissioner Wilson stated that the County is adopting an accessory dwelling unit (ADU) ordinance, and the towns could adopt it as well.
- Commissioner Rhodes reported that elections will be held at the May meeting.

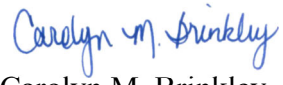
PRESS AND PUBLIC COMMENTS
- None.

DISCUSSION OF NEXT MEETING DATE AND LOCATION:

The next Council of Governments meeting is scheduled for May 8, 2024 at 6:30 p.m. and will be hosted by the Town of Centreville.

On a motion by Ms. Moore, seconded Council Member Kiel, the Council unanimously agreed to adjourn the March 13, 2024 meeting. The motion passed unanimously, and the meeting adjourned at 9:00 p.m.

Respectfully submitted,



Carolyn M. Brinkley
Secretary

MUNICIPAL HAZARD PERSPECTIVE UPDATE

Name: Carolyn Brinkley

Municipality: Town of Centreville

Email: cbrinkley@townofcentreville.org

Phone Number: 410-758-1180 ext. 14

Evaluation of Identified Hazards and Risk

Natural hazards identified in the previous 2019 Plan are provided in the table below. Please provide your local perspective on hazards and their frequency of occurrence, particularly during this past planning cycle (5 years). For each hazard, please state how the frequency of occurrence, magnitude of impact, and/or geographic extent has changed in your community: (I) Increase, (D) Decrease, or (NC) No Change.

In addition, please provide an explanation for any hazards marked (I) Increase or (D) Decrease in the "Additional Comments" column.

Natural Hazards	Municipal Perspective (I) Increase, (D) Decrease, or (NC) No Change	Additional Comments (Explanation for marked I or D)
Flooding: Riverine/Urban/Coastal	NC	
Hurricane and Coastal Erosion	I	Based on imagery of properties located along Watson Road.
Sea Level Change **(Added in 2019)**	Increase	Flooding high tides occur more often at the Wharf area.
Drought & Extreme Heat		
Severe Winter Weather	NC	
Temperature Extremes		
Wildfire		
Thunderstorm and Lightning	NC	
High Wind **(Added 2019)**		
Earthquake		
Tornado		
Dam Failure	Decrease	Removal of Centreville dam at Gravel Run in 2014.

Other Comments

MUNICIPAL HAZARD PERSPECTIVE UPDATE

Name: Nancy Lindyberg

Municipality: Town of Church Hill

Email: townofchurchhill@breezeline.net

Phone Number: 410 758-3740

Evaluation of Identified Hazards and Risk

Natural hazards identified in the previous 2019 Plan are provided in the table below. Please provide your local perspective on hazards and their frequency of occurrence, particularly during this past planning cycle (5 years). For each hazard, please state how the frequency of occurrence, magnitude of impact, and/or geographic extent has changed in your community: (I) Increase, (D) Decrease, or (NC) No Change.

In addition, please provide an explanation for any hazards marked (I) Increase or (D) Decrease in the "Additional Comments" column.

Natural Hazards	Municipal Perspective (I) Increase, (D) Decrease, or (NC) No Change	Additional Comments (Explanation for marked I or D)
Flooding: Riverine/Urban/Coastal	NC	
Hurricane and Coastal Erosion	NC	
Sea Level Change **(Added in 2019)**	NC	
Drought & Extreme Heat	NC	
Severe Winter Weather	NC	
Temperature Extremes	NC	
Wildfire	NC	
Thunderstorm and Lightning	NC	
High Wind **(Added 2019)**	NC	
Earthquake	NC	
Tornado	NC	
Dam Failure	NC	

Other Comments

MUNICIPAL HAZARD PERSPECTIVE UPDATE

Name: Amy Moore

Municipality: Town of Queenstown

Email: amoore@Queenstown-md.com

Phone Number: 410-827-7646

Evaluation of Identified Hazards and Risk

Natural hazards identified in the previous 2019 Plan are provided in the table below. Please provide your local perspective on hazards and their frequency of occurrence, particularly during this past planning cycle (5 years). For each hazard, please state how the frequency of occurrence, magnitude of impact, and/or geographic extent has changed in your community: (I) Increase, (D) Decrease, or (NC) No Change.

In addition, please provide an explanation for any hazards marked (I) Increase or (D) Decrease in the "Additional Comments" column.

Natural Hazards	Municipal Perspective (I) Increase, (D) Decrease, or (NC) No Change	Additional Comments (Explanation for marked I or D)
Flooding: Riverine/Urban/Coastal	I	more flooding in certain areas of town
Hurricane and Coastal Erosion	NC	
Sea Level Change **(Added in 2019)**	NC	
Drought & Extreme Heat	I	warmer temps and no rain
Severe Winter Weather	D	warmer winter temps
Temperature Extremes	NC	
Wildfire	NC	
Thunderstorm and Lightning	I	Due to warmer temps in summer
High Wind **(Added 2019)**	NC	
Earthquake	NC	
Tornado	NC	
Dam Failure	NC	

Other Comments

Barclay Municipal Meeting – September 12, 2024, from 1:30 am - 3:30 pm

Attendees: Virginia Albers (Town Manager), Michele King (SP&D), Debi Hopkins (QAC DES)

Risk Assessment

Natural Hazards	Municipal Perspective (I) Increase, (D) Decrease, or (NC) No Change	Additional Comments (Explanation for marked I or D)
Flooding: Riverine/Urban/Coastal	NC	
Hurricane and Coastal Erosion	NC	
Sea Level Change	NC	
Drought & Extreme Heat	NC	
Severe Winter Weather	NC	Mild Winters
Temperature Extremes	NC	
Wildfire	NC	
Thunderstorm and Lightning	NC	
High Wind	NC	
Earthquake	NC	
Tornado	NC	
Dam Failure	NC	

Changes in Development

Past 5 years

The Town has had a building moratorium in place for the past 5 years. Therefore, no new development has occurred.

Future Development

- Chesapeake Burial Vaults
- 4-acre parcel – possible subdivision for 4 single family housing units
- Renovations to structures will take place once moratorium is removed.

Capabilities – Planning/Regulatory

Tool/Program	Status		
	In Place (Y/N)	Adopted or Updated (Year)	Under Development / Comments
Hazard Mitigation Plan	Y	2019	QAC Multi-Jurisdictional HMP
Emergency Operations Plan	N		
Capital Improvement Plan	Y	Annual	Annual Budget
Continuity of Operations Plan	N		
Floodplain Management Ordinance	Y		
Zoning Regulations	Y	2015	Zoning Ordinance Barclay, Maryland
Subdivision Regulations	Y	2015	
Comprehensive Plan	Y	2018	Barclay Community Plan
Stormwater Management Plan	N		
Natural Resource Protection Plan	N		
Parks and Recreation Plan	N		
Hazardous Waste Assessment	N		
Firewise Community	N		
Storm Ready	N		
Citizen Corps	N		
Building Code	Y	2015	

The **EOP** establishes the management structure, key responsibilities, emergency assignments, and general procedures needed during and after a disaster or emergency.

A **natural resource protection plan** is a detailed plan for managing natural resources in a specific area or project.

Firewise communities are those that have taken appropriate measures to become more resistant to wildfire structural damage.

StormReady is a nationwide program which began in the summer of 2000. It is a voluntary program designed to help counties and communities take a proactive approach to the kinds of severe weather that affect their areas by improving local hazardous weather operations and heightening public awareness.

Citizen Corps Program's mission is to strengthen the collaboration between government and community leaders from all sectors to encourage citizens' preparedness through education, training, and volunteer service to make communities safer, stronger, and better prepared to respond to all hazards and all threats.

Capabilities – Staff and Technical Assistance

Staff or Personnel Resource	Yes	No	Department or Staff Member	Comments
Land Use/Development Planning	Yes	No		Planning Commission
Engineering		No		
Emergency Manager		No		
Floodplain Manager		No		
Staff with experience using Geographic Information Systems software		No		
Grant-writing staff or other fiscal staff	Yes			Brown Associates has been hired to assist with grants.

The Town has one (1) staff member.

Self-Assessment of Capability

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability	✓		
Administrative and Technical Capability		✓	
Fiscal Capability	✓		
Community Political Capability	✓		

Capabilities- NFIP Community Questionnaire

Floodplain Manager?

Participation in NFIP –

TABLE 3-2: QUEEN ANNE'S COUNTY NFIP INSURANCE REPORT

COMMUNITY NAME	NFIP STATUS	SPECIAL FLOOD HAZARD AREA	COASTAL/ TIDAL	COASTAL BARRIER RESOURCE SYSTEM	UPDATED ORDINANCE	FREEBOARD
Town of Barclay	Participating	No	No	No	Yes/NSFHA	0

TABLE 3-3: QUEEN ANNE'S COUNTY NFIP INSURANCE REPORT

COMMUNITY NAME	2019 NUMBER OF POLICIES	2024 NUMBER OF POLICIES	TOTAL PREMIUM/ TOTAL PAID	TOTAL CLAIMS SINCE 1978	TOTAL PAID SINCE 1978
Town of Barclay	0	1	674	0	0

Source: FEMA Policy & Claim Statistics for Flood Insurance, as of June 21, 2024.

2019 Mitigation Actions

Previous Action				Responsible Department
Flooding of Trap Hill Ditch causes septic tank overflows in the Town of Barclay. Work with the Town of Sudlersville to extend sewer service area using the Sudlersville Water Treatment facility. *Please Note: Town of Barclay has imposed a building moratorium within town limits until sewer facility/septic issues are resolved.*				Town of Barclay
✓ **Complete**	**Incomplete**	**Ongoing**	**In-Process**	**Pending**
2024 Status Update: Once the sewer extension project is complete, the issue will be resolved.				

Discussion Question #1

Has the Hazard Mitigation Plan been integrated into the Town's policies or other planning documents in the past 5 years?

No, the hazard mitigation plan has not been incorporated into the other Town policies or planning documents.

Do you plan to integrate the Hazard Mitigation Plan into the Town's Comprehensive Plan?

The hazard mitigation plan was not integrated into the Comprehensive Plan, however, will be incorporated into the next plan update.

Discussion Question #2

How do you plan to maintain the Hazard Mitigation Plan in the next 5 years?

An annual meeting will be held with Town Commissioners to discuss the hazard mitigation plan and town specific mitigation action items.

Discussion Question #3

What are the Town's thoughts on future conditions and how that could impact your jurisdiction.

The Town does not anticipate any future conditions impacts due to the town's flat topography. There are no waterways within town limits.

Discussion Question #4

Are there any structures that you are concerned about being impacted?

The town indicated that there are no structures of concern within town limits. No dilapidated structures are within the town. A church owned by the Town is soon to be sold.

Are there any community activities that could be impacted/affected by hazard events?

There are no community activities within the town and no parks are located in the town. Future community events could be held at the new town hall once it is constructed.

Discussion Question #5

Are there vulnerable populations in your community that you are concerned about?

The Town of Barclay has a larger population of 65 years and older. A majority of the renters in the town are limited English speaking population.

What actions are taken to protect these populations?

The town has an email listing that is used to provide emergency notifications. A new website has been developed for the town and will be utilized as well for providing information. A bulletin board located at the Town Center that is also used to provide information.

The Town of Sudlersville is only 3 miles away, therefore the Town of Barclay relies on them.

Discussion Question #6

Are there any historic/cultural resources you are concerned about being impacted by hazards?

There are no historic or cultural resources the town is concerned about being impacted by hazards. The Town did indicate that Reeb Millwork Corporation is located in the town and employs over 400 citizens. If this structure were impacted, it would be detrimental not only for the employees and their families, but also the economy.

Mitigation Actions

Flood

- Are there any roadways that flood during a heavy rain event?
- Stormwater management issues?
- Flooding from unnamed tributary along Barclay Road (RT 302) or the Barclay Cutoff Road during a heavy rain event?

Temporary flooding occurs at the crossroads in town due to clogged drains.

Thunderstorm (Lightning, Hail & Strong Winds)

- Conduct an assessment of all critical electronic systems within municipal property to identify lightning protection levels and possible mitigation strategies, such as additional electrical surge protectors and lightning rods.
    - Any specific area that is currently a concern?

This mitigation action will be rewritten to specifically identify the new Town Hall.

Tornado / Severe Winter Storm / Tropical Systems (Hurricane, Tropical Storms & Nor'easters)

- Collaboratively identify areas with dangerous trees and conduct outreach with property owners on strategies for removal or trimming.

Only one mobile home is located within town limits. This mobile home is temporary and will be removed once the single-family housing unit is constructed.

Aspen, contracted by Delmarva Power, trims the trees around the power lines running through town.

Extreme Temperatures

- Conduct an education campaign for homeowners and builders on how to protect their pipes, including locating water pipes on the inside of building insulation or keeping them out of attics, crawl spaces, and vulnerable outside walls.

This will be included as a town mitigation action item. The town will utilize the website to conduct the educational campaign.

Tornado / Severe Winter Storm / Tropical Systems (Hurricane, Tropical Storms & Nor'easters) / Earthquake / Thunderstorm (Lightning, Hail & Strong Winds)

- Access the need for back-up generators, which are essential during power outages to maintain critical public functions. These functions include emergency communications, traffic signals, pump and water booster stations.
    - Any specific locations currently in need of a generator?

No town owned structures need a generator. A generator is included in the new Town Hall project.

Wildfire

- Implement hazard fuel reduction and fire prevention measures such as clean-up and debris removal of abandoned buildings, abandoned lands, etc.

This action item will not be included since the Town has a fire ordinance.

Drought / Soil Movement

- Develop a Public Education/Outreach Program to inform the public on water conservation mitigation measures. Conserving groundwater during a drought event and can help mitigate land subsidence.

This will be included as a town mitigation action item. The town will utilize the website to conduct the educational campaign.

All Hazards

- Increase outreach and education for hazard awareness and natural disaster preparedness, especially for low-income, elderly, non-English-speaking, and other vulnerable populations.

This action item will be included in the hazard mitigation plan for the Town of Barclay.

- Integrate the hazard mitigation plan into other plans, ordinances and programs that dictate land use decisions in the community, including Capital Improvement Programs, Master Plans, and Strategic Plans.

This mitigation action will be rewritten to specifically state to integrate the hazard mitigation plan into the Comprehensive Plan update.

- Utilize multiple avenues, including organization website, social media, and public education campaigns to disseminate natural hazard information and methods to prepare for and mitigate those risks.

This action item will be included in the hazard mitigation plan for the Town of Barclay.

Centreville Municipal Meeting – September 24, 2024, from 10:00 am - 12:00 pm

Attendees: Carolyn Brinkley (Town Manager), Michele King (SP&D), Debi Hopkins (QAC DES)

Risk Assessment

Risk Assessment was completed and provided on 7/31/2024.

Changes in Development

Development in the past 5 years:

No development has occurred in the past 5 years.

In the past 2 years, infill development occurred on a 4-lot subdivision located at the end of Glendale & Winsor Streets.

The Town is currently upgrading WWTP. In the past 3 years, no large allocations were allowed due to lack of capacity.

Comprehensive Plan 2040:

- Future Development
    - Centreville presently has no housing units in the development pipeline, which is to say there are no unbuilt housing developments with final plan or plat approval. However, the Providence Farm subdivision continues to build out and has less than 12 lots remaining.

In the past 6 months, the Town has had a moratorium on subdivisions with over 7 EDUs.

Carter Farm Project – Located along Rt. 304

- Carter Farm qualifies as an agrihood since it will occupy nearly 20% of the developable land and in addition to the community's natural setting along the water, the farm will be a significant amenity. Proportionally, based on the number of homesites, the amount of land dedicated to the farm is in line with other Agrihoods.
- 126 residences plus some commercial area
- Environmental Impact - Wildlife habitat will be preserved and expanded through extensive new native plantings. Please note that the Corsica River Conservancy has reviewed our plans in detail and have endorsed the development.
    - Yellow Bank Stream is directly behind the property

The Town Council will no provide large allocations and this project has not received an approved site plan.

Another development project is the Terpin Farm. A site plan has not been developed since developers are waiting on sewer allocations.

Capabilities – Planning/Regulatory

Tool/Program	Status		
	In Place (Y/N)	Adopted or Updated (Year)	Under Development / Comments
Hazard Mitigation Plan	Y	2019	QAC Multi-Jurisdictional HMP
Emergency Operations Plan	N		
Capital Improvement Plan	Y	Annual	Fiscal Year Budgets
Continuity of Operations Plan	N		
Floodplain Management Ordinance	Y	2014	Chapter 66 Floodplain Management
Zoning Regulations	Y	Amended 2022	Chapter 170 Zoning
Subdivision Regulations	Y	2020	Chapter 138 Subdivision Regulations
Comprehensive Plan	Y	2022	Town of Centreville Comprehensive Plan: 2040
Stormwater Management Plan	Y	2013	Chapter 132 Stormwater Management
Natural Resource Protection Plan	Y	1993	Chapter 69 Forest Conservation
Parks and Recreation Plan	Y		Parks Master Plan
Hazardous Waste Assessment	N		
Firewise Community	N		
Storm Ready	N		
Citizen Corps	N		
Building Code	Y	Amended 2024	Chapter 28 Building Construction

The **EOP** establishes the management structure, key responsibilities, emergency assignments, and general procedures needed during and after a disaster or emergency.

A **natural resource protection plan** is a detailed plan for managing natural resources in a specific area or project.

Firewise communities are those that have taken appropriate measures to become more resistant to wildfire structural damage.

StormReady is a nationwide program which began in the summer of 2000. It is a voluntary program designed to help counties and communities take a proactive approach to the kinds of severe weather that affect their areas by improving local hazardous weather operations and heightening public awareness.

Citizen Corps Program's mission is to strengthen the collaboration between government and community leaders from all sectors to encourage citizens' preparedness through education, training, and volunteer service to make communities safer, stronger, and better prepared to respond to all hazards and all threats.

Capabilities – Staff and Technical Assistance

Staff or Personnel Resource	Yes	No	Department or Staff Member	Comments
Land Use/Development Planning	Yes		1	Planner
Engineering		No		Contracted when needed.
Emergency Manager		No		
Floodplain Manager	Yes		1	Town Manager
Staff with experience using Geographic Information Systems software		No		
Grant-writing staff or other fiscal staff	Yes		1	1 Finance staff is a grant writer.

Self-Assessment of Capability

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability			✓
Administrative and Technical Capability			✓
Fiscal Capability		✓	
Community Political Capability			✓

Capabilities- NFIP Community Questionnaire

Floodplain Manager – Town Manager

Participation in NFIP –

TABLE 3-2: QUEEN ANNE'S COUNTY NFIP INSURANCE REPORT

COMMUNITY NAME	NFIP STATUS	SPECIAL FLOOD HAZARD AREA	COASTAL/ TIDAL	COASTAL BARRIER RESOURCE SYSTEM	UPDATED ORDINANCE	FREEBOARD
Town of Centreville	Participating	Yes	Yes	No	Yes/Tidal	2

TABLE 3-3: QUEEN ANNE'S COUNTY NFIP INSURANCE REPORT

COMMUNITY NAME	2019 NUMBER OF POLICIES	2024 NUMBER OF POLICIES	TOTAL PREMIUM/ TOTAL PAID	TOTAL CLAIMS SINCE 1978	TOTAL PAID SINCE 1978
Town of Centreville	24	36	18,437	22	258,850.11

Source: FEMA Policy & Claim Statistics for Flood Insurance, as of June 21, 2024.

TABLE 3-4: MUNICIPAL COMMUNITY ASSISTANCE VISITS OR CONTACTS (CAVS OR CACS)

PARTICIPATING NFIP COMMUNITY NAME	MOST RECENCT CAV OR CAC DATE
Town of Centreville	CAC- 6/10/2019

2019 Mitigation Actions

Previous Action				Responsible Department
Extend MD SHA close system storm drain in Commerce Street to eliminate flooding on private property and roadway.				Town of Centreville
Complete	**Incomplete**	**Ongoing**	✓ **In-Process**	**Pending**
2024 Status Update: The Town is in the process of buying the SHA property on South Commerce Street, which will be converted to program open space. The Town will install a SWM system on property, which will eliminate flooding.				
Coordinate with MD SHA to re-profile both Liberty and Commerce Streets with a reduced crown and uniform cross-slope to permit the recovery of former curb containment heights.				Town of Centreville
✓ **Complete**	**Incomplete**	**Ongoing**	**In-Process**	**Pending**
2024 Status Update: This was completed when Liberty & Commerce Streets were updated, and SHA repaved the area.				
Coordinate with MD DNR and MD SHA to implement water quality best management practice for Commerce Street drainage to reduce the flows leading to Millstream.				Town of Centreville
Complete	**Incomplete**	**Ongoing**	✓ **In-Process**	**Pending**
2024 Status Update: This will be addressed when the Town will install a SWM system on property, which will eliminate flooding.				
Upgrade Wharf Pumping Station-Incomplete mitigation action items from 2012.				Town of Centreville
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
2024 Status Update: This project is incomplete.				

Discussion Question #1

Has the Hazard Mitigation Plan been integrated into the Town's policies or other planning documents in the past 5 years?

No.

Do you plan to integrate the Hazard Mitigation Plan into the Town's Comprehensive Plan?

- Centreville Comprehensive Plan 2040 does not include the QAC Hazard Mitigation Plan
    - Does the Town plan to integrate the HMP in future iterations?

Yes, amendments will be made and will include the HMP.

Discussion Question #2

How do you plan to maintain the Hazard Mitigation Plan in the next 5 years?

The Town will conduct a review with the Council annually. Mitigation actions will be reviewed at this time as well.

Discussion Question #3

What are the Town's thoughts on future conditions and how that could impact your jurisdiction.

Wharf area has daily flooding and impacts operations. The park's shoreline was reinforced with rip rap and plantings. The slips on the County side are still an issue. Phragmites are being removed on a 3-year cycle. Once this is completed and planting will occur.

The SHA bridge at Mill Stream floods during hurricanes. Bridges at both ends were replaced in 2017.

Discussion Question #4

Are there any structures that you are concerned about being impacted?

Grant funding for a generator at the police department was denied since it is located in the special flood hazard area. The Town provided funding for the police department to purchase the generator.

The pump station at the Wharf and 2 additional Town owned pump stations are in need of generators.

Are there any community activities that could be impacted/affected by hazard events?

- Holiday Parade is the first Friday in December.
- Drink Maryland in June.
- Centreville Day in October.

Discussion Question #5

Are there vulnerable populations in your community that you are concerned about?

- Symphony Village is located in Centreville and is an over 55 community.
- Corsica Hill is a full-scale nursing home located in Centreville.
- Crossroads Community works with disabled populations. Majority of this population lives in low-income housing units.
- Centreville does have a Spanish speaking population, which includes business owners.

What actions are taken to protect these populations?

The Town is interested in working with the County to either promote or use their alert notification system. The Town currently conducts an email blast or their website to provide notifications. Citizens can sign up online or at Town Hall. The Centreville Police Department uses Facebook to provide notifications. The police department also uses the County's alert notification system.

Discussion Question #6

Are there any historic/cultural resources you are concerned about being impacted by hazards?

- In 2004, the Centreville Historic District was listed in the Maryland's National Register Properties.
- Captain John H. Ozmon Store – 114 Corsica Street– Centreville Warf - close proximity to Corsica River
    - Has this property experienced flooding? – Not that the Town is aware of. 115 Corsica Street is an AirBnb.
- Keating House – 208 S. Liberty Street
- Female Seminary – 205-207 Commerce Street
- Centreville Armory – S. Commerce Street
- Jackson Collins House – 201 S. Commerce Street
- Concord African American Center
- Court House - This facility is vulnerable to high winds.

Mitigation Actions

Hazard Perspective Questionnaire

- Increased high tide flooding at the Wharf area.
    - Is water overtopping Watson Road during high tides?

A major event would flood the roadway. This road was repaired years ago, and flooding has not occurred to date. The Wharf parking lot flooding frequently.

- Increase coastal erosion on Watson Road.
    - Are there additional areas experiencing an increase in coastal erosion?

Shoreline work was completed to the left of the roadway. On the right of the roadway, phragmites are being removed with planting scheduled. The right side around to Carter Farm is eroding. These parcels are private property and owners need to be educated on erosion and ways to mitigate.

Flood

Comprehensive Plan 2040

During flooding events the most noticeable part of the floodplain is where S. Commerce and S. Liberty Streets join to form the two-way section of MD Route 213.

2019 HMP

The Town identified both the north and south ends of Commerce Street and Liberty Streets as flood prone. Tidal storm surge events flood these areas and require the detouring of vehicles. Sources of flooding include Three Bridges Branch, Gravel Run, and Millstream.

- Have any mitigation measures been taken to reducing flooding in these areas.

This area would flood during a major hurricane event. The purchase of the 40-acre SHA parcel will mitigate flooding at this area.

The center of Town is subject to flooding from virtually every significant rainfall event. According to the Town, this flooding is due to the lack of a closed storm drain system and the loss of curb containment height due to the Maryland State Highway Administration (SHA). SHA has paved over existing gutter pans.

- Has this issue been rectified?

Flooding still occurs due to the curb height is lower.

Flood mitigation projects that the Town of Centreville are currently engaged in include coordination with SHA to alleviate a small but persistent drainage problem at the corner of Liberty Row and Liberty Street.

- Have these projects been completed? If so, when?

Yes, both bridges were replaced, and road paving were completed in June 2020.

QAC HMP – Appendix H Nuisance & Urban Flood Plan

Route 213 North experiences flooding during heavy rain events. The road is bridged over Gravel Run; however, extreme rain events cause the stream to exceed bank full. This site is located in the Gravel Run regulatory 1-percent-annual-chance floodplain; however, flood depths were not available at the bridge.

Route 213 South experiences flooding during heavy rain events. The road is bridged over Mills Stream; however, extreme rain events cause the stream to exceed bank full. This site is located in the Mill Stream regulatory 1-percent-annual-chance floodplain; however, flood depths were not available at the bridge.

- Has these issues been addressed?

Yes, both bridges were replaced, and road paving were completed in June 2020.

Roadway flooding occurs in front of the Board of Education on Chesterfield Ave. This area has increased development over years, which resulted in less area for water to flow. Therefore, drainage systems become overwhelmed during flash flood events, causing roadway flooding.

- Has the drainage issue at this location been resolved?

This is still an issue.

A low area on Route 213 between westbound entrance to Route 301 and Symphony Village (Taylor Mill Rd) floods during heavy rain events. A tributary to Mill Stream Branch transects this section of road.

- Has the low area at this location been elevated?

No.

Flooding occurs at two (2) locations on Route 304, Corsica Neck Road. The first site is at the section of road bridged over Corsica River. This site is located in the Corsica River regulatory 1-percent-annual-chance floodplain; however, flood depths were not available at the bridge.

- Has SHA addressed this issue?

No.

Drought / Soil Movement

Comprehensive Plan 2040

Groundwater, drawn from the Aquia Greensand Formation (aquifer), is the sole source for potable water supplies in Centreville. According to the Queen Anne's County Comprehensive Water and Sewer Plan, this formation is the most important source of groundwater in Queen Anne's County, with several hundred wells, mostly on Kent Island and in the Grasonville and Queenstown areas.

- Develop a Public Education/Outreach Program to inform the public on water conservation mitigation measures. Conserving groundwater during a drought event and can help mitigate land subsidence.

Will be completed through email blast and website.

Thunderstorm (Lightning, Hail & Strong Winds)

- ~~Conduct an assessment of all critical electronic systems within municipal property to identify lightning protection levels and possible mitigation strategies, such as additional electrical surge protectors and lightning rods.~~

Town Hall has surge protectors.

Tornado / Severe Winter Storm / Tropical Systems (Hurricane, Tropical Storms & Nor'easters)

- Collaboratively identify areas with dangerous trees and conduct outreach with property owners on strategies for removal or trimming.
    - Any specific area that is currently a concern?

Delmarva Power conducts tree trimming.

Extreme Temperatures

- Conduct an education campaign for homeowners and builders on how to protect their pipes, including locating water pipes on the inside of building insulation or keeping them out of attics, crawl spaces, and vulnerable outside walls.

Tornado / Severe Winter Storm / Tropical Systems (Hurricane, Tropical Storms & Nor'easters) / Earthquake / Thunderstorm (Lightning, Hail & Strong Winds)

- ~~Assess the need for back-up generators, which are essential during power outages to maintain critical public functions. These functions include emergency communications, traffic signals, pump and water booster stations.~~
    - Any specific locations currently in need of a generator?

Town purchased a generator for the Centreville Police Department. WWTP has a generator.

Wildfire

- ~~Implement hazard fuel reduction and fire prevention measures such as clean-up and debris removal of abandoned buildings, abandoned lands, etc.~~

All Hazards

- Increase outreach and education for hazard awareness and natural disaster preparedness, especially for low-income, elderly, non-English-speaking, and other vulnerable populations.

- Integrate the hazard mitigation plan into other plans, ordinances and programs that dictate land use decisions in the community, including Capital Improvement Programs, Master Plans, and Strategic Plans.

- Utilize multiple avenues, including organization website, social media, and public education campaigns to disseminate natural hazard information and methods to prepare for and mitigate those risks.

Include for the Town in the plan update.

Millington Municipal Meeting – September 19, 2024, from 10:00 am - 12:00 pm

Attendees: Jo Manning (Town Manager), Michele King (SP&D), Debi Hopkins (QAC DES)

Risk Assessment

Natural Hazards	Municipal Perspective (I) Increase, (D) Decrease, or (NC) No Change	Additional Comments (Explanation for marked I or D)
Flooding: Riverine/Urban/Coastal	NC	
Hurricane and Coastal Erosion	Hurricane NC/ Coastal Erosion I	Banks on Upper Chester River were cleared.
Sea Level Change	NC	
Drought & Extreme Heat	NC	
Severe Winter Weather	NC	
Temperature Extremes	NC	
Wildfire	NC	
Thunderstorm and Lightning	NC	
High Wind	NC	
Earthquake	NC	
Tornado	NC	
Dam Failure	NC	USACE is removing the dam.

Changes in Development

Development in the past 5 years:

Not on the Queen Anne's County portion of the Town.

2023 COMPREHENSIVE PLAN:

The "Rural Residential Planning Area" encompasses nine parcels totaling approximately 22 acres located on the Queen Anne's County side of the Chester River. This planning area has minimal infill potential due to many constraining factors, including the Chesapeake Bay Critical Area, floodplain, hydric soils, and sensitive forest habitat. Millington's objectives for the Rural Residential Planning Area are to: • Maintain low-density residential uses. • Improve the appearance of this gateway to the town. • Conserve sensitive environmental features. Development standards for this planning area should emphasize protecting sensitive environmental areas and wildlife habitats of concern to the State. The Town should continue the Resource Conservation Area classification for these properties and not approve Critical Area Growth Allocation in the planning area.

The Town is currently working with 2 developers for a small development on the Queen Anne's County side.

Capabilities – Planning/Regulatory

Tool/Program	Status		
	In Place (Y/N)	Adopted or Updated (Year)	Under Development / Comments
Hazard Mitigation Plan	Y	2019	QAC Multi-Jurisdictional HMP
Emergency Operations Plan	Y	2022	In Cooperation with VFD
Capital Improvement Plan	Y	Annual	Capital Budget
Continuity of Operations Plan	N		
Floodplain Management Ordinance	Y	2024	Chapter 34 Floodplains
Zoning Regulations	Y	2022	Chapter 80 Zoning Ordinance
Subdivision Regulations	Y	2024	Chapter 66 Subdivision of Land
Comprehensive Plan	Y	2023	Town Of Millington 2023 Comprehensive Plan
Stormwater Management Plan	Y	2024	Chapter 60 Stormwater Management
Natural Resource Protection Plan	N		
Parks and Recreation Plan	N		
Hazardous Waste Assessment	N		
Firewise Community	N		
Storm Ready	N		
Citizen Corps	N		
Building Code	Y	2006	Follows QAC Building Code – Updated when County Updates

The **EOP** establishes the management structure, key responsibilities, emergency assignments, and general procedures needed during and after a disaster or emergency.

A **natural resource protection plan** is a detailed plan for managing natural resources in a specific area or project.

Firewise communities are those that have taken appropriate measures to become more resistant to wildfire structural damage.

StormReady is a nationwide program which began in the summer of 2000. It is a voluntary program designed to help counties and communities take a proactive approach to the kinds of severe weather that affect their areas by improving local hazardous weather operations and heightening public awareness.

Citizen Corps Program's mission is to strengthen the collaboration between government and community leaders from all sectors to encourage citizens' preparedness through education, training, and volunteer service to make communities safer, stronger, and better prepared to respond to all hazards and all threats.

Capabilities – Staff and Technical Assistance

Staff or Personnel Resource	Yes	No	Department or Staff Member	Comments
Land Use/Development Planning	Yes			Planning Consultant
Engineering	Yes			Contract with KC Technology
Emergency Manager		No		
Floodplain Manager	Yes			Town Manager
Staff with experience using Geographic Information Systems software		No		
Grant-writing staff or other fiscal staff	Yes			Town Manager

There are only 2 staff members in the Town.

Self-Assessment of Capability

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability		•	
Administrative and Technical Capability			•
Fiscal Capability		•	
Community Political Capability			•

Capabilities- NFIP Community Questionnaire

Floodplain Manager – Town Manager

Participation in NFIP –

TABLE 3-2: QUEEN ANNE'S COUNTY NFIP INSURANCE REPORT

COMMUNITY NAME	NFIP STATUS	SPECIAL FLOOD HAZARD AREA	COASTAL/ TIDAL	COASTAL BARRIER RESOURCE SYSTEM	UPDATED ORDINANCE	FREEBOARD
Town of Millington	Participating	Yes	No	No	Yes/Nontidal	2

TABLE 3-3: QUEEN ANNE'S COUNTY NFIP INSURANCE REPORT

COMMUNITY NAME	2019 NUMBER OF POLICIES	2024 NUMBER OF POLICIES	TOTAL PREMIUM/ TOTAL PAID	TOTAL CLAIMS SINCE 1978	TOTAL PAID SINCE 1978
Town of Millington	0	11	5,632	16	383,455.63

Source: FEMA Policy & Claim Statistics for Flood Insurance, as of June 21, 2024.

TABLE 3-4: MUNICIPAL COMMUNITY ASSISTANCE VISITS OR CONTACTS (CAVS OR CACS)

PARTICIPATING NFIP COMMUNITY NAME	MOST RECENCT CAV OR CAC DATE
Town of Millington	CAC 4/12/2018

2019 Mitigation Actions

Previous Action				Responsible Department
Review and update flood buy-out listing, adding (2) properties in the Millington Area. (Information obtained from the Town of Millington)				Town of Millington
Complete	• **Incomplete**	**Ongoing**	**In-Process**	**Pending**
2024 Status Update: One property on Lime Landing is a severe repetitive loss property is being considered for acquisition. This property has a Millington address, however, is located outside Town limits.				
Relocate or retrofit flood prone Millington Wastewater Treatment Plant. WWTP has been flooded numerous times.				Town of Millington
Complete	**Incomplete**	**Ongoing**	• **In-Process**	**Pending**
2024 Status Update: The Town partnered with Kent County to relocate the WWTP. A parcel has been chosen for relocation and the project is at 75% design phase. The proposed completion date for this project is 2026. The current WWTP will converted into a grinder pump.				

Discussion Question #1

Has the Hazard Mitigation Plan been integrated into the Town's policies or other planning documents in the past 5 years?

No.

Do you plan to integrate the Hazard Mitigation Plan into the Town's Comprehensive Plan?

- 2023 Comprehensive Plan – Includes statement about Kent County HMP.

In addition to floodplain regulations, the Town recently completed (in cooperation with Kent County) a "Hazard Mitigation Plan" that identifies strategies to reduce damage caused by flooding. It covers fuel tank anchoring, the elevation of structures, structural retrofits, prevention methods, and public education. As part of this project, the Town agrees to work with future developers to mitigate flood hazards through planning practices emphasizing economic, social, and environmental sustainability.

- Does the Town plan to integrate the QAC HMP in future iterations?

Yes.

Discussion Question #2

How do you plan to maintain the Hazard Mitigation Plan in the next 5 years?

The Town will conduct an annual review of the plan and mitigation actions identified for the Town. Statuses for these mitigation actions will be determined.

Discussion Question #3

What are the Town's thoughts on future conditions and how that could impact your jurisdiction.

The Crumpton River has not be dredged since the 1970's. Delaware's growth has increased runoff into this river. In addition, runoff has created silt mud and transfers into the river, raising water levels. Future conditions will further acerbate this issue and increase flooding.

Discussion Question #4

Are there any structures that you are concerned about being impacted?

The WTP and Town Hall need a generator.

Are there any community activities that could be impacted/affected by hazard events?

No.

The Town of Millington did purchase the Millington Elementary School and plans to renovate the facility for a business and community center. This facility could serve as a shelter in the future.

Discussion Question #5

Are there vulnerable populations in your community that you are concerned about?

- Large elderly population – widows/widowers
- 52 senior living apartments are being developed in the Town.
- Large Hispanic population – 50% can speak limited English.

- Low-income population – 1/3 use fuel oil or propane for heating and window units for cooling.
    - Cooling during extreme temp events is an issue for these residents.

What actions are taken to protect these populations?

Does the Town have an alert system, or do they use the County's Citizen Alert Notification System? Or a Town Email Blast?

Facebook, Town website, and monthly utility bills are used to provide notifications.

The Town has a contract with Choptank Health to utilize their phone tree system to make calls during hazard events.

Discussion Question #6

Are there any historic/cultural resources you are concerned about being impacted by hazards?

- Asbury Cemetery – has never flooded
- Historic Old Mill on the river – 1800 structure
    - Concerned about flooding due to future conditions

Mitigation Actions

2019 Hazard Mitigation Plan

Area most at-risk to flooding is the southern portion of town along Sassafras Street (Route 313).

- Is this still a high priority location?

Yes, this is still a concern.

Repetitive roadway flooding occurs along Sassafras Street. This flooding results from storm surge events, excessive rain events, tropical storms/hurricanes, or lunar tidal effects.

- Have any mitigation measures been completed to alleviate flooding?

No. Evacuation issues are a concern for the Town and Volunteer Fire Department. There are 4 ways to leave the town; 3 bridges and 1 roadway. The Town could be isolated during an extreme flood event.

The Town of Millington has utilized the FEMA Hazard Mitigation Assistance Grant Programs (HMGP) to acquire at-risk flood properties. Additional structures have been targeted for hazard mitigation projects and include properties south of the Chester River (those properties located in the Queen Anne's County section of the Town of Millington).

- Have any structures been acquired since 2019?
- Are there plans to acquire any structures in the next 5 years?

No.

The Town identified the wastewater treatment plant as flood prone and in need of mitigation.

- Have any mitigation measures been completed to alleviate flooding?

This is no longer an issue with the new WWTP relocation project.

RT 313 (Sassafras Street) - Town of Millington

This site is in the southern portion of the Town of Millington along Sassafras Street. The impacted area begins right before High Bridge Road and along Sassafras Street extending to the County line. Just south of the County line, Chester River intersects with the roadway. This entire area floods due to storm surge (hurricane), extreme rainfall, and lunar tidal effects. This site is located in Chester River regulatory 1-percent-annual-chance floodplain. Utilizing the riverine depth grid, the deepest point on the roadway has a flood depth of 5.8'.

Previously discussed.

Thunderstorm (Lightning, Hail & Strong Winds)

- Lightning
    - Conduct an assessment of all critical electronic systems within municipal property to identify lightning protection levels and possible mitigation strategies, such as additional electrical surge protectors and lightning rods.

There is no protection at the Town Hall.

- Strong Winds
    - ~~Conduct engineering inspections of fire stations to assess each facility's ability to sustain damage from wind events.~~
- Hail
    - Conduct outreach activities to increase public awareness of hail dangers, including mailing safety brochures with monthly water bills.

Outreach could be conducted using the 225 utility bills sent monthly.

Tornado / Severe Winter Storm / Tropical Systems (Hurricane, Tropical Storms & Nor'easters)

- Collaboratively identify areas with dangerous trees and conduct outreach with property owners on strategies for removal or trimming.
    - Any specific area that is currently a concern?

There are very old trees located on private property that are a concern. The Town would like to work with the utility companies to trim the trees. The trees on the church property are a priority.

Severe Winter Storm

- Retrofit public buildings to withstand snow loads and prevent roof collapse.
    - Are there any Town owned structures that have flat roofs?

Town Hall, WTP, WTTP, and school are only town owned structures. No issues.

The Town needs to develop a code for developers who purchase flat roof structures to create a slope on these roofs.

Extreme Temperatures

- Conduct an education campaign for homeowners and builders on how to protect their pipes, including locating water pipes on the inside of building insulation or keeping them out of attics, crawl spaces, and vulnerable outside walls.
    - Is outreach conducted for extreme temp events?

The Town would use Facebook to promote mitigation measures. The Town does provide information on water conservation and looking for leaks on the Town's website.

- ~~Increase tree plantings around buildings to shade parking lots and along public rights-of-ways.~~
    - Do you have any areas in mind?

Currently working with RiverKeepers to plant trees on the Queen Anne's County portion of the Town.

Wildfire

- Implement hazard fuel reduction and fire prevention measures such as clean-up and debris removal of abandoned buildings, abandoned lands, etc.
    - Any areas of concern in the Town?

There is a lot of abandoned land on both sides of Route 313 going into the Town.

- ~~Routinely inspecting the functionality of fire hydrants.~~
    - Who does this and how often?

Fire hydrants are inspected and flushed regularly.

Drought / Soil Movement

- Encourage citizens to take water-saving measures, such as:
    - Installing low-flow water saving showerheads and toilets.
    - Turning water flow off while brushing teeth or during other cleaning activities.
    - Adjusting sprinklers to water the lawn and not the sidewalk or street.
    - Running the dishwasher and washing machine only when they are full.
    - Checking for leaks in plumping or dripping faucets.
    - Installing rain-capturing devices for irrigation.
    - Encouraging the installation of graywater systems in homes to encourage water reuse.
        - How would you do this?

Currently doing with on the Town's website.

- Use permeable driveways and surfaces to reduce runoff and promote groundwater recharge.
    - Any area where this would make sense? Public Property?
    - This could be added as a Green Infrastructure project as well as other plans or grants.

This should be directed toward new development.

All Hazards

- Increase outreach and education for hazard awareness and natural disaster preparedness, especially for low-income, elderly, non-English-speaking, and other vulnerable populations.

- Integrate the hazard mitigation plan into other plans, ordinances and programs that dictate land use decisions in the community, including Capital Improvement Programs, Master Plans, and Strategic Plans.

- Utilize multiple avenues, including organization website, social media, and public education campaigns to disseminate natural hazard information and methods to prepare for and mitigate those risks.

Include in the plan update for the Town.

Queenstown Municipal Meeting – September 24, 2024, from 1:30 pm - 3:30 pm

Attendees: Amy Moore (Town Manager), Michele King (SP&D), Debi Hopkins (QAC DES)

Risk Assessment

Risk Assessment was completed and provided on 7/1/2024

Changes in Development

Development in the past 5 years:

There has not been any development in the past 5 years in Queenstown.

Comprehensive Plan 2040:

- Future Development
    - Dudley North – The Dudley North property in included in Queenstown's Land Use plan as a priority annexation area. Design recommendations for this property are as follows. Figure 8-1 illustrates how the design guidelines can be met.
    - Dudley Home Farm - The Dudley Home Farm is included in the Queenstown's Long Range Growth plan.
    - Dudley South - Dudley South is included in the Queenstown's Long Range Growth plan.
    - Callahan Farm - The Callahan Farm is included in the Queenstown's Long Range Growth plan.

Dudley North, Home Far and South were annexed into the Town, however, have not been development. Two (2) acres were sold to the Volunteer Fire Department for a new station. Plans have been developed for the remaining acreage, just not executed to date.

The Callahan Farm was not annexed and is no longer planned for development.

The Wheatland Farm, along Route 50, was annexed into Town limits and development has begun. Mixed use commercial will be located along the front of the development and 200 single family and townhouses will be constructed in the back of the property.

Capabilities – Planning/Regulatory

Tool/Program	Status		
	In Place (Y/N)	Adopted or Updated (Year)	Under Development / Comments
Hazard Mitigation Plan	Y	2019	QAC Multi-Jurisdictional HMP
Emergency Operations Plan	N		Follows the County
Capital Improvement Plan	Y	Annual	Annual Budget
Continuity of Operations Plan	N		
Floodplain Management Ordinance	Y	2022	Chapter 19 Floodplain – Ordinance 14-04
Zoning Regulations	Y	2022	Queenstown Zoning Ordinance
Subdivision Regulations	Y	2013	Queenstown Subdivision Ordinance
Comprehensive Plan	Y	2019	2017 Comprehensive Plan Queenstown, Maryland – Revised 2019
Stormwater Management Plan	Y	2010	Stormwater Management Chapter Town Code Chapter 25
Natural Resource Protection Plan	Y	2013	Forest Conservation Chapter Town Code Chapter 26
Parks and Recreation Plan	Y	2021	Queenstown Trails Master Plan
Hazardous Waste Assessment	N		
Firewise Community	N		
Storm Ready	N		
Citizen Corps	N		
Building Code	Y	2022	Ordinance No. 22-04 (2021 IRC)

The **EOP** establishes the management structure, key responsibilities, emergency assignments, and general procedures needed during and after a disaster or emergency.

A **natural resource protection plan** is a detailed plan for managing natural resources in a specific area or project.

Firewise communities are those that have taken appropriate measures to become more resistant to wildfire structural damage.

StormReady is a nationwide program which began in the summer of 2000. It is a voluntary program designed to help counties and communities take a proactive approach to the kinds of severe weather that affect their areas by improving local hazardous weather operations and heightening public awareness.

Citizen Corps Program's mission is to strengthen the collaboration between government and community leaders from all sectors to encourage citizens' preparedness through education, training, and volunteer service to make communities safer, stronger, and better prepared to respond to all hazards and all threats.

Capabilities – Staff and Technical Assistance

Staff or Personnel Resource	Yes	No	Department or Staff Member	Comments
Land Use/Development Planning	Yes			Town Planner - Contractor
Engineering	Yes			Contractor
Emergency Manager		No		
Floodplain Manager		No		Town Planner
Staff with experience using Geographic Information Systems software		No		
Grant-writing staff or other fiscal staff			No specific staff for grants	Town Manager

There are only 3 staff in office: 2 Public Works staff and Town Manager.

Self-Assessment of Capability

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability			
Administrative and Technical Capability			
Fiscal Capability			
Community Political Capability			

Capabilities- NFIP Community Questionnaire

Floodplain Manager – No

Participation in NFIP:

TABLE 3-2: QUEEN ANNE'S COUNTY NFIP INSURANCE REPORT

COMMUNITY NAME	NFIP STATUS	SPECIAL FLOOD HAZARD AREA	COASTAL/ TIDAL	COASTAL BARRIER RESOURCE SYSTEM	UPDATED ORDINANCE	FREEBOARD
Town of Queenstown	Participating	Yes	Yes	No	Yes/Full MD Model Ordinance	2

TABLE 3-3: QUEEN ANNE'S COUNTY NFIP INSURANCE REPORT

COMMUNITY NAME	2019 NUMBER OF POLICIES	2024 NUMBER OF POLICIES	TOTAL PREMIUM/ TOTAL PAID	TOTAL CLAIMS SINCE 1978	TOTAL PAID SINCE 1978
Town of Queenstown	19	66	31,174	26	392,555.13

Source: FEMA Policy & Claim Statistics for Flood Insurance, as of June 21, 2024.

TABLE 3-4: MUNICIPAL COMMUNITY ASSISTANCE VISITS OR CONTACTS (CAVS OR CACS)

PARTICIPATING NFIP COMMUNITY NAME	MOST RECENCT CAV OR CAC DATE
Town of Queenstown	CAV 11/12/2020

2019 Mitigation Actions

Previous Action				Responsible Department
Install emergency generator at Town Office, which may be used as a shelter facility.				Town of Queenstown
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
2024 Status Update: This project is incomplete. Carry forward.				
Purchase mobile message sign board for hazard warning and notification.				Town of Queenstown
Complete	✓ **Incomplete**	**Ongoing**	**In-Process**	**Pending**
2024 Status Update: This project is incomplete. Carry forward.				

Discussion Question #1

Has the Hazard Mitigation Plan been integrated into the Town's policies or other planning documents in the past 5 years?

No.

Do you plan to integrate the Hazard Mitigation Plan into the Town's Comprehensive Plan?

- 2017 Comprehensive Plan Queenstown, Maryland – Revised 2019
    - Does the Town plan to integrate the HMP in future iterations?

The Town Manager will consult with the Planning Commission about integrating the hazard mitigation plan into future iterations of planning documents.

Discussion Question #2

How do you plan to maintain the Hazard Mitigation Plan in the next 5 years?

The Town will review the hazard mitigation plan annually with Town Council and determine status of the Town's mitigation actions.

Discussion Question #3

What are the Town's thoughts on future conditions and how that could impact your jurisdiction.

Nuisance Flood Plan-The areas impacted by nuisance flooding will increase gradually in the coming years as changing climate elevates water levels and drives precipitation patterns to new extremes. This shift, however, is likely to accelerate gradually over time. New areas may become impacted, leading to an increased risk.

Future conditions will cause additional issues for the Town, which is already limited with only 2 public works staff. Future conditions will increase high tides which causes an increase overall flooding and roadway flooding. MD Route 18 between Melvin and Thompson Avenues currently floods.

Discussion Question #4

Are there any structures that you are concerned about being impacted?

- Comp Plan – Dudley North Design shows the relocation of the fire station. Will the fire stations be constructed to include a generator and wind resistant glass doors?

The WWTP has a generator and is tested weekly. There has not been an issue at the WWTP, however future conditions are a concern for the facility.

The Town property is out of the flood areas and does have flood insurance policy.

The Town does own and operate pump stations, which do not have generators.

Are there any community activities that could be impacted/affected by hazard events?

- Queenstown VFD Annual Fair – September
- Annual Queenstown Community Yard Sale – September
- Halloween & Easter Activities at the park
- Annual Christmas Tree lighting in December

- Yearly concerts at the park during the summer

Discussion Question #5

Are there vulnerable populations in your community that you are concerned about?

There are only a few households with non-English speaking families within the Town. The Town does have a 65 years and older population. However, the majority of the Town's population is younger people.

What actions are taken to protect these populations?

Does the Town have an alert system, or do they use the County's Citizen Alert Notification System? Or the Town's Email Blast?

Queenstown Newsletters - The Town recently launched a new automated email/phone notification system for important update alerts. This will be the primary method the Town uses to notify residents of water/sewer repairs, outages, road closures or other important updates. Please contact the Town Office to provide current email/phone contact information to ensure you receive these notifications. Notifications are also posted on our website at www.queenstown-md.com.

The newsletters are sent out with the sewer bills. Notifications are also posted on the Town's Facebook page.

Discussion Question #6

Are there any historic/cultural resources you are concerned about being impacted by hazards?

- Bowlingly (Bollingly), Neale's Residence, Ferry House - 111 Bowlingly Circle
- Queenstown Courthouse - Main Street (MD 18) & Del Rhodes Avenue
- My Lord's Gift - Links Lane
- Waterman Property - Kirkely Road
- St. Peter's Roman Catholic Church - Ocean Gateway (US 50)
- St. Luke's Episcopal Church - Main Street (MD 18) & Dudley Road
- Nationwide Insurance Agency - Main Street (MD 18)
- Canterbury House (Probable site of Queenstown Jail) 6923 Main Street (MD 18)
- Sherwood House (Caroline T. Wilson House) 7120 Main Street (MD 18)
- Burnt Tavern (Chester House Hotel, Gabler House) 7200 Main Street (MD 18)
- Stone Granary 7133 First Avenue
- Robert Price, III Residence 200 Del Rhodes Avenue
- Crescent House 7009 Main Street
- Denny-Bishop-Hane House 6915 Main Street

The Town's main historic structure concern is the Colonial Courthouse, which is town owned.

Mitigation Actions

Hazard Perspective Questionnaire

- Increased flooding in certain areas of Town.
    - Where are these areas?

- Are mitigation measures being considered to reduce flooding in this area?

Flood

Nuisance Flood Plan

In the Town of Queenstown, nuisance flooding occurs at **MD Rt. 18 (Main St.), between Melvin Ave. and Thompson, and including entrance to Skipjack Cove Lane**. Typically, flooding in these areas can last for hours and sometimes require the closure of the road. What these areas all have in common is a direct connection to Queenstown Creek with very little topographic relief. Tidal fluctuations and the resulting tailwater conditions have a direct impact on the storm drain capacity throughout the entire area of interest. Furthermore, some high tide events can cause flooding in some areas, even without any associated rainfall. Nuisance flooding is also experienced as debris washes into ditches and causes them to overflow. Culverts in low-lying areas may have difficulty conveying water adequately, causing ponding on low-lying roadways. All of the aforementioned areas are significantly developed, where most of the development occurred prior to any floodplain regulations.

QAC HMP – Appendix H Nuisance & Urban Flood Plan

RT 18 (Main Street) between Melvin Avenue and Thompson Avenue - Queenstown

Main Street between Melvin and Thompson Avenues, including Skipjack Cove Lane experiences flooding during higher than normal tides. Flooding is due to the Little Queenstown Creek. This site is located in Little Queenstown Creek regulatory 1-percent-annual-chance floodplain. Utilizing the coastal depth grid, the deepest point on the roadway has a flood depth of 2.6'.

Del Rhodes Avenue - Queenstown

Del Rhodes Road crosses Wye River, which causing roadway flooding during heavy rain events and tidal surge. This site is near the Queenstown Boundary in the vicinity of the sewer lift station. This area is located in the Broad Creek regulatory 1-percent-annual-chance floodplain. Utilizing the coastal depth grid, the deepest point on the roadway has a flood depth of 3.3'.

The sewer lift station is town owned and would be affected.

Thunderstorm (Lightning, Hail & Strong Winds)

- Lightning
  - Conduct an assessment of all critical electronic systems within municipal property to identify lightning protection levels and possible mitigation strategies, such as additional electrical surge protectors and lightning rods.

The Town Hall does have surge protectors, but the Town would consider a lightning rod.

- ~~Strong Winds~~
  - ~~Conduct engineering inspections of fire stations to assess each facility's ability to sustain damage from wind events.~~

- Hail
    - Conduct outreach activities to increase public awareness of hail dangers, including mailing safety brochures with monthly water bills.
        - This could include other hazards.
        - Is any of this emailed?

The Town would complete the action by including this information into the newsletter or as an insert in the sewer bill.

Tornado / Severe Winter Storm / Tropical Systems (Hurricane, Tropical Storms & Nor'easters)

- Collaboratively identify areas with dangerous trees and conduct outreach with property owners on strategies for removal or trimming.
    - Any specific area that is currently a concern?

Delmarva Power trims the trees along the power lines.

Severe Winter Storm

- ~~Retrofit public buildings to withstand snow loads and prevent roof collapse.~~
    - Are there any Town owned structures that have flat roofs?

No.

Extreme Temperatures

- Conduct an education campaign for homeowners and builders on how to protect their pipes, including locating water pipes on the inside of building insulation or keeping them out of attics, crawl spaces, and vulnerable outside walls.
    - Is outreach conducted for extreme temp events?

Outreach is not currently being conducted for extreme temp events but could be included in the newsletter. Delmarva Power does send out notices.

- ~~Increase tree plantings around buildings to shade parking lots and along public rights-of-ways.~~
    - Do you have any areas in mind?

No.

Wildfire

- ~~Implement hazard fuel reduction and fire prevention measures such as clean-up and debris removal of abandoned buildings, abandoned lands, etc.~~
    - Any areas of concern in the Town?

Residents notify the Town of fallen trees within the wooded lot located along Route 301 on Acre Road.

- ~~Routinely inspecting the functionality of fire hydrants.~~
    - Who does this and how often?

Fire hydrants are flushed twice a year.

Drought / Soil Movement

- Conserving groundwater during a drought event and can help mitigate land subsidence.
    - Encourage citizens to take water-saving measures, such as:
    - Installing low-flow water saving showerheads and toilets.
    - Turning water flow off while brushing teeth or during other cleaning activities.
    - Adjusting sprinklers to water the lawn and not the sidewalk or street.
    - Running the dishwasher and washing machine only when they are full.
    - Checking for leaks in plumping or dripping faucets.
    - Installing rain-capturing devices for irrigation.
    - Encouraging the installation of graywater systems in homes to encourage water reuse.
        - How would you do this?

The Town has sent information in the past due to high water bills. Information could be provided again within the newsletter.

- Use permeable driveways and surfaces to reduce runoff and promote groundwater recharge.
    - Any area where this would make sense? Public Property? No.
    - This could be added as a Green Infrastructure project as well as other plans or grants.

During plan review process, permeable driveways and surfaces are suggested/encouraged.

All Hazards

- Increase outreach and education for hazard awareness and natural disaster preparedness, especially for low-income, elderly, non-English-speaking, and other vulnerable populations.
- Integrate the hazard mitigation plan into other plans, ordinances and programs that dictate land use decisions in the community, including Capital Improvement Programs, Master Plans, and Strategic Plans.
- Utilize multiple avenues, including organization website, social media, and public education campaigns to disseminate natural hazard information and methods to prepare for and mitigate those risks.

The Town would like to have these included in the plan update.

Sudlersville Municipal Meeting – September 12, 2024, from 10:00 am - 12:00 pm

Attendees: Paige Crew (Town Clerk), Michele King (SP&D), Debi Hopkins (QAC DES), Lori Morris (QAC DES)

Risk Assessment

Natural Hazards	Municipal Perspective (I) Increase, (D) Decrease, or (NC) No Change	Additional Comments (Explanation for marked I or D)
Flooding: Riverine/Urban/Coastal	NC	1 heavy rain event lasted 3 days and caused some flooding but impacts occurred.
Hurricane and Coastal Erosion	NC	
Sea Level Change	NC	
Drought & Extreme Heat	NC	
Severe Winter Weather	NC	
Temperature Extremes	NC	
Wildfire	NC	
Thunderstorm and Lightning	NC	
High Wind	NC	
Earthquake	NC	
Tornado	NC	
Dam Failure	NC	

Changes in Development

Past 5 Years:

There has been no development in the past 5 years.

Future Development:

Subdivision – Development occurring behind the new middle school – Charles Street.

Senior Center being constructed along Church Street and Elevator Road. This structure is outside Town limits.

Capabilities – Planning/Regulatory

Tool/Program	Status		
	In Place (Y/N)	Adopted or Updated (Year)	Under Development / Comments
Hazard Mitigation Plan	Y	2019	QAC Mult-Jurisdictional HMP
Emergency Operations Plan	N		
Capital Improvement Plan	Y	Annual	Yearly Budget
Continuity of Operations Plan	N		
Floodplain Management Ordinance	N		No SFHA with Town Limits
Zoning Regulations	Y	2016	2016 Sudlersville Zoning Ordinance
Subdivision Regulations	Y	2005	Town of Sudlersville Subdivision Regulations
Comprehensive Plan	Y	2014	2014 Sudlersville Comprehensive Plan
Stormwater Management Plan	Y	2016	Adopted by: Ordinance 005, 7/23/1984 Amended on: 1/6/2016, Ordinance 2015-04
Natural Resource Protection Plan	N		
Parks and Recreation Plan	N		
Hazardous Waste Assessment	N		
Firewise Community	N		
Storm Ready	N		
Citizen Corps	N		
Building Code	Y	2015	Building Construction and Building Code Adopted by: Ordinance 2002-03: 7/2/2002 Amended on: 12/5/2012, Ordinance 2012-03 Amended on: 10/7/2015, Ordinance 2015-03

The **EOP** establishes the management structure, key responsibilities, emergency assignments, and general procedures needed during and after a disaster or emergency.

A **natural resource protection plan** is a detailed plan for managing natural resources in a specific area or project.

Firewise communities are those that have taken appropriate measures to become more resistant to wildfire structural damage.

StormReady is a nationwide program which began in the summer of 2000. It is a voluntary program designed to help counties and communities take a proactive approach to the kinds of severe weather that affect their areas by improving local hazardous weather operations and heightening public awareness.

Citizen Corps Program's mission is to strengthen the collaboration between government and community leaders from all sectors to encourage citizens' preparedness through education, training, and volunteer service to make communities safer, stronger, and better prepared to respond to all hazards and all threats.

Capabilities – Staff and Technical Assistance

Staff or Personnel Resource	Yes	No	Department or Staff Member	Comments
Land Use/Development Planning		No		
Engineering	Yes		1	Hired 3rd Party Engineer to assist with subdivision
Emergency Manager		No		
Floodplain Manager		No		
Staff with experience using Geographic Information Systems software		No		
Grant-writing staff or other fiscal staff		No		

The Town has a staff of one (1) person who has only been in the position for less than 1 year.

Self-Assessment of Capability

Area	Degree of Capability		
	Limited	Moderate	High
Planning and Regulatory Capability		✓	
Administrative and Technical Capability		✓	
Fiscal Capability		✓	
Community Political Capability		✓	

Capabilities- NFIP Community Questionnaire

Participation in NFIP –

TABLE 3-2: QUEEN ANNE'S COUNTY NFIP INSURANCE REPORT

COMMUNITY NAME	NFIP STATUS	SPECIAL FLOOD HAZARD AREA	COASTAL/ TIDAL	COASTAL BARRIER RESOURCE SYSTEM	UPDATED ORDINANCE	FREEBOARD
Town of Sudlersville	Not Participating	No	No	No	No	0

TABLE 3-3: QUEEN ANNE'S COUNTY NFIP INSURANCE REPORT

COMMUNITY NAME	2019 NUMBER OF POLICIES	2024 NUMBER OF POLICIES	TOTAL PREMIUM/ TOTAL PAID	TOTAL CLAIMS SINCE 1978	TOTAL PAID SINCE 1978
Town of Sudlersville	0	1	660	0	0

Source: FEMA Policy & Claim Statistics for Flood Insurance, as of June 21, 2024.

2019 Mitigation Actions

Previous Action				Responsible Department
Flooding of Trap Hill Ditch causes septic tank overflows in the Town of Barclay. Work with the Town of Sudlersville to extend sewer service area using the Sudlersville Water Treatment facility. *Please Note: Town of Barclay has imposed a building moratorium within town limits until sewer facility/septic issues are resolved.*				Town of Sudlersville
✓ **Complete**	**Incomplete**	**Ongoing**	**In-Process**	**Pending**
2024 Status Update: This project was completed during the summer of 2024. The entire Town of Barclay is now connected to the Sudlersville sewer system.				

Discussion Question #1

Has the Hazard Mitigation Plan been integrated into the Town's policies or other planning documents in the past 5 years?

Yes – Ms. Crew will provide the plans that include the Hazard Mitigation Plan.

Do you plan to integrate the Hazard Mitigation Plan into the Town's Comprehensive Plan?

Grant funding was received to update the Town's Comprehensive Plan. The Hazard Mitigation Plan will be included.

Discussion Question #2

How do you plan to maintain the Hazard Mitigation Plan in the next 5 years?

Annual review will be conducted with the commissioners.

Discussion Question #3

What are the Town's thoughts on future conditions and how that could impact your jurisdiction.

The Town is a farming community and could be impacted by higher temperatures, drought, and flood.

Discussion Question #4

Are there any structures that you are concerned about being impacted?

There are no Town owned structures of concerned for being impacted by hazards.

Are there any community activities that could be impacted/affected by hazard events?

The Fire Department conducts an annual carnival.

A Peach Festival is held outside of town limits. Traffic traveling through Sudlersville increases significantly due to this event.

Discussion Question #5

Are there vulnerable populations in your community that you are concerned about?

The Town is concerned about populations 65 years and older. Foxxtown Apartments are designed for this population. The Sudlersville Senior Center is also located within town limits.

The Judy Center, which works with low income and limited English-speaking populations, is also located within the Town. The Center has hubs located in the Town of Church Hill and Grasonville.

What actions are taken to protect these populations?

Town of Sudlersville Emergency Alerts – Rave 911

Get alerted about emergencies and other important community news by signing up for our Emergency Alert Program. This system enables us to provide you with critical information quickly in a variety of situations, such as severe weather, unexpected road closures, missing persons and evacuations of buildings or neighborhoods. You will receive time-sensitive messages wherever you specify, such as your home, mobile or business phones, email address, text messages and more. You pick where, you pick how.

In addition to Rave 911, the Town also utilizes Facebook and their website to provide emergency warnings and updates to the residents.

Discussion Question #6

Are there any historic/cultural resources you are concerned about being impacted by hazards?

The St. Andrew's Episcopal Chapel, 104 Maple Avenue, is listed in the Maryland's National Register Properties. There is no concern of this structure being impacted by identified hazards.

The Jimmy Fox statue is also located in the Town of Sudlersville, however has not been impacted by hazard events.

Mitigation Actions

Flood

- Consider flood mitigation improvements, such as raising the road and studying potential culvert improvements, on East Main Street which floods during heavy rainfall events.

Ms. Crew will follow up with Town Commissioners and provide feedback on East Main Street improvements.

Thunderstorm (Lightning, Hail & Strong Winds)

- Lightning
    - Conduct an assessment of all critical electronic systems within municipal property to identify lightning protection levels and possible mitigation strategies, such as additional electrical surge protectors and lightning rods.

Ms. Crew will determine if the Town Hall and other municipal properties have surge protectors or grounding/lightning rods.

Once specific facilities are identified, the action item will be modified to include those facilities and include in the Plan update.

- Hail
    - Conduct outreach activities to increase public awareness of hail dangers, including mailing safety brochures with monthly water bills.

Include in Plan update, however state outreach activities will be conducted through Facebook and the Town's website.

Tornado / Severe Winter Storm / Tropical Systems (Hurricane, Tropical Storms & Nor'easters)

- Collaboratively identify areas with dangerous trees and conduct outreach with property owners on strategies for removal or trimming.

Town maintenance routinely trims trees and assists residents with problematic trees on there property.

Extreme Temperatures

- Conduct an education campaign for homeowners and builders on how to protect their pipes, including locating water pipes on the inside of building insulation or keeping them out of attics, crawl spaces, and vulnerable outside walls.

This action item will be included in the Plan update. The Town will post material on the Town's Facebook and website.

Tornado / Severe Winter Storm / Tropical Systems (Hurricane, Tropical Storms & Nor'easters) / Earthquake / Thunderstorm (Lightning, Hail & Strong Winds)

- Assess the need for back-up generators, which are essential during power outages to maintain critical public functions. These functions include emergency communications, traffic signals, pump, and water booster stations.

Ms. Crew will determine if the WWTP or pump stations have generators.

The Town Hall does not have a generator. This action item will be modified to include specific facilities for inclusion in the Plan update.

Wildfire

- Implement hazard fuel reduction and fire prevention measures such as clean-up and debris removal of abandoned buildings, abandoned lands, etc.

This action item will be included in the Plan update.

Drought / Soil Movement

- Encourage citizens to take water-saving measures, such as:
    - Installing low-flow water saving showerheads and toilets.
    - Turning water flow off while brushing teeth or during other cleaning activities.
    - Adjusting sprinklers to water the lawn and not the sidewalk or street.
    - Running the dishwasher and washing machine only when they are full.
    - Checking for leaks in plumping or dripping faucets.
    - Installing rain-capturing devices for irrigation.
    - Encouraging the installation of graywater systems in homes to encourage water reuse.

This action item will be included in the Plan update. The Town will utilize their Facebook and website to complete this action.

- Use permeable driveways and surfaces to reduce runoff and promote groundwater recharge.

This action item will be modified to specify that this technique be consider during the design phase of the new subdivision.

Severe Winter Storm

- Who does snow removal for the Town? Are there any issues or concerns?

Town maintenance salts sidewalks and plows streets during severe winter storm events.

All Hazards

- Increase outreach and education for hazard awareness and natural disaster preparedness, especially for low-income, elderly, non-English-speaking, and other vulnerable populations.

This action item will be included in the Plan update, specifically identifying the elderly and non-English speaking populations in the Town.

- Integrate the hazard mitigation plan into other plans, ordinances and programs that dictate land use decisions in the community, including Capital Improvement Programs, Master Plans, and Strategic Plans.

This action item will be included in the Plan update, however, modified to include a statement about integrating of the Hazard Mitigation Plan into the Comprehensive Plan update.

- Utilize multiple avenues, including organization website, social media, and public education campaigns to disseminate natural hazard information and methods to prepare for and mitigate those risks.

This action item will be modified to state “Continue using multiple…” and included in the Plan update.

Appendix D
Public Outreach & Survey Results

This Appendix includes the various types of outreach methods used by Queen Anne's County in collaboration with various stakeholders, including municipalities, during this plan update. Also included in this appendix is the public survey results. The following is included

- Website Content, YouTube Video & Newspaper Information
- Public Surveys Flyers (Both English & Spanish Versions)
- Social Media Posts
- Public Survey Results

Website Content, YouTube Video, Newspaper Information





Source: https://www.youtube.com/watch?v=_FnN1AfIR4E&t=1s

Hazard Mitigation

Queen Anne's County, Maryland is updating the ***Queen Anne's County Hazard Mitigation Plan.*** Federal grant funding provided by FEMA has been obtained to complete this planning project.

Hazard mitigation is sustained action taken to reduce or eliminate the long-term risk to human life and property from hazard.



Source: https://www.qac.org/1328/Hazard-Mitigation

Home › News Flash

County News

Posted on: May 2, 2024

Queen Anne's County Seeks Public Input on Hazard Mitigation Plan



Over the years, Queen Anne's County has faced various hazards, prompting proactive measures aimed at reducing risks and future losses. The Department of Emergency Services in Queen Anne's County is inviting public input on the Hazard Mitigation Plan. This plan identifies potential hazards and outlines projects designed to mitigate or prevent damage before disasters strike.

Input from residents, community members, workers, and business owners is crucial to the success of the County's hazard mitigation initiatives. There are several ways to participate:

- **Public Survey:** Share your feedback on local hazards and disaster risk concerns by completing a brief survey. The survey consists of fewer than twenty questions and takes approximately ten minutes to complete. Access the survey at Survey Link. (https://www.surveymonkey.com/r/ZV2V7TX)
- **Follow Us:** Stay informed about hazard mitigation progress and other emergency preparedness, response, and recovery information by following us on social media @QACDES
- **Spread the Word:** Help raise awareness about the Hazard Mitigation Plan among your family, friends, and neighbors, and encourage them to participate.

Hazard mitigation, according to FEMA, is the effort to reduce loss of life and property by lessening the impact of disasters. It is most effective when implemented under a comprehensive, long-term mitigation plan. Governments engage in hazard mitigation planning to identify risks and vulnerabilities associated with natural disasters and develop long-term strategies for protecting people and property from future hazard events. Mitigation plans are key to breaking the cycle of disaster damage, reconstruction, and repeated damage. Mitigation efforts not only save lives but also significantly reduce disaster costs. For every $1 spent on disaster mitigation, more than $6 are saved that would otherwise be allocated to response and recovery efforts.

For inquiries regarding the plan, please contact Debra Hopkins at dhopkins@qac.org.

Learn more about the Queen Anne's County Hazard Mitigation Plan by visiting https://www.qac.org/1328/Hazard-Mitigation.

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Source: https://www.qac.org/CivicAlerts.aspx?AID=2660



Draft Hazard Mitigation Plan - Submit Your Public Review!

QACTV
4.2K subscribers
Subscribe

0 | Share | Download | Save

31 views Dec 19, 2024
The Department of Emergency Services is excited to announce that the draft Hazard Mitigation Plan is ready for public review and comment. We encourage you to explore the links provided to learn more and share your thoughts. Your input is valuable—thank you for being part of this important process!

Survey - https://www.surveymonkey.com/r/SBKVBBR

Online Public Comment Meeting (January 7, 2025 at 6:00 PM) - https://smithplanninganddesign.my.web...

Complete Information - https://www.qac.org/1328/Hazard-Mitig...

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Email us at qactv@qac.org

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https://www.myeasternshoremd.com/qa/news/qac-multi-jurisdictional-hazard-mitigation-plan-draft-open-to-public/article_eca1dfca-cde4-11ef-9cf4-8ff3c523df87.html

CENTERPIECE | DEVELOPING

QAC Multi-Jurisdictional Hazard Mitigation Plan draft open to public

ANDREA GRABENSTEIN agrabenstein2chespub.com
Jan 8, 2025



Privacy - Terms

QUEEN ANNE'S COUNTY — Preparing for tomorrow's safer community today, Queen Anne's County Department of Emergency Services announced its draft Multi-Jurisdictional Hazard Mitigation Plan is ready for public review.

The Plan originally developed in 2005 provided momentum for making homes, businesses, and communities as safe as possible against the impacts of floods, tornadoes, winter weather, and other natural hazards.

The updated 2025 plan, continues to make sure the County is prepared for all kinds of hazards by identifying, planning, and implementing cost effective risk reduction measures through a comprehensive approach.

Receiving a grant from the Federal Emergency Management Agency (FEMA), the plan updates the 2019 Queen Anne's County Multi Jurisdictional Hazard Mitigation Plan, as required every five years.

Presenting an overview of the most updated hazard mitigation plan draft, a question and answer session welcomed public comment Jan. 7.

The plan update mainly involved the identification of hazard areas, with special emphasis on the identification of structures at-risk to flood hazards including riverine, coastal, storm surge, and sea level-rise, according to Michele King, of Smith Planning and Design.

The nearly 500-page comprehensive draft outlines the planning process, local hazards, community capabilities, and strategies from the previous plan, she said.

Hazards identified in-depth within the plan include: natural hazards like flooding; technological such as man-made systems like dams; and threats such as terrorism, she said.

Long term proactive planning is crucial as at the end of the day mitigation saves everyone money, King noted.

As it is impossible to know all hazards the county could potentially face, public involvement has been extremely crucial, according to Debra Hopkins of DES.

Hard copy stations were set up throughout the county and online public surveys collected data, receiving more than 200 participants to be included in the plan.

“Public participation is a key part of the planning process, and we value input to ensure the plan reflects the needs and priorities of Queen Anne’s County,” Hopkins said.

A key aspect of the draft’s developing process was identifying key stakeholders and forming a Hazard Mitigation Planning Committee, according to King.

All county municipalities were involved in the plan as well as departments like Planning and Zoning, Public Works, Finance, the Sheriff’s Office, the Health Department, Centreville Police Department, the Maryland Emergency Management Agency, and the Eastern Shore Land Conservancy.

The draft of the Queen Anne’s County Hazard Mitigation Plan is available for public review and residents, businesses, and other stakeholders are continually encouraged to provide feedback. to contribute to the development of a safer and more resilient community.

“Every bit helps us make a stronger plan,” Hopkins said.

The next steps of the process involves input evaluating public data. The Maryland Department of Emergency Management will review the plan and provide feedback. Once approved, the plan will be submitted to FEMA for review before being approved by the Queen Anne’s County Commissioners for official adoption.

The draft Hazard Mitigation Plan and additional resources are available at https://www.qac.org/1328/Hazard-Mitigation.

Public Surveys Flyers
(Both English & Spanish Versions)



PUBLIC SURVEY

Queen Anne's County Department of Emergency Services (DES) was awarded a FEMA Hazard Mitigation Planning Grant to update the **Queen Anne's County Multi-Jurisdictional Hazard Mitigation Plan**. DES is the lead agency for this plan update.

Please take a moment to participate in our Public Survey!

Scan the QR Code to take the survey online.

Online Survey Link:
https://www.surveymonkey.com/r/ZV2V7TX

For more information about this planning project, please visit:
https://www.qac.org/1328/Hazard-Mitigation

Queen Anne's County
2024 Hazard Mitigation Plan Update



The 2024 Hazard Mitigation Plan Update assesses new and existing hazards that affect our community and identifies steps to reduce the impact of hazards through mitigation strategies, projects, and actions.

Purpose:

- Build community resilience that educates and prepares residents on the types of hazards facing our community
- Identify capabilities and resource needs
- Improve the ability to rapidly recover from disasters
- Reduce damages and costs from disasters

We need your help!

Input from community members helps ensure the plan captures the concerns of affected communities. Fill out our short survey at www.surveymonkey.com/r/ZV2V7TX or scan the QR code.

For more info visit https://www.qac.org/1328/Hazard-Mitigation

For questions, email Debra Hopkins - dhopkins@qac.org

Condado de Queen Anne Actualización del Plan de Mitigación de Peligros para 2025



Actualización del Plan de Mitigación de Riesgos para 2025

Evalúa peligros nuevos y existentes que afecta a nuestra comunidad e identifica medidas para reducir el impacto de los peligros a través de estrategias de mitigación, proyectos y acciones.

Objetivo:

- Desarrollar resiliencia comunitaria que eduque y prepare a los residentes sobre los tipos de peligros que enfrenta nuestra comunidad.
- Identifica capacidades y necesidades de recursos.
- Mejorar la capacidad de recuperarse rápidamente de los desastres.
- Reducir los daños y costos de los desastres

¡Necesitamos tu ayuda!

Los aportes de los miembros de la comunidad ayudan a garantizar el plan que capta las preocupaciones de las comunidades afectadas. Llenar nuestra breve encuesta en es.surveymonkey.com/r/6HHCNZL o escanear el código QR.

Para obtener más información, visite https://www.qac.org/1328/Hazard-Mitigation

Si tiene preguntas, envíe un correo electrónico a **Debra Hopkins** - dhopkins@qac.org

Social Media Posts



Source: [Queen Anne's County Facebook]



Source: [Queen Anne's County Department of Emergency Services]

Queen Anne's County Government
23h ·

Over the years, Queen Anne's County has faced various hazards, prompting proactive measures aimed at reducing risks and future losses. The Department of Emergency Services in Queen Anne's County is inviting public input on the Hazard Mitigation Plan. This plan identifies potential hazards and outlines projects designed to mitigate or prevent damage before disasters strike.
Learn more: https://www.qac.org/CivicAlerts.aspx?AID=2745
Access the survey at https://www.surveymonkey.com/r/ZV2V7TX

A lo largo de los años, el condado de Queen Anne se ha enfrentado a diversos peligros, lo que ha
motivado la adopción de medidas proactivas destinadas a reducir los riesgos y las pérdidas futuras. El Departamento de Servicios de Emergencia del condado de Queen Anne invita al público a dar su opinión sobre el Plan de Mitigación de Peligros. Este plan identifica peligros potenciales y describe proyectos diseñados para mitigar o prevenir daños antes de que ocurran las catástrofes.

Obtenga más información sobre el Plan de Mitigación de Peligros del condado de Queen Anne en https://www.qac.org/CivicAlerts.aspx?AID=2744
Acceda a la encuesta en el siguiente enlace.
(https://es.surveymonkey.com/r/6HHCNZL)



Source: [Queen Anne's County Facebook]



Source: [Queen Anne's County Department of Emergency Services]

Queen Anne's County Department...
5d ·

🛠️ Help Shape the Future of Queen Anne's County! Our Hazard Mitigation Plan draft is ready for review! Take a moment to read the plan, share your thoughts in our survey, and join us for a virtual Q&A session on January 7, 2025, at 6:00 PM. Together, we can create a safer community for everyone. 🌳🏡
🔗 Review the plan & survey:
https://ow.ly/cNS950Uz1Xa
📅 Q&A Meeting: **https://ow.ly/svxN50Uz1Xb**



Source: Queen Anne's County Department of Emergency Services

Queen Anne's County Department...
1d ·

🚨 Have Your Say in Hazard Mitigation!
The draft Hazard Mitigation Plan is here, and we want your input! Review the plan, take our quick survey, and join us for a live Q&A session on January 7, 2025, at 6:00 PM. Your feedback helps us build a safer Queen Anne's County. 🌟
📝 Review the plan & take the survey:
https://ow.ly/aQEt50Uz1Lo
💻 Join the Q&A: **https://ow.ly/ewQz50Uz1Lt**



Source: Queen Anne's County Department of Emergency Services

Queen Anne's County Department…
10h ·

📣 Join Us for a Live Q&A Session!
Have questions about the Queen Anne's County Hazard Mitigation Plan? 🛡️ Join our virtual Q&A session on January 7, 2025, at 6:00 PM to get answers and share your feedback. Your voice matters in shaping a safer, more resilient community! 💻
👉 Join the Meeting **https://ow.ly/zboO50Uz1AV**

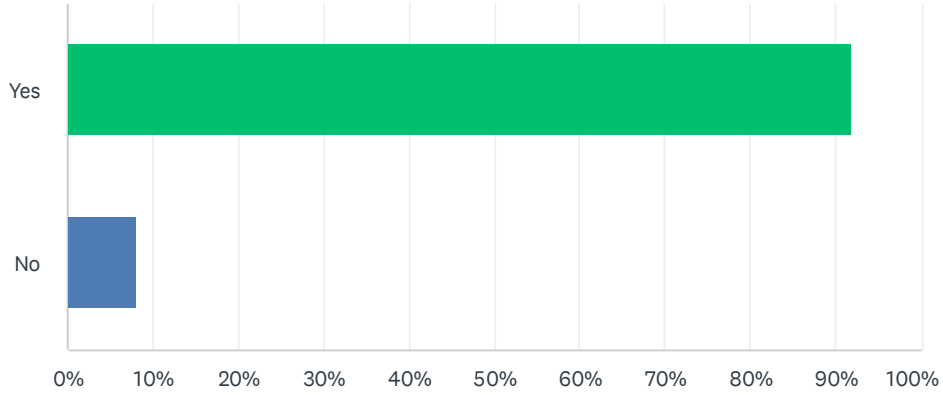


Source: [Queen Anne's County Department of Emergency Services]

Public Survey Results

Q1 Are you a resident of Queen Anne's County?

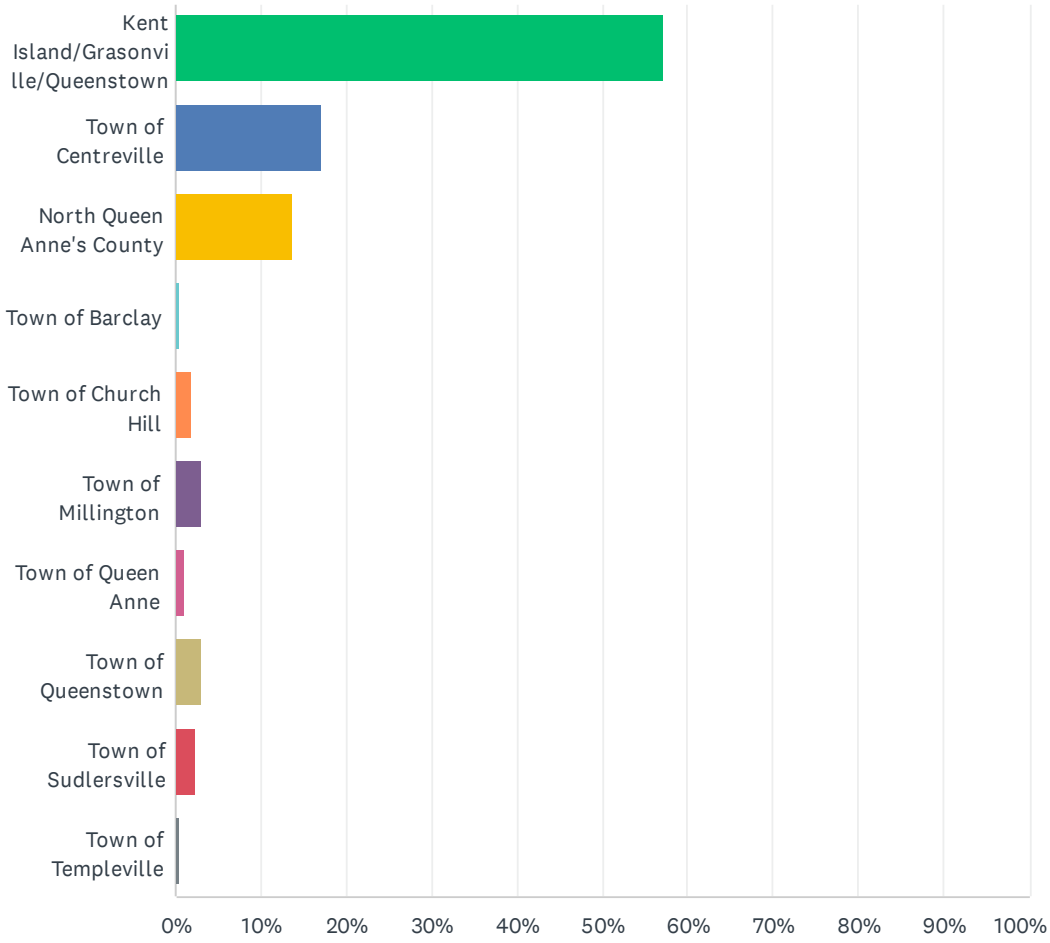
Answered: 212 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	91.98%	195
No	8.02%	17
TOTAL		212

Q2 Queen Anne's County has three unique and distinct areas and 8 municipalities. Please select the are where you currently live.

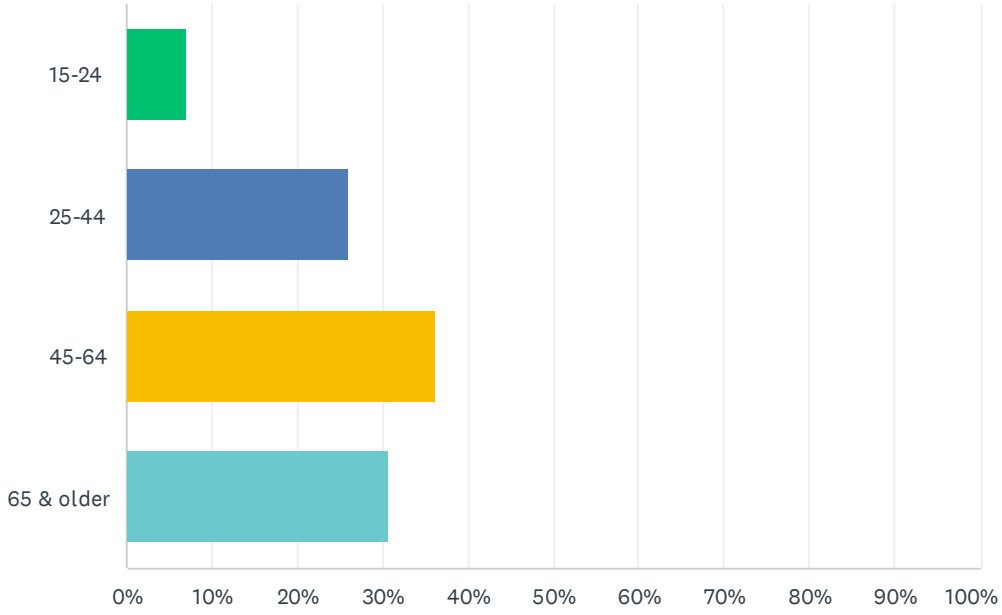
Answered: 205 Skipped: 7



ANSWER CHOICES	RESPONSES	
Kent Island/Grasonville/Queenstown	57.07%	117
Town of Centreville	17.07%	35
North Queen Anne's County	13.66%	28
Town of Barclay	0.49%	1
Town of Church Hill	1.95%	4
Town of Millington	2.93%	6
Town of Queen Anne	0.98%	2
Town of Queenstown	2.93%	6
Town of Sudlersville	2.44%	5
Town of Templeville	0.49%	1
TOTAL		205

Q3 In what age group do you belong?

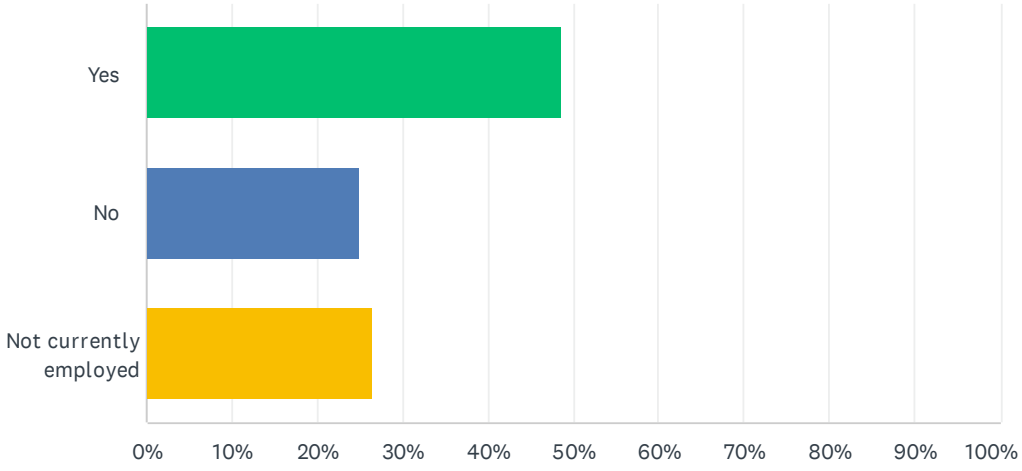
Answered: 212 Skipped: 0



ANSWER CHOICES	RESPONSES	
15-24	7.08%	15
25-44	25.94%	55
45-64	36.32%	77
65 & older	30.66%	65
TOTAL		212

Q4 Do you work in Queen Anne's County?

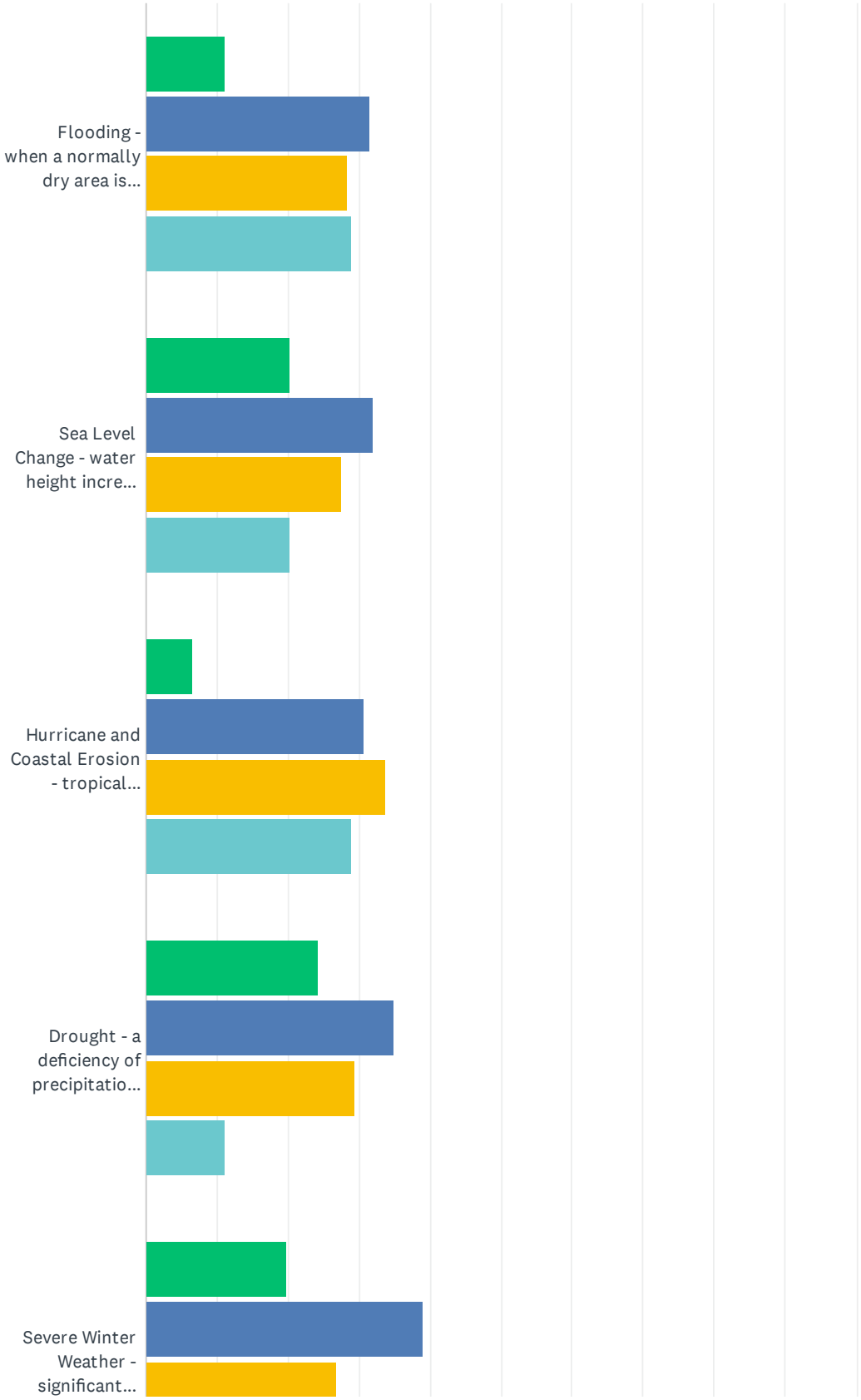
Answered: 212 Skipped: 0

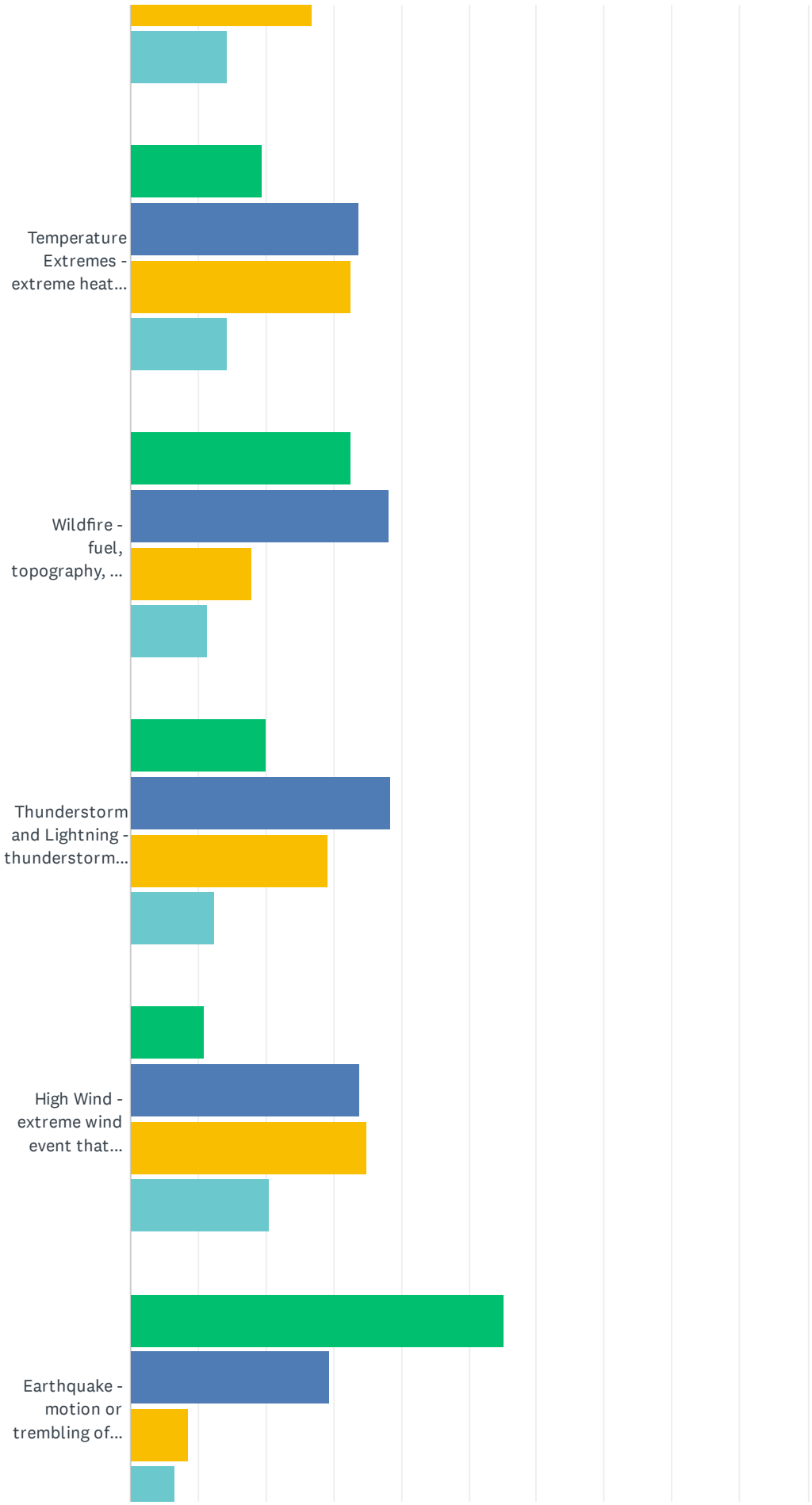


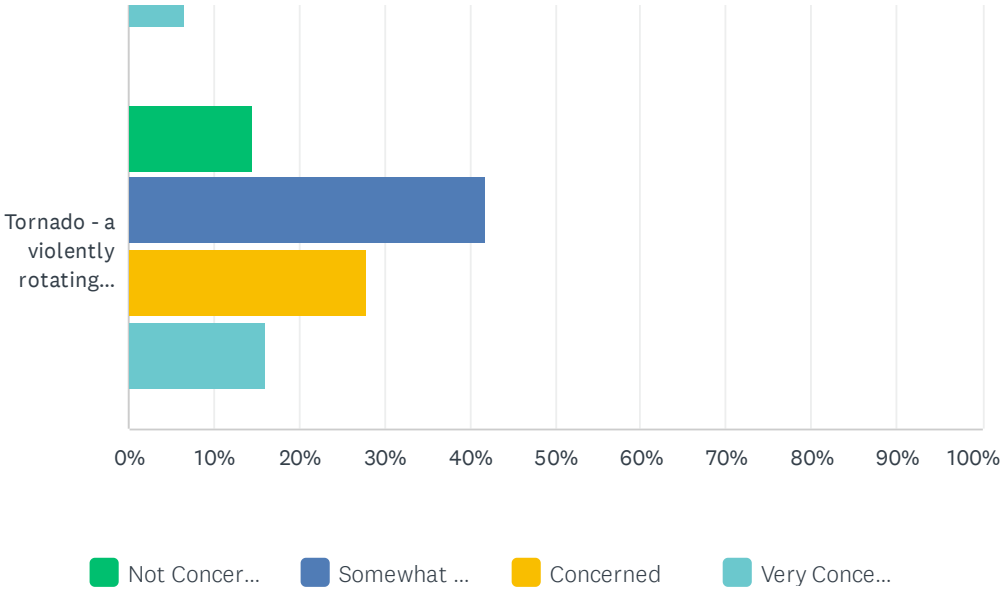
ANSWER CHOICES	RESPONSES	
Yes	48.58%	103
No	25.00%	53
Not currently employed	26.42%	56
TOTAL		212

Q5 Please indicate your level of concern for each hazard.

Answered: 197 Skipped: 15



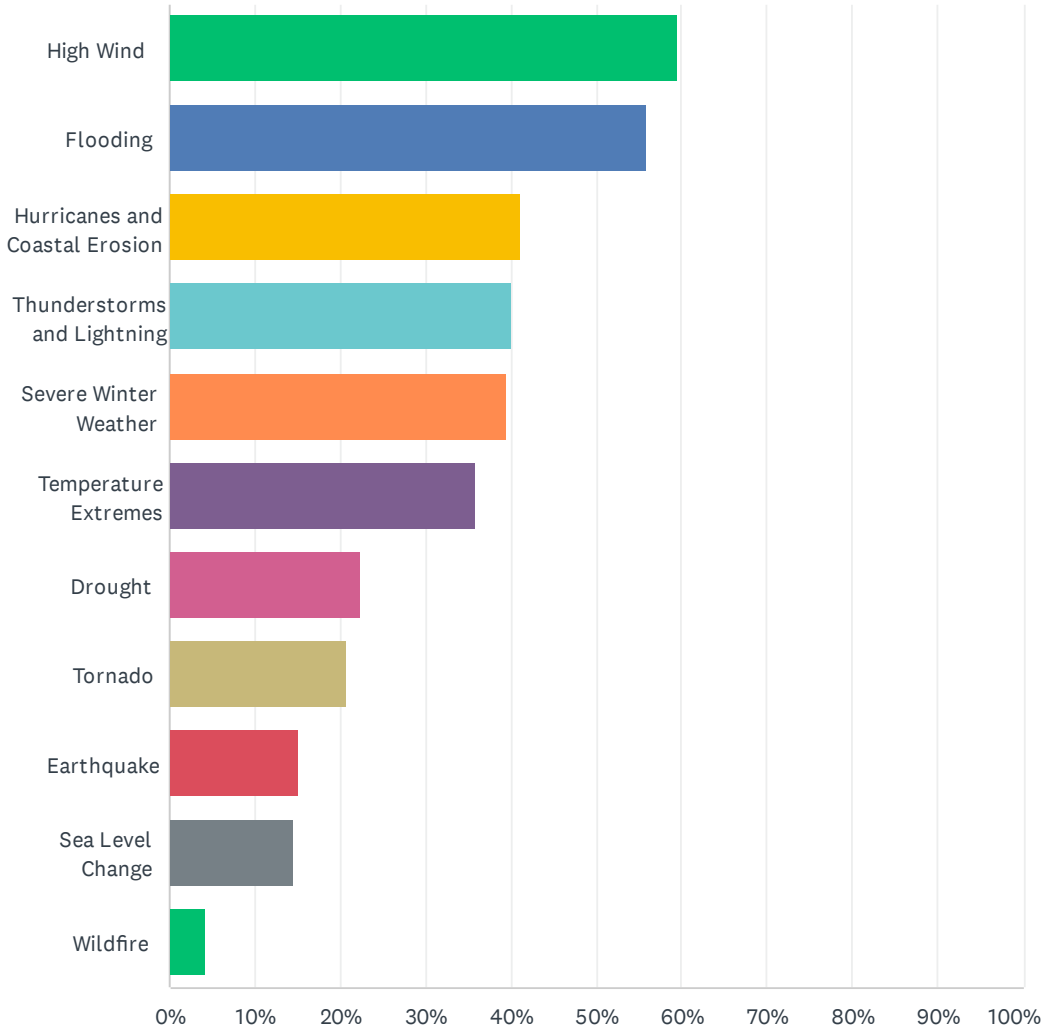

Temperature Extremes - extreme heat...
Wildfire - fuel, topography, ...
Thunderstorm and Lightning - thunderstorm...
High Wind - extreme wind event that...
Earthquake - motion or trembling of...


Tornado - a violently rotating...
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Not Concer...
Somewhat ...
Concerned
Very Conce...

	NOT CONCERNED	SOMEWHAT CONCERNED	CONCERNED	VERY CONCERNED	TOTAL
Flooding - when a normally dry area is inundated with excess water from snowmelt or rainfall accumulates and overflows onto the stream banks and adjacent floodplains affecting roadways and/or buildings	11.17% 22	31.47% 62	28.43% 56	28.93% 57	197
Sea Level Change - water height increase of the ocean and bays as a result of melting ice or warming seas	20.30% 40	31.98% 63	27.41% 54	20.30% 40	197
Hurricane and Coastal Erosion - tropical storms and hurricanes that can cause storm surge inundation and exacerbation of shoreline erosion	6.63% 13	30.61% 60	33.67% 66	29.08% 57	196
Drought - a deficiency of precipitation, which can be aggravated by other factors such as high temperatures, high winds, and low relative humidity	24.37% 48	35.03% 69	29.44% 58	11.17% 22	197
Severe Winter Weather - significant snowfall, blizzards or ice storms, which can cause hazardous driving conditions, communications and electrical power failure, community isolation	19.80% 39	39.09% 77	26.90% 53	14.21% 28	197
Temperature Extremes - extreme heat is usually defined through a combination of temperature and humidity; extreme cold is based on the temperature with wind chill	19.39% 38	33.67% 66	32.65% 64	14.29% 28	196
Wildfire - fuel, topography, and weather provide the conditions that allow wildfires to spread, most wildfires are caused by people through criminal or accidental misuse of fire	32.65% 64	38.27% 75	17.86% 35	11.22% 22	196
Thunderstorm and Lightning - thunderstorms are associated with strong winds, heavy precipitation, and lightning strikes, which can all be hazardous under the right conditions and locations	20.00% 39	38.46% 75	29.23% 57	12.31% 24	195
High Wind - extreme wind event that occurs during different weather events and can impact buildings, power, etc.	10.77% 21	33.85% 66	34.87% 68	20.51% 40	195
Earthquake - motion or trembling of the ground produced by sudden displacement of rock usually within the upper 10-20 miles of the Earth's crust affecting roadways and foundations of buildings	55.33% 109	29.44% 58	8.63% 17	6.60% 13	197
Tornado - a violently rotating funnel-shaped column of air that extends from a thunderstorm cloud toward the ground	14.43% 28	41.75% 81	27.84% 54	15.98% 31	194

Q6 Have you been personally affected by one or more of these hazards? (Please check all that apply)

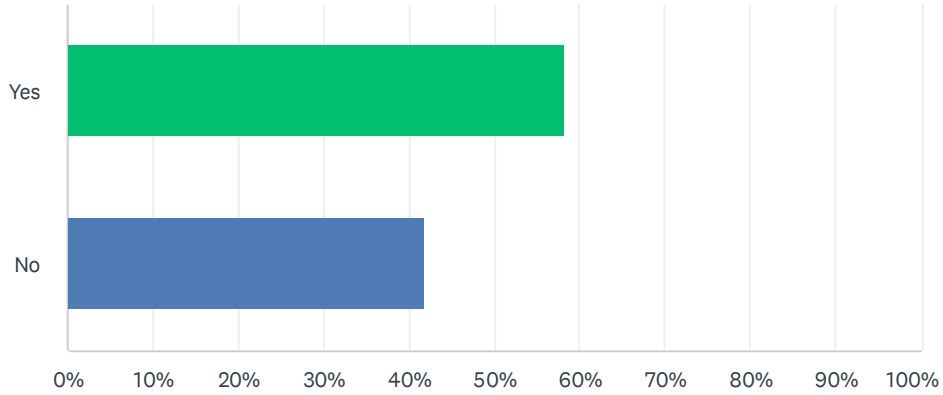
Answered: 165 Skipped: 47



ANSWER CHOICES	RESPONSES	
High Wind	59.39%	98
Flooding	55.76%	92
Hurricanes and Coastal Erosion	41.21%	68
Thunderstorms and Lightning	40.00%	66
Severe Winter Weather	39.39%	65
Temperature Extremes	35.76%	59
Drought	22.42%	37
Tornado	20.61%	34
Earthquake	15.15%	25
Sea Level Change	14.55%	24
Wildfire	4.24%	7
Total Respondents: 165		

Q7 When you moved into your residence or commercial property, did you consider the impact a natural or non-natural hazard event could have on your property?

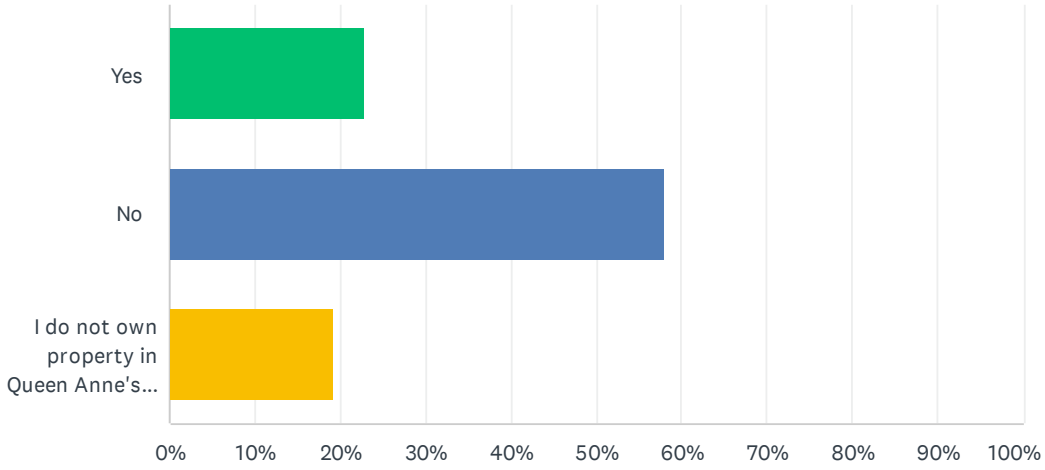
Answered: 189 Skipped: 23



ANSWER CHOICES	RESPONSES	
Yes	58.20%	110
No	41.80%	79
TOTAL		189

Q8 If you own your home or commercial property, do you have flood insurance?

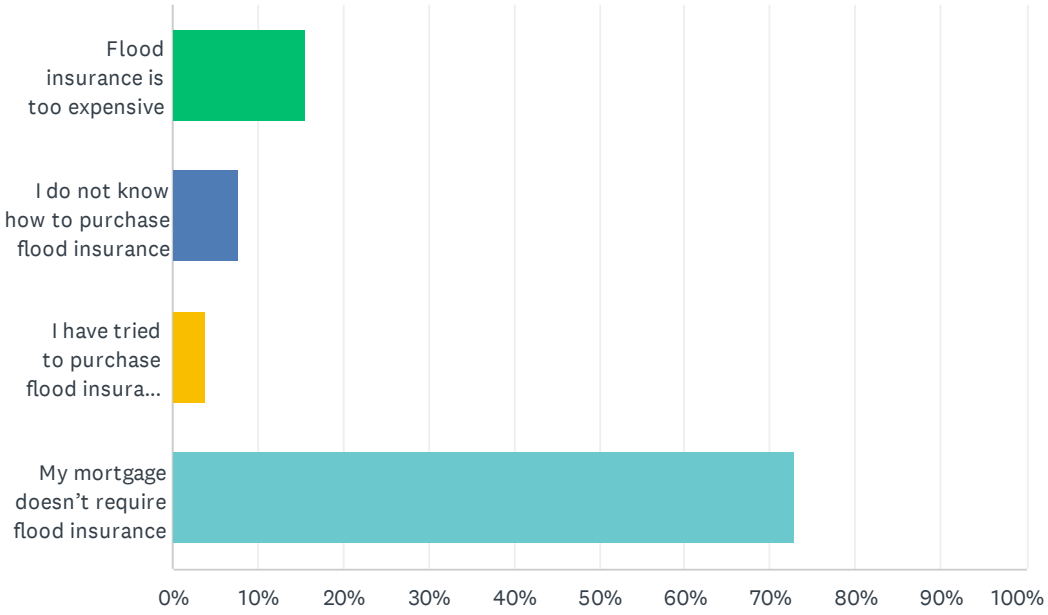
Answered: 188 Skipped: 24



ANSWER CHOICES	RESPONSES	
Yes	22.87%	43
No	57.98%	109
I do not own property in Queen Anne's County	19.15%	36
TOTAL		188

Q9 If “No”, what is the primary reason why you do not carry flood insurance?

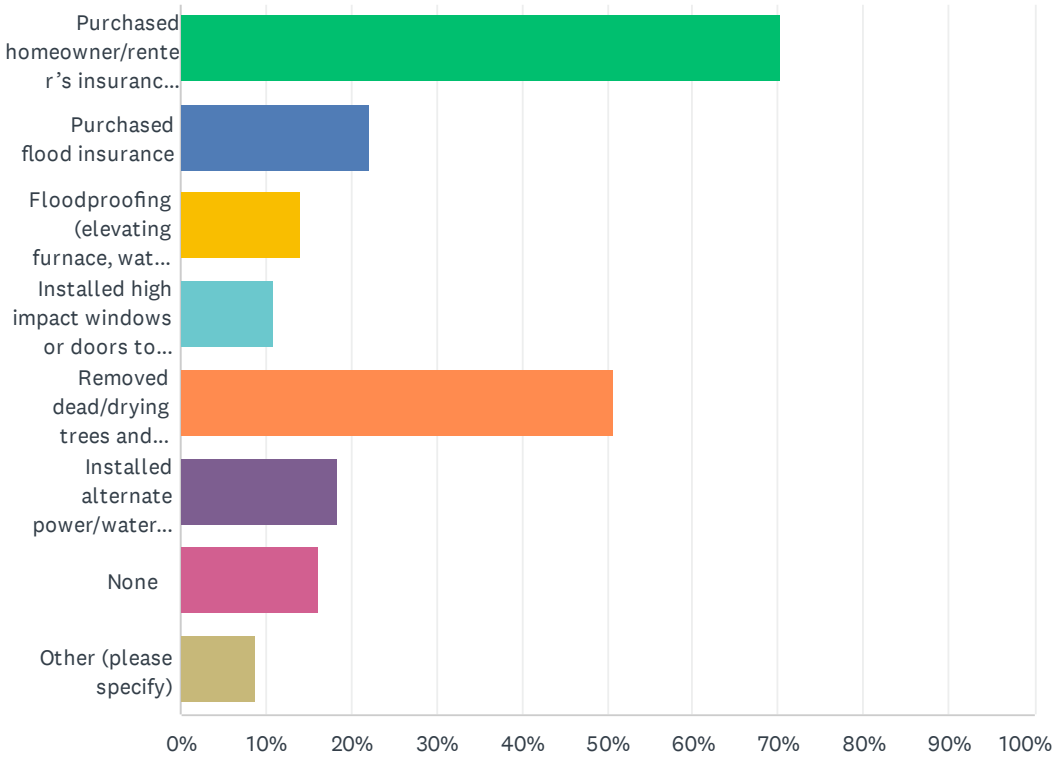
Answered: 129 Skipped: 83



ANSWER CHOICES	RESPONSES	
Flood insurance is too expensive	15.50%	20
I do not know how to purchase flood insurance	7.75%	10
I have tried to purchase flood insurance but have been unsuccessful	3.88%	5
My mortgage doesn’t require flood insurance	72.87%	94
TOTAL		129

Q10 Have you taken any of the following actions to reduce the risk of hazards to your residence or commercial property?

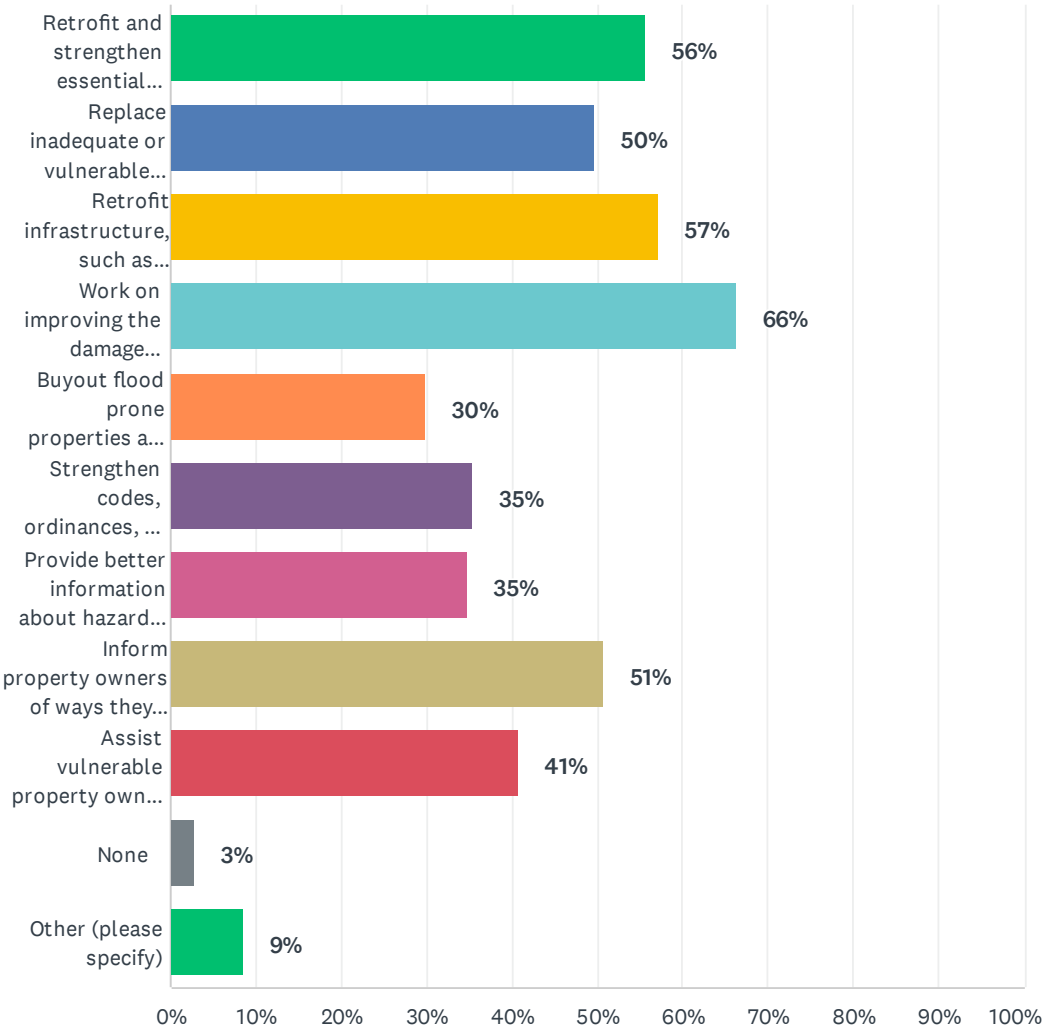
Answered: 185 Skipped: 27



ANSWER CHOICES	RESPONSES	
Purchased homeowner/renter's insurance policies	70.27%	130
Purchased flood insurance	22.16%	41
Floodproofing (elevating furnace, water heaters, electric panels)	14.05%	26
Installed high impact windows or doors to withstand high winds	10.81%	20
Removed dead/drying trees and vegetation from around the home	50.81%	94
Installed alternate power/water supply	18.38%	34
None	16.22%	30
Other (please specify)	8.65%	16
Total Respondents: 185		

Q11 Which of the following mitigation project types do you believe should be focused on to reduce disruptions of services and strengthen the community (check all that apply)?

Answered: 187 Skipped: 25



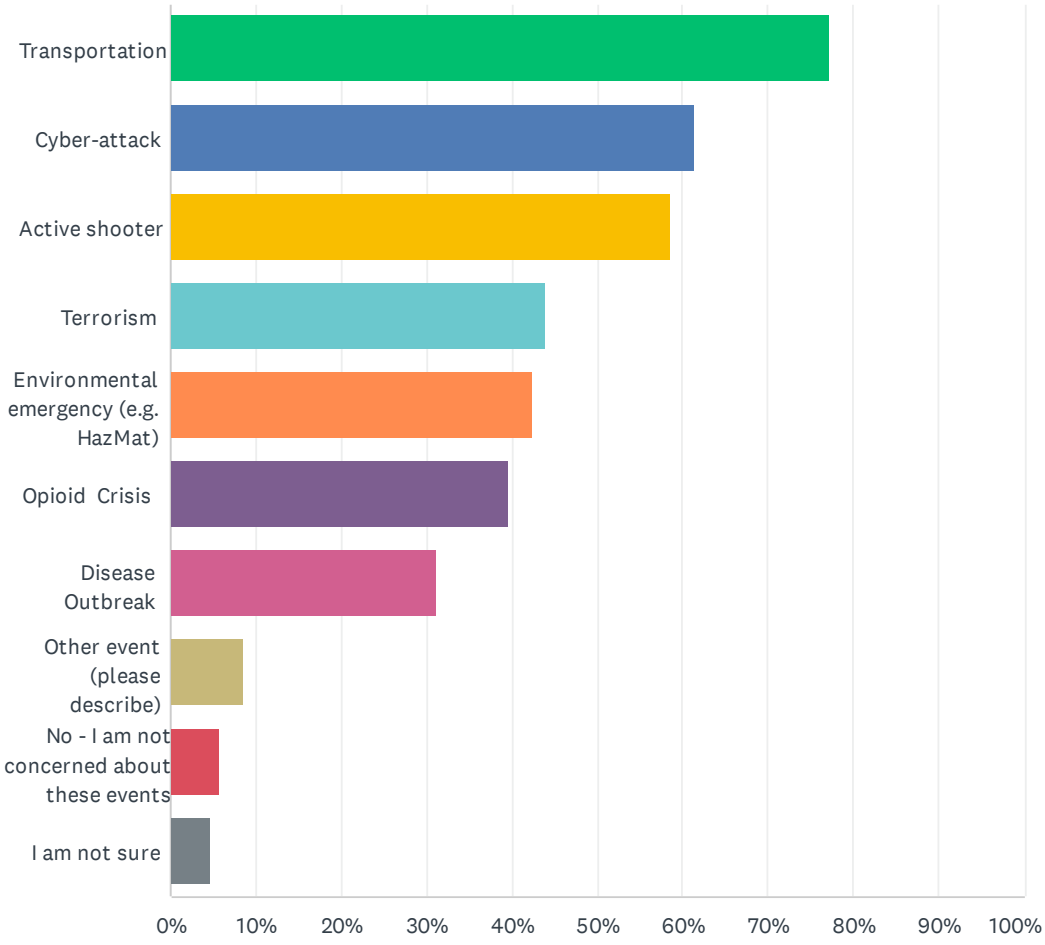
ANSWER CHOICES	RESPONSES	
Retrofit and strengthen essential facilities such as police, fire, emergency medical services, hospitals, schools, etc.	56%	104
Replace inadequate or vulnerable bridges	50%	93
Retrofit infrastructure, such as elevating roadways and improving drainage systems	57%	107
Work on improving the damage resistance of utilities (electricity, communications, water/sewer, etc.)	66%	124
Buyout flood prone properties and maintain as open space	30%	56
Strengthen codes, ordinances, and plans to require higher hazard risk management standards	35%	66
Provide better information about hazard risk and high-hazard areas	35%	65
Inform property owners of ways they can mitigate damage to their property	51%	95
Assist vulnerable property owners with securing funding to mitigate impacts to their property	41%	76
None	3%	5
Other (please specify)	9%	16
Total Respondents: 187		

Q12 In the last 10 years, have you evacuated from your home or business as a result of a disaster (e.g., flooding, power outage, water failure)? If so, how long were you displaced? Did you go to a shelter?

Answered: 134 Skipped: 78

Q13 Are you concerned about any of the events, emergencies, or crises listed below? (Please check all that apply.)

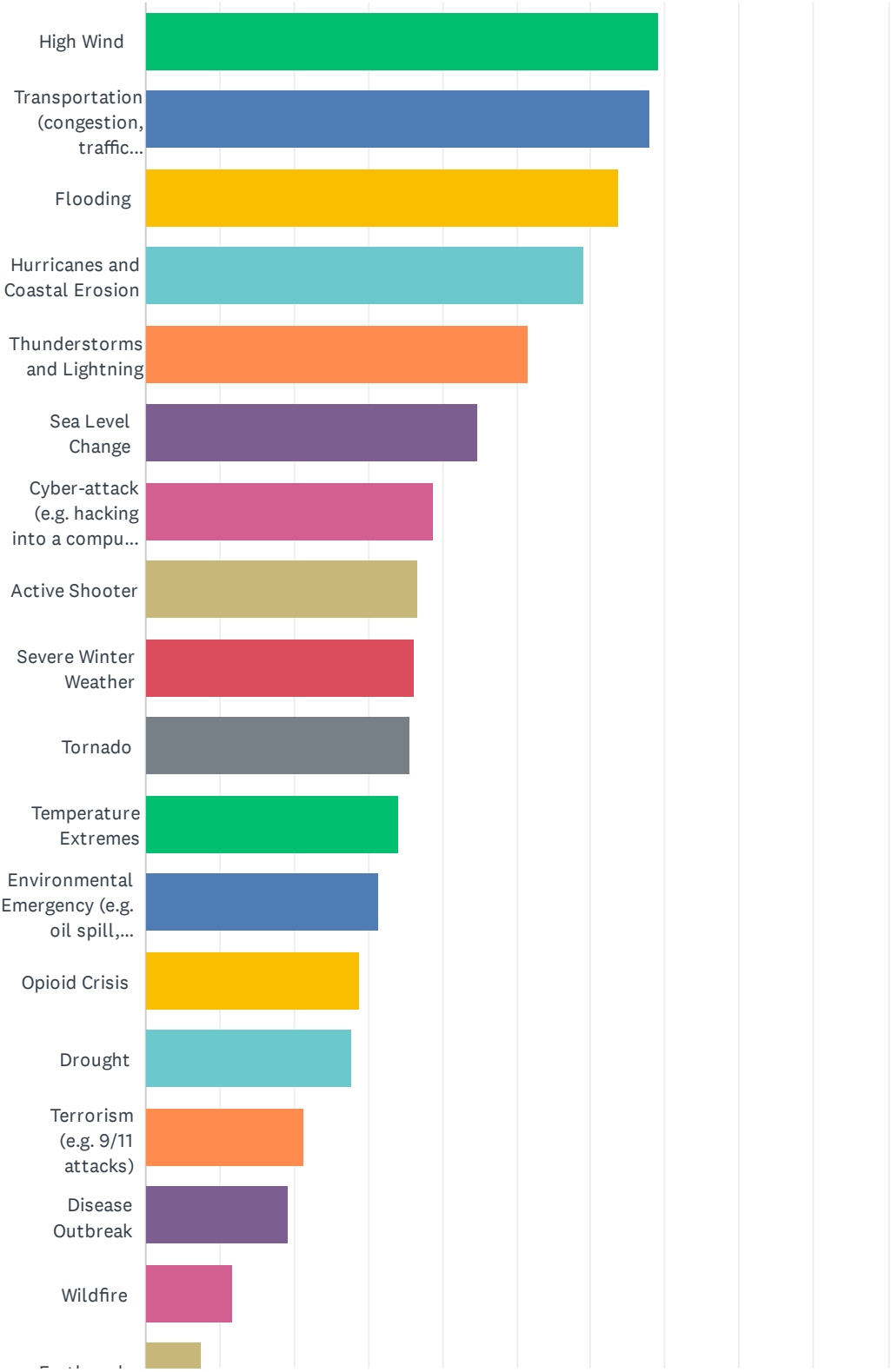
Answered: 189 Skipped: 23

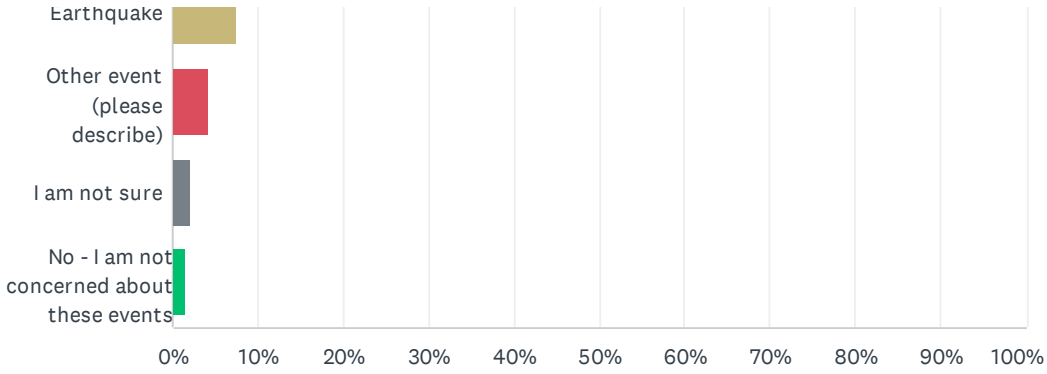


ANSWER CHOICES	RESPONSES	
Transportation	77.25%	146
Cyber-attack	61.38%	116
Active shooter	58.73%	111
Terrorism	43.92%	83
Environmental emergency (e.g. HazMat)	42.33%	80
Opioid Crisis	39.68%	75
Disease Outbreak	31.22%	59
Other event (please describe)	8.47%	16
No - I am not concerned about these events	5.82%	11
I am not sure	4.76%	9
Total Respondents: 189		

Q14 Please choose from the below list to indicate which hazards or events you feel may particularly affect your area of the county or town. (Please check all that apply.)

Answered: 188 Skipped: 24

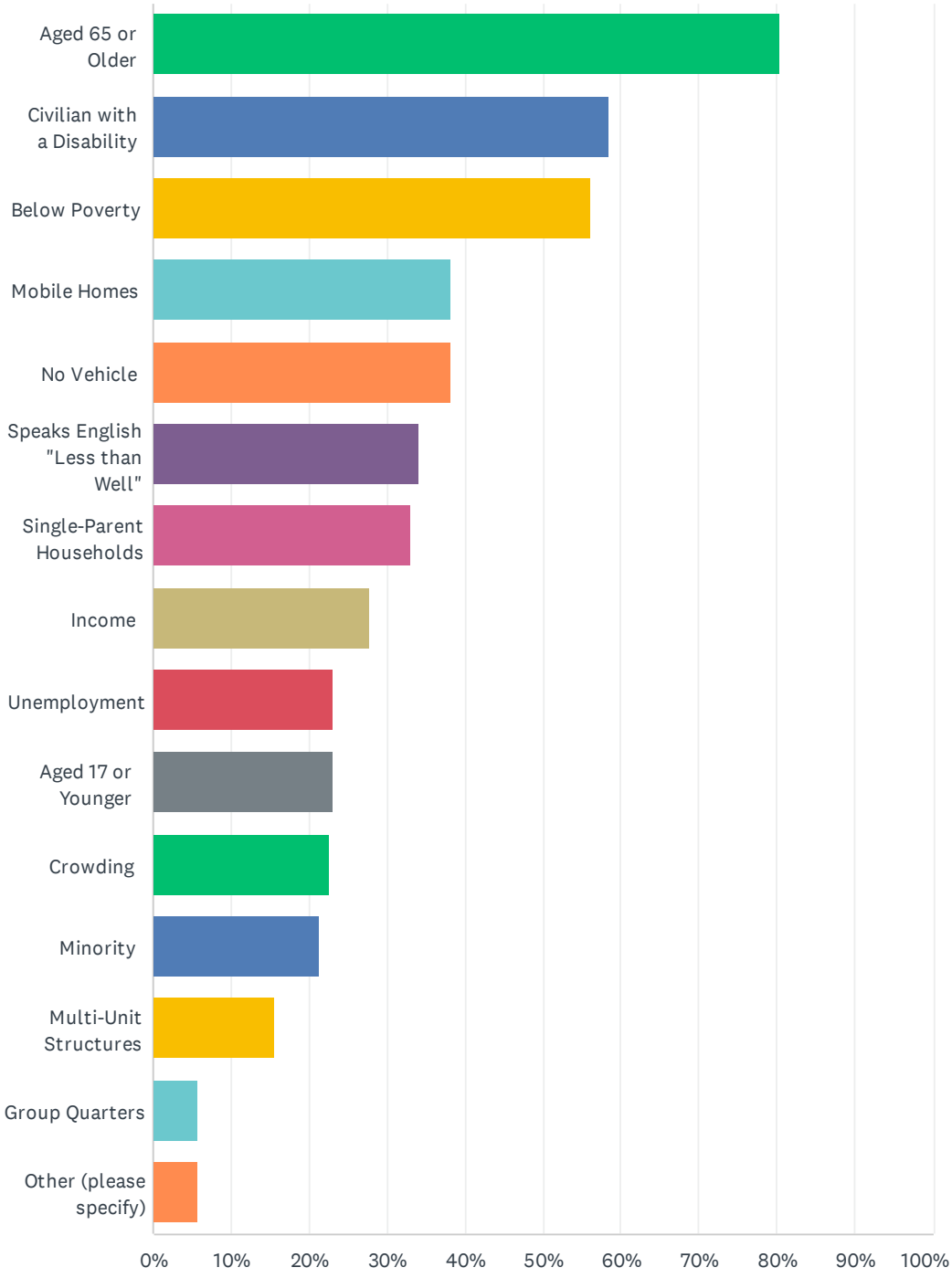




ANSWER CHOICES	RESPONSES	
High Wind	69.15%	130
Transportation (congestion, traffic accidents)	68.09%	128
Flooding	63.83%	120
Hurricanes and Coastal Erosion	59.04%	111
Thunderstorms and Lightning	51.60%	97
Sea Level Change	44.68%	84
Cyber-attack (e.g. hacking into a computer system)	38.83%	73
Active Shooter	36.70%	69
Severe Winter Weather	36.17%	68
Tornado	35.64%	67
Temperature Extremes	34.04%	64
Environmental Emergency (e.g. oil spill, hazardous material)	31.38%	59
Opioid Crisis	28.72%	54
Drought	27.66%	52
Terrorism (e.g. 9/11 attacks)	21.28%	40
Disease Outbreak	19.15%	36
Wildfire	11.70%	22
Earthquake	7.45%	14
Other event (please describe)	4.26%	8
I am not sure	2.13%	4
No - I am not concerned about these events	1.60%	3
Total Respondents: 188		

Q15 In terms of social vulnerability, do you feel that a specific group, or groups, in Queen Anne's County are particularly at risk for, or could be harmed by, any of the hazards listed in Question 14? This question is not intended to be limited to certain groups - we are eager to learn of any and all types and sizes of groups you think might be at particular risk.Note: CDC 15 Social Factors below.

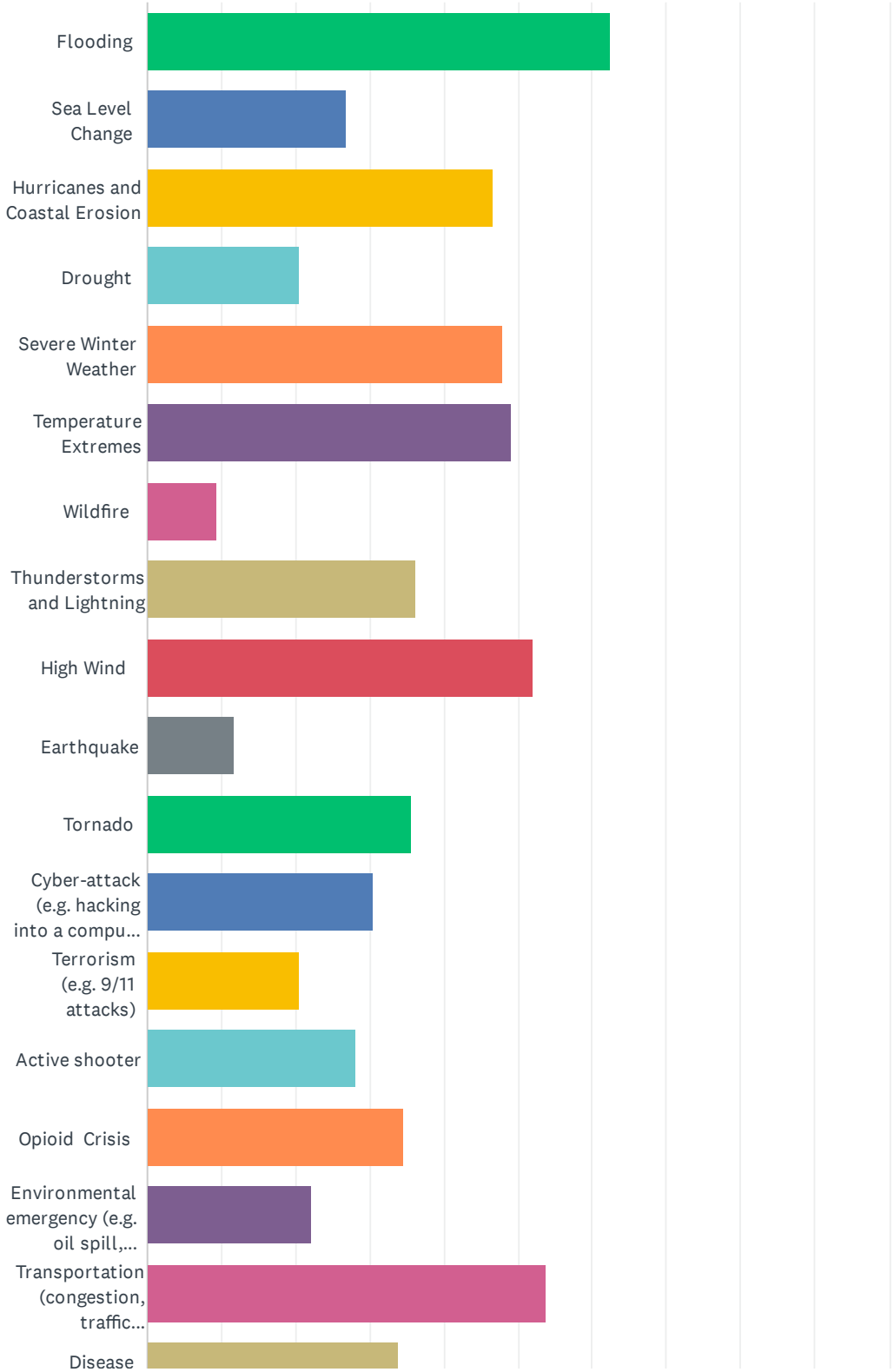
Answered: 173 Skipped: 39

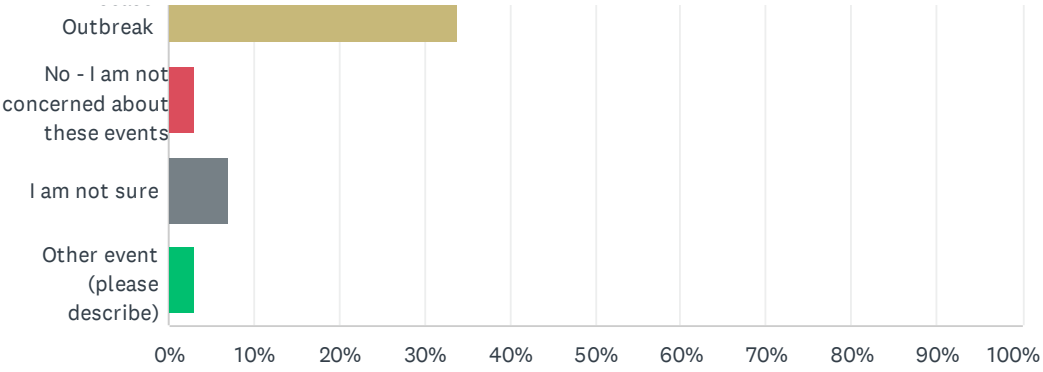

Aged 65 or Older
Civilian with a Disability
Below Poverty
Mobile Homes
No Vehicle
Speaks English "Less than Well"
Single-Parent Households
Income
Unemployment
Aged 17 or Younger
Crowding
Minority
Multi-Unit Structures
Group Quarters
Other (please specify)
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

ANSWER CHOICES	RESPONSES	
Aged 65 or Older	80.35%	139
Civilian with a Disability	58.38%	101
Below Poverty	56.07%	97
Mobile Homes	38.15%	66
No Vehicle	38.15%	66
Speaks English "Less than Well"	34.10%	59
Single-Parent Households	32.95%	57
Income	27.75%	48
Unemployment	23.12%	40
Aged 17 or Younger	23.12%	40
Crowding	22.54%	39
Minority	21.39%	37
Multi-Unit Structures	15.61%	27
Group Quarters	5.78%	10
Other (please specify)	5.78%	10
Total Respondents: 173		

Q16 Please choose from the below list to indicate which hazards or events you feel may particularly affect this group? (Multiple options may be chosen.)

Answered: 171 Skipped: 41





ANSWER CHOICES	RESPONSES	
Flooding	62.57%	107
Sea Level Change	26.90%	46
Hurricanes and Coastal Erosion	46.78%	80
Drought	20.47%	35
Severe Winter Weather	47.95%	82
Temperature Extremes	49.12%	84
Wildfire	9.36%	16
Thunderstorms and Lightning	36.26%	62
High Wind	52.05%	89
Earthquake	11.70%	20
Tornado	35.67%	61
Cyber-attack (e.g. hacking into a computer system)	30.41%	52
Terrorism (e.g. 9/11 attacks)	20.47%	35
Active shooter	28.07%	48
Opioid Crisis	34.50%	59
Environmental emergency (e.g. oil spill, hazardous material)	22.22%	38
Transportation (congestion, traffic accidents)	53.80%	92
Disease Outbreak	33.92%	58
No - I am not concerned about these events	2.92%	5
I am not sure	7.02%	12
Other event (please describe)	2.92%	5
Total Respondents: 171		