

**ANNUAL REPORT
FISCAL YEAR 2020**

**ONE YEAR PLAN
FISCAL YEAR 2022**

**CALVERT COUNTY
LOCAL BEHAVIORAL HEALTH AUTHORITY
ANNUAL PLAN**



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MISSION AND VISION STATEMENTS

Mission and Vision Statement



Mission:

To ensure all Calvert County Residents have access to quality Behavioral Health Services

Vision:

To cultivate a comprehensive system of behavioral health care in Calvert County, which provides individualized service to promote wellness, empowerment, and recovery across the lifespan of our residents.

GLOSSARY AND ACRONYMS

Glossary and Acronyms

Administrative Services Organization (ASO)- An organization that is contracted to work with the Maryland Behavioral Health Administration, Core Service Agencies, Local Addiction Authorities, and Local Behavioral Health Authorities to manage the Public Behavioral Health Services. This organization is responsible for authorizing services, providing utilization management, managing information, processing claims, and providing evaluation services.

Adult Interdisciplinary Team (AIDT)- A local multi-disciplinary meeting that focuses on adult residents of Calvert County, which promotes improved service delivery systems by addressing not only the quality of direct services, but also by seeking to improve accessibility, accountability, and coordination among professionals and agencies in service delivery.

Adverse Childhood Experiences (ACES)- Potentially traumatic experiences that occur in childhood years (0-17 years).

Behavioral Health Administration (BHA)- A unit of the Maryland Department of Health: established to administer State funded Behavioral Health programs.

Behavioral Health Advisory Council (BHAC)- A body of individuals responsible for planning, policy, workforce development, and services to ensure a coordinated, quality system of care that is outcome-guided and that integrates prevention, recovery, evidence-based practices, and cost-effective strategies that enhance behavioral health services across the state

Behavioral Health Clinic (BHC)- A licensed facility specifically designed to provide the community with an all-inclusive range of substance use and mental health disorder treatment services.

Calvert County Health Department (CCHD)- A government organization that provides local public health services under the direction of the Health Officer. This organization is authorized to enforce the health laws and regulations of Maryland and the health ordinances of Calvert County. The health department provides a number of health-related services that directly benefit individuals as well as the community at large.

Calvert County Health Department Behavioral Health (CCHDBH)- A division of the Calvert County Health Department that provides behavioral health services to individuals of all ages who have mental health and/or substance use disorders as well as to individuals in crisis.

Calvert County Psychogeriatric Assessment and Treatment Program (CCPAT)- A grant funded program offering individual, group, and family counseling to adults 55+ in all three Calvert County Office on Aging locations, within Calvert County nursing homes, and in client's private residence.

Calvert Health Medical Center (CHMC)- a not-for-profit, privately-owned hospital accredited by the Joint Commission on Accreditation of Healthcare Organizations, licensed by the Maryland Department of Health and Mental Hygiene, and certified to bill Medicare and Medicaid as well as various private insurance carriers.

GLOSSARY AND ACRONYMS

Care Coordination Organization (CCO)- Services offered to families with children and/or adolescents with severe mental health diagnoses, in addition to therapy. Services are voluntary and provided in the home, at the job, at school, in court, and throughout the community. The goal of this program is to build resiliency in youth receiving services by assisting families with navigating the behavioral health system, providing support, reinforcing therapeutic goals, attending IEP meetings, and more.

The Centers for Disease Control and Prevention (CDC)- A national public health institute in the United States. This is a federal agency, under the Department of Health and Human Services.

Center for Children (CFC)- A private non-profit organization dedicated to the prevention and treatment of child abuse and the promotion of positive mental health through crisis intervention, therapy and education.

Center for Medicare and Medicaid Services (CMS)- A federal agency that administers the nation's major healthcare programs including Medicare, Medicaid, and Children's Health Improvement Program (CHIP). The agency aims to provide a healthcare system with better care, access to coverage, and improved health.

Child and Adolescent (C&A)- Individuals under the age of 18.

Commission on Accreditation of Rehabilitation Facilities (CARF)- An independent, nonprofit organization that provides accreditation services at the request of health and human service providers.

Continuing Education Unit (CEU)- A measure used in continuing education programs to assist the professional to maintain their license in their profession

Continuity of Operations Program (COOP)- A federal initiative to encourage departments and organizations to plan to address how critical operations will continue under a broad range of circumstances including emergencies and disasters.

Continuum of Care (COC)- A program involving an integrated system of care that provides a comprehensive array of health services spanning all levels of intensity of care to individuals with Serious Mental Illness and/or chronic Substance Use Disorder. Services provided include housing and utility subsidies, case management, care coordination and more.

Core Service Agency (CSA)- The local mental health authority responsible for planning, managing, and monitoring public mental health services at the local level. These organizations exist under the authority of the Secretary of the Maryland Department of Health and also are agents of the county government, which approve their organizational structure.

Coronavirus Disease (COVID-19)- An infectious disease caused by a newly discovered coronavirus.

Crisis Intervention Center (CIC)- A provider of Crisis Services located within the Calvert County Health Department. Services provided include counseling, advocacy, shelter, and community education.

GLOSSARY AND ACRONYMS

Crisis Intervention Team (CIT)- A local initiative designed to improve the way law enforcement and the community respond to people experiencing mental health crises. The team is built on strong partnerships between law enforcement, mental health provider agencies and individuals and families affected by mental illness.

Department of Human Services (DHS)- A Maryland State Agency that assists vulnerable low-income residents with buying healthy foods, paying energy bills, and obtaining medical insurance. This department also provides safe and stable environments for at-risk children and adults.

Department of Rehabilitative Services (DORS)- A vocational rehabilitation program that assists individuals with disabilities with obtaining and maintaining employment. Eligible individuals with disabilities are assisted with maintaining independence in their home and communities by means such as ramps and bathroom modifications.

Emergency Department (ED)- The department of a hospital responsible for the provision of medical and surgical care to patients arriving at the hospital in need of immediate care.

Emergency Psychiatric Services (EPS)- A twenty-four hour/seven day a week operation, located within the Calvert Health Services Emergency Department, that provides emergency psychiatric services and extended observation beds for individuals in crisis. EPS provides face to face psychiatric evaluations by a qualified mental health professional and conducts somatic evaluations to rule out medical etiology of problems. EPS staff actively seek alternatives to hospitalization by making referrals to other community health services, as needed.

Eye Movement Desensitization and Reprocessing (EMDR)- A psychotherapy treatment that was originally designed to alleviate the distress associated with traumatic memories.

Federal Emergency Management Agency (FEMA)- A federal Agency designated to provide financial and other assistance to government entities during a disaster.

Fiscal Year (FY)- A 12-month period used by companies and governments for financial reporting and budgeting. The Maryland State Fiscal Year runs from July 1 to June 30.

General Education Development (GED)- A credential that certifies that an individual has academic knowledge and skills equivalent to a high school graduate.

Individualized Education Program (IEP)- A legal document under United States law that is developed for each public-school child in the U.S. who needs special education. It is created through a team of the child's parent and district personnel who are knowledgeable about the child's needs.

In-Home Intervention Program (IHIP)- A therapeutic program that provides intensive in-home intervention to empower individuals and families, divert individuals from hospitalization or residential treatment placement, and to maintain individuals in their homes. These programs are available for both adults (**IHIP-A**) and children and adolescents (**IHIP-C**).

GLOSSARY AND ACRONYMS

Intensive Outpatient Program (IOP)- A treatment program used to address Mental Health and Substance Use Disorders that do not require detoxification or round-the-clock supervision. These programs must provide at least 9 hours of therapeutic programming per week.

Level of Service/Case Management Inventory (LS/CMI)- An assessment tool that measures the risk and need factors of late adolescents and adults who have been incarcerated. This single application provides all the essential tools needed to aid professionals in treatment planning for and management of incarcerated individuals in justice, forensic, correctional, prevention, and related agencies.

LGBTQ+- An initialism that stands for lesbian, gay, bisexual, transgender, questioning, and more.

Local Addictions Authority (LAA)- - The local substance use disorder authority responsible for planning, managing, and monitoring public mental health services at the local level. These organizations exist under the authority of the Secretary of the Maryland Department of Health and also are agents of the county government, which approve their organizational structure.

Local Behavioral Health Authority (LBHA)- An organization responsible for planning, managing and monitoring the Public Behavioral Health System in local jurisdictions and providing information and referral services to individuals seeking mental health and substance use-related resources to facilitate access to care.

Local Behavioral Health Authority Advisory Council (LBHAC)- The council oversees the work of the local Core Service Agency and Local Addiction Authority, or Local Behavioral Health Authority and is responsible for assisting in developing the plans, strategies, and priorities of the county for meeting the identified needs of the general public and the criminal justice system for behavioral health evaluation, prevention, intervention, and treatment.

Local Designated Authority (LDA)- A person or body specified or described in the law or policy of a jurisdiction for the purposes of governing and/or managing and monitoring.

Local Drug and Alcohol Abuse Council (LDAAC)- The council oversees the work of the Local Addiction Authority or Local Behavioral Health Authority and is responsible for assisting in developing the plans, strategies, and priorities of the county for meeting the identified needs of the general public and the criminal justice system for substance use evaluation, prevention, intervention, and treatment.

Local Health Department (LHD)- A local government agency on the front lines of public health. In addition to enforcing health laws, particularly in regard to sanitation and communicable diseases, the health department provides a number of health-related services that directly benefit individuals as well as the community at large.

Local Jurisdiction-The government or legal body that has the authority to make legal pronouncements and administer justice to individuals and companies who are conducting transactions within a given geographical location.

GLOSSARY AND ACRONYMS

Local Mental Health Advisory Council (LMHAC)- The council oversees the work of the local Core Service Agency or Local Behavioral Health Authority and is responsible for assisting in developing the plans, strategies, and priorities of the county for meeting the identified needs of the general public and the criminal justice system for mental health evaluation, prevention, intervention, and treatment.

Maryland Addiction Consultation Services (MACS)- A grant funded program offered through the University of Maryland School of Medicine that provides support to prescribers and their practices in addressing the needs of their patients with substance use disorders and chronic pain management. This program offers consultation, education training opportunities and events, technical assistance for practices looking to implement or expand office-based addiction treatment services, and real-time online learning sessions with expert specialists' teams through their MACS TeleECHO Clinic.

Maryland Association of Behavioral Health Authorities (MABHA)- A non-profit organization composed of Maryland's Core Service Agencies, Local Addiction Authorities, and Local Behavioral Health Authorities.

Maryland Department of Health (MDH)- A public health department, responsible for improving the health status of Maryland residents and ensuring access to quality health care. MDH is responsible for helping each person live a life free from the threat of communicable diseases, tainted foods, and dangerous products. MDH regulates health care providers, facilities, and organizations, and manages direct services to patients, where appropriate.

Maryland Emergency Management Agency (MEMA)- The agency designated by the Governor of Maryland to be responsible for handling emergency situations in Maryland.

Maryland Certification of Recovery Residence (M CORR)- A credentialing entity, located within the Maryland Behavioral Health Administration, that develops and administers a certification process for recovery residences.

Maryland Community Criminal Justice Treatment Program (MCCJTP)- A state funded program that provides clinical intervention and case management services to individuals diagnosed with a serious mental illness within the local detention center.

Medical Assistance/Medicaid (MA)- Pays the medical bills of needy and low-income individuals. It is administered by the State and pays medical bills with Federal and State funds.

Medication Assisted Treatment (MAT)- The use of medications in combination with counseling and behavioral therapies, which is effective in the treatment of opioid use disorders (OUD) and can help some people to sustain recovery. There are three drugs approved by the United States Food and Drug Administration for the treatment of opioid dependence: buprenorphine, methadone, and naltrexone. All three of these treatments have been demonstrated to be safe and effective in combination with counseling and psychosocial support.

Memorandum of Understanding (MOU)- A type of agreement between two or more parties. While not legally binding, they carry a degree of seriousness and mutual respect.

GLOSSARY AND ACRONYMS

Mental Health Housing Stabilization (MHHS)- A program designed to provide 24/7 assessment, stabilization, and case management services to adults diagnosed with mental illness who are at risk for homelessness or who may already be homeless.

Mobile Crisis Team (MCT)- A behavioral health service which services the community by providing immediate response emergency mental health and/or substance use disorder evaluations. These services are often available on a 24-hour basis and are delivered within the client's home or in the community.

National Alliance on Mental Illness (NAMI)- The nation's largest grassroots mental health organization dedicated to building better lives for the millions of Americans affected by mental illness. They are an association of more than 500 local affiliates who work in the community to raise awareness and provide support and education that was not previously available to those in need.

Office of Emergency Management (OEM)- A government organization responsible for minimizing the effects of disasters through mitigation, planning, training, and response efforts

On Our Own (OOO)- A peer-operated behavioral health advocacy and education organization which promotes equality, justice, autonomy, and choice about life decisions for individuals with mental health and substance use needs. This organization provides residents with information and referral services to community agencies and programs.

Opioid Treatment Provider (OTP)- Behavioral Health provider organizations that provide Medication Assisted Treatment for people diagnosed with an Opioid Use Disorder. These organizations must be certified by the Substance Abuse and Mental Health Services Administration (SAMHSA) and accredited by an independent, SAMHSA-approved accrediting body. For SAMHSA certification, OTPs must comply with all pertinent state laws and regulations and all regulations enforced by the Drug Enforcement Administration.

Opioid Use Disorder (OUD)- A chronic brain disease caused by physical and psychological reliance on opiates.

Outpatient Mental Health Clinic (OMHC)- A licensed healthcare facility where patients obtain therapeutic services from a variety of mental health professionals. Depending on the particular clinic, individual therapy, group therapy and medication management may be available.

Partial Hospitalization Program (PHP)- A short-term treatment program that enables patients who require significant support to stay in the community and avoid inpatient care. Depending on clinical need, patients receive treatment for either 4 or 6.5 hours per day.

Prescription Drug Monitoring Program (PDMP)- A software program established by the Maryland Department of Health, to support healthcare providers and their patients in the safe and effective use of prescription drugs. This program collects and securely stores information on drugs that contain controlled substances and are dispensed to patients in Maryland.

GLOSSARY AND ACRONYMS

Performance Improvement Plan (PIP)- A tool given to a grant funded program with performance deficiencies. It may be used to address failures to meet specific goals or performance measures or to ameliorate behavior-related concerns.

Performance Measures (PMS)- The expected outcomes and results of a grant funded program. Data collected assists with determining the effectiveness and efficiency of grant funded services.

Personal Protective Equipment (PPE)- Protective clothing, helmets, gloves, face shields, goggles, facemasks and/or respirators or other equipment designed to protect the wearer from injury or the spread of infection or illness.

Projects for Assistance in Transition from Homelessness (PATH)- A Federally funded grant program that provides case management services to individuals diagnosed with serious mental illness, including those with co-occurring substance abuse disorders, who are experiencing homelessness or the risk of becoming homeless.

Psychiatric Rehabilitation Program (PRP)- An accreditation-based licensed program that provides community-based comprehensive rehabilitation and recovery services and supports and promotes successful community integration and use of community resources.

Public Behavioral Health System (PBHS)- All the activities whose primary purpose is to promote, restore or maintain behavioral health. This includes all organizations and resources focused on improving behavioral health.

Request for Proposal (RFP)-A document that announces and provides details about a project, as well as solicits bids from contractors who will help complete the project.

Residential Rehabilitation Program (RRP)- A program that provides housing and supportive services to individuals diagnosed with a Serious Mental Illness with the goal of supporting an individual to transition to independent housing. Services include providing staff support in areas such as medication monitoring, independent living skills, symptom management, stress management, relapse prevention, linkages to employment, education and/or vocational services, crisis prevention and other services that will help with the individual's recovery.

Residential Treatment Center (RTC)- A type of behavioral healthcare facility where patients live at the facility while receiving treatment. Services provided include but are not limited to individual and group therapy, medication management, medical services, and psychoeducation.

Serious Mental Illness (SMI)/Severe and Persistent Mental Illness (SPMI)- A severity of mental illness where an individual experiences severe symptoms or severe difficulty in social, occupational or school functioning that, despite treatment, has lasted for 2 years or more.

Site Visit/Audit- A part of the quality evaluation and monitoring process for grant funded and fee-for-service behavioral health services. The purposes of site visits include observing facilities, interacting with staff and consumers, accessing documentation, scrutinizing tangible evidence of consumer achievements and checking the veracity of self-assessment statements.

GLOSSARY AND ACRONYMS

Social Security Administration (SSA)- An independent agency of the United States Federal Government that administers Social Security, a social insurance program consisting of retirement, disability, and survivor benefits.

Social Security Outreach Access and Recovery (SOAR)- A program designed to increase access to Social Security Administration disability benefits for eligible individuals who are experiencing or at risk of homelessness and have a mental illness, medical impairment, and/or a co-occurring substance use disorder.

Southern Maryland Community Network (SMCN)- A private, non-profit mental health agency serving individuals in the Southern Maryland Tri-County area that have been diagnosed with severe and persistent mental illnesses.

Substance Use Disorder (SUD)- A chronic brain disease caused by physical and psychological reliance on drugs and/or alcohol.

Targeted Case Management (TCM)- Case management services provided to individuals diagnosed with a serious mental illness. These comprehensive services include assessment, development of an individualized plan, referral to services, and monitoring of progress and needs.

Transitional Aged Youth (TAY)- Young people between the ages of sixteen and twenty-five who are in transition from state custody or foster care environments and are at-risk.

Traumatic Brain Injury (TBI)- A disruption in the normal function of the brain that is caused by a bump, blow, jolt to the head, or penetrating head injury.

Treatment Intervention Procedure (TIPS)- A dynamic, skills-based training program designed to prevent intoxication, drunk driving and underage drinking by enhancing the fundamental "people skills" of servers, sellers and consumers of alcohol.

Wellness Recovery Action Plan (WRAP)- A self-designed prevention and wellness process that anyone can use to get well, stay well and make their life the way they want it to be.

INTRODUCTION

A. Introduction

The Calvert County Local Behavioral Health Authority (LBHA) is responsible for managing the Public Behavioral Health System (PBHS) in Calvert County. The agency was created in July 2019 by integrating the local Core Service Agency (CSA) and Local Addictions Authority (LAA). The LBHA is located within the umbrella of the Calvert County Health Department under the direction of the Health Officer as well as with the cooperation of our Local Mental Health Advisory Council (LMHAC) and the Local Drug and Alcohol Abuse Council (LDAAC), which have been meeting together as a Local Behavioral Health Advisory Council (LBHAC) since December 2019.

Mission: To ensure all Calvert County residents have access to quality behavioral health services.

Vision: To cultivate a comprehensive system of behavioral health care in Calvert County, that provides individualized services to promote wellness, empowerment, and recovery across the lifespan of our residents.

Calvert County itself is a small, exurban county located 30 miles southeast of Washington, DC. The latest population estimate puts the current population at 92,525 (U.S. Census Bureau). The population breakdown by race is 81% White, 13.3% Black, 0.5% Native American, 1.9% Asian, 0.1% Pacific Islander, and 3.2% Biracial. There are more women than men living in Calvert, making up 50.4% of the population. The largest segment of the population is between the ages of 19 and 64, making up 61.5% of the population, with children and adolescents under the age of 18 accounting for 23%, and individuals over the age of 65 comprising the remaining 15.5%.

Geographically, Calvert County is the smallest county in Maryland, with only 213 square miles of land. The land itself is long and spread out, reaching 35 miles in length, and it is bounded by the Chesapeake Bay on the east and the Patuxent River on the west. Calvert County is reported to be one of the richest counties in the nation with a median income of \$109,313 and the 2nd lowest Medicaid eligibility rate in the State at 16.5%.

The LBHA office is physically located in Prince Frederick, approximately halfway between the northern and southern ends of the county. During FY21, the LBHA has been mainly teleworking, due to the COVID-19 pandemic. The office is currently staffed by 4 individuals which include the Director, an Office Supervisor, and two Behavioral health Coordinators. The two Coordinators focus their efforts in specific specialized areas, one in forensics and homelessness and the other in crisis services and recovery support. The Child & Adolescent Coordinator position remains vacant at this time due to lack of administrative funding for the position and these duties have been delegated throughout the rest of the department or have been put on hold due to lack of staffing.

A core purpose of the Calvert County LBHA is to provide behavioral health expertise to and collaborate with local stakeholders from multiple systems, to ensure that Calvert County residents have timely access to effective behavioral health interventions, treatment, services

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and supports. Fulfilling this responsibility will result in better health and wellbeing for all individuals and families in Calvert. The LBHA has four essential roles: leadership, management, oversight, and operations.

The LBHA must practice leadership by collaborating with behavioral health entities to develop a comprehensive continuum of behavioral health services for the PBHS at the local level. The LBHA is responsible for providing the public and consumers with prevention, education, and information on behavioral health. In Calvert County we also focus on providing behavioral health expertise to key stakeholders throughout the local jurisdiction. We hold bi-monthly Advisory Council and Behavioral Health Provider Meetings on opposite months that assist with facilitating coordination among stakeholders to develop, enhance and promote comprehensive and accessible services for the PBHS at the local level.

The LBHA takes on the role of management to assess, plan, design and manage needed behavioral health programs and services for the PBHS at the local level. Specifically, the LBHA coordinates care and support services for people who have behavioral health conditions, especially individuals with complex needs. The LBHA develops and implements a strategic plan for the local PBHS that meets State requirements, to include regular and ongoing assessment of local behavioral health needs and efforts to meet those needs. This plan assists with designing, developing and managing needed behavioral health services, as well as a budgeting for PBHS program and service grant awards. Finally, they coordinate with the local health department to design approaches to prevent or mitigate the impact of behavioral health needs on the local community and procure service and contract with behavioral health providers to implement local behavioral health programs and services. Special populations of focus within Calvert County include, but are not limited to, individuals in crisis, individuals experiencing homelessness, and individuals diagnosed with Opioid Use Disorder.

Oversight of the implementation of behavioral health programs and services ensure compliance and promote quality service availability for local residents. This is done by monitoring, evaluating and reporting on performance of grant funded programs. Following the Conditions of Award for each grant awarded, the LBHA conducts audits, collects monthly data reports, and assess the findings to determine the quality of services. They also conduct site visits annually to a broader scope of behavioral health providers to ensure compliance and quality of care throughout the local jurisdiction. The LBHA also assists the Administrative Service Organization during audits of fee-for-service programs as well as acting as the point of contact for grievances against local providers.

Finally, the Calvert County LBHA is responsible for managing operations and administrative functions within the organization itself. This is done by developing and implementing written policies and procedures to ensure the LBHA operates in compliance with local, state, and federal requirements. Other duties include engaging in administrative activities that address issues such as legal, procurement, and information technology. The LBHA administrative budget is closely managed using approaches that avoid duplication of effort and make the best

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use of limited public resources. Human resource activities are conducted including staff recruitment, retention, and professional development and training.

B. New Developments and Challenges

Local Behavioral Health Advisory Council (LBHAC)

In December 2020, the Local Mental Health Advisory Council (LMHAC) and the Local Drug and Alcohol Abuse Council (LDAAC) began meeting together to form the Calvert County Local Behavioral Health Advisory Council. A workgroup was created to assist with rewriting the Bylaws for this council to formalize their integration. During FY20, the work group has met three times and has finalized the membership, terms, and duties of the council. Following the final meeting of the workgroup it was discovered that the Board of County Commissioners must also review and approve changes to the Core Service Agency (CSA) Bylaws to transition those to reflect the merge of the CSA with the Local Addictions Authority (LAA) into the LBHA. This has delayed the process of submitting the merged council bylaws for approval, first to the LBHAC, and then to the County Commissioners.

COVID-19

In January of 2020 the United States saw its first cases of what has been termed the SARS-CoV-2, COVID-19 or Coronavirus for short. Two short months later, in March, the State of Maryland began implementing measures to control the rate of infection, including mandating teleworking for all eligible employees. Since this time, the LBHA has been teleworking, at least part time. Between the months of March and July, the LBHA also increased the frequency of our Local Behavioral Health Provider Meeting to monthly to assist with coordinating provider efforts and updating providers about the current state of events.

During this unprecedented time, the Governor's Executive Order allowed for exceptions to normal rules and regulations regarding the utilization of telehealth services. Many Calvert County providers have adjusted their outpatient programming to integrate telehealth services to ensure continued and safe access to services. Organizations that continue to provide in person services are required to follow specific safety protocols including, social distancing, extreme cleaning measures, mandatory mask-wearing of all staff and consumers, elimination of or limited visitation, etc. In many cases this transition has gone smoothly however there are situations where telehealth has not been able to adequately meet the needs of the community. Certain populations such as young children, individuals without access to necessary technology, and certain populations of individuals with serious mental illness cannot always be served and unfortunately have slipped through the cracks at times.

Another result of the pandemic that has further complicated accessing services for individuals and services that cannot utilize telehealth is the impact on local transportation. In March public transportation began operating on a modified schedule. Then from April to mid-May they reduced even further to demand response service for essential trips only. Modified service was reimplemented mid-May and then full service was resumed in June 2020. Saturday service was cancelled April thru October. Many individuals who receive services in the Public Behavioral Health System (PBHS) rely on public transportation to attend appointments so the lack of access during this period created even further barriers to in person services. As mentioned

NEW DEVELOPMENTS AND CHALLENGES

previously, certain vulnerable populations have been more adversely impacted by lack of transportation and access to resources to access telehealth services.

The global pandemic has also caused disruption and barriers to many of our grant services. The national shutdown and COVID-19 restrictions caused some of the behavioral health programs within the county to halt services. Through Calvert County's State Opioid Response Recovery Housing Grant, Oxford House Inc was able to open a new recovery house with plans to begin accepting residents on April 15, 2020. Unfortunately, this timing was at the beginning of the pandemic and they had to push the opening date back to June 1, 2020. They were given strict guidelines to follow in order to ensure the safety of new residents and staff which ultimately slowed the process of filling the home with new residents. They were instructed to admit a maximum of 5 individuals for the first 2 week, and only 2 residents every 2 weeks following the opening of the home.

The Temporary Cash Assistance Addition Specialist program has not been fully operational since the national shutdown in March 2020. The Calvert County Department of Social Services has been operating remotely since the shutdown in March 2020. Paperwork is being submitted via e-mail, fax and at a drop off receptacle in the front vestibule of the building. Due to the pandemic, DSS is no longer making Substance Use Disorder screening a requirement for Temporary Cash Assistance (TCA). While the Addiction Specialist continued to contact existing consumers to provide case management via telehealth, no new individuals have been referred or screened during this time.

The onset of COVID-19 caused the Calvert County Detention Center to significantly reduce the number of incarcerated individuals and halt visitation of the public, including service providers. Calvert County has a number of detention center based grant services that were not able to meet with individuals in the detention center prior to their release. This has caused a tremendous disruption in grant implementation and offering services to detained individuals. Re-entry case managers have made the effort to contact individuals after release to help connect them with appropriate resources.

Similar issues have been faced in LBHA court-based grant services. Since March 2020, our local courts have restricted operations to emergencies and limited other prioritized cases. They are currently utilizing Level II protocol in which District and Circuit Courts will hear specific case types remotely or in-person, but jury trials will not be held until restrictions are lifted. This has suspended or drastically reduced operations of most grant funded court-based services including the Court Assessor, State's Attorney Liaison, and Drug Court Programs. Meeting the Conditions of Award has been very difficult, if not impossible, for our local providers of court-based services.

The Family Navigation Program, provided by Maryland Coalition of Families, has continued to offer services via telehealth during the pandemic. By making adjustments to programming, they have continued to meet their program goals of providing support and resources to local families. Outreach encounters with local organizations have been limited in order to protect the health and safety of program staff. Maryland Coalition of Families collects satisfaction data

from all participants and even with the changes and adjustments to their services they continue to receive an average of 4.94/5 satisfaction rating of their services.

While the national shutdown was implemented to ensure the safety of the general public it was important for certain programs to keep their doors open. On Our Own of Calvert was able to make specific adjustments in order to ensure the homeless population could still receive life-saving services within the county. They reduced programming to 4 hours per day, from 9am to 1pm, to allow for showers and meal distribution. On Our Own limited the consumers to the homeless population during this time. They adhered to strict cleaning protocols and maintained social distancing. They were able to open their doors back up to the general public by July 2020, taking proper precautions.

Administrative Services Organization Transition

The transition of the Administrative Services Organization (ASO) from Beacon Health Services to Optum Maryland on January 1, 2020 has created a number of challenges throughout the entire system of behavioral health care. Lack of training for LBHA staff as well as providers led to mass confusion about how to file and approve claims, enter and/or find individuals in the Incedo platform, and track whether payments have been made for services rendered. On top of lack of training, the Incedo platform itself has had countless problems causing many local providers to have to hire additional staff or pay out numerous hours of overtime to billing staff to re-enter claims that were either lost, inappropriately denied, or had been sent to the incorrect jurisdiction for approval. Supportive Employment and Crisis bed authorizations had the most barriers to approval. The estimated payments process also had a number of roadblocks with some providers being paid far more than their actual billing and others only being reimbursed as little as 1% of what they were owed. One year into the transition, many of these problems still exist and have caused undue hardship to a provider network that is also strained due to an ongoing pandemic that has also disrupted the provision of services and the associated costs.

Administrative Understaffing

During 2020 there was turnover within the LBHA staff, causing challenges to remaining staff who have had to take on the responsibilities of the vacant positions. While one position was filled fairly quickly, the vacant Child & Adolescent Coordinator position cannot be filled due to a lack of administrative funding to cover the cost of this position. The knowledge and experience of the individual who filled this position previously has also been a great loss for the LBHA team. The goal of the LBHA Director is to have highly skilled staff who are knowledgeable, adaptive, and capable of learning and organizing the required work effectively. In order to provide appropriate compensation and benefits to current staff for the work being conducted, the C&A Coordinator position remains vacant due to lack of sufficient funding.

C. LBHA Organizational/Re-organizational Structure

Calvert County Local Behavioral Health Authority has been operating since July 2019 following the merge of the Core Service Agency and Local Addictions Authority. The LBHA is located within the umbrella of the Calvert County Health Department and operates under the direction and authority of the Calvert County Health Officer. Prior to the merge, the Core Service Agency (CSA) and Local Addictions Authority (LAA) were located in separate departments within the Health Department. The decision to merge was made by Health Department leadership in consultation with BHA, the Local Mental Health Advisory Council (LMHAC), and the Local Drug and Alcohol Advisory Council (LDAAC).

Following the achievement of integrating the CSA and LAA into the LBHA, it was determined that the next steps of organizational integration would be to join the two Advisory Councils. During the October 2019 meetings of each council, they voted to begin meeting together beginning in December 2019. During the December meeting a workgroup was created, including members from diverse stakeholders from the two Advisory Councils, to begin rewriting the bylaws of the LMHAC. These bylaws are approved by the Calvert County Commissioners Board of Health, which consists of the elected Commissioners and the Health Officer of the County. At this time, the workgroup is in the final stages of this task and, once complete, will submit the final bylaws to the commissioners for approval. This will officially merge the two councils into the Calvert County Local Behavioral Health Advisory Council (LBHAC).

The internal operations of the LBHA are managed by a small team including the Director, an Office Supervisor, and two Behavioral Health Coordinators. The Department is supervised by the Deputy Health Officer of the Health Department under the authority of the Health Officer. See attachment A for the organizational chart, a detailed overview of the organizational hierarchy. The team works closely together to ensure proper planning, monitoring, and implementation of goals and programs. The LBHA also has close relationships with local and State stakeholders. See attachment B for an Eco-map visualizing the relationship the LBHA has with other state and local organizations. This map shows how the LBHA influences and is influenced by local and state organizations, as well as how our provider network, grant funded services, and county organizations are linked to one another in assisting our residents meet their behavioral health needs.

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D. FY20 Highlights and Achievements

FY20 Plan Goal Review

In December 2019, the LBHA team, in conjunction with local Advisory Council stakeholders, created goals to plan the work for Fiscal Year 2021. The following is a summary of the progress and efforts made towards meeting these goals.

Goal 1: The Local Behavioral Health Authority will Integrate the Local Mental Health Advisory Council (LMHAC) and Local Drug and Alcohol Abuse Council (LDAAC) into a Local Behavioral Health Advisory Council (LBHAC).

Progress: The two Advisory Councils voted to begin meeting together in October 2019 and held their first joint Advisory Council Meeting in December 2019. A Bylaws workgroup was created during that initial meeting to ensure stakeholder collaboration in updating and integrating the Councils at the local level. The Bylaws workgroup has convened 4 times in FY21 to discuss membership, terms, officers, duties, and other details that are necessary to include in the bylaws document. During the November 2020 meeting the final details for the proposed bylaws were agreed upon by the workgroup members. After discussion with the Calvert County Government, it was determined that the entire Core Service Agency Bylaws must be updated to reflect the integration of the CSA and LAA into the LBHA.

Goal 2: Increase access to mental health and substance use disorder services for children and adolescents in Calvert County.

Progress: The Calvert County Local Behavioral Health Authority has worked with the Calvert County Family Network to facilitate their local needs assessment, a portion of which focused on Child and Adolescent Behavioral Health needs. Youth depression was identified as one of the key areas of concern for local teens and a lack of providers to provide services for this population was also pinpointed as a concern. Mental Health hospitalizations for youth are also noted to be higher than the State average. These results will guide LBHA goals for FY22.

Goal 3: The Calvert County LBHA will reduce barriers to shelter and housing for homeless individuals in Calvert County.

Progress: The Calvert County Government held a Housing Taskforce engaging multiple stakeholders at the local level. The LBHA sent multiple staff to these meetings to represent the needs of individuals and families experiencing homelessness in our county. The Task Force developed a strategic plan to address affordable housing through meetings that engaged input from diverse stakeholders. Draft recommendations include a market trend analysis, educating

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the community and designing developer incentives. The Housing for All Task Force initiative is working to meet one of the comprehensive plan goals to provide housing for multigenerational communities, with a focus on workforce housing for millennials and seniors. This initiative allows senior citizens to age in place, in close proximity to valuable health services. The Homeless Needs Assessment is planned for January - June 2021.

Goal 4: The Calvert County LBHA will increase awareness of the importance of effective treatment for behavioral health disorders within Calvert County residents.

Progress: The Calvert LBHA has planned for 2 cultural competency trainings in February 2021, Understanding & Exploring the Role of Cultural Competency in Service Delivery and Ethical and Cultural Issues in a Healthcare Setting. A presentation on the importance of cultural competence in behavioral health will be made to the Advisory Council at their April Meeting to ensure that all behavioral health stakeholders are kept well informed about the importance of delivering equitable healthcare services to individuals with behavioral health disorders from diverse backgrounds.

Currently in Calvert County, there are no specific support groups being offered for diverse populations including non-white people, the LGBTQ+ community, etc. The LBHA is presently developing more opportunities for individuals to feel understood and supported by working towards starting a new support group for the LGBTQ community. The LBHA has collaborated with the Calvert Rainbow Alliance and developed a plan for starting a support group. Due to the pandemic, this support group will be offered virtually on the fourth Tuesday of each month at 6:30pm. The group name is "I Am" and the first meeting was held on January 26, 2021. Once it is deemed safe to return to in-person services, the group will meet at Calvert Rainbow Alliance's physical location in Prince Frederick.

Goal 5: The LBHA will expand access to Medication Assisted Treatment (MAT) for Substance Use Disorders (SUD) in Calvert County during FY21.

Progress: The Calvert County LBHA partnered with the Health Department to apply for Hub & Spoke Pilot funding and the proposal was accepted. This funding will provide additional grant funds to local medical providers to assist with implementation of this model within Primary Care and other medical practices. This funding will assist with improving access to Buprenorphine induction and medication management within the community. The LBHA also continues to work with MACS to coordinate Buprenorphine 101 and other specialty trainings for local somatic care professionals. At least 3 are planned for the spring; one scheduled for January 11, 2021 from 12:00pm-1:00pm, focusing on the hospital setting and understanding the prescribers' role in treatment of OUD within the hospital setting, one is scheduled on January 27, 2021 from 12:00pm-1:00pm focusing on the prescribers' next steps in treating OUD and is a

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joint effort with St. Mary's county, and the third is scheduled on April 14, 2021 from 12:00pm-1:00pm as a Buprenorphine 101 to help engage prescribers from community-based practices. A presentation on the efficacy of Medication Assisted Treatment is also scheduled for the February Local Behavioral Health Advisory Council Meeting to continue to inform local stakeholders about the importance of destigmatizing this evidence-based treatment. An RFP was also issued during this fiscal year to provide comprehensive training to Detention Center staff on mental health disorders, substance use disorders, and Medication Assisted Treatment, among other topics.

In an effort to inform Calvert County providers about Buprenorphine Initiative funding opportunities, the LBHA developed several strategies including creating a PowerPoint presentation and flier for advertisement purposes. The slideshow was presented at the Provider Meeting and the Advisory Council meeting to educate individuals on how to access the funding. A copy of the applications and flier were sent via email to all of the Calvert County providers that work with the LBHA. During the end of year site visits to agencies such as Bayside Recovery, Project Chesapeake, Avenues, and A+ Counseling, the LBHA Coordinator handed out the applications and the flier, explaining the process. The LBHA will continue to make efforts necessary to inform the public of these funding opportunities.

In December, the LBHA began collaborating with local Primary Care providers through presentations about local resources and Q&A sessions. This effort to educate medical providers about behavioral health resources within the county, along with other efforts through the Community Health Improvement Roundtable to improve coordination between somatic and behavioral health care, are the initial steps towards meeting this goal.

The Local Behavioral Health Authority has been eager to develop a public awareness event to help break the stigma of Medication-Assisted Treatment (MAT). The pandemic restrictions created challenges, preventing any in-person events to occur so the LBHA decided to develop a multi-purpose campaign to not only educate the public, but to also provide the public with free PPE. With the help of the Messaging Workgroup, the LBHA created a logo and added the phrase: "Unmask the Myths: MAT saves lives" to cloth masks, disposable masks, and hand sanitizers. The LBHA also created a postcard to hand out with the Myths vs Facts to help educate individuals about the effectiveness of MAT. After presenting the idea at the Provider Meeting, the LBHA received 9 agency requests for this PPE. The LBHA donated the remainder of items to Project Echo to hand out during a community resource fair. The LBHA was able to purchase 300 cloth masks, 2,000 disposable masks, 80 hand sanitizers, and 500 postcards for distribution.

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New Services

At the outset of the FY20 year, the Calvert LBHA, in conjunction with BHA and other local stakeholders, identified 5 new services that were able to be implemented in the county to assist with filling gaps in services and meeting the needs of our residents.

MAT Case Manager

The MAT Case Manager provides case management services to individuals who have been diagnosed with an Opioid Use Disorder or Alcohol Use Disorder and may need assistance with referral to Medication Assisted Treatment. Care coordination is conducted between client's MAT provider, somatic care physician, behavioral health treatment provider, and/or any other agencies involved in each individual's care team.

Legal Liaison

This program provides wraparound case management services to individuals involved in the criminal justice system in Calvert County. The Legal Liaison will work with individuals who are both pre and post arrest to provide intervention and referral to needed services. This program will work to build relationships with the local State's Attorney's and Public Defender's Offices to assist with removing legal barriers to treatment for client's in crisis.

School Based Services Coordinator

The School Based Services Coordinator is responsible for Coordinating the efforts of the Calvert County School Based treatment providers with the local Handle with Care efforts between Law Enforcement, Mobile Crisis, Rational Re-Entry, and the Calvert County Public School system. This program ensures that services delivered to local students are seamless, coordinated, and ensures referrals to necessary external services are made when necessary.

Treatment in the Detention Center

This program has expanded the behavioral health treatment capacity in the Calvert County Detention Center. Services provided include mental health, substance use disorder, and co-occurring treatment services. Inmates are screened by case managers within the Detention Center and then referred to the appropriate jail-based treatment services including individual therapy, level 1 Substance Use Disorder group therapy, level 2.1 Substance Use Disorder Intensive Outpatient Program. For individuals with shorter sentences or who are nearing release, linkages to community based behavioral health services are also made to ensure all individuals with diagnosed behavioral health disorders are provided the opportunity to receive services both inside and outside of the Detention Center.

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Court Assessor/Diversion Program (SUD)

This program is a partner to our Mental Health Court Assessor/Diversion Program. It provides behavioral health assessment and wraparound case management services to individuals involved in the criminal justice system in Calvert County. This program will work to connect eligible individuals involved with the Calvert County Court System with local resources to divert them from future incarceration.

Training Highlights

During FY19, the LBHA focused some of our efforts on behavioral health workforce development, both directly, and through our grant-based services. The LBHA contracted with two licensed clinicians to provide behavioral health training to local providers. In January 2020, the LBHA hosted a training on Writing Effective Progress Notes. This training was attended by 25 local providers including clinicians, case managers, supervisors, and supportive service providers. The second training, held in May 2020, was entitled The Effects of Parental Substance Use on Children and Extended Families. This training was well attended by 35 individuals and explored the disease of addiction and the impact it has on the mental health and substance use of the children and families of those who suffer from this disease.

During this year another training was conducted using LBHA grant funds through the Buprenorphine Initiative. The Calvert County Health Department Behavioral Health Clinic also hosted a Buprenorphine 101 training for local Physician's, Nurse Practitioners, and Physician Assistants, in order to educate them about the efficacy of providing Medication Assisted Treatment to individuals with Opioids Use Disorder. Through a partnership with the University of Maryland MACS, Dr. Eric Weintraub and Dr. Drew Fuller presented the facts about the Opioid Epidemic and the importance of using evidence-based treatments such as MAT during intervention. This event was attended by 24 individuals, including prescribers and clinicians.

Resources for Residents Seeking Services

One goal of the Calvert LBHA is to empower individuals to be able to choose the services that will best fulfill their behavioral health needs. In the spirit of this goal, brochures were developed and designed, including the names, contact information, and services provided by local clinical behavioral health programs. The first set of brochures focused on adult behavioral health services which were printed just prior to the onset of the COVID-19 pandemic. During FY20 the brochures were unable to be distributed due to concerns about providing paper materials during a highly contagious pandemic. Development of a similar brochure focusing on child & adolescent clinical behavioral health services began near the end of the year and work was continued into FY21.

Advisory Council Updates

In December 2019, the Calvert County Local Mental Health Advisory Council (LMHAC) and the Local Drug and Alcohol Abuse Council began to meet together as a first step towards creating an integrated Advisory Council. Two workgroups were created from the outset, the Messaging

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Workgroup and the Bylaws Workgroup. The Messaging Workgroup has assisted the LBHA with creating a new mission and vision statement, identifying outreach strategies to reduce stigma and educate the public about available services within the county, and coordinate outreach and messaging between multiple organizations. The Bylaws workgroup has had the task of reviewing and updating the LMHAC bylaws to create an integrated council. During FY20, this workgroup established the process for updating the bylaws and began work on identifying the required membership according to Maryland Code.

Provider Highlights and Achievements

On Our Own of Calvert County is a peer support organization that exists for people seeking mental health and substance abuse services in Calvert County. At the onset of the COVID-19 pandemic, most of the Wellness and Recovery centers in Maryland, like On Our Own, were forced to shut their doors and remain vacant due to the state lockdown. The Calvert County location worked closely with the Health Department to develop plans to continue to provide necessary services to Calvert County residents despite the COVID-19 restrictions. There were a few adjustments to programming needed to ensure the safety of staff and consumers. On Our Own management worked hard to remain open and offer services during this critical time. Beginning March 20th, the facility adjusted their hours of operation to 9:00am-1:00pm, Monday-Friday. During this time, they limited services to provide the homeless with shelter, meals, transportation, and laundry facilities. The staff took temperatures daily and provided hand sanitizer and masks. On Our Own had the ability to social distance by reducing the number of individuals served to 8-10 people per day. They followed all CDC guidelines while continuing to serve Calvert County residents that had no place to go during this challenging time.

The Peer-to-Peer grant funds are utilized to provide Peer Recovery Services to residents of Calvert County with substance use disorders. Funds are utilized to employ both Peer Recovery Specialist and Certified Peer Recovery Specialists (individuals with lived experience in behavioral health recovery) to provide one-on-one meetings, Peer Support groups, activities that reduce isolation, Recovery Plan development, accessing entitlements and other social services, community outreach and resource connection activities, and recovery advocacy work. The Peer-to-Peer grant met all requirements during FY20, providing services to a total of 1563 unduplicated individuals and 4,719 peer encounters. The individuals served received an array of services including but not limited to general peer support services, WRAP, assistance with pharmacy and medication needs, referrals to self-help support groups, assistance with transportation, referrals to recovery housing providers, connection to inpatient treatment, referrals to re-entry services, and one on one sessions with peers. All peer encounters were done in a safe and secure environment to ensure individuals felt comfortable. Peer Support Services have been a huge success within the county and has exceeded expectations in meeting the needs of Calvert County residents.

The MAT Coordinator, discussed above under the New Services section, exceeded performance measures in FY20. Despite delays in hiring related to the COVID-19 pandemic, the MAT Coordinator enrolled an average of 25 unduplicated individuals per month into the program,

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compared to the projected 15 indicated in the conditions of award. In just 2 months, the MAT coordinator enrolled a total of 49 unduplicated individuals, which is a quarter of the projected 180 unduplicated individuals served over the course of a year. The end-of-year audit indicated that this program is succeeding in its goal to engage Calvert County residents in behavioral health services for Medicated Assisted Treatment.

The Emergency Psychiatric Services grant funds are utilized to provide 24 hour per day, 7 day per week, face to face emergency psychiatric evaluations by a qualified mental health professional within the Calvert County Medical Center Emergency Department. Over the course of FY20, the Emergency Psychiatric Services program served 1,242 individuals out of the projected 1,000. Despite the national pandemic and required shutdown, the EPS kept their doors open for business and continued to provide services to Calvert County residents 24/7. The EPS staff has provided necessary services despite the challenges brought on by the pandemic. During the end-of-year audit we reviewed 10 consumer files. Out of the 10 randomized consumer files reviewed, all requirements were met, with comprehensive notes and necessary signatures. Each patient was provided a somatic examination within an average of an hour of being admitted and completed a psychosocial evaluation, on average, within 2.5 hours of admission. The EPS staff has done a phenomenal job documenting comprehensive notes on each consumer and ensuring that all their needs are met with an appropriate level of care.

The Rapid Recovery Response Program is a community-based, peer driven Mobile Crisis Team and provides an alternative intervention for individuals refusing transport by Emergency Medical Services to an emergency department or high risk for contact with Emergency Medical Services, police, and crisis response systems. This service has been an important resource for Calvert County residents in behavioral health crises. This program provided exceptional service to those in need of Rapid Access to Medication Assisted Treatment, screening 169 individuals and enrolling 154 of those screened. The Recovery Rapid Response team also exceeded the average time of inductions from point of contact. The conditions projected it should take 12 hours but during the mid-year-audit, the average timeframe pulled from the 10 randomized consumer files for FY20 was 7.8 hours. This program has provided services to any Calvert County residents in search of assistance and staff make several attempts to follow up with program participants to coordinate care across the continuum of services in Calvert. It is also important to note that with the onset of COVID-19, the Mobile Crisis Team (MCT) persevered and acclimated, providing Telehealth services in addition to their regular operations. They continued to work hard, despite abnormal circumstances, to reach the needs of our county residents.

The Maryland Community Criminal Justice Treatment Program (MCCJTP) is a multi-agency collaborative that provides shelter and treatment services to mentally ill offenders in their communities. Created to serve inmates who have been diagnosed with a mental health disorder, the program now also offers services to Calvert residents on probation and parole. Case management services are provided that include crisis intervention, screening, counseling, discharge planning, and community follow up. In FY 2020, 298 unduplicated individuals were

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assessed and 1,418 services were completed. This program consistently exceeds expected outcomes

During FY20, the Calvert County SSI/SSDI Outreach, Access, & Recovery (SOAR) Program has increased from 4 to 10 SOAR certified case workers. Our goal was to increase the amount of SOAR certified case works by 50% in FY2020. During this period, SOAR certified case workers assisted 2 Calvert County residents with the SOAR process and 1 of those individuals was awarded SSI.

The population of individuals over the age of 65 continues to increase throughout the world, and Calvert County has a large population of retired and elderly individuals. The Calvert County Psychogeriatric Assessment and Treatment Program (CCPAT) supports this population by assuring access to clinically appropriate, culturally and linguistically competent care in the community and in congregate living settings. The goal of this program is to encourage people to age well by helping them to preserve their mental, as well as general, health and sense of vitality and fulfillment as they age. In FY20 a total of 237 individuals were seen and 1,288 services were completed, far exceeding the required outcomes.

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E. Planning Process

1. No Wrong Door

Calvert County behavioral health providers have a history of working together collaboratively to ensure that the needs of our residents are being met. Interagency referrals have always been commonplace, both because of the high rates of co-occurring disorders, as well as the collaborative partnerships that agencies have created with one another. Over the past few years, Calvert has seen many new providers that have begun offering services within the county. This has expanded the provider network and brought new services that were not previously offered within the county.

Since the inception of the LBHA, the main focus has been on merging the CSA/LAA's administrative functions which has led to further focus on integrating treatment services within the county as well. There are multiple agencies currently offering co-occurring treatment, but no agency offers the entire spectrum of behavioral health services to all county residents. In December of 2019, the LBHA began holding a provider meeting for all behavioral health providers in the county. One of the goals of this meeting is to assist our local providers, both old and new, with making the necessary connections with each other to ensure a "No Wrong Door" approach. During our provider, meeting, local providers can discuss their services with each other to ensure everyone is aware of the broad spectrum of services available within the county. Most provider meetings also contain a presentation from local providers about the services they offer. So far in FY21, 4 presentations have been given by organizations including Maryland Addiction Consultation Services (MACS), In Home Intervention Program for Adults (IHIP-A), Maryland's Commitment to Veterans, and Calvert Crisis Response.

Another project the LBHA has implemented to further ensure a "No Wrong Door" approach is the creation of treatment services brochures that will be available to residents as well as providers. An Adult Clinical Behavioral Health Services brochure was completed in FY20 and 1000 were printed and distributed to local providers, to community members at community resource fairs, and to local Primary Care Providers. A similar brochure for Child and Adolescent clinical behavioral health services was created and has been finalized and sent for printing. These brochures help to educate providers, consumers, and community members about available clinical resources for behavioral health treatment.

2. Complaints

The LBHA also handles consumer and provider complaints. Conflict resolution initially begins at the provider level. All consumers during the orientation process with local providers are given a copy of their complaint procedures and educated about each step in the process. Any consumer, guardian, family member or provider may request the LBHA to review a complaint if resolution at the provider level has not been satisfactory or applicable. If the complainant has not attempted to resolve the situation with the provider, it will be recommended that the consumer be redirected and utilize the providers procedures. The LBHA will assist the consumer with this process if requested and

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appropriate. After reviewing the written complaint and talking with concerned parties, the LBHA director or his/her designee will recommend actions to resolve the conflict. This review will be completed within five (5) working days. If either party feels the recommended actions are unacceptable, the party may submit a second complaint form requesting a review by the Calvert County Health Officer. After reviewing the written complaint and talking with concerned parties, the Health Officer will recommend actions to resolve the conflict. This review will be completed within ten (10) working days. The LBHA uses this process with all grant recipients as well and includes a clause in all grant contracts to ensure that providers will cooperate with the complaint process should the need arise. If complaints against grant recipients are found to have sufficient cause a Performance Improvement Plan will be executed and the contract could be terminated if deemed necessary.

3. Planning for Unmet Needs

In 2017, a Sequential Intercept Model Map was conducted for Calvert County that focused on the criminal justice system. This needs assessment-identified resources, gaps, and priorities in Calvert County for adults with severe mental illness and co-occurring disorders. This assessment was also used to map opportunities and gaps in services for disconnected youth and parents of incarcerated children. This tool was then updated in 2019 and the update is included in Attachment D.

The Calvert County LBHA also conducts and/or participates in comprehensive needs assessment with its community partners to ensure that gaps in services are identified.

The Calvert County Family Network conducted a Child and Adolescent Needs assessment in 2020 that the LBHA assisted with as a member of the Board of Directors. Results of this effort help to guide LBHA work by identifying areas of need for local children and families. Youth depression was identified as one of the key areas of concern for local teens and a lack of providers to provide services for this population was also pinpointed as a concern. Mental Health hospitalizations for youth are also noted to be higher than the State average. The LBHA is working with the Calvert County Family Network to plan strategies to address the data collected during the needs assessment.

The LBHA also participated in Calvert Health Medical Services Community Health Improvement Roundtable's Community Health Needs Assessment. The data collected during this community survey indicated that behavioral health was a key area of need identified by local community members. Areas of particular concerns include lack of resources, stress, and emotional wellness. Data from this report also indicate that adolescent self-injury and suicidal ideation as well as pediatric mental health hospitalization in Calvert County are more than double the statewide average. This needs assessment led to the creation of a behavioral health subcommittee that will work with the LBHAC to assist with addressing the needs identified in this assessment.

The Calvert County LBHA also has a homeless services needs assessment planned for the second half of FY21. Gathering data on the resources currently available as well as the gaps

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in services will allow the LBHA to make data informed decisions about planning for unmet needs moving forward.

4. Plans to Engage Stakeholders

In order to ensure diverse perspectives are included in the LBHA planning process, the Local behavioral Health Advisory Council (LBHAC) has been engaged to assist in multiple ways. The LBHAC consists of a diverse range of individuals living and working in Calvert County. They continue to assist in strategic planning for the PBHS as well as participating in initiatives to assist the LBHA with meeting the goals specified in the plan. Volunteers from the Advisory Council also participate in work groups to assist with integration and outreach and the LBHA staff frequently recruit individuals from other organizations and community coalitions to assist with planning and implementation of local services.

LBHA staff also sit on a number of community coalitions to ensure that behavioral health needs are represented in multiple forums. The Calvert County Family Network acts as the Local Management Board and works to build a community in which all children and families thrive. The Director is a member of the Board of Directors for this organization and lends expertise in behavioral health to this important mission. The Director also sits on the local Community Health Improvement Roundtable, a partnership between the local hospital, the Health Department, and other community stakeholders. Recently this group has been working with the LBHAC to create a joint behavioral health subcommittee to ensure coordination of activities. As a member of the Overdose Fatality Review Team, the LBHA Director works together with other community organizations to process local overdose deaths and identify any gaps that could improve the provision of services to prevent future deaths.

The Homeless and Forensic Services Coordinator also participates in a number of local and regional community coalitions. As a member of the Calvert County Homeless Services Board this position engages with local and regional stakeholders to advocate for and plan to meet the needs of individuals in Calvert County experiencing homelessness. The LBHA works together with the Homeless Services Board to secure grant funding, promote access to and utilization of local programs, and to end homelessness in Calvert. As a member of the Adult Interdisciplinary Team (AIDT) the Forensic and Homeless Services Coordinator promotes improved service delivery systems by addressing not only the quality of direct services, but also by seeking to improve accessibility, accountability, and coordination among professionals and agencies in service delivery.

5. Relationship and interaction with LBHAC and BHAC

The Calvert County Local Behavioral Health Advisory Council (LBHAC) is technically still two councils, the Local Mental Health Advisory Council (LMHAC) and the Local Drug and Alcohol Abuse Council (LDAAC). They have been meeting together since December of 2019 and have a workgroup that has worked towards updating the bylaws at the county level to integrate them into one council. The councils meet bi-monthly and conduct business together in an

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integrated fashion. Many of the council members also participate in LBHA workgroups, RFP selection committees, and outreach events.

Through MABHA and BHA, Calvert County has received information about trends and recommendations from the state BHAC. We frequently consider the information that is received when planning our local efforts. During FY21, the Director has attended some of the State Behavioral Health Advisory Council meetings in an effort

6. Coordination of Activities in Emergency

As a department of the Calvert County Health Department, the LBHA has access to a Public Health Emergency Planner through the Emergency Preparedness Department. A Continuity of Operations Plan (COOP) has been created by the LBHA, in conjunction with Emergency Preparedness, that designates essential functions of the LBHA and the resources required to ensure continuity of these services in case of an emergency. The essential functions identified by the LBHA include Coordination of Child & Adolescent and Adult Services (i.e. hospital releases, RRP referrals, referrals to treatment, etc.), Coordination of behavioral health services in the event of a disaster, and payment of invoices for services. For more specific information about these services and the resources required to ensure their completion in case of an emergency please refer to Attachment D for a complete copy of the LBHA COOP.

7. All Hazards Plan

Please see Attachment E for a complete copy of the Calvert County All Hazards Plan.

F. Service Delivery and Recovery Supports

1. Treatment Services

Calvert County has a small but active provider network that provides a number of very important behavioral health services to our residents. These providers utilize a mixture of fee for service as well as grant funds to meet the needs of our community. Please see below for a description of the services available.

Inpatient/Residential Services

Inpatient Services are those provided on a 24-hour basis with medical monitoring and support. Residential services provide a range of 24-hour services in a structured living environment for individuals who need support for their mental health or substance use recovery before living on their own. Calvert County has several inpatient and residential service providers for mental health and substance abuse services.

Calvert Health Services, our local hospital, offers comprehensive services for individuals and families. The inpatient unit operates 24 hours per day and is staffed by a board-certified psychiatrist, registered nurses, social workers, mental health counselors, occupational therapists, and a public-school teacher. Services include individual therapy, group therapy, family or couples' therapy, supportive therapy and education on illness, treatment, coping skills and relapse prevention. Every individual who receives inpatient services is linked with outpatient providers prior to discharge, and through collaboration with the LBHA, schedules follow-up appointments within a week of discharge. They also offer a Partial Hospitalization Program as a step down from their intensive, inpatient program.

Avenues Recovery Center is a unique community-based residential style 60-day substance use disorder treatment program that is truly customized to the needs and unique circumstances of each individual. Avenues offers multiple levels of care, including Medium and High Intensity Residential Services as well as Partial Hospitalization and Intensive Outpatient Services, to support clients in various stages of addiction recovery.

Their primary focus is a 60-day treatment program, rebuilding clients throughout the stages of change, from helplessness through stability. Avenues focuses on treating the whole person – body, mind, and spirit, and delivering personalized care to individuals seeking recovery. Life skills, wellness, nutrition, social acceptance, financial responsibilities, and family values are all key components of their clinical treatment program. The extended care program carries on beyond the traditional 30 days being able to put sincere focus on any underlying mental health disorder.

Research shows that housing is one of the main factors that determines health and stability. Because of this fact, a number of services have been created to address the importance of obtaining and maintaining housing for individuals with serious mental illness. Southern Maryland Community Network (SMCN) is Calvert County's Residential Rehabilitation Provider. The goal of this program is to provide supervised housing to individuals while they are working on their mental health goals. Services offered through this program include, but

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are not limited to, assistance developing daily living and self-care skills, natural supports, providing case management services, employment support, financial management, and more. This program is available to individuals diagnosed with a serious mental illness and two levels of service are offered based upon the individual's needs, general and intensive.

Another important residential resource available in Calvert County is our local recovery residences. Calvert County has multiple resources for recovery residences for individuals in recovery from substance use disorders who require a safe and stable living situation to facilitate their recovery goals. Sober Gals and Gents is an MCORR certified Recovery Residence located in Lusby, Maryland dedicated to helping both men and women with their integration into a sober lifestyle. They provide a protected environment with other individuals in recovery that is walking distance to employment opportunities, public transportation, and recreational activities. Calvert is also currently the home of three Oxford Houses, 2 men's homes and 1 women's home. These are democratically run, self-supporting, and drug free homes that operate under the umbrella of Oxford House, Inc., a nationally recognized 501 (c) 3 organization. Oxford House, Inc. has also been awarded State Opioid Response grants through the LBHA to provide recovery housing and is contracted to open 5 new homes within the county, 3 for men and 2 for women and children.

Outpatient Treatment Services

A thorough continuum of behavioral health care must include a variety of levels of care and types of services. Calvert County is the home to many agencies that attempt to meet the different levels of need of the consumers in the PBHS.

The highest level of outpatient care is Partial Hospitalization. This level of care is offered up to seven days per week and individuals typically commute from home to treatment. In some cases, individuals at this level of care do receive residential housing supports to assist with their recovery in conjunction with PHP. This service is offered through our local hospital, Calvert Health Services, for individuals who need this level of care related to their mental health. Avenues Recovery Center is the only provider of this level of care in Calvert County for Substance Use Disorders.

An Intensive Outpatient Program (IOP) typically consists of 9 hours of programming or more per week. Calvert County does not currently have any mental health providers of IOP, but we are the home to several substance use disorder treatment programs that offer this level of care. The Calvert County Health Department Behavioral Health offers IOP groups at their Chesapeake Beach, Barstow, and Lusby locations. Having this service available in the Northern, Central, and Southern parts of the county has proven an effective way to assist individuals without reliable transportation with attending treatment. Utopia Health Services and Project Chesapeake, treatment programs that are located in Prince Fredrick, also address transportation difficulties by providing transportation to groups and appointments. Project Chesapeake focuses mainly on the forensic population, working closely with parole and probation as well as our local drug court. A+ Counseling in Dunkirk is

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also an IOP provider and is focused on treating the whole person by integrating primary care into their practice.

The above-mentioned behavioral health providers also offer level one substance abuse services. These services are frequently utilized as Relapse Prevention Groups or groups for individuals who is Substance Use Disorder have not yet escalated to levels that require IOP services. In Calvert County, level one services are also offered to adolescents through Project Chesapeake and the Calvert County Health Department Behavioral Health. The Center for Children, one of our local child and adolescent treatment providers, is also in the process of starting up an adolescent Substance Use Disorder treatment program. Unfortunately, at this time, there are no IOP services for adolescents in the county and no residential treatment facilities in the state to assist adolescents with Substance Use Disorders.

Outpatient mental health counseling is offered in a variety of formats within Calvert. We have a small number of private practitioners who accept Medical Assistance as well as a few group practices, and many of the clinic settings mentioned above. Blue Sails Counseling in Lusby offers individual and group counseling to individuals with both private and public insurance. They also offer specialty groups and therapy services to individuals in the LGBTQ+ community. Another group practice with a focus on serving the LGBTQ+ community is Therapy Cafe. They are a large group practice based in Prince Frederick that offers traditional and holistic therapeutic services. The Center for Children focuses on providing services to children, youth, and families. They offer specialized therapeutic services including, but not limited to, Functional Family Therapy and Trauma Focused Cognitive Behavioral Therapy. Another child and adolescent provider is Barstow Acres Children's Center, focusing on providing many forms of play therapy, as well as providing social skills groups, a therapeutic day camp during the summer months, and continuing education and professional development training on interventions for children, youth, and families. The Calvert County Health Department Behavioral Health recently had 19 of their therapists trained in Eye Movement Desensitization and Reprocessing (EMDR) and purchased the equipment for all of their offices. Another large practice located in Dunkirk, MD is Dr. Andrew Gergley and Associates. This practice provided mental health treatment to individuals of all ages utilizing individual, group, family, and play therapy services.

Equally as important as the therapeutic services provided are medication management services. Calvert County has local resources for both psychiatric and substance use disorder medication management. All of our local clinics provide some form of medication management, whether in person, through telehealth, or some combination of both.

Calvert County is home to a licensed Opioid Treatment Provider (OTP), Bayside Recovery. They provide Methadone and Buprenorphine Maintenance treatment as well as individual and group counseling services, laboratory testing, and guest dosing services for out of county individuals who are visiting the area. A number of our local Substance Use Disorder treatment programs facilitate buprenorphine inductions and maintenance services as well as providing Vivitrol prescriptions and injections. Avenues Recovery Center offers MAT

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inductions and maintenance for residents. Through the Buprenorphine Initiative and the Hub and Spoke Pilot Program the LBHA and the Calvert County Health Department Behavioral Health Clinic are working together to expand access within the county to Buprenorphine maintenance therapy, increase public awareness about the effectiveness of MAT, and reduce the associated stigma. Grant funds are utilized to assist Physicians, Nurse Practitioners, and Physician's Assistants with completing Data 2000 Waiver training, to fund a physician mentor to provide technical assistance and outreach to local doctors who have a Data Waiver, fund buprenorphine induction, medication management appointments, and buprenorphine medication for uninsured or underinsured individuals.

Calvert County also has two clinics that employ Board Certified Child & Adolescent Psychiatrists to work with our local youth. The Center for Children and Barstow Acres Children's Center both offer psychiatric medication management services through their Prince Frederick offices to children and adolescents. The Calvert County Health Department Behavioral Health offers medication management at all 4 of their sites spanning the northern, central, and southern areas of the county.

In Home Intervention Programs (IHIP) are for individuals who require a higher level of therapeutic services and would benefit from these services being offered within the home, rather than in an office setting. The goal is to reduce the risk of institutionalization and out-of-home placement while improving overall functioning. Services are most intense during the beginning phase of the program and reduce in intensity as individuals meet their treatment plan goals and their symptoms begin to stabilize. IHIP-C is offered to children and adolescents through the Center for Children. Pathways is the adult provider of IHIP-A services in Calvert County.

Crisis Services

Another essential part of the behavioral health system of care is crisis services. These services vary tremendously depending on the agency offering the service as well as the target population. In Calvert County, we have a wide variety of services and providers that assist individuals in this acute state of need.

The Calvert County Health Department Behavioral Health Clinic (CCHDBH) has expanded their capacity to provide comprehensive crisis services. This past year the Crisis Intervention Center (CIC) was merged with CCHDBH which allowed them to expand domestic violence services to the other clinic locations in Chesapeake Beach, Lusby, and Barstow. The CIC agency works to eliminate Family and Sexual Violence in Calvert County. They strive to achieve this through counseling, advocacy, sheltering, increasing community awareness, and changing social attitudes. The Crisis Intervention Center believes it is the right of every human being to live free of the fear of abuse and violence. The local Domestic Violence Shelter, Safe Harbor, is funded through this department as well. The primary objective of this facility is to provide a supportive shelter experience for the family to establish its own healthy living environment. As a Health Department program, it provides mental health services and drug treatment, as well as prevention and parenting

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education. The Crisis Intervention Center is also the only agency in Calvert County at this time that is a court approved provider of an Abuser Intervention Program for Domestic Violence offenders.

CCHDBH has also rebranded and expanded their other crisis services to create the Calvert Crisis Response team. The crisis response team continues to work with the local Sheriff's department and Emergency Medical Services to respond to local overdose calls routed through 911 dispatch. They also take self-referrals from community members who call the crisis hotline. The hotline has merged with the local domestic violence hotline and through braided funding is now able to accommodate mental health, substance use disorder, domestic violence, and any other crisis calls they receive. The physical location of Calvert Crisis Response has also begun seeing individuals in crisis who do not want the Mobile Crisis Team (MCT) coming to their home, providing telehealth services, and taking walk-in appointments. They continue to offer on-demand Buprenorphine induction for individuals who meet medical and clinical criteria as well as referral to ongoing medication management and clinical counseling services.

The Calvert Health Services Emergency Department is a large provider of 24-hour emergency and crisis services. In the ED, a physician and a licensed social worker or psychologist sees individuals. Once the physician rules out medical issues, individuals are referred to inpatient treatment services or discharged with follow-up referrals. Calvert Health Services holds two grants to assist individuals with receiving follow-up services within a 7-day time span. The Hospital Diversion Program (Calvert Health Emergency Room) in a collaboration with the Calvert County Health Department Behavioral Health utilizes the Urgent Care and Emergency Psychiatric Services grants to divert persons with psychiatric and addiction disorders from hospitals to alternative services in order to prevent multiple non-emergent and costly hospital visits. The target population includes uninsured and underinsured adult and or adolescent residents with co-occurring conditions who frequent emergency rooms and inpatient services.

During FY21, Southern Maryland Community Network (SMCN) was awarded funding to transition their Mental Health Housing Stabilization (MHHS) program into an enhanced Residential Crisis Services program. Once operational, this program will provide 24 hour/7 day a week assessment, stabilization, and case management services to Adults 18 and older who are in crisis. This enhanced model will also incorporate psychiatric care, therapy, nurse case management, and peer recovery support services.

Case Management Services

There are times when therapy and medication management cannot fully meet the needs of individuals with behavioral health disorders, particularly when they are severe and persistent. Due to this fact, varying levels of case management services are available to eligible individuals.

The lowest levels of case management supports is typically provides through Psychiatric Rehabilitation Programs. PRP services are offered on an individual, flexible, around the clock

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basis with the goal of preventing institutionalization and living an active and productive life within the community. Services offered include linkage to community resources; linkage to psychiatrists and therapists; help with life skills; help with housing searches; financial management/budget assistance; and social skills education. Local providers of PRP services for children, adolescents and adults include Project Chesapeake, Utopia Health Services, and Southern Maryland Community Network.

For individuals who require a more intensive level of case management, Targeted Case Management (TCM) services are offered. TCM ensures that persons with psychiatric disabilities have the resources they need to enhance their ability to function independently in their community. TCM provides services that are flexible, comprehensive and mobile. Consumers and their families are provided many opportunities to establish peer networks and support systems. Similar to PRP, TCM links recipients with psychiatric, legal, educational, and medical resources as well as assisting individuals with obtaining benefits and entitlements. The Center for Children provides TCM and services to Calvert County children and adolescents. The Southern Maryland Community Network is the adult provider for this jurisdiction.

Supported Employment Programs can introduce or reintroduce individuals with serious and persistent mental illness into the workforce and assist them to remain successfully employed. Case managers can assist individuals with coordination with other agencies and referrals; vocational assessments; vocational counseling and entitlements; job development; job coaching; and job placement. Services are provided for adults at least 18 years of age, have a severe, persistent mental illness and are interested in employment, education, and training. Individuals must also be eligible for the public behavioral health system.

Calvert County State Care Coordination utilizes LBHA funding to expand access to a comprehensive array of community-based recovery support services for residents in varying stages of recovery. In order to be enrolled in the program a consumer must meet eligibility requirements, must have independently chosen to enroll and participate in the program, and must be referred through a designated portal/access point. All services are designed to assist recipients in remaining engaged in their recovery while promoting independence, self-sufficiency, and stability as they transition back into their communities.

Unlike State Care Coordination, Care Coordination services are offered to children, adolescents and their families. This program is offered in addition to therapy for children and adolescents with severe mental health diagnoses. Services are voluntary and provided in the home, at the job, at school, in court, and throughout the community. The program is one of the many services offered by the Center for Children with the purpose of fostering and sustaining positive mental health in children and families. The goal of this program is to build resiliency in youth receiving services by assisting families with navigating the behavioral health system, providing support, reinforcing therapeutic goals, attending IEP meetings, and more. Center for Children is the Calvert County provider of this grant-funded service.

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Specialty Behavioral Health Services

Behavioral health treatment is complex and multifaceted on its own. However, there are times when circumstances can make this already overwhelming process, even more involved. Fortunately, Calvert County has several specialty behavioral health treatment services that assist with meeting the complex needs of our residents across their lifespan.

Calvert County Health Department Healthy Beginnings program assists pregnant women with Opioid Use Disorder (OUD) enter recovery and have healthy babies. This program provides education on pregnancy, drug and alcohol abuse, mental health, childbirth and infant care. Participants are linked with a nurse case manager that works closely with them, their doctors and counselors to achieve a safe and healthy pregnancy. Participants also have access to peer support services and a dietitian. This program also offers resources for baby supplies, pediatric care, transportation assistance, domestic violence support, dental care and support to stop smoking. These services are offered free to participants of the program and are located in one convenient location.

The Calvert County Health Department Behavioral Health has a school based behavioral health program. Licensed clinicians are available in every public school. Services provided include short and long-term individual, group, and family therapy. The goal of this program is to assist with improving attendance at school, improve grades, reduce behavioral problems, and eliminate barriers to treatment for children and their families.

Also available within the local Department of Human Services is screening and assessment services through the LBHA Temporary Cash Assistance Addictions Specialist Program grant. The CCHDBH employs a licensed addictions counselor to screen and assess individuals applying for Temporary Cash Assistance. Individuals who meet criteria for SUD are then referred to local treatment resources and enrolled in case management services through this program to follow-up on treatment compliance.

It is estimated that more than 15% of the Calvert County population is above the age of 65 years old (Calvert County Comprehensive Plan). The Psychogeriatric program supports older adults in Calvert County by assuring access to clinically appropriate, culturally and linguistically competent care. These services are provided at local agencies as well as in congregate living settings, to assist individuals with preserving their mental health and sense of vitality and fulfillment as they age.

Calvert County has an Adult Treatment Court for adults who have been charged with non-violent offenses and are diagnosed with a Substance Use Disorder. Under Judicial supervision, the mission of the Calvert County Adult Treatment Court is to enhance the well-being and safety of the community through heightened treatment and supervision of individuals involved with the criminal justice system who have substance use disorders, providing comprehensive services with the goal of assisting individuals with finding lasting recovery. It offers an alternative to incarceration and aims to reduce overall crime and recidivism rates. LBHA funding is utilized to employ a case manager to work with

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individuals enrolled in the Adult Treatment Court and ensure they have access to the services and supports they need to be successful.

Jail diversion programs are initiatives in which persons with behavioral health disorders who are involved with the criminal justice system are redirected from traditional criminal justice pathways to the mental health and substance abuse treatment systems. The services provided include linkage to Community Mental Health Programs, Targeted Case Management Programs, Local Housing Authority, Substance Abuse Treatment Programs, Anger Management programs, and Co-Occurring programs. The Court Assessor / Diversion Program works very closely with the Calvert County's criminal justice system which will help remedy the circumstances leading to the original arrest and avoid conviction, while being able to have the support of their family and friends.

The Maryland Community Criminal Justice Treatment Program (MCCJTP) is a multi-agency collaborative that provides shelter and treatment services to individuals with mental illness who are involved with the criminal justice system. This is a grant funded program through the LBHA and was created to serve individuals diagnosed with mental illness who are incarcerated or on probation and parole. Case management services are offered include crisis intervention, screening, counseling, discharge planning, and community follow up. Other services offered include mental health screening and assessments, individual and group therapy sessions, short-term crisis intervention, coordination with other services within the detention center, and help with post release discharge in order to set up continuing support within the community.

Therapy and treatment services are also provided within the local detention center through multiple different grant funds. Diagnostic, treatment planning, individual and group therapy, as well as case management are all offered to eligible individuals. CCHDBH currently collaborates with the Calvert County Detention Center and other agencies to provide re-entry services as well. The Rational Re-Entry program is currently funded through the State Opioid Response grant. The SOR grant provides for case managers and therapists who administer the LS/CMI risk/recidivism tool to inmates at moderate to high risk of recidivism, resulting in an individualized treatment plan that includes substance use/mental health treatment along with linkages to vocational services, the Department of Human Services, medical treatment, housing, transportation, educational and other services in the community. Treatment begins in the jail (IOP, Level 1, mental health and trauma treatment) and is mirrored in the community upon release. Those with an Opioid Use Disorder are provided education on MAT and access to Vivitrol injections while incarcerated (2 weeks prior to release). Those who prefer buprenorphine are linked to providers through the Crisis Response Team within 32 hours of release. Case management does a warm-handoff and continues to follow all participants for a minimum of 6 months.

Also provided within the detention center is Men and Women's trauma groups, facilitated by our local Crisis Intervention Center. These programs are designed to work with inmates who have suffered physical or emotional trauma. Professional facilitators identify and treat symptoms of Post-Traumatic Stress Disorder and teach relaxation techniques.

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The Calvert County LBHA also administers the Substance Abuse Treatment Outcomes Partnership grant, which assists with funding some of the above-mentioned treatment and case management services offered by CCHDBH within the detention center. This grant also funds work in the Calvert Health Services Emergency Department. Project Phoenix assists with linking individuals with behavioral health services within the local ED with treatment services including therapy, medication management, and supportive services.

Court officials who sentence individuals who have been found guilty of sex offenses often times require these individuals to attend sex offender treatment programs. In Calvert County, two providers offer Sex offender court evaluations, psychosexual evaluations, and sex offender treatment groups. Dr. Karen Ray has been providing this service within Calvert County for years and Utopia Health Services has begun to do so more recently.

The Projects for Assistance in Transition from Homelessness (PATH) is a grant funded program that employs a case manager who links homeless individuals to area providers and utilizes programs that are already in place within the community. Calvert County Health Department Behavioral Health, Project Phoenix, Southern Maryland Community Network (SMCN), Department of Human Services (DHS), Parole and Probation, Project Echo and Safe Harbor Shelters are all partners in this program. Clients can receive therapy and medication monitoring at the Behavioral Health Clinic, Case Management and Supportive Employment through SMCN are just a couple of the examples of services provided to clients in the PATH program.

The Continuum of Care Housing Program is a federal grant program that provides rental assistance to individuals experiencing homelessness who have been diagnosed with a serious mental illness and/or chronic substance use disorder and their families. The program in Calvert County provides sponsor based rental assistance through Southern Maryland Community Network. Individuals in this program are provided case management and mental health treatment services to assist them with remaining in housing within the community.

Treatment and support services for individuals who struggle with problem gambling are an essential component of a robust continuum of care. Gambling can co-occur with or at times replace other addictive disorders during recovery. Two local providers, Utopia Health Services and CCHDBH, have clinicians trained to work with individuals diagnosed with a gambling disorder. Services are offered to both individuals and their families. Maryland Coalition of Families provides Family Peer Support to families impacted by Problem Gambling. Support is free and confidential. Families are connected with a Family Peer Support Services Specialist that has lived experience with Problem Gambling to provide resources and emotional support. They also provide referrals to the University of Maryland Center for Excellence on Problem Gambling to provide services/supports to the target gambler.

Calvert County Health Department offers a free Smoking Cessation Program. The eight-week program uses a combination of behavioral counseling and a variety of cessation

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products. The cessation products are provided free of charge to individuals who are registered and attend the Program.

Behavioral Health Peer Services

Calvert County has a number of peer-based services within the county that strive to meet the needs of individuals and families of individuals with Behavioral Health Disorders. We have two community centers providing services to help put a face on recovery, build recovery capital and serve as a physical location for community members to meet in a safe and recovery-oriented environment.

On Our Own of Calvert serves as the county Wellness and Recovery Center and Recovery Community Center focusing on providing peer support services to individuals with behavioral health disorders. Their mission is to support and empower individuals by enhancing self-esteem and quality of life through mental health peer support services. Services provided include emotional support, recreational activities, transportation, educational activities, support groups, housing and employment assistance, volunteer opportunities, a warm line, and more.

The Calvert County Health Department Behavioral Health houses our substance abuse Recovery Community Center and employs Certified Peer Recovery Specialists to provide non-clinical services that assist individuals and families to recover from mental illness, substance use and/or trauma. They include social support, linkage to and coordination among service providers within the community, and a full range of human services that facilitate recovery and wellness contributing to an improved quality of life. The CCHDBH Peer Recovery Specialists assist individuals with creating a recovery plan, finding healthy recreational activities, facilitate self-help groups, and empower others to identify their strengths and resources. The LBHA provides grant funding for this important program through our Peer-to-Peer Grant from the Behavioral Health Administration.

Maryland Coalition of Families provides peer support to families and caregivers of individuals with mental health, substance use, and gambling disorders. All services provided are free of charge and can include emotional support, information and resource referral, and advocacy and empowerment. Individuals employed by Maryland Coalition of Families are themselves family members of loved ones with mental health and/or substance use disorders and they receive training to assist them with providing quality support and care to county residents who are impacted by these diseases. Recently their focus has been on assisting families with navigating the public-school system as well as the juvenile justice system. The LBHA provides grant funding through our Family Navigation Services Grant to assist with funding these important services within our county.

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2. Outreach and Public Awareness

The Calvert County LBHA has the responsibility of ensuring that local residents are aware of the services and resources to assist them towards finding lasting recovery. This is done in many ways in order to ensure that as many people as possible are informed. The LBHA uses the Calvert County Behavioral Health Facebook page to promote local events, educate the community about mental health and substance use disorders and reduce stigma. The bi-monthly LBHA provider meeting is a forum for local providers to inform each other of new services being offered and coordinate their efforts to meet the needs of their clients. Staff attend local resource events to distribute educational and resource materials. In FY20 local clinical services resource brochures were created and in FY21 they were distributed at local resource fairs, to behavioral health providers, and to local primary care physicians to distribute information about accessing local treatment services to the general public.

The LBHA team uses this multifaceted approach, as well as relying on local providers of fee for service and grant funded services, our network of stakeholders including Advisory Council members, and relationships with local advocacy organizations to ensure that outreach reaches diverse populations within the county. Calvert is a fairly homogeneous area with 81% of the population identifying as White. This makes outreach to and representation from culturally and linguistically diverse populations all the more important to ensure the needs of all of our residents are being met.

Another important way in which the Calvert County LBHA ensures our residents needs are met is through local behavioral health workforce development. This is approached in a few ways, through continuing education, resource presentations, and outreach to providers. The LBHA contracts with experts to provide continuing education on many different topics of interest. In FY20, two free trainings were offered for local providers, one on the Effects of Parental Substance Use Disorder on Children and Families and the other on Effective Documentation and more trainings have been coordinated in FY21. During LBHA provider meetings local evidence-based practices are frequently invited to present about their programs to educate providers about resources available to their clients. The LBHA has also been focused on developing the certified peer workforce within the county. The Crisis and Recovery Support Services Coordinator has developed two presentations to be delivered to local providers and their staff. The first discusses the benefits to employers of incorporating certified peers into their workforce as well as ways to do so since the service is not currently billable. The second presentation is for staff of behavioral health providers on the benefits of becoming a certified peer as well as the process for doing so. So far in FY21, three (3) presentations have been given to local providers and their staff.

During FY20, Prevention Services implemented various initiatives and successful media campaigns via three grants targeting opioid misuse as well as binge and underage drinking. Staff were able to train 153 community members, who work in the alcohol business locally, in a State certified Responsible Beverage Service program, TIPS. In conjunction with that initiative, we were able to contract with local law enforcement to conduct 39 compliance checks to ensure alcohol sales compliance throughout the County. Prevention

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Services staff, with assistance from Recovery Support staff, were able to train 1058 community members and 45 local inmates on how to identify an opioid overdose and respond with Narcan (Naloxone).

Staff attended 45 events throughout the fiscal year in order to provide educational materials and general information on alcohol and other drug use and misuse. Audiences served at these events were youth, parents, current and past drug users, and the general population. Collaboration among many agencies contributed to the success of implementing our initiatives, but it has to be highlighted that we were able to collaborate with local high schools to support students involved in their Opioid and Heroin Addiction Prevention clubs, where prevention and educational materials were created and disseminated by the students involved.

The Prevention Team and Calvert County Public Schools had a series of meetings to determine the needs of students during the continuing COVID-19 pandemic. As a result, the Prevention Team is creating a Doodle Series for online distribution to high school students. The Prevention Team expects to launch this program in March 2021. Doodle Series Topics:

1. Depression and Suicide Prevention
2. Alcohol Prevention
3. COVID-19 – Calvert County specific statistics
4. Marijuana
5. Naloxone – how to use it
6. What does Substance Use Disorder (SUD) treatment look like
7. Process of asking for help/therapy

The Prevention Team also conducted four presentations to students at Mill Creek Middle School on coping with COVID isolation, depression and suicide prevention. 86 students attended this presentation. The Prevention Team anticipates that they will deliver this presentation to other area middle schools in 2021.

Reacting to community needs and the changing methods of prevention outreach during the COVID-19 pandemic, the Prevention Team created the Podcast series: “If You Only Knew: Real Stories / Real People”. The series is available on-demand and has reached a total of 300+ residents so far. <https://ifyouonlyknew.podomatic.com/> Podcast topics include:

1. “Overdose Awareness” – aired on 8/13/20.
2. “Peer recovery support services and substance use” – aired on 9/2020.
3. “Positive Vibes: Local mom’s non-profit organization raising awareness after her son’s fatal overdose.” – aired on 10/2020.
4. “Medication Assisted Treatment (MAT)” – aired on 12/3/20
5. “Mobile Crisis Team” – aired on 12/8/20

In 2021, the Team has plans to produce podcasts on the following topics:

1. “Data Waiver 2000” – airing on 1/18/21.

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2. "Substance Use and Domestic Violence" – Date TBD
3. "Drug Court" – Date TBD

3. Sub-grantee Monitoring

The Calvert County LBHA strives to ensure that local behavioral health consumers have access to quality treatment and rehabilitation services. This is made possible by engaging in the planning, oversight, monitoring, evaluation, and service development of the PBHS. LBHA vendors are required to submit monthly reporting forms for the majority of grant-funded services, which has allowed staff to problem solve with programs that may be struggling to meet the required outcomes. The LBHA staff work closely with programs and their staff to make sure consumers have adequate and appropriate services and that program operations are serving the needs of their consumers. Staff monitors and facilitates the development of new programs by listening to fresh ideas and reviewing licensing applications.

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G. Data and Planning

Section 1: Demographics

Table 1A

Fact	Maryland	Calvert County, Maryland
Population estimates, July 1, 2019, (V2019)	6,045,680	92,525
Persons under 5 years, percent	6.0%	5.30%
Persons under 18 years, percent	22.1%	23.00%
Persons 65 years and over, percent	15.9%	15.50%
Female persons, percent	51.6%	50.40%
White alone, percent	58.5%	81.00%
Black or African American alone, percent	31.1%	13.30%
American Indian and Alaska Native alone, percent	0.6%	0.50%
Asian alone, percent	6.7%	1.90%
Native Hawaiian and Other Pacific Islander alone, percent	0.1%	0.10%
Two or More Races, percent	2.9%	3.20%
Hispanic or Latino, percent	10.6%	4.40%
White alone, not Hispanic or Latino, percent	50.0%	77.50%
Veterans, 2015-2019	365,356	8,738

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Median value of owner-occupied housing units, 2015-2019	\$314,800	\$358,800
Median selected monthly owner costs -with a mortgage, 2015-2019	\$2,017	\$2,166
Median selected monthly owner costs -without a mortgage, 2015-2019	\$627	\$632
Median gross rent, 2015-2019	\$1,392	\$1,520
Households, 2015-2019	2,205,204	31,973
Persons per household, 2015-2019	2.67	2.84
Living in same house 1 year ago, percent of persons age 1 year+, 2015-2019	86.4%	88.70%
Language other than English spoken at home, percent of persons age 5 years+, 2015-2019	19.0%	4.20%
Households with a computer, percent, 2015-2019	92.4%	93.80%
Households with a broadband Internet subscription, percent, 2015-2019	86.4%	90.20%
High school graduate or higher, percent of persons age 25 years+, 2015-2019	90.2%	94.70%
Bachelor's degree or higher, percent of persons age 25 years+, 2015-2019	40.2%	32.40%
With a disability, under age 65 years, percent, 2015-2019	7.5%	6.60%
Persons without health insurance, under age 65 years, percent	6.9%	3.80%
Mean travel time to work (minutes), workers age 16 years+, 2015-2019	33.2	42.5

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Median household income (in 2019 dollars), 2015-2019	\$84,805	\$109,313
Per capita income in past 12 months (in 2019 dollars), 2015-2019	\$42,122	\$45,783
Persons in poverty, percent	9.0%	5.70%
Population per square mile, 2010	594.8	416.3
Land area in square miles, 2010	9,707.24	213.15

Data Source: U.S. Census Bureau

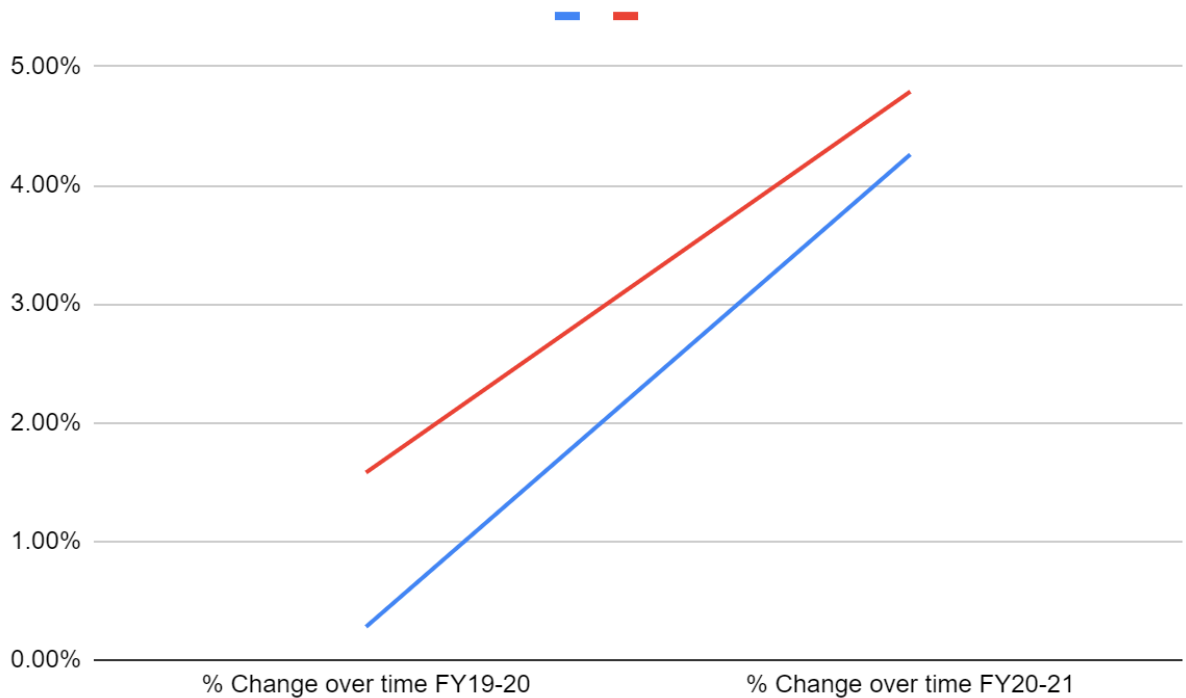
Section 2: Insurance

Table 2A

Average Monthly # Medicaid Eligible Population by Fiscal Year						
	FY19	FY20	FY21	% Change over time FY19-20	% Change over time FY20-21	% Change over time FY19-21
Calvert	14,557	14597	15220	0.28%	4.26%	4.55%
Statewide Total	1,406,421	1,428,641	1,497,036	1.58%	4.79%	6.44%

Data Source: Medicaid Eligibility: Published by The Hilltop Institute at UMBC and Data Source: Maryland Vital Statistics Est. Md. Population July 1, 2018

Chart 2A



As evidenced by the data in Table 2A and Chart 2A, the Medicaid eligibility rate in both the State of Maryland and in Calvert County has increased between FY19 and FY21. However, it appears that Calvert’s Medicaid eligibility increased at a slightly higher rate than that of the rest of Maryland.

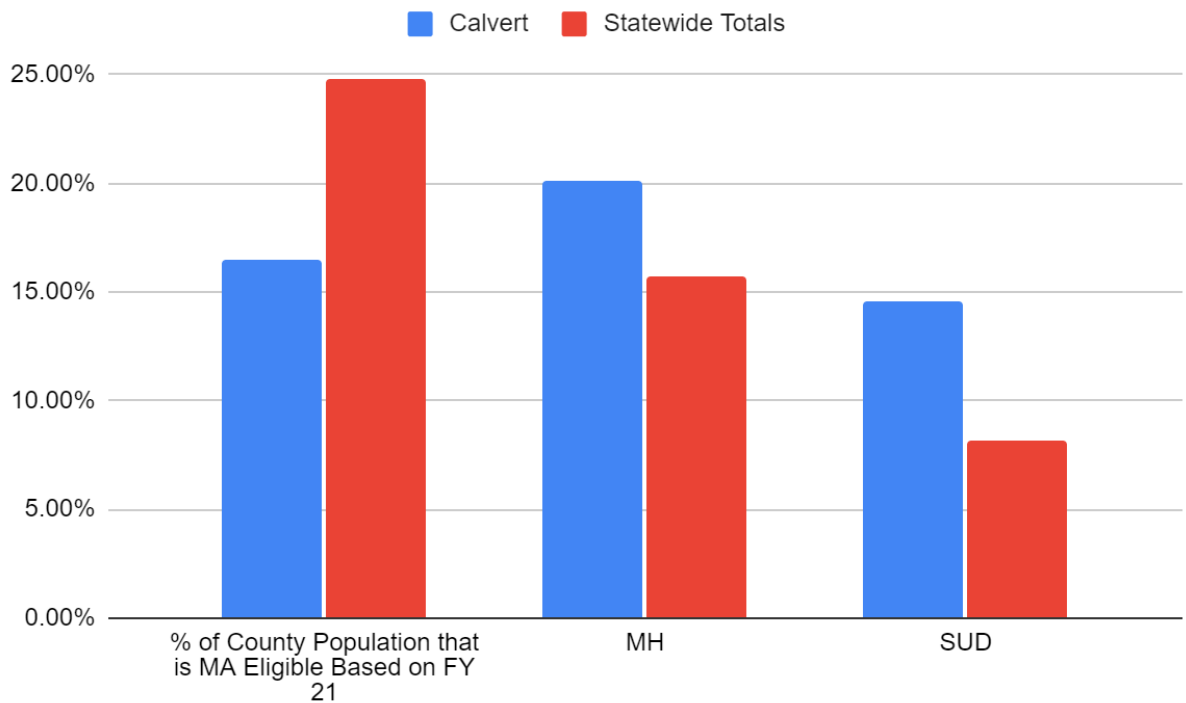
DATA AND PLANNING

Table 2B

	% of County Population that is MA Eligible Based on FY 21	FY2019 MA Penetration Rate		Projected Number of MA to Receive Services in the PBHS during FY 21	
		MH	SUD	MH	SUD
Calvert	16.5%	20.1%	14.6%	3,054	2,226
Statewide Totals	24.8%	15.7%	8.2%	235,035	122,757

Data Source: Medicaid Eligibility: Published by The Hilltop Institute at UMBC and Data Source: Maryland Vital Statistics Est. Md. Population July 1, 2018

Chart 2B



Despite the fact that Calvert County has more than 8% fewer individuals eligible for Medical Assistance, those individuals are disproportionately impacted by Mental Health and Substance Use Disorders. In Calvert County individuals with Medical Assistance exceeded the State of Maryland in the use of Mental Health and Substance Use Disorder treatment services.

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Section 3: Socioeconomic Data

Table 3A

% of Total Population in Poverty, CY18					
	All	# of People in Poverty	Children 0-17	Number of Children 0-17 in Poverty	Ranking Total Population in Poverty
Calvert	5.4	4,912	6.6	1,394	21/22
Statewide	9.1	538,823	12.1	159,874	

Data Source: United States Department of Agriculture

In 2018, the Federal Government defined living in poverty as one individual earning \$12,140 or less per year and for each subsequent family member \$4,320 can be added to that amount. Calvert County has significantly fewer individuals living in poverty than the other counties in the State of Maryland. Only one other county has a smaller percentage of residents living in poverty. As indicated in Table 1A the median household income is \$109,313 and the average household size is 2.84 individuals. On average, Calvert County residents earn \$38,490.50 annually per person, per household. The Maryland average is \$31,762.17, \$6,728.33 less than Calvert County. Despite similar population rates of children 0-17 in Calvert and Maryland, Calvert has nearly half the number of children living in poverty than Maryland (6.6% vs 12.1%).

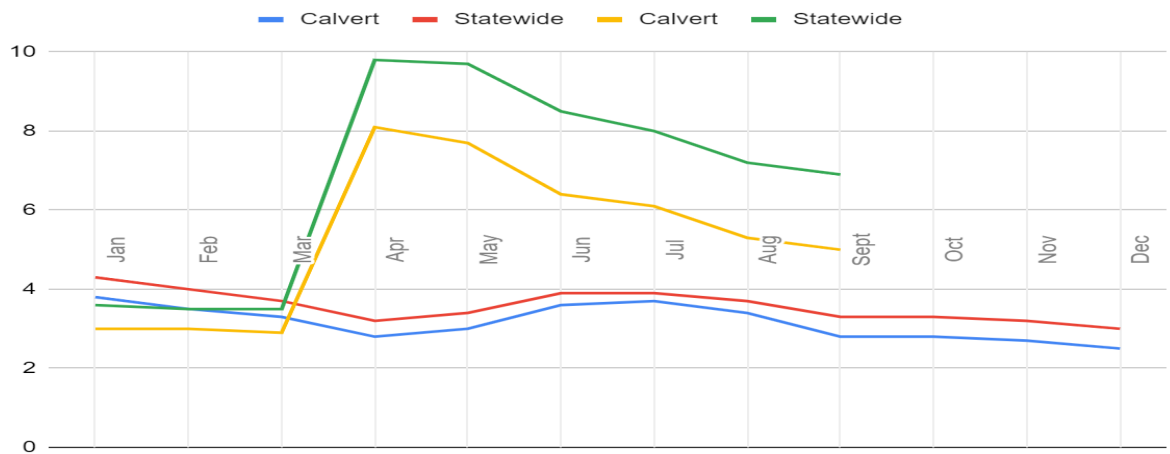
DATA AND PLANNING

Table 3B

Monthly Unemployment Rate CY 19												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Calvert	3.8	3.5	3.3	2.8	3.0	3.6	3.7	3.4	2.8	2.8	2.7	2.5
Statewide	4.3	4.0	3.7	3.2	3.4	3.9	3.9	3.7	3.3	3.3	3.2	3.0
Monthly Unemployment Rate CY 20												
Calvert	3.0	3.0	2.9	8.1	7.7	6.4	6.1	5.3	5.0			
Statewide	3.6	3.5	3.5	9.8	9.7	8.5	8.0	7.2	6.9			

Data Source: Bureau of Labor Statistics Publisher: MD Office of Workforce Information & Performance

Chart 3B



Unemployment data for 2019 shows a steadily dropping unemployment rate both in Calvert County and in the State of Maryland. This rate remained steady during the first two months of 2020 however in March a spike in unemployment accompanied the beginning of the COVID-19 pandemic and its impact on the job market. During the early months of the pandemic the unemployment rate more than doubled but has been seen to be slowly decreasing. Based on this data the job market in both Maryland and Calvert has not fully recovered to its pre-pandemic rate. This data may help to explain the increase in Medical Assistance Eligibility seen in Table 2A between Fiscal Years 2019 and 2021.

Section 4: Children, Adolescent, and Young Adults

Table 4A

Percentage of students who ever took prescription pain medicine without a doctor's prescription or differently than how a doctor told them to use it (counting drugs such as Codeine, Vicodin, OxyContin, Hydrocodone, and Percocet, one or more times during their lifetime.)								
	Statewide	Calvert	Female	Male	Black	Hispanic	Multiple Races	White
2014	14.2%	15.1%	15.5%	14.7%	14.2%	26.4%	13.5%	14.6%
2016	13.7%	13.4%	14.4%	11.3%	11.3%	19.9%	13.3%	12.7%
2018	14.6%	13.5%	13.4%	13.4%	17.0%	21.2%	14.8%	11.6%

Data Source: Centers for Disease Control and Prevention. 2014-2018 Youth Risk Behavior Survey. Available at: www.cdc.gov/YRBSS

Chart 4AA

Percentage of students who ever took prescription pain medicine without a doctor's prescription or differently than ho...

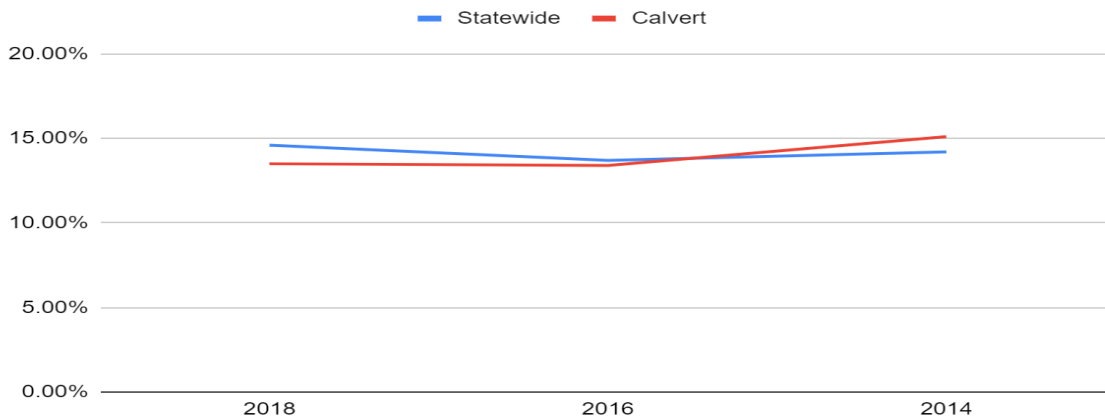


Chart 4AB

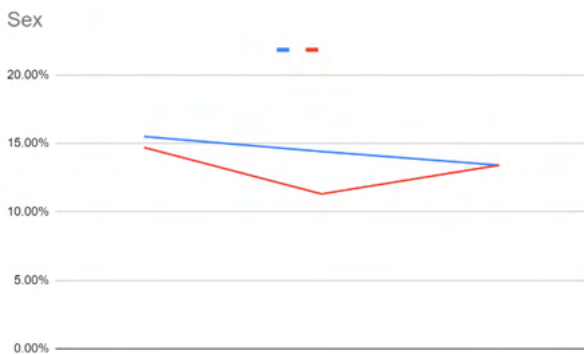
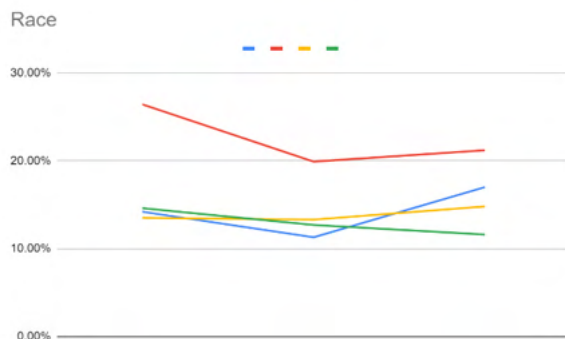


Chart 4AC



DATA AND PLANNING

Table 4B

Percentage of students who ever used heroin, (also called "Smack", "Junk", or "China White"), one or more times during their lifetime.								
	Statewide	Calvert	Female	Male	Black	Hispanic	Multiple Races	White
2014	4.2%	3.8%	2.2%	5.2%	4.5%	15.4%	1.0%	3.0%
2016	4.3%	2.7%	1.5%	3.4%	1.1%	8.6%	6.8%	2.0%
2018	3.7%	2.8%	1.9%	3.7%	5.4%	8.3%	1.5%	1.7%

Data Source: Centers for Disease Control and Prevention. 2014-2018 Youth Risk Behavior Survey. Available at: www.cdc.gov/YRBSS

Chart 4BA

Percentage of students who ever used heroin, (also called "Smack", "Junk", or "China White"), one or more times during...

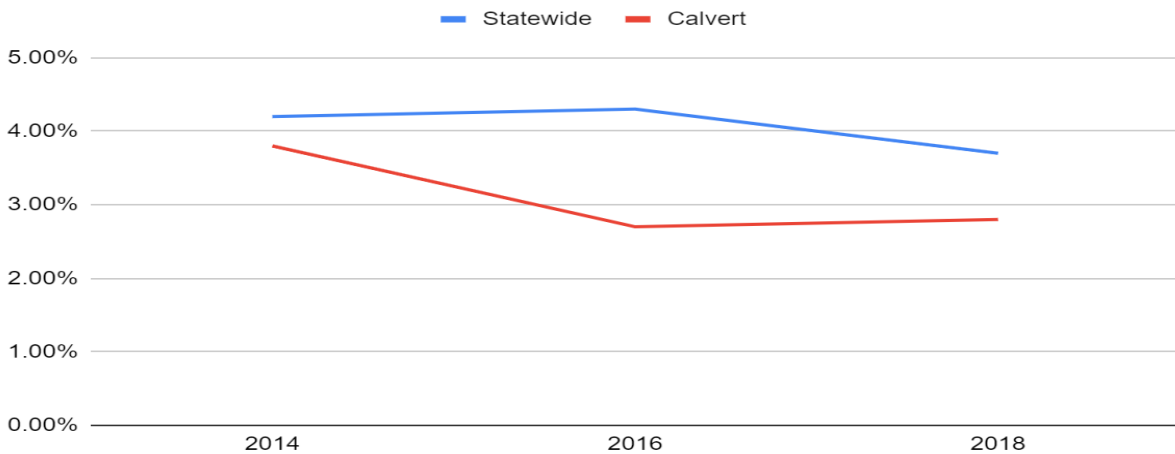
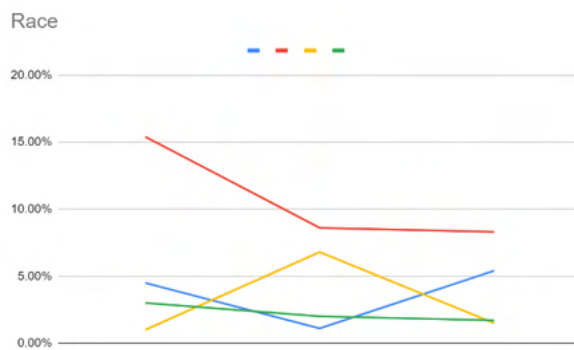


Chart 4BB



Chart 4BC



DATA AND PLANNING

Table 4C

Percentage of students who ever used cocaine (any form of cocaine, including powder, crack, or freebase), one or more times during their life.								
	Statewide	Calvert	Female	Male	Black	Hispanic	Multiple Races	White
2014	5.4%	5.1%	2.8%	7.4%	6.0%	17.4%	4.6%	4.2%
2016	5.4%	4.8%	3.1%	5.7%	2.3%	11.4%	8.3%	4.1%
2018	4.8%	4.6%	3.4%	5.6%	4.2%	13.9%	3.0%	3.7%

Data Source: Centers for Disease Control and Prevention. 2014-2018 Youth Risk Behavior Survey. Available at: www.cdc.gov/YRBSS

Chart 4CA

Percentage of students who ever used cocaine (any form of cocaine, including powder, crack, or freebase), one or more ti...

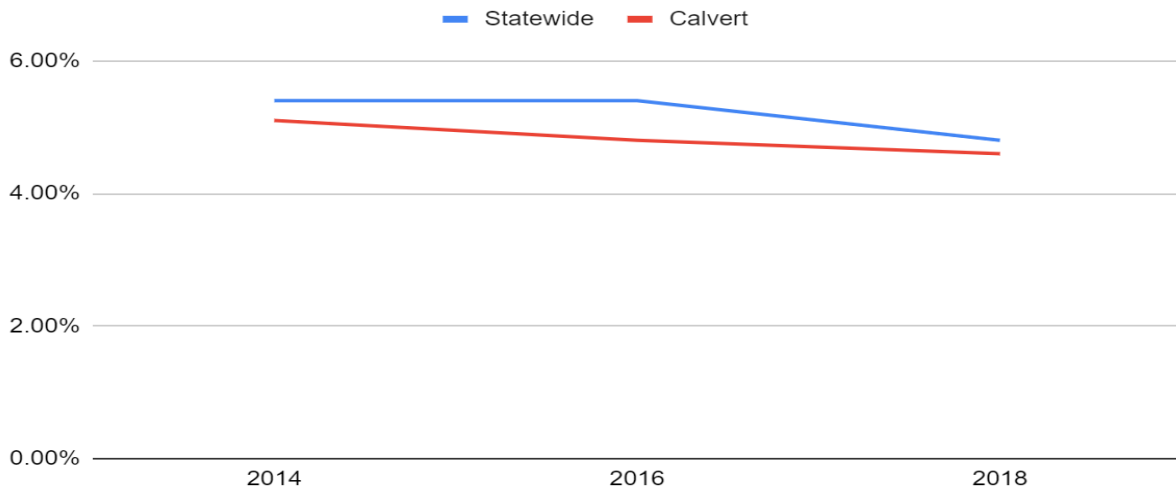
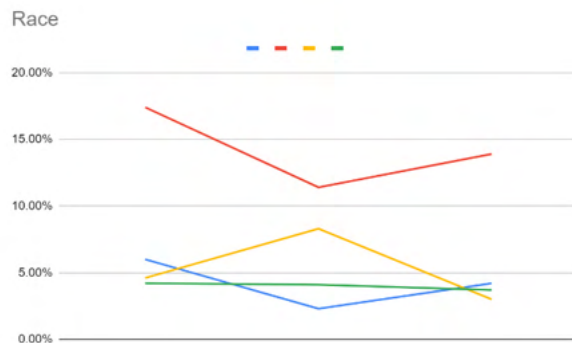


Chart 4CB



Chart 4CC



DATA AND PLANNING

Table 4D

Percentage of students who ever used methamphetamines, (also called “Speed”, “Crystal Meth”), one or more times during their life.								
	Statewide	Calvert	Female	Male	Black	Hispanic	Multiple Races	White
2014	4.2%	3.6%	1.9%	5.5%	5.0%	16.1%	1.6%	2.7%
2016	4.6%	3.3%	1.9%	3.8%	1.3%	7.6%	7.0%	2.6%
2018	3.7%	2.6%	1.8%	3.2%	4.9%	11.2%	1.4%	0.6%

Data Source: Centers for Disease Control and Prevention. 2014-2018 Youth Risk Behavior Survey. Available at: www.cdc.gov/YRBSS

Chart 4DA

Percentage of students who ever used methamphetamines, (also called “Speed”, “Crystal Meth”), one or more times duri...

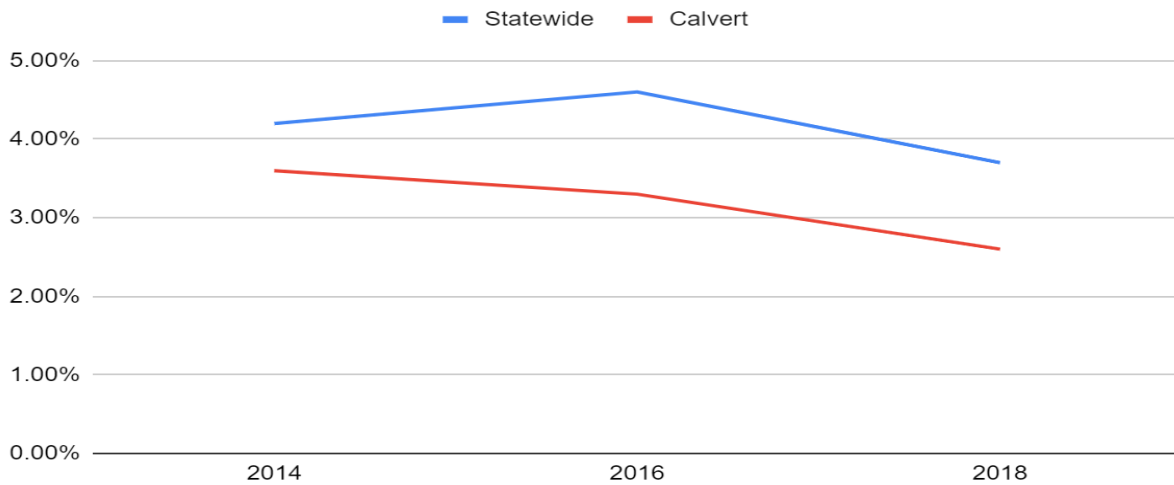


Chart 4DB

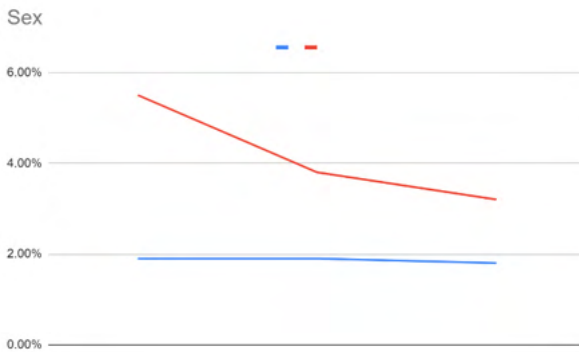
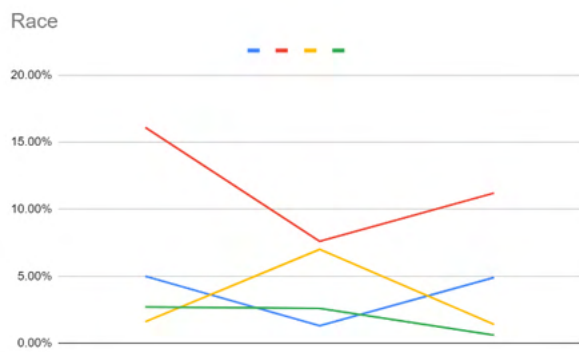


Chart 4DC



DATA AND PLANNING

Table 4E

Percentage of students who were offered, sold, or given an illegal drug on school property (during the 12 months before the survey.)								
	Statewide	Calvert	Female	Male	Black	Hispanic	Multiple Races	White
2014	26.2%	21.0%	19.6%	22.2%	19.2%	38.4%	22.8%	19.7%
2016	23.5%	19.4%	18.9%	19.4%	17.1%	29.1%	27.5%	18.4%
2018	23.2%	21.0%	19.6%	22.2%	19.2%	38.4%	22.8%	19.7%

Data Source: Centers for Disease Control and Prevention. 2014-2018 Youth Risk Behavior Survey. Available at: www.cdc.gov/YRBSS

Chart 4EA

Percentage of students who were offered, sold, or given an illegal drug on school property (during the 12 months before t...

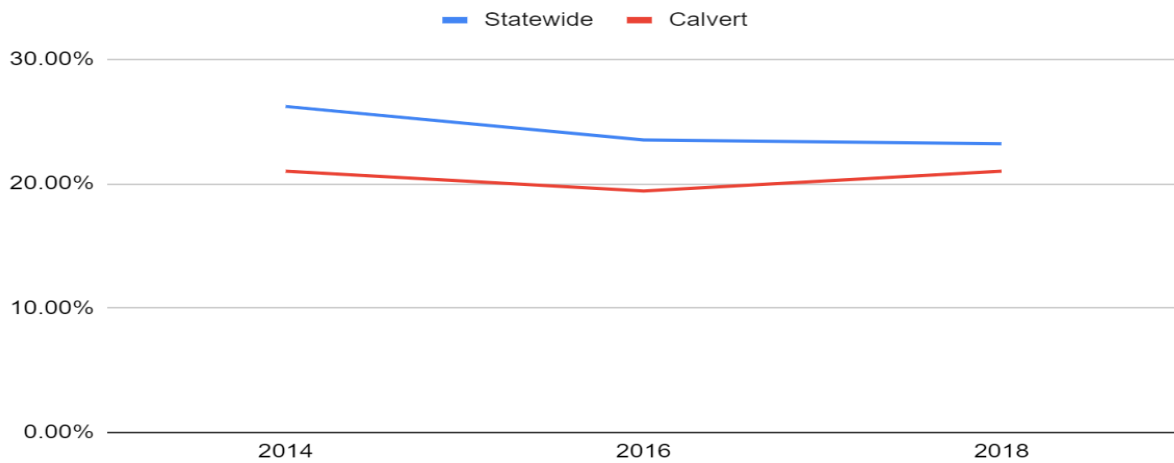
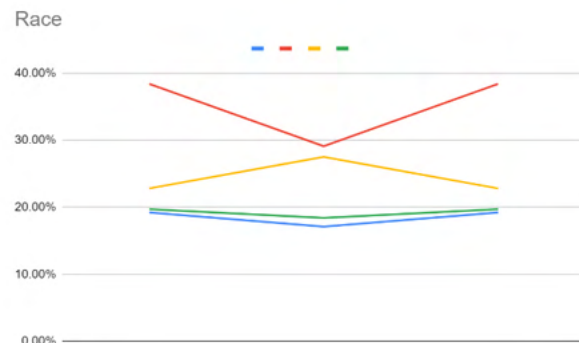


Chart 4EB



Chart 4EC



DATA AND PLANNING

Table 4F

Percentage of students who carried a weapon on school property (such as a gun, knife, or a club, on at least 1 day during the 30 days before the survey.								
	Statewide	Calvert	Female	Male	Black	Hispanic	Multiple Races	White
2014	4.3%	3.7%	1.5%	5.7%	3.3%	9.2%	1.7%	3.3%
2016	7.4%	5.8%	3.0%	7.6%	3.9%	9.5%	7.9%	5.2%
2018	5.7%	3.9%	2.2%	5.5%	6.0%	10.7%	3.7%	2.8%

Data Source: Centers for Disease Control and Prevention. 2014-2018 Youth Risk Behavior Survey. Available at: www.cdc.gov/YRBSS

Chart 4FA

Percentage of students who carried a weapon on school property (such as a gun, knife, or a club, on at least 1 day du...

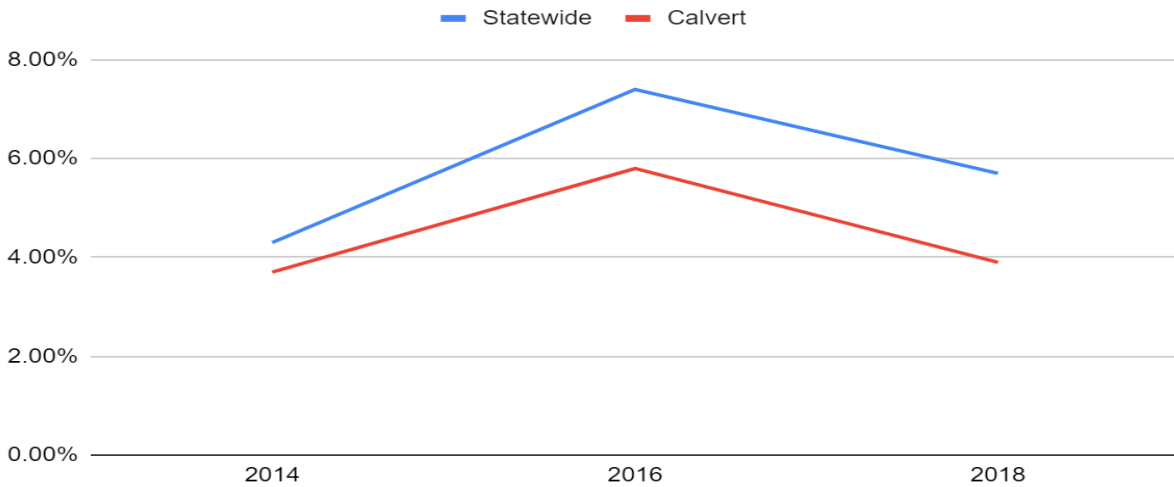


Chart 4FB

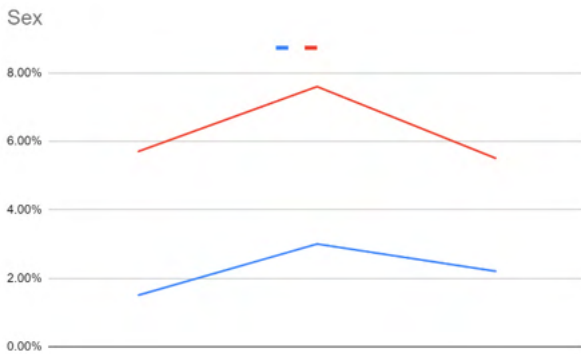
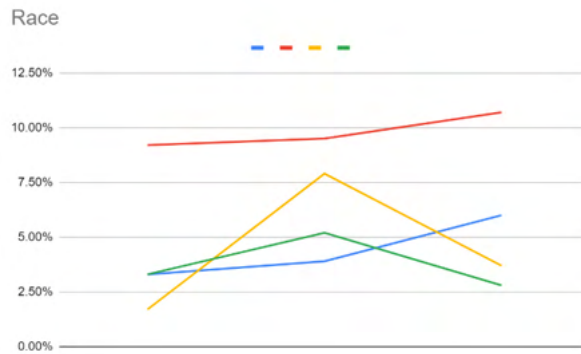


Chart 4FC



DATA AND PLANNING

Table 4G

Percentage of students who were threatened or injured with a weapon on school property, (such as a gun, knife, or club), one or more times during the 12 months before the survey								
	Statewide	Calvert	Female	Male	Black	Hispanic	Multiple Races	White
2014	7.2%	5.6%	3.7%	7.2%	5.5%	12.8%	7.4%	4.8%
2016	7.8%	5.2%	4.1%	5.6%	5.4%	11.1%	7.3%	4.1%
2018	7.8%	6.7%	5.1%	8.0%	7.3%	14.8%	9.3%	5.4%

Data Source: Centers for Disease Control and Prevention. 2014-2018 Youth Risk Behavior Survey. Available at: www.cdc.gov/YRBSS

Chart 4GA

Percentage of students who were threatened or injured with a weapon on school property, (such as a gun, knife, or club), o...

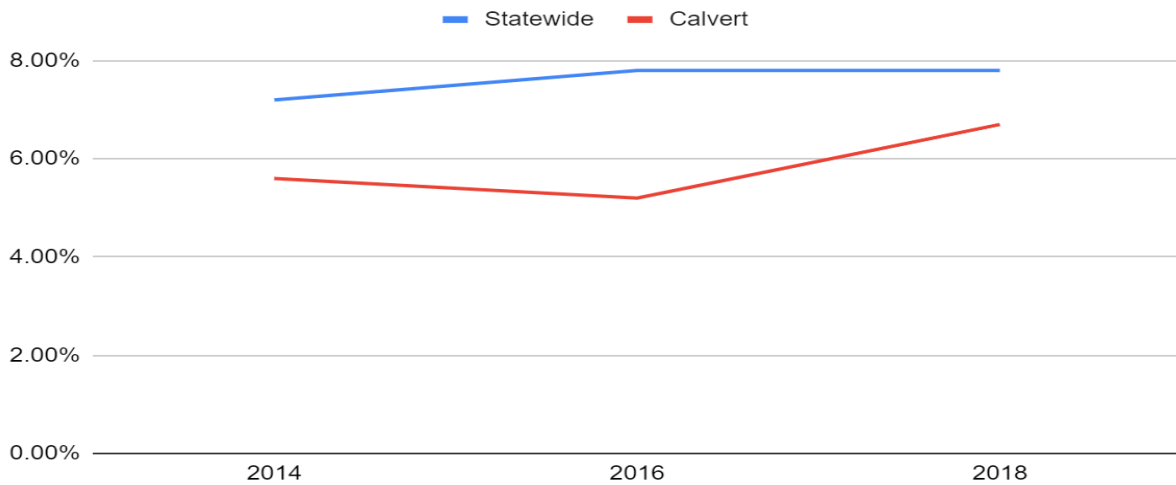


Chart 4GB

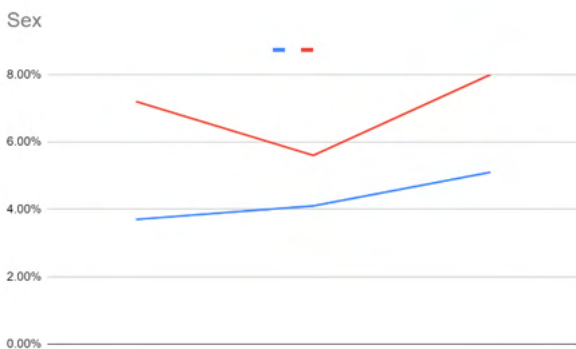
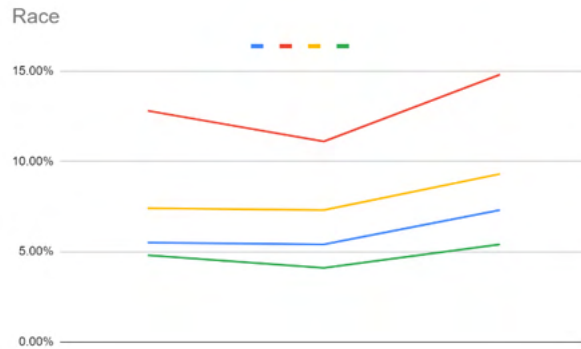


Chart 4GC



DATA AND PLANNING

Table 4H

Percentage of students who experienced physical dating violence (being physically hurt on purpose by someone they were dating or going out with (counting such things as being hit, slammed into something, or injured with an object or weapon), one or more times during the 12 months before the survey, among students who dated or went out with someone during the 12 months before the survey.)								
	Statewide	Calvert	Female	Male	Black	Hispanic	Multiple Races	White
2014	10.1%	10.7%	13.8%	7.1%	14.1%	16.6%	-	9.4%
2016	9.9%	8.6%	8.7%	7.9%	7.1%	16.1%	12.9%	7.6%
2018	11.6%	9.6%	10.6%	8.3%	12.7%	19.3%	7.6%	7.9%

Data Source: Centers for Disease Control and Prevention. 2014-2018 Youth Risk Behavior Survey. Available at: www.cdc.gov/YRBSS

Chart 4HA

Percentage of students who experienced physical dating violence (being physically hurt on purpose by someone they...

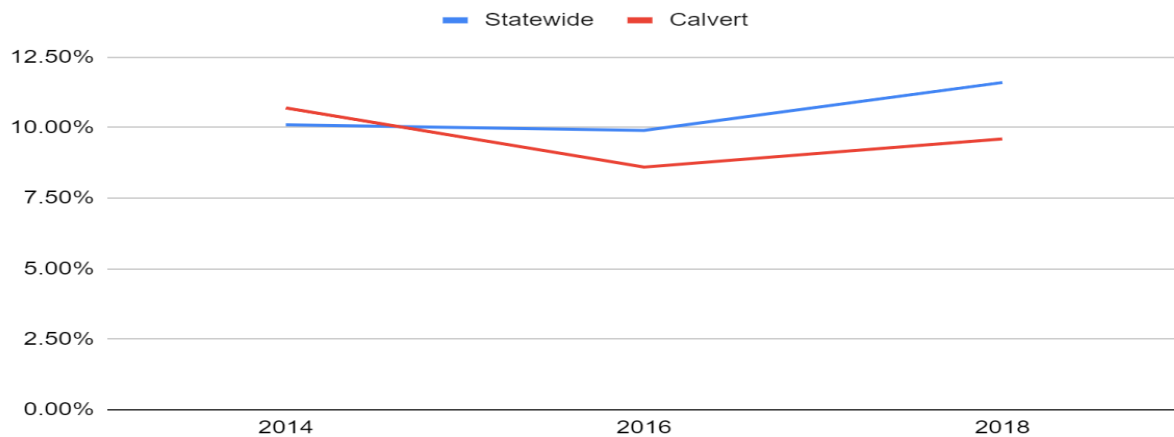
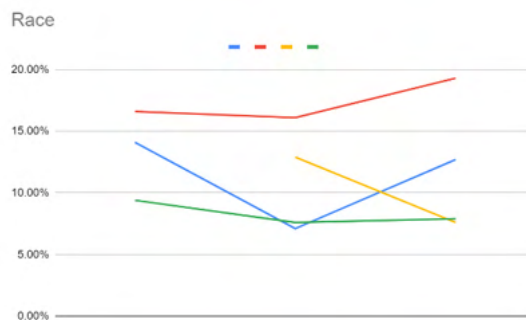


Chart 4HB



Chart 4HC



DATA AND PLANNING

Table 4I

Percentage of students who seriously considered attempting suicide (ever during the 12 months before the survey.)								
	Statewide	Calvert	Female	Male	Black	Hispanic	Multiple Races	White
2014	15.9%	16.2%	21.4%	10.7%	12.6%	32.8%	20.6%	15.6%
2016	17.3%	17.5%	23.5%	11.1%	13.9%	29.1%	23.9%	16.8%
2018	18.0%	17.8%	22.8%	12.2%	13.0%	30.3%	27.5%	17.0%

Data Source: Centers for Disease Control and Prevention. 2014-2018 Youth Risk Behavior Survey. Available at: www.cdc.gov/YRBSS

Chart 4IA

Percentage of students who seriously considered attempting suicide (ever during the 12 months before the survey.)

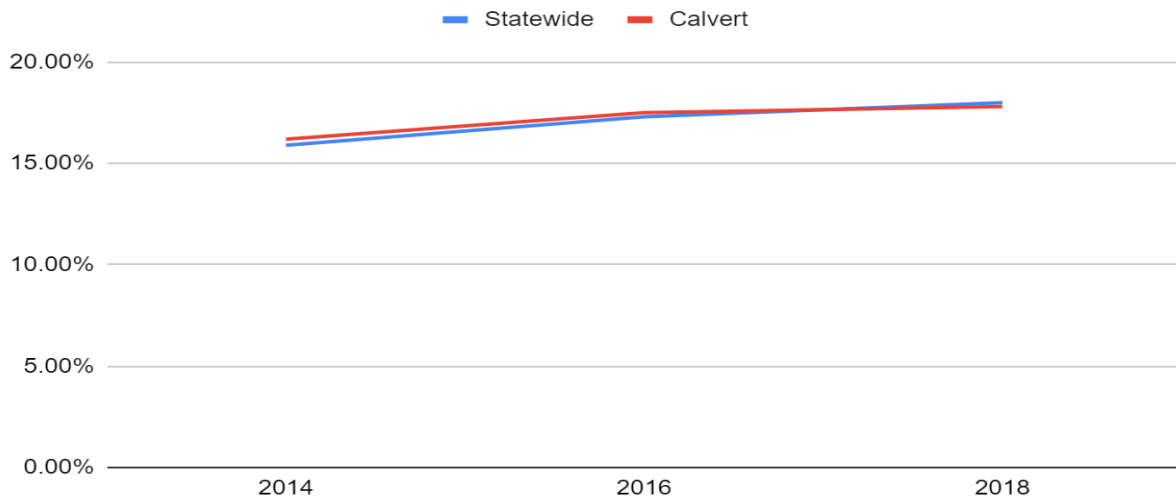
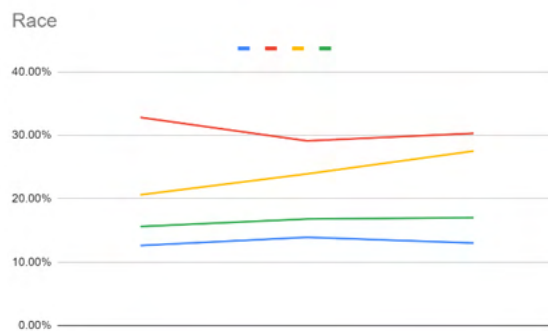


Chart 4IB



Chart 4IC



DATA AND PLANNING

Table 4J

Percentage of students who made a plan about how they would attempt suicide (during the 12 months before the survey).								
	Statewide	Calvert	Female	Male	Black	Hispanic	Multiple Races	White
2014	12.7%	12.4%	15.8%	8.8%	9.9%	29.6%	12.9%	11.7%
2016	14.4%	13.6%	16.8%	10.1%	13.7%	21.3%	18.3%	12.9%
2018	16.2%	14.0%	17.0%	10.4%	12.5%	25.2%	20.2%	12.8%

Data Source: Centers for Disease Control and Prevention. 2014-2018 Youth Risk Behavior Survey. Available at: www.cdc.gov/YRBSS

Chart 4JA

Percentage of students who made a plan about how they would attempt suicide (during the 12 months before the survey).

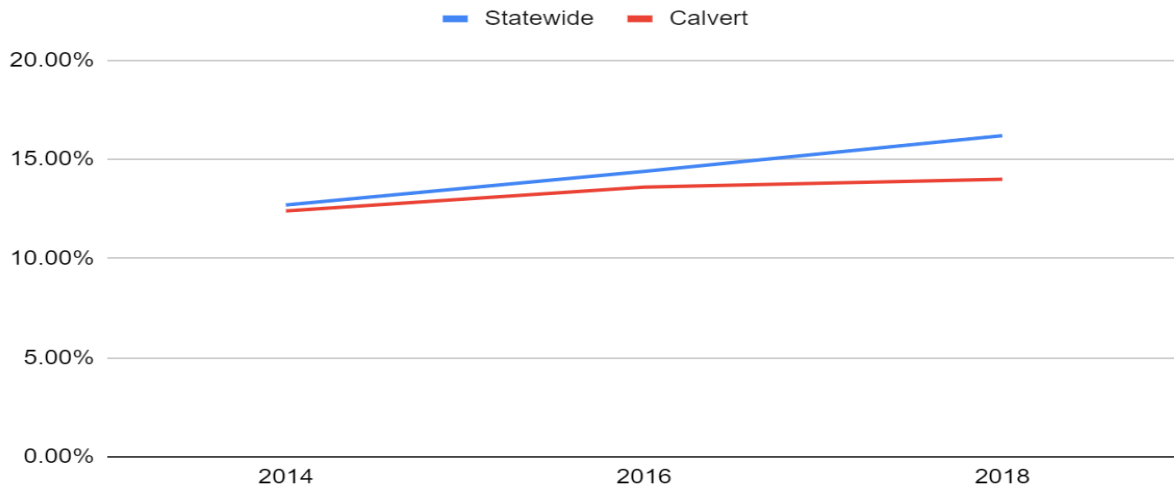


Chart 4JB

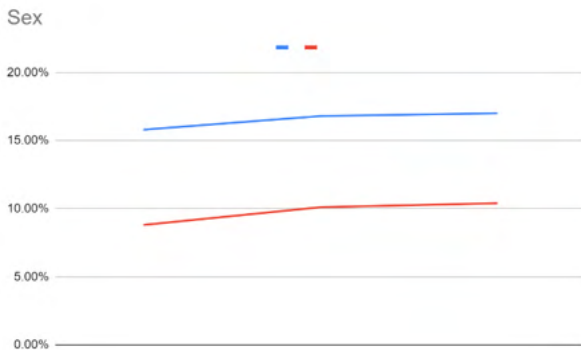
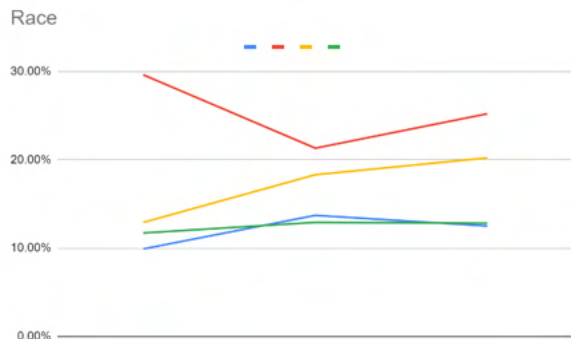


Chart 4JC



DATA AND PLANNING

Table 4K

Percentage of students who currently drink alcohol (at least one drink of alcohol, on at least 1 day during the 30 days before the survey.)								
	Statewide	Calvert	Female	Male	Black	Hispanic	Multiple Races	White
2014	26.1%	34.4%	37.6%	31.2%	26.8%	40.1%	40.4%	35.5%
2016	25.5%	33.4%	37.3%	29.2%	22.4%	29.5%	35.1%	35.9%
2018	24.1%	30.8%	33.2%	28.1%	19.9%	35.1%	28.7%	32.8%

Data Source: Centers for Disease Control and Prevention. 2014-2018 Youth Risk Behavior Survey. Available at: www.cdc.gov/YRBSS

Chart 4KA

Percentage of students who currently drink alcohol (at least one drink of alcohol, on at least 1 day during the 30 days bef...

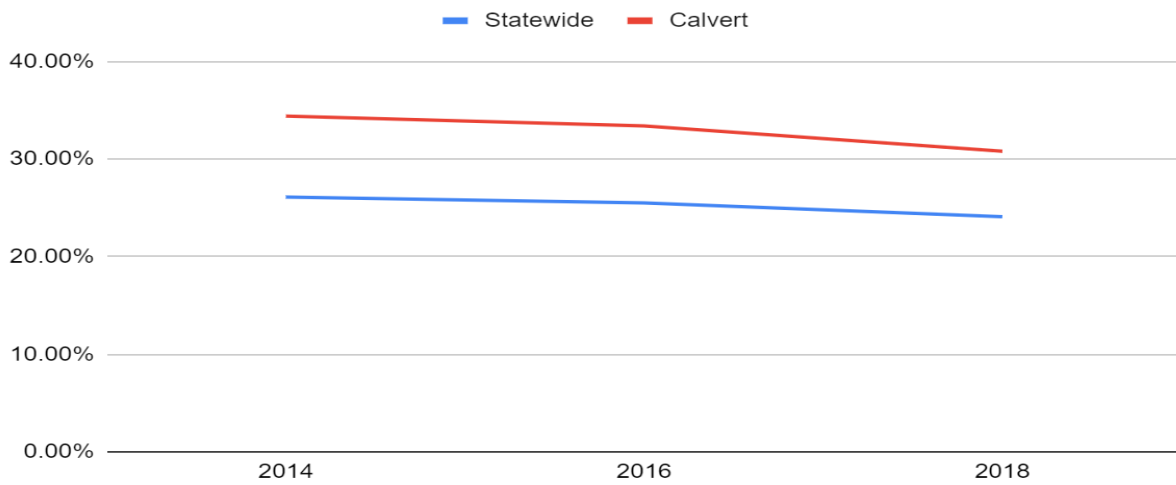
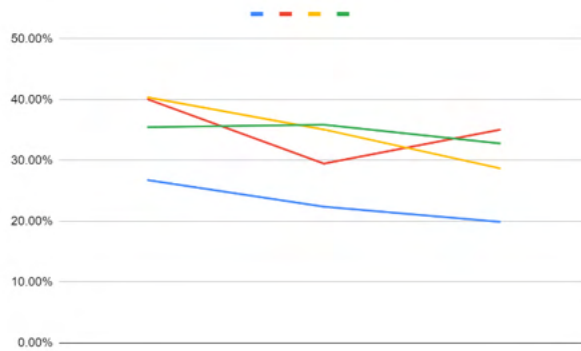


Chart 4KB



Chart 4KC



DATA AND PLANNING

Table 4L

Percentage of students who currently use marijuana (one or more times during the 30 days before the survey.)								
	Statewide	Calvert	Female	Male	Black	Hispanic	Multiple Races	White
2014	18.8%	18.7%	18.5%	19.6%	22.0%	24.8%	20.7%	18.2%
2016	18.4%	18.3%	19.1%	17.2%	12.1%	23.2%	26.3%	18.1%
2018	17.6%	19.1%	18.5%	19.6%	22.0%	24.8%	20.7%	18.2%

Data Source: Centers for Disease Control and Prevention. 2014-2018 Youth Risk Behavior Survey. Available at: www.cdc.gov/YRBSS

Chart 4LA

Percentage of students who currently use marijuana (one or more times during the 30 days before the survey.)

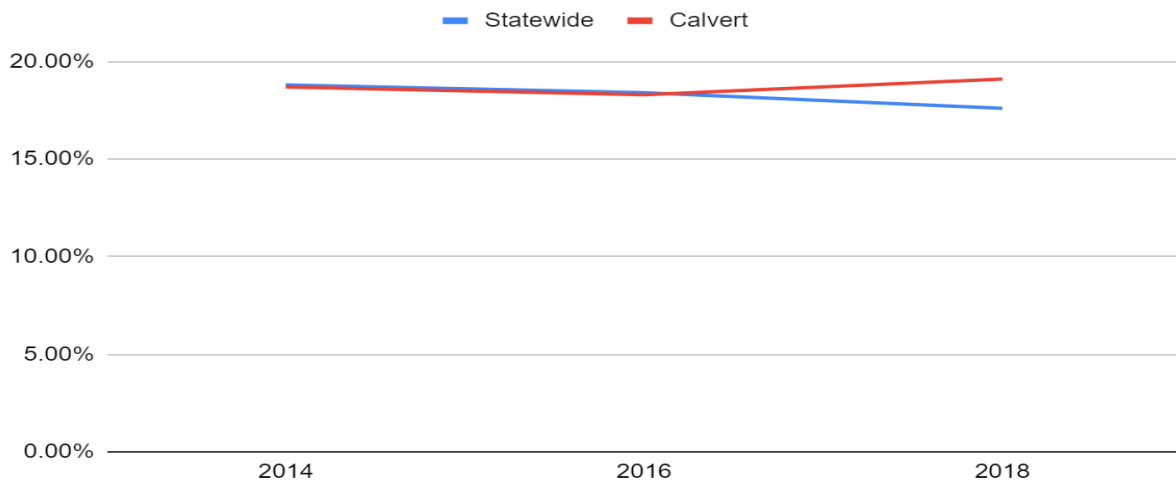


Chart 4LB

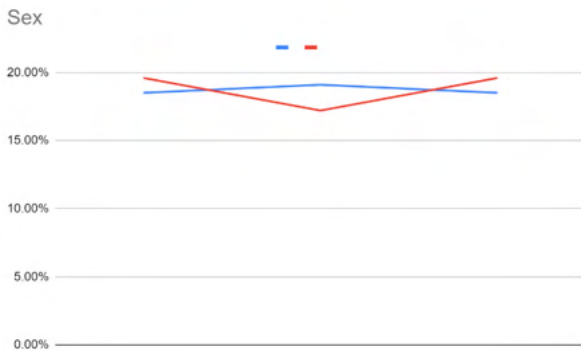


Chart 4LC



DATA AND PLANNING

Much of the data related to Children, Adolescents, and Young Adults shows that Calvert County youth experience many of the same or fewer indicators of mental health and/or substance use disorders when compared to youth around the State of Maryland. Data shows that youth elsewhere in the State of Maryland have higher rates of heroin and methamphetamine use, as well as drug use, drug trafficking, and violence involving a weapon at school than is seen in Calvert County. Calvert County and Maryland have similar rates of prescription medication abuse, cocaine, and marijuana use, suicidal ideation, and intimate partner violence (although IVP rates are beginning to diverge, with the State pulling further ahead of Calvert). The one area where Calvert County significantly exceeds State levels is with youth alcohol consumption. Calvert County youth are consistently more likely to consume alcohol than youth from other areas of the State. Research shows that this is a common pattern in rural areas where alcohol is more available than other illicit drugs and its use by youth may be more accepted (Warren, Smalley, and Barefoot, 2017). Coupled with the lack of sober recreational activities, this may explain the differences between Calvert and other areas of the State.

Other important data to note includes the Statewide overrepresentation of Hispanic youth in nearly all of the data points reported in this section. While at this time, no local data was able to be located, across the State of Maryland Hispanic youth are far more likely to abuse substances, experience mental health issues including suicidal ideation, intimate partner violence, as well as drug trafficking and violence involving a weapon at school. These trends mirror national trends and it is hypothesized that acculturation, language difficulties, and cultural incompatibilities may be antecedents that could be causing this overrepresentation (Halley Grigsby, et al, 2014). Research has also shown a link between substance misuse and depressive symptoms (including suicidal ideation) which would further explain this data.

Biracial youth are also disproportionately represented related to experiencing suicidal ideation. Research into this trend has been conducted and it appears that the importance of establishing cultural and individual identity during the developmental stage of adolescence may play a part (Choi, et al, 2006). Teens from all backgrounds are constantly working to find out who they are and figure out their path in life. Multiracial youth can have a more difficult time with this due to racial discrimination, societal inconsistencies, and experiencing injustices. Unlike monoracial youth, children, adolescents, and young adults with multiple racial and/or ethnic backgrounds may struggle to develop their identity and to feel accepted more than their monoracial peers. This could explain higher rates of depression and suicidal ideation in this population.

While county specific data about these issues is not available at this time, it is important to note that over 80% of Calvert County is White. Many of the problems facing Hispanic and Biracial youth highlighted above may be compounded within our county due to the lack of diversity and community for youth of color. Discrimination, both individual and institutional remains a problem that can exacerbate other risk factors.

Choi, Y., Harachi, T. W., Gillmore, M. R., & Catalano, R. F. (2006). Are multiracial adolescents at greater risk? Comparisons of rates, patterns, and correlates of substance use and violence between monoracial

DATA AND PLANNING

and multiracial adolescents. *The American journal of orthopsychiatry*, 76(1), 86–97. <https://doi.org/10.1037/0002-9432.76.1.86>

Halley Grigsby, T. J., Forster, M., Soto, D. W., Baezconde-Garbanati, L., & Unger, J. B. (2014). Problematic substance use among Hispanic adolescents and young adults: implications for prevention efforts. *Substance use & misuse*, 49(8), 1025–1038. <https://doi.org/10.3109/10826084.2013.852585>

Warren, J. C., Smalley, K. B., & Barefoot, K. N. (2017). Recent Alcohol, Tobacco, and Substance Use Variations between Rural and Urban Middle and High School Students. *Journal of child & adolescent substance abuse*, 26(1), 60–65. <https://doi.org/10.1080/1067828X.2016.1210550>

DATA AND PLANNING

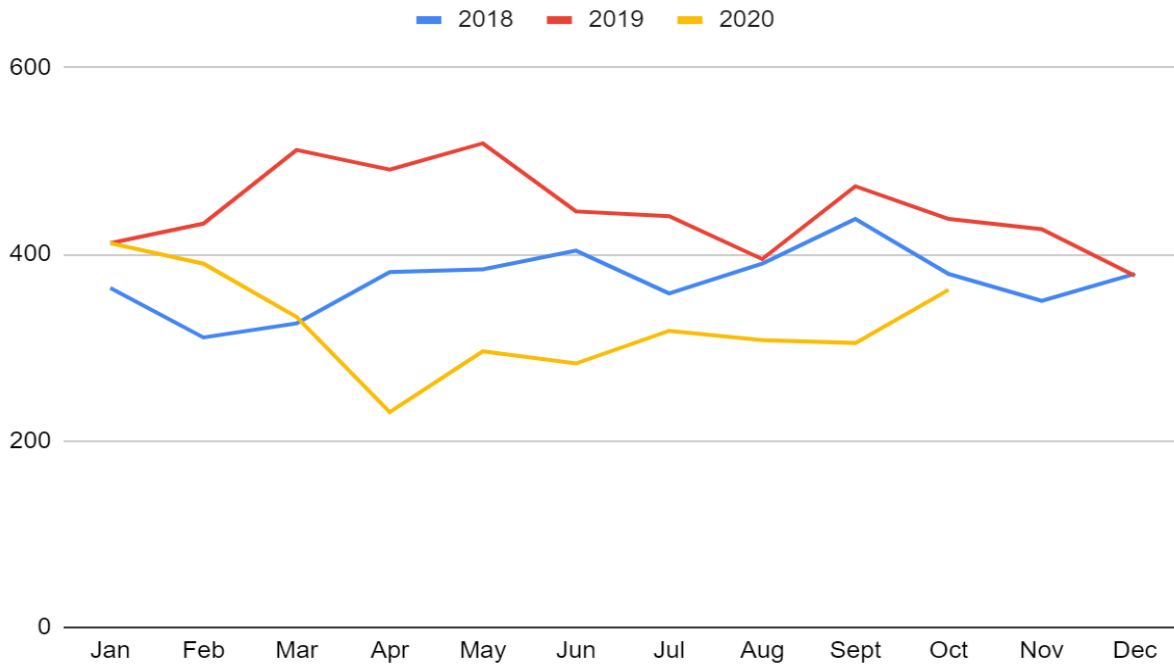
Section 5: Mental Health

Table 5A

ESSENCE Statewide Suicide Ideation Presentations by Month													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
2018	364	311	326	381	384	404	358	390	438	379	350	379	4,464
2019	412	433	512	491	519	446	441	395	473	438	427	377	5,364
2020	412	390	333	231	296	283	318	308	305	362	0	0	3,238

Data Source: Electronic Surveillance System for the Early Notification of Community-Based Epidemics

Chart 5A



DATA AND PLANNING

Table 5B

ESSENCE Suicide Ideation for CY 2018-2020		
	Statewide	Calvert
2018	4,464	25
2019	5,364	41
2020	3,238	29

Data Source: Electronic Surveillance System for the Early Notification of Community-Based Epidemics

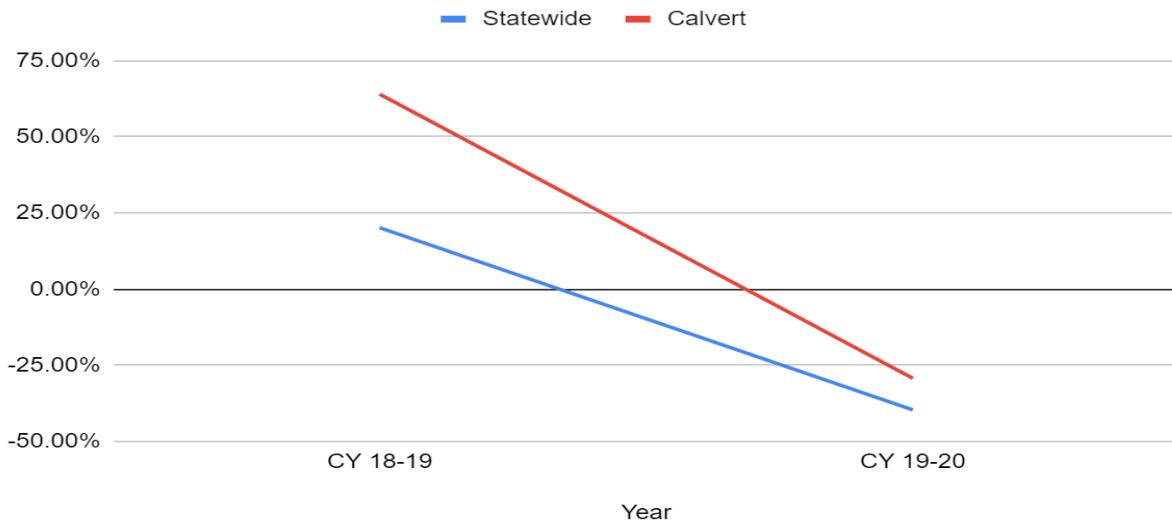
Table 5C

ESSENCE Suicidal Ideation for CY 2018-2020 % Change Over Time		
Year	Statewide	Calvert
CY 18-19	20.16%	64.00%
CY 19-20	-39.63%	-29.27%
CY18-20	-27.46%	16.00%

Data Source: Electronic Surveillance System for the Early Notification of Community-Based Epidemics

Chart 5C

ESSENCE Suicidal Ideation % Change Over Time



DATA AND PLANNING

The data displayed in Tables 5A, 5B, and 5C indicates that in 2020 there has been a significant reduction in reporting of suicidal ideation in the State of Maryland. An important factor that could be contributing to this trend may be the COVID-19 pandemic. It has been observed that people are seeking treatment in hospital and outpatient settings in lower numbers due to fears of exposure to the current pandemic. Another contributing factor could be that hospitals, health departments, and other community health organizations have increased patient volume and duties directly related to COVID-19 infections and outbreak management. It is possible that this has caused decreased reporting of occurrences of suicidal ideation as well.

Table 5D

ESSENCE Suicide Presentations for CY 2018-2020							
		2018		2019		2020	
		Calvert	Statewide	Calvert	Statewide	Calvert	Statewide
Age	0-25	<11	1,809	16	2,291	16	1,398
	26-64	12	2,472	21	2,853	13	1,695
	65+	<11	170	<11	217	0	142
Gender	Female	11	2,283	17	2,785	14	1,756
	Male	14	2,180	24	2,579	15	1,481
Race	Black	<11	1,575	<11	2,033	<11	1,161
	White	22	2,452	22	2,764	15	1,739
	Other	<11	437	16	567	12	338

Data Source: Electronic Surveillance System for the Early Notification of Community-Based Epidemics

DATA AND PLANNING

Table 5E

Calvert County Behavioral Health Emergency Department Visits 2018-2020												
	2018				2019				2020			
	Total Seen	Admitted	Transferred	PHP	Total Seen	Admitted	Transferred	PHP	Total Seen	Admitted	Transferred	PHP
Jan	147	45	13	18	121	27	18	11	140	37	16	17
Feb	120	26	16	9	119	0	46	12	132	35	15	21
Mar	139	41	20	12	104	24	17	13	69	22	8	4
Apr	137	34	17	14	137	50	21	14	63	22	5	0
May	146	39	10	13	126	28	13	12	81	20	8	3
Jun	122	38	13	9	103	35	5	5	86	0	25	12
Jul	116	35	23	5	107	37	11	6	101	28	17	14
Aug	118	45	16	13	96	33	12	8	104	27	15	9
Sept	111	44	8	7	113	37	10	8	109	30	12	13
Oct	170	56	14	20	134	41	6	19	127	27	15	22
Nov	112	31	12	9	112	30	7	13	114	27	10	14
Dec	127	34	12	13	109	35	8	13				
Total	1,565	468	174	142	1,381	377	174	134	1,126	275	146	129

Data Source: Calvert Health Medical Center Emergency Department

The data in Table 5E comes directly from the Emergency Psychiatric Services Program in the Calvert Health Medical Center (CHMC) Emergency Department. An Important factor to keep in mind when viewing this data is that CHMC has had ongoing significant renovations to their facilities which have impacted the number of individuals able to be served. In February and March 2019, the inpatient program was closed for 6 weeks for renovations which is reflected in the number of individuals admitted to the unit during that time (0 in February). The inpatient unit was again closed for 4 weeks in June of 2020 for renovations and is reflected in the number of admissions (0). Also, important to note is that at the beginning of the COVID-019 pandemic the PHP program at CHMC initially closed and when it did reopen to provide service it did so in a limited capacity of only 7 adults and 6 adolescents (typically each program can accommodate 10 individuals).

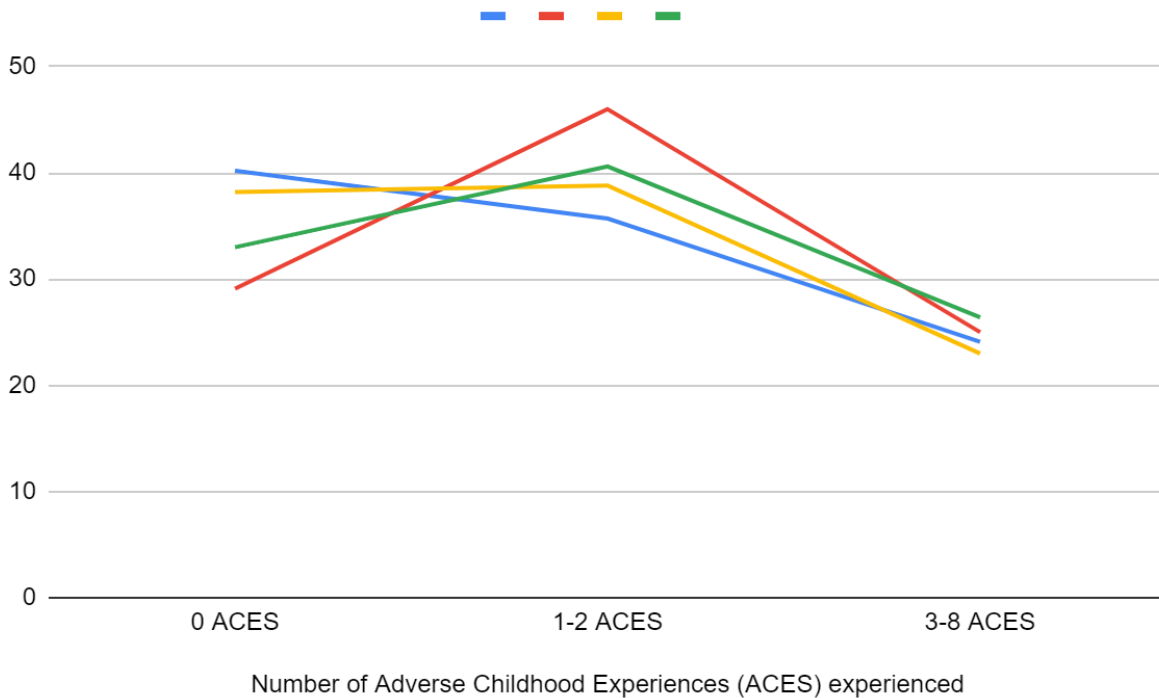
Section 6: Adverse Childhood Experiences (ACES)

Table 6A

Number of Adverse Childhood Experiences (ACES) experienced				
	2015		2018	
	Statewide	Calvert	Statewide	Calvert
0 ACES	40.2	29.1	38.2	33
1-2 ACES	35.7	46	38.8	40.6
3-8 ACES	24.1	25	23	26.4

Data Source: Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. [2015 and 2018].

Chart 6A



Data in Table 6A shows that overall Calvert and Maryland have similar rates of individuals reporting 0 and 3-8 Adverse Childhood Experiences prior to the age of 18. However, rates of individuals reporting 1-2 Adverse Childhood Experiences are much higher in Calvert County than the state average.

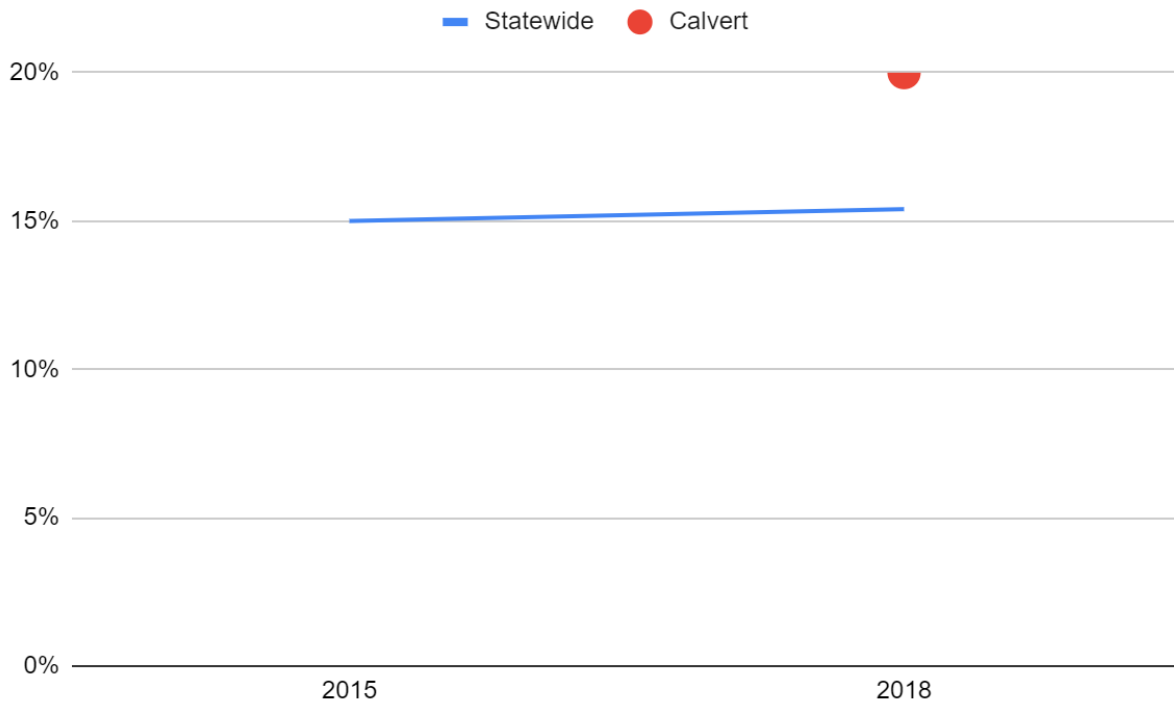
DATA AND PLANNING

Table 6B

Did You Live with Anyone who was Depressed, Mentally Ill, or Suicidal		
	2015	2018
Statewide	15%	15.4%
Calvert		20%

Data Source: Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. [2015 and 2018].

Chart 6B



Information from Table 6B shows that in 2018 Calvert County residents reported higher rates of individuals reporting growing up with a household member who was depressed, mentally ill, and/or suicidal. Unfortunately, data from 2015 is unavailable so there is no way to draw many conclusions from this information since there is no way to do a multi-year comparative analysis.

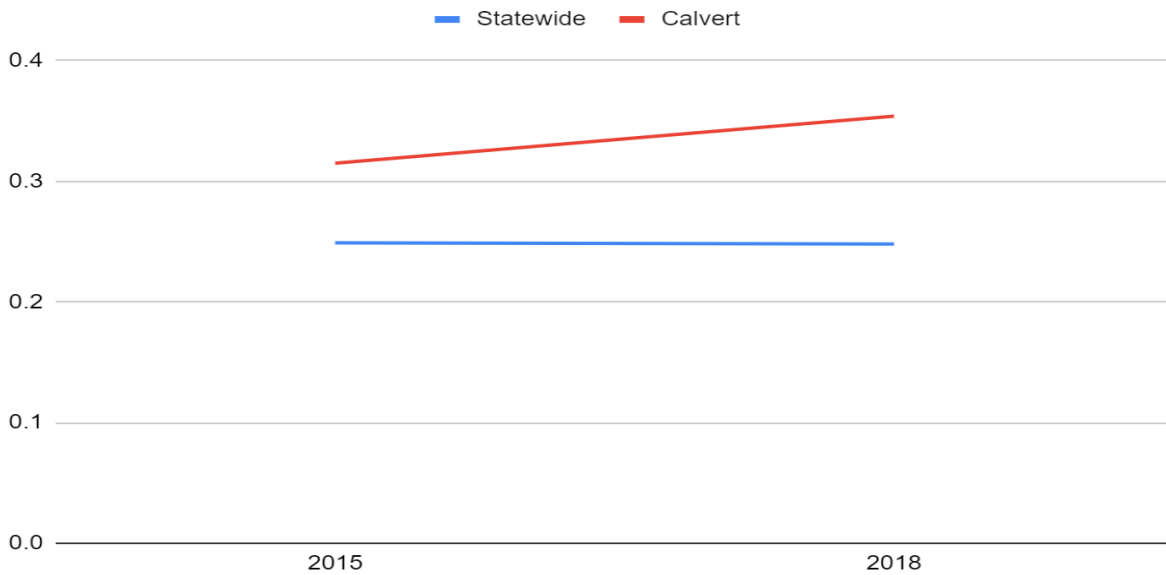
DATA AND PLANNING

Table 6C

Did you Live with Anyone who was a problem drinker or alcoholic? Did you Live with Anyone who Used Illegal Street Drugs or who Abused Prescription Medications?		
	2015	2018
Statewide	24.9%	24.8%
Calvert	31.5%	35.4%

Data Source: Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. [2015 and 2018].

Chart 6C



In Section 4, above, it is discussed that Calvert County has similar, if not lower, rates of illicit substance use and abuse in youth than the State of Maryland. It was noted however, that alcohol use among youth is significantly higher. When correlated to data from Table 2B, Projected number of individuals receiving services in the PBHS, and Table 6C, regarding parental alcohol and substance abuse, it appears that there may be a link. Research shows that children whose parents have problematic alcohol and drug use may experience both genetic and environmental factors that increase their own likelihood of developing a Substance Use Disorder (Lander, Howsare, and Byrne, 2013). As discussed in Section 4, rural areas tend to see higher rates of alcohol use in youth, rather than illicit drugs, and the high prevalence of problem drinking and/or drug use in Calvert parents may also be a contributing factor to teen alcohol consumption.

Lander, L., Howsare, J., & Byrne, M. (2013). The impact of substance use disorders on families and children: from theory to practice. *Social work in public health, 28*(3-4), 194–205. <https://doi.org/10.1080/19371918.2013.759005>

DATA AND PLANNING

Table 6D

Were Your Parents Separated or Divorced?		
	2015	2018
Statewide	24.9%	29.1%
Calvert	31.5%	38%

Data Source: Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. [2015 and 2018].

Chart 6D

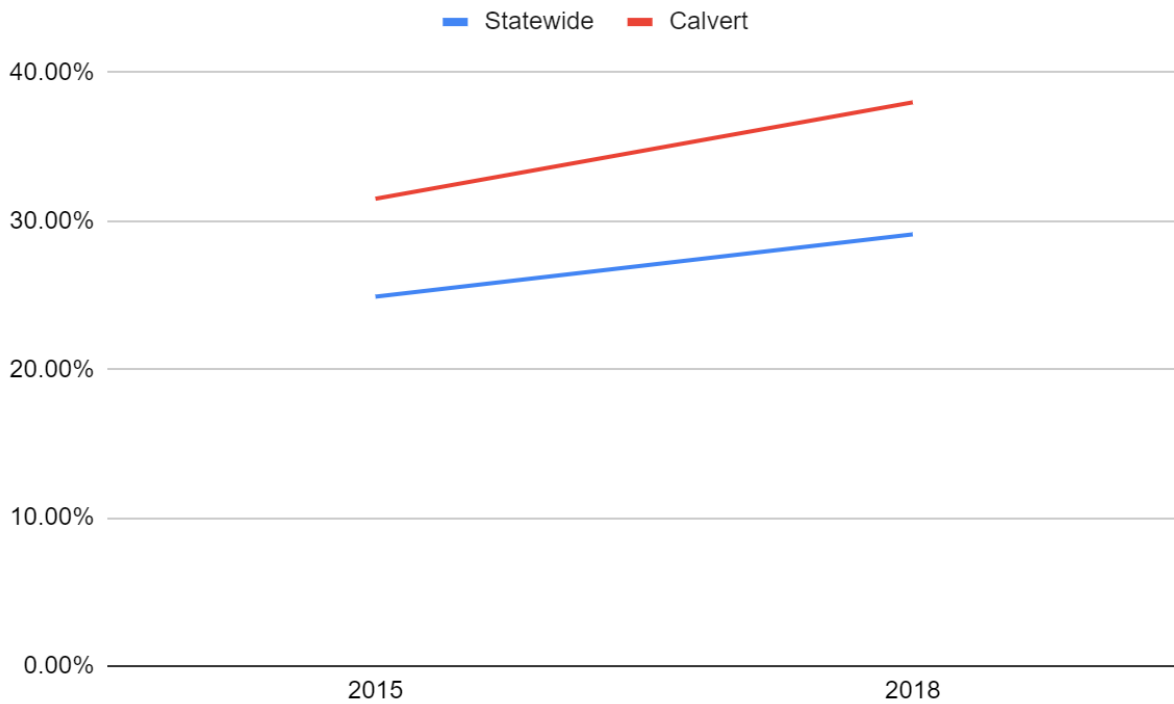


Table 6D shows that Calvert County residents report slightly higher rates of their parents separating or divorcing when they were under the age of 18 than the overall State of Maryland. That rate is also climbing at a slightly faster pace than the rest of the state.

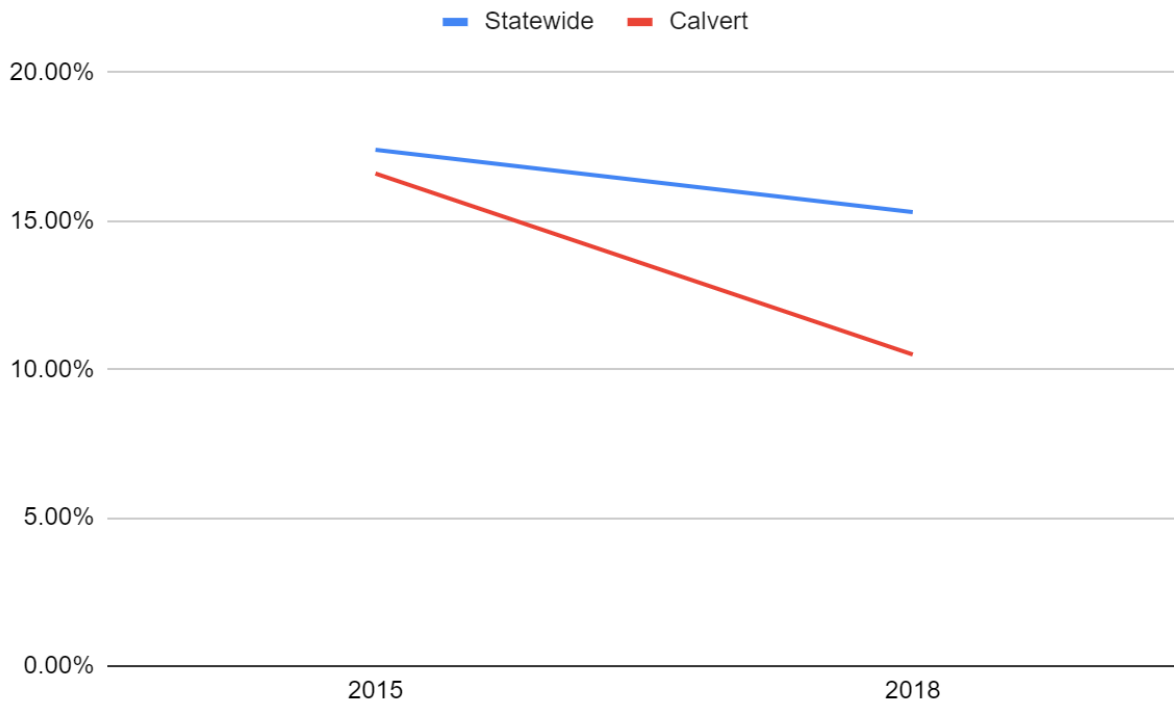
DATA AND PLANNING

Table 6E

How Often Did Your Parents or Adults in Your Home Ever Slap, Hit, Kick, Punch, or Beat Each Other Up?		
	2015	2018
Statewide	17.4%	15.3%
Calvert	16.6%	10.5%

Data Source: Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. [2015 and 2018].

Chart 6E



Calvert County residents report lower rates of household domestic violence as children than the State of Maryland. The rate is also decreasing from 16.6% to 10.5% between 2015 and 2018.

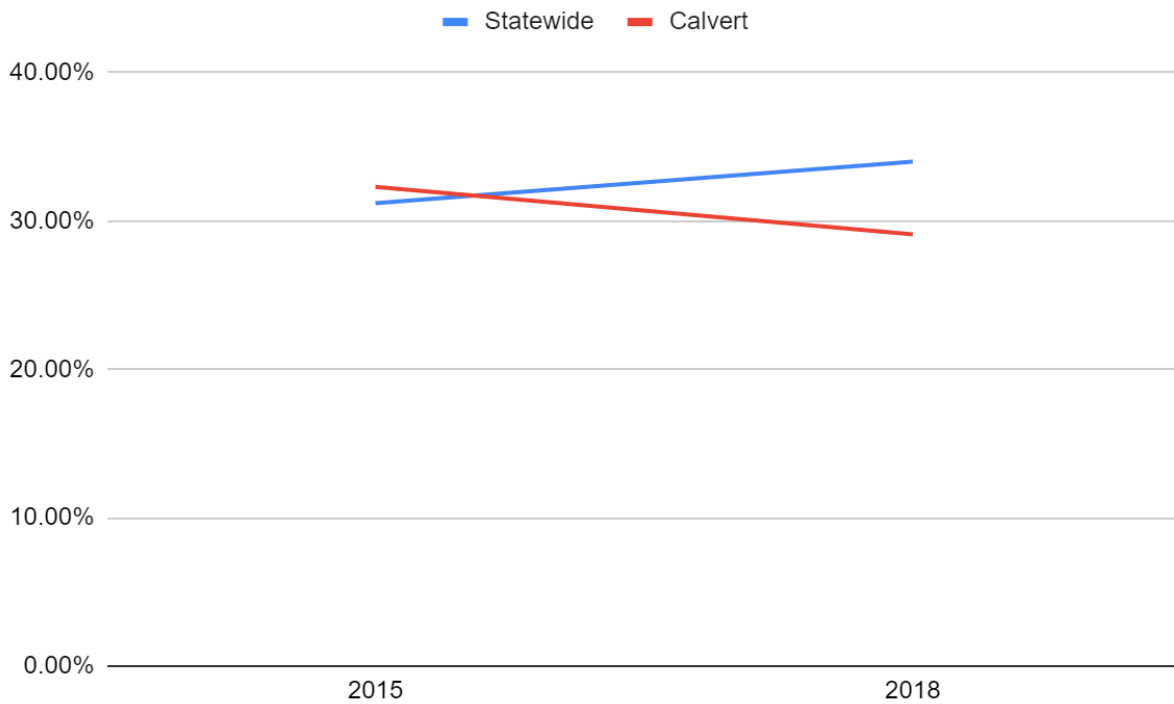
DATA AND PLANNING

Table 6F

How Often Did a Parent or Adult in Your Home Ever Swear at You, Insult You, or Put You Down?		
	2015	2018
Statewide	31.2%	34%
Calvert	32.3%	29.1%

Data Source: Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. [2015 and 2018].

Chart 6F



Calvert County residents report similar rates of being emotionally or verbally abused as children to the State of Maryland.

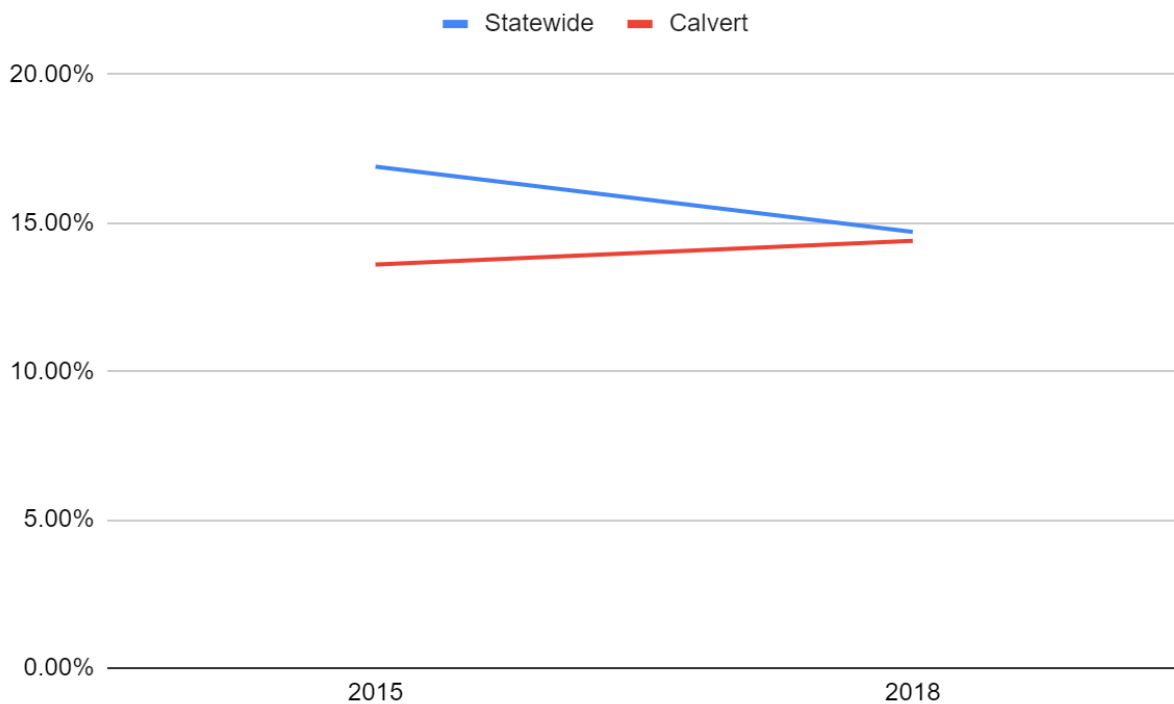
DATA AND PLANNING

Table 6G

Before Age 18, How Often Did a Parent or Adult in Your Home Ever Hit, Beat, Kick, or Physically Hurt You in Any Way? Do Not Include Spanking.		
	2015	2018
Statewide	16.9%	14.7%
Calvert	13.6%	14.4%

Data Source: Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. [2015 and 2018].

Chart 6G



In 2015 Calvert County residents reported experiencing physical abuse as minors at slightly lower rates than residents of the entire State of Maryland (13.6% and 16.9% respectively). In 2018 the reported rates were almost identical with the State of Maryland reporting 14.7% and Calvert County residents reporting 14.4%. This is a decrease for the state of 2.2% and an increase for Calvert of less than 1%.

Section 7: Substance Use Disorder

Chart 7A

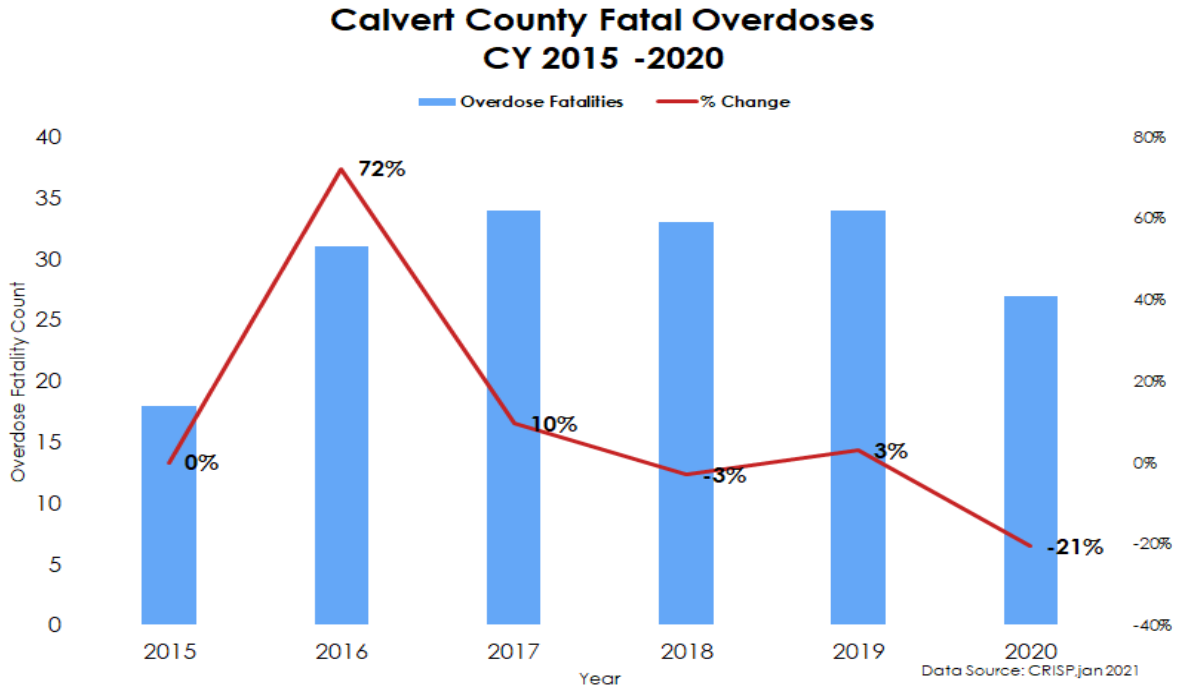
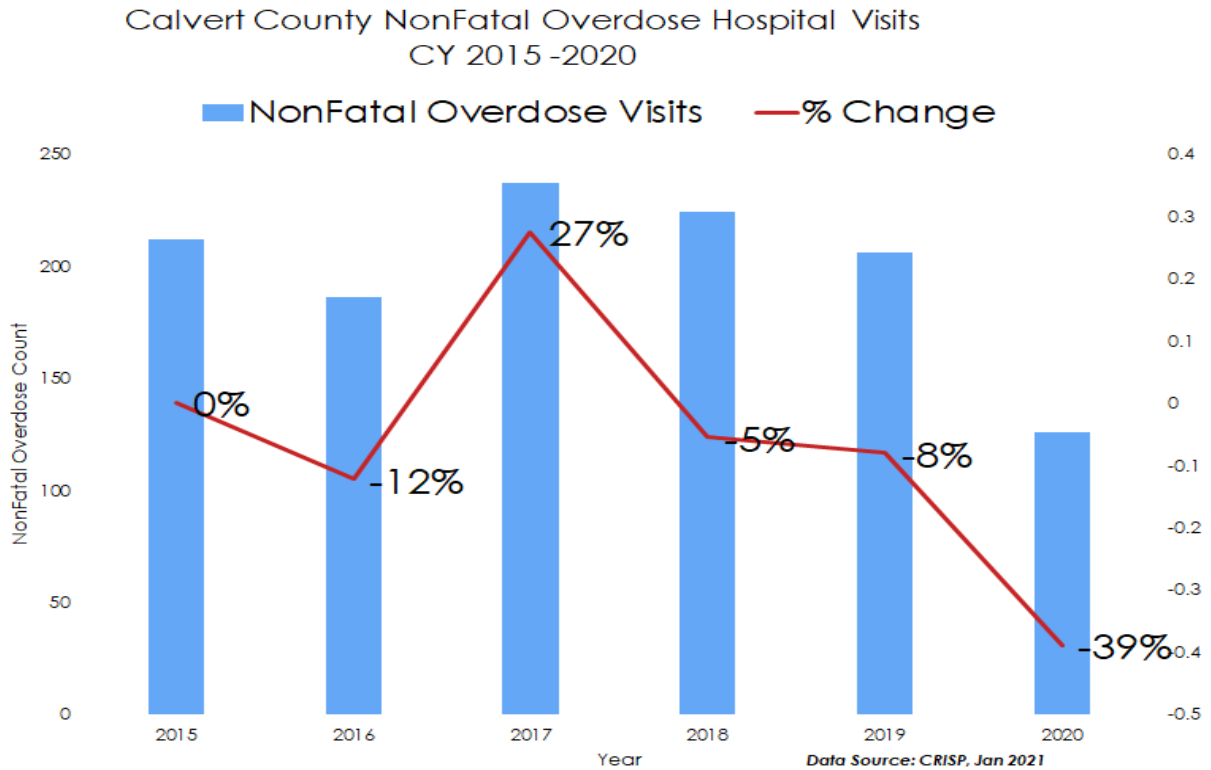


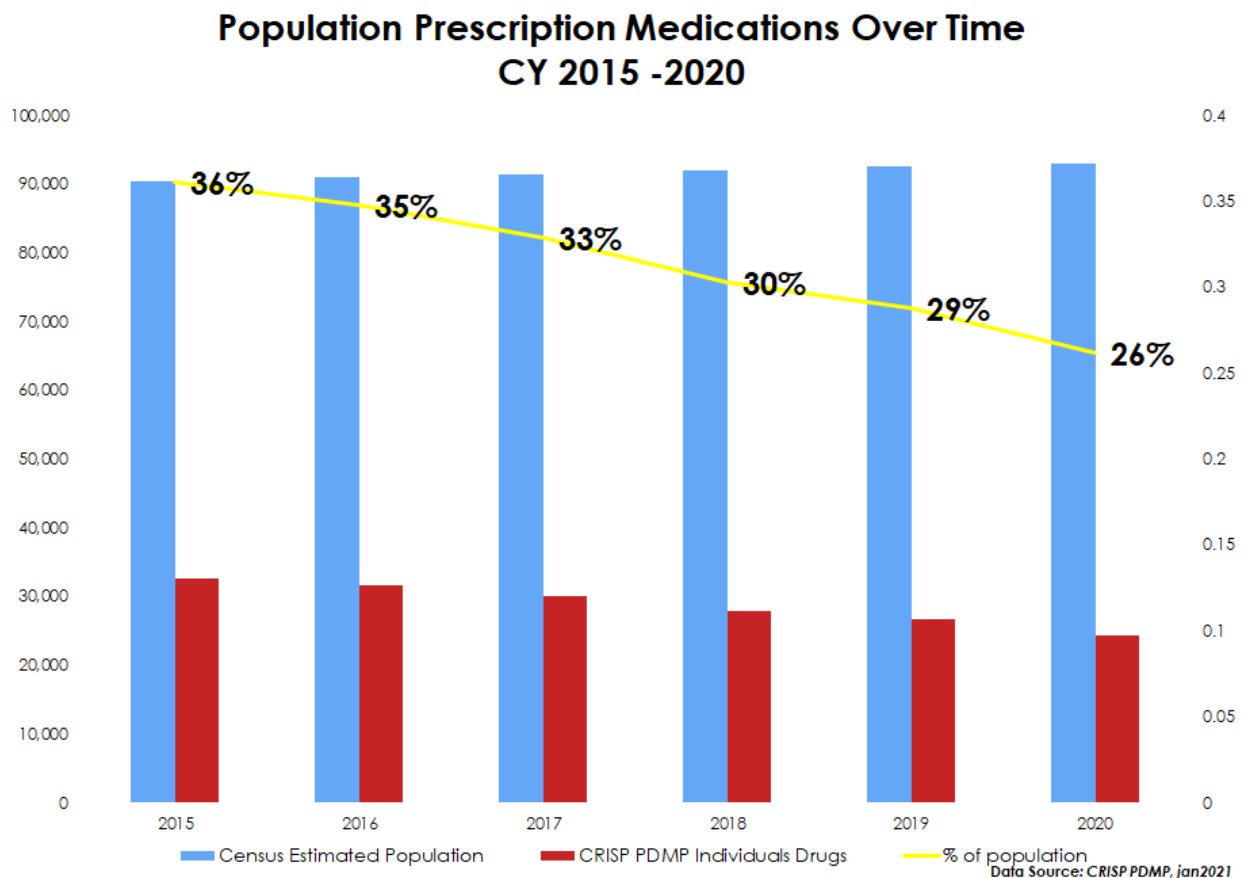
Chart 7B



DATA AND PLANNING

As can be seen in Charts 7A, the opioid epidemic began to significantly impact the overdose fatality rate in Calvert County in 2016. Calvert experienced a 72% increase in fatalities from overdose from 2015 to 2016. Since then, fatalities have remained fairly stable up until 2020 when a reduction of 21% was seen. Non-fatal overdoses however didn't see a significant spike until 2017 but have been on the decline since then with a significant drop in 2020. Calvert has put many interventions into place including significant naloxone distribution, an expansion of access to Medication Assisted Treatment, and a newer focus on Harm Reduction education and services. The CDC reports that during the COVID-19 pandemic, the US has seen the highest number of overdose deaths ever. Calvert has not seen this same increase, reporting fewer overdose fatalities during the pandemic.

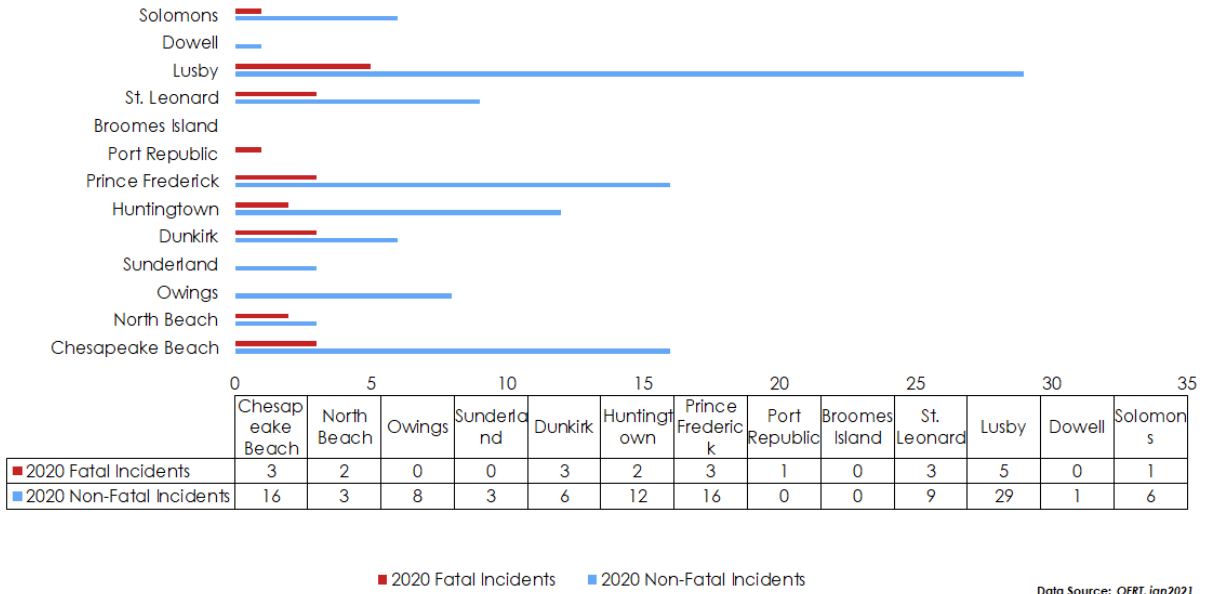
Chart 7C



According to data in Chart 7C, overall prescribing of medications has decreased by 10% since 2015 while the population of Calvert County has increased during that same time. Although this information does not specify different types of medications it is important to note that Calvert Health Medical Center created an Opioid Stewardship Program in 2015. Working with the Calvert County Health Department and other local organizations, the Stewardship implemented a Dilaudid-free Emergency Department initiative in March 2017 resulting in a 94% decrease in prescriptions for Dilaudid and 26% reduction in overall opioid prescriptions.

Chart 7D

**CALVERT COUNTY OVERDOSES BY CDP
CY 2020**



There are a few areas of the county that are hot spots for overdose. Lusby, MD has the highest rate of overdose in Calvert in 2020 with 29 non-fatal and 5 fatal. Chesapeake Beach and Prince Frederick have the second highest rates with each area seeing 16 non-fatal and 3 fatal overdoses. These three areas are geographically spread out, with Lusby at the Southern end of the county, Prince Frederick in the center and Chesapeake Beach. These areas are some of the most densely populated areas in the county, which may account for the higher rates of overdose.

Chart 7E

Overdose Fatality Injection Drug Use CY 2020

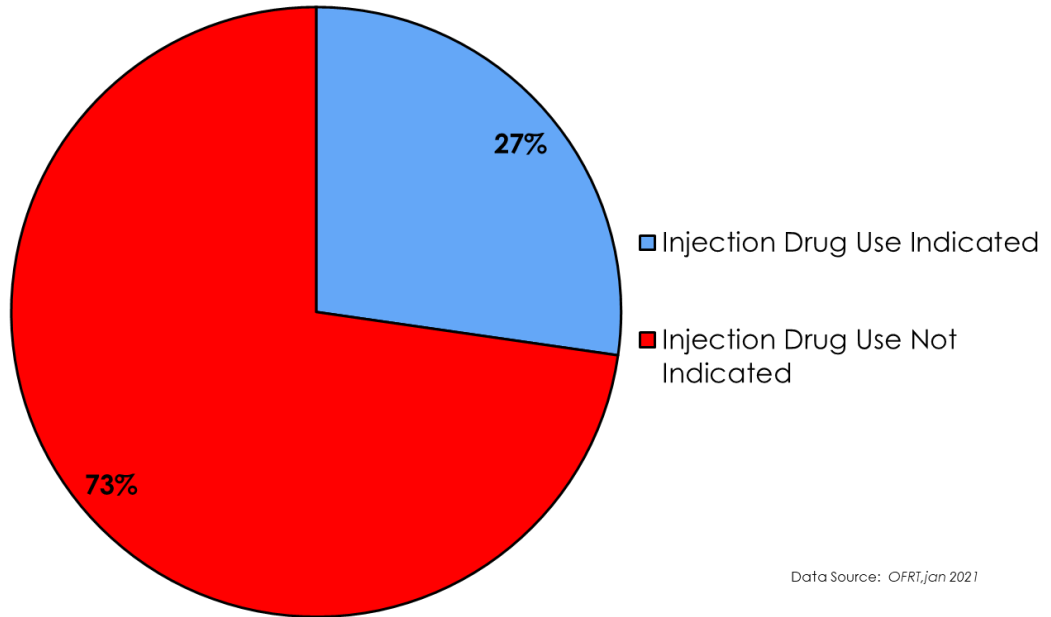
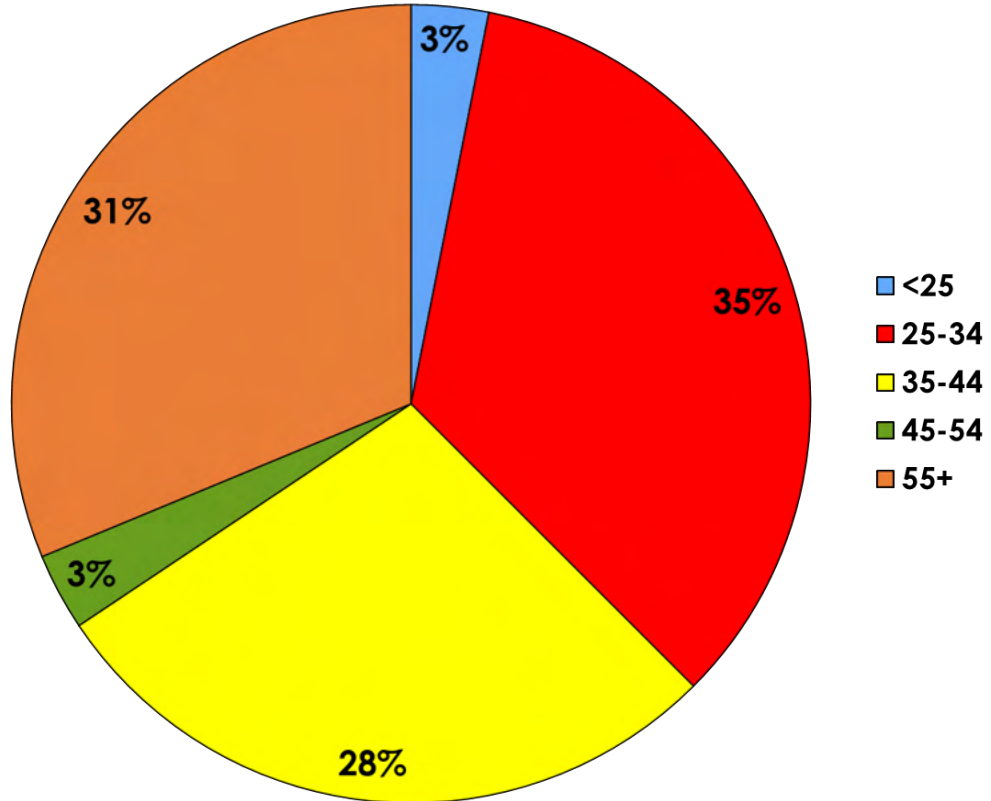


Chart 7E indicates that only 27% of overdose deaths in Calvert County during 2020 were related to injection drug use. It is not uncommon for overdoses to be the result of mixing multiple substances and local Sheriff reports have indicated this is a factor in many local overdoses. Recent reports also have noted that the opiate Fentanyl has infiltrated much of the drug supply throughout the State of Maryland. Fentanyl is less likely to respond to the lifesaving drug Naloxone due to its potency and at times has been found to be mixed into other substances without the knowledge of the person using it. These factors may be linked to the high number of overdoses where injection drug use was not indicated.

Chart 7F

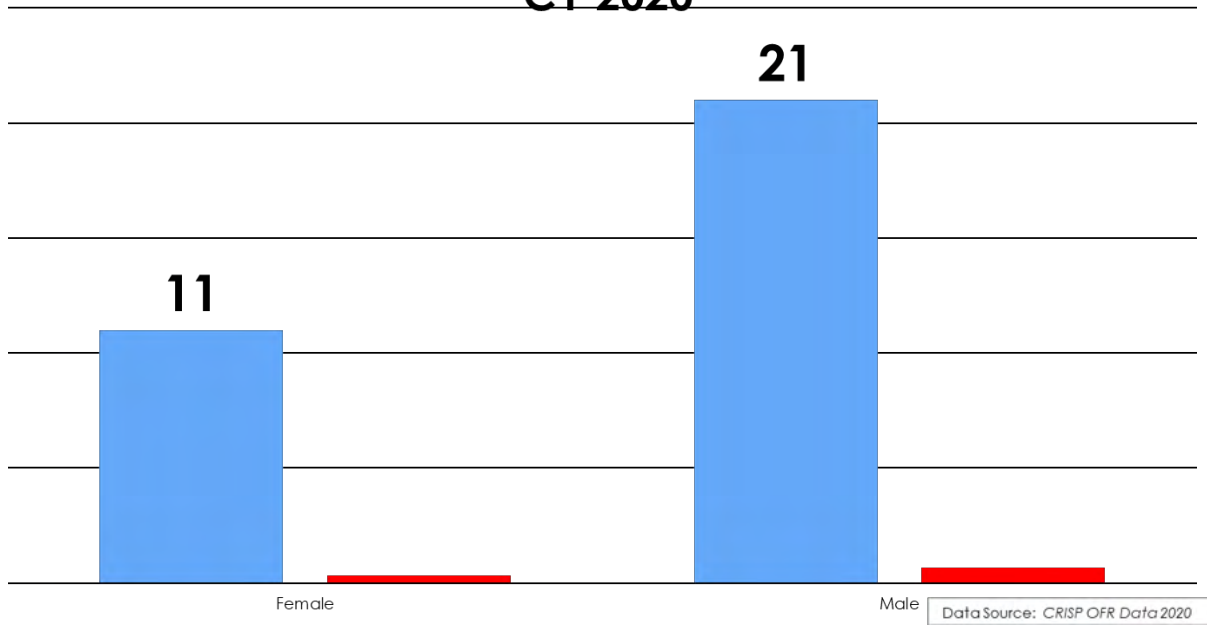
Calvert County OFRT Overdose Fatality by Age CY 2020



The data in Chart 7F shows that individuals between the ages of 25 and 44 as well as individuals over the age of 55 have the highest rates of overdose in Calvert County.

Chart 7G

Calvert County OFRT Overdose Fatality by Gender CY 2020



In 2020 men were almost twice as likely to die of an overdose in Calvert County.

DATA AND PLANNING

Section 8: Forensic

Table 8A

Calvert County Detention Center Bookings by Gender					
	Male		Female		Total
2018	2297	73%	779	25%	3140
2019	2550	74%	887	26%	3463
2020	1656	78%	462	22%	2118

Data Source: Calvert County Detention Center

Chart 8AA

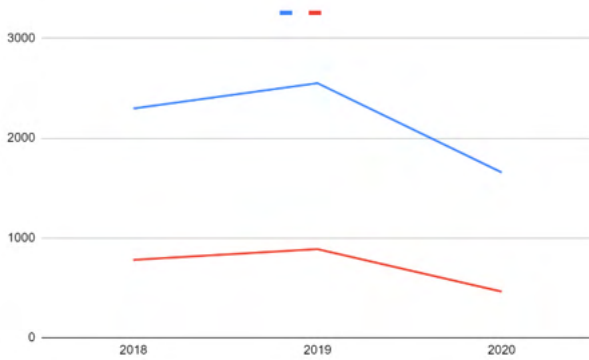
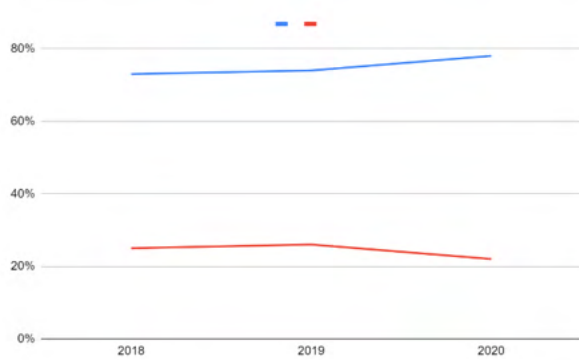


Chart 8AB



In Calvert County, the local detention center population has historically been predominantly male, between 73% and 78% of bookings. In 2019 the total number of bookings increased from 2018 by 323 but it then reduced dramatically in 2020 by 1,345. This was due to the COVID-19 pandemic. The local detention center worked with local law enforcement and court systems to dramatically reduce the inmate population to assist with ensuring the health and safety of the inmate population and the staff at the detention center.

DATA AND PLANNING

Table 8B

Calvert County Detention Center Bookings by Race									
	Black		White		Native American		Asian/Pacific Islander		Total
2018	1009	32%	2065	65%	1	0.03%	7	0.3%	3140
2019	1164	34%	2257	65%	2	0.1%	9	0.4%	3463
2020	835	39%	1268	60%	1	0.05%	11	1%	2118

Data Source: Calvert County Detention Center

Chart 8BA

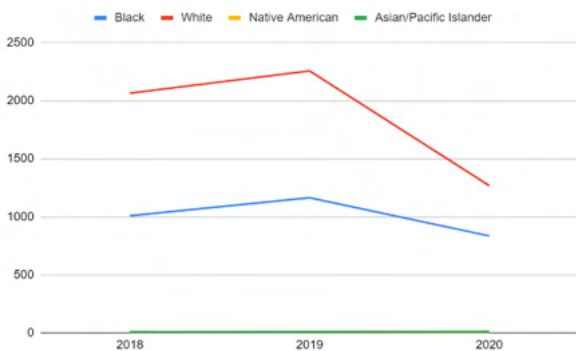


Chart 8BB

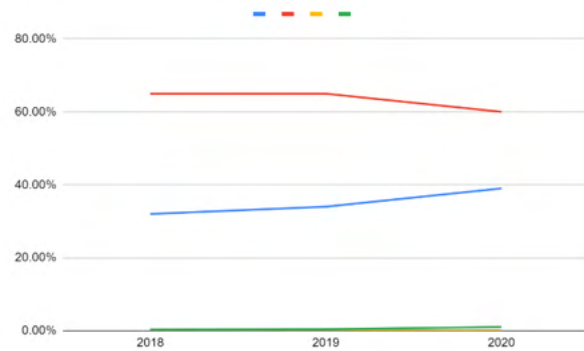


Table 8B shows the breakdown of booking at the Calvert County Detention Center by race. Chart 8BB shows that despite the reduction in the population, the racial make-up of inmates has remained steady across the 3 years analyzed. The racial make-up of detention center bookings is not reflective of the actual racial make-up of Calvert County. Only 13.3% of the population of Calvert County is African American and yet they constitute up to 39% of individuals being booked.

DATA AND PLANNING

Table 8C

Calvert County Detention Center Booking by Employment Status					
	Employed		Unemployed		Total
2018	1647	52%	1432	46%	3140
2019	1372	40%	2055	59%	3463
2020	688	32%	1401	66%	2118

Data Source: Calvert County Detention Center

Chart 8CA

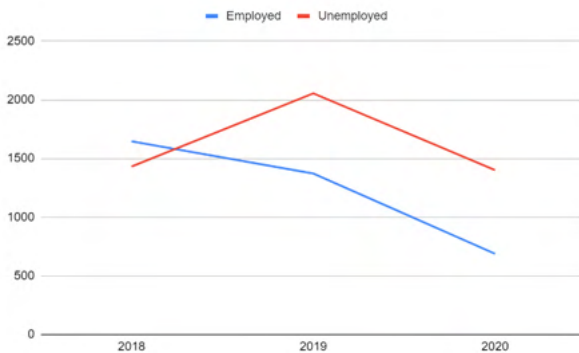
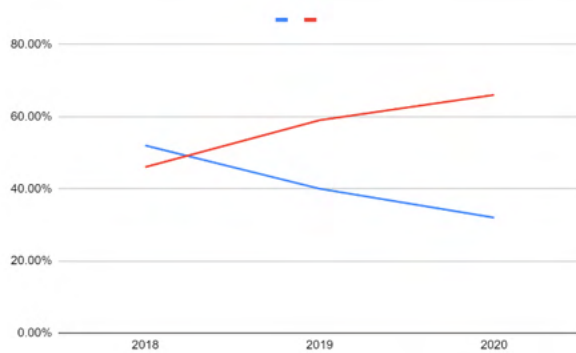


Chart 8CB



In 2018 the majority of individuals booked at the Calvert County Detention Center were employed (52%). This number has trended downwards since then with unemployed individuals overtaking employed individuals being booked in 2019 and 2020. The percentage of unemployed individuals being booked following arrest has been increasing annually from 46% to 59% between 2018 and 2019 and then again to 66% in 2020. This is likely related to the increase in the prerelease population being held at our local detention center. According to local stakeholders, there has been a shift in our detention center population in recent years. A larger proportion of individuals who are incarcerated locally are being transferred from prisons prior to being released into the community versus those being detained locally for shorter periods.

DATA AND PLANNING

Table 8D

Calvert County Detention Center Bookings by Age									
	18-24		25-40		40-64		65+		Total
2018	468	15%	1884	60%	1002	32%	46	1%	3140
2019	504	15%	1954	56%	1276	37%	34	1%	3463
2020	307	14%	1213	57%	777	37%	29	1%	2118

Data Source: Calvert County Detention Center

Chart 8DA

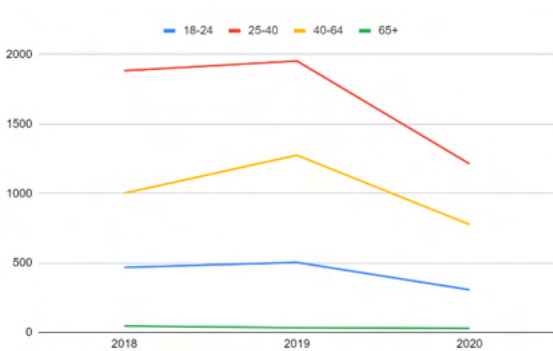
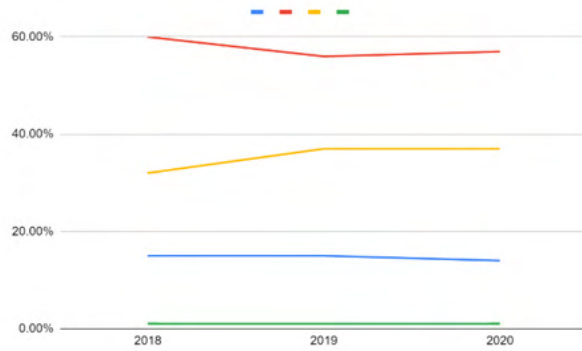


Chart 8DB



The age range of individuals being incarcerated in Calvert County are individuals between the ages of 25 and 40. This age range makes up over half of all incarcerations between 2018 and 2020. Individuals aged 40-64 come next as most likely to be incarcerated ranging between 32% and 37% between 2018 and 2020. Next, Transition Aged Youth between the ages of 18 and 24 make up the incarcerated population at approximately 15% and finally individuals over the age of 65 at 1%. The rates of incarceration across age ranges remain fairly stable across time however it is important to note that these ranges are not evenly distributed.

DATA AND PLANNING

Table 8E

Calvert County Detention Center Booking by Residency Status					
	Calvert Resident		Non Resident		Total
2018	1802	57%	1338	43%	3140
2019	1964	57%	1499	43%	3463
2020	1161	55%	957	45%	2118

Data Source: Calvert County Detention Center

Chart 8EA

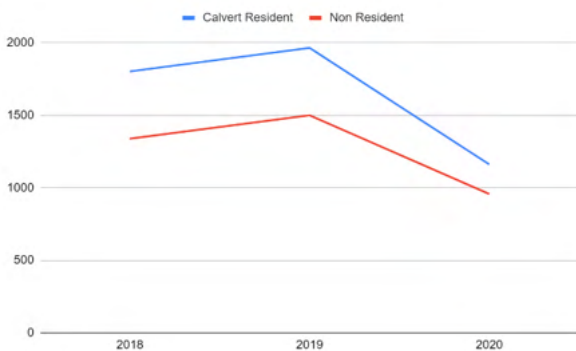
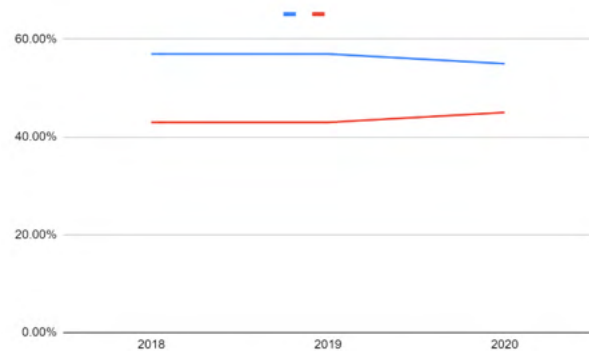


Chart 8EB



According to Calvert County Detention Center data in Table 8E, just over half of incarcerated individuals are Calvert County residents. This information could be relevant when compared to findings in Table 8B related to the racial breakdown of incarcerated individuals. Calvert County lies adjacent to two counties that have predominantly African American populations (Charles and Prince George’s Counties). However, without further data there is no way to confirm if or how this may be impacting demographics within the detention center or if there are other factors which could be contributing to this data.

H. FY2022 Goals

1. Health Integration

Need/Gaps: To improve coordination and reduce the likelihood of duplicated efforts, BHA has supported local authorities in moving towards integrating system management functions for behavioral health.

Following integration of the CSA and LAA into the LBHA in July 2019, the local Advisory Councils determined that merging their functions into one council would be a fitting next step. This will assist with improving Calvert County's score in Domain 1, Leadership and Governance, and Domain 6, Stakeholder Collaboration. Much of the legwork for this goal was accomplished during FY21, however the process of updating the council bylaws is a long one and will need to be completed during FY22.

Goal: The Local Behavioral Health Authority will integrate the Local Mental Health Advisory Council (LMHAC) and Local Drug and Alcohol Abuse Council (LDAAC) into a Local Behavioral Health Advisory Council (LBHAC).

Objective: The LBHA will update the Core Service Agency Bylaws through the Calvert County Government to reflect the integration of the Core Service Agency and Local Addictions Authority by December 2021.

Strategies:

- The LBHA will coordinate with the Local Health Officer, a representative of the Calvert County Commissioners, and the County Attorney to update the CSA bylaws.
- The LBHAC bylaws subcommittee will review changes made to the CSA bylaws.
- The LBHA will seek feedback from the LMHAC and LDAAC on any updates made to the bylaws.

Objective: The LBHA will submit integrated bylaws to the Calvert County Commissioners by December 2021.

Strategies:

- The LBHA will verify the process for submitting revisions to bylaws to the County Commissioners.
- The LBHA will verify the dates of upcoming Calvert County Board of Health meetings.

FY2022 GOALS

Performance Measures

- LBHAC Bylaws will be completed and submitted to the Calvert County Commissioners by Dec 2021.

Performance Target

- The LBHA will have an integrated Advisory Council that includes diverse stakeholders from the community by July 2022.

2. Child and Adolescent Mental Health

Needs/Gaps: The Calvert County Family Network conducted a local needs assessment for children, youth and families, a portion of which focused on Child and Adolescent Behavioral Health needs. Youth depression was identified as one of the key areas of concern for Calvert County teens and a lack of providers to provide services for this population was also pinpointed as a concern. Community members identified stigma, family instability, chronic stress, and bullying as contributing factors to high levels of depression. Mental Health hospitalizations for youth are also noted to be higher than the State average. Teens make up the highest proportion of mental health hospitalizations. The Needs Assessment also shows that a lack of providers of services targeting this population coupled with high rates of private insurance coverage within the county, which does not cover many important behavioral health services, make accessing services difficult. Another factor identified was high rates of Adverse Childhood Experiences reported including having a parent who is mentally ill, having a parent with a substance use disorder, and being emotionally abused by household members.

Goal: Calvert County will experience a reduction in adolescent suicide attempts by 2024.

Objective: The Calvert County LBHA will educate the public about the availability of local behavioral health services.

Strategies:

- The LBHA will hold at least 2 open sessions with local pediatricians to educate them about behavioral health resources for children and adolescents.
- The LBHA will coordinate at least 2 local trainings for behavioral health providers on topics relevant to the CAYA population.
- The LBHA will hold at least 2 educational forums for Calvert County parents on the mental health topics.
- The LBHAC will create a child & adolescent subcommittee of the LBHAC to assist with addressing needs and gaps in local services.

Performance Measures:

- 2 open sessions with pediatricians.
- 2 trainings for behavioral health providers on behavioral health topics
- 2 educational forums on mental health topics for Calvert parents

Performance Targets

FY2022 GOALS

- 5% reduction in reported feelings of sadness or hopelessness in High School students by 2024.
- 5% reduction in inpatient hospitalization rates for children and adolescents by 2024.

3. Homelessness

Needs/Gaps: In 2019, the Calvert County Community Resources Department established a Housing Task Force to explore the housing needs of the county. One area of need that was identified was supportive and barrier free housing and shelter for homeless individuals, particularly those with behavioral health disorders. Calvert County does have a range of services available to homeless and near homeless individuals however, the volume of individuals seeking these services far exceeds the availability. It is also important to note that many of our shelter options are through volunteer organizations and faith-based initiatives. During the winter of 2020/2021, the safe nights program in Calvert County was only able to accept 10 individuals into their cold weather shelter program. They also placed restrictions on who could participate that limited access for individuals experiencing homelessness that have active warrants and/or a history of a sex offense.

Goal: The Calvert County LBHA will reduce barriers to shelter and housing for homeless individuals in Calvert County.

Objective: The Calvert County LBHA will identify gaps in shelter and housing for homeless individuals in Calvert County by December 2021.

Strategies

- The LBHA will convene a taskforce that includes local stakeholders to investigate the gaps in services and ways to fill them.
- The LBHA will conduct a needs assessment with local stakeholders to identify resources and gaps in services for homeless individuals living in Calvert County.

Performance Measures

- 1 Homeless Services needs assessment will be conducted by December 2021.

Performance Target

- A 20% reduction in individuals identified as “literally homeless” by 2025.

4. Health Equity

Needs/Gaps: Stigma often makes individuals with Mental Health and Substance Use Disorders and individuals in recovery, family and friends, treatment professionals, community activists, and other stakeholders feel powerless, angry, and frustrated. The racial landscape of Calvert County is predominantly White, making up 81% of residents while African American's are 13% and Hispanic individuals just over 4%. Another important area of focus is with our local LGBTQ+ population. Statistics and demographic data about this population is not readily available, but what is known is that individuals who are LGBTQ+ face stigma and discrimination regularly. When a population lacks diversity, treatment can become homogenous leading to fewer resources for those with diverse needs. It is of the utmost importance that our residents, of all cultures, feel safe and understood when seeking treatment. Calvert County providers consistently assess the cultural needs of our population and focus on recruitment and retention of diverse staff to meet the needs of all of our residents.

Goal: The Calvert County LBHA will increase access to effective behavioral health treatment for residents regardless of age, race, gender, creed, sexual orientation, and/or disability.

Objective: The Calvert County LBHA will educate local behavioral health providers and stakeholders about evidence-based interventions to serve diverse populations.

Strategies:

- The Calvert County LBHA will coordinate Continuing Education opportunities for local behavioral health providers on Health Equity and cultural competency.
- The Calvert County LBHA will schedule presentations at its bi-monthly provider meeting on resources to assist organizations with better serving diverse populations.
- Provide annual training on cultural competency to all LBHA staff and Advisory Council members.

Objective: The Calvert County LBHA will participate in at least 3 community resource events to distribute information about local behavioral health services to the general public.

Strategies:

- The LBHA will print up to date brochures with local resources to hand out to residents and local providers.
- The LBHA will educate local providers about upcoming resource events to ensure stakeholder participation.

FY2022 GOALS

- The LBHA will include dates of local resource events in their quarterly newsletter.
- The LBHA will purchase “swag” to distribute at local resource events.

Performance Measures:

- 2 CEU trainings on the topic of cultural competency and/or health equity
- 2 presentations at provider meetings on services for diverse populations
- 1 presentation to the LBHAC on cultural competency
- 3 Community Resource Events participated in by July 2022.

Performance Targets:

- Calvert County behavioral health providers will increase their ability to provide culturally competent, equitable treatment services.
- Calvert County residents from diverse backgrounds will have knowledge of resources available to them.

5. Medication Assisted Treatment (MAT)

Need/Gaps: Every 11 minutes, a person in the United States dies from an opioid overdose. Opioid Use Disorder (OUD) is a chronic brain disease caused by the recurrent use of opioids, including prescription drugs such as oxycodone or hydrocodone and illicit substances such as heroin and fentanyl. Recent trends indicate that the majority of opiates being sold and used in our community contain some, if not all, fentanyl. It is also important to note that other drug supplies have been found to be contaminated with fentanyl, at times, without the knowledge of the individuals using them. Fentanyl can be over 50 times more potent than heroin making overdose from using this substance much more likely, in particular if individuals are not aware of its presence.

The most effective therapy for OUD, called medication-assisted treatment (MAT), combines counseling or other behavioral therapy with medications approved by the Food and Drug Administration (FDA). The medications work to relieve the symptoms of opioid withdrawal and/or block the effects of opioids while behavioral therapies help patients improve coping skills and reduce the likelihood of relapse. Unfortunately, the number of people with opioid dependence far exceeds treatment capacity within Calvert County. Over the past few years, efforts have been made to implement a hub and spoke model in Calvert County, and in FY21 we were able to secure funding to assist with implementing a Hub and Spoke Pilot Program. It continues to remain difficult to recruit and maintain spokes, however medical providers are showing increased interest in education and participation in this model. Improved access to MAT services remains a priority in Calvert County at this time.

Goal: The LBHA will expand access to Medication Assisted Treatment (MAT) for Substance Related Disorders (SRD) in Calvert County during FY21.

Objective: The LBHA will increase the number of local medical providers who have a DATA Waiver by 2 by the end of FY22.

Strategies:

- o The LBHA and their sub-vendors will educate local providers about peer counseling for MAT prescribers.
- o The LBHA and their sub-vendors will educate local providers about reimbursement opportunities for DATA Waiver training.
- o The Director will explore funding opportunities to expand access to MAT services in the county.

Objective: The LBHA will educate local stakeholders about MAT on a quarterly basis.

Strategies:

FY2022 GOALS

- The LBHA will host at least one CEU training for local providers on the topic of MAT.
- The Director will coordinate with local law enforcement and the local detention center to beginning planning for implementation of HB 116 in 2023.
- The LBHA will invite knowledgeable individuals/organizations to present to the Advisory Councils about MAT.

Performance Measures:

- Two New Primary Care Physicians based in Calvert County will receive a DATA Waiver by July 2021.
- Four educational events focusing on the topic of MAT will be held in Calvert County by July 2021.

Performance Target:

- Increased access to MAT services in Calvert County.
- Reduction in stigma associated with MAT in Calvert County.

PLAN APPROVAL REQUIREMENTS

I. Plan Approval Requirements

A. Advisory Council Letter and Approval

CALVERT COUNTY HEALTH DEPARTMENT
Local Behavioral Health Authority
P.O. Box 980
Prince Frederick, Maryland 20678

Laurence Polsky, MD, MPH, F.A.C.O.G.
Health Officer

Andrea McDonald England
Director



STATE OF MARYLAND

Phone (410) 535-5400
(443) 295-8584

Fax (443) 968-8979

www.calverthealth.org

February 10, 2021

Dr. Aliya Jones
Behavioral Health Administration
SGSH, Dix Building
Catonsville, MD 21228

RE: Calvert County Local Behavioral Health Advisory Council Review of Calvert County LBHA FY22 Annual Plan

Dear Dr. Jones,

The Calvert County Local Behavioral Health Advisory Council reviewed and approved the 2020 Annual Report/2022 Annual Plan and 2022 Annual Financial Plan. Board members were informed that these documents would be reviewed on February 10, 2021, during the regularly scheduled Advisory Council meeting. The final documents were provided to the council on February 5, 2021 via email for review. During the meeting the FY 2020 Annual Report, the FY 2022 Annual Plan and FY 2022 Mental Health Plan and budgets were reviewed and council members were provided the opportunity to give feedback and request changes when necessary. The LBHA Joint Advisory Board approved the plan and budgets as written with corrections and/or recommendations.

The Calvert County Local Behavioral Health Advisory Council receives bi-monthly updates on grant funded programs in order to monitor the status of the Public Behavioral Health System in Calvert County. Advisory Council members are also provided the opportunity at each meeting to give updates on their respective programs and to advocate for the needs of Calvert County residents. Attached to this letter are the minutes from the February 10, 2021 Local Behavioral Health Advisory Council meeting where the FY22 Annual Plan was reviewed and approved.

Sincerely,

A handwritten signature in black ink, appearing to read 'L. Polsky', written over a printed name.

Dr. Laurence Polsky
Calvert County Health Officer

PLAN APPROVAL REQUIREMENTS

B. Membership Lists

County Health Officer

Dr. Laurence Polsky
975 N Solomons Island Road, Prince Frederick, MD 20678
Phone 410-535-5400 ext. 305; Fax 410-535-5285

Representative of a State inpatient facility that serves the county

Vacant

County Behavioral Health Director-

Doris McDonald
280 Stafford Road, Barstow, MD 20610
Phone 410-535-3079 ext. 14; Fax 410-535-2220

Representative of the County Commissioners

Jennifer Moreland (designee)
30 Duke Street Suite 102, Prince Frederick, MD 20678
Phone 410-535-1600 ext. 8803; Fax 410-535-5467

Director of Local Department of Social Services

Cheryl Harms (designee)
200 Duke Street, Prince Frederick, MD 20678
Phone 443-550-6900; Fax 410-286-7429

Practicing Physician

Dr. Drew Fuller
975 N Solomons Island Road, Prince Frederick, MD 20678
Phone 410-535-5400; Fax 410-414-8092

The Director of the Department of Juvenile Services

Cynthia Scribner (designee)
200 Duke Street Suite 2800, Prince Frederick, MD 20678
Phone 443-550-6297; Fax 443-550-6376

The Director of the Department of Parole and Probation

Lisa Thomas (designee)
200 Duke Street Suite 1100, Prince Frederick, MD 20678
Phone 443-550-6780; Fax 410-535-5696

The State's Attorney for the County

James Zafiropolous (designee)
175 Main Street, Prince Frederick, MD 20678
Phone 410-535-1600 ext. 2312; Fax 410-535-2436

PLAN APPROVAL REQUIREMENTS

The District Public Defender

Vacant

The Local Sheriff

Mike Evans

30 Church Street, Prince Frederick, MD 20678

Phone 410-535-2800; Fax 410-535-1770

The superintendent of local schools

Kim Roof (designee)

1305 Dares Beach Road, Prince Frederick, MD 20678

Phone 443-550-8460; Fax 410-286-1913

A representative of the local hospital

Noelle Flaherty

100 Hospital Road, Prince Frederick, MD 20678

Phone 410-535-8217; Fax 410-535-8224

Kara Harrer

100 Hospital Road, Prince Frederick, MD 20678

Phone 410-414-4768; Fax 410-535-8307

The Director of the local Department of Aging

Susan Justice

450 West Dares Beach Road, Prince Frederick, MD 20678

Phone 410-535-4606; Fax 410-535-1903

A county administrative judge of the circuit court

Shawn Reinhardt (designee)

175 Main Street, Prince Frederick, MD 20678

Phone 410-535-1600 ext. 2317; Fax 410-414-8051

A county administrative judge of the district court

Patrick Loveless (designee)

200 Duke Street, Prince Frederick, MD 20678

Phone 443-550-6703; Fax 443-550-6702

An individual who is currently receiving or has in the past received behavioral health services

Megan Sarikaya

280 Stafford Road, Barstow, MD 20610

Phone 410-535-3079 ext 35; Fax 410-535-2220

Patricia Estep

120 Jibsail Drive, Prince Frederick, MD 20678

Phone 410-535-7576; Fax 410-535-0984

A parent of an adult with a behavioral health disorder

Vacant

PLAN APPROVAL REQUIREMENTS

A parent of a child or adolescent with a behavioral health disorder

Nicole Ukommunne
105 Paul Mellon Court, Waldorf, MD 20602
Phone 410-844-4132; Fax 410-730-8331

A local behavioral health advocacy agency

Candice D'Agostino
30 Duke Street Suite 104, Prince Frederick, MD 20678
Phone 410-535-3733; Fax 410-535-5467

Local behavioral health rehabilitation or housing program

Lauren Joeckel
125 Fairground Road, Prince Frederick, MD 20678
Phone 410-431-0945; Fax 410-535-8935

A provider of behavioral health services that is not a physician

Vacant

At least one provider of behavioral health prevention services

Anita Ray
1020 North Prince Frederick Boulevard, Prince Frederick, MD 20678
Phone 410-535-3079; Fax 410-535-2220

A member of the general public who is knowledgeable and active on behavioral health issues that affect the community

Danielle Johnson
120 Jibsail Drive, Prince Frederick, MD 20678
Phone 410-535-7576; Fax 410-535-0984

The Administrator of the local Detention Center

Josh Underwood (designee)
325 Stafford Road, Barstow, MD 20610
Phone 410-535-4300; Fax 410-535-4537

A member of the clergy who is knowledgeable about treatment of behavioral health disorders

Reverend Margaret Van Auker
100 Lower Marlboro Road, Sunderland, MD 20689
Phone 410-326-4874

PLAN APPROVAL REQUIREMENTS

C. Meeting Minutes

Calvert County
Local Drug and Alcohol Abuse Council
Meeting Minutes
02/10/2021

COUNCIL MEMBERS PRESENT:

Andrea McDonald-Fingland, Wayne Millette, Katie Wandishin, Kristy Kidwell, Jennifer Moreland, Nicole Ukoumunne, Betsy VanAuker, Candice D'Agostino, Doris McDonald, Dr. Drew Fuller, Kara Herrer, Megan Sarikaya, Susan Justice, Cynthia Scribner, Lisa Thomas, Lauren Joeckel Sara Haina (Proxy for Anita Ray)

I. WELCOME, ROLL CALL

- Kristy went through the list of council members to review who was in attendance.

II. LBHA UPDATES

- **Wayne Millette –**
 - All 2nd Quarter STATS have been Received
 - State Hospitals currently have 10 beds open, but there are 70 individuals waiting to be accepted from Detention centers and Prison system.
 - We still have Adolescent Consumer Support Funds available, With Spring and summer upon us, get your requests in soon as these funds will go fast once everything starts to reopen.
 - Most Programs are Meeting the COA requirements.
 - We are reviewing programs that are not meeting their COA's and those programs may be seeing an Improvement plan.

- **Katie Wandishin-**
 - Winter Edition Newsletter is complete, and a copy will be emailed out.
 - Developed a LGBTQ + support group in collaboration with Calvert Alliance Group
 - First Meeting was on January 26, 2021 at 6:30pm providing it virtual for the time being, every 4th Friday at 6:30pm.
 - Developed Youth Mental Health Support Group

PLAN APPROVAL REQUIREMENTS

- First meeting will be February 26 at 5pm and every 4th Friday at 5pm.
- Grant Updates:
 - All reports turned in on time and complete
 - Most of the Programs are on task for meeting their Performance Measures.
 - TCA has begun operating with a virtual Addictions Specialist appointment as of yesterday, 2/9/21 per FIA guidance.
 - Oxford Still only has One House under NCE Grant but have toured a few potential houses, for women.
 - Are looking to hire another coordinator for SOR II (no Houses under SOR II at this time)

➤ **Andrea McDonald-Fingland –**

- **Hub and Spoke Award** – The Calvert County Behavioral Health Authority will contract with Calvert County Health Department Division of Behavioral Health (CCBH) to implement a pilot Hub & Spoke model. Staff will provide Care Coordination services between the community-based prescriber (spoke) and the Hub (CCBH). Staff will also provide outreach services, along with being a Hub to Spokes and potential Spokes as Calvert County builds MAT Capacity among long-term health care providers: Primary Care Providers, Pain Management Offices and OBGYNs
- **Adolescent Clubhouse Award**- Funds will be utilized to open and operate an Adolescent Clubhouse for youth ages 12-17 who have been diagnosed with or are at risk for developing an Opioid Use Disorder. The vendor will provide a clean, safe, and sober environment for participants to meet and engage in recovery-oriented activities. The provider will also work closely with a Family Navigation program to ensure parental/guardian access to Family Navigation services. The clubhouse will provide the opportunity for the Family Navigation program to provide on-site services at least 2 days per week.
- **Rollover Award- Mini Grants**
 - **Detention Center Training** Funding will be used to develop and implement virtual, in person, and pre-recorded trainings for the staff at the Calvert County Detention Center (CCDC). The training curriculum will be delivered to all shifts of the Detention Center staff including -Administrative staff and be two-fold, including:
 - ✓ Mental Health First Aid
 - ✓ Behavioral Health Information SessionMental Health First Aid trainings will be delivered by certified Instructors and will follow the Mental Health approved curriculum.

PLAN APPROVAL REQUIREMENTS

Behavioral Health information Sessions will include information on topics including but not limited to:

- ✓ Substance Use
 - ✓ Co-occurring Disorders
 - ✓ Medication assisted Treatment and HB 116
 - ✓ Anti-stigma Training
 - ✓ Conflict Resolution
- **Conflict Resolution Education for Recovery**- Funding will be used to develop and implement a conflict resolution education program for staff and clients enrolled in the Calvert County Adult Treatment. The program will consist of 4-6 sessions of conflict resolution programming. Additional conflict coaching and/or mediation will be made available to participants following completion of the training modules. Module content will include but is not limited to:
- ✓ Understanding the basic brain functions in anger and conflict
 - ✓ Causes of conflict
 - ✓ Rethinking conflict interactions
 - ✓ Conflict styles
 - ✓ Relationships and conflict
 - ✓ Healthy communication
 - ✓ Skills for conflict management
 - ✓ Stress and conflict

III. MEMBERSHIP REVIEW

- **Vote for New Appointment**
 - Lauren Joeckel, Reviewed application with Council.
 - ✓ Motion to Approve – Candice D’Agostino
 - ✓ 2nd the Motion – Jennifer Moreland
 - ✓ 0- Stays, 0- Nays, All in Favor
 - ✓ Vote was Unanimous
- **Vote for Re- Appointment**
 - Doris McDonald
 - ✓ Motion to Approve- Candice D’Agostino
 - ✓ 2nd the Motion- Margaret VanAuker
 - ✓ 0- Stays, 0- Nays, All in Favor
 - ✓ Vote was Unanimous
 - Cheryl Harms –
 - ✓ Motion to Approve – Doris McDonald

PLAN APPROVAL REQUIREMENTS

- ✓ 2nd the Motion – Wayne Millette
- ✓ 0- Stay, 0- Nays, All In favor.
- ✓ Vote was Unanimous

IV. HOMELESS NEEDS ASSESSMENT

- Volunteers Needed for Workgroup

V. WORKGROUP UPDATES

- Messaging Workgroup – (Katie Wandshin LBHA) We Last met on 01/21/2021, we reviewed the final Draft of the Newsletter Winter Edition to make final Edits. Most of the Focus in the meeting was given to developing our Communication Strategic Plan and reviewing Data Analyses. Our goal for next meeting is to finalize the goals and plans of this workgroup and present to the Advisory council. The CSP will allow us to determine our next outreach efforts.
- By-Laws Workgroup – CSA By-laws will have to be re-written and approved before we can complete the LBHA By-laws. We are hoping to have this complete before the end of FY21 so they can be approved by the County commissioners.

VI. ANNUAL PLAN REVIEW

- Mission and Vision Statement Section-
 - Pg. 14 had inaccurate information, Jennifer Moreland to send updated information.
 - No other suggestions, edits or feedback.
- Organizational Structure- No Suggestions, edits or feedback given.
- FY20 Highlights/Achievements/Goals- No Suggestions, edits or feedback given.
- Planning Process- No Suggestions, edits or feedback given.
- Service Delivery- No Suggestions, edits or feedback given.
- Data/Planning – Suggestion made, Population (Pre- release) add sentence. Chart 7E needs a correction in the title.
- Fy22 Goals- No Suggestions, edits or feedback given.
- Financial Worksheets for Programs reviewed- No Suggestions, edits or feedback given.
 - **Vote to Approve with Corrections:**
 - ✓ Motion to Approve- Dr. Fuller
 - ✓ 2nd to Motion – Candice D’Agostino
 - ✓ 0- Stays, 0- Nays- All in Favor, Vote was Unanimous.

VII. December Meeting Minutes Approval-

- Motion to Approve- Candice D’Agostino
- 2nd to motion – Margaret VanAuker
- 0 Stays, 0-Nays – All In favor

PLAN APPROVAL REQUIREMENTS

VIII. Program Updates: Jennifer Moreland shared the task Force Needs Assessment and Calvert County Local Management Board Needs Assessment.

- **MEETING ADJOURNED**
- **Next LDAAC Meeting – April, 7 2021 from 12pm-2pm**

*Respectfully Submitted,
Kristy Kidwell*

ATTACHMENTS

J. Attachments

A. Organizational Hierarchy

B. Eco-Map

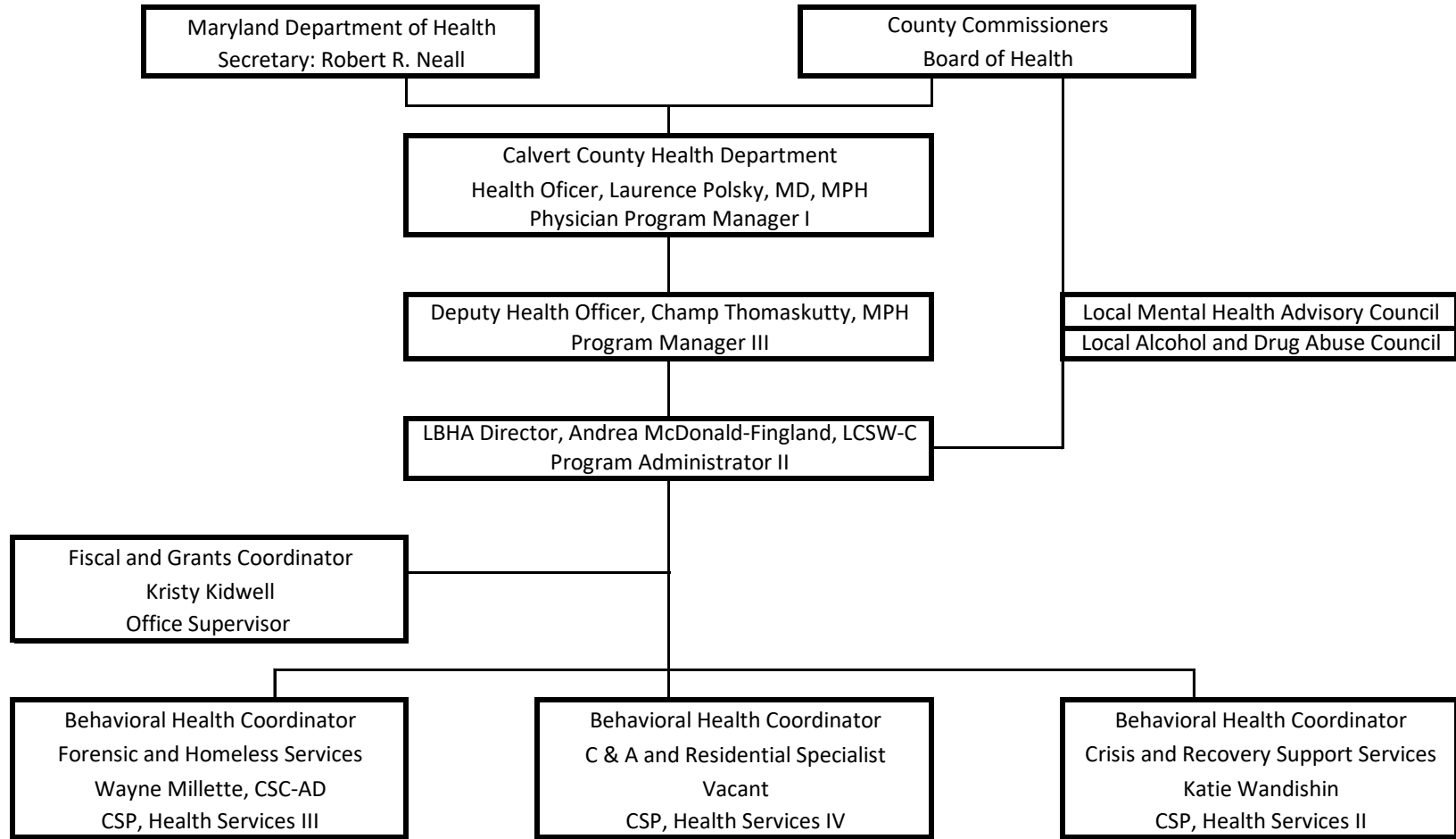
C. CLAS Self-Assessment and Goals

D. LBHA Continuity of Operations Program (COOP)

E. Calvert County All Hazards Plan

Attachement A

Calvert County Local Behavioral Health Authority
Organizational Chart



ATTACHMENT C

NATIONAL CLAS STANDARDS SELF-ASSESSMENT TOOL

GOAL 1: ESTABLISH AND MAINTAIN CULTURALLY AND LINGUISTICALLY COMPETENT BEHAVIORAL HEALTH SERVICES		LEVEL			
1	Our Mission and Vision statements reflect organizational commitment to cultural and linguistic competence. (Standard 1)	0	1	X	3
2	We have established culturally and linguistically appropriate goals, management accountability, and infused them throughout the organization’s planning and operations. (Standard 9)			X	
3	Our organizational governance and leadership promote and use CLAS standards in policies, practices and allocation of resources. (Standard 2)		X		
4	We have created conflict and grievance resolution processes that are culturally and linguistically appropriate to identify, prevent, and resolve conflicts or complaints. (Standard 14)	X			
5	We communicate our organization’s progress in implementing and sustaining CLAS to all stakeholders, constituents, and the general public. (Standard 15)			X	
GOAL 2: ELIMINATE CULTURAL AND LINGUISTIC BARRIERS TO ACCESS OF BEHAVIORAL HEALTH SERVICES					
1	We offer language assistance to individuals who have limited English proficiency and/or other communication needs including individuals who use American Sign Language, at no cost to them, to facilitate timely access to behavioral health services. (Standard 5)			X	
2	We inform all individuals of the availability of verbal, signing and written professional language assistance services in their preferred language or form of communication. (Standard 6)				X
3	We ensure the competence of individuals providing language assistance, recognizing that the use of untrained individuals and/or minors as interpreters should be avoided. (Standard 7)				X
4	We provide easy-to-understand print and multimedia materials and signage in the languages commonly used by individuals in our community. (Standard 8)		X		
GOAL 3: CREATE A SYSTEM OF DATA DRIVEN DECISION MAKING PROCESSES THAT RESULT IN THE FORMATION OF CULTURALLY AND LINGUISTICALLY COMPETENT POLICIES AND PRACTICES					
1	We conduct regular assessments of community health assets and needs and use the results to plan and implement services that respond to the cultural and linguistic diversity of the community we serve. (Standard 12)				X
2	We collect and maintain accurate and reliable demographic data to monitor and evaluate the impact of CLAS on health equity and outcomes and to inform service delivery. (Standard 11)			X	

GOAL 4: SUPPORT THE USAGE OF EVIDENCE-BASED PRACTICES TO ADDRESS THE UNIQUE NEEDS OF INDIVIDUALS SERVED IN MARYLAND’S PBHS		LEVEL			
		0	1	2	3
1	We conduct ongoing assessments of our organization’s CLAS-related activities and integrate CLAS-related quality improvement and accountability measures into program activities. (Standard 10)		X		
2	We partner with the community to design, implement and evaluate policies, practices, and services to ensure cultural and linguistic appropriateness. (Standard 13)			X	
GOAL 5: ADVOCATE FOR AND INSTITUTE ONGOING WORKFORCE DEVELOPMENT PROGRAMS IN CULTURAL AND LINGUISTIC COMPETENCE REFLECTIVE OF MARYLAND’S DIVERSE POPULATION					
1	We recruit, promote, and support a culturally and linguistically diverse governance, leadership, and workforce that are responsive to the community we serve. (Standard 3)			X	
2	We provide orientation and training to new and existing members of our governing body, leadership and staff on culturally and linguistically appropriate policies and practices on a regular basis. (Standard 4)				X

FY2022 CULTURAL AND LINGUISTIC COMPETENCY STRATEGIES

TEMPLATE

Instructions: CSAs, LAAs and LHBA's receiving funding from the MDH/BHA are required to submit Cultural and Linguistic Competency (CLC) Strategies as part of their FY2022 Plan Submissions. The following template should be used to list your strategies to advance CLC efforts in your jurisdiction.

COVER PAGE

(a) Name of Agency/Organization: Calvert County Local Behavioral Health Authority
(b) Address: 975 North Solomon's Island Road, Prince Frederick, MD 20678
(c) Region (MDH/BHA designated region): Calvert County, MD
(d) Name of contact person (Agency/Organization Lead or Designee): Andrea McDonald-Fingland, LCSW-C, Director E-mail: andrea.mcdonald-fingland@maryland.gov Telephone #: 443-295-8577
(e) Brief overview of services provided by agency/organization(no more than 95 words): The Local Behavioral Health Authority (LBHA) is responsible for planning, managing, and monitoring the Public Behavioral Health System in Calvert County and providing information and referral services to individuals seeking mental health and substance use disorder treatment resources.
(f) Agency/organization mission statement: To ensure all Calvert County residents have access to quality Behavioral Health services.
(g) Agency/organization vision statement: To cultivate a comprehensive system of Behavioral Health care in Calvert County that provides individualized service to promote wellness, empowerment and recovery across the lifespan of our residents.

PART 1: CLAS SELF- ASSESSMENT

Instructions: Attach a copy of the completed CLAS Self-Assessment Tool for the agency.

PART 2: OVERARCHING GOALS AND SELECTED STANDARDS FOR PRIORITY FOCUS

Instructions: For each of the overarching goals below list the (a) Associated standard that is prioritized for focus, then, include the following information for each overarching goal in the space provided: (b) Strategies to build competency for the selected standard, (c) Performance Measures for achieving competency for the selected standard, and, (d) Intended impact for addressing the selected standard.

Refer to your completed CLAS Self-Assessment Tool to identify the prioritized standard that has been selected for focus under each of the overarching goals. Refer to the CLCSP Guidelines for additional information. ([https://bha.health.maryland.gov/Documents/CLCSP%20final%20document%20-%20TA%2004.25.19%20\(1\).pdf](https://bha.health.maryland.gov/Documents/CLCSP%20final%20document%20-%20TA%2004.25.19%20(1).pdf))

GOAL 1: ESTABLISH AND MAINTAIN CULTURALLY AND LINGUISTICALLY COMPETENT BEHAVIORAL HEALTH SERVICES

Selected a standard for priority focus (What is the standard selected; include language for the standard as stated in the CLAS Self-Assessment Tool):

We have created conflict and grievance resolution processes that are culturally and linguistically appropriate to identify, prevent, and resolve conflicts or complaints. (Standard 14)

Strategies to build competency (What tasks and activities will be implemented to build competency for the prioritized standard):

Designate a workgroup to review current grievance procedure and update to ensure it is culturally and linguistically appropriate.

- Enlist culturally diverse service recipients to participate in updating current policies and procedures.
- Have the new grievance procedure reviewed by an expert in cultural competency.
- The Local Behavioral Health Advisory Council will review and approve the new grievance procedure.

Performance Measures (How will success be measured):

The LBHA will have a finalized culturally and linguistically competent complaint/grievance procedure that has been approved by the Local Behavioral Health Advisory Council.

Intended impact (What is the intended impact for addressing the prioritized/selected Standard):

Calvert County Residents of all ages, races, genders, sexes, creeds, etc. will have a way to have complaints against providers investigated and resolved.

FY2022 CULTURAL AND LINGUISTIC COMPETENCY STRATEGIES

GOAL 2: ELIMINATE CULTURAL AND LINGUISTIC BARRIERS TO ACCESS BEHAVIORAL HEALTH SERVICES

Selected standard for priority focus (What is the standard selected; include language for the standard as stated in the CLAS Self-Assessment Tool):

We provide easy-to-understand print and multimedia materials and signage in the languages commonly used by individuals in our community. (Standard 8)

Strategies to build competency (What tasks and activities will be implemented to build competency for the prioritized standard):

- Conduct Assessment of languages spoken within the county.
- Apply for grant funding to pay for marketing material.

Performance Measures (How will success be measured):

Each Interested agency is provided with marketing brochures in all needed languages.

Intended impact (What is the intended impact for addressing the prioritized/selected Standard):

All county residents have access to materials to inform them about available services in their native language.

GOAL 3: CREATE A SYSTEM OF DATA DRIVEN DECISION MAKING PROCESSES THAT RESULT IN THE FORMATION OF CULTURALLY AND LINGUISTICALLY COMPETENT POLICIES AND PRACTICES

Selected standard for priority focus (What is the standard selected; include language for the standard as stated in the CLAS Self-Assessment Tool):

We collect and maintain accurate and reliable demographic data to monitor and evaluate the impact of CLAS on health equity and outcomes and to inform service delivery. (Standard 11)

Strategies to build competency (What tasks and activities will be implemented to build competency for the prioritized standard):

- Review and analyze 2020 census data.
- The LBHA will implement annual consumer satisfaction surveys in grant-based services to determine client satisfaction with programs.

Performance Measures (How will success be measured):

- 25% of LBHA grants will implement an annual consumer satisfaction survey that includes collecting demographic data.

Intended impact (What is the intended impact for addressing the prioritized/selected Standard):

- Calvert County provides data driven, evidence based behavioral health care.

GOAL 4: SUPPORT THE USAGE OF EVIDENCE-BASED PRACTICES TO ADDRESS THE UNIQUE NEEDS OF INDIVIDUALS IN MARYLAND’S PUBLIC BEHAVIORAL HEALTH SYSTEM

Selected standard for priority focus (What is the standard selected; include language for the standard as stated in the CLAS Self-Assessment Tool):

We conduct ongoing assessments of our organization’s CLAS related activities and integrate CLAS-related quality improvement and accountability measures into program activities. (Standard 10)

Strategies to build competency (What tasks and activities will be implemented to build competency for the prioritized standard):

- The LBHA will provide training resources to local providers on the topic of cultural competency.
- The LBHA will provide annual training to the Local Behavioral Health Advisory Council on the topic of cultural competency.
- The Local Behavioral Health Advisory Council will create a subcommittee on Health Equity to guide the LBHA on matters of cultural and linguistic competency within Calvert County.
- LBHA staff will attend training on cultural and linguistic competency.

Performance Measures (How will success be measured):

- 1 annual training for local providers on Cultural and Linguistic competence.
- 1 annual training for the Local Behavioral Health Advisory Council on Cultural and Linguistic competence.
- 1 annual training for all LBHA staff on Cultural and Linguistic competence.

Intended impact (What is the intended impact for addressing the prioritized/selected Standard):

The LBHA will incorporate cultural and linguistic competency as a matter of day to day business, rather than an afterthought.

GOAL 5: ADVOCATE FOR AND INSTITUTE ONGOING WORKFORCE DEVELOPMENT PROGRAMS IN CULTURAL AND LINGUISTIC COMPETENCE REFLECTIVE OF MARYLAND’S DIVERSE POPULATION

Selected standard for priority focus (What is the standard selected; include language for the standard as stated in the CLAS Self-Assessment Tool):

We recruit, promote, and support a culturally and linguistically diverse governance, leadership, and workforce that are responsive to the community we serve. (Standard 3)

Strategies to build competency (What tasks and activities will be implemented to build competency for the prioritized standard):

- The Local Behavioral Health Advisory Council will fill vacant positions with culturally, linguistically, and/or ethnically diverse individuals.
- The LBHA will review all grant contracts to determine areas that can be modified to require cultural competency training and workforce development.
- The LBHA will educate local providers and stakeholders on cultural and linguistic competency.

Performance Measures (How will success be measured):

- 1 annual training for local providers on Cultural and Linguistic competence.
- 1 annual training for the Local Behavioral Health Advisory Council on Cultural and Linguistic competence.
- 1 annual training for all LBHA staff on Cultural and Linguistic competence.
- 100% of LBHA contracts include requirements about cultural competency training and workforce development for program staff.
- 15% of Local Behavioral Health Advisory Council members will include culturally, linguistically, and/or ethnically diverse individuals

Intended impact (What is the intended impact for addressing the prioritized/selected Standard):

The LBHA has access to diverse viewpoints for prioritization of work and decision making about systems management activities.

ATTACHMENT D

Local Behavioral Health
Authority
(LBHA)

ATTACHMENT B

Worksheet 1

Organization Functions

Task A. List All Organization Functions.

1. Examine organization legislative and regulatory mission.
2. Review existing SOPs and EOPs.
3. Talk to experts and former employees familiar with the organization.
4. In the first column of the table below, list all organization functions identified, including Essential Support Functions (ESFs).

Task B. Identify Essential Functions.

1. Reexamine organization mission.
2. Examine the services the organization provides to other agencies and the public.
3. Identify supporting critical processes and services in column 2.
4. Indicate in column 3 which functions are "essential" after considering their relationship to the organization mission.

The first two rows provide examples of essential and non-essential functions.

All Functions	Description of Function	Essential Function?
Planning for behavioral health services	Write annual behavioral health plan	No
Contract for behavioral health services	Prepare written contracts	No
Contract monitoring	On-site inspections of provided service	No
Hear Complaints	Review and research complaint	No
Coordination of Child & Adolescent Services	Assist families who have children with behavioral health needs, in obtaining the most appropriate care.	Yes
Coordination of Adult services	Assist consumers in obtaining appropriate level of care	Yes
Budget/grant development	Composing budgets and modifications	No
Reviews and authorizes requests for uninsured exceptions, supported employment, housing and crisis beds	Reviews requests for these services through APS internet system	No
Monitors RRP beds	Reviews all adult residential placements	No
Safeguard against unnecessary utilization of public behavioral health services	Monitor expenditures for utilization	No
Administrative oversight of Behavioral Health Services	Administrative and budgetary duties	No
Coordination of behavioral health services in the event of a disaster with State and local authorities and local providers of behavioral health services	Work with local behavioral health providers in ensuring continuation of care and the provision of behavioral health services to victims in a disaster.	Yes
Payment of invoices for services	Process purchase orders for pay for services.	Yes

ATTACHMENT B

Worksheet 2

Resource Requirements for Critical Processes and Services Supporting Essential Functions

Complete a separate worksheet for each essential function. First, using the information from the description column on Worksheet 1, list the Critical Processes and Services for each function. Next, determine the personnel needed to perform that service and list the title of the position in the second column. In the last two columns list all records, equipment, and systems needed to make that essential function operable.

Essential Function: Coordination of C&A services

Description of Function (Critical Process or Service)	RTO	Priority	Personnel	Records	Equipment and Systems
Gathering of information (diagnostic, psychological testing, education, judicial records, hospitalization history, and placement history).	Immediate	2	Child and Adolescent Coordinator	Records and information to be obtained from various behavioral health professional agencies	Telephone Computer Access to internet and e-mail Copier Desk and chair Confidential meeting area File cabinet Office supplies

Essential Function: Coordination of Adult services

Description of Function (Critical Process or Service)	RTO	Priority	Personnel	Records	Equipment and Systems
Review and Authorization of behavioral health services	Immediate	2	Coordinator of Adult Services	Residential applications	Telephone Computer Access to internet and e-mail Copier File cabinet or portfolio and office supplies

ATTACHMENT B

Worksheet 2

Resource Requirements for Critical Processes and Services Supporting Essential Functions

Complete a separate worksheet for each essential function. First, using the information from the description column on Worksheet 1, list the Critical Processes and Services for each function. Next, determine the personnel needed to perform that service and list the title of the position in the second column. In the last two columns list all records, equipment, and systems needed to make that essential function operable.

Essential Function: Coordination of behavioral health services in the event of a disaster with State and local authorities and local providers of behavioral health services

Description of Function (Critical Process or Service)	RTO	Priority	Personnel	Records	Equipment and Systems
Inform BHA of local disaster and keep them updated. Determine what behavioral health services are needed. Inform local County government of disaster and needs. Keep detailed records of all expenditure for Federal Gov reimbursement	Immediate	1	All staff: Director Finance Officer Coord of C&A Services Coord of Adult Services	BHA phone tree County Directory CCHD Emergency Contact List Provider Lists (name, phone etc.)	Three computers. Access to internet and e-mail 4 phones Desk, chairs, office supplies Motor Vehicle Disaster supplies kit already stored in the office.

Essential Function: Payment of invoices for services

Description of Function(Critical Process or Service)	RTO	Priority	Personnel	Records	Equipment and Systems
Prepares PO for payment Submitted to either County or State for	Within 3 days	4	Finance Officer	Financial Reports of spending. PO requisition	Computer Access to internet and e-mail

ATTACHMENT B

payment.				forms	Copier phone Desk, chair some office supplies
----------	--	--	--	-------	--

ATTACHMENT B

Critical Service Provider Within CCHD	Critical Process or Service	Critical System Server	Critical Equipment	Critical Networks	Priority
Global Dependencies	Files Shares, Intranet for internal state applications and Internet for external applications, as well as Groupwise email	Calvert, SOL-Calvert, Patuxent, NGWServer	Switches, routers, servers and workstations	Local Network, and the External Md State Network	Highest
Administration	File Shares, Rumba Birth and Death Certificates	Calvert, SOL-Calvert	Switches, routers, servers and workstations	Local Network. and the External Md State Network	Highest
Behavioral Health	MediNotes, Medical Mastermind, and various Internet Applications	Calvert-MH	Switches, routers, servers and workstations	Local Network. and the External Md State Network	Highest
Crisis Intervention	PatTrac (Hotline Database), Medical Mastermind, and various Internet Applications	SOL-Calvert, Patuxent	Switches, routers, servers and workstations	Local Network. and the External Md State Network	Highest
Substance Abuse	SMART, POSIT, Toxicology Reports and various Internet applications	Patuxent, CSAS Server	Switches, routers, servers and workstations	Local Network. and the External Md State Network	Highest
Community Health	PatTrac, and various Internet Applications (Ahlers for Reproductive Health) (SAIL for MCHiPs) (Immunet for DSR)	SOL-Calvert	Switches, routers, servers and workstations	Local Network. and the External Md State Network	Highest
Environmentall Health	Hansen (for Permits and Information) PatTrac for Inspections and Rabies)	EHServer	Switches, routers, servers and workstations	Local Network. and the External Md State Network	Highest
Backup	Backup File storage and Archive	Calvert-Backup	Switches, routers, and servers	Local Network, and the External Md State Network	Highest

ATTACHMENT B

Worksheet 14

Requirements for Alternate Work Sites

For this task, identify the requirements for the alternate work site by essential function. Requirements include personnel, special needs, power, communication, and space. The example given in line one of the table is a general guide for the type of information that should be provided.

Essential Function	Number of Personnel	Power	Communication	Space Requirements	Food	Transportation	Lodging
Coord of C&A Services	1	Standard	Telephone: land and cell; internet; fax	120 sq ft	Food service for 1	From primary to alternate work site and/or from home to site	Lodging for four
Coord of Adult Services	2	Standard	Telephone: land and cell; internet; fax	120 sq ft	Food service for 2	From primary to alternate work site and/or from home to site	"
Oversight of Behavioral Health	2	Standard	Telephone: land and cell; internet; fax	160 sq ft	Food service for 2	From primary to alternate work site and/or from home to site	"
Coord BH in event of disaster	4	Standard	Telephone: land and cell; internet; fax				"
Payment Invoices	1	Standard	Computer; Internet				"

ATTACHMENT B

Local Behavioral
Health Authority

Vital Records
Protection Methods

Vital Record	Storage Location	Maintenance Frequency	Current Protection Method	Recommendation for Additional Protection Methods
Patient Records for adults, adolescents and children	Within CCHD, multi-locations and Cloud Aperture	Daily	Secure password protection	None
Financial files	Within CCHD, multi-locations and Cloud Aperture	Daily	Secure password protection	None

ATTACHMENT B

Communications Systems Supporting Essential Functions

Communication Mode	Current Provider	Service Provided	Special Services	Note
Voice Lines	Verizon	Land lines	None	None
Fax Lines	Verizon	Land Lines	None	Multiple lines One secured line
Cellular Phones	Verizon	Wireless	None	24/7 coverage
Internet/email VOiP	MDH/MEIMSS	On-line service Phone	On-line service Phone	None Connect to State emergency centers
Satellite Phone	Sky Terra	Wireless service	Connection to State-wide local health departments/ hospitals	None
800 MHz radios	Calvert County	Wireless service	Inter-agency	17 radios in
Ham radio system	Owned	Wireless service	Operated by	Fax/Email capable
Mass Notification System	Everbridge	Email; Phone; text; voicemail; audio; all with receipt of confirmation	Conference Bridge Capabilities; mobile app; ability to create preset messaging templates	Staff can tier their preference of notifications and keep up to date contact information

ATTACHMENT B

Local Behavioral
Health Authority
Order of Succession

KEY POSITION	SUCCESSOR 1	SUCCESSOR 2	SUCCESSOR 3	SUCCESSOR 4
Andrea McDonald-Fingland, LCSW-C Program Administrator (LBHA)	Champ Thomaskutty Deputy Health Officer	Wayne Millette Adult Coordinator	Katie Wandishin Adult Coordinator	

ATTACHMENT B

Worksheet 21

Building Alert Systems

List the systems that are in place to alert building occupants to evacuate and to shelter-in- place. Also, describe the systems, note their maintenance frequency, and identify any back- up systems.

Building: "Main Health"

Evacuation Systems	Description	Maintenance	Back-Up
Public address system	Voice active	monthly	Fire alarm
Fire alarm system	Audio/visual	quarterly	Public address system
Everbridge	Mass Notification		Everbridge
Shelter-in-Place- Systems	Description	Maintenance/ Frequency	Back-Up Systems
Public address system	Voice active	monthly	Fire alarm
Fire alarm system	Audio/visual	quarterly	Public address system
Everbridge	Mass Notification	quarterly	Everbridge

ATTACHMENT B

Worksheet 23

Designated Assembly Areas

Identify the designated assembly area for employees evacuating the building in the event of an emergency. Also, identify two alternate assembly areas to be used in the event that designated area cannot be used.

Building: Main Health

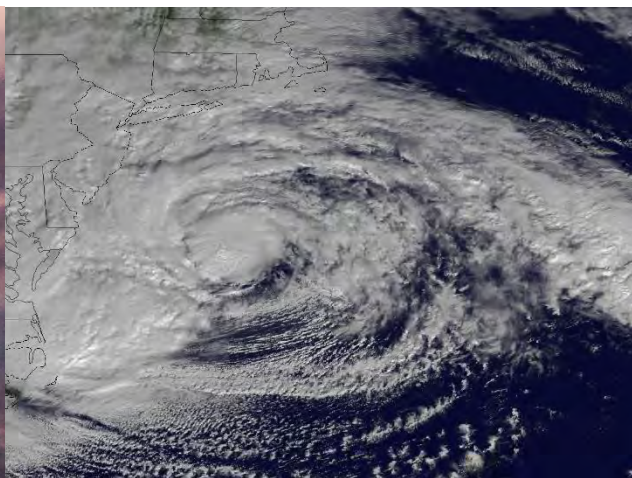
Floor:

Designated Assembly Area	Alternate Assembly Area 1	Alternate Assembly Area 2
<i>3rd floor North Parking Lot</i>	<i>South Parking Lot</i>	<i>North Employee Parking Lot</i>
<i>2nd floor West Parking Lot</i>	<i>North Parking Lot</i>	<i>North Employee Parking Lot</i>
<i>3rd floor East Parking Lot</i>	<i>East Hospital Lot</i>	<i>North Employee Parking Lot</i>

ATTACHMENT B

COUNSELING SERVICE

Will Counseling Be Provided?	Who Will Provide the Services?	Contact Information for Person/Group Providing Services?	Who Will Counseling Be Provided For?	Special Counseling Services Provided by the Person/Group
Yes	LBHA	Andrea McDonald-Fingland, LCSW-C, Director	Staff, Community Members	BH



Calvert County Maryland

All-Hazard Mitigation Plan

June 1, 2017



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All-Hazard Mitigation Plan

Calvert County, Maryland



June 12, 2017

Prepared For:

Calvert County Department of Public Safety
Division of Emergency Management
175 Main Street
Prince Frederick, MD 20678

Acknowledgements:

This All-Hazard Mitigation Plan was prepared under the guidance of the County's Department of Public Safety and the Division of Emergency Management with the participation of the Hazard Mitigation Steering Committee. Members of the Steering Committee are listed in Chapter 1.

This plan was funded by a grant from the FEMA Pre-Disaster Mitigation Grant.

This plan is an update of the original 2010 Hazard Mitigation Plan. As such, certain sections of the plan, such as the county background and geography, have been retained for continuity.

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Photo 3.1 - Steering Committee Meeting #1

Photo 3.2 - Steering Committee Meeting #2

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Photo 4.15 - Natural Gas Pipelines

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Photo 7.1 – National Flood Insurance Program DFIRM Map

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CHAPTER 1: INTRODUCTION



Introduction

This Chapter provides a general introduction to the 2017 Calvert County Hazard Mitigation Plan Update and is comprised of the following sections: Background, Mission, Purpose, Scope, Authority, and Organization.

Background

Hazard Mitigation is defined by the Federal Emergency Management Agency (FEMA) as “sustained action taken to reduce or eliminate long-term risk to people and property from hazards and their effects”. The hazard mitigation planning process involves the formulation of actions to reduce injuries, deaths, property damage, economic losses, and degradation of natural resources caused by natural and man-made disasters as well as a community’s risk. Hazard mitigation is considered one of four phases in the emergency management cycle. The other phases, emergency preparedness, emergency response, and recovery and are defined below.

- Hazard mitigation activities involve actions that reduce or eliminate the probability of an occurrence or reduce the impact of a disaster. The goal of the mitigation phase is to make communities more resistant to disasters and thereby decrease the need for a response. Mitigation occurs long before a disaster.
- Preparedness activities include planning and preparing for when a disaster strikes and includes response capability actions to ensure an effective and efficient use of resources and efforts to minimize damage. Preparedness occurs just before a disaster.
- Emergency response activities include providing emergency assistance to victims and minimizing property loss. The response phase begins during or immediately after the onset of

a disaster.

- Recovery activities include short and long-term activities that help return individuals and communities to normalcy as soon as possible. Recovery actions involve clean-up efforts, temporary housing, and replacement of infrastructure. Recovery activities typically commence several days or weeks after a disaster and are long-term in nature.

Mission

The Calvert County Hazard Mitigation Plan Steering Committee, through the 2017 Hazard Mitigation Plan Update, seeks to develop practical planning solutions for the variety of hazards that pose a risk to Calvert County, its two municipalities, Chesapeake Beach and North Beach, as well as the seven towns identified in the County Comprehensive Plan;

- Dunkirk
- Owings
- Huntingtown
- Prince Frederick
- St. Leonard
- Lusby
- Solomons

This all-hazards approach is a comprehensive and proactive planning process. It establishes a more efficient mobilization of resources that will ensure effective mitigation measures to protect life, property, and the environment in Calvert County.

Purpose

The Calvert County Hazard Mitigation Plan was developed in accordance with the requirements of FEMA's Section 322 of the Disaster Mitigation Act of 2000. An essential aspect of comprehensive disaster mitigation planning is a thorough understanding of potential hazards, vulnerabilities, and risks. The purpose of the hazard vulnerability analysis is to determine; the extent to which natural hazards threaten Calvert County; areas of the community that are at greatest risk; the significance of the threats; any facilities that occupy at-risk areas; and the effects hazards can have on critical facilities. This Plan Update seeks to reduce the County's human, social, environmental and economic loss from future disasters. In addition to the Mitigation Plan Update, the County has also chosen to develop a county-wide THIRA (Threat Hazard Identification and Risk Assessment) which was conducted concurrently with the Plan Update process.

Scope

In October of 2016, the Calvert County Department of Public Safety, Emergency Management Division contracted with the Vision Planning and Consulting Team (comprised of Vision Planning and Consulting (VPC) from Fulton, Maryland, and the Eastern Shore Regional GIS Cooperative (ESRGC) from Salisbury, Maryland), to develop the Plan Update in compliance with the requirements of the Disaster Mitigation Act of 2000. The Hazard Mitigation Plan Update was funded by Hazard Mitigation Assistance (HMA) funds from the Federal Emergency Management Agency (FEMA) and administered by the Maryland Emergency Management Agency (MEMA). The Plan Update is a multi-jurisdictional all-hazards plan that covers Calvert County, its two municipalities and seven designated towns.

It must be noted that future funding for mitigation projects will be contingent upon having each individual jurisdiction within Calvert County adopt the Plan after the County has adopted the Plan. Any jurisdiction that does not adopt the 2016 Plan Update will become ineligible for pre- and post-disaster mitigation funds.

Authority and Reference

Authority for this Plan originates from the following federal sources:

- Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C., Section 322, as amended
- Code of Federal Regulations (CFR), Title 44, Parts 201 and 206
- Disaster Mitigation Act of 2000, Public Law 106-390, as amended

Authority for this Plan originates from the following Maryland sources:

- Maryland State Hazard Mitigation Plan Update

The following Federal Emergency Management Agency (FEMA) guides and reference documents were used to prepare this document:

- FEMA. Local Mitigation Planning Tool and Guide. March 2012
- FEMA. Local Mitigation Planning Handbook. March 2013.

Organization of the Plan

The 2016 Hazard Mitigation Plan Update comprises seven chapters. Chapter 1 contains an introduction to the Plan Update process. Chapter 2 includes an overview of the geographic, socio-economic and demographic characteristics of the county. Chapter 3 discusses the planning process. Chapter 4 comprises the hazard identification and risk assessment and examines vulnerability and the potential losses from the top priority hazards. Chapter 5 includes a historic profile of hazard types and associated losses as well as a vulnerability assessment, which analyzes the potential for future damages due to the hazards identified. Chapter 6 contains a capability assessment, including a review of existing plans and ordinances from the counties and municipalities. Chapter 7 discusses the mitigation strategy including updated mitigation goals and objectives, mitigation actions, and the method for prioritization and implementation of mitigation actions. Chapter 8 outlines how Calvert County and its municipalities will implement the Plan once it is adopted and ways to monitor its progress and ensure continued public involvement. The final chapter (Chapter 8) also includes the prerequisites of the Plan, including letters of adoption by the County Commission and the individual municipalities.

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CHAPTER 2: COMMUNITY PROFILE



Introduction

This Chapter is composed of the profile of Calvert County and its municipalities. Information on the County's geographic layout, climate, demographic makeup, and employment and industry profile are included below. The data used to develop the demographic, and housing profiles comes directly from the US Census Bureau's 2015 estimates.

Geography and Environment

Calvert County is located in southern Maryland approximately 30 miles southeast of Washington DC. The County is a peninsula and is bordered by the Chesapeake Bay in the south and east while the western shore is bounded by the Patuxent River. The two incorporated towns in the County are both located along the Chesapeake Bay; Chesapeake Beach, incorporated in 1886, and North Beach, incorporated in 1910. There are seven designated "town centers" within the county, including Prince Frederick, the county seat. Others include Dunkirk, Huntington, Lusby, Owings, St. Leonard, and Solomon's Island. According to the U.S. Census Bureau, the 2015 population estimate of Calvert County was 90,595¹, and the total number of households around 31,041.

¹ <https://www.census.gov/quickfacts/table/PST045215/24009.00>

Figure 2.1 Regional Context of Study Area

Physical Features

The topography in Calvert County is varied. There is an upland plain running the length of the County from the northwest to the southwest. The land is more rugged on the east side of the plain, ending in sharp cliffs, reaching heights of over 120 feet in places along the coast² of the Chesapeake Bay, which are mostly composed of clay, sand, and gravel, while the west side is marked by gradual down sloping land leading out towards the Patuxent River that provides excellent land for farming. This plain also divides the watersheds into The Lower Western Shore and the Patuxent River watersheds. The elevation ranges between 10 and 40 feet throughout the County.

Watersheds

Calvert County crosses two of the State's primary watersheds; the Lower Western Shore Watershed and the Patuxent Watershed. These two are separated along the central elevation line through the county with the Lower Western Shore on the east side of the county, draining into the Chesapeake Bay, and the Patuxent Watershed on the west, which drains into the Patuxent River.

Climate

Calvert County has a generally mild climate with four distinct seasons, low humidity, and mild temperatures. The average summer temperature is 74.4 degrees and there is an average of 200 freeze-free days a year. On average, 43.1 inches of precipitation fall annually. Snowfall averages 19.4 inches annually.³

² http://calvertgis.co.cal.md.us/toposeries/calvert_topo_page_868.pdf

³ <http://www.co.cal.md.us/index.aspx?nid=825>

Population and Demographics

According to the US Census Bureau's 2015 estimates, the population of Calvert County is around 90,595 residents. The demographic breakdown from those 2015 estimates is as follows; Persons under 5 years old, 5.4%; Persons under 18 years old, 23.7%; Persons 65 or older, 13.5%. The census bureau also suggests that as many as 7% of the population under 65 years of age may experience some sort of disability.

The population per square mile according to the 2010 census is 416.3 person per square mile, with Calvert County being composed of 213.15 square miles.

There are approximately 31,041 households in the county (2010-2014) with an average of 2.87 persons per household. Additionally, it is estimated that over 81% of the housing units in the county are owner occupied⁴.

Table 2.1: Population Projections

	2020 Projected	2025 Projected	2030 Projected	2035 Projected	2040 Projected
State of Maryland	6,244,510	6,429,750	6,612,190	6,762,300	6,889,690
Calvert County	95,600	98,350	100,200	101,050	101,450
Female	48,800	50,380	51,480	52,060	52,350
Male	46,800	47,980	48,720	48,990	49,110
Aged 65+	15,480	19,210	23,110	25,070	24,870
Total Households	34,325	36,125	37,350	37,950	38,125

Source: U.S. Bureau of the Census; Maryland Department of Planning⁵

Employment and Industry Profile

Economy

According to the 2010 Census, it is estimated that around 92.5% of Calvert residents aged 25 or older have a High school diploma or higher, and that 29.3% of persons age 25 years and over have a Bachelor's degree or higher.

Calvert County's industry is as varied as its landscape. In addition to the traditional farming industry, which dates back to the early 1800's, there is also a large recreational and tourism component to the county which is represented by such businesses as waterfront restaurants, charter boat services, marinas, resorts, waterparks, and boardwalks. Additional major industries and employers are listed in Table 2.

Table 2.2: Calvert County Major Employers

Major Employers	Approximate Number of Employees
Calvert Memorial Hospital	1,200
Exelon / Calvert Cliffs Nuclear Power Plant	800
Walmart	420

⁴ <https://www.census.gov/quickfacts/table/PST045215/24009,00>

⁵ http://www.mdp.state.md.us/msdc/s3_projection.shtml

Major Employers	Approximate Number of Employees
Giant Food	360
Safeway	340
Chesapeake Beach Resort & Spa	300
Asbury Solomons	250
Arc of Southern Maryland	201
DirectMail.com	200
McDonald's	180
Edward B. Howlin	180
Calvert County Nursing Center	179
Food Lion	173
Stoney's Seafood House	165
The Calverton School	162
Solomons Nursing Center	160
Recorded Books	145
URS	125
Fantasy World Entertainment	125
College of Southern Maryland	117
Gott Company	113
Dominion Cove Point	112
Calvert Internal Medicine Group	108
Chesapeake Biological Laboratory	108

<http://www.ecalvert.com/180/Major-Employers>

Income and Poverty

The median income for a household in the county is estimated to be \$95,828 (in 2015 dollars) with a per capita income of \$39,011. In addition, 5.9% of the population is living in poverty⁶. According to the Maryland Department of Commerce, there are approximately 2,215 people in the county unemployed, equaling a 4.6% unemployment rate⁷.

⁶ <https://www.census.gov/quickfacts/table/PST045215/24009,00>

⁷ <http://commerce.maryland.gov/about/rankings-and-statistics/data-explorer>

Transportation

Calvert County is accessible across multiple major transportation networks, including highways and waterways. I-95, US 301, Maryland Routes 2, 4, and 5, and Route 235 make up the web of major highways crossing the county. Maryland Route 2 connects to US 50/301 in the north, and Maryland Route 4 connects to US 301 in the south, and the Capital Beltway (I-495). The Thomas Johnson Bridge, which crosses over the Patuxent River, connects Maryland Routes 2 and 4 in the southern part of Calvert County to Maryland Routes 5 and 235 in neighboring St. Mary's County.

The Port of Baltimore is nearby and facilitates major imports and exports for the region. Calvert County is accessible by water with a 50-foot channel through the Chesapeake Bay.

Utilities

Power for the county is provided by Southern Maryland Electric Cooperative, Inc. (SMECO), Baltimore Gas and Electric (BG&E) and Washington Gas.

The majority of county residents are served by private water systems, individual wells and traditional septic systems. Public water and sewerage service is provided to pocket communities and town centers. The county's wastewater system is comprised of five wastewater treatment plants, 45 wastewater pump stations, 32 miles of sewer force main and 34 miles of gravity sewer. The water system is comprised of 19 municipal water systems, 77 miles of water main, 7 hydropneumatic tanks and 14 elevated storage tanks.

The Calvert Cliffs Nuclear Power Plant is run by Exelon Corporation and is located near Lusby, along the eastern side of the county, directly on the shore of the Chesapeake Bay.

The Cove Point Liquefied Natural Gas (LNG) plant is run by Dominion energy and is located near Lusby on the eastern side of the county, directly on the shore of the Chesapeake Bay.

Verizon Communications is the county's primary telecommunications carrier. Additionally, long-distance telecommunications services are also provided by AT&T, Comcast, MCI WorldCom, Sprint, and over 250 additional carriers and resellers of Wide Area Telephone Service (WATS) and cellular phone service. Additional communications utilities such as cable internet, ISDN switching, and fiber optics utilities are also offered to residents in the county.

Residential Construction

According to the 2015 Census estimates, there are around 34,766 housing units in Calvert County. Of these, 29,943 are listed as single detached housing units, 351 are listed as mobile home, and 840 are identified as structures with more than 20 units per building⁸.

Educational/Institutional

Calvert County is home to thirteen elementary schools, six middle schools, and four high schools.

⁸ <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>

Elementary Schools

<u>Appeal Elementary School</u> 11655 H.G. Trueman Rd. Lusby, MD 20657	<u>Mutual Elementary School</u> 1455 Ball Rd. Port Republic, MD 20676
<u>Barstow Elementary School</u> 295 JW Williams Rd. Prince Frederick, MD 20678	<u>Patuxent Elementary School</u> 35 Appeal Ln. Lusby, MD 20657
<u>Beach Elementary School</u> 7900 Old Bayside Rd. Chesapeake Beach, MD 20732	<u>Plum Point Elementary School</u> 1245 Plum Point Rd. Huntingtown, MD 20639
<u>Calvert Elementary School</u> 1450 Dares Beach Road Prince Frederick, MD 20678	<u>St. Leonard Elementary School</u> 5370 St. Leonard Rd. St. Leonard, MD 20685
<u>Dowell Elementary School</u> 12680 H.G. Trueman Rd. Lusby, MD 20657	<u>Sunderland Elementary School</u> 150 Clyde Jones Road Sunderland, MD 20689
<u>Huntingtown Elementary School</u> 4345 Huntingtown Road Huntingtown, MD 20639	<u>Windy Hill Elementary School</u> 9550 Boyd's Turn Rd. Owings, MD 20736
<u>Mt. Harmony Elementary School</u> 900 West Mt. Harmony Rd. Owings, MD 20736	

Middle Schools

<u>Calvert Middle School</u> 655 Chesapeake Blvd. Prince Frederick, MD 20678	<u>Plum Point Middle School</u> 1475 Plum Point Rd. Huntingtown, MD 20639
<u>Mill Creek Middle School</u> 601 Margaret Taylor Rd. Lusby, MD 20657	<u>Southern Middle School</u> 9615 H.G. Trueman Rd. Lusby, MD 20657
<u>Northern Middle School</u> 2954 Chaneyville Road Owings, MD 20736	<u>Windy Hill Middle School</u> 9560 Boyd's Turn Road Owings, MD 20736

High Schools

<u>Calvert High School</u> 520 Fox Run Blvd. Prince Frederick, MD 20678	<u>Northern High School</u> 2950 Chaneyville Rd. Owings, MD 20736
<u>Huntingtown High School</u> 4125 Solomons Island Rd. Huntingtown, MD 20639	<u>Patuxent High School</u> 12485 Southern Connector Blvd. Lusby, MD 20657

Other Facilities

<u>Arthur Storer Planetarium</u> 600 Dares Beach Rd. Prince Frederick, MD 20678	<u>Calvert Country School</u> 1350 Dares Beach Rd. Prince Frederick, MD 20678
<u>Career & Technology Academy</u> 330 Dorsey Rd. Prince Frederick, MD 20678	<u>Hunting Creek Annex</u> 4105 Old Town Rd. Huntingtown, MD 20639

In addition to the County Schools, Calvert is home to two Institutions of higher education. The College of Southern Maryland has a campus in Prince Frederick and the University of Maryland Center for Environmental Science has their Chesapeake Biological Laboratory in Solomons Island. Both of these institutions maintain their own Emergency Operations Plans and Disaster Management Plans respectively.

Calvert County is also home to Calvert Memorial Hospital, a full-service institution including emergency care, birthing center, behavioral health center, cardiac, and surgical centers in addition to several other services.

Development Trends

The Maryland Department of Planning estimates that the Calvert County population will grow at an average rate of .85% percent per year between 2015 and 2030 with an estimated population in 2030 of 100,200.

In Calvert County, the Town Centers are the homes of concentrated development. The Town Centers are: the incorporated Towns of North Beach and Chesapeake Beach, Owings, Dunkirk, Huntingtown, Prince Frederick, St. Leonard, Lusby, and Solomons Island. To continue to promote this development pattern, the county has developed Master Plans for each of the Town Centers and rezoned areas within one mile of each town to permit higher density with the purchase of Transferable Development Rights. Calvert County strives to provide safe and efficient roads, water, wastewater systems, public transportation, and utilities. Additionally, the county creates and encourages such public amenities as sidewalks, bike trails, parks, town squares, walking/hiking paths, and indoor recreational and cultural facilities. The county's goal of creating a more compact pattern of development is aimed at reducing dependence on automobiles and enabling people to live within close proximity to stores, offices, entertainment, and services and encouraging alternate transportation methods.

Originally, residential development in Calvert County was limited to small-lot communities along the Chesapeake Bay, which were originally intended only for seasonal/recreational use during the summer and shoulder seasons. These neighborhoods were developed prior to the adoption of county zoning regulations in 1967.

These small-lot communities, which are predominately right on the Chesapeake Bay, were developed and occupied before many of the health and safety regulations and mandates were created and adopted by the county. This causes multiple problems in these areas now with challenges such as beach/shoreline erosion, sewage disposal, stormwater management, road maintenance, and nuisance flooding.

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CHAPTER 3: PLANNING PROCESS



Introduction

The Hazard Mitigation Plan Update process was comprised of the following four main phases: Phase 1 – Organize Steering Committee and Process; Phase 2 – Assess Hazards, Risks, Vulnerability, and Mitigation Capability; Phase 3 – Develop a Mitigation Plan; and Phase 4 – Implement the Plan. Each phase was performed to obtain maximum participation from steering committee members, municipalities, and residents. The Hazard Mitigation Plan Update process was conducted over a 10-month period from October 2016- July 2017.

Phase 1 – Organize Steering Committee and Process: The first phase focused on energizing residents to become interested, involved, and educated in the Plan Update process. In order to achieve this goal, input was solicited throughout the planning process via a two-prong approach: 1) Steering Committee Meetings; and 2) Public Outreach Meetings. Members of the Steering Committee from the 2010 Planning Process were contacted and invited to become members of the Hazard Mitigation Planning Committee for the 2017 Plan Update in an effort to ensure continuity as well as to capitalize on their local knowledge. Each of these avenues for public involvement served its own purpose and required a different tier of involvement to ensure participation from local, county, state, and regional levels. They are discussed in detail in the next section of this Chapter.

Phase 2 – Assess Hazards, Risks, Vulnerability, and Mitigation Capability: In this step, information on past hazard events that affected Calvert County was gathered and specific hazards identified in the 2010 Plan were revisited. This step also involved a literature review of publications addressing historical hazard events, an internet search for data related to historic events, and an inventory and review of the existing GIS coverage and other pertinent documentation. The hazard identification phase included summaries on past occurrences and the probability of future events.

The vulnerability analysis section identified specific areas including critical facilities that were vulnerable to hazards and included estimates of potential losses. Past and future development trends and high hazard areas not suited for development were also analyzed as part of this step.

A Mitigation Capability Assessment was conducted to identify the roles and capabilities of various departments and agencies within the County and individual municipalities. The Assessment also involved a Plan Integration component, which included a review of a select few county and municipal plans and ordinances. The analysis included a report of those documents that addressed or had the potential to address hazard mitigation issues.

Phase 3 – Develop a Mitigation Plan- Based on data from the hazard, vulnerability, and capability assessments, a set of mitigation goals were developed, that were aimed at protecting Calvert County from long-term vulnerability to the hazards that were identified in the THIRA. A comprehensive range of mitigation actions and projects to reduce the effects of each hazard, with emphasis on new and existing buildings and infrastructure, was developed in this step.

The Plan explored mitigation actions in the following six categories to attain their goals:

- Preventative Measures – e.g., zoning, floodplain, stormwater, and other mandates or ordinances.
- Property Protection – e.g., elevating structures or utilities, flood proofing, etc.
- Structural Projects – e.g., levees, reservoirs, drainage channel improvements, dams, etc.
- Education and Outreach – e.g., outreach projects, technical, application and grant assistance
- Natural Resource Protection – e.g., wetlands protection, best management practices for stormwater management, and buyouts and demolitions.
- Emergency Services – e.g., warnings/alerts, sandbagging, evacuation, retrofitting, critical facilities protection, etc.

While some mitigation actions are more ‘broad’ in nature and cover the entire County, others are specific to each municipality, community, or town center. Municipal actions from the 2010 plan were revisited and it was ensured that each municipality identified at least one action, along with a timeline, estimated cost, and entity(ies) responsible for implementation.

Phase 4 – Implement the Plan - In the final phase, an action plan was developed, that described how the mitigation strategies and activities identified would be prioritized, implemented, funded, and administered by the County and its municipalities. Cost estimates and possible funding sources to implement recommended projects were identified. This phase also included methods to monitor, evaluate, and update the mitigation plan within a five-year cycle as well as recommendations on how to incorporate community participation into the plan maintenance process.

Update Process and Participation Summary

Requirement §201.6(c)(1): *The Plan must document the planning process, including how it was prepared and who was involved in the process for each jurisdiction.*

As mentioned above, community input was solicited throughout the planning process via Steering Committee Meetings and Public Meetings, each of which are detailed below.

Steering Committee Involvement

The Steering Committee which undertook the Plan Update process was comprised of representatives from the Calvert County Division of Emergency Management, Calvert County Community Planning and Building, Calvert County Public Works, Chesapeake Biological Lab, and citizen representatives from the Chesapeake Beach, Broomes Island, Cove Point, Need Estate, and North Beach communities.

Photo 3.1 Steering Committee Meeting #1



Six Steering Committee meetings were held during the Plan Update Process: The first Steering Committee Meeting was held on 24 October 2016 at the Calvert County Courthouse Square Building in Prince Frederick. At this meeting, VPC Consultants:

- Discussed the plan integration process;
- Finalized timeline and deliverables;
- Reviewed goals and objectives from the 2010 Hazard Mitigation Plan with the Committee for clarity, cohesiveness, and relevance.

The second Steering Committee Meeting was held on 14 November 2016 at the Calvert County Emergency Operations Center in Prince Frederick. At this meeting, VPC Consultants:

- Reviewed goals and objectives from the 2010 Flood Mitigation Plan with the Committee for clarity, cohesiveness, and relevance
- Discussed the status (Completed, In Progress, Deferred) of the Action Items from the 2010 Flood Mitigation Plan
- Collected input regarding key questions and concerns from the Steering Committee's community representatives;

Photo 3.2 Steering Committee Meeting #2



The third Steering Committee Meeting was held on 28 November 2016 at the Harriet Brown Community Center in Prince Frederick. At this meeting, ESRGC, represented by Dr. Mike Scott of Salisbury University:

- Explained the Hazard Identification and Vulnerability Assessment process to the Committee
- Answered questions related to potential hazards and their likelihood of occurrence
- Provided maps for display and markup by steering committee members to gather more input on stormwater runoff and nuisance flooding

Photo 3.3 Steering Committee Meeting #3



The fourth Steering Committee Meeting was held on February 22, 2017 at the Calvert County EOC in Prince Frederick. The Committee was provided a brief overview and loss statistics for the various hazards that are most likely to face the County. A short Q/A session was held for anyone unfamiliar with the current science behind the hazards and projection estimates. The meeting focused on:

- Ranking hazards according to potential damage and likelihood of occurrence.
- Action items for each of the hazards were suggested and discussed.
- Discussing how to provide the public with the most up to date information available, through the most likely channels (text, email, social media, mass notification, etc.)

The final Steering Committee Meeting was held on the 13th of April 2017, at the Harriet Brown Community Center in Prince Frederick. The steering committee met to finalize the mitigation actions developed for the county and both municipalities. The actions had been emailed out weeks ahead of the meeting to ensure the committee had time to review them and develop any questions or comments for the actions developed. The committee also;

- Ranked the actions by social, administrative, and economic impacts.
- Determined the Lead Agency, Timeline, Estimated Cost and potential Funding Sources for each action item.
- Was provided a printed draft of the plan up to this point for review and to provide comments and notes. One copy of the draft plan was also provided to the Emergency Management Division for extensive review and notation.

Public & Stakeholder Participation

Requirement §201.6(a)(3): *Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process ... Statewide plans will not be accepted as multi-jurisdictional plans.*

The VPC team and the Calvert County Emergency Management Division Chief held a kick-off meeting on October 3rd, 2016. This meeting officially initiated the planning process and included discussions on the project tasks, project schedule, deliverables, and Steering Committee

composition.

Following the kick-off meeting, the Steering Committee from the 2010 Plan was contacted to determine their interest in participating in this Plan Update process. **Table 3.1** includes the members of the Calvert County Steering Committee and representative agencies for this Plan Update.

Table 3.1 – Hazard Mitigation Plan Update Steering Committee

NAME	AGENCY/LOCATION
John Hoffman – Town Engineer	Town of North Beach
Joanne Hunt – Secretary	Town of North Beach
Mark Frazer – Mayor	Town of North Beach
Bill Watson – Zoning Administrator	Town of Chesapeake Beach
Bruce Wahl – Mayor	Town of Chesapeake Beach
Christopher Jakubiack – Town Planner	Town of Chesapeake Beach
Al Jeffery	Calvert County Public Safety, Division of Emergency Management
Shelly Gooding	Calvert County Public Safety, Division of Emergency Management
Andy Balchin	Calvert County Public Works
Kian Liong	Calvert County Public Works
Wilson Freeland	Calvert County Department of General Services
Linda Vassallo	Calvert County Economic Development
Dave Brownlee	Calvert County Department of Planning and Zoning
Tay Harris	Calvert County Department of Planning and Zoning
Lisa Harford	Breezy Point Community
Jennifer Anderson	Breezy Point Community
Lori McCarty	Broomes Island Community
Brandi Elliot	Broomes Island Community
Steve Ferrell	Broomes Island Community
Allan Spahr	Cove Point Community
Bob Boxwell	Cove Point Natural Heritage Trust
Jeff Green, President	Long Beach Civic Association
Janet Gean	Neeld Estate Community
Betsy Ross	Neeld Estate Community
James Shepard	Solomon's Island Community
Terry Cox	Dominion Energy
Rick Woods	Exelon Corporation
Hali Kilbourne	University of Maryland - Chesapeake Biological Lab

Multi-Jurisdictional Planning

Table 3.2 identifies the level of participation of each municipality during the Plan Update process.

Table 3.2 – Municipal Participation

Municipal Participation				
Municipality	Questionnaire Completion	Attendance at Steering Committee Meetings	Mitigation Goals and Actions Input	Draft Plan Review
Chesapeake Beach	YES		YES	
North Beach		YES	YES	

Requirement §201.6(b): *In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:*

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(2) An opportunity for 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;

Public Involvement

An initial Public Meeting was held on 28 November 2016 at the Harriet Brown Community Center in Prince Frederick. The meeting was advertised in three local newspapers, county social media outlets, and on the county website <http://www.co.cal.md.us/>. A PowerPoint was developed and presented by VPC Consultants. The public was provided an opportunity to:

- Review the results of the updated Hazard Risk and Vulnerability Assessment;
- Review updated goals and objectives;
- Examine options for mitigation actions and projects, and
- Review proposed prioritization criteria for mitigation projects.
- Review and edit maps to include known flooding problems or other hazards

Additionally, a presentation was given by Dr. Mike Scott of Salisbury University;

- Explained the Hazard Identification and Vulnerability Assessment process to the public and the committee.
- Answered questions related to potential hazards and the likelihood of their occurrence.
- Provided maps for display and markup by all attendees to gather more input on stormwater runoff and nuisance flooding in the county.

Finally, VPC explained the planning process and deliverable schedule to the public and emphasized the importance of the public and municipalities involvement in the process for the Community Rating System (CRS) program to be effective.

Copies of the draft Plan Update were made available online at the Division of Emergency Management for a period of two weeks for public comment. Comments received during the review period were incorporated into the final version of the Plan Update.

A final Public Meeting was held on April 13th, 2017 at the Harriet Brown Community Center in Prince Frederick. Representatives from the County Division of Emergency Management and Vision Planning and Consulting were on location from 6:30-8:30pm to answer any questions.

CHAPTER 4: HAZARD IDENTIFICATION AND RISK ANALYSIS



Introduction – Hazard Identification

The United States and its communities are vulnerable to a wide array of natural and human-caused hazards that threaten life and property. These hazards include:

Natural

- Flood
- Hurricanes and Coastal Storms
- Severe Thunderstorms
- Tornadoes
- Wildfire
- Drought/Extreme Heat
- Winter Storms and Freezes
- Hail
- Erosion
- Dam/Levee Failure
- Earthquakes, Sinkholes and Landslides

Human-Caused

- Hazardous Materials (HazMat)
- Energy Pipeline Failures
- Terrorism

Some of these hazards are interrelated (i.e., hurricanes can cause flooding and tornadoes), and some consist of hazardous elements that are not listed separately (i.e., severe thunderstorms can cause lightning; hurricanes can cause coastal erosion). In addition, terrorist-related incidents or accidents involving chemical, radiological or biological agents can coincide with natural hazard events, such as flooding caused by destruction of a dam or an accidental chemical release caused by a tornado. It should also be noted that some hazards, such as severe winter storms, may impact a large area yet cause little damage, while other hazards, such as a tornado, may impact a small area yet cause extensive damage. This section provides a general description for each of the hazards listed above along with their hazardous elements, written from a national perspective.

Natural Hazards

Flood

Flooding is the most frequent and costly natural hazard in the United States, a hazard that has caused more than 10,000 deaths since 1900. Nearly 90 percent of presidential disaster declarations result from natural events in which flooding was a major component.

Floods are generally the result of excessive precipitation, and can be classified under two categories: general floods, precipitation over a given river basin for a long period of time; and flash floods, the product of heavy localized precipitation in a short time period over a given location. The severity of a flooding event is determined by the following: a combination of stream and river basin topography and physiography; precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing.

General floods are usually long-term events that may last for several days. The primary types of general flooding include riverine, coastal, and urban flooding. Riverine flooding is a function of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Coastal flooding is typically a result of storm surge, wind-driven waves, and heavy rainfall produced by hurricanes, tropical storms, nor'easters, and other large coastal storms. Urban flooding occurs where man-made development has obstructed the natural flow of water and decreased the ability of natural groundcover to absorb and retain surface water runoff.

Flash flooding events usually occur from a dam or levee failure within minutes or hours of heavy amounts of rainfall, or from a sudden release of water held by an ice jam. Most flash flooding is caused by slow-moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. Although flash flooding occurs often along mountain streams, it is also common in urbanized areas where much of the ground is covered by impervious surfaces. Flash flood waters move at very high speeds- "walls" of water can reach heights of 10 to 20 feet. Flash flood waters and the accompanying debris can

Photo 4.1 Midwest Floods in June 1994



A total of 534 counties in nine states were declared for federal disaster aid as a result of the Midwest Floods in June 1994. Homes, businesses and personal property were all destroyed by the high flood levels; 168,340 people registered for federal assistance. (FEMA News Photo)

uproot trees, roll boulders, destroy buildings, and obliterate bridges and roads.

The periodic flooding of lands adjacent to rivers, streams, and shorelines (land known as floodplain) is a natural and inevitable occurrence that can be expected to take place based upon established recurrence intervals. The recurrence interval of a flood is defined as the average time interval, in years, expected between a flood event of a particular magnitude and an equal or larger flood. Flood magnitude increases with increasing recurrence interval.

Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be covered by the 10-year flood and the 100-year floodplain by the 100-year flood. Flood frequencies such as the 100-year flood are determined by plotting a graph of the size of all known floods for an area and determining how often floods of a particular size occur. Another way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 100-year flood has a 1 percent chance of occurring in any given year.

Table 4.1 shows flood damage values by fiscal year from a national perspective.

Table 4.1 - National Flood Damage by Fiscal Year (Oct.-Sept.) 1990 - 2014

Fiscal Year	Damage (Billions of Current Dollars)	Inflation Adjustment	Damage (Billions of 2014 Dollars)	U.S. Population (Millions)	Damage Per Capita (2014 Dollars)	Flood Fatalities
2014	\$2,861,426,089.00	1.000	\$2,861,426,089	317.68	\$9.01	38
2013	\$2,175,518,874.54	1.016	\$2,210,809,876	315.18	\$7.01	80
2012	\$506,368,342.10	1.031	\$522,119,985	312.86	\$1.67	29
2011	\$8,648,709,658.17	1.052	\$9,102,294,087	310.50	\$29.31	113
2010	\$5,172,733,151.99	1.086	\$5,615,860,859	308.11	\$18.23	103
2009	\$996,350,292.93	1.103	\$1,099,446,636	306.77	\$3.58	56
2008	\$6,136,677,306.23	1.100	\$6,747,571,742	304.09	\$22.19	82
2007	\$2,571,631,102.33	1.142	\$2,936,200,387	301.23	\$9.75	87
2006	\$4,034,316,650.85	1.174	\$4,737,440,410	298.38	\$15.88	76
2005	\$45,641,927,156.26	1.212	\$55,325,587,646	295.52	\$187.21	43
2004	\$15,363,887,745.72	1.253	\$19,254,554,417	292.81	\$65.76	82
2003	\$2,826,192,364.69	1.287	\$3,636,203,672	290.11	\$12.53	86
2002	\$1,380,637,071.75	1.316	\$1,816,823,223	287.63	\$6.32	49
2001	\$8,448,554,328.91	1.337	\$11,299,869,817	284.97	\$39.65	48
2000	\$1,534,953,230.18	1.375	\$2,110,213,054	282.16	\$7.48	38
1999	\$6,213,228,434.31	1.421	\$8,828,900,640	279.04	\$31.64	68
1998	\$2,847,771,022.54	1.452	\$4,136,011,784	275.85	\$14.99	136
1997	\$9,962,460,912.62	1.475	\$14,694,536,739	272.65	\$53.90	118
1996	\$7,079,446,559.79	1.509	\$10,681,707,207	269.39	\$39.65	131
1995	\$5,897,082,264.51	1.553	\$9,160,444,009	266.28	\$34.40	80
1994	\$1,271,677,329.61	1.597	\$2,031,388,693	263.13	\$7.72	91
1993	\$18,806,442,570.44	1.638	\$30,810,809,608	259.92	\$118.54	103
1992	\$889,219,833.64	1.687	\$1,500,430,125	256.51	\$5.85	62
1991	\$1,982,191,491.88	1.738	\$3,445,345,705	252.98	\$13.62	61
1990	\$1,872,216,779.84	1.811	\$3,391,133,218	249.62	\$13.59	142

Source: Hydrologic Information Center, National Weather Service

Hurricanes and Coastal Storms

Hurricanes, tropical storms, nor'easters and typhoons, also classified as cyclones, are any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. A tropical cyclone refers to any such circulation that develops over tropical waters. Tropical cyclones act as a "safety-valve," limiting the continued build-up of heat and energy in tropical regions by maintaining the atmospheric heat and moisture balance between the tropics and the pole-ward latitudes. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation, and tornadoes. Coastal areas are also vulnerable to the additional forces of storm surge, wind-driven waves, and tidal flooding which can be more destructive than cyclone wind.

The key energy source for a tropical cyclone is the release of latent heat from the condensation of warm water. Their formation requires a low-pressure disturbance, warm sea surface temperature, rotational force from the spinning of the earth, and the absence of wind shear in the lowest 50,000 feet of the atmosphere. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic hurricane season, which encompasses the months of June through November. The peak of the Atlantic hurricane season is in early to mid-September and the average number of storms that reach hurricane intensity per year in this basin is about six (6).

Photo 4.2 Hurricane Lili Damage



Wind and rain from Hurricane Lili damage road signs along I-10 in Louisiana October 3, 2002. (Photo by Lauren Hobart/FEMA News Photo)

Figure 4.1 shows for any particular location what the chance is that a tropical storm or hurricane will affect the area sometime during the whole June to November Atlantic hurricane season. The figure was created by the National Oceanic and Atmospheric Administration's Hurricane Research Division using data from 1944 to 1999 and counting hits when a storm or hurricane was within approximately 100 miles (165 km) of each location.

As an incipient hurricane develops, barometric pressure (measured in Millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach, or exceed, 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center in Miami, Florida.

When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Scale, which rates hurricane intensity on a scale of 1 to 5, with 5 being the most intense. The Saffir-Simpson Scale was slightly modified in 2012 in order to "resolve awkwardness with conversions among the various units used for wind speed in advisory products" (NHC). The Saffir-Simpson Scale is shown in **Table 4.2**.

Figure 4.1 - Empirical Probability of a Named Storm

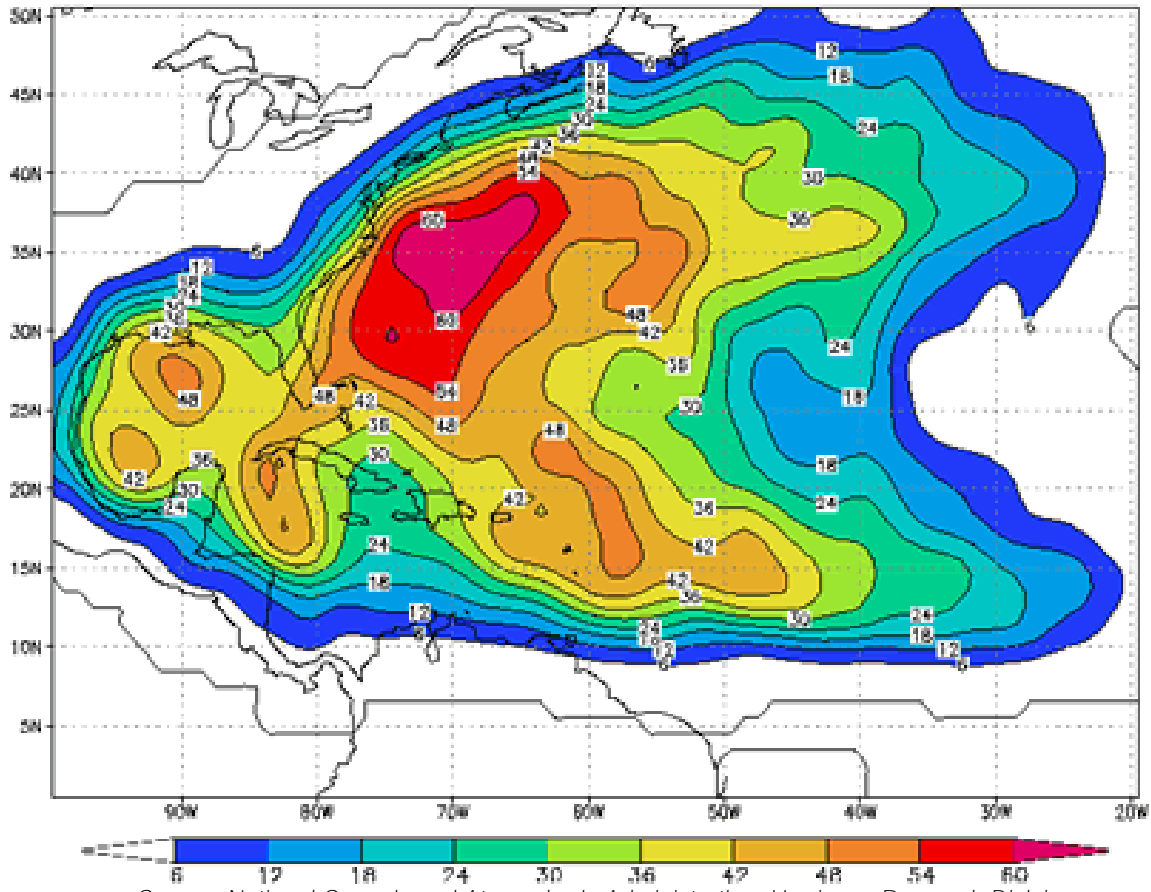


Table 4.2
Saffir-Simpson Wind Scale

The Saffir-Simpson Scale categorizes hurricane intensity linearly based upon maximum sustained winds, barometric pressure, and storm surge potential, which are combined to estimate potential damage. Categories 3, 4, and 5 are classified as “major” hurricanes, and while hurricanes within this range comprise only 20 percent of total tropical cyclone landfalls, they account for over 70 percent of the damage in the United States.

Category	Maximum Sustained Wind Speed (mph)
1	74-95 mph
2	96-110 mph
3	111-129 mph
4	130-156 mph
5	157 mph or higher

Table 4.3 describes the damage that could be expected for each category of hurricane as determined by the Saffir-Simpson Scale.

Table 4.3 - Hurricane Damage Classification

Category	Damage Level	Description
1	MINIMAL	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, 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.
2	MODERATE	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.
3	EXTENSIVE	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.
4	EXTREME	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 possibly months. Most of the area will be uninhabitable for weeks or months.
5	CATASTROPHIC	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: National Hurricane Center

A storm surge is a large dome of water often 50 to 100 miles wide and rising anywhere from four to five feet in a Category 1 hurricane up to 20 feet in a Category 5 storm. The storm surge arrives ahead of the storm's actual landfall and the more intense the hurricane is, the sooner the surge arrives. Water rise can be very rapid, posing a serious threat to those who have not yet evacuated flood-prone areas.

A storm surge is a wave that has outrun its generating source and become a long period swell. The surge is always highest in the right-front quadrant of the direction in which the hurricane is moving. As the storm approaches shore, the greatest storm surge will be to the north of the hurricane eye. Such a surge of high water topped by waves driven by hurricane force winds can be devastating to coastal regions, causing severe beach erosion and property damage along the immediate coast.

Storm surge heights, and associated waves, are dependent upon the shape of the continental shelf (narrow or wide) and the depth of the ocean bottom (bathymetry). A narrow shelf, or one that drops steeply from the shoreline and subsequently produces deep water close to the shoreline, tends to produce a lower surge but higher and more powerful storm waves.

Damage during hurricanes may also result from spawned tornadoes and inland flooding associated with heavy rainfall that usually accompanies these storms. Hurricane Floyd, as an example, was at one time a Category 4 hurricane racing towards the North Carolina coast. As far inland as Raleigh, the state capital located more than 100 miles from the coast, communities were preparing for extremely damaging winds exceeding 100 miles per hour. However, Floyd made landfall as a Category 2 hurricane and will be remembered for causing the worst inland flooding disaster in North Carolina's history. Rainfall amounts were as high as 20 inches in certain locales and 67 counties sustained damages.

Photo 4.3 Hurricane Floyd Storm Surge Damage



Hurricane Floyd brought a devastating 15 feet of storm surge that damaged or destroyed hundreds of houses along the ocean front of Long Beach on Oak Island, North Carolina in September 1999. A prime example of successful hazard mitigation, the elevated home (right) survived while the older, ground-level block foundation of the home on the left was crushed. (Photo by Dave Gatley/FEMA News Photo)

Similar to hurricanes, nor'easters are ocean storms capable of causing substantial damage to coastal areas in the Eastern United States due to their associated strong winds and heavy surf. Nor'easters are named for the winds that blow in from the northeast and drive the storm up the East Coast along the Gulf Stream, a band of warm water that lies off the Atlantic coast. They are caused by the interaction of the jet stream with horizontal temperature gradients and generally occur during the fall and winter months when moisture and cold air are plentiful.

Nor'easters are known for dumping heavy amounts of rain and snow, producing hurricane-force winds, and creating high surfs that cause severe beach erosion and coastal flooding. There are two main components to a nor'easter: (1) a Gulf Stream low-pressure system (counter-clockwise winds) generated off the southeastern U.S. coast, gathering warm air and moisture from the Atlantic, and pulled up the East Coast by strong northeasterly winds at the leading edge of the storm; and (2) an Arctic high-pressure system (clockwise winds) which meets the low-pressure system with cold, arctic air blowing down from Canada. When the two systems collide, the moisture and cold air produce a mix of precipitation and have the potential for creating dangerously high winds and heavy seas. As the low-pressure system deepens, the intensity of the winds and waves will increase and cause serious damage to coastal areas as the storm moves northeast.

Table 4.4 shows an intensity scale proposed for nor'easters that is based upon levels of coastal degradation.

Table 4.4
Dolan-Davis Nor'easter Intensity Scale

Storm Class	Beach Erosion	Dune Erosion	Overwash	Property Damage
1 (Weak)	Minor changes	None	No	No
2 (Moderate)	Modest; mostly to lower beach	Minor	No	Modest
3 (Significant)	Erosion extends across beach	Can be significant	No	Loss of many structures at local level
4 (Severe)	Severe beach erosion and recession	Severe dune erosion or destruction	On low beaches	Loss of structures at community-scale
5 (Extreme)	Extreme beach erosion	Dunes destroyed over extensive areas	Massive in sheets and channels	Extensive at regional-scale; millions of dollars

Source: North Carolina Division of Emergency Management

Severe Thunderstorms

According to the National Weather Service, more than 100,000 thunderstorms occur each year, though only about 10 percent of these storms are classified as “severe.” Although thunderstorms generally affect a small area when they occur, they are very dangerous because of their ability to generate tornadoes, hailstorms, strong winds, flash flooding, and damaging lightning. While thunderstorms can occur in all regions of the United States, they are most common in the central and southern states because atmospheric conditions in those regions are most ideal for generating these powerful storms.

Thunderstorms are caused when air masses of varying temperatures meet. Rapidly rising warm moist air serves as the “engine” for thunderstorms. These storms can occur singularly, in lines, or in clusters. They can move through an area very quickly or linger for several hours.

Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a “bolt” when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes but the surrounding air cools following the bolt. This rapid

Photo 4.4 Lightning Strikes



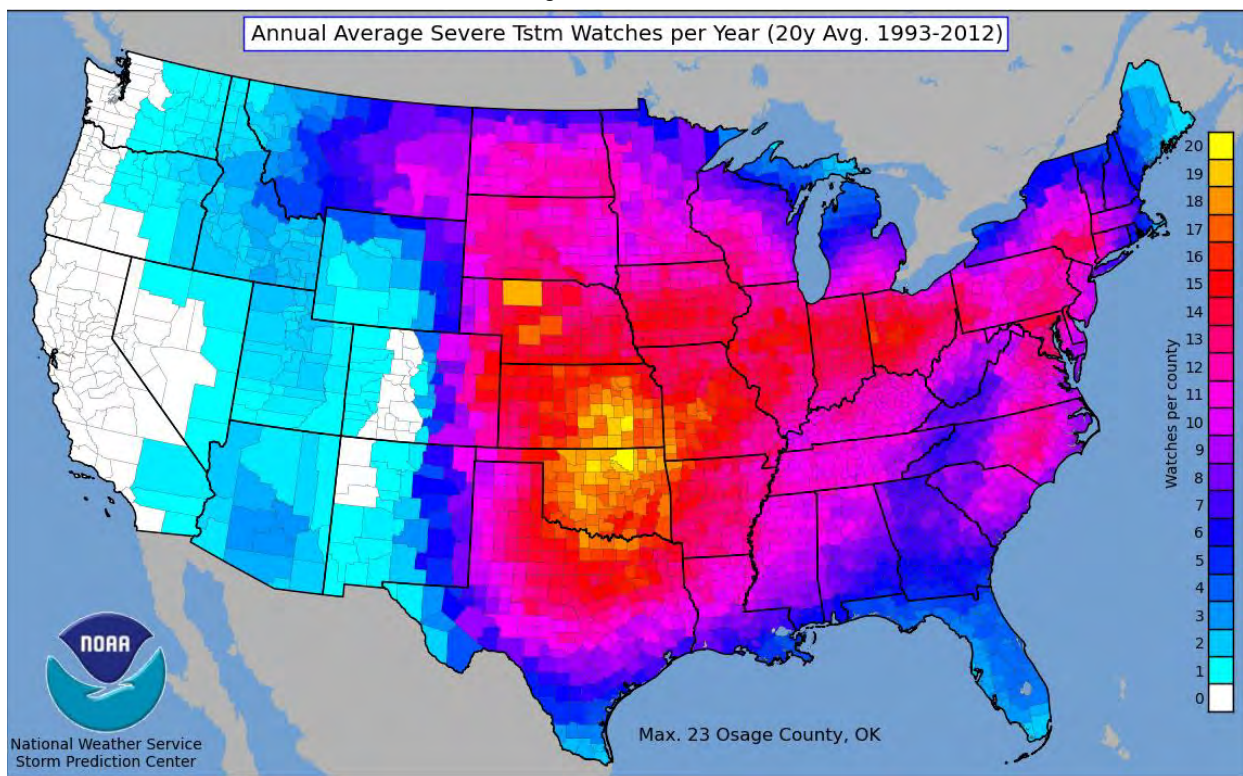
Multiple cloud-to-ground and cloud-to-cloud lightning strikes observed during a nighttime thunderstorm. (Photo courtesy of NOAA Photo Library, NOAA Central Library; OAR/ERL/ National Severe Storms Laboratory)

heating and cooling of the surrounding air causes thunder. On average, 89 people are killed each year by lightning strikes in the United States.

The National Weather Service has been collecting data for thunder days, number and duration of thunder events, and lightning strike density since 1948. A series of maps was generated showing the annual average thunder event duration, the annual average number of thunder events, and the mean annual density of lightning strikes. The figure below illustrates the most recent statistic on thunderstorm activity.

Figure 4.2 illustrates thunderstorm hazard activity based on the annual average number of thunderstorm watches from 1993 to 2012.

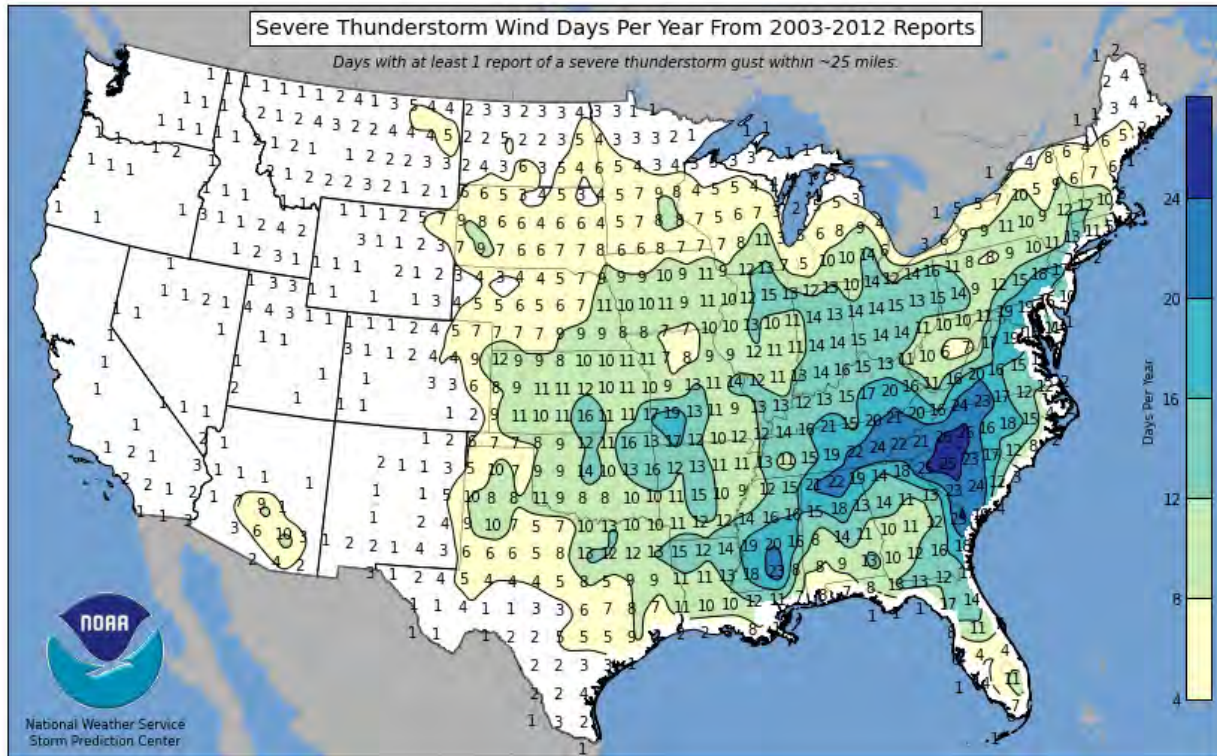
Figure 4.2
Annual Average Number of Thunder Events



Source: Federal Emergency Management Agency

The number of severe thunderstorm wind days per year in the conterminous United States is shown in **Figure 4.3**. These numbers represent the number of days where at least one report of a severe thunderstorm gust (greater than 40 mph) was recorded within 25 miles. Compared with Figure 4.2 above, this map shows that while severe thunderstorm watches are most common in the Plains, severe thunderstorm occurrences are actually centered on the Piedmont of North and South Carolina.

Figure 4.3 – Severe Thunderstorm Wind Days



Source: National Weather Service NOAA

Tornadoes

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes result from hurricanes and other coastal storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. According to the National Weather Service, tornado wind speeds normally range from 40 to more than 300 miles per hour. The most violent tornadoes have rotating winds of 250 miles per hour or more and are capable of causing extreme destruction and turning normally harmless objects into deadly missiles.

Each year, an average of over 1200 tornadoes is reported nationwide, resulting in an average of 60 deaths and 1,500 injuries (NOAA, 2002). They are

Photo 4.5 Dimmitt, TX Tornado of June 1995



The most comprehensively observed tornado in history, this tornado south of Dimmitt, Texas developed June 2, 1995 curving northward across Texas Highway 86 where it entirely removed 300 feet of asphalt from the road tossing it more than 600 feet into an adjacent field. It also caused F4 damage at an isolated rural residence just north of the road. (NOAA Photo Library, NOAA Central Library; OAR/ERL/National Severe Storms Laboratory)

more likely to occur during the spring and early summer months of March through June and can occur at any time of day, but are likely to form in the late afternoon and early evening. Most tornadoes are a few dozen yards wide and touch down briefly, but even small short-lived tornadoes can inflict tremendous damage. Highly destructive tornadoes may carve out a path over a mile wide and several miles long.

Waterspouts are weak tornadoes that form over warm water and are most common along the Gulf Coast and southeastern states. Waterspouts occasionally move inland, becoming tornadoes that cause damage and injury. However, most waterspouts dissipate over the open water causing threats only to marine and boating interests. Typically, a waterspout is weak and short-lived, and because they are so common, most go unreported unless they cause damage.

The destruction caused by tornadoes ranges from light to inconceivable depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damages to structures of light construction such as residential homes (particularly mobile homes), and tend to remain localized in impact. The Fujita-Pearson Scale for Tornadoes was updated to the Enhanced-Fujita scale on February 1, 2007. The Enhanced-Fujita (EF) Scale is still a set of wind estimates based on damage, however takes into account construction quality, provides damage indicators, and a definitive correlation between damage and wind speed. The EF-Scale (**Table 4.5**) consists of 28 damage indicators consisting of buildings, structures and trees. For each Damage Indicator (DI), several Degrees of Damage (DODs) are identified. The DODs are sequenced so each one requires a higher expected wind speed than the previous one. Damage ranges from the initiation of visible damage to complete destruction of the particular DI. A benefit of this approach is that, in the future, additional DIs can be added to the current list as new information becomes available.

Table 4.5
Enhanced Fujita Scale for Tornadoes

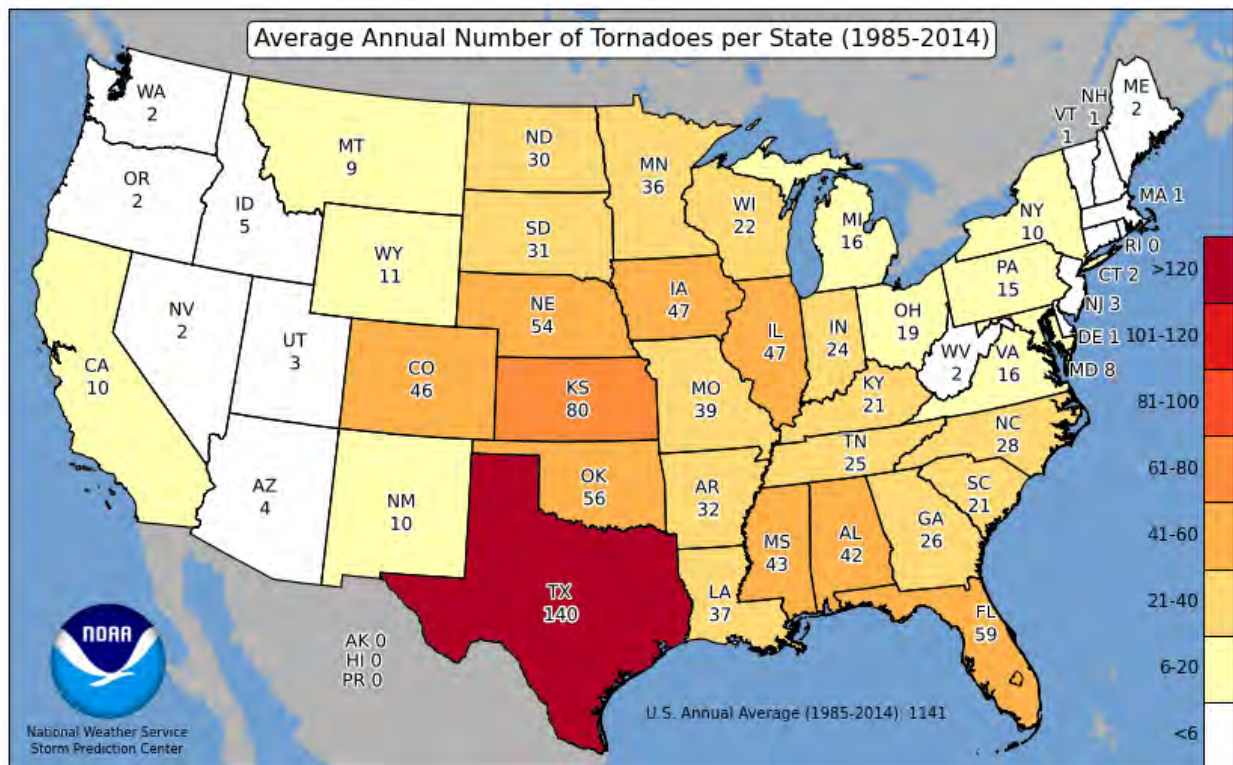
EF-Scale Number	3 Second Gust (mph)	Type of Damage Done
EF0	65-85	Light Damage: Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	86-110	Moderate Damage: Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	Considerable Damage: Roofs torn off well-constructed houses; mobile homes demolished; large trees snapped or uprooted; light object missiles generated; cars lifted off ground.
EF3	136-165	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	Devastating Damage: Whole frame houses, well-constructed houses and mobile homes completely leveled; cars thrown and small missiles generated.
EF5	>200	Incredible Damage: Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100m (109 yd.); high-rise buildings have significant structural deformation; incredible phenomena will occur.

Source: NOAA's NWS Storm Prediction Center

According to the NOAA Storm Prediction Center (SPC), the highest concentration of tornadoes in the United States has been in Texas, Kansas, Florida, and Oklahoma respectively. Although the Great Plains region of the Central United States does favor the development of the largest and most dangerous tornadoes (earning the designation of “tornado alley”), Florida experiences the greatest number of tornadoes per square mile of all U.S. states (SPC, 2002).

Figure 4.4 shows tornado activity in the United States based on the average number of tornadoes between 1985 and 2014.

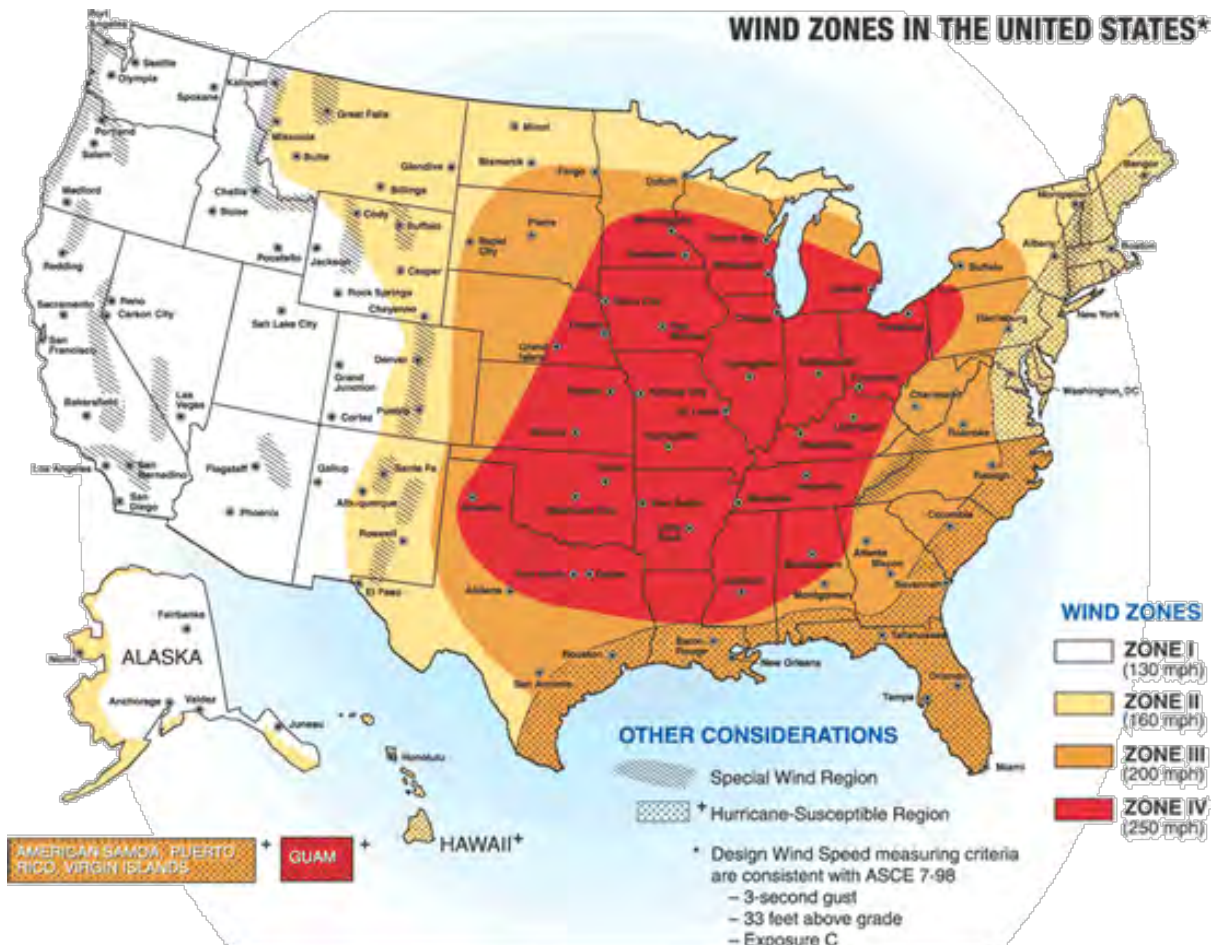
Figure 4.4
Tornado Activity in the United States



The tornadoes associated with tropical cyclones are most frequent in September and October when the incidence of tropical storm systems is greatest. This type of tornado usually occurs around the perimeter of the storm, and most often to the right and ahead of the storm path or the storm center as it comes ashore. These tornadoes commonly occur as part of large outbreaks and generally move in an easterly direction.

Figure 4.5 shows how the frequency and strength of extreme windstorms vary across the United States. The map was produced by the Federal Emergency Management Agency and is based on 40 years of tornado history and over 100 years of hurricane history. Zone IV, the darkest area on the map, has experienced both the greatest number of tornadoes and the strongest tornadoes. As shown by the map key, wind speeds in Zone IV can be as high as 250 MPH.

Figure 4.5 - Wind Zones in the United States



Source: Federal Emergency Management Agency

Wildfire

A wildfire is any fire occurring in a wildland area (i.e. grassland, forest, brush land) except for fire under prescription.⁹ Wildfires are part of the natural management of the Earth’s ecosystems, but may also be caused by natural or human factors. Over 80 percent of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning.

There are three classes of wildland fires: surface fire, ground fire, and crown fire. A surface fire is the most common of these three classes and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire (muck fire) is usually started by lightning or human carelessness and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. Wildland fires are usually signaled by dense smoke that fills the area for miles around.

⁹ Prescription burning, or “controlled burn,” undertaken by land management agencies is the process of igniting fires under selected conditions, in accordance with strict parameters.

State and local governments can impose fire safety regulations on home sites and developments to help curb wildfire. Land treatment measures such as fire access roads, water storage, helipads, safety zones, buffers, firebreaks, fuel breaks, and fuel management can be designed as part of an overall fire defense system to aid in fire control. Fuel management, prescribed burning, and cooperative land management planning can also be encouraged to reduce fire hazards.

Fire probability depends on local weather conditions, outdoor activities such as camping, debris burning, and construction, and the degree of public cooperation with fire prevention measures. Drought conditions and other natural disasters (tornadoes, hurricanes, etc.) increase the probability of wildfires by producing fuel in both urban and rural settings. Forest damage from hurricanes and tornadoes may block interior access roads and fire breaks, pull down overhead power lines, or damage pavement and underground utilities.

Many individual homes and cabins, subdivisions, resorts, recreational areas, organizational camps, businesses, and industries are located within high fire hazard areas. The increasing demand for outdoor recreation places more people in wildlands during holidays, weekends, and vacation periods. Unfortunately, wildland residents and visitors are rarely educated or prepared for the inferno that can sweep through the brush and timber and destroy property in minutes.

Drought/Extreme Heat

Drought is a natural climatic condition caused by an extended period of limited rainfall beyond that which occurs naturally in a broad geographic area. High temperatures, high winds, and low humidity can worsen drought conditions, and can make areas more susceptible to wildfire. Human demands and actions can also hasten drought-related impacts.

Droughts are frequently classified as one of following four types:

- Meteorological
- Agricultural
- Hydrological
- Socio-economic.

Meteorological droughts are typically defined by the level of “dryness” when compared to an average, or normal amount of precipitation over a given period of time. Agricultural droughts relate common characteristics of drought to their specific agricultural-related impacts. Emphasis tends to be placed on factors such as soil water deficits, water needs based on differing stages of crop development, and water reservoir levels.

Photo 4.6 Wildfires in Montana in August 2000



On Sunday, August 6, 2000, several forest fires converged near Sula, Montana, forming a firestorm that overran 100,000 acres and destroyed 10 homes. Temperatures in the flame front were estimated at more than 800 degrees. Note the elk gathering near the East Fork of the Bitterroot River. (Photo by John McColgan/U.S. Forest Service Firefighter)

Hydrological drought is directly related to the effect of precipitation shortfalls on surface and groundwater supplies. Human factors, particularly changes in land use, can alter the hydrologic characteristics of a basin. Socio-economic drought is the result of water shortages that limit the ability to supply water-dependent products in the marketplace.

While drought mostly impacts land and water resources, extreme heat can pose a significant risk to humans. Extreme heat can be defined as temperatures that hover 10 degrees or more above the average high temperature for the region, last for prolonged periods of time, and are often accompanied by high humidity. Under normal conditions, the human body's internal thermostat produces perspiration that evaporates and cools the body. However, in extreme heat and high humidity, evaporation is slowed and the body must work much harder to maintain a normal temperature.

Elderly persons, young children, persons with respiratory difficulties, and those who are sick or overweight are more likely to become victims of extreme heat. Because men sweat more than women, they are more susceptible to heat-related illness because they become more quickly dehydrated.

Studies have shown that a significant rise in heat-related illness occurs when excessive heat persists for more than two days. Spending at least two hours per day in air conditioning can significantly reduce the number of heat-related illnesses.

Extreme heat in urban areas can create health concerns when stagnant atmospheric conditions trap pollutants, thus adding unhealthy air to excessively hot temperatures. In addition, the "urban heat island effect" can produce significantly higher nighttime temperatures because asphalt and concrete (which store heat longer) gradually release heat at night.

Figure 4.6 shows a U.S. Drought Monitor summary map from the United States Department of Agriculture for February 14, 2017. Drought Monitor summary maps identify general drought areas and label droughts by intensity, with D1 being the least intense and D4 being the most intense.

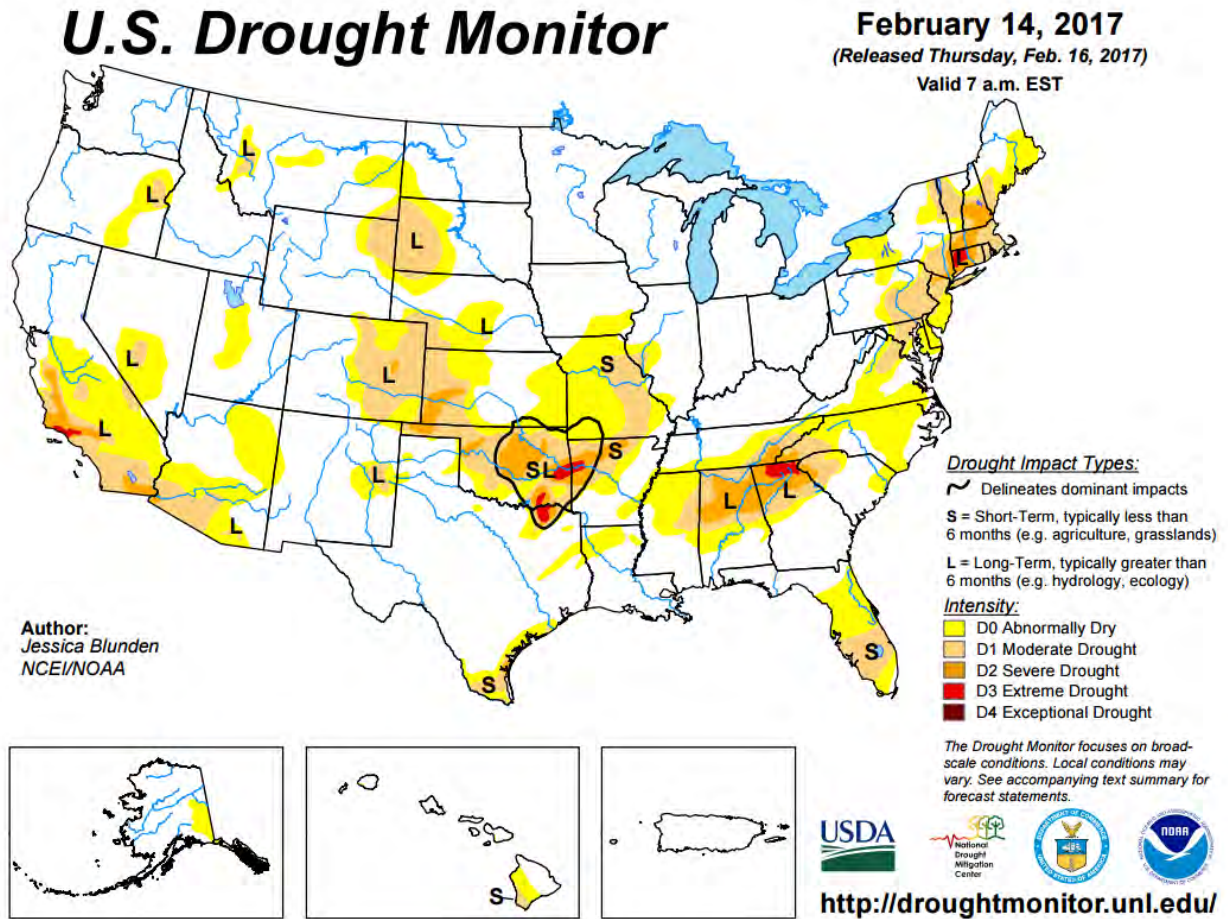
Weekly-updated maps may be obtained online from The Drought Monitor Web site, maintained by the National Drought Mitigation Center, located at the following Web address: <http://drought.unl.edu/dm>.

Photo 4.7 Drought Conditions



A USGS streamflow gaging station at the Ogeechee River near Eden, Georgia in July 2000 illustrates the drought conditions that can severely affect water supplies, agriculture, stream water quality, recreation, navigation, and forest resources. (Photo courtesy of the United States Geological Survey)

Figure 4.6 - U.S. Drought Monitor



Hail

Hailstorms are an outgrowth of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation — as balls or irregularly shaped masses of ice greater than 0.75 in. (1.91 cm) in diameter. The size of hailstones is a direct function of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a function of the intensity of heating at the Earth’s surface. Higher temperature gradients relative to elevation above the surface result in increased suspension time and hailstone size.

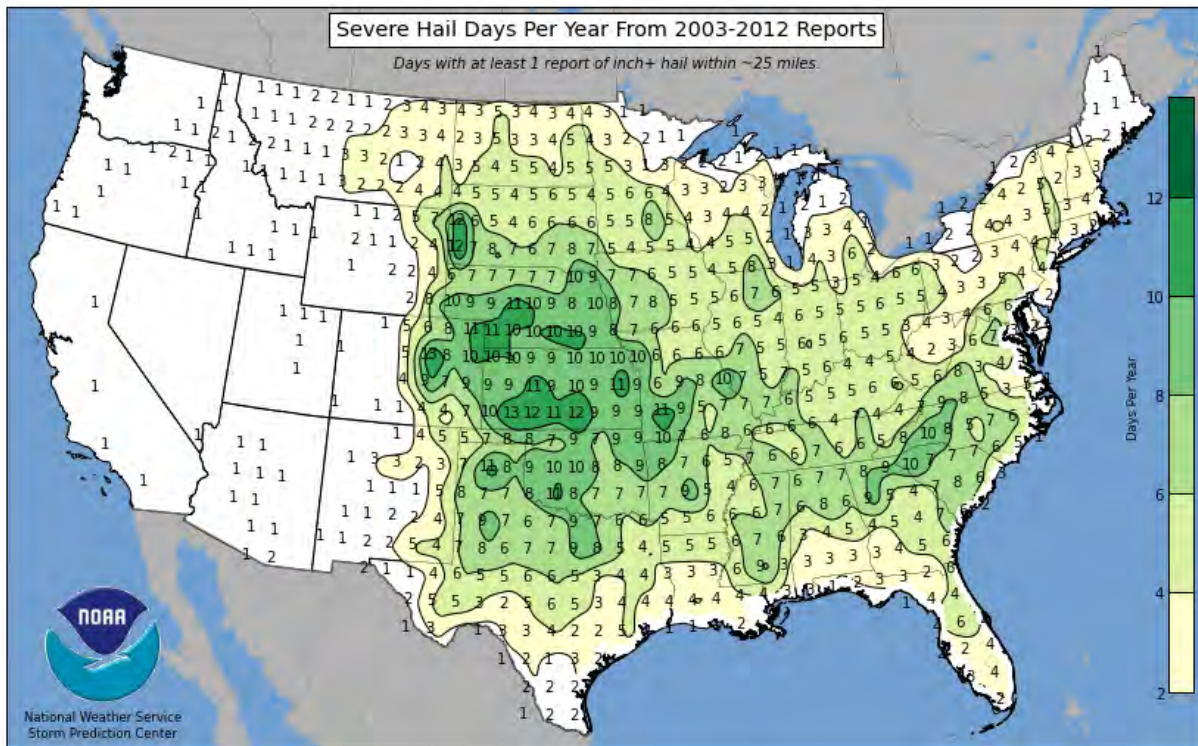
Photo 4.8 Hailstorm



Large hail collects on streets and grass during a severe thunderstorm. Larger stones appear to be nearly two to three inches in diameter. (NOAA Photo Library, NOAA Central Library; OAR/ERL/National Severe Storms Laboratory)

Figure 4.7 shows number of hailstorm days in the United States.

Figure 4.7
Average number of hailstorm days in the United States



Source: National Weather Service

Winter Storms and Freezes

A winter storm can range from a moderate snow over a period of a few hours to blizzard conditions with blinding wind-driven snow that lasts for several days. Some winter storms may be large enough to affect several states, while others may affect only a single community. Many winter storms are accompanied by low temperatures and heavy and/or blowing snow, which can severely impair visibility.

Winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Sleet – raindrops that freeze into ice pellets before reaching the ground – usually bounce when hitting a surface and do not stick to objects; however, sleet can accumulate like snow and cause a hazard to motorists. Freezing rain is rain that falls onto a surface with a temperature below freezing, forming a glaze of ice. Even small accumulations of ice can cause a significant hazard, especially on power lines and trees. An ice storm occurs when freezing rain falls and freezes immediately upon impact. Communications and power can be disrupted for days, and even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

A freeze is weather marked by low temperatures, especially when below the freezing point (zero degrees Celsius or thirty-two degrees Fahrenheit). Agricultural production is seriously affected when temperatures remain below the freezing point.

Photo 4.9 Winter Storm and Freeze Damage



A heavy layer of ice was more weight than this tree in Kansas City, Missouri could withstand during a January 2002 ice storm that swept through the region bringing down trees, power lines and telephone lines. (Photo by Heather Oliver/FEMA News Photo)

Erosion

Erosion is the gradual breakdown and movement of land due to both physical and chemical processes of water, wind, and general meteorological conditions. Natural, or geologic, erosion has occurred since the Earth's formation and continues at a very slow and uniform rate each year.

There are two types of soil erosion: wind erosion and water erosion. Wind erosion can cause significant soil loss. Winds blowing across sparsely vegetated or disturbed land can pick up soil particles and carry them through the air, thus displacing them. Water erosion can occur over land or in streams and channels. Water erosion that takes place over land may result from raindrops, shallow sheets of water flowing off the land, or shallow surface flow, which is concentrated in low spots. Stream channel erosion may occur as the volume and velocity of water flow increases enough to cause movement of the streambed and bank soils. Major storms such as hurricanes may cause significant erosion by combining high winds with heavy surf and storm surge to significantly impact the shoreline.

An area's potential for erosion is determined by four factors: soil characteristics, vegetative cover, topography climate or rainfall, and topography. Soils composed of a large percentage of silt and fine sand are most susceptible to erosion. As the content of these soils increases in the level of

clay and organic material, the potential for erosion decreases. Well-drained and well-graded gravels and gravel-sand mixtures are the least likely to erode. Coarse gravel soils are highly permeable and have a good capacity for absorption, which can prevent or delay the amount of surface runoff. Vegetative cover can be very helpful in controlling erosion by shielding the soil surface from falling rain, absorbing water from the soil, and slowing the velocity of runoff. Runoff is also affected by the topography of the area including size, shape and slope. The greater the slope length and gradient, the more potential an area has for erosion. Climate can affect the amount of runoff, especially the frequency, intensity and duration of rainfall and storms. When rainstorms are frequent, intense, or of long duration, erosion risks are high. Seasonal changes in temperature and rainfall amounts define the period of highest erosion risk of the year.

During the past 20 years, the importance of erosion control has gained the increased attention of the public. Implementation of erosion control measures consistent with sound agricultural and construction operations is needed to minimize the adverse effects associated with increasing settling out of the soil particles due to water or wind. The increase in government regulatory programs and public concern has resulted in a wide range of erosion control products, techniques, and analytical methodologies in the United States. The preferred method of erosion control in recent years has been the restoration of vegetation.

Dam/Levee 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 have resulted in an increased emphasis on safety, operation and maintenance.

There are about 80,000 dams in the United States today, the majority of which are privately owned. Other owners include state and local authorities, public utilities, and federal agencies. The benefits of dams are numerous: they provide water for drinking, navigation, and agricultural irrigation. Dams also provide hydroelectric power, create lakes for fishing and recreation, and save lives by preventing or reducing floods.

Though dams have many benefits, they also can pose a risk to communities if not designed, operated, and maintained properly. In the event of a dam failure, the energy of the water stored behind even a small dam is capable of causing loss of life and great property damage if development exists downstream of the dam. If a levee breaks, scores of properties are quickly submerged in floodwaters and residents may become trapped by this rapidly rising water. The failure of dams and levees has the potential to place large numbers of people and great amounts of property in harm's way.

Photo 4.10 Large Dam



Dam failure can result from natural events, human-induced events, or a combination of the two. Failures due to natural events such as hurricanes, earthquakes or landslides are significant because there is generally little or no advance warning. The most common cause of dam failure is prolonged rainfall that produces flooding. (Photo: Michael Baker Corporation)

Earthquakes, Sinkholes and Landslides

Earthquake

An earthquake is the motion or trembling of the ground produced by sudden displacement of rock in the Earth's crust. Earthquakes result from crustal strain, volcanism, landslides, or the collapse of 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.

Most property damage and earthquake-related deaths 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, which are directly related to the earthquake size, distance from the fault, site and regional geology. Other damaging earthquake effects include landslides, the down-slope movement of soil and rock (mountain regions and along hillsides), and liquefaction, in which ground soil loses the ability to resist shear and flows much like quick sand. In the case of liquefaction, anything relying on the substrata for support can shift, tilt, rupture, or collapse.

Most earthquakes are caused by the release of stresses accumulated as a result of the rupture of rocks along opposing fault planes in the Earth's outer crust. These fault planes are typically found along borders of the Earth's ten tectonic plates. These plate borders generally follow the outlines of the continents, with the North American plate following the continental border with the Pacific Ocean in the west, but following the mid-Atlantic trench in the east. As earthquakes occurring in the mid-Atlantic trench usually pose little danger to humans, the greatest earthquake threat in North America is along the Pacific Coast.

The areas of greatest tectonic instability occur at the perimeters of the slowly moving plates, as these locations are subjected to the greatest strains from plates traveling in opposite directions and at different speeds. Deformation along plate boundaries causes strain in the rock and the consequent buildup of stored energy. When the built-up stress exceeds the rocks' strength, a rupture occurs. The rock on both sides of the fracture is snapped, releasing the stored energy and producing seismic waves, generating an earthquake.

Earthquakes are measured in terms of their magnitude and intensity. Magnitude is measured using the Richter Scale, an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude (see **Table 4.6**). Each unit increase in magnitude on the Richter Scale corresponds to a ten-fold increase in wave amplitude, or a 32-fold increase in energy. Intensity is most commonly measured using the Modified Mercalli Intensity (MMI) Scale based on direct and indirect measurements of seismic effects. The scale levels are typically described using roman numerals, with an I corresponding to imperceptible (instrumental) events, IV corresponding to moderate (felt by people awake), to XII for catastrophic

Photo 4.11 Earthquake Damage



Many roads, including bridges and elevated highways, were damaged by the 6.7 magnitude earthquake that impacted the Northridge, California area January 17, 1994. Approximately 114,000 structures were damaged and 72 deaths were attributed to the event. Damage costs were estimated at \$25 billion. (FEMA News Photo)

(total destruction). A detailed description of the Modified Mercalli Intensity Scale of earthquake intensity and its correspondence to the Richter Scale is given in **Table 4.7**.

Table 4.6
Richter Scale

Richter Magnitudes	Earthquake Effects
Less than 3.5	Generally not felt, but recorded.
3.5-5.4	Often felt, but rarely causes damage.
Under 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1-6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0-7.9	Major earthquake. Can cause serious damage over larger areas.
8 or greater	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

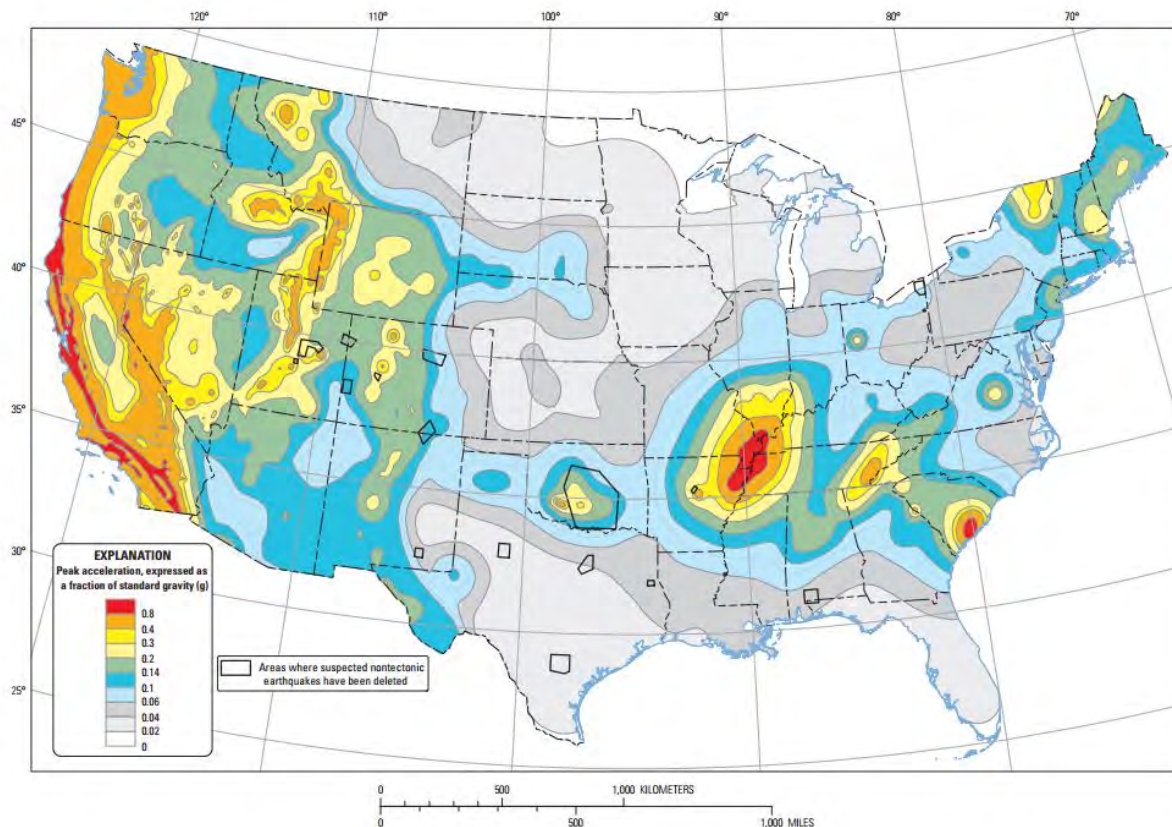
Table 4.7
Modified Mercalli Intensity Scale for Earthquakes

Scale	Intensity	Description of Effects	Corresponding Richter Scale Magnitude
I	Instrumental	Detected only on seismographs	
II	Feeble	Some people feel it	<4.2
III	Slight	Felt by people resting; like a truck rumbling by	
IV	Moderate	Felt by people walking	
V	Slightly Strong	Sleepers awake; church bells ring	<4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves	<5.4
VII	Very Strong	Mild Alarm; walls crack; plaster falls	<6.1
VIII	Destructive	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open	<6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides widespread	<7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards	<8.1
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves	>8.1

Source: North Carolina Division of Emergency Management

Figure 4.8 shows the probability that ground motion will reach a certain level during an earthquake in the Eastern US. The data show peak horizontal ground acceleration (the fastest measured change in speed, for a particle at ground level that is moving horizontally due to an earthquake) with a 2 percent probability of exceedance in 50 years. The map was compiled by the U.S. Geological Survey (USGS) Geologic Hazards Team, which conducts global investigations of earthquake, geomagnetic, and landslide hazards.

Figure 4.8
2% probability of exceedance in 50 years map of peak ground acceleration



Source: United States Geological Survey, 2014

Sinkholes

Sinkholes are a natural and common geologic feature in areas with underlying limestone and other rock types that are soluble in natural water. Most limestone is porous, allowing the acidic water of rain to percolate through their strata, dissolving some limestone and carrying it away in solution. Over time, this persistent erosional process can create extensive underground voids and drainage systems in much of the carbonate rocks. Collapse of overlying sediments into the underground cavities produces sinkholes.

The three general types of sinkholes are: subsidence, solution, and collapse. Collapse sinkholes are most common in areas where the overburden (the sediments and water contained in the unsaturated zone, surficial aquifer system, and the confining layer above an aquifer) is thick, but the confining layer is breached or absent. Collapse sinkholes can form with little warning and leave behind a deep, steep sided hole. Subsidence sinkholes form gradually where the overburden is thin and only a veneer of sediments is overlying the limestone. Solution sinkholes form where no overburden is present and the limestone is exposed at land surface.

Sinkholes occur in many shapes, from steep-walled holes to bowl or cone shaped depressions. Sinkholes are dramatic because the land generally stays intact for a while until the underground spaces get too big. If there is not enough support for the land above the spaces, then a sudden collapse of the land surface can occur. Under natural conditions, sinkholes form slowly and

expand gradually. However, human activities such as dredging, constructing reservoirs, diverting surface water, and pumping groundwater can accelerate the rate of sinkhole expansions, resulting in the abrupt formation of collapse sinkholes.

Although a sinkhole can form without warning, specific signs can signal potential development:

- Slumping or falling fence posts, trees, or foundations
- Sudden formation of small ponds
- Wilting vegetation
- Discolored well water
- Structural cracks in walls, floors.

Sinkhole formation is aggravated and accelerated by urbanization. Development increases water usage, alters drainage pathways, overloads the ground surface, and redistributes soil. According to the United States Geological Survey (USGS), sinkhole damages over the last 15 years cost on average at least \$300 million per year. However, there is no national tracking of sinkhole occurrence or damages, the actual damage is likely higher.

Landslides

A landslide is the downward and outward movement of slope-forming soil, rock, and vegetation, which is driven by gravity. Landslides may be triggered by both natural and human-caused changes in the environment, including heavy rain, rapid snow melt, steepening of slopes due to construction or erosion, earthquakes, volcanic eruptions, and changes in groundwater levels.

There are several types of landslides: rock falls, rock topple, slides, and flows. Rock falls are rapid movements of bedrock, which result in bouncing or rolling. A topple is a section or block of rock that rotates or tilts before falling to the slope below. Slides are movements of soil or rock along a distinct surface of rupture, which separates the slide material from the more stable underlying material.

Mudflows, sometimes referred to as mudslides, mudflows, lahars or debris avalanches, are fast-moving rivers of rock, earth, and other debris saturated with water. They develop when water rapidly accumulates in the ground, such as heavy rainfall or rapid snowmelt, changing the soil into a flowing river of mud or "slurry." Slurry can flow rapidly down slopes or through channels, and can strike with little or no warning at avalanche speeds. Slurry can travel several miles from its source, growing in size as it picks up trees, cars, and other materials along the way. As the flows reach flatter ground, the mudflow spreads over a broad area where it can accumulate in thick deposits.

Landslides are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of flooding that often accompanies these events. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly.

Photo 4.12 Sinkhole Collapse



Collapses, such as the sudden formation of sinkholes, may destroy buildings, roads, and utilities. (Photo: Bettmann)

Among the most destructive types of debris flows are those that accompany volcanic eruptions. A spectacular example in the United States was a massive debris flow resulting from the 1980 eruptions of Mount St. Helens, Washington. Areas near the bases of many volcanoes in the Cascade Mountain Range of California, Oregon and Washington are at risk from the same types of flows during future volcanic eruptions.

Areas that are generally prone to landslide hazards include previous landslide areas; the bases of steep slopes; the bases of drainage channels; and developed hillsides where leach-field septic systems are used.

Areas that are typically considered safe from landslides include areas that have not moved in the past; relatively flat-lying areas away from sudden changes in slope; and areas at the top or along ridges, set back from the tops of slopes.

In the United States, it is estimated that landslides cause up to \$2 billion in damages and from 25 to 50 deaths annually. Globally, landslides cause billions of dollars in damage and thousands of deaths and injuries each year.

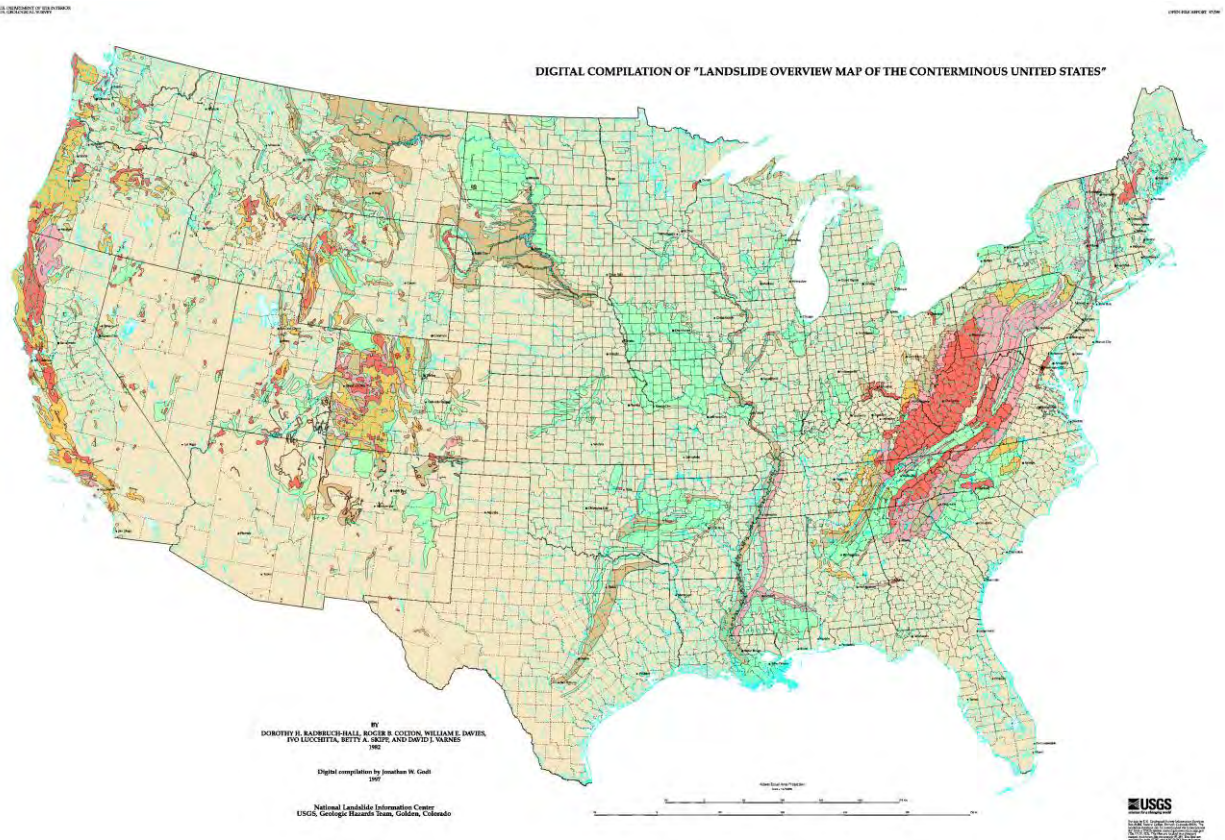
Photo 4.13 Landslide Destruction



Landslides can damage or destroy roads, railroads, pipelines, electrical and telephone lines, mines, oil wells, buildings, canals, sewers, bridges, dams, seaports, airports, forests, parks, and farms. (Photo by Lynn Forman)

Figure 4.9 delineates areas where large numbers of landslides have occurred and areas, which are susceptible to landsliding in the conterminous United States. This map layer is provided in the U.S. Geological Survey Professional Paper 1183, Landslide Overview Map of the Conterminous United States, available online at: <https://landslides.usgs.gov/hazards/nationalmap/>.

Figure 4.9 - Landslide Overview Map of the Conterminous United States



EXPLANATION

LANDSLIDE INCIDENCE

- Low (less than 1.5% of area involved)
- Moderate (1.5%-15% of area involved)
- High (greater than 15% of area involved)

LANDSLIDE SUSCEPTIBILITY/INCIDENCE

- Moderate susceptibility/low incidence
- High susceptibility/low incidence
- High susceptibility/moderate incidence

Susceptibility not indicated where same or lower than incidence. Susceptibility to landsliding was defined as the probable degree of response of [the areal] rocks and soils to natural or artificial cutting or loading of slopes, or to anomalously high precipitation. High, moderate, and low susceptibility are delimited by the same percentages used in classifying the incidence of landsliding. Some generalization was necessary at this scale, and several small areas of high incidence and susceptibility were slightly exaggerated.

Source: United States Geological Survey

Human-Caused Hazards

Hazardous Materials (HazMat)

Hazardous materials (HazMat) incidents can apply to fixed facilities as well as mobile, transportation-related accidents in the air, by rail, on the Nation's highways and on the water. In 2016 alone, there were 24,194 HazMat incidents, 2,892 of which are highway incidents, 2,850 are railroad incidents and 4,216 are from water-borne vessels. (National Response Center, 2017).

In essence, HazMat incidents consist of solid, liquid and/or gaseous contaminants that are released from fixed or mobile containers, whether by accident or by design as with an intentional terrorist attack. A HazMat incident can last hours to days, while some chemicals can be corrosive or otherwise damaging over longer periods of time. In addition to the primary release, explosions and/or fires can result from a release, and contaminants can be extended beyond the initial area by persons, vehicles, water, wind and possibly wildlife as well.

HazMat incidents can also occur as a result of or in tandem with natural hazard events, such as floods, hurricanes, tornadoes and earthquakes, which in addition to causing incidents can also hinder response efforts. In the case of Hurricane Floyd in September 1999, communities along the Eastern United States were faced with flooded junkyards, disturbed cemeteries, deceased livestock, floating propane tanks, uncontrolled fertilizer spills and a variety of other environmental pollutants that caused widespread toxicological concern.

Energy Pipeline Failures

The energy infrastructure of the United States is comprised of many components, including the physical network of pipes for oil and natural gas, electricity transmission lines, and other means for transporting energy to the Nation's consumers. This infrastructure also includes facilities that convert raw natural resources into energy products, as well as the rail network, trucking lines and marine transportation (U.S. Department of Energy, 2003). Much of this infrastructure is aging, and in addition to the challenges of keeping the infrastructure up-to-date with the latest technological advances and consumer needs, the potential for an energy pipeline failure to become a hazard in-and-of-itself must be considered.

Photo 4.14 Hazardous Material(s) Spill



Propane tanks, gasoline, oil and other hazardous materials and debris in Princeville, North Carolina were cleaned up by Environmental Protection Agency crews following Hurricane Floyd in September 1999. The town remained off limits to residents for some time due to health-related concerns. (Photo by Dave Saville/FEMA News Photo)

Photo 4.15 Natural Gas Pipelines



Virtually all natural gas in the United States is moved via pipeline. (Photo courtesy of the Department of Energy)

The two million miles of oil pipelines in the United States are the principal mode for transporting oil and petroleum products such as gasoline, and virtually all natural gas in the United States is moved via pipeline as well (DOE, 2003). Much of this oil pipeline infrastructure is old, requiring regular safety and environmental reviews to ensure its safety and reliability. The potential risk of pipeline accidents is a significant national concern.

The energy infrastructure is vulnerable to physical and cyber disruption, either of which could threaten its integrity and safety (DOE, 2003). Disruptions could originate with natural events such as geomagnetic storms and earthquakes, or could result from accidents, equipment failures or deliberate interference. In addition, the Nation's transportation and power infrastructures have grown increasingly complex and interdependent—consequently, any disruption could have far-reaching consequences.

Terrorism

The Federal Emergency Management Agency, in its guidance on integrating human-caused hazards into state and local hazard mitigation plans (FEMA Publication 386-7), has established a set of categories that can be applied to the profiling of intentional acts of terrorism. These categories are: contamination; energy release (i.e., explosives, arson, etc.); and disruption of a service.

Data Sources

American Society of Civil Engineers (ASCE), "Facts About Windstorms."

Web site: www.windhazards.org/facts.cfm

Bureau of Reclamation, U.S. Department of the Interior

Web site: www.usbr.gov

Federal Emergency Management Agency (FEMA)

Web site: www.fema.gov

National Climatic Data Center (NCDC), U.S. Department of Commerce, National Oceanic and Atmospheric Administration

Web site: <http://wf.ncdc.noaa.gov/oa/ncdc.html>

National Drought Mitigation Center, University of Nebraska-Lincoln

Web site: www.drought.unl.edu/index.htm

National Severe Storms Laboratory (NSSL), U.S. Department of Commerce, National Oceanic and Atmospheric Administration

Web site: www.nssl.noaa.gov

National Weather Service (NWS), U.S. Department of Commerce, National Oceanic and Atmospheric Administration

Web site: www.nws.noaa.gov

Storm Prediction Center (SPC), U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service

Web site: www.spc.noaa.gov

The Tornado Project, St. Johnsbury, Vermont

Web site: www.tornadoproject.com

United States Geological Survey (USGS), U.S. Department of the Interior

Web site: www.usgs.gov

Introduction – Risk Analysis



The **Hazard Analysis** Section provides information on historical hazard occurrences in Calvert County for the hazards listed below. This listing differs slightly in terminology, order and grouping from the **Hazard Identification** section as those hazards affecting Calvert County are more fully explored.

Natural

- Flood
 - Storm Surge/Tide
 - Coastal Flooding
- Severe Winds
 - Hurricanes
 - Coastal Storms
- Thunderstorms
- Tornadoes
- Wildfire
- Drought/Extreme Heat
- Hail
- Winter Storms
- Coastal Erosion
- Dam/Levee Failure
- Earthquakes

Human-Caused

- Hazardous Materials (HazMat)
- Energy Pipeline Failures
- Terrorism

Historical records, such as those available from the National Oceanic and Atmospheric Administration's National Climatic Data Center (NCDC), are used to identify the level of risk. The methodological assumption is that the data sources cited are the best data available, however not always complete. To the extent possible, other sources have been used to supplement NCDC records.

Natural Hazards

Flood

According to the National Climatic Data Center, 39 flood events were reported in Calvert County between January 1, 1996 and December 31, 2016. These 39 events included flash flooding, flood, coastal flood, and storm surge/tide events and resulted in zero (0) deaths, zero (0) injuries and a total of approximately \$1.5 million in property damage (NCDC, 2017). Descriptions of major flooding events that have impacted people, property and the environment are below

Significant flood events that have impacted people, property and the environment:

Along Chesapeake Bay, September 6, 1996

Tropical Storm Fran tracked West of Maryland, bringing a storm surge of up to 6ft in the Chesapeake Bay, affecting coastal communities in Calvert County. \$750,000 in damages were reported in Calvert County. (NCDC, 2017)

Coastal Zone, October 8, 1996

The same nor'easter which spawned wind gusts in excess of 60 mph also produced waves of 6 feet or greater in the Chesapeake Bay. Fortunately, the wind direction was from the north/northeast, limiting the pounding along the shore. Nevertheless, overwash created by the high waves caused minor damage to piers and bulkheads in Calvert and St Mary's Counties. \$10,000 in damages were reported in Calvert County. (NCDC, 2017)

Coastal Zone, January 28, 1998

A fairly intense and slow-moving nor'easter produced a large area of moderate to heavy rains across central and lower southern Maryland beginning late on the 27th and continuing through late afternoon on the 28th. The heaviest rain fell while the storm was tracking along the South and North Carolina coastline. Storm totals ranged from 1 1/2 to 2 1/2 inches over the area, except between 3 and 4 inches across lower southern Maryland. (NCDC, 2017)

Countywide, February 4-5, 1998

A powerful nor'easter, carrying copious moisture from the Gulf of Mexico and Caribbean region, dumped between 2 and 4 inches of rain across much of Maryland between the foothills and the Chesapeake Bay. Highest totals, ranging from 3 to 5 inches, fell in lower southern Maryland, causing widespread flooding of low lying areas and small streams and creeks. The nor'easter, coming on the heels of one just a week earlier, caused tides of 3 to 4 feet above normal from the Calvert Co/Anne Arundel Co line south to Point Lookout in extreme southeastern St Mary's Co; and along the lower tidal Potomac River along the Charles and St Mary's shoreline, including Cobb Island and St George Island. \$230,000 in damages were reported in Calvert County. (NCDC, 2017)

Countywide, September 16, 1999

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 by evening on the 16th. Rainbands on the outer edge of the hurricane began to affect Maryland east of Washington County shortly after 8:00 AM EDT on the 15th and continued to cross the area through afternoon on the 16th. A total of 2 to 5 inches of rain fell in Frederick, Carroll, Montgomery, and Howard Counties. A total of 5 to 8 inches fell across Baltimore, Prince George's, and Charles Counties. Between 8 and 12 inches fell across St. Mary's, Anne Arundel,

and Harford Counties. The amount of damage Anne Arundel, Calvert, Charles, Harford, and St. Mary's Counties received from the storm qualified them for FEMA disaster assistance. \$500,000 in damages were reported in Calvert County. (NCDRC, 2017)

North Beach, July 1, 2016

A cold front passed through the area on July 1st. A southerly flow ahead of the boundary caused warm and humid air in place, which led to an unstable atmosphere. The instability combined with lift from the cold front caused thunderstorms to develop. Some thunderstorms were severe due to stronger shear profiles from an upper-level trough overhead along with the unstable atmosphere. Thunderstorms produced heavy rainfall.

There was a vehicle stuck in high water near Chesapeake Ave and Fourth Street. There were also reports of high water on Route 261. This area is a flood prone area. \$5,000 in damages were reported in Calvert County. (NCDRC, 2017)

Hurricanes and Tropical Storms

Severe wind events resulting from hurricanes, tropical storms and nor'easters can cause widespread damage and loss of life, as evidenced by the numerous coastal events that have impacted the State of Maryland. Although there has not been a direct strike from a major hurricane in more than two decades (a fact often attributed to the geographic position of North Carolina), Maryland has experienced the effects of as many as 56 tropical events from 1980 to 2015, including hurricanes, tropical depressions and tropical storms. Details of the most recent events are presented below. There has not yet been a direct landfall event in Calvert County, however the Chesapeake Bay plays a significant role in how the county is affected by tropical events.

Tropical Storm Andrea (2013)



The remnants of Tropical Storm Andrea moving up the Eastern Seaboard, from the Southeast States to the Mid-Atlantic and Northeast Coasts, led to waves of heavy rain and thunderstorms from the early morning hours through late evening on June 7th. The initial burst of heavy precipitation arrived during the early morning on the 7th as moisture surged into the Mid-Atlantic Region ahead of Tropical Storm Andrea, with the center of its low pressure located near the coast of Georgia. Throughout the course of the day, the cyclone became post-tropical as it accelerated northeast along the East Coast of the United States, delivering another round of heavy rain with some strong thunderstorms to the Mid-Atlantic States during late afternoon and evening of the 7th.

Hurricane Sandy (2012)



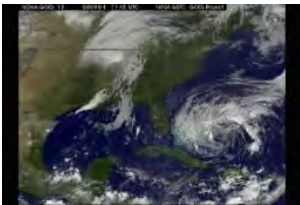
Post-Tropical Storm Sandy caused an estimated \$5 million dollars in damage on the Eastern Shore of Maryland. Most of the damages were due to flooding caused by excessive rainfall, as up to 13 inches of rain were reported, and due to the high winds, which caused trees and wires to come down across the state. Delmarva Power, which serves portions of the eastern shore counties, reported over 30,000 households without power during the peak of the storm. The majority of residents had power returned by the morning of the 30th. Hundreds of roads were closed due to numerous downed trees and flooding. No direct deaths were reported on the Eastern Shore of Maryland due to the storm.

Hurricane Irene (2011)



Hurricane Irene caused an estimated \$4 million in damages across Maryland. Tropical storm force wind gusts overspread the Eastern Shore with peak wind gusts averaged 50 to 60 mph. Event precipitation totals averaged 6 to 12 inches and caused widespread field and roadway flooding. On August 25, Maryland Governor Martin O'Malley declared a state of emergency in preparation for Irene. The Chesapeake Bay Bridge was closed to vehicular traffic. In Calvert County, sections of Maryland State Routes 273, 213 and 272 were closed. About seventy-percent of all Delmarva Power customers lost power.

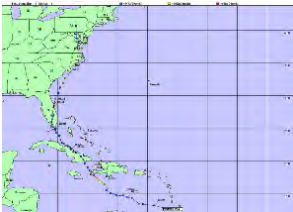
Tropical Storm Hanna (2008)



Tropical Storm Hanna brought heavy rain, strong winds and tidal flooding to the Eastern Shore during the day and into the evening of the 6th. Rain moved into the region during the morning, fell heavy at times from the late morning into the afternoon and ended during the evening. Storm totals ranged from around 1 to about 4 inches with the highest amounts in Calvert County. The strongest winds occurred during the morning and afternoon with peak gusts as high as 56 mph. Siding was ripped from a restaurant in Tilghman (Talbot County). About 10,000 homes and businesses lost power on the Delmarva Peninsula. All power was restored by the 7th. Tidal flooding occurred during the early evening as the surge averaged two to three feet and affected Talbot and Caroline Counties. Many planned activities were cancelled. The Maryland Department of Natural Resources suspended camping at all Eastern Shore State Parks and Chesapeake College was closed.

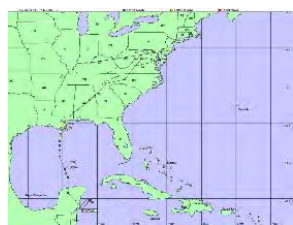
A limited state of emergency was declared because of Hanna. The eastbound lanes of the William Preston Lane Junior Memorial Bridge (Queen Anne's County) were closed the morning of the 6th and reopened during the afternoon, but driving restrictions remained in place in both directions into the evening. The persistent strong winds knocked down several trees and limbs. This caused scattered power outages and a few road closures. The heavy rain caused a few road closures in Calvert County, although the majority of the closures were caused by tidal flooding farther south.

Tropical Storm Ernesto (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. Delmarva Power reported about 21,350 of its customers lost power on the 1st and 2nd of September. Businesses in Chestertown closed early because of the power outages on the first. The strong winds caused some minor damage to businesses on Chesapeake Bay in Talbot County. The county received about 50 calls about downed trees. Kent County responded to about 10 calls of downed trees.

Tropical Storm Cindy (2005)



Heavy rain associated with the remnants of Tropical Storm Cindy fell across Calvert County during the first half of the day on July 8th. The rain itself started during the evening of the 7th and ended during the afternoon of the 8th. Storm totals averaged two to three inches. The heavy rain caused some field and roadway flooding, but did not fall in a concentrated burst. Thus, no serious stream or river flooding was reported. Specific storm totals included 2.79 inches at the Conowingo Dam and 1.63 inches

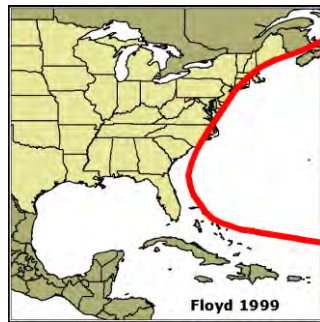
in Fair Hills. Lesser amounts fell farther south all the Eastern Shore through Talbot County. The remnants of Tropical Storm Cindy moved from near Atlanta, Georgia at 8 a.m. EDT on the 7th northeast to near Washington, D.C. at 8 a.m. EDT on the 8th, lower Delaware at 2 p.m. EDT on the 8th and about 100 miles east of Atlantic City at 8 p.m. EDT on the 8th.

Hurricane Isabel (2003)



Tropical Storm Isabel caused a record-breaking tide and storm surge up the Chesapeake Bay, heavy rain and strong power outage producing winds. Isabel made landfall as a hurricane near Drum Inlet, North Carolina around 1:00 p.m. EDT on the 18th and weakened as it tracked farther inland. At one time in its life cycle, it was a powerful Category 5 hurricane when it was north of the Leewood Islands. Isabel's track took it west of the bay and was able to funnel water into the bay. The National Hurricane Center states that a 2 to 4-foot storm surge in Maryland was generated by Hurricane Isabel. This caused flooding along coastal areas into Calvert County. About 65,750 homes and businesses lost power with half of the outages in Calvert County.

Hurricane Floyd (1999)



Hurricane Floyd battered the Maryland Eastern Shore on September 16th 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 highest verifiable storm total was 14.00 inches in Chestertown (Kent County). Based on Doppler Radar storm totals estimate similar amounts also fell across northern Queen Anne's County. Flooding along tidal sections of inland creeks and rivers were exacerbated during times of high tide. The torrential downpours associated with Hurricane Floyd exceeded the 100-year-flood return period for most of the Eastern Shore.

Hundreds of roads and bridges were closed. At one point, there were 225 roads closed throughout the state. About 450 people were evacuated from low lying areas, 300 in Calvert County. Five people were seriously injured. Dozens more were rescued from trapped vehicles. A 32-year-old man died on September 19th near Centreville (Queen Anne's County) when he was ejected from his motorcycle while attempting to jump over a washed-out bridge. While the highest wind gusts in most areas were less than 60 mph, the combination of the heavy rain that loosened the ground and the persistence of the strong winds uprooted hundreds of trees across the Eastern Shore. About 17,000 homes and businesses lost power. Power was restored by the 19th. A state of emergency was declared on the 16th and all schools were closed. The preliminary damage estimate was 15.25 million dollars. President Clinton declared all of the Maryland Eastern shore a disaster area.

Thunderstorms

According to the National Climatic Data Center, Calvert County experienced 130 thunderstorm events including high wind, lightning, strong wind, and thunderstorm wind for the period January 2006 through December 2016. These events resulted in Zero (0) deaths, four (4) injuries and a total of approximately \$1.65 million in property damage (NCDC, 2017). **Table 4.8** provides a breakdown of this thunderstorm activity.

Table 4.8
Summary of Thunderstorm Activity in Calvert County (2006-2016)

LOCATION	DATE	TIME	TYPE	MAGNITUDE	DEATHS	INJURIES	DAMAGE
St Leonard	7/16/2007	1532	Thunderstorm Wind	50	0	0	\$1,000
Lusby	7/19/2007	1450	Thunderstorm Wind	52	0	0	\$10,000
Dares Beach	3/8/2008	1645	Thunderstorm Wind	50	0	0	\$10,000
Calvert (Zone)	5/11/2008	2200	High Wind	50	0	2	\$100,000
North Beach	5/31/2008	1355	Thunderstorm Wind	78	0	0	\$0
Huntingtown	5/31/2008	1405	Thunderstorm Wind	50	0	0	\$2,000
Solomons	5/31/2008	1520	Thunderstorm Wind	50	0	0	\$15,000
Appeal	5/31/2008	1520	Thunderstorm Wind	50	0	0	\$15,000
Owings	6/4/2008	1433	Thunderstorm Wind	52	0	0	\$10,000
Port Republic	6/4/2008	2041	Thunderstorm Wind	50	0	0	\$10,000
Dunkirk	6/7/2008	2123	Thunderstorm Wind	50	0	0	\$1,000
Chaneyville	6/7/2008	2123	Thunderstorm Wind	50	0	0	\$1,000
Dunkirk	6/7/2008	2123	Thunderstorm Wind	50	0	0	\$1,000
Dunkirk	6/7/2008	2125	Thunderstorm Wind	50	0	0	\$15,000
Sunderland	6/7/2008	2128	Thunderstorm Wind	50	0	0	\$1,000
Mt Harmony	6/7/2008	2128	Thunderstorm Wind	50	0	0	\$5,000
Dunkirk	6/7/2008	2129	Thunderstorm Wind	50	0	0	\$1,000
Wilson	6/7/2008	2145	Thunderstorm Wind	50	0	0	\$1,000
Lusby	6/14/2008	1740	Thunderstorm Wind	50	0	0	\$5,000
North Beach	6/16/2008	1550	Thunderstorm Wind	50	0	0	\$5,000
Buena Vista	7/4/2008	1749	Thunderstorm Wind	50	0	0	\$50,000
St Leonard	7/4/2008	1808	Thunderstorm Wind	50	0	0	\$10,000
Lusby	7/4/2008	1812	Thunderstorm Wind	50	0	0	\$10,000
Port Republic	7/4/2008	1825	Lightning		0	0	\$20,000
Mutual	8/2/2008	2045	Thunderstorm Wind	50	0	0	\$0
St Leonard	8/2/2008	2047	Thunderstorm Wind	50	0	0	\$0
Mt Harmony	9/30/2008	2046	Thunderstorm Wind	50	0	0	\$0
Stoakley	4/21/2009	1808	Thunderstorm Wind	50	0	0	\$0
Island Creek	8/21/2009	1400	Thunderstorm Wind	56	0	0	\$0
Calvert (Zone)	2/26/2010	700	Strong Wind	40	0	0	\$500
Parran	6/3/2010	1712	Thunderstorm Wind	52	0	0	\$500
Appeal	6/3/2010	1728	Thunderstorm Wind	52	0	0	\$500
Dunkirk	7/13/2010	1957	Thunderstorm Wind	52	0	0	\$2,000
Dunkirk	7/13/2010	1958	Thunderstorm Wind	52	0	0	\$2,000
Chaney	7/13/2010	2000	Thunderstorm Wind	52	0	0	\$2,000
Paris	7/13/2010	2010	Thunderstorm Wind	52	0	0	\$2,000
Chaney	8/5/2010	1519	Thunderstorm Wind	52	0	0	\$5,000
Dunkirk	8/5/2010	1519	Thunderstorm Wind	56	0	0	\$10,000
Dunkirk	8/5/2010	1520	Thunderstorm Wind	61	0	0	\$5,000

LOCATION	DATE	TIME	TYPE	MAGNITUDE	DEATHS	INJURIES	DAMAGE
Calvert (Zone)	2/19/2011	600	High Wind	52	0	0	\$1,000
Calvert (Zone)	2/25/2011	1600	High Wind	50	0	0	\$0
Dunkirk	4/5/2011	401	Thunderstorm Wind	61	0	0	\$1,000
Dunkirk	4/5/2011	401	Thunderstorm Wind	61	0	0	\$2,000
Sunderland	4/5/2011	403	Thunderstorm Wind	56	0	0	\$1,000
Cox	4/5/2011	405	Thunderstorm Wind	56	0	0	\$1,000
Owings	4/5/2011	407	Thunderstorm Wind	61	0	0	\$10,000
Sollers	4/5/2011	420	Thunderstorm Wind	52	0	0	\$1,000
Huntingtown	4/16/2011	1753	Thunderstorm Wind	50	0	0	\$2,000
Appeal	6/12/2011	1430	Thunderstorm Wind	50	0	0	\$1,000
Drum Pt	6/16/2011	2158	Thunderstorm Wind	52	0	0	\$5,000
Drum Pt	6/16/2011	2159	Thunderstorm Wind	52	0	0	\$5,000
Cove Pt	6/16/2011	2200	Thunderstorm Wind	52	0	0	\$5,000
Dunkirk	6/17/2011	1803	Thunderstorm Wind	61	0	0	\$10,000
Chaney	6/17/2011	1805	Thunderstorm Wind	56	0	0	\$2,000
Dunkirk	6/17/2011	1806	Thunderstorm Wind	52	0	0	\$10,000
Dunkirk	6/17/2011	1806	Thunderstorm Wind	52	0	0	\$2,000
Chaneyville	6/17/2011	1806	Thunderstorm Wind	61	0	0	\$2,000
Owings	6/17/2011	1807	Thunderstorm Wind	61	0	0	\$10,000
Chesapeake Beach	6/17/2011	1812	Thunderstorm Wind	56	0	0	\$5,000
North Beach	6/17/2011	1815	Thunderstorm Wind	56	0	0	\$1,000
North Beach	6/17/2011	1815	Thunderstorm Wind	61	0	0	\$5,000
Mutual	7/11/2011	2052	Thunderstorm Wind	52	0	0	\$1,000
St Leonard	7/11/2011	2054	Thunderstorm Wind	52	0	0	\$1,000
Wallville	7/19/2011	1904	Thunderstorm Wind	56	0	0	\$20,000
Wallville	7/19/2011	1904	Thunderstorm Wind	52	0	0	\$1,000
North Beach	8/1/2011	1840	Thunderstorm Wind	61	0	0	\$1,000
Chesapeake Beach	8/1/2011	1842	Thunderstorm Wind	61	0	2	\$100,000
North Beach	8/1/2011	1843	Thunderstorm Wind	56	0	0	\$2,000
North Beach	8/1/2011	1845	Thunderstorm Wind	63	0	0	\$0
Huntingtown	8/21/2011	1555	Thunderstorm Wind	52	0	0	\$0
Breezy Pt	8/21/2011	1607	Thunderstorm Wind	52	0	0	\$0
Breezy Pt	8/21/2011	1607	Thunderstorm Wind	50	0	0	\$0
Mt Harmony	6/29/2012	2213	Thunderstorm Wind	61	0	0	\$1,000
North Beach	6/29/2012	2215	Thunderstorm Wind	51	0	0	\$0
Huntingtown	6/29/2012	2215	Thunderstorm Wind	57	0	0	\$1,000
Huntingtown	6/29/2012	2215	Thunderstorm Wind	52	0	0	\$0
North Beach	6/29/2012	2218	Thunderstorm Wind	61	0	0	\$0
Huntingtown	6/29/2012	2225	Thunderstorm Wind	52	0	0	\$0
Wilson	7/8/2012	1710	Thunderstorm Wind	52	0	0	\$1,000
Bowens	7/8/2012	1712	Thunderstorm Wind	52	0	0	\$0

LOCATION	DATE	TIME	TYPE	MAGNITUDE	DEATHS	INJURIES	DAMAGE
Chaneyville	7/28/2012	1738	Thunderstorm Wind	52	0	0	\$1,000
Paris	7/28/2012	1739	Thunderstorm Wind	52	0	0	\$1,000
Coster	9/18/2012	1551	Thunderstorm Wind	50	0	0	\$500
Calvert (Zone)	10/29/2012	1553	High Wind	56	0	0	\$812,880
Dunkirk	4/19/2013	1824	Thunderstorm Wind	56	0	0	\$0
Chaney	4/19/2013	1824	Thunderstorm Wind	56	0	0	\$0
Huntingtown	4/19/2013	1827	Thunderstorm Wind	56	0	0	\$0
Appeal	4/19/2013	1854	Thunderstorm Wind	56	0	0	\$10,000
Dunkirk	6/28/2013	1530	Thunderstorm Wind	52	0	0	\$0
Dowell	5/22/2014	1645	Thunderstorm Wind	52	0	0	\$0
Solomons	5/22/2014	1646	Thunderstorm Wind	52	0	0	\$0
Drum Pt	5/22/2014	1648	Thunderstorm Wind	52	0	0	\$1,000
Cox	5/27/2014	1858	Thunderstorm Wind	52	0	0	\$0
Chaney	6/18/2014	2356	Thunderstorm Wind	52	0	0	\$0
Chaney	6/18/2014	2357	Thunderstorm Wind	52	0	0	\$0
St Leonard	7/14/2014	1755	Thunderstorm Wind	52	0	0	\$3,000
Calvert (Zone)	2/14/2015	1114	High Wind	50	0	0	\$0
Chaney	6/18/2015	1633	Thunderstorm Wind	52	0	0	\$1,000
Chaney	6/18/2015	1634	Thunderstorm Wind	52	0	0	\$1,000
Chaney	6/18/2015	1636	Thunderstorm Wind	52	0	0	\$1,000
Chaney	6/18/2015	1637	Thunderstorm Wind	52	0	0	\$1,000
Chaney	6/18/2015	1638	Thunderstorm Wind	52	0	0	\$1,000
Owings	6/18/2015	1639	Thunderstorm Wind	52	0	0	\$1,000
Chaneyville	6/18/2015	1640	Thunderstorm Wind	52	0	0	\$1,000
Chaneyville	6/18/2015	1641	Thunderstorm Wind	52	0	0	\$1,000
Sunderland	6/18/2015	1642	Thunderstorm Wind	52	0	0	\$1,000
Huntingtown	6/18/2015	1645	Thunderstorm Wind	52	0	0	\$1,000
Sunderland	6/18/2015	1645	Thunderstorm Wind	52	0	0	\$1,000
Parran	6/18/2015	1650	Thunderstorm Wind	52	0	0	\$1,000
Parran	6/18/2015	1651	Thunderstorm Wind	52	0	0	\$1,000
Dares Beach	6/18/2015	1656	Thunderstorm Wind	52	0	0	\$3,000
Adelina	6/18/2015	1719	Thunderstorm Wind	52	0	0	\$1,000
Stoakley	6/20/2015	2032	Thunderstorm Wind	52	0	0	\$1,000
Dares Beach	6/20/2015	2033	Thunderstorm Wind	52	0	0	\$1,000
Stoakley	6/23/2015	1939	Thunderstorm Wind	52	0	0	\$1,000
Bertha	6/30/2015	1527	Thunderstorm Wind	52	0	0	\$1,000
Dunkirk	6/30/2015	2328	Thunderstorm Wind	52	0	0	\$3,000
Parran	2/24/2016	1610	Thunderstorm Wind	52	0	0	\$0
Willows	2/24/2016	1800	Thunderstorm Wind	61	0	0	\$0
Calvert (Zone)	4/3/2016	55	High Wind	50	0	0	\$0
Chaneyville	4/7/2016	1621	Thunderstorm Wind	43	0	0	\$1,000

LOCATION	DATE	TIME	TYPE	MAGNITUDE	DEATHS	INJURIES	DAMAGE
Chaney	4/7/2016	1626	Thunderstorm Wind	43	0	0	\$1,000
Barstow	7/18/2016	1610	Thunderstorm Wind	50	0	0	\$0
Huntingtown	7/19/2016	2332	Thunderstorm Wind	52	0	0	\$0
TOTAL:							\$1,394,880

Source: National Climatic Data Center

Tornadoes

In an assessment conducted by the National Weather Service Storm Prediction Center covering the 30-year period from 1980 to 2009, the State of Maryland ranked #33 in the Nation for number of tornadoes (213), #27 in number of fatalities (6), #29 in number of F2 or greater tornadoes (23), and #24 in number of F4 & F5 tornadoes (2).

Independent of the Storm Prediction Center state-ranking project, the National Climatic Data Center indicates that the geographic area of the State of Maryland experienced 95 tornado events from January 1, 2006 through December 31, 2016. NCDC data supports the statistics for the State of Maryland of (0) deaths and (7) injuries, and reflects a total of approximately \$11.111 million in property damage, with an additional \$43,500 in crop damage. As for Calvert County, there were four (4) tornado events between the dates of January 1, 2006 through December 31, 2016. The NCDC indicates that these events were responsible for \$407,000 in property damages, with an additional \$5,000 in crop damages. According to the NCDC, Calvert County experienced 16 tornadoes from January 1, 1950 through December 31, 2016.

Table 4.9 lists all 16 tornadoes that were reported to the National Climatic Data Center as having touched down in Calvert County. These events are responsible for two deaths, two injuries and \$11,352,500 in property damages in the county.

Table 4.9
Summary of Tornado Activity in the Calvert County (1950-2015)

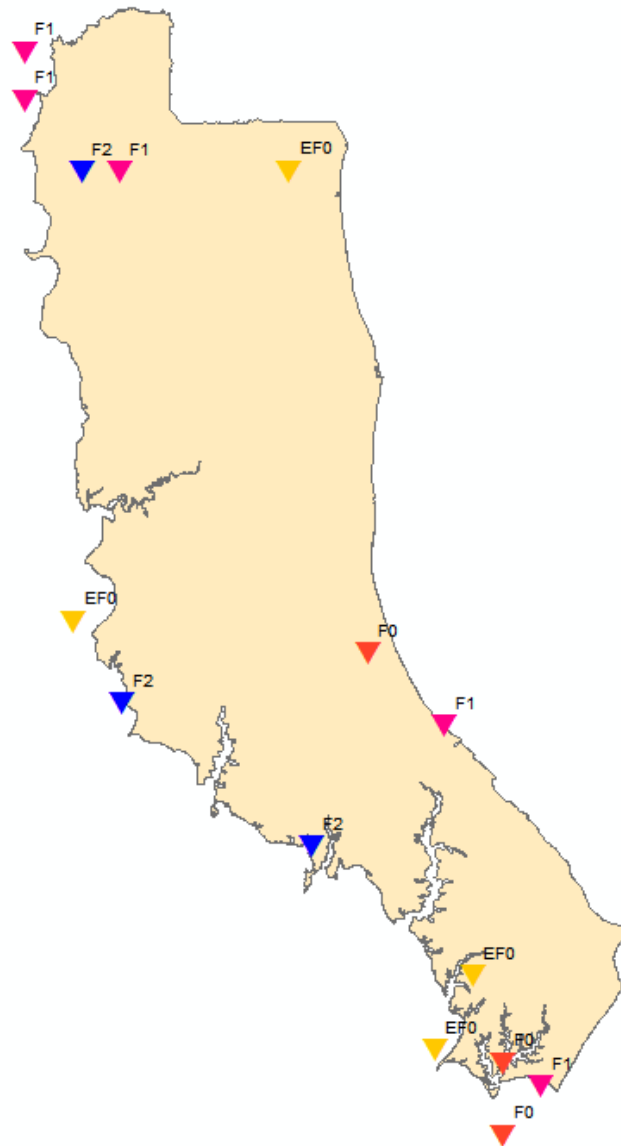
LOCATION	DATE	TIME	TYPE	SCALE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Calvert Co.	6/27/1978	1800	Tornado	F2	0	0	\$250,000	\$0
Calvert Co.	9/5/1979	1715	Tornado	F1	0	1	\$250,000	\$0
Calvert Co.	10/13/1983	1853	Tornado	F2	0	0	\$25,000	\$0
Calvert Co.	5/8/1984	1555	Tornado	F0	0	0	\$25,000	\$0
Calvert Co.	8/17/1994	1005	Tornado	F0	0	0	\$500	\$0
Dunkirk	7/13/1996	235	Tornado	F1	0	0	\$120,000	\$0
Dunkirk	4/21/2000	1440	Tornado	F1	0	0	\$210,000	\$0
Chaney	5/13/2000	1903	Tornado	F1	0	1	\$20,000	\$0
Solomons	5/22/2001	1855	Tornado	F0	0	0	\$0	\$0
Bowens	4/28/2002	1831	Tornado	F2	2	0	\$10,000,000	\$0
Long Beach	4/28/2002	1842	Tornado	F1	0	0	\$5,000	\$0
Solomons	9/28/2004	1500	Tornado	F0	0	0	\$40,000	\$0
Paris	6/4/2008	1440	Tornado	EF0	0	0	\$400,000	\$0
Appeal	4/28/2011	1041	Tornado	EF0	0	0	\$7,000	\$0

LOCATION	DATE	TIME	TYPE	SCALE	DEATHS	INJURIES	PROPERTY DAMAGE	CROP DAMAGE
Buena Vista	8/7/2012	1655	Tornado	EF0	0	0	\$0	\$0
Coster	2/21/2014	1233	Tornado	EF0	0	0	\$0	\$5,000
TOTAL:					2	2	\$11,352,500	\$5,000

Source: National Climatic Data Center

Figure 4.10 illustrates graphically historical tornado occurrences within Calvert County.

Figure 4.10
Historical Tornado Occurrences



Wildfire

According to the Maryland Department of Natural Resources, the busiest wildfires seasons typically occur in the spring and the fall of the year. These are the transition times for natural cover fuels. In spring, with the absence of moist deciduous vegetation and forest canopy shade, the sun warms the forest floor pre-heating the fuels. In fall, an abundance of new fuel accumulates with leaf fall. Given adequate rainfall amounts throughout the state, wildfires are mostly suppressed on initial attack and can be intense but of short duration. However, unusually hot and dry conditions or drought can turn a mild fire season into a serious problem that often requires extended attack operations to completely suppress wildfires.

The NCDC has 0 reported wildfires for Calvert County between the dates of January 1, 2006 through December 31, 2016.

Drought

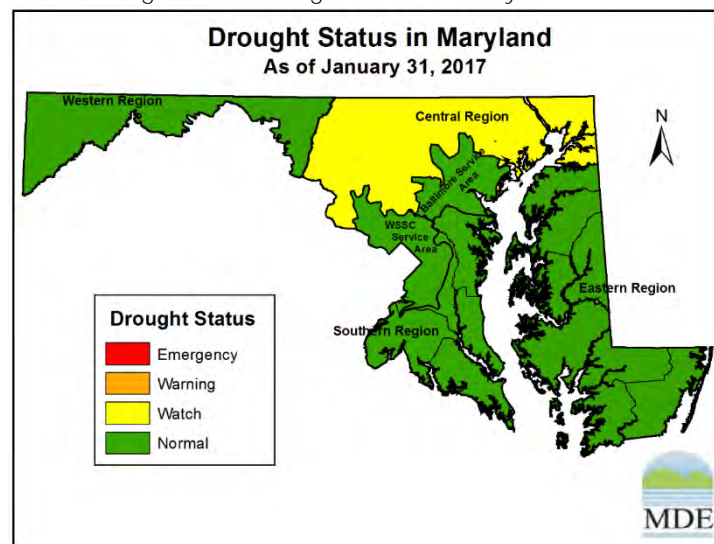
According to the National Climatic Data Center, the State of Maryland has experienced 450 reported droughts and/or periods of unseasonably dry weather from 1996 through December 2016.

All crop damage reported for this period totals \$99.72 million. Of these 450 events, Calvert County was reportedly affected by 12 events, however there no deaths, injuries, or damages associated.

The droughts of 1999 were the worst agricultural droughts in Maryland; devastating farmers. 55% of pasture land, 45% of corn, 39% of sorghum, 29% of tobacco, and 34% of soybeans across the state were reported in poor or very poor condition by month's end. 42% of topsoil and 84% of subsoil were reported as short or very short of moisture. Frederick County expected to lose 90% of their corn and soybean crop, and \$9 million in lost revenues. Montgomery County expected a 50% loss of soybean and sweet corn and a 60% loss of hay and corn for a loss of \$11 million. Washington County reported a corn crop loss of 60% and \$10 million in lost revenue. St. Mary's County reported a 60% loss of corn and soybean crops.

Calvert County farmers reported 30% losses in corn, soybeans, and hay. Statewide, crop losses were expected to exceed \$100 million. In addition to agricultural lands, forests and rural vegetation were also dangerously dry. The Maryland DNR responded to 600 fires that burned over 2500 acres from January to July, a 100% increase from the previous year. The Cumulative Severity Index (CSI), a measure of fire danger which ranges from 1 to 800, ranged from 503 in Allegany County to 629 in Prince Georges County on August 12th.

Figure 4.11 Drought Status in Maryland



Extreme Temperature

According to the National Climatic Data Center, Calvert County experienced 35 extreme temperature events, including cold/wind chill, extreme cold/wind chill, freezing fog, frost/freeze, heat, and excessive heat from January 2006 through December 2016. These heat waves and cold snaps have caused one (1) death and zero (0) injuries.

In 2008, a hot and very humid air mass seeped into the Mid Atlantic on July 17 and July 18. The heat index value climbed to around 105 degrees both afternoons. Emergency response officials reported sporadic incidents of heat-related illness, such as shortness of breath and heat exhaustion, around the Washington/Baltimore Metropolitan region. Three deaths were attributed directly to this heat wave. The deaths occurred in the Maryland suburbs of Washington DC in the counties of Prince Georges, Calvert, and Carroll. Two additional deaths, also in the Maryland suburbs, were indirectly attributed to this heat wave, since they were related to pre-existing health conditions. (NCDC, 2017)

Hail

According to the National Climatic Data Center, Calvert County experienced 17 hail events from 2006 through December 2016 (see **Table 4.10**), with some hail stones reaching 1.75 inches in diameter; these events total (0) deaths, (0) injuries, and no reported damages.

Table 4.10
Hail Activity in Calvert County (2006-2016)

LOCATION	DATE	TIME	TYPE	MAGNITUDE	DEATHS	INJURIES	DAMAGE
St Leonard	7/16/2007	1532	Hail	1	0	0	\$0
Huntingtown	5/31/2008	1405	Hail	1	0	0	\$0
Stoakley	5/31/2008	1442	Hail	0.75	0	0	\$0
Kenwood Beach	6/22/2008	1747	Hail	0.75	0	0	\$0
Dunkirk	6/22/2008	1834	Hail	0.75	0	0	\$0
Barstow	7/4/2008	1756	Hail	0.75	0	0	\$0
Island Creek	6/2/2009	1713	Hail	0.88	0	0	\$0
St Leonard	6/2/2009	1719	Hail	0.75	0	0	\$0
St Leonard	6/2/2009	1720	Hail	0.75	0	0	\$0
Lusby	6/2/2009	1727	Hail	0.75	0	0	\$0
Bowens	6/26/2009	1959	Hail	0.75	0	0	\$0
Barstow	5/14/2010	1845	Hail	1	0	0	\$0
Breezy Pt	8/21/2011	1607	Hail	1	0	0	\$0
Dares Beach	6/22/2012	1543	Hail	1	0	0	\$0
Solomons	5/22/2014	1650	Hail	1.75	0	0	\$0
Chaneyville	5/2/2016	1905	Hail	1.75	0	0	\$0
Chesapeake Beach	5/23/2016	1654	Hail	1	0	0	\$0

Source: National Climatic Data Center

A detailed map illustrating historical occurrences is presented in the *Vulnerability Assessment* Chapter along with indicators of countywide vulnerability.

Winter Storms

According to the National Climatic Data Center, Calvert County experienced 80 distinct winter storm events, including blizzards, heavy snow, ice storm, sleet, winter storm, and winter weather, from 2006 through December 2016 (see **Table 4.11**). These storm events resulted in a total of (0) deaths, (0) injuries, and \$0 in property damage.

Table 4.11
Winter Storm Activity in Calvert County (2005-2015)

LOCATION	DATE	TIME	TYPE	DEATHS	INJURIES	DAMAGE
CALVERT (ZONE)	1/17/2008	800	Winter Weather	0	0	\$0
CALVERT (ZONE)	2/20/2008	600	Winter Weather	0	0	\$0
CALVERT (ZONE)	2/22/2008	0	Winter Weather	0	0	\$0
CALVERT (ZONE)	1/27/2009	500	Winter Storm	0	0	\$0
CALVERT (ZONE)	3/1/2009	1700	Winter Storm	0	0	\$0
CALVERT (ZONE)	12/5/2009	1000	Winter Weather	0	0	\$0
CALVERT (ZONE)	12/18/2009	1900	Winter Storm	0	0	\$0
CALVERT (ZONE)	1/7/2010	2100	Winter Weather	0	0	\$0
CALVERT (ZONE)	1/30/2010	1000	Winter Storm	0	0	\$0
CALVERT (ZONE)	2/2/2010	1700	Winter Weather	0	0	\$0
CALVERT (ZONE)	2/5/2010	1100	Winter Storm	0	0	\$0
CALVERT (ZONE)	2/6/2010	1100	Blizzard	0	0	\$0
CALVERT (ZONE)	2/9/2010	1700	Winter Storm	0	0	\$0
CALVERT (ZONE)	2/10/2010	800	Blizzard	0	0	\$0
CALVERT (ZONE)	12/16/2010	1000	Winter Weather	0	0	\$0
CALVERT (ZONE)	12/25/2010	1700	Winter Weather	0	0	\$0
CALVERT (ZONE)	1/11/2011	1700	Winter Weather	0	0	\$0
CALVERT (ZONE)	1/17/2011	2000	Winter Weather	0	0	\$0
CALVERT (ZONE)	1/26/2011	1600	Winter Weather	0	0	\$0
CALVERT (ZONE)	1/31/2011	1600	Winter Weather	0	0	\$0
CALVERT (ZONE)	2/1/2011	500	Winter Weather	0	0	\$0
CALVERT (ZONE)	3/27/2011	300	Winter Weather	0	0	\$0
CALVERT (ZONE)	1/20/2012	2000	Winter Weather	0	0	\$0
CALVERT (ZONE)	1/22/2012	1800	Winter Weather	0	0	\$0
CALVERT (ZONE)	1/23/2013	2200	Winter Weather	0	0	\$0
CALVERT (ZONE)	1/25/2013	1400	Winter Weather	0	0	\$0
CALVERT (ZONE)	1/28/2013	400	Winter Weather	0	0	\$0
CALVERT (ZONE)	3/25/2013	100	Winter Weather	0	0	\$0
CALVERT (ZONE)	12/8/2013	600	Winter Weather	0	0	\$0
CALVERT (ZONE)	1/2/2014	1600	Winter Weather	0	0	\$0
CALVERT (ZONE)	1/10/2014	500	Winter Weather	0	0	\$0
CALVERT (ZONE)	1/21/2014	1100	Winter Weather	0	0	\$0
CALVERT (ZONE)	1/28/2014	1900	Winter Weather	0	0	\$0

LOCATION	DATE	TIME	TYPE	DEATHS	INJURIES	DAMAGE
CALVERT (ZONE)	2/4/2014	2000	Winter Weather	0	0	\$0
CALVERT (ZONE)	2/12/2014	1900	Winter Weather	0	0	\$0
CALVERT (ZONE)	2/13/2014	1600	Winter Weather	0	0	\$0
CALVERT (ZONE)	2/25/2014	800	Winter Weather	0	0	\$0
CALVERT (ZONE)	2/26/2014	300	Winter Weather	0	0	\$0
CALVERT (ZONE)	3/3/2014	400	Winter Storm	0	0	\$0
CALVERT (ZONE)	3/16/2014	1800	Winter Storm	0	0	\$0
CALVERT (ZONE)	1/14/2015	300	Winter Weather	0	0	\$0
CALVERT (ZONE)	2/9/2015	2100	Winter Weather	0	0	\$0
CALVERT (ZONE)	2/16/2015	1400	Winter Storm	0	0	\$0
CALVERT (ZONE)	2/21/2015	800	Winter Weather	0	0	\$0
CALVERT (ZONE)	2/25/2015	2300	Winter Weather	0	0	\$0
CALVERT (ZONE)	3/1/2015	800	Ice Storm	0	0	\$0
CALVERT (ZONE)	3/3/2015	1300	Winter Weather	0	0	\$0
CALVERT (ZONE)	3/5/2015	1000	Winter Storm	0	0	\$0
CALVERT (ZONE)	1/23/2016	700	Blizzard	0	0	\$0
CALVERT (ZONE)	2/14/2016	2300	Winter Storm	0	0	\$0
CALVERT (ZONE)	3/3/2016	1900	Winter Weather	0	0	\$0

Source: National Climatic Data Center

Coastal Erosion

An evaluation of erosion hazards in the United States was conducted as a collaborative project of The H. John Heinz III Center for Science, Economics and the Environment in April 2000, a study prepared for the Federal Emergency Management Agency (www.heinzcenter.org). The Heinz Center evaluation provides an assessment of coastal erosion and the potential loss of property along U.S. shorelines.

In 1990, the State of Maryland had an estimated 1,000 people living within 500 feet of the Atlantic shoreline, according to data derived from analyzing U.S. Census Block Groups. According to the study, an estimated 25 percent of those homes within 500 feet of U.S. coastlines and Great Lakes coastlines are likely to be lost to erosion by 2060.

Calvert County is not adjacent to the Atlantic Ocean. However, according to the Development of the Maryland Shoreline Inventory Methods and Guidelines for Calvert County (August, 2006), the county resides within the Atlantic Coastal Plain. Calvert County is a peninsula surrounded by the Patuxent River and the Chesapeake Bay. The data inventory developed for the Shoreline Situation Report, designed to assist with management and planning of tidal shorelines, is based on a three-tiered shoreline assessment approach;

- The immediate riparian zone, evaluated for land use;
- The bank, evaluated for height, stability, cover and natural protection; and
- The shoreline, describing the presence of shoreline structures for shore protection and recreational access.

Dam/Levee Failure

According to the Maryland’s Department of the Environment Dam Safety Program, there are 439 dams in Maryland ranging in height from 6 feet to 296 feet. There are (81) high hazard dams, (114) significant hazard dams and (244) low hazard dams. (MDE, February 2015)

The data below (**Table 4.12**) was provided by MDE Dam Safety Division. Calvert County has 17 dams, (2) of which are classified as high hazard, (9) significant hazard and (6) low hazard. Dam hazard definitions, as accepted by the National Interagency Committee on Dam Safety, are as follows:

1. Low Hazard Potential — Unlikely loss of life, minor increases to existing flood levels at road and buildings
2. Significant Hazard Potential — Possible loss of life, significant increased flood risks to roads and buildings with no more than 2 houses
3. High Hazard Potential — Probably loss of life, major increases in existing flood levels at houses, buildings, major interstates and state roads

Figure 4.12 illustrates hazard ratings per dam within Calvert County.

Figure 4.12
Dam Hazard Ratings

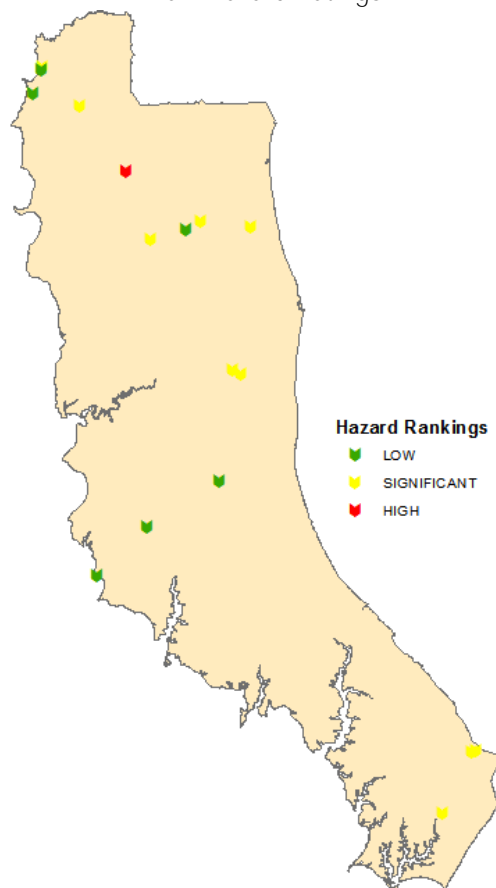


Table 4.12
County Dam Hazard Data

Dam Name	Owner Name	Hazard	River or Stream	Built
Ferry Landing Woods Pond	Ferry Landing Woods Civic Association	Low	Patuxent River - Tr	1981
Calvert Gateway	Penwick Village Ltd Partnership	Significant	Hall Creek-Tr	2000
Shores of Calvert Upper Dam	Shores of Calvert Assn	Significant	Patuxent River-Tr	1972
Shores of Calvert Lower Dam	Shores of Calvert Assn	Low	Patuxent River-Tr	1972
Victoria Station Community Lake	Victoria Station Homeowners Assoc	High	Graham Creek	1986
Sunderland Railroad Embankment Pond	John Ireland	Low	Fishing Creek-Tr	N/A
Lake Ridge Community Pond Dam	Edward B. Howlin, Inc.	Significant	Fishing Creek-Tr	1969
Lake Karylbrook Community Pond	Calvert County Department of Public Works – Roads	Significant	Fishing Creek-Tr	N/A
Queensberry Drive Swm	Queensberry Community Association, Inc.	Significant	Hunting Creek-Tr	2001
Prince Frederick Wwtp Pond 2	Calvert County Department of Public Works	Low	Offstream-Parker Creek	2002
Bowens Farm Pond	Mike and Barb Scarborough	Low	Cypress Swamp-Tr	1970
Starkey Pond	Tom Starkey	Low	Morsell Creek	N/A
Cove Point Lng Secondary Dam	Dominion Cove Point Lng, Lp	Significant	Wilbur Creek	1974
Cove Point Lng Main Dam	Dominion Cove Point Lng, Lp	Significant	Wilbur Creek	1974
Chesapeake Ranch Estates Dam	Chesapeake Ranch Estates	High	Mill Creek	1965
Queensberry Drive Playground Dam	Queensberry Community Association, Inc.	Significant	Hunting Creek-Tr	2001
Twin Lakes Upper Pond (Hoile Lane)	Calvert County Department of Public Works – Roads	Significant	Cocktown Creek-Tr	1970

Source: Dam Safety Division, MDE

Earthquakes

According to the Maryland Geological Survey, 54 earthquakes have been impacted the State of Maryland during a period from 1758 through 2015. One notable was the Virginia earthquake in 2011. Measured at a magnitude 5.8 and a MMI of VII, this earthquake's epicenter was located about 60 miles northeast of Richmond, Virginia, however it was felt as far as Calvert County.

Table 4.13 lists all recorded earthquakes in the State of Maryland for the period 1962 through 2015, along with their intensity.

Table 4.13
Recorded Earthquakes in the State of Maryland (1962-2015)

DATE	LOCATION	MODIFIED MERCALLI INTENSITY
9/7/1962	Hancock	IV
4/26/1978	Hancock	...
5/23/1986	Accocheek – Piscataway	...
1/13/1990	Randallstown (V), Eldersburg (IV), Ellicott City (IV), Granite (IV), Owings Mills (III)	V
4/4/1990	Granite - Randallstown – Baltimore	II
9/28/1991	Granite – Randallstown	III
3/10/1993	Columbia (IV) - Ellicott City (II) - Fulton (II)	II-IV
3/12/1993	Columbia - Allview Estates	II-III
3/15/1993	Columbia - Allview Estates – Laurel	III-V
3/16/1993	Columbia - Allview Estates	II-III
3/16/1993	Columbia - Allview Estates	II-III
3/17/1993	Columbia - Allview Estates	I-II
3/19/1993	Columbia - Allview Estates	I-II
3/19/1993	Columbia - Allview Estates	I
3/21/1993	Aberdeen - Bel Air	I-II
3/22/1993	Columbia - Allview Estates	not felt
3/26/1993	Ellicott City near jct US40 & 29	I-II
4/4/1993	Columbia - Allview Estates	I-III
4/4/1993	Columbia - Allview Estates	I-II
4/8/1993	Columbia - Allview Estates	I-II
7/9/1993	Columbia - Allview Estates	II-III
7/12/1993	Columbia - Allview Estates	III-IV
10/28/1993	Ilchester - Ellicott City	IV
10/28/1993	Ilchester - Ellicott City	IV
11/17/1993	Columbia - Allview Estates	III
11/27/1993	Columbia - Allview Estates	I-II
11/27/1993	Columbia - Allview Estates	I-II
10/28/1994	Glen Burnie - Pasadena -Gambrills -Millersville	IV
8/2/1996	Perryville	II-III
10/17/1996	Rising Sun (epicenter may be in Pennsylvania)	IV
12/6/1996	Columbia - Allview Estates	II
12/14/1996	Columbia - Allview Estates	II
12/16/1996	Ilchester - Ellicott City	I
12/22/1996	Columbia - Allview Estates	III
12/18/2001	Columbia nr US29-Md32	II
3/22/2002	Columbia nr US29-Md32	I
12/9/2003	28 miles west of the Richmond in rural Powhatan County, VA	VI

DATE	LOCATION	MODIFIED MERCALLI INTENSITY
2/23/2005	SE Baltimore near Fort McHenry, Dundalk, Glen Burnie, Pasadena, Gambrills	VI
12/27/2008	9 km (6 miles) W of Lancaster, PA.	IV
7/1/2009	Southwestern New Jersey	III
9/29/2009	7 km (4 miles) NNE (15°) from Bel Air North, MD	II
7/16/2010	Potomac-Shenandoah Region, MD	V
8/23/2011	8 km (5 miles) SSW (195°) from Mineral, VA	V-VI

Source: Maryland Geological Survey

Landslides and Sinkholes

Landslides and sinkholes, discussed in the *Hazard Identification* section, were not analyzed in detail due to extremely low probability of occurrence within the State of Maryland.

Human-Caused Hazards

Hazardous Materials (HazMat)

Located in Calvert County, MD., Calvert Cliffs Nuclear Power Plant began operating in 1975; fully operational in 1977. The power plant is built on a 1,500-acre site on the western shore of the Chesapeake Bay, about 50 miles SE of Washington, D.C. (Exelon Corp, 2017)

According to the United States Nuclear Regulatory Commission, Calvert Cliffs Nuclear Power Plant has reported 22 events between 2011 and 2016. These reported events are summarized below in **Table 4.14**

Table 4.14
Calvert Cliffs Nuclear Power Plant Incident Summary (2011 - 2016)

Accession Number	Date	Document	Report Number
ML11297A113	10/20/2011	LER 11-001-00, for Calvert Cliffs, Unit 1, Regarding Reactor Trip Due to a Phase-to-Phase Short Circuit on Main Transformer.	LER 11-001-00
ML11340A030	12/2/2011	LER 11-002-00, for Calvert Cliffs Nuclear Power Plant, Unit 1, regarding Technical Specification 3.0.3 Entry for Inoperable 125 VDC Channels.	LER 11-002-00
ML11354A244	12/16/2011	LER 11-003-00 for Calvert Cliffs, Unit 1, Regarding 1A Emergency Diesel Generator Inoperability Due to Water Intrusion.	LER 11-003-00
ML12201A068	7/17/2012	LER 12-001-00 for Calvert Cliffs Nuclear Power Plant, Unit 1, "Valve Surveillance Requirement Not Met Due to Legacy Issues".	LER 12-001-00
ML12256A988	9/11/2012	LER 12-002-00 for Calvert Cliffs, Unit 1 Regarding Reactor Coolant Pressure Boundary Leakage Due to Tubing High Cyclic Fatigue.	LER 12-002-00
ML12285A380	10/10/2012	LER 12-003-00 for Calvert Cliffs Nuclear Power Plant, "Plant Shutdown Completed due to Control Element Assembly Misalignment".	LER 12-003-00
ML13175A358	6/21/2013	LER 12-003-01 for Calvert Cliffs, Unit 1 Regarding Plant Shutdown Completed due to Control Element Assembly Misalignment.	LER 12-003-01
ML13353A171	12/17/2013	LER 13-002-00 from Calvert Cliffs Nuclear Power Plant Regarding Unfused Ammeter Circuits Result in Appendix R Unanalyzed Condition.	LER 13-002-00
ML14080A308	3/20/2014	LER 14-001-00 for Calvert Cliffs Nuclear Power Plant, Unit 1, Regarding Reactor Trip Due to Turbine Control System Reboot.	LER 14-001-00

Accession Number	Date	Document	Report Number
ML14097A071	4/3/2014	LER 14-002-00 for Calvert Cliffs, Unit 1 Regarding Condition Prohibited by Technical Specifications Due to Auxiliary Feedwater Train Inoperable Due to Human Performance Error.	LER 14-002-00
ML14119A438	4/24/2014	LER 14-003-00 for Calvert Cliffs Nuclear Power Plant Regarding Pressurizer Safety Valves As-Found Settings (Low) Outside Technical Specification Limits Due to Inadequate Lift Spring Performance.	LER 14-003-00
ML14126A603	5/1/2014	LER 14-004-00 for Calvert Cliffs, Unit 1, Regarding Unfused 250 VDC Circuits Result in 10 CFR Part 50 Appendix R Unanalyzed Condition Due to Original Design did not Adequately Address Fire Protection Requirements.	LER 14-004-00
ML14139A417	5/12/2014	LER 14-005-00 for Calvert Cliffs Nuclear Power Plant Regarding Condition Prohibited by Technical Specifications Due to Human Performance Error.	LER 14-005-00
ML14182A662	7/26/2014	LER 14-006-00 for Calvert Cliffs Nuclear Power Plant, Unit 1 Regarding Reactor Trip Due to Reactor Protective System Matrix Relay Testing Pushbutton Failure.	LER 14-006-00
ML14265A416	9/19/2014	LER 14-007-00 for Calvert Cliffs, Unit 1 Regarding Reactor Coolant System Pressure Boundary Leakage in Reactor Coolant Pump Differential Pressure Transmitter Tubing.	LER 14-007-00
ML15084A008	3/20/2015	LER 15-001-00 for Calvert Cliffs Nuclear Power Plant, Unit 1, Regarding Component Cooling and Shutdown Heat Exchanger Lineup Potential to Exceed Design Basis Temperatures.	LER 15-001-00
ML15160A321	7/5/2015	LER 15-002-00 for Calvert Cliffs, Units 1 and 2, Regarding Automatic Reactor Trips Due to Transmission System Disturbance.	LER 15-002-00
ML15317A007	11/9/2015	LER 15-003-00 for Calvert Cliffs, Unit 1, Regarding Diesel Generator Inoperable Due to Lube Oil Filter Fouling Due to Coolant Leakby on a Cylinder Liner.	LER 15-003-00
ML16083A363	3/21/2016	LER 16-001-00 for Calvert Cliffs Nuclear Power Plant Unit 1, Regarding Manual Reactor Trip Due to High Secondary Side Sodium Levels Due to a Condenser Tube Leak.	LER 16-001-00
ML16106A304	4/14/2016	LER 16-002-00 for Calvert Cliffs, Unit 1, Regarding Pressurizer Safety Relief Nozzle Dissimilar Metal Weld Flaw Exceeded American Society of Mechanical Engineers Code Allowable Limit.	LER 16-002-00
ML16204A377	7/20/2016	LER 16-004-00 for Calvert Cliffs, Unit 1 Regarding High Energy Line Break Barrier Breached Due to Human Performance Error Causing Both Service Water Trains to be Inoperable.	LER 16-004-00
ML16216A148	7/29/2016	LER 16-003-00 for Calvert Cliffs Nuclear Power Plant, Unit No. 1 Regarding Automatic Trip on Loss of Load due to Spurious Steam Generator High Level Turbine Trip.	LER 16-003-00

Source: NRC: Nuclear Regulatory Commission

Table 4.15 shows Nuclear Regulatory Commission (NRC) data for Calvert County with regard to number of incidents, injuries, deaths and damages incurred as the result of hazardous materials incidents.

Table 4.15 NRC HazMat Data for Calvert County

Year	Type of Incident							Injuries	Fatalities	Damages
	Fixed	Mobile	Rail	Tank	Vessel	Pipeline	Other			
2010	0	1	0	1	1	0	2	0	0	0
2011	1	1	0	1	2	0	3	0	0	0
2012	5	1	0	2	1	0	0	0	0	0
2013	0	0	0	2	0	0	6	0	0	0
2014	2	2	0	0	3	0	2	0	0	0
Total	8	5	0	6	7	0	13	0	0	0

Source: NRC: Nuclear Regulatory Commission

Energy Pipeline Failures

A history of hazards is not currently available for energy pipeline failures in Calvert County.

Terrorism

Because of the relatively recent, or heightened, focus being placed on managing terrorism and consequences of terrorism in the United States, no historical database is currently available for cataloging acts of terrorism. However, at the time of this Plan's development, no significant historical occurrences of terrorism were known to have taken place within the Calvert County planning area. Under a DHS Terrorism Preparedness Grant, Calvert County and others participate in the State's Preparedness Report and the Threat Identification and Risk Assessment (THIRA) prepared for US Dept. of Homeland Security. This information is sensitive in nature and not included in this Plan.

Probability of Future Events in Calvert County

The final step of any hazard analysis is calculating the likelihood of future events. Given the number of events that have occurred in the past and the time period over which those events have occurred, one can calculate the number of events that occur per year. This gives a sense of the probability of future occurrences. The results of this calculation for Calvert County are presented in **Table 4.16**. For floods, the events that are tallied are generally nuisance events without a great deal of damage. The probability of a 100-year flood (and its predicted extent) is 1% in any given year. Earthquakes require a similar explanation. While 58 total events have taken place according to the historical record, only one of those was capable of causing any damage at all, however slight. Finally, there is no historical record of occurrence for several hazards.

Table 4.16 - Probability of Future Events (All Hazards)

Hazard	Number of Events	Time Period	Events per Year	Probability of Future Occurrence
Flood	39	1996 – 2016	1.95/0.0100	Medium
Tropical Storm	3	1996 - 2016	0.15	Low
Severe Thunderstorm	130	2006 - 2016	13	High
Tornado	16	1950 - 2016	0.24	Low
Wildfire	2	2005 - 2015	0.18	Low
Drought	12	1996 - 2016	0.6	Low
Extreme Temperature	35	2006 - 2016	3.5	High
Hail	17	2006 - 2016	1.7	Medium
Winter Storm	80	2006 - 2016	8	High
Coastal Erosion	Unknown	N/A	Unknown	Low
Dam Failure	Unknown	N/A	Unknown	Low
Earthquake	54 (1 MMI >= VI)	1758 – 2015	0.21/0.003	Low
Sinkhole/Landslide	Unknown	N/A	Unknown	Low
Hazardous Material Release	3	2006 - 2016	0.3	Low
Energy Pipeline Failure	Unknown	N/A	Unknown	Low

Hazard Profiles for Towns in Calvert County

Hazard profiles have been provided for the following two municipalities in Calvert County: North Beach and Chesapeake Beach.

North Beach

Hazards of greatest concern include flooding, thunderstorms and winter storms. Hazards of moderate consideration include fires, and hazardous material accidents. Terrorism in North Beach is the hazard of least concern in this vulnerability assessment.

There are 111 parcels within the floodplain in North Beach; a flood occurrence could cause potential damage near \$19,253,000.

Chesapeake Beach

Hazards of greatest concern include fires, hazardous materials, winter storms, drought/water supply, and flooding in the Chesapeake Beach. Hazards of moderate consideration include transportation accidents, while terrorism in Chesapeake Beach is of least concern.

The loss estimate in Chesapeake Beach could potentially reach \$277,388,000 for the 860 parcels within the floodplain.

Data Sources

Photos courtesy of the National Aeronautics and Space Administration (NASA).
Historic hurricane track graphics courtesy of the National Hurricane Center.

American Society of Civil Engineers (ASCE), "Facts About Windstorms."
Web site: www.windhazards.org/facts.cfm

Bureau of Reclamation, U.S. Department of the Interior
Web site: www.usbr.gov

Federal Emergency Management Agency (FEMA)
Web site: www.fema.gov

National Climatic Data Center (NCDC), U.S. Department of Commerce, National Oceanic and Atmospheric Administration
Web site: <http://lwf.ncdc.noaa.gov/oa/ncdc.html>

National Geophysical Data Center, "Tsunamis and Tsunami-Like Waves of the Eastern United States"
Web site: <http://www.ngdc.noaa.gov/seg/hazard/tsu.shtml>

National Inventory of Dams, U.S. Department of the Interior
Web site: <http://crunch.tec.army.mil/nid/webpages/nid.cfm>

National Hurricane Center, National Oceanic & Atmospheric Administration (NOAA)
Web site: http://www.nhc.noaa.gov/http://www.nhc.noaa.gov/HAW2/english/history/opal_1995_map.gif

National Severe Storms Laboratory (NSSL), U.S. Department of Commerce, National Oceanic and Atmospheric Administration
Web site: www.nssl.noaa.gov

National Weather Service (NWS), U.S. Department of Commerce, National Oceanic and Atmospheric Administration
Web site: www.nws.noaa.gov

Storm Prediction Center (SPC), U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service
Web site: www.spc.noaa.gov

The Tornado Project, St. Johnsbury, Vermont
Web site: www.tornadoproject.com

Exelon Corporation
Web site: www.exeloncorp.com

United States Geological Survey (USGS), U.S. Department of the Interior
Web site: www.usgs.gov

Dam Safety Division, Maryland Department of the Environment
Web site: www.mde.maryland.gov/damsafety

CHAPTER 5: VULNERABILITY ASSESSMENT



Introduction

High-level, detailed vulnerability assessments were completed for Calvert County for flood (riverine and coastal), severe winds (hurricanes and coastal storms), thunderstorms, tornadoes, drought, hail, winter storms, dam/levee failure, earthquakes, hazardous materials and energy pipeline failures, due to the higher level of risk for these hazards compared to others. It is important to note that the risk assessments for the county are based on best available data and represent a base-level assessment for the planning area. Additional work will be needed on an ongoing basis to enhance, expand and further improve the accuracy of the baseline established here.

The loss estimates provided in this section have resulted in an *approximation* of risk. These estimates should be used to understand relative risk from hazards and potential losses. However, it is important to understand that uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from approximations and simplifications that are necessary for a comprehensive analysis (such as abbreviated inventories, demographics or economic parameters).

To conduct the risk assessment effort, two distinct hazard risk assessment methodologies were applied; utilizing both HAZUS-MH® version 2.2 (FEMA's loss estimation software) and a statistical risk assessment methodology. Both approaches provide estimates for the potential impact by using a common, systematic framework for evaluation.

The HAZUS-MH risk assessment methodology is parametric, in that distinct hazard and inventory

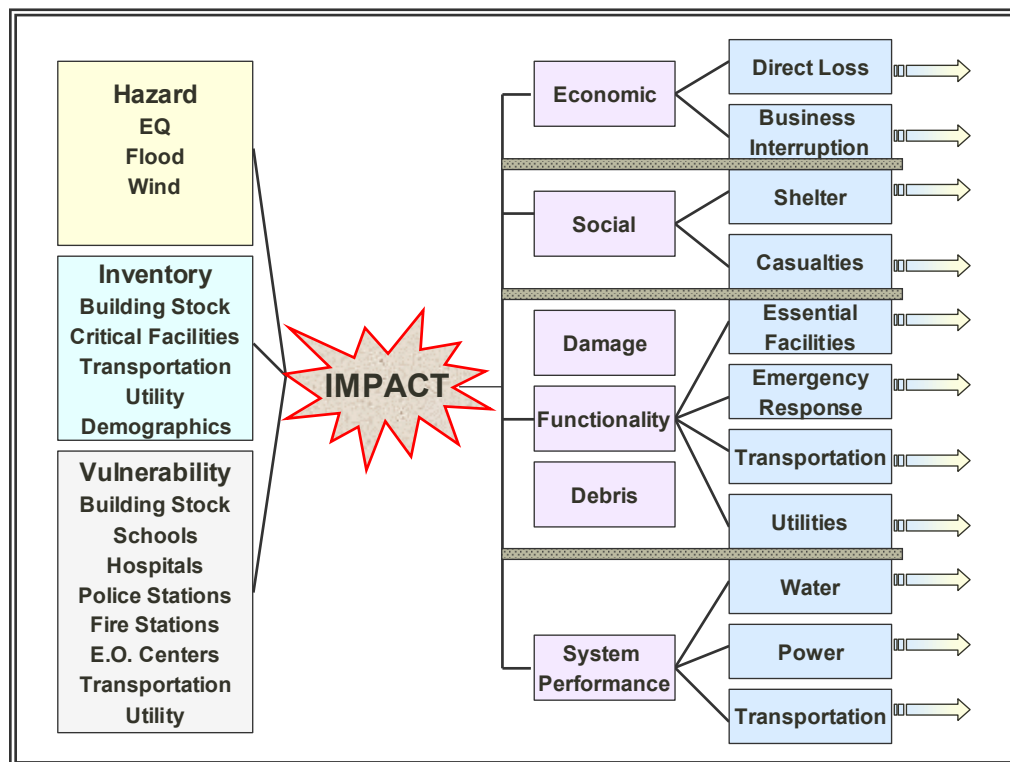
parameters (for example, wind speed and building types) were modeled using the HAZUS-MH software to determine the impact (damages and losses) on the built environment. The HAZUS-MH software was used to estimate losses from wind (hurricane and tornado) and flood hazards.

The second methodology, a statistical risk assessment methodology, was applied to analyze hazards of concern that are outside the scope of the HAZUS-MH software. The HAZUS-driven methodology uses a statistical approach and mathematical modeling of risk to predict a hazard’s frequency of occurrence and estimated impacts based on recorded or historic damage information.

Explanation of HAZUS-MH Risk Assessment Methodology

HAZUS-MH is FEMA’s standardized loss estimation software program, built upon an integrated geographic information system (GIS) platform (**Figure 5.1**). This risk assessment applied HAZUS-MH to produce regional profiles and estimate losses for three of the seven hazards addressed in this section: flood, hurricane winds and earthquake.

Figure 5.1 Conceptual Model of HAZUS-MH Methodology



Explanation of Regional Vulnerability Assessment Methodology

Vulnerabilities associated with other natural hazards were analyzed using a regional assessment methodology developed and used specifically for this effort. This approach is based on the principal that any spatially-nonspecific hazard event is essentially a random occurrence within a region and had just as much chance of occurring within the study area as outside. Historical data for each hazard are used and statistical evaluations are performed using manual calculations. The general steps used in

the statistical vulnerability assessment methodology are summarized below:

- Buffer the study area to determine the regional assessment area;
- Compile hazard occurrence data for the regional area from national and local sources;
- Categorize hazard parameters for each hazard to be modeled (e.g., tornado);
- Calculate the annualized occurrence and loss estimates for each regional subdivision;
- Normalize the annualized occurrence and loss estimates by land area and number of housing units respectively; and
- Determine the overall regional average of annualized occurrence and loss

The economic loss results are presented here using two interrelated risk indicators:

- 1) The Annualized Loss (AL), which is the estimated long-term value of losses to the general building stock in any single year in a specified geographic area (i.e., county)
- 2) The Annualized Loss Ratio (ALR), which expresses estimated annualized loss as a fraction of the building inventory replacement value, also referred to as the total exposure to the hazard.

The estimated Annualized Loss (AL) addresses the two key components of risk: the probability of the hazard occurring in the study area and the consequences of the hazard, largely a function of building construction type and quality, and of the intensity of the hazard event. By annualizing estimated losses, the AL factors in historic patterns of frequent smaller events with infrequent but larger events to provide a balanced presentation of the risk.

The Annualized Loss Ratio (ALR) represents the AL as a fraction of the replacement value of the local building inventory. This ratio is calculated using the following formula:

“ALR = ANNUALIZED LOSSES / TOTAL EXPOSURE AT RISK”

The annualized loss ratio gauges the relationship between average annualized loss and building replacement value. This ratio can be used as a measure of relative risk between areas and, since it is normalized by replacement value, it can be directly compared across different geographic units such as metropolitan areas or counties.

It is important to note that HAZUS-MH was used to produce “worst case scenario” results. The outputs in this document are considered to be the result of a worst-case scenario event for each hazard, and it is understood that any smaller events which could occur would most likely create fewer losses than those calculated here.

Figure 5.2 Census Tracts



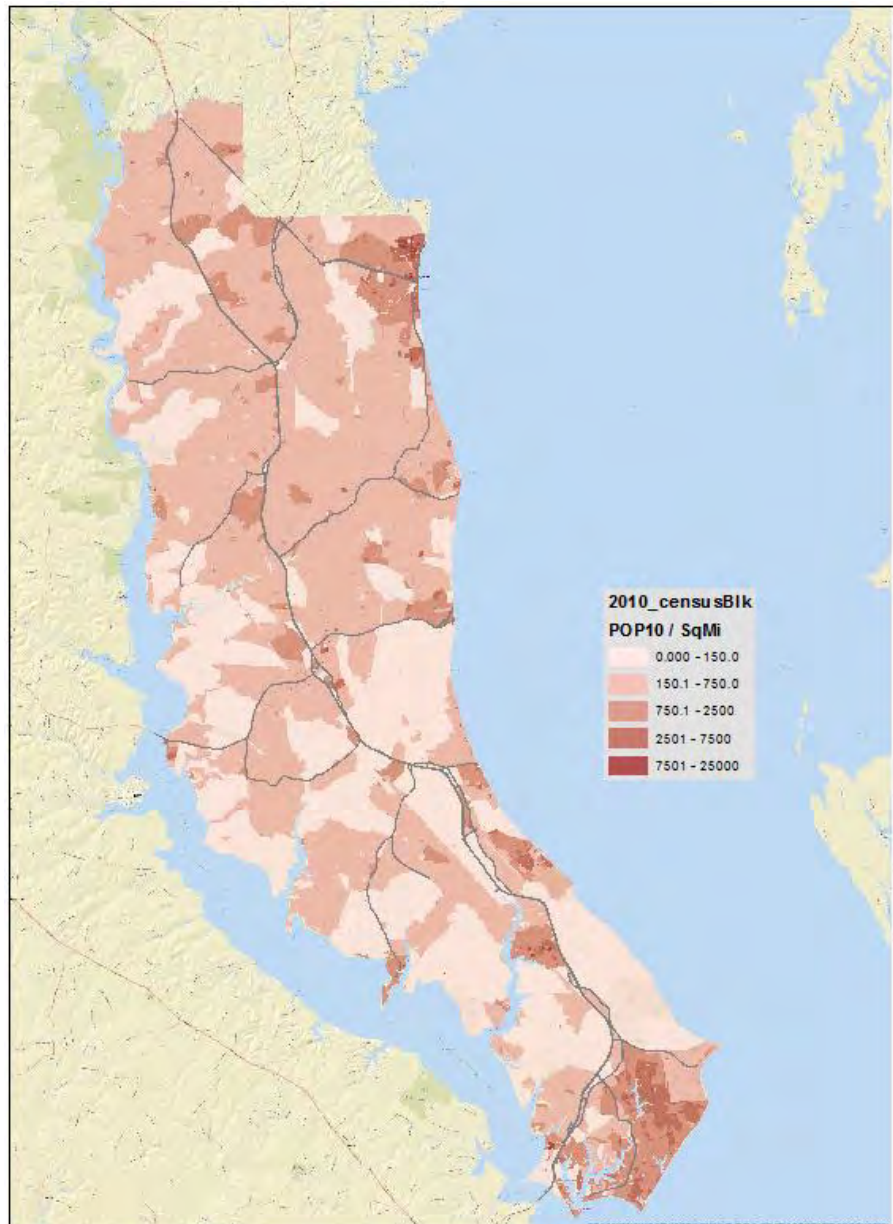
Census Tracts

Many of the tables presented in the Vulnerability Assessment use Census Tracts, which are semi-permanent statistical subdivisions used by the United Census Bureau. Census Tracts provide a stable set of geographic units for presenting statistical data; the map to the right depicts the 18 census tracts within Calvert County.

Calvert County Overview

According to the U.S. Census Bureau, the total population of Calvert County in 2010 was 88,737. (The total population in 2010 for the entire state of Maryland was 5,773,552.) Although 2015 population estimates have been released, the counts for 2010 are the latest available at the census block scale, as is necessary for a detailed analysis. The population of Calvert County grew 19% from 2000. The most densely populated areas of the county are in the southern tip of Solomons Island, and the towns located in the North East corner of the county – North Beach and Chesapeake Beach. **(Figure 5.3).**

Figure 5.3 Population Distribution by Census Tracts (U.S. Census 2010)



The latest value from HAZUS-MH of total dollar exposure within Calvert County is estimated to be approximately \$214,202,000. This modeled estimate consists of single-family residential buildings, multi-family residential buildings and commercial facilities. Fortunately, for the flood vulnerability analysis, actual tax parcel boundaries and their assessed valuations were available to be used. Using the data from the Calvert County Government, the actual total dollar exposure in the county is \$214,202,145.

Development Trends

The resident population of the State of Maryland is projected to increase from 5,772,717 in 2010 to approximately 7,835,975 by 2060 (Census Bureau; Proximity One, June 2015). From April 1, 2000 to July 1, 2014, Maryland's rate of population change was 3.5% (U.S. Census Bureau). These trends demonstrate that Maryland's population is increasing, and consequently the number of residential structures and the associated exposure of residential buildings will increase as well. Assuming a multiplier of 1.456¹⁰, the total residential exposure of Calvert County could reach an estimated dollar value of \$311,878,000 by 2025. This estimate does not of course take into account many other development factors, such as available land for new residential construction. Future Plan updates will address development trends in more detail, in particular for hazards with a physical hazard boundary (i.e., flood, storm surge, etc.)

Critical Facilities

For the purposes of this risk assessment, the label "critical facility" refers to five categories of locations that will be very important during the response and recovery phase of a hazard event. Those categories are: Medical Care Facilities, Emergency Operations Centers, Fire Departments, Police Departments and Schools. According to HAZUS-MH 2.2, there are a total of 73 critical facilities in Calvert County, Maryland.

Flood

In November 2014, FEMA released a new National Flood Hazard Layer for Calvert County, complete with a 1% chance per year depth grid that was created with state-of-the-art methods. Because this data was available and determined by the Hazard Mitigation Plan Update Steering Committee to be authoritative, it was directed to be used as the basis for the flood vulnerability assessment. Because only coastal flooding depths were predicted in the November 2014 study, additional analysis was conducted, using the HAZUS-MH Flood Information Tool and the Digital Flood Insurance Rate Maps, to calculate the predicted depths from a 1% chance per year riverine flooding event. Unfortunately, only a 1% chance per year flood depth grid was available, rather than the typical range of various return periods.

Because the actual property parcels with assessed values were available from Calvert County, there was an opportunity to examine the potential damage from flooding at the parcel level, rather than the census tract level available in HAZUS-MH. The GIS process used to accomplish this is:

1. Select all of the property parcels in Calvert County that intersect the 1% chance per year flood extent.
2. Reduce the assessed value of the parcel's structures by the percentage that the parcel is flooded. This assumes that the impact of a flood would be even across a parcel. This is a best practice in GIS analysis generally when the specific configuration of buildings on a parcel is not known.
3. Convert the raster flood depth grid into polygons for every 6" of flood depth.

¹⁰ Based on the percent change in housing units for a two-year period and weighted for Calvert County.

4. For each property parcel, determine the flood depth polygon with the greatest intersecting area. In other words, pick the flood depth polygon value that intersects each property parcel the most.
5. Using the type of property, assume the height of the building foundation and remove this value from the flood depth. For example, if a parcel is predicted to be flooded by 3 ft. of water in a 1% chance per year scenario, and the primary structure is assumed to have an 18-inch foundation (crawl space), then one can assume 1.5 ft. of flood water impacting the structure.
6. Finally, use the depth-damage curves from HAZUS-MH to relate the depth of the floodwater to the percent damaged. This damage percent, for both the building and its content, is multiplied by the reduced assessed value to calculate the estimated damage amount.

The result of this process is parcel-based map of the potential flood damage in Calvert County. This parcel-based vulnerability map may now be used to identify which properties are the most at risk from flooding in the County, what are their characteristics, and whom to contact to discuss potential mitigation options. It could also now be used to track the change in vulnerability over time as either the data regarding individual properties improves, or more up-to-date assessment valuations are considered.

Approximately 5% of Calvert County land area falls within the 1% chance per year flood zone (**Figure 5.4**). Also, 6,417 out of 48,704 property parcels (13.17%) intersect the flood zone. The predicted depth of flood water is between 0 and 12.6 feet (**Figure 5.5**).

Figure 5.4
FEMA 1% chance per year Flood Zone in Calvert County



Figure 5.5
 FEMA 1% chance per year Flood Depth in Calvert County

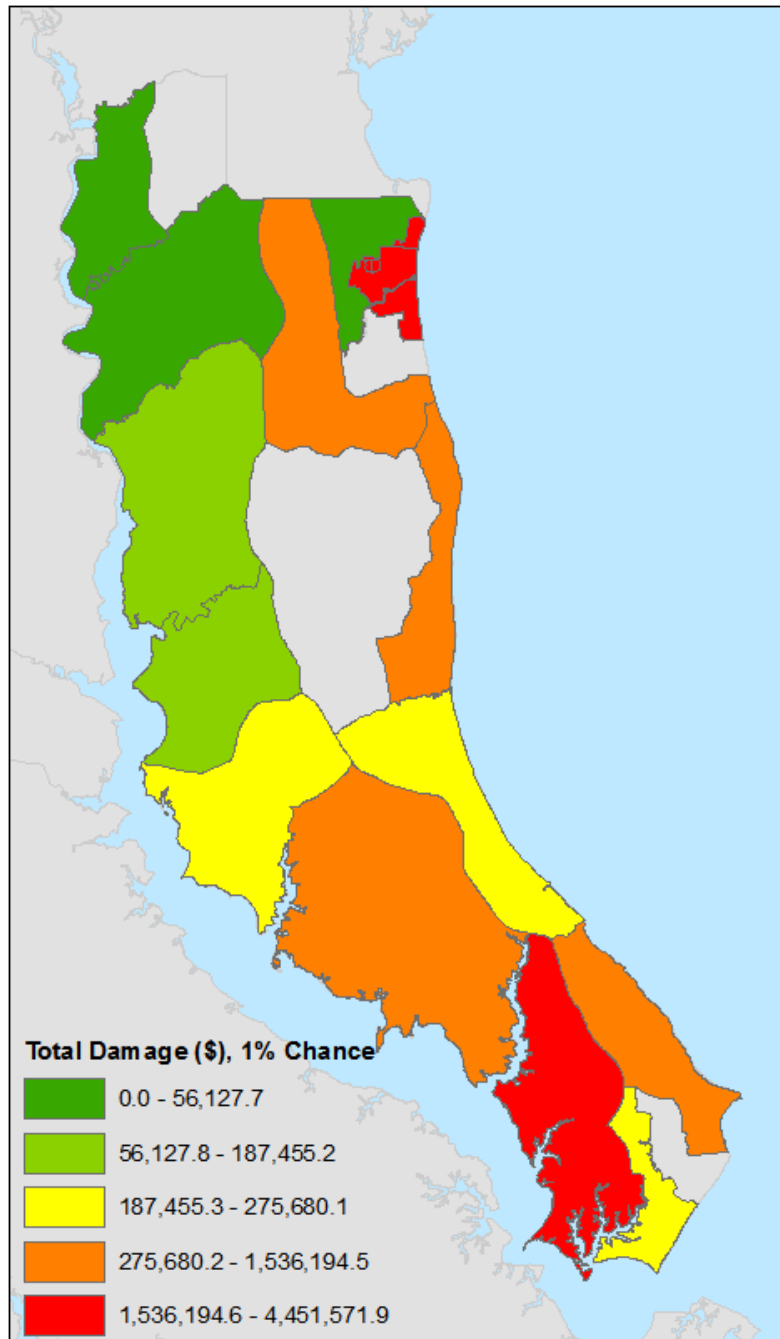


The total built property exposure (both building and contents) in the county is \$214,202,000 (Table 5.1). The total estimated annualized losses equal \$1,717,700, yielding a loss ratio of 0.00081. Again, this analysis has only used a 1% chance per year flood; including the 10%, 4%, 2%, and 0.2% chance per year flood depths would increase the loss ratio significantly.

Table 5.1
Potential Annualized Losses from Flood by Jurisdiction

Jurisdiction	Total Exposure	Estimated Losses	Loss Ratio
Tract # 860101	\$0	\$0	0.0000
Tract # 860102	-	-	-
Tract # 860200	\$1,194,000	\$561	0.00046
Tract # 860300	\$3,119,000	\$8,417	0.00269
Tract # 860401	\$849,000	\$237	0.00027
Tract # 860402	-	-	-
Tract # 860501	-	-	-
Tract # 860502	\$14,352,000	\$11,462	0.00079
Tract # 860600	\$1,104,000	\$1,874	0.00169
Tract # 860701	\$1,308,000	\$1,663	0.00127
Tract # 860702	-	-	-
Tract # 860703	\$7,345,000	\$2,716	0.00036
Tract # 860801	\$18,232,000	\$14,700	0.00080
Tract # 860802	\$6,555,000	\$2,550	0.00038
Tract # 860900	\$50,202,000	\$44,516	0.00088
Tract # 861001	\$25,372,000	\$15,362	0.00060
Tract # 861003	\$5,294,000	\$2,757	0.00052
Tract # 861004	-	-	-
North Beach	\$26,723,000	\$23,562	0.00088
Chesapeake Beach	\$52,553,000	\$41,391	0.00078
TOTAL	\$214,202,000	\$171,770	0.00081

Figure 5.6 - Losses per Tract from 1% chance per year Flood in Calvert County



Another means of gauging the vulnerability within Calvert County to flooding was determined to be the vulnerability of critical facilities to the 1% chance per year flood return periods. Within the county, 44 critical facilities were assessed with regard to flood risk (**Table 4.3-3**). Although the North Beach Volunteer Fire Department parking lot does show evidence of flooding in the 1% flood event, the building remains untouched. Additionally, the Calvert County Sheriff's Substation shows a similar pattern with the parking lot being flooded, while the building itself remains out of the flood zone. In Summary, no facilities in Calvert County fall completely within the 1% chance per year floodplain.

Table 5.2
Potential Damage to Critical Facilities from Flood by Type*

Type	Number of Critical Facilities	1% chance per year Flood			0.2% chance per year Flood		
		> 50% Chance of Minor Damage	> 50% Chance of Moderate Damage	> 50% Chance of Severe Damage	> 50% Chance of Minor Damage	> 50% Chance of Moderate Damage	> 50% Chance of Severe Damage
EOCs	1	0	0	0	0	0	0
Fire Stations	5	0	0	0	0	0	0
Hospitals	1	0	0	0	0	0	0
Police Stations	2	0	0	0	0	0	0
Schools	35	0	0	0	0	0	0
TOTAL	44	0	0	0	0	0	0

*Moderate: 5 to 30 percent damage, Slight: 1 to 5 percent damage, Negligible: less than 1 percent damage

Repetitive Loss Properties

A repetitive loss property is an NFIP-insured property that has had at least four paid flood losses of more than \$1,000, or has had two paid flood losses within 10 years that, in aggregate, equal or exceed the value of the property, or has had three or more paid losses that, in aggregate, equal or exceed the value of the property.

Repetitive loss properties not only increase the NFIP's annual losses and the need for borrowing; but they drain funds needed to prepare for catastrophic events. Community leaders and residents are also concerned with the repetitive loss problem because residents' lives are disrupted and may be threatened by the continual flooding. Addressing repetitive loss properties through the implementation of specific mitigation projects represent one of the most effective ways to reduce future flood losses.

According to FEMA as of October 2016, Calvert County has 41 unmitigated repetitive loss properties. According to their property address, the following communities contain these repetitive loss properties:

- Lusby (Cove Point)– 16 properties
- Saint Leonard (Long Beach) – 6 properties
- Saint Leonard (J Llowd Bowen Road) – 1 property
- Huntingtown (Neeld Estate) – 5 properties
- Town of North Beach – 5 properties
- Town of Chesapeake Beach – 3 properties
- Broomes Island – 2 properties
- Owings – 2 properties
- Solomons – 1 property

The loss and policy statistics for Calvert County have been included in **Tables 5.3 and 5.4** and are accurate as of October 31, 2016. The loss statistics are totals from January 1, 1978 to October 31, 2016. Calvert County incurs 2.63 percent of the total losses for the State of Maryland and 1.215 percent of the total policies

Table 5.3 Losses and total payments for Calvert County and Municipalities

Area	Losses	Total Payments
Maryland	18,136	\$287,257,099.64
Calvert County	313	\$4,470,955.17
Town of Chesapeake Beach	70	\$1,550,673.09
City of North Beach	95	\$2,624,714.48

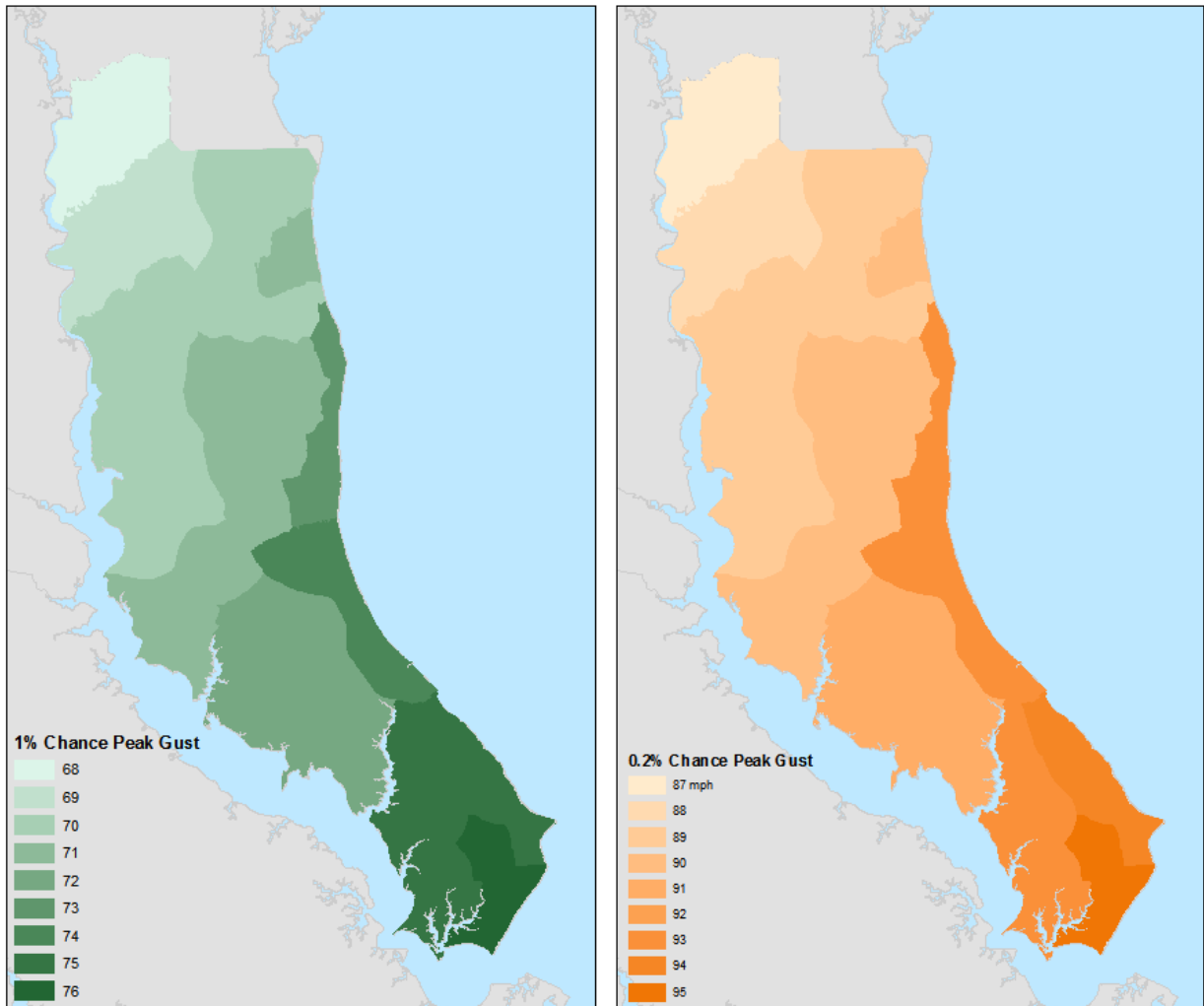
Table 5.4 Number of Insurance Policies in Force for Calvert County and Municipalities

Area	Policies in Force	Insurance in Force	Whole Written Premiums in Force
Maryland	67,139	\$15,576,282,400	\$39,555,407
Calvert County	533	\$152,661,700	\$481,319
Town of Chesapeake Beach	173	\$52,423,000	\$123,043
City of North Beach	110	\$25,950,600	\$129,039

Coastal Wind

Historical evidence shows that the State of Maryland is vulnerable to severe, hurricane and tropical storm-force winds. The approach for determining vulnerability to coastal winds included a number of factors. HAZUS-MH was used for wind speed data as well as an inventory and in-house damage functions, which were used in estimating losses. The potential hurricane wind gusts that could affect the area range from 68 to 75 mph for a 1% chance per year event to 87 to 95 mph for a 0.2% chance per year event, with the stronger winds being in the southern and eastern quadrants of the county (**Figure 5.7**).

Figure 5.7 - Potential Hurricane Wind Gusts for 1% and 0.2% per year Wind Events



Modeled from HAZUS-MH, the total built property exposure to coastal winds (both building and contents) in the county is \$19,652,598 (Table 5.5).

Table 5.5
Potential Annualized Losses from Hurricane Winds by Jurisdiction

Jurisdiction	Total Exposure	Estimated Losses	Loss Ratio
Tract # 860101	\$817,641,000	\$3,224	0.0000039
Tract # 860102	\$777,814,000	\$768	0.0000009
Tract # 860200	\$1,441,435,000	\$2,519	0.0000017
Tract # 860300	\$966,690,000	\$1,773	0.0000018
Tract # 860401	\$1,347,643,000	\$4,064	0.0000030
Tract # 860402	\$557,201,000	\$1,606	0.0000028
Tract # 860501	\$1,303,107,000	\$3,157	0.0000024
Tract # 860502	\$734,435,000	\$3,280	0.0000044
Tract # 860600	\$1,673,133,000	\$3,075	0.0000018

Tract # 860701	\$730,734,000	\$3,768	0.0000051
Tract # 860702	\$892,065,000	\$1,177	0.0000013
Tract # 860703	\$656,391,000	\$6,947	0.0000105
Tract # 860801	\$1,621,833,000	\$28,836	0.0000177
Tract # 860802	\$1,019,027,000	\$23,243	0.0000228
Tract # 860900	\$1,709,975,000	\$41,805	0.0000244
Tract # 861001	\$325,264,000	\$9,772	0.0000300
Tract # 861003	\$1,277,882,000	\$43,732	0.0000342
Tract # 861004	\$1,239,594,000	\$46,031	0.0000371
North Beach	\$97,076,000	\$293	0.0000030
Chesapeake Beach	\$646,451,000	\$1,925	0.0000029
TOTAL	\$19,835,391,000	\$230,995	0.0000116

Another means of gauging the vulnerability within Calvert County to coastal wind was the vulnerability of critical facilities to the 1% chance per year and 0.2% chance per year wind return periods. During a 1% chance per year wind event, no critical facilities had more than a 50% chance of sustaining minor, moderate, or severe damage. In a 0.2% chance per year wind event, 1 facility has a better than 50% chance of sustaining severe (10 to 50% damage), (**Table 5.6**).

Table 5.6
Potential Damage to Critical Facilities from Hurricane Winds by Type¹¹

Type	Number of Critical Facilities	1% chance per year Wind			0.2% chance per year Wind		
		> 50% Chance of Minor Damage	> 50% Chance of Moderate Damage	> 50% Chance of Severe Damage	> 50% Chance of Minor Damage	> 50% Chance of Moderate Damage	> 50% Chance of Severe Damage
EOCs	1	0	0	0	0	0	0
Fire Stations	5	0	0	0	0	0	0
Hospitals	1	0	0	0	0	0	0
Police Stations	2	0	0	0	0	0	0
Schools	35	0	0	0	0	0	0
TOTAL	44	0	0	0	0	0	0

Tornado

Historical evidence shows that Calvert County is vulnerable to tornadic activity. This particular hazard may result from severe thunderstorm activity or may occur during a tropical storm or hurricane. Because it cannot be predicted where a tornado may touch down, all buildings and facilities are considered to be exposed to this hazard and could potentially be impacted. It is also not possible to estimate the number of residential, commercial, and other buildings or facilities that may experience losses.

¹¹ The definitions used are as follows. Minor: less than 2 percent damage. Moderate: 3 to 10 percent damage. Severe: 10 to 50 percent damage.

Therefore, the approach to determining the County's vulnerability to a tornado is to examine not just tornado events in the County boundary, but to look at all of the events of the neighboring counties within 25 miles of the boundary of the County as well. A tornado that impacts Charles County, MD (to the west of Calvert County) could have just as easily impacted Calvert County instead. The actual location of the tornado at this scale of analysis is simply a matter of luck rather than any of the County's unique geographical factors.

Because the neighboring jurisdictions are of differing sizes and densities, the results for must be scaled appropriately. For example, Dorchester County had 0.44 tornado events per year, the same as Calvert County's 0.44 events per year. But, Dorchester County is bigger than Calvert – one would expect the larger county to have more tornado events. In fact, Calvert County is 35% the size of Dorchester County. Therefore, a county the size of Dorchester would have been impacted by 0.154 events per year if the county had been the same size as Calvert. The annualized losses are scaled similarly, but use numbers of housing units as a proxy for differences in building exposure.

Table 5.7 shows the number of events in Calvert County and those counties bordering Calvert County. **Table 5.8** shows the number of annual events and the amount of annual loss in Calvert County and bordering counties after the appropriate scale factor has been applied. **Table 5.9** shows annualized potential losses from tornado events by jurisdiction within Calvert County. The total estimated annualized losses for the county equal \$315,347.22.

Table 5.7
Potential Annualized Losses from Tornadoes

Jurisdiction	Events	Losses	Years	Annual Events	Annual Losses
Calvert County, MD	16	\$11,352,500.00	36	0.444	\$315,347.22
St. Mary's County, MD	28	\$4,138,500.00	37	0.757	\$111,851.35
Charles County, MD	23	\$116,437,000.00	37	0.622	\$3,146,945.95
Prince George's County, MD	22	\$110,930,000.00	23	0.957	\$4,823,043.48
Anne Arundel County, MD	14	\$6,506,000.00	33	0.424	\$197,151.52
Talbot County, MD	3	\$26,000.00	22	0.136	\$1,181.82
Dorchester County, MD	11	\$5,722,000.00	25	0.440	\$228,880.00
Average	16.7	\$36,444,571.43	30.4	0.540	\$1,260,628.76

Table 5.8
Normalized Occurrences and Losses from Tornadoes

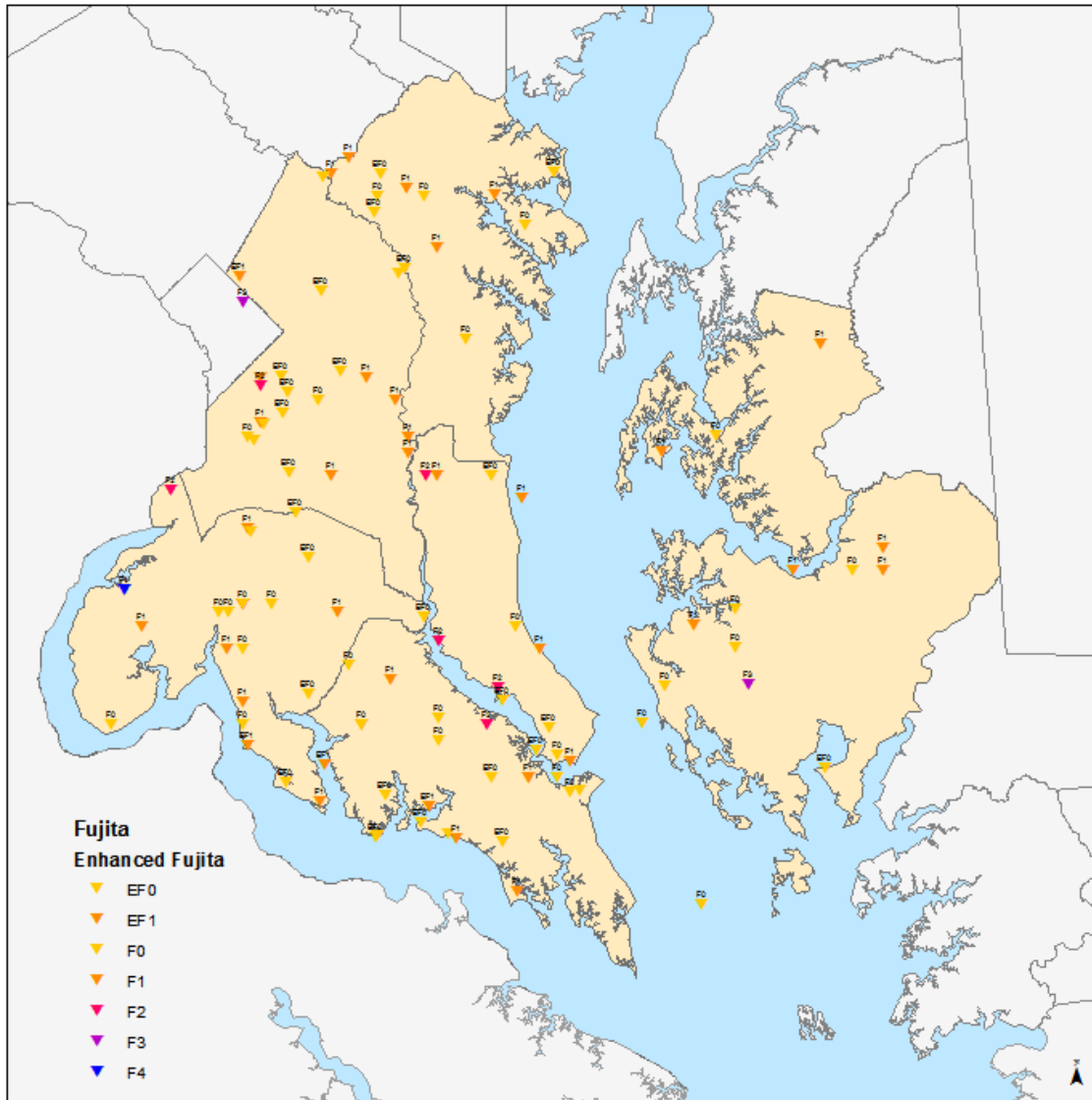
Jurisdiction	Annual Events	Area Scale Factor	Scaled Events	Annual Loss	HU Scale	Scaled Annual Loss
Calvert County, MD	0.444	1.000	0.444	\$315,347.22	1.000	\$315,347.22
St. Mary's County, MD	0.757	2.214	0.342	\$111,851.35	1.242	\$90,057.45
Charles County, MD	0.622	1.864	0.334	\$3,146,945.95	1.662	\$1,893,469.28
Prince George's County, MD	0.957	1.446	0.662	\$4,823,043.48	9.594	\$502,714.56
Anne Arundel County, MD	0.424	1.704	0.249	\$197,151.52	6.327	\$31,160.35
Talbot County, MD	0.136	1.382	0.098	\$1,181.82	0.582	\$2,030.62
Dorchester County, MD	0.440	2.849	0.154	\$228,880.00	0.485	\$471,917.53

The location and magnitude of past tornado events within 25 miles of the county is presented in **Figure 4.3-8**.

Table 5.9
Potential Annualized Losses from Tornadoes by Jurisdiction

Jurisdiction	Total Exposure	% of Total Exposure	Estimated Loss
Tract # 860101	\$817,641,000	4.1%	\$19,367.80
Tract # 860102	\$777,814,000	3.9%	\$18,423.03
Tract # 860200	\$1,441,435,000	7.3%	\$34,484.13
Tract # 860300	\$966,690,000	4.9%	\$23,146.88
Tract # 860401	\$1,347,643,000	6.8%	\$32,122.20
Tract # 860402	\$557,201,000	2.8%	\$13,226.79
Tract # 860501	\$1,303,107,000	6.6%	\$31,177.43
Tract # 860502	\$734,435,000	3.7%	\$17,478.26
Tract # 860600	\$1,673,133,000	8.4%	\$39,680.36
Tract # 860701	\$730,734,000	3.7%	\$17,478.26
Tract # 860702	\$892,065,000	4.5%	\$21,257.34
Tract # 860703	\$656,391,000	3.3%	\$15,588.71
Tract # 860801	\$1,621,833,000	8.2%	\$38,735.59
Tract # 860802	\$1,019,027,000	5.1%	\$24,091.65
Tract # 860900	\$1,709,975,000	8.6%	\$40,625.13
Tract # 861001	\$325,264,000	1.6%	\$7,558.16
Tract # 861003	\$1,277,882,000	6.4%	\$30,232.66
Tract # 861004	\$1,239,594,000	6.2%	\$29,287.89
North Beach	\$97,076,000	0.5%	\$2,361.93
Chesapeake Beach	\$646,451,000	3.3%	\$19,367.80
TOTAL	\$19,835,391,000	100%	\$472,385.29

Figure 5.8 Location and Magnitude of Past Tornado Events within 25 miles



Drought

Although the State of Maryland as a whole is vulnerable to drought, estimated potential losses are somewhat difficult to calculate because drought causes little damage to the built environment, mostly affecting crops and farmland. Therefore, it is assumed that all buildings and facilities are exposed to drought but would experience negligible damage in the occurrence of a drought event.

The approach used to determine vulnerability within Calvert County consisted of a number of factors. Statistical data for the past 100 years from the University of Nebraska, developed based on Palmer Drought and Crop Severity Indices, was analyzed. Drought event frequency/impact was then determined for Calvert County. Also used was USDA agriculture data from 1997. Drought impact on the non-irrigated agriculture products profile was then determined. **Table 5.10** shows the number of events in Calvert County and those counties bordering Calvert County.

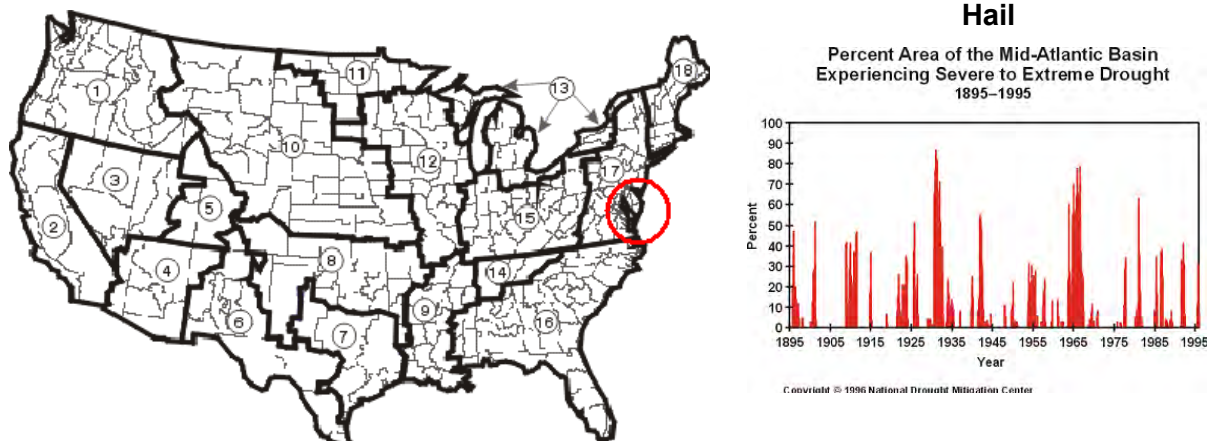
Table 5.10
Annualized Losses from Drought

Jurisdiction	Events	Losses	Years	Annual Events	Annual Losses
Calvert County, MD	16	\$334,000	18	0.889	\$18,555.56
St. Mary's County, MD	12	\$334,000	18	0.667	\$18,555.56
Charles County, MD	12	\$334,000	18	0.667	\$18,555.56
Prince George's County, MD	11	\$334,000	19	0.579	\$17,578.95
Anne Arundel County, MD	12	\$334,000	19	0.632	\$17,578.95
Talbot County, MD	59	-	19	3.105	\$0.00
Dorchester County, MD	1	\$2,000,000	18	0.056	\$111,111.11
Average	17.571	\$524,285.71			\$28,847.95

There was one notable drought event that occurred on November 1, 1998. This event is the sole cause of the damaged notes above in each county. This event was caused by abnormally low rainfall totals over a 5-month period. This drought event contributed to \$40 million in damage to the fall harvest as well as 303 reported fires across the state of Maryland.

Figure 4.3-9 shows the hazard profile for drought in the geographic area surrounding Calvert County¹².

Figure 4.3-9
Hazard Profile for Drought in and Around Calvert County



The State of Maryland is minimally vulnerable to hail storms. Hail does occur in the Mid-Atlantic but is usually not large enough nor widespread enough to cause any significant damage to the built environment. It does, however, have the potential of harming crops in the agricultural areas of Calvert County.

¹² This information was obtained from the National Drought Mitigation Center (www.drought.unl.edu), which helps people and institutions develop and implement measures to reduce societal vulnerability to drought, stressing preparedness and risk management rather than crisis management.

The approach to determining vulnerability to hail is similar to that used for severe thunderstorm wind. Historical hail loss data from the National Oceanic and Atmospheric Administration (NOAA) was gathered for Calvert County and the neighboring counties. All historical losses were scaled to account for inflation, and average historic losses were calculated (**Table 5.11**). As with tornadoes (above), because the neighboring jurisdictions are of differing sizes and densities, the results must be normalized appropriately using the method described previously (**Table 5.12**).

Because the total estimated annualized losses for the county is negligible (\$263), annualized expected losses from hail events by jurisdiction were not calculated. The annualized loss ratio is 0.00000018.

Table 5.11
Potential Annualized Losses from Hail

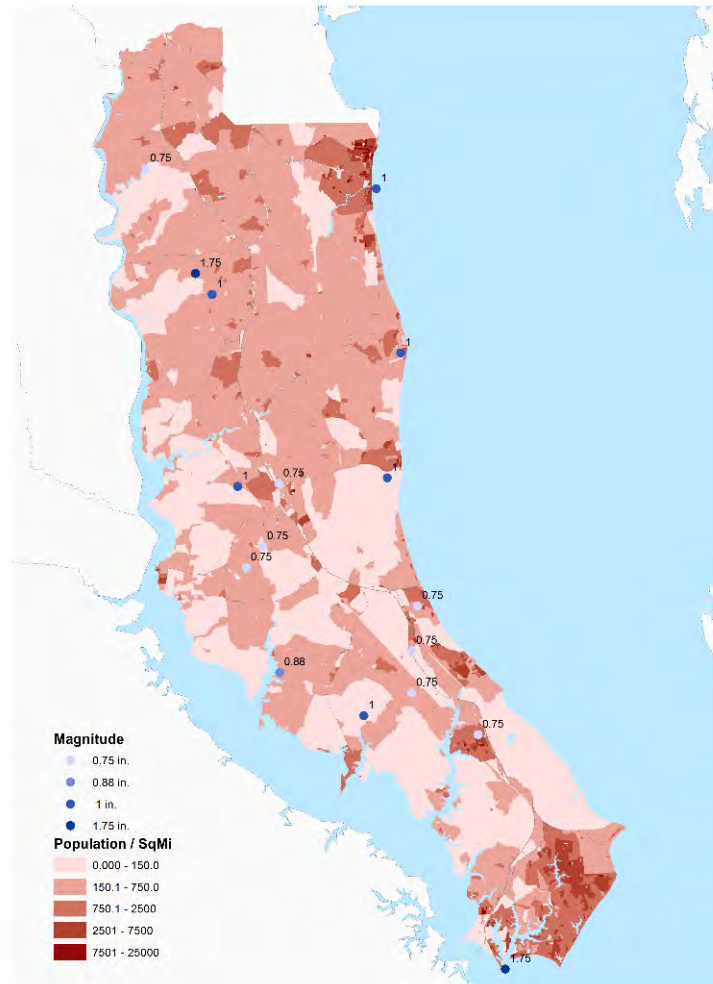
Jurisdiction	Events	Losses	Years	Annual Events	Annual Losses
Calvert County, MD	36	\$6,050.00	23	1.565	\$263.04
St. Mary's County, MD	49	\$12,000.00	35	1.400	\$342.86
Charles County, MD	76	\$806,500.00	34	2.235	\$23,720.59
Prince George's County, MD	85	\$12,000.00	38	2.237	\$315.79
Anne Arundel County, MD	68	\$17,000.00	33	2.061	\$515.15
Talbot County, MD	14	\$0.00	19	0.737	\$0.00
Dorchester County, MD	24	\$0.00	22	1.091	\$0.00
Normalized Average	50.286	\$121,935.71	29.143	1.618	\$3,593.92

Table 5.12
Normalized Occurrences and Losses from Hail

Jurisdiction	Annual Events	Area Scale Factor	Scaled Events	Annual Loss	HU Scale	Scaled Annual Loss
Calvert	1.57	1.00	1.57	\$263	1.00	\$263
St. Mary's	1.40	0.98	1.37	\$343	1.00	\$341
Charles	2.24	0.76	1.70	\$23,721	0.75	\$17,739
Prince George's	2.24	0.71	1.60	\$316	0.13	\$40
Anne Arundel	2.06	0.85	1.75	\$515	0.19	\$100
Talbot	0.74	1.29	0.95	\$0	2.10	\$0
Dorchester	1.09	0.61	0.67	\$0	2.48	\$0

Figure 5.9 shows recorded hail activity by hailstone size, relative to population distribution within the county.

Figure 5.9 - Recorded Hail Activity by Hailstone Size in Relation to Population Distribution



Winter Storms

Historical evidence shows that Calvert County is quite vulnerable to winter storms, with several occurring each year. Because winter storms generally impact large areas, all buildings and facilities are considered to be exposed to this hazard and could potentially be impacted. It is also not possible to estimate the number of residential, commercial, and other buildings or facilities that may experience losses. Additionally, it is important to note that for winter storms, some factors that contribute to a community’s actual and perceived losses are not reflected in this analysis, such as removal of snow from roadways, debris clean-up, some indirect losses from power outages, etc.

The approach to determining vulnerability to winter storms is similar to that used for tornadoes. Historical winter storm loss data from the National Oceanic and Atmospheric Administration (NOAA) was gathered for Calvert County and the neighboring counties. All historical losses were scaled to account for inflation, and average historic losses were calculated (**Table 5.13**). As with tornadoes (above), because the neighboring jurisdictions are of differing sizes and densities, the results must be normalized appropriately using the method described previously (**Table 5.14**). **Table 5.15** shows annualized expected losses from winter storm events by jurisdiction within Calvert County. The total estimated annualized losses for the county equal \$500 and an annualized loss ratio of 0.0000013.

Table 5.13
Potential Annualized Losses from Winter Storms

Jurisdiction	Events	Losses	Years	Annual Events	Annual Losses
Calvert County, MD	81	\$10,000.00	20	4.050	\$500.00
St. Mary's County, MD	78	\$15,000.00	20	3.900	\$750.00
Charles County, MD	93	\$5,000.00	20	4.650	\$250.00
Prince George's County, MD	108	\$1,090,000.00	20	5.400	\$54,500.00
Anne Arundel County, MD	111	\$2,172,000.00	20	5.550	\$108,600.00
Talbot County, MD	110	\$400,000.00	20	5.500	\$20,000.00
Dorchester County, MD	67	\$0.00	20	3.350	\$0.00
Average	92.571	\$527,428.57	20.000	4.629	\$26,371.43

Table 5.14
Normalized Occurrences and Losses from Winter Storms

Jurisdiction	Annual Events	Area Scale Factor	Scaled Events	Annual Loss	AL Scale	Scaled Annual Loss
Calvert County, MD	0.89	1.00	0.89	\$18,556	1.00	\$18,556
St. Mary's County, MD	0.67	0.98	0.65	\$18,556	0.11	\$2,024
Charles County, MD	0.67	0.76	0.51	\$18,556	0.21	\$3,830
Prince George's County, MD	0.58	0.71	0.41	\$17,579	0.13	\$2,363
Anne Arundel County, MD	0.63	0.85	0.54	\$17,579	1.00	\$17,566
Talbot County, MD	3.11	1.29	4.01	\$0	0.05	\$0
Dorchester County, MD	0.06	0.61	0.03	\$111,111	0.02	\$2,442

Table 5.15
Potential Annualized Losses from Winter Storms by Jurisdiction

Jurisdiction	Total Exposure	% of Total Exposure	Estimated Losses
Tract # 860101	\$817,641,000	4.1%	\$1,081.23
Tract # 860102	\$777,814,000	3.9%	\$1,028.49
Tract # 860200	\$1,441,435,000	7.3%	\$1,925.11
Tract # 860300	\$966,690,000	4.9%	\$1,292.20
Tract # 860401	\$1,347,643,000	6.8%	\$1,793.26
Tract # 860402	\$557,201,000	2.8%	\$738.40
Tract # 860501	\$1,303,107,000	6.6%	\$1,740.51
Tract # 860502	\$734,435,000	3.7%	\$975.74
Tract # 860600	\$1,673,133,000	8.4%	\$2,215.20
Tract # 860701	\$730,734,000	3.7%	\$975.74
Tract # 860702	\$892,065,000	4.5%	\$1,186.71
Tract # 860703	\$656,391,000	3.3%	\$870.26
Tract # 860801	\$1,621,833,000	8.2%	\$2,162.46

Tract # 860802	\$1,019,027,000	5.1%	\$1,344.94
Tract # 860900	\$1,709,975,000	8.6%	\$2,267.94
Tract # 861001	\$325,264,000	1.6%	\$421.94
Tract # 861003	\$1,277,882,000	6.4%	\$1,687.77
Tract # 861004	\$1,239,594,000	6.2%	\$1,635.03
North Beach	\$97,076,000	0.5%	\$131.86
Chesapeake Beach	\$646,451,000	3.3%	\$1,081.23
TOTAL	\$19,835,391,000	100%	\$26,371.43

Thunderstorm Wind

Calvert County, according to historical records, is affected by severe thunderstorms several times a year. The strong winds and lightning generated from severe thunderstorms pose a threat to the residents, the built environment, and particularly the trees within the County. However, because severe thunderstorms are not spatially-constrained, one must consider the entire County at risk. In addition, the extent of damage from severe thunderstorm wind may be either localized or widespread but it is rarely consistent across space. Therefore, it is impossible to predict if certain areas of the county may be more vulnerable than others and even to estimate the number of buildings that may suffer loss from a severe thunderstorm wind.

The approach to determining vulnerability to severe thunderstorms is similar to that used for tornadoes. Historical severe thunderstorm loss data from the National Oceanic and Atmospheric Administration (NOAA) was gathered for Calvert County and the neighboring counties. All historical losses were scaled to account for inflation, and average historic losses were calculated (**Table 5.16**). As with tornadoes (above), because the neighboring jurisdictions are of differing sizes and densities, the results must be normalized appropriately using the method described previously (**Table 5.17**). **Table 5.18** shows annualized expected losses from severe thunderstorm events by jurisdiction within Calvert County. The total estimated annualized losses for the county equal \$129,507 and an annualized loss ratio of 0.0000065.

Table 5.16
Potential Annualized Losses from Severe Thunderstorms

Jurisdiction	Events	Losses	Years	Annual Events	Annual Losses
Calvert County, MD	220	\$2,850,000.00	36	6.111	\$79,166.67
St. Mary's County, MD	242	\$6,840,600.00	39	6.205	\$175,400.00
Charles County, MD	294	\$2,404,000.00	39	7.538	\$61,641.03
Prince George's County, MD	381	\$8,760,750.00	37	10.297	\$236,777.03
Anne Arundel County, MD	439	\$8,582,250.00	39	11.256	\$220,057.69
Talbot County, MD	218	\$1,811,010.00	38	5.737	\$47,658.16
Dorchester County, MD	87	\$2,833,000.00	33	2.636	\$85,848.48
Average	268.714	\$4,868,801.43	37.286	7.112	\$129,507.01

Table 5.17
Normalized Occurrences and Losses from Severe Thunderstorms

Jurisdiction	Annual Events	Area Scale Factor	Scaled Events	Annual Loss	AL Scale	Scaled Annual Loss
Calvert County, MD	6.11	1.00	6.11	\$79,167	1.00	\$79,167
St. Mary's County, MD	6.21	0.98	6.08	\$175,400	1.00	\$174,639
Charles County, MD	7.54	0.76	5.73	\$61,641	0.75	\$46,097
Prince George's County, MD	10.30	0.71	7.36	\$236,777	0.13	\$29,655
Anne Arundel County, MD	11.26	0.85	9.57	\$220,058	0.19	\$42,552
Talbot County, MD	5.74	1.29	7.41	\$47,658	2.10	\$100,061
Dorchester County, MD	2.64	0.61	1.61	\$85,848	2.48	\$213,159

Table 5.18
Potential Annualized Losses from Thunderstorms by Jurisdiction

Jurisdiction	Total Exposure	% of Total Exposure	Estimated Losses
Tract # 860101	\$817,641,000	4.1%	\$5,309.78
Tract # 860102	\$777,814,000	3.9%	\$5,050.77
Tract # 860200	\$1,441,435,000	7.3%	\$9,454.01
Tract # 860300	\$966,690,000	4.9%	\$6,345.84
Tract # 860401	\$1,347,643,000	6.8%	\$8,806.47
Tract # 860402	\$557,201,000	2.8%	\$3,626.19
Tract # 860501	\$1,303,107,000	6.6%	\$8,547.46
Tract # 860502	\$734,435,000	3.7%	\$4,791.75
Tract # 860600	\$1,673,133,000	8.4%	\$10,878.5
Tract # 860701	\$730,734,000	3.7%	\$4,791.75
Tract # 860702	\$892,065,000	4.5%	\$5,827.81
Tract # 860703	\$656,391,000	3.3%	\$4,273.73
Tract # 860801	\$1,621,833,000	8.2%	\$10,619.57
Tract # 860802	\$1,019,027,000	5.1%	\$6,604.85
Tract # 860900	\$1,709,975,000	8.6%	\$11,137.60
Tract # 861001	\$325,264,000	1.6%	\$2,072.11
Tract # 861003	\$1,277,882,000	6.4%	\$8,288.44
Tract # 861004	\$1,239,594,000	6.2%	\$8,029.43
North Beach	\$97,076,000	0.5%	\$647.53
Chesapeake Beach	\$646,451,000	3.3%	\$4,273.73
TOTAL	\$19,835,391,000	100.0%	\$129,507.01

Earthquake

Figure 5.10 shows the potential ground motion for a 1% chance per year and 0.2% chance per year earthquake. While Calvert County has felt earthquakes every so often, none have been significant enough to cause any damage for well over 100 years. The coastal plain of the Mid-Atlantic is notorious for being a seismically quiet zone. However, if a serious earthquake were to occur, the losses would likely be significant.

This explains the amount of potential annualized losses for the county of \$530,180 (**Table 5.19**) or an annualized loss ratio of 0.0000267. **Table 5.20** shows potential damage to critical facilities from earthquake events by jurisdiction within Calvert County. None are predicted to suffer more than negligible damage in either a 1% or 0.2% chance per year earthquake.

Figure 5.10

Peak Ground Acceleration (Ground Motion) for 1% and 0.2% chance per year Events

1% chance per year Ground Motion

0.2% chance per year Ground Motion

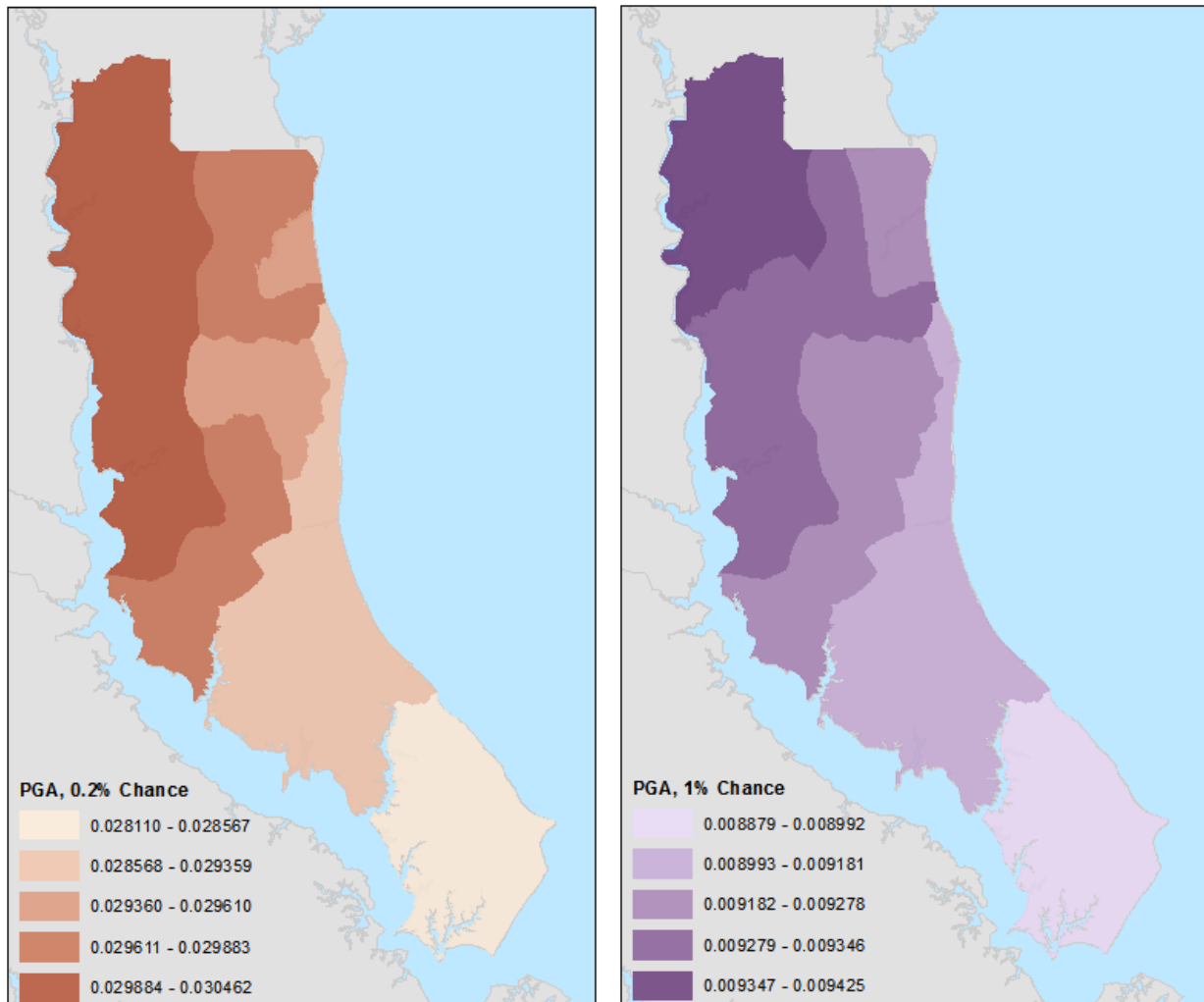


Table 5.19
Potential Annualized Losses from Earthquake per Jurisdiction

Jurisdiction	Total Exposure	Estimated Losses	Loss Ratio
Tract # 860101	\$817,641,000	\$23,480	0.0000011
Tract # 860102	\$777,814,000	\$23,290	0.0000011
Tract # 860200	\$1,441,435,000	\$40,660	0.0000020
Tract # 860300	\$966,690,000	\$25,900	0.0000013
Tract # 860401	\$1,347,643,000	\$36,200	0.0000018
Tract # 860402	\$557,201,000	\$15,070	0.0000007
Tract # 860501	\$1,303,107,000	\$33,950	0.0000017
Tract # 860502	\$734,435,000	\$18,450	0.0000009
Tract # 860600	\$1,673,133,000	\$45,400	0.0000022
Tract # 860701	\$730,734,000	\$23,030	0.0000011
Tract # 860702	\$892,065,000	\$27,920	0.0000014
Tract # 860703	\$656,391,000	\$18,060	0.0000009
Tract # 860801	\$1,621,833,000	\$41,220	0.0000020
Tract # 860802	\$1,019,027,000	\$25,690	0.0000012
Tract # 860900	\$1,709,975,000	\$43,970	0.0000022
Tract # 861001	\$325,264,000	\$8,360	0.0000004
Tract # 861003	\$1,277,882,000	\$30,940	0.0000015
Tract # 861004	\$1,239,594,000	\$28,580	0.0000014
North Beach	\$97,076,000	\$2,610	0.0000001
Chesapeake Beach	\$646,451,000	\$17,400	0.0000008
TOTAL	\$19,835,391,000	\$530,180	0.0000267

Table 5.20
Potential Damage to Critical Facilities from Earthquake per Type¹³

Type	Number of Critical Facilities	1% chance per year Earthquake			0.2% chance per year Earthquake		
		> 50% Chance of Minor Damage	> 50% Chance of Moderate Damage	> 50% Chance of Severe Damage	> 50% Chance of Minor Damage	> 50% Chance of Moderate Damage	> 50% Chance of Severe Damage
EOCs	1	0	0	0	0	0	0
Fire Stations	5	0	0	0	0	0	0
Hospitals	1	0	0	0	0	0	0
Police Stations	2	0	0	0	0	0	0
Schools	35	0	0	0	0	0	0
TOTAL	44	0	0	0	0	0	0

¹³ The definitions used are as follows. Negligible: less than 1 percent damage. Slight: 1 to 5 percent damage. Moderate: 5 to 30 percent damage. Extensive (where applicable): 30 to 60 percent damage.

Dam/Levee Failure

The approach for determining vulnerability to dam and/or levee failure consists of a number of factors. Data from the USACE National Inventory of Dams (NID)¹⁴ in addition to the HAZUS-MH demographic inventory was used, with an assumption that dam breaks most likely will occur at the time of maximum capacity. **Table 5.21** shows dams in Calvert County and their associated Hazard Risk Levels, along with the year build and structure height in feet.

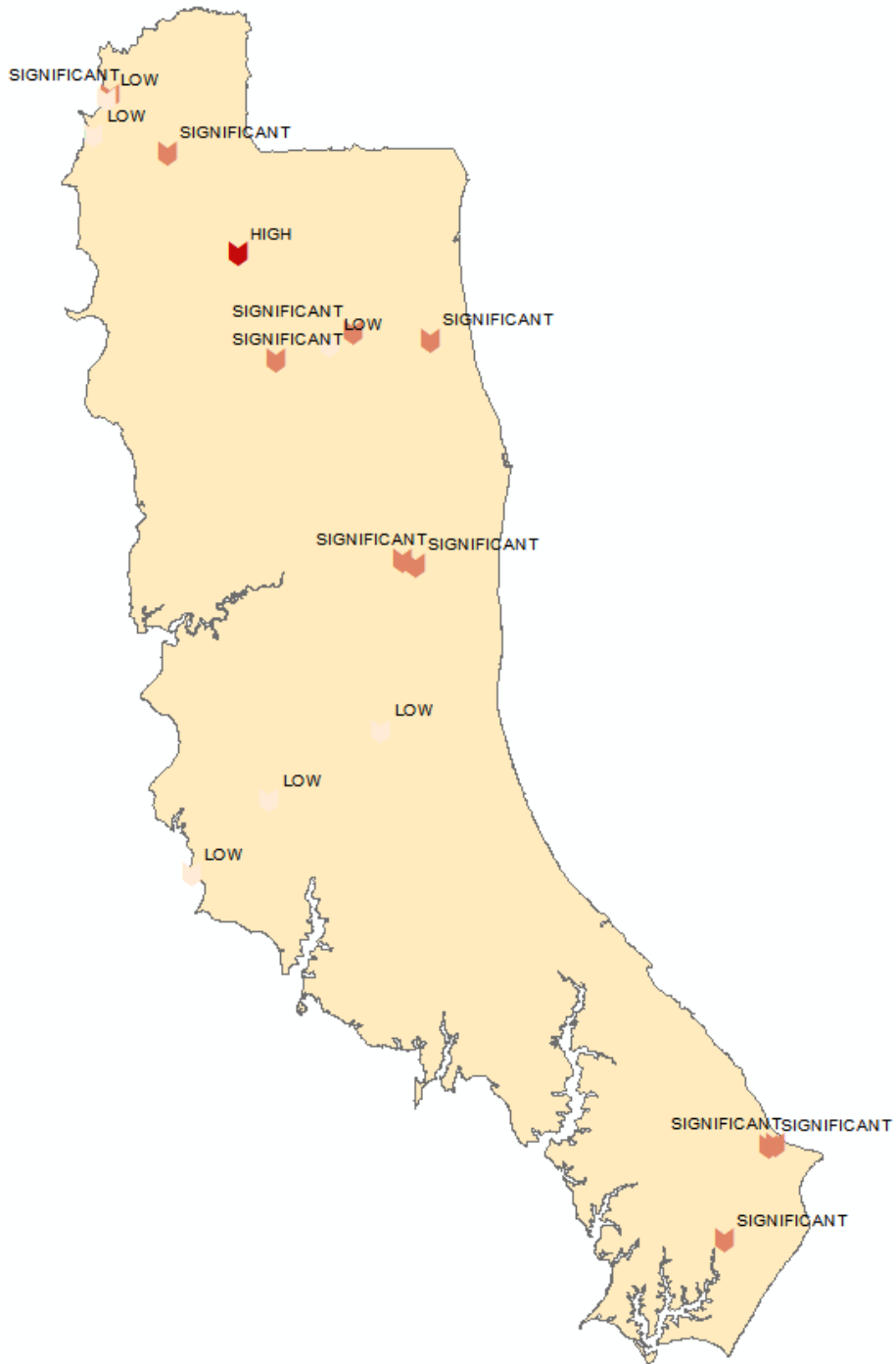
Table 5.21
Estimated Exposure of People to Dam Failure

Dam Name	Hazard	Ht(feet)	Built
Ferry Landing Woods Pond	Low	11	1981
Calvert Gateway	Significant	10	2000
Shores of Calvert Upper Dam	Significant	5	1972
Shores of Calvert Lower Dam	Low	15	1972
Victoria Station Community Lake	High	105	1986
Sunderland Railroad Embankment Pond	Low	25	N/A
Lake Ridge Community Pond Dam	Significant	10	1969
Lake Karylbrook Community Pond	Significant	67	N/A
Queensberry Drive Swm	Significant	52	2001
Prince Frederick Wwtp Pond 2	Low	15	2002
Bowens Farm Pond	Low	40	1970
Starkey Pond	Low	42	N/A
Cove Point Lng Secondary Dam	Significant	7	1974
Cove Point Lng Main Dam	Significant	20	1974
Chesapeake Ranch Estates Dam	High	27	1965
Queensberry Drive Playground Dam	Significant	42	2001
Twin Lakes Upper Pond (Hoile Lane)	Significant	31	1970

Figure 5.11 shows the location of dams within Calvert County, along with their hazard ranking (high, significant or low), in relation to population density.

¹⁴ With the National Dam Inspection Act of 1972, the U.S. Congress authorized the U.S. Army Corps of Engineers (USACE) to inventory dams located in the United States. The Water Resources Development Act of 1986 authorized USACE to maintain and periodically publish an updated National Inventory of Dams (NID).

Figure 5.11
Location of Dams with Hazard Ranking within Calvert County



Other Hazards

Though communities in the State of Maryland recognize that the state is vulnerable to other hazards such as wildfire, erosion, sinkholes, landslides, tsunamis, or terrorism, a high-level detailed risk assessment was not completed for Calvert County due to the low level of risk and/or vulnerability for these hazards within the area as a whole as compared with other hazards.

Conclusions on Hazard Risk

Table 5.22 summarizes the annualized expected losses presented for each natural hazard in this section. Based upon the methodologies described in the beginning of this section, the risk from natural hazards in Calvert County can be rated on a scale of Low, Moderate or High for each identified natural hazard based upon these annualized losses and an annualized loss ratio (**Table 5.23**). Because of the nature of human-caused hazards and the nature in which risk and vulnerability is presented for human-caused hazards, it is not possible to rank them fairly in direct comparison with natural hazards. In summary, all human-caused hazards addressed in this section—terrorism (chemical, radiological and biological agents), hazardous materials incidents (HazMat), and energy pipeline failures—warrant an overall rating of low risk for Calvert County.

Table 5.22
Potential Annualized Loss Rates per Jurisdiction

Jurisdiction	Flooding	Coastal Wind	Tornado	Drought	Hail	Winter Storm	Thunder -storm	Earthquake
Tract # 860101	0.0000000	0.0000039	0.0000237	---	---	0.0000013	0.0000065	0.0000011
Tract # 860102	-	0.0000009	0.0000237	---	---	0.0000013	0.0000065	0.0000011
Tract # 860200	0.0004600	0.0000017	0.0000239	---	---	0.0000013	0.0000066	0.0000020
Tract # 860300	0.0026900	0.0000018	0.0000239	---	---	0.0000013	0.0000066	0.0000013
Tract # 860401	0.0002700	0.0000030	0.0000238	---	---	0.0000013	0.0000065	0.0000018
Tract # 860402	-	0.0000028	0.0000237	---	---	0.0000013	0.0000065	0.0000007
Tract # 860501	-	0.0000024	0.0000239	---	---	0.0000013	0.0000066	0.0000017
Tract # 860502	0.0007900	0.0000044	0.0000238	---	---	0.0000013	0.0000065	0.0000009
Tract # 860600	0.0016900	0.0000018	0.0000237	---	---	0.0000013	0.0000065	0.0000022
Tract # 860701	0.0012700	0.0000051	0.0000239	---	---	0.0000013	0.0000066	0.0000011
Tract # 860702	-	0.0000013	0.0000238	---	---	0.0000013	0.0000065	0.0000014
Tract # 860703	0.0003600	0.0000105	0.0000237	---	---	0.0000013	0.0000065	0.0000009
Tract # 860801	0.0008000	0.0000177	0.0000239	---	---	0.0000013	0.0000065	0.0000020
Tract # 860802	0.0003800	0.0000228	0.0000236	---	---	0.0000013	0.0000065	0.0000012
Tract # 860900	0.0008800	0.0000244	0.0000238	---	---	0.0000013	0.0000065	0.0000022
Tract # 861001	0.0006000	0.0000300	0.0000232	---	---	0.0000013	0.0000064	0.0000004
Tract # 861003	0.0005200	0.0000342	0.0000237	---	---	0.0000013	0.0000065	0.0000015
Tract # 861004	-	0.0000371	0.0000236	---	---	0.0000013	0.0000065	0.0000014
North Beach	0.0008800	0.0000030	0.0000243	---	---	0.0000014	0.0000067	0.0000001
Chesapeake Beach	0.0007800	0.0000029	0.0000300	---	---	0.0000017	0.0000066	0.0000008
TOTAL	0.00081	0.0000116	0.0000238	0.0000015	0.0000002	0.0000013	0.0000065	0.0000267

* Both Drought and Hail loss ratios were calculated from the amount of assessed value of farm properties in the county and therefore are not directly comparable to the other hazards

Table 5.23
Estimated Level of Risk by Hazard for Calvert County (High, Moderate, Low)

Flood	Coastal Wind	Tornado	Drought	Hail	Winter Storm	Thunderstorm	Earthquake
High	High	Moderate	Low	Low	Moderate	Moderate	Moderate

It should be noted that although some hazards may show Medium or Low risk, hazard occurrence is still possible. Also, any hazard occurrence could potentially cause a great impact and losses could be extremely high (e.g. an F5 tornado or a Category 5 hurricane).

Table 5.24 provides an overall ranking of risk by hazard for Calvert County.

Table 5.24
Overall Risk Ranking for Calvert County

Hazard	Rank
Flood	1
Coastal Storm Wind	2
Tornado	3
Severe Thunderstorm	4
Lightning	5
Earthquake	6
Winter Storm	7
Extreme Temperatures	8
Hail	9
Drought	10

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CHAPTER 6: CAPABILITY ASSESSMENT



Introduction

Performing a mitigation capability assessment is an integral component to developing a comprehensive and implementable mitigation strategy. The capability assessment identifies existing gaps, conflicts, and/or shortcomings, between various county plans, that may need to be addressed through future mitigation actions and helps to ensure that proposed mitigation actions are practical, while considering the municipalities' capacity for implementation. This assessment also examines completed or in-progress actions that merit continued support and enhancement through future efforts.

This mitigation capability assessment comprises three components:

1. Plan Integration and Document Review - an inventory of the County's existing planning and regulatory tools and a review and incorporation of existing plans and other technical information as appropriate,
2. Emergency Response Capabilities and Responsibilities
3. Municipal Capability Assessment - an analysis of municipal capacity from a planning, policy, staffing, and training standpoint.

Plan Integration and Document Review

Requirement §201.6(b): Review and incorporate, if appropriate, existing plans, studies, reports, and technical information.

The purpose of a plan/ordinance review as part of this planning process is tri-fold:

- To identify existing county and municipal initiatives;
- To provide an inventory and review of sample plans and ordinances and identify sections in these documents that address hazard mitigation-related issues; and

- To provide a platform to integrate plans and other documents so recommendations and strategies do not contradict one another (e.g., between the hazard mitigation plan and comprehensive plan).

A Document Review comprises an inventory of the County's existing planning and regulatory tools and a review and incorporation of existing plans and other technical information as appropriate. The purpose of a plan/ordinance review is tri-fold:

- To identify existing county standards and mandates
- To provide an inventory and review of sample plans and ordinances and identify sections in these documents that address hazard mitigation-related issues
- To provide a platform to integrate plans and other documents so recommendations and strategies are not in contradiction with one another (e.g., between the hazard mitigation plan and comprehensive plan).

VPC reviewed updates to existing road ordinances, stormwater management plans, sediment and erosion control plans, and community flood mitigation plans, among others, and summarized their connections with hazard mitigation.

County and Local Documents Reviewed

County Plans and Ordinances

- Calvert County Floodplain Regulations
- Calvert County Road Ordinance
- Calvert County Soil and Erosion Control Regulations
- Calvert County Stormwater Management Ordinance

Community Plans and Ordinances

- Breezy Point/Neeld Estate Flood Mitigation Plan
- Broomes Island Flood Mitigation Plan
- Cove Point Community Flood Mitigation Plan

Breezy Point/Neeld Estate – 2017 (draft)

At the time this Plan was written, the Breezy Point/Neeld Estate Flood Mitigation Plan was under development and was not available for review. The draft plan is currently available online at <http://www.co.cal.md.us/DocumentCenter/View/14875>.

Cove Point Community Flood Mitigation Plan – 2014

The Cove Point Community Flood Mitigation Plan is designed to identify community specific flooding issues; recommend mitigation actions; and suggest funding sources for the mitigation efforts.

Recommendations from the Cove Point Community Flood Mitigation Plan are detailed in Chapter 9 of this document: Goals and Mitigation Strategy.

Observations: No reference is made to elevating or floodproofing properties, restricting development, planting vegetation, or potential retreat from the area.

Recommendations: Five "standard" mitigation actions have been identified in the Calvert County

Flood Mitigation Plan and are reiterated below. These actions should be included in the Cove Point plan to fortify the communities limited mitigation efforts.

- Conduct extensive educational outreach. Encourage residents outside of the current floodplain to prepare for sea level rise and floodplain creep.
- Increasing freeboard and elevating buildings even in areas above base flood elevation to prepare for sea level rise and the potential for floodplain creep.
- Wet floodproofing basements or crawlspace areas. Encouraging wet floodproofing even in areas above base flood elevation to prepare for the potential of floodplain creep.
- Elevating utilities and using water-safe/waterproof paints, compounds, and flooring in all first-floor enclosures.
- Encourage planting of mature trees and vegetation to stabilize the soil and prohibit clearing of new land for development, especially within 30 meters of the current floodplain.

Broomes Island Flood Mitigation Plan - 2016

The purpose of the Broomes Island Flood Mitigation Plan is “To develop a flood mitigation plan to improve the Broomes Island community’s resistance to flooding by identifying actions that reduce flood impacts to residents, structures, and infrastructure; reviewing and modifying, if necessary, the emergency response plan for Broomes Island; and by identifying projected impacts of sea level rise scenarios at 2050 and 2100.”

Recommendations from the Broomes Island Plan are detailed in Chapter 9 of this document: Goals and Mitigation Strategy.

Observations: This Plan is robust in nature and addresses pertinent issues.

Recommendations: No additional recommendations at this time.

Calvert County Floodplain Ordinance - Amended in 2011 and 2014

The Calvert County Floodplain Ordinance was established to protect residents and properties in areas that suffer from periodic flooding from; loss of life, use, or property. Flood hazard areas can interrupt business, day to day operations, and even government services. As such, Calvert County has adhered to NFIP regulations since September 28th, 1984. All development or new construction from that date forward is compliant.

Table 6.1. Floodplain Coordinators

Municipality	Name	Address	Telephone Number
North Beach	John Hoffman	Town of North Beach, Town Hall, North Beach, MD	410-535-5940
Chesapeake Beach	Bill Watson	Town of Chesapeake Beach, Town Hall, Chesapeake Beach, MD	410-286-5222
Calvert County	John Swartz, Certified Floodplain Manager	Department of Community Planning and Building, 150 Main Street, 3 rd Floor, Prince Frederick, MD 20678	410-535-1600 X2238

The following sections of the Ordinance relate directly to mitigation and are acceptable standards and echoed in this document;

8-2.03 – I.2 - Subdivision Proposals and Development Proposals

a.i. Subdivision proposals and *development* proposals shall have utilities and facilities such as sewer, gas, electrical, and water systems located and constructed to minimize flood damage.

8-2.03 – I.3 - Protection of Water Supply and Sanitary Sewage Systems

- a. New and replacement water supply systems shall be designed to minimize or eliminate infiltration of floodwaters into the systems.
- b. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into systems and discharges from systems into floodwaters.
- c. On-site waste disposal systems shall be located to avoid impairment to or contamination from them during conditions of *flooding*

8-2.03 – I.4 - Buildings and Structures

d. Have electrical systems, equipment and components, and mechanical, heating, ventilating, air conditioning, and plumbing appliances, plumbing fixtures, duct systems, and other service equipment located at or above the elevation of the *lowest floor* required in Section 8-2.03.J.4.a or J.5.a (A Zones) or Section 8-2.03.K.3.b (*V Zones and Coastal A Zones*). Electrical wiring systems are permitted to be located below elevation of the *lowest floor* provided they conform to the provisions of the electrical part of the *building code* for wet locations. If replaced as part of a *substantial improvement*, electrical systems, equipment and components, and heating, ventilation, air conditioning, and plumbing appliances, plumbing fixtures, duct systems, and other service equipment shall meet the requirements of this section.

Photo 6.1 – Elevated Utilities



8-2.03 I.6 – Historic Features

Repair, alteration, addition, rehabilitation, or other improvement of *historic features* shall be subject to the requirements of these regulations if the proposed work is determined to be a *substantial improvement*, unless a determination is made that the proposed work will not preclude the *feature's* continued designation as a *historic feature*. The Floodplain Administrator may require documentation of a *structure's* continued eligibility and designation as a *historic feature*.

8-2.03 I.7 – Manufactured Homes

- a. New *manufactured homes* shall not be placed or installed in *floodways* or *coastal high hazard areas* (V Zones).
- b. For the purpose of these regulations, the *lowest floor* of a *manufactured home* is the bottom of the lowest horizontal supporting member (longitudinal chassis frame beam).

8-2.03 I.9 – Critical and Essential Facilities

- a. Not be located in *coastal high hazard areas* (V Zones), Coastal A Zones or floodways.
- b. If located in flood hazard areas other than *coastal high hazard areas*, Coastal A Zones and floodways, be elevated to the higher of elevation required by these regulations plus one foot (3 foot above the *base flood elevation*), the elevation required by the *building code*, or the elevation of the 0.2 percent chance (500-year) flood.

8-2.03 I.11 – Gas or Liquid Storage Tanks

- a. Underground tanks in flood hazard areas shall be anchored to prevent flotation, collapse or lateral movement resulting from hydrostatic loads, including the effects of buoyancy, during conditions of the *base flood*.
- b. Above-ground tanks in flood hazard areas shall be anchored to a supporting structure and elevated to or above the *base flood elevation*, or shall be anchored or otherwise designed and constructed to prevent flotation, collapse, or lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, during conditions of the *base flood*.
- c. In flood hazard areas, tank inlets, fill openings, outlets and vents shall be:
 - i. At or above the *base flood elevation* or fitted with covers designed to prevent the inflow of floodwater or outflow of the contents of the tanks during conditions of the *base flood*; and
 - ii. Anchored to prevent lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy, during conditions of the *base flood*.

Photo 6.2 – Elevated Structure



8-2.03 J.3 -Residential Structures and Residential Portions of Mixed Use Structures

- a.i - *Lowest floors* shall be elevated to or above the *flood protection elevation* (2 foot above the Base Flood Elevation).

Recommendations:

Consider removing:

8-2.03 – I.4.e - As an alternative to paragraph (d), electrical systems, equipment and components, and heating, ventilating, air conditioning, and plumbing appliances, plumbing fixtures, duct systems, and other service equipment are permitted to be located below the elevation of the *lowest floor* provided they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to that elevation.

Remove the caveat entirely to curb new development in flood prone areas.

Consider modifying to read:

8-2.03 – I.4.f - Have the electric panelboard elevated at least four (4) feet above the BFE. Increase the requirements to match the new BFEs.

8-2.03 – I.7.c.ii – Be installed in accordance with the anchor and tie-down requirements of the *building code* or the manufacturer's written installation instructions and specifications. Specifically include the suggestion of Hurricane Straps for tie downs.

8-2.03 J.3 - a.i - *Lowest floors* shall be elevated to or above the *flood protection elevation* (2 foot above the Base Flood Elevation).

Consider increasing to 3 feet above BFE.

Calvert County Grading, Erosion and Sediment Control Ordinance – 2016

The purpose of the Calvert County Grading, Erosion and Sediment Control Ordinance is to protect, maintain, and enhance the safety, and welfare in the County by establishing minimum to review and approve Erosion and Sediment Control Plans. The proper erosion and sediment control practices will reduce the amount of off-site sedimentation caused by soil erosion, and will assist in the maintenance of stream, river and bay water quality standards.

The Ordinance is applicable to the “disturbance, development and use of all land within the unincorporated County, unless expressly and specifically exempted, “grandfathered” or provided (for) otherwise.” The provisions of this Plan apply to the development and use of all land within the County, and the incorporated areas of the County once adopted by the municipality, and an agreement with Public Works.

The following sections of the plan relate directly to flood mitigation and planning and are acceptable standards.

§38-6 Vesting and Grandfathering

Calvert County honors the “vested” rights provided by Maryland Case Law. This allows for the continuance of certain development standards that were enacted prior to the enactment of the Ordinance.

B.1 - Any plans that receive final approval after January 9, 2013 must be in compliance with the requirements of this Ordinance and the Standards and Specifications.

B.4 - If a plan was approved prior to January 9, 2013, the site can proceed under the stands under which it was approved.

§38-7 Exemptions for Activities Located Outside the Critical Area and Buffer

2.a - Clearing or grading activities that disturb less than 5,000 square feet of land area and disturb less than 100 cubic yards of earth that do not direct runoff to highly erodible soils and do not disturb or discharge toward steep slopes and not related to new construction of a single-family dwelling.

3 - Any surface mining operation and the affected land covered by a surface mining permit issued by the State of Maryland, Department of Natural Resources, under the authority of the Maryland Annotated Code, Natural Resources Article, Title 7, Subtitle 6A

§38-8 Variance

B. Any variance granted must include appropriate erosion and sediment control measures, which

may include, without limitation: redundant controls; accelerated stabilization; more frequent inspections; and other measures that may be required by the approving authority to serve the purpose of this Chapter 38.

Observations: This Plan is robust in nature.

Recommendations: There are no additional recommendations at this time.

Calvert County Road Ordinance – 2016

The purpose of the Calvert County Roads Ordinance is to establish the guidelines, regulations and criteria for the planning, development, construction, improvement, reconstruction, maintenance, and repairs to the roads, within the county including, but not limited to, sidewalks, curbs, gutters, storm drainage infrastructure and facilities, utilities, incidental structures, street lighting, and landscaping, etc.

Specific sections of the plan that directly relate to flood mitigation and that are acceptable standards are as follows;

§104-28 Drainage

- A. Every roadway and residential subdivision shall be provided with storm drains, culverts, drainage ways, or other means of conveyance adequate to collect and dispose of all water, originating on or flowing across the roads and property without inundating or damaging roads, lots, or other properties.
- B. Drainage facilities shall be designed in accordance with Part 4, Storm Drainage Design Criteria, of this ordinance.
- D. Flood Plain District - Development of designated flood plain areas designated by mapping or elevation shall be restricted to the uses specified in the County Zoning Ordinance and in accordance with erosion and sediment control plans approved by the U.S. Department of Agriculture/NRCS.

§104-41 Introduction

- D. All drainage structures are to be built according to the current edition of The Calvert County Construction Standards for Roads, Streets, and Incidental Structures, or as otherwise approved. A structure schedule specifying the Calvert County and/or MSHA detail number shall be provided on the plans.
- E. Where a subdivision is traversed by a water course, stream, or other natural drainage course, the director shall require the developer to:
 - 1. Dedicate an easement area of sufficient width to adequately dispose of the surface drainage water expected in a 50-year storm, and conforming substantially with the lines of such natural water course;
 - 2. Furnish by dedication sufficient easement or construction, or both, to safely dispose of such stormwater.

§104-42 Right-to-Discharge and Storm Drain Easements

A. Storm Drain Easements are required by the County for all public or private storm drainage facilities, whether natural or improved, surface or subsurface, including stormwater management facilities. Additionally, no structures other than those of the storm drainage system itself are allowed within the storm drain easements and access to these areas is not to be restricted in any way.

C. The standard storm drain easement width is a minimum of 20 feet.

§104-43 Study of Impact on Downstream Development

A. A local study of the impact on existing downstream development and/or conditions to be caused by proposed upstream development will be conducted. This study will then be submitted to the Engineering Division prior to final plan approval. This study will include a development impact statement to the county addressing the following:

§104-45 General - Overland Flow of a 1% chance Frequency Rain Storm

A. The Engineering Division Chief may require a study showing the routing of a 100- year storm through a proposed development and proposed storm drainage system.

B. Factors to be considered in requiring a 1% chance storm routing are size and type of development, proposed lot and road grading, proximity of streams, location of septic fields, possibility of property damage, etc. Proposed developments shall be examined individually based on the above criteria, the development impact statement, and other contributing factors.

§104-68 Retaining Walls Supporting Any Infrastructure and Embankments

A.3 - Existing retaining walls of any height located within a right-of-way or associated easement may be subject to removal or modification if the director deems that the wall poses a potential safety hazard, obstructs vision, alters stormwater management or storm drainage function, or hinders maintenance work within a right-of-way and/or easement area.

Observations: This Plan is robust in nature.

Recommendations: There are no additional recommendations at this time.

Calvert County Stormwater Management Ordinance - 2010

The purpose of the Calvert County Stormwater Management Ordinance is to “protect, maintain and enhance the public health, safety, and general welfare” by delineating the minimum requirements and provisions to mitigate the impacts of stormwater runoff. The goal is to manage stormwater by using innovative environmental site design and to maintain, even after development, the pre-development runoff patterns and to “reduce stream channel erosion, pollution, siltation and sedimentation, and local flooding.”

The Stormwater Ordinance applies to all new, improvement, and redevelopment projects that have not received final approval for erosion and sediment control and stormwater management plans by May 4, 2010.

The Ordinance contains specific sections relevant to Flood Mitigation and are considered acceptable standards are listed as follows:

§ 123-6. Exemptions

B. Additions or modifications to existing single family detached residential structures if they comply with C of this section;

C. Developments that do not disturb over 5,000 square feet of land area; including new and redevelopment.

§ 123-8. Redevelopment

B. All redevelopment designs shall:

1. Reduce impervious area within the limit of disturbance (LOD) by at least 50 percent according to the Design Manual;
2. Implement ESD to the MEP to provide water quality treatment for at least 50 percent of the existing impervious area within the LOD;
3. Use a combination of Section 123-8 B. (1) and (2) of this Ordinance for at least 50 percent of the existing site impervious area.

§ 123-9. Variances

B. Fees in lieu of stormwater management practices shall be required at the discretion of the Engineer when a written variance is issued in accordance with the provisions of this Ordinance. The Board has established a fee schedule for fees in lieu of stormwater management practices based on the following (which may be amended from time to time):

Table 6.2: Fees in Lieu for Calvert County Stormwater Ordinance

Type of Development	Fee
Single Family Residential	\$600.00/Dwelling Unit
Commercial Development	\$8,000.00/Impervious Acre

§ 123-10. Minimum Control Requirements

A.2 - Control of the 2-year and 10-year frequency storm event is required according to the Design Manual and all subsequent revisions if the Department determines that additional stormwater management is necessary because historical flooding problems exist and downstream floodplain development and conveyance system design cannot be controlled.

A.3 - The Department may require more than the minimum control requirements specified in this Ordinance if hydrologic or topographic conditions warrant or if flooding, stream channel erosion, or water quality problems exist downstream from a proposed project.

Observations: This Plan is robust in nature.

Recommendations: There are no additional recommendations at this time.

Maryland State Plans

Planning studies include a wide variety of projects such as comprehensive plans, master plans, land use plans, revitalization plans, mitigation plans, and transportation plans. In general, land use plans and comprehensive plans discuss the direction of growth of the community and can pave the way to integrate principles of hazard mitigation

State of Maryland Hazard Mitigation Plan – August 2016

The State Hazard Mitigation Plan identifies a number of objectives and policies to assist local communities such as Calvert County and its municipalities with their hazard mitigation strategies. The following specific mitigation actions discuss the State's support to local governments with local mitigation projects:

- Since many important mitigation decisions are and will continue to be made at the local government level MEMA will continue to support the development and implementation of local hazard mitigation plans.
- The State will strive to improve knowledge and data sharing capabilities statewide.
- MEMA has integrated local mitigation plan mitigation goals, objectives and strategies into the 2016 State of Maryland Hazard Mitigation Plan and will continue in future updates.
- MEMA will continue to support local governments in the updating and development of local hazard mitigation plans by providing extensive technical assistance. This assistance will include continued training on regulatory requirements and the use of Hazard Analysis and Risk Assessment Data and Floodplain Management training.
- MEMA will partner with responsible State agencies to identify mitigation strategies for State-owned facilities that have been identified in the Risk Assessment as located in hazard areas for flash and riverine flooding.

Additionally, the State Hazard Analysis provided Calvert County a high risk ranking for tidal/coastal flooding, a medium-high ranking for both thunderstorms and flooding, and a high ranking for winter storms. The Analysis identifies most areas bordering the Chesapeake Bay are protected from flooding by the bluffs that characterize this portion of the Bay's western shore, with the exception of low-lying areas near Cove Point, Long Beach, Parker's Creek, and upper North Beach.

Emergency Response Capabilities and Responsibilities

Calvert County is vulnerable to various natural and technological hazards that have the potential to disrupt the county and cause serious damage. During emergencies, local response agencies generally have the capability to provide effective response actions that protect life and property. Mutual Aid Agreements and Memorandum of Understanding are in place to ensure the emergency support functions of the various groups involved in emergency management generally parallel their normal daily activities – that is, the same personnel, equipment, and materials used on a regular basis would be used to combat major disasters.

Calvert County Fire/Rescue/EMS is an all-volunteer system which is comprised of 6 fire stations which include both Fire, Rescue, and EMS capabilities, 1 EMS only station; 1 advanced life support station with chase vehicles; and 1 dive team. In extreme circumstances, augmentation of these resources (e.g., from State/Federal governments) may be needed. The County is able to utilize available resources from the private sector and volunteer organizations where possible and/or necessary. The County Department of Public Safety maintains resource information on supplies, equipment, facilities, and skilled personnel available for emergency response and recovery.

Photo 6.3 – County Emergency Operations Center



The Calvert County Division of Emergency Management, within the Department of Public Safety, is the entity responsible for planning and coordinating plans, procedures and resources in preparation for, and response to, a natural or man-made disaster. Emergency management services at the State level are coordinated by the Maryland Emergency Management Agency. The County EMD office is located at 175 Main Street in Prince Frederick which also contains the County's Emergency Communications Center and Emergency Operation Center (EOC). The EOC is located in the lower level of the north wing of the Courthouse, along with the Calvert Control (911 Center). The Emergency Operations Center is staffed during normal working hours and the County 911 Center is staffed 24/7. Upon activation of the EOC, 24-hour staffing is available through personnel assigned to EOC communications. An alternate EOC is located at the Prince Frederick Fire Department located at 450 Solomons Island Rd South, Prince Frederick, Maryland 20678, on Route 2 and 4, just south of Duke Street, and is activated should the primary EOC become inoperable or uninhabitable. Calvert County's EOC is equipped with a bunkroom, showers, and full kitchen with cooking supplies, plates, utensils, and cups. The EOC has a backup generator which will operate all systems in the EOC. The alternate EOC mirrors the capabilities of the main EOC.

The EOC may be activated at one of four levels (**Figure 6.1**) depending upon the nature and scope of the incident or potential incident. The EOC may also be activated for a significant planned event in order to monitor events and provide for an effective response if necessary. The Director of Public Safety and/or Emergency Management Division Chief will designate the level of activation and will ensure appropriate notifications are made.



Figure 6.1 – Emergency Operations Center Activation Levels

All department and agency points-of-contact (POC) will be notified of the EOC activation by EMD through the Calvert County Mass Notification System and/or other available means. In turn, agency EOC Representatives will be notified through their agency’s internal notification process.

The ultimate responsibility for Emergency Management of any disaster rests with the Calvert County Board of Commissioners. The Board is responsible for all policy-level decisions which are implemented through the County Administrator. A Public Information Officer is responsible for preparing news releases and coordinating the release of information to the media and the public.

As summarized in Table 5.3, various agencies within Calvert County have designated roles in the event of an emergency. Several agencies have a representative to the EOC: Fire and Rescue; County Health Department; Department of Social Services; American Red Cross; Calvert County Public Works; Board of Education; Maryland State Police; Calvert County Sheriff’s Office; Emergency Medical Services (EMS); Radiological Officers, and Facilities Management. During some emergency situations, certain agencies may be required to relocate their center of control to the Emergency Operations Center. Appointing authorities can assign County employees to perform emergency work at any location in the County and for periods of time other than the normal hours of employment.

Table 6.3. Emergency Responsibilities of Select Calvert County Organizations

Action	Responsible Agency
Ordering an evacuation	Division of Emergency Management in conjunction with the Board of County Commissioners
Activating the emergency operations center	Division of Emergency Management
Opening and operating evacuation shelters	EOC activates the shelters if the Board of Education and Department of Social Services agree. Only schools with shower facilities (high schools) are used as shelters

Sandbagging certain areas	Property owners are primarily responsible for sandbagging with some assistance from Public Works.
Closing levee and floodwall systems	City of Chesapeake Beach
Closing streets or bridges	Public Works, Transportation, and Law Enforcement
Monitoring water levels at the high hazard dams which fall outside the city limits	Public Works, all bridges are privately owned
Shutting off power to threatened areas	Southern Maryland Electric Cooperative, BG&E
Releasing children from school	Board of Education

The implementation of the EOP and activation of the EOC may occur simultaneously. The level of EOP and EOC activation will be based upon the severity and scope of the incident. The ICS integrated with Emergency Support Functions (ESF) and various annexes established by this plan may be selectively activated based upon initial or anticipated requirements.

The EOP may be implemented by the President of the Board of County Commissioners, the County Administrator, the Director of Public Safety, the Emergency Management Division Chief, or their designees. Annex A of the County's Emergency Operations Plan lays out the procedures to be used by the County's Division of Emergency Management staff in the operation of the Emergency Operations Center during major emergency or disaster situations.

The Communications Annex (Annex B) provides information on communication capabilities during emergency situations when the Emergency Operations Center has been activated. The Annex identifies the organization and responsibilities of a number of agencies including the Division of Emergency Management; county departments with communication capabilities; Calvert Control; Fire, Rescue, and Police services; and Radio Amateur Civil Emergency Services.

Evacuation issues are addressed in Annex C of the County's EOP. The purpose of this Annex is to provide for an orderly and coordinated evacuation in the event of hazards such as a riverine flood, hurricane, hazardous materials incident, fixed nuclear facility incident, major fire, transportation accident, or terrorist attack. Measures considered for control and coordination when planning for an evacuation include; geographic area; traffic control points; assembly points; and shelters.

The County Public Information Officer prepares public information releases to advise residents of areas affected and actions to be taken, i.e. assembly points for persons without private transportation, evacuation routes to be used, etc. and insures that current and accurate information is available for dissemination.

The County's Emergency Management website also provides a link to emergency management information: <http://www.co.cal.md.us/residents/safety/emergency/> and to resources including state and federal agencies and the American Red Cross.

The Department of Public Safety maintains a 24/7 monitoring and notification capability through the Calvert Control Center-911 Communications. The Division of Emergency Management Division Chief or his/her designee is responsible for making internal and external emergency notifications to identified agencies and organizations as required. The Calvert County Emergency Communications 911 Center also has capabilities to communicate with the deaf through text telephone (TTY), and maintains a roster of interpreters to communicate with non-English speaking individuals.



The Calvert Control Center-911 Communications operates the county's 911 and dispatch facility for police, fire, and emergency medical services. The Calvert Control Center uses a Computer-aided Dispatch (CAD) system to process telephone calls and dispatch police, fire, and EMS in a timely manner. The Calvert Control Center makes emergency notifications to identified agencies and organizations as required.

The DEM Division Chief, in cooperation with the Calvert County Public Information Officer (PIO), maintains the capability to provide warnings and emergency information to the public through multiple communications modes. Depending on the characteristics of the hazard and the size and population of the area that is threatened, one or more of the following systems/techniques can be used to warn the public including door-to-door sweeps by emergency service personnel; telephone fan-out to schools, major employers, hospitals, nursing homes, and day care centers.

Additional resources include but are not limited to:

- The Emergency Alert System (EAS): A national system jointly administered by the Federal Communications Commission, the Federal Emergency Management Agency (FEMA), and the National Weather Service. It is designed to provide the President of the United States automatic access to the nation's broadcast systems to speak directly to the nation in times of national disaster.
- Emergency Information Line: Maintained by DEM and provides pre-recorded preparedness information residents will need during an emergency. During an activation of the EOP the capabilities are expanded and the emergency information line is staffed with call takers 24 hours a day, reporting to and receiving messaging information from the PIO.
- Comcast Channel 6: Provides residents with critical information during severe weather or other emergencies. Current programming can be interrupted during emergencies to provide information and recommended protective actions directions to the public. The channel 6 emergency messaging system provides the capability for "crawl messaging" for persons with hearing disabilities and audio instructions with descriptive messages for residents with visual disabilities.
- The Emergency Notification Network (EMnet): Emergency Management information can be provided to the media through the internet or satellite for immediate transmission to the general public. EMnet is a privately managed messaging network for the emergency management community. It is a satellite-based secure system that provides two-way internet capabilities in the event the

primary system is not available. Participants use the network to convey urgent messages and support documentation (reports, photos, information, etc....) within the emergency management community, as well as to create and issue EAS messages to broadcasters. EMnet also allows the DEM Staff to see EAS messages which are originated by other organizations such as the National Weather Service that are issued to the county and other local jurisdictions.

- FEMA's Integrated Public Alert and Warning System (IPAWS): IPAWS is an internet-based capability Federal, State, territorial, tribal, and local authorities can use to issue critical public alerts and warnings. IPAWS is accessed through software that meets IPAWS system requirements. There is no cost to send messages through IPAWS, although there may be costs associated with acquiring compatible alert origination software. IPAWS is not mandatory and does not replace existing methods of alerting, but instead complements existing systems and offers new capabilities.
- Mass Notification System (MNS): Provides the capability to distribute notifications and emergency alerts to residents via electronic mail, cellular telephone, or pager using a text messaging system. List-serves and focused MNS groups provide information electronically to the residents of neighborhoods that are highly vulnerable to localized flooding and other hazards. MNS registration is accessible on the Calvert County Website as well as for individuals with access and functional needs who request assistance in registering for the delivery mode of their choice.

Local Radio Stations: Calvert County has agreements in place with local radio providers to broadcast emergency information on local stations during disasters or emergencies.

Western Shore:

- | | | |
|-----------|-----------|------------------|
| ○ WKIK FM | 102.9 MHz | California |
| ○ WKIK AM | 1560 kHz | La Plata |
| ○ WPRS FM | 104.1 MHz | La Plata |
| ○ WTOP FM | 103.5 MHz | Frederick and DC |
| ○ WYRX FM | 97.7 MHz | Lexington Park |
| ○ WPTX AM | 1690 kHz | Lexington Park |
| ○ WSMD FM | 98.3 MHz | Mechanicsville |
| ○ WGOP AM | 540 kHz | Pocomoke |
| ○ WRAR FM | 105.5 MHz | Tappahannock |
| ○ WNNT FM | 100.9 MHz | Warsaw |

Eastern Shore:

- | | | |
|-----------|-----------|-----------|
| ○ WCEI FM | 96.7 MHz | Easton |
| ○ WEMD AM | 1460kHz | Easton |
| ○ WCEM FM | 106.3 MHz | Cambridge |
| ○ WCEM AM | 1240 kHz | Cambridge |

Public Access Cable Television:

- | | |
|---------------------------|---------------------------|
| ○ Comcast Cable Channel 6 | Calvert County Government |
|---------------------------|---------------------------|

- Calvert County may also use variable messaging sign boards along major roadways as another method for providing information and warnings to the public.

- Radio Amateur Civil Emergency Services (RACES)
 - Provide support for ESF's 2- Communications, 5- Emergency Management, 6- Mass care, Emergency Assistance, Housing and Human Services.
 - Coordinate and provide emergency communications for outlying areas, local shelters, Maryland State Emergency Management Agency in the EOC.
 - Provide backup communications via RACES network for communications between adjacent county EOC's.
 - Provide other communications services requested if within the scope or capability of RACES personnel to do so.
 - Participate in training and exercises as determined by the Director of Emergency Management.

CHAPTER 7: MITIGATION STRATEGY



Update Process Summary

Requirement §201.6(c)(3): *The Plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.*

The mitigation strategy serves as the long-term road map to reduce the potential losses, vulnerabilities, and shortcomings identified in the Hazard Identification and Risk Assessment section. A typical mitigation strategy includes a list of goals and objectives, along with specific mitigation actions to address the goals and objectives. Actions are then prioritized, based on the community's requirements.

The mitigation strategy in this Plan comprises the following seven subsections:

- Goals and Objectives
- Identification and Analysis of Mitigation Techniques
- Mitigation Action Implementation Plan
- Municipal Mitigation Actions
- National Flood Insurance Program and Continued Compliance
- Prioritization of Mitigation Actions
- Deleted, Combined, and Removed Actions

Definitions

Goals: Goals represent broad statements that are achieved through the implementation of more specific, action-oriented objectives. Goals provide the framework for achieving the intent of the mission statement.

Hazard Mitigation Projects: Projects are defined as specific actions taken to address defined vulnerabilities to existing buildings or systems. Potential funding sources are listed for each project.

Mitigation Action Plan: Prioritized listing of actions (policies and projects), including a categorization of mitigation technique, hazards addressed, individual or organization responsible for implementation, estimated timeline for completion and list of potential funding sources.

Goals and Objectives

Requirement §201.6(c)(3)(i): *[The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards*

For the purposes of this Plan, goals are defined as general policy guidelines or broad statements that represent a vision for a community. Calvert County's Vision is to "Seek common planning solutions for the variety of hazards that pose a risk to Calvert County and its municipalities".

Objectives define strategies or implementation steps to attain the identified goals. Compared to goals, objectives are more specific and measurable. The goals for this planning process have been developed in close coordination with the Steering Committee based on the following: findings from the THIRA (issues), mitigation capability assessment (gaps); and original goals and objectives from the 2010 plan (revisited and revised by the Steering Committee).

The goals and objectives from the 2010 (original) Calvert County Hazard Mitigation Plan were reviewed and reorganized by the Steering Committee and were designed to serve as the basis for the mitigation actions at the County and municipal level. Each mitigation action is linked to one or more goals and objectives.

Following is the list of the 2017 Calvert County Hazard Mitigation Plan goals and objectives. Goals and objectives that were determined to be applicable at the county level as well as to both municipalities have an asterisk (*) placed next to them. The goals and objectives have been organized to mirror the 2016 Maryland State Hazard Mitigation Plan categories, be in harmony with the goals from the State Plan, categorized to match the goals in the Calvert County Flood Mitigation Plan, and to be applicable at both the county and local levels.

Preventative Measures

Goal 1*: *Minimize losses and institute adequate regulations through land use regulations.*

- Identify and support public and private projects and programs to retrofit, relocate, or acquire properties as well as remove structures susceptible to repetitive flooding.
- Continue to implement systematic maintenance programs for stormwater management systems.

- Discourage new development in high hazard areas through appropriate regulations and land use planning.
- Enforce local, state and federal floodplain regulations and building standards for development in flood hazard areas.

Goal 2*: Ensure hazard mitigation goals are consistent with all other County and Municipal plans and ordinances.

- Incorporate hazard mitigation principles into new and existing plans and ordinances.
- Integrate a hazard mitigation section into Calvert County Comprehensive Plan and Chesapeake Beach and North Beach Comprehensive Plans.

Property Protection

Goal 3*: Minimize future losses from all disasters by reducing the risk to people and property.

- Protect populations and properties throughout Calvert County that may be susceptible to economic or physical loss from disasters, consistent with the standards established in this Plan and other plans which have, or may be, adopted by the County or Towns.
- Provide protection of critical facilities/infrastructure vital to disaster response, such as fire and police stations, and those vital to the continuous operations of the County, municipalities and communities, such as hospitals and health care facilities, water and sewer facilities, electrical and other utilities, and transportation systems.

Goal 4*: Emphasize pre- and post-disaster planning to decrease vulnerability to loss of existing and new construction.

- Promote to elected officials, builders, and existing and potential homeowners, the economic and safety benefits of designing mitigation features into new construction and retrofit of existing structures.
- Identify vulnerable existing critical facilities and infrastructure and encourage pre-disaster retrofit.

Public Education and Outreach

Goal 5*: Support a balance between government regulation/enforcement, and personal awareness/responsibility for hazard mitigation, by emphasizing education and training for property owners, families and individuals.

- Continue to develop and support disaster preparedness education and awareness programs, targeting residents, visitors, businesses, and elected officials.
- Continue to develop economic incentive programs, for both public and private sectors, that promote structural retrofitting where and when it is determined to be the best option.

Goal 6*: Emphasize the benefits of hazard mitigation principles through ongoing public outreach activities.

- Educate the public on higher standards of protection to structures and facilities.
- Identify and coordinate public information programs and events such as contests and festivals with public and private partners.
- Identify and seek funding sources that will support hazard mitigation awareness and training programs.

Goal 7: Reduce economic vulnerability and increase recovery capabilities of business and industry.

- Continue public education and outreach on the topics of economic vulnerability and recovery through collaborative programs involving government, businesses and community organizations.

Natural Resources***Goal 8*: Protect natural resources and open-spaces that provide flood and other hazard mitigation.***

- Encourage actions that protect natural resources while supporting community resiliency and hazard mitigation efforts.
- Coordinate natural resource preservation and land use planning to ensure that those natural resource areas, that are shown in this or other adopted community plans to provide hazard mitigation benefits, remain open spaces, and retain the natural benefits they provide.

Emergency Services***Goal 9*: Ensure continued coordination and linkages between local jurisdictions and neighboring county and statewide mitigation and resiliency activities to strengthen response and recovery efforts.***

- Include local, regional, and statewide jurisdictions in trainings, drills, and exercises to strengthen interagency cooperation.
- Encourage open data and/or data sharing policies and agreements between municipal, county, regional and state jurisdictions to aide in hazard and emergency response, and prepare for Next Generation 911 implementation.

Structural Projects***Goal 10*: Protect infrastructure, and critical facilities to reduce potential disruption of regular activities during and after hazard events.***

- Efficiently utilize resources to reinforce infrastructure, to withstand potential hazards, and to ensure continued use during and after an event.
- Coordinate with the Towns of Chesapeake Beach and North Beach to research, secure, and effectively use external, or additional, sources of funding to help make the infrastructure and critical facilities on which the residents, businesses and visitors of the County and Towns depend, more resilient to various hazards and events.

Identification and Analysis of Mitigation Techniques

Requirement §201.6(c)(3)(ii): *[The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*

Mitigation actions have been developed for the entire County as well as for each participating municipality. While some actions may be more general in nature and could apply to more than one jurisdiction, most actions are specific to a jurisdiction. The mitigation actions that were developed were based on the following: issues identified in the Hazard Identification and Risk Assessment, gaps identified in the mitigation capability analysis, input from the Steering Committee on actions in the 2010 Plan, and feedback from the Public Meetings.

The actions in the 2010 Plan were reviewed and each action was examined by the Steering Committee and assigned one of the following categories:

- Not Started – Actions that had not been initiated since the adoption of the 2010 Plan
- In Progress – Work has been initiated on these actions; these projects have a definite end-date
- On-Going – Actions that are performed on a regular and continuous basis by the department
- Not Applicable – Actions that were deemed by the Steering Committee to not apply to the Hazard Mitigation Plan
- Completed – Actions that were completed since the adoption of the 2010 Plan
- Cancelled – Actions that were terminated.

Municipal-specific actions from the 2010 Plan were also revisited and updated based on municipal input. These mitigation actions may be implemented through a variety of local tools such as: changes in ordinances and policies, inclusion into capital improvements budgets, and grant funding.

In formulating the Mitigation Strategy, the Steering Committee used the six mitigation categories as utilized by the Maryland State 2016 Hazard Mitigation Plan. They include: 1) Preventative Measures, 2) Public Outreach and Education, 3) Natural Resource Protection, 4) Emergency Services, 5) Property Protection, and 6) Structural Projects. These categories form the basis of the mitigation actions detailed in this plan. Descriptions of each category and examples for each are included below:

Preventative Measures - Preventative activities are those that are performed to keep hazard-related issues from exacerbating in the community. They are effective in reducing a community's future vulnerability, particularly in areas where development has not occurred. Examples of preventative activities include: zoning and subdivision regulations; building codes; hazard mapping; floodplain regulations; stormwater management; drainage system maintenance, and capital improvements programming.

Natural Resource Protection - Natural resource protection activities include those actions that can reduce the impact of hazards by preserving or restoring the function of natural systems. Natural systems that can be classified as high hazard areas include floodplains, wetlands, and barrier islands. Thus, natural resource protection can serve the dual purpose of protecting lives

and property while enhancing water quality or recreational opportunities. These actions are usually implemented by parks, recreation, or conservation agencies. Examples include: erosion and sediment control; stream and wetland restoration; habitat preservation, and slope stabilization.

Public Outreach and Education - Public Information and awareness activities are conducted to advise and educate residents, business owners, potential property buyers, and visitors about hazards and mitigation techniques that can be used to protect lives and property. Examples of measures used to educate and inform the public include: outreach and education; training; demonstrations; real estate disclosure; hazard expositions, and State/ Federal Program Coordination (StormReady, NFIP, CRS).

Property Protection - Property protection measures include those actions that can be undertaken by private homeowners so their structures can: better withstand hazard events; be removed from hazardous locations, or can be insured to cover potential losses. Examples include: acquisition; building elevation; retrofitting (i.e., wind proofing, flood proofing, seismic design standards, etc.), drainage, etc.

Emergency Services - Although emergency services are not necessarily considered mitigation techniques, these services minimize the impact of a hazard on people and property. Actions taken immediately prior to, during, or in response to a hazard event include: warning systems; search and rescue operations; evacuation planning and management, and flood fighting techniques.

Structural Projects - Structural projects such as reservoirs, levees and floodwalls, dams, channel improvements, crossings and roadways, drainage and storm sewer improvements, and drainage system maintenance are designed to control floodwaters.

Mitigation Action Implementation Plan

The mitigation actions that were developed were based on results from the Hazard Identification and Risk Assessment; mitigation capability analysis; input from the Steering Committee; actions that have been completed in the past; recent past hazard occurrences, and feedback from the Municipal Workshop. Based on qualitative ranking during the Hazard Identification and Vulnerability Analysis phase, three hazards were deemed as high priority hazards by the Steering Committee. These included: flood, severe thunderstorm, and coastal storm wind. Efforts were made to ensure that mitigation actions were included for each of these hazards.

Actions from the 2010 Plan that were categorized as “Not Started” “In Progress” and “On-Going” were carried over to the 2017 Plan Update and rephrased by the Steering Committee as needed, in addition to the new actions that were developed. Mitigation actions from the 2010 Plan that fell into the latter two categories: “In Progress” and “On-Going” were elaborated on identify progress made to date and adjusted to demonstrate the current status of these actions. Once the actions were finalized by the Consultant and Steering Committee, an implementation strategy was developed, which identified the following for each action:

- hazard mitigated;
- lead agency for implementation;
- approximate cost, and
- expected timeline.

Table 7.1 identifies County-level mitigation actions. Some actions from the 2010 Plan have been deleted based on consensus from the Steering Committee as having been completed, being infeasible, or inapplicable due to merging of agencies, elimination of staff positions, etc. **Table 7.2** defines the acronyms used to populate the actions table. Some recommendations from the original plan were merged with others for brevity and clarity purposes. Any actions removed from the plan are noted and justified in Table 7.7.

Table 7.1 Acronyms for Mitigation Action Item Implementation Table

BOE	Board of Education
CCDNR	Calvert County Department of Natural Resources
CDBG	Community Development Block Grant
CERT	Community Emergency Response Teams
CIP	Capital Improvement Plan
COOP	Continuity of Operations
CPB	Community Planning and Building
CSCD	Calvert Soil Conservation District
DED	Department of Economic Development
DEM	Division of Emergency Management
DIP	Division of Inspections and Permits
DSS	Department of Social Services
EMPG	Emergency Management Performance Grant
FEMA	Federal Emergency Management Agency
FMA	Flood Mitigation Assistance
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
MDE	Maryland Department of the Environment
MDOT	Maryland Department of Transportation
MEMA	Maryland Emergency Management Agency
PDM	Pre-Disaster Mitigation
PIO	Public Information Officer
RLP	Rural Legacy Program
SHA	State Highway Administration
TBD	To be Determined

Table 7.2 – Mitigation Actions

Action ID	Project Description	Hazard Mitigated	Lead Agency	Funding Source	Est. Cost	Timeline	Action Category
Ongoing Actions							
1	Continue to support a regular maintenance program for emergency generators at the county's critical facilities. Develop a regular maintenance program that includes a schedule to change filters, etc.	All	General Services, Public Safety, Technology Services	Coop with utility companies, county staff time.	Staff Time	Ongoing	Emergency Services
2*	Update Comprehensive Plan to include a Hazard Mitigation Section that provides an assessment of hazard vulnerability and appropriate mitigation recommendations	All	County – Community Planning and Building (CPB), Municipalities – Municipal Staff/Officials	Calvert County and Municipalities CIP	Staff Time	1 year	Preventative Measures
3	Continue to conduct routine inspections, regular maintenance, and annual tests on all emergency communications equipment, public address systems, and hazard alert sirens to ensure unhindered operation during an emergency event	All	County - Division of Emergency Management (Public Safety), Local -	County/Town staff time	Staff Time	Ongoing	Emergency Services
4	Continue to ensure that a planned, coordinated, and effective public warning dissemination program exists at the local level and is well maintained.	All	Public Safety	County/Town staff time	\$25,000-100,000	Ongoing	Emergency Services
5*	Utilize existing technical proficiency at the local level for conducting post-disaster damage assessments.	All	County and Municipal Staff/Officials	Public Safety technical and training assistance	TBD	Ongoing	Emergency Services

Table 7.2 – Mitigation Actions

Action ID	Project Description	Hazard Mitigated	Lead Agency	Funding Source	Est. Cost	Timeline	Action Category
6	Ensure reconstruction activities are compliant with NFIP substantial damage/improvement requirements and existing codes.	Flood	CPB	Staff Time	Staff time	Ongoing	Preventative Measures
7	Introduce NOAA Weather Alert radios in designated critical facilities across the county for situational awareness.	All	Public Safety	HMGP, EMPG	<\$25,000	1-2 years	Public Education and Outreach
8	Continue to develop and distribute a public informational pamphlet related to the potential health and safety implications of various natural hazard events. Also place the information on the County website and COMCAST		State Health Department, Technical Service's Public Relations Officer	State Health Department, county staff time	<\$25,000	Ongoing	Public Education and Outreach
9	Continue to conduct hazard response practice drills and emergency management training exercises on an annual basis	All	Public Safety	County Staff time	\$25,000-100,000	Ongoing	Emergency Services
10*	Identify natural resources that provide natural mitigation such as wetlands, buffers, etc and make them a priority for conservation.	All	CPB, Municipal Officials/Staff with technical assistance	Calvert County CIP, EPA, CDBG	\$25,000-100,000	2-5 years	Natural Resource Protection
11	Develop and implement a post-disaster recovery plan.	All	Public Safety with technical assistance from MEMA/FEMA	Local Staff time	Staff Time	1-2 years	Public Education and Outreach
12	Continue to work with local radio stations to promote continuity of public awareness and disaster preparedness.	All	Public Safety	County staff time, COOP with local radio stations	Staff Time	Ongoing	Public Education and Outreach

Table 7.2 – Mitigation Actions

Action ID	Project Description	Hazard Mitigated	Lead Agency	Funding Source	Est. Cost	Timeline	Action Category
13	Continue to maintain and replace county owned critical infrastructure.	All	Public Works	Calvert County CIP, SHA, MDOT	>\$100,000	Ongoing	Property Protection
14	In flooded areas, conduct to conduct rigorous sampling and analysis of public and private drinking water supply sources immediately after an inundating flood event and issue boil water advisories as needed	Flood, Storm Surge, Nuisance Flooding	Health Department, Public Water Suppliers and Property Owners	Public Health	\$25,000-100,000	Ongoing	Public Education and Outreach
15*	Work with local businesses and local industry owners to develop a continuity of operations plan.	All	Department of Economic Development (DED), CPB, Municipal Staff/Officials	County/Town staff time, MEMA technical assistance	<\$25,000	Ongoing	Public Education and Outreach
16*	Continue to provide technical assistance to local residents and business owners in applying for hazard mitigation/assistance funds and identifying cost beneficial mitigation measures to incorporate into reconstruction activities	All	CPB, Public Safety, Local - Municipal Staff/Officials	County staff time, Public Safety, technical assistance	<\$25,000	Ongoing	Public Education and Outreach
17*	Continue to ensure County and municipal compliance with local Stormwater Management Plans	Flood, Storm Surge, Nuisance Flooding	Public Works, Municipal Staff/Officials with technical assistance	County, North Beach, Chesapeake Beach	\$25,000-\$100,000	2-5 years	Preventative Measures
18	Continue to ensure compliance with approved Erosion and Sedimentation Control Plans and continue to work with local farmers to implement BMPs	Erosion, Flood	Public Works, Calvert Soil Conservation District (CSCD)	County staff time	<\$25,000	Ongoing	Natural Resource Protection

Table 7.2 – Mitigation Actions

Action ID	Project Description	Hazard Mitigated	Lead Agency	Funding Source	Est. Cost	Timeline	Action Category
19	Continue to distribute a public summary of this hazard mitigation plan including relevant information on hazard-prone areas, hazard specific “do’s” and “don’ts” and emergency contact information	All	Public Relations Office	County	<\$25,000	Ongoing	Public Education and Outreach
20*	Maintain zoning ordinance provisions for protection of all hazard areas	All	CPB, Municipalities	No Funding Required	Staff time	Ongoing	Preventative
21*	Continue to coordinate with the County, municipality and/or the Maryland Department of Transportation on the potential feasibility of replacing, removing, or enlarging those bridge and culvert stream crossings that are unable to pass the 10-year frequency flood flow	Flood, Storm Surge, Nuisance Flooding	Public Works, Municipalities, Maryland Department of Transportation (MDOT), SHA	Calvert County CIP, MDOT, SHA	>\$100,000	Ongoing	Structural Projects
22*	Give high priority to undeveloped floodplain areas for preservation.	Flood, Storm Surge, Nuisance Flooding	County – Division of Natural Resources (CCDNR), CPB, Local – Municipal Officials	HMGP, FMA, CDBG, PDM, Rural Legacy Program (RLP)	>\$100,000	Ongoing	Natural Resources
23*	Continue a community-specific stormwater maintenance program consisting of routine inspections and subsequent debris removal	Flood, Storm Surge, Nuisance Flooding	Municipal Staff/Officials, Public Works	Local Funding	>\$100,000	Ongoing	Natural Resource Protection

Table 7.2 – Mitigation Actions

Action ID	Project Description	Hazard Mitigated	Lead Agency	Funding Source	Est. Cost	Timeline	Action Category
24	Recommend to the Board of Education to develop and implement a natural hazards awareness curriculum.	All	County Public Relations Officer, Board of Education (BOE) with technical assistance from FEMA/MEMA	No Funding Required	Staff Time	1-2 years	Public Education and Outreach
New Mitigation Actions – 2017							
25	Reduce vulnerability to wildfires by providing public education on increasing buffers and defensible spaces.	Wildfire	Public Safety	Local Funding	<\$25,000	Ongoing	Preventative Measures
26	Make recommendations to the state to develop a disclaimer for developing along the cliffs.	Earthquake, Landslide, Erosion	Public Safety, CPB	Local	Staff Time	1-2 years	Natural Resource Protection
27	Continue to encourage Calvert County citizens to be better prepared to face hazards by promoting and offering Community Emergency Response Team (CERT) training/classes to increase the number of citizen responders in the municipalities and population centers.	All	Public Safety	State Homeland Security Grant	Staff time	Ongoing	Public Education and Outreach
28	Continue to identify at-risk populations (elderly, homeless, persons with physical or mental disabilities) to various hazards and maintain records of those vulnerable populations and the types of assistance they may need before, during, or after a hazard.	All	Public Safety, Department of Community Resources, Department of Social Services	Staff time	<\$25,000	Ongoing	Public Education and Outreach

Table 7.2 – Mitigation Actions

Action ID	Project Description	Hazard Mitigated	Lead Agency	Funding Source	Est. Cost	Timeline	Action Category
29	Continue to conduct annual Training Exercises for all hazard events at least twice a year.	All	Public Safety	Local Funding	<\$25,000	Ongoing	Emergency Services
30	Continue the process to meet requirements to become certified as a Storm Ready Community (by the National Weather Service StormReady® Program).	Tornado, Hurricane, Nor'easter, Thunderstorm, Winter Storm, Flood	Public Safety	State Homeland Security Grant, Local Funds	\$25,000-100,000	Ongoing	Preventative Measures
31	Conduct seminars in schools on various hazards that could threaten the County and provide informational packets for students to take home.	All	Public Safety, BOE, County	Local Funds	Staff Time	1-2 years	Public Education and Outreach
32	Implement FEMA's Integrated Public Alert and Warning System (IPAWS) for sudden onset hazards such as tornados, thunderstorms, or flash floods.	Tornado, Flash Flood, Thunderstorm	Public Safety	No Funding Required	Free	Ongoing	Emergency Services
33	Create a ReadyCalvert website for hazard education and preparedness to inform residents on what to do before, during, and after each potential hazard.	All	Public Safety, County staff time, Technology Services	Local Funds	<\$25,000	1-3 years	Public Education and Outreach
34	Continue to maintain relationships with the County School Board to enhance the County's shelter capabilities.	All	Public Safety, County staff time	Local Funds	Staff Time	Ongoing	Preventative Measures

Table 7.2 – Mitigation Actions

Action ID	Project Description	Hazard Mitigated	Lead Agency	Funding Source	Est. Cost	Timeline	Action Category
35	Develop a volunteer database to identify qualified shelter staff (nurses, teachers, retired military, police, or emergency services, etc.) to bolster the County's staffing capabilities.	All	Public Safety, DSS	Local Funds	<\$25,000	1-3 years	Emergency Services
36	Conduct data analytics of the County's emergency websites and media outlets to track the reach and efficacy of information including news posts, bulletins, and reading materials.	All	Public Safety, PIO, Technology Services	Local Funds	<\$25,000	1-3 years	Public Education and Outreach
37	Develop an Emergency Management "Brand" to be the face of Emergency Preparedness and provide a trusted and reliable source of information to the public. Raise awareness of the County's Emergency Management Division and their roles and responsibilities.	All	Public Safety	Local Funds	<\$25,000	1-3 years	Public Education and Outreach
38	Work with the Board of Education to introduce and conduct tornado drills in schools and educate children and families about the growing threat of tornados.	Tornado	Public Safety, BOE, County staff time	Local Funds	Staff Time	3-5 years	Public Education and Outreach
39	Continue to coordinate with County PIO to develop a "pre-approved" set of releases to be disseminated to the public in a timely manner in the event of an emergency.	All	Public Safety, PIO, County staff time	Local Funds	Staff time	Ongoing	Public Education and Outreach

Municipal Mitigation Actions

Requirement §201.6(c)(3)(iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Multi-jurisdictional plans require all municipalities to have at least one mitigation action to be included in the hazard mitigation plan. **Table 7.1** identifies the mitigation actions for the entire county. Actions that were determined to be applicable to the entire county as well as to both municipalities have an asterisk (*) placed next to the Action ID Number. These ten (10) actions were developed in the same manner as the county-level projects, and in addition, drew heavily from the suggestions from local representatives. The Table includes mitigation actions for each municipality, the hazard mitigated by the action, the Lead Agency which is the responsible entity for implementing the project, possible funding sources, estimated cost, and projected timeline.

National Flood Insurance Program (NFIP) and Continued Compliance

Requirement §201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

Communities that participate in the NFIP are required to adopt flood maps and local requests for map updates; adopt and enforce minimum floodplain management regulations that help mitigate the effects of flooding on new and improved structures in the Special Flood Hazard Area; offer property owners flood insurance as a protection against flood losses in exchange for floodplain management regulations that reduce future flood damages, and perform community assistance and monitoring activities.

While FEMA is the official administering agency for National Flood Insurance Program (NFIP) participation, it is the County's responsibility to have the capability and to serve as a resource for flood mitigation activities. Calvert County is a participant in the NFIP. The County and both municipalities are committed to continuing compliance with the NFIP via three of its basic components:

- 1) floodplain identification and mapping risk;
- 2) responsible floodplain management, and
- 3) flood insurance.

After discussions with the Calvert County staff, and a brief questionnaire, the following information is summarized in **Tables 7.3 and 7.4** to document how the County, and its municipalities, currently address, and will continue to address, NFIP compliance and requirements in the future.

Currently, although the County participates, no municipalities in Calvert County participate in the NFIP. Updated DFIRM mapping is available through FEMA's Risk Map program, which became effective in 2015.

Photo 7.1 NFIP DFIRM Map

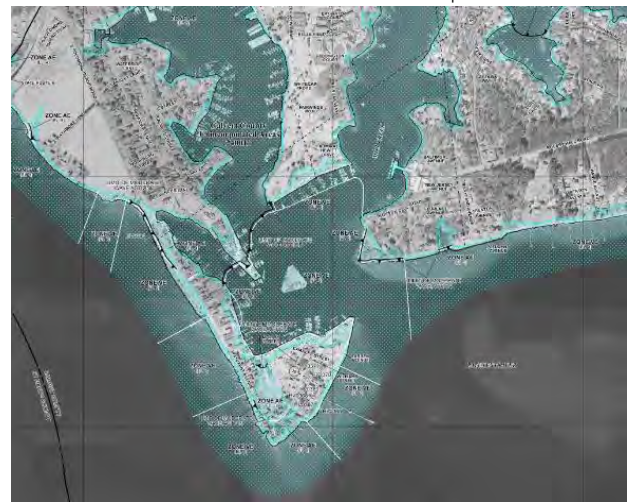


Table 7.3 – Calvert County Flood Insurance Program Continued Compliance

<i>Flood Identification and Mapping</i>	
Does the County make the Flood Insurance Rate Map and Flood Insurance Studies available to the public? Where are these documents housed within the County?	Yes. The documents are housed with the Department of Planning and Zoning.
Will the recently developed Digital Flood Insurance Rate Maps be made available to the public as well? How?	Yes. They are available on-line and through county staff.
Are Letters of Map Revisions (LOMRs) reviewed and signed by County officials? If during the subdivision review process, a new development determines a reduction in the floodplain delineation of the FIRM floodplain, is the developer required to submit a LOMR submission to FEMA?	The developer must provide the LOMRs to the county for review. The FIRMS must be amended through FEMA prior to acceptance by the county for review.
Does the County provide advice to community residents regarding elevation certificates and Letter of Map Amendment (LOMA) applications?	Yes.
Does the County maintain records of approved letters of map change?	Yes. All correspondence with FEMA is maintained.
Does the County assist residents in interpreting the FIRM and County flood studies to determine the property's status in the floodplain? If yes, which department?	Yes. The Department of Planning and Zoning.
<i>Floodplain Management</i>	
Are any restrictions on floodplain use enforced through the subdivision and building permit process?	Yes. Restrictions are enforced at both levels and Site Plan review.
Do all proposed developments require plans to go through the County's subdivision approval process or to acquire a building permit for new structures?	Yes.
Are all new structures required to be at least 1.5 feet above the 100-year base flood elevation?	Calvert County has a 2' free board requirement.
Is the County committed to educating residents about the value and availability of flood insurance? Is an annual letter sent to residents in the floodplain explaining the importance of flood insurance and where it may be obtained?	Yes.

Does the County assist residents in interpreting the FIRM and County flood studies to determine their property's floodplain status, and offer advice regarding elevation certificates and LOMA applications?	Yes.
When was the last Community Assistance Visit conducted and, as of that date, was Calvert County found to meet the requirements for continued participation in the NFIP?	We revised our maps and ordinance in 2011 and 2014. We joined the CRS in 2016. Kevin Wagner, MDE, conducted our CAV just prior to joining the CRS. Calvert County meets the requirements for continued participation in the NFIP.

Table 7.4 Town of Chesapeake Beach Flood Insurance Program Continued Compliance

Flood Identification and Mapping	
Does Chesapeake Beach make the Flood Insurance Rate Map and Flood Insurance Studies available to the public? Where are these documents housed within Chesapeake Beach?	<p>The Town Web page has the current FIRM maps, for Chesapeake Beach, on-line.</p> <p>The Town Clerk has hard copies of the maps and Flood Insurance Study available at Town Hall – 8200 Bayside Road, Chesapeake Beach, MD 20732 Phone 410-257-2230</p>
Will the recently developed Digital Flood Insurance Rate Maps be made available to the public as well? How?	See above.
Are Letters of Map Revisions (LOMRs) reviewed and signed by Town officials? If during the subdivision review process, a new development determines a reduction in the floodplain delineation of the FIRM floodplain, is the developer required to submit a LOMR submission to FEMA?	<p>Yes, the Town reviews and signs LOMRs.</p> <p>IF the developer chooses to request a revision, the Town will review, provide any appropriate advice and upon acceptability sign. The developer would be required to make the submittal, pay fees, etc.</p>
Does the Town provide advice to community residents regarding elevation certificates and Letter of Map Amendment (LOMA) applications?	Yes.
Does Chesapeake Beach maintain records of approved letters of map change?	Since our first request has only recently been submitted, we have not, to my knowledge, had any prior requests. Once approved, the letters will be scanned and stored on-line.
Does Chesapeake Beach assist residents in interpreting the FIRM and Town flood studies to determine the property's status in the floodplain? If yes, which department?	Yes, the Floodplain Administrator provides limited advice in assisting a property owner to make a determination of whether the property is affected by a flood hazard area and the area's status.

Floodplain Management	
Are any restrictions on floodplain use enforced through the subdivision and building permit process?	Yes, once identified as impacted by a flood hazard area, the application is reviewed and advice given to the applicant, as to procedures, requirements and suggestions for minimization or mitigation.
Do all proposed developments require plans to go through Chesapeake Beach's permit approval process or to acquire a building permit for new structures?	While a very few structures (fences, sheds under 250 square feet, ETC.) are exempted from requiring a permit, the Town reviews and considers issuance of all submitted applications for new structures.
Are all new structures required to be at least 1.5 feet above the 100-year base flood elevation?	The Town Floodplain Management Ordinance has a requirement of a buffer of at least 2 feet above the base flood elevation.
Is Chesapeake Beach committed to educating residents about the value and availability of flood insurance? Is an annual letter sent to residents in the floodplain explaining the importance of flood insurance and where it may be obtained?	The Town attempts to keep the affected property owners informed about new impacts to a flood hazard area which may affect that property owner. No such letter has ever been sent to advise of the benefits of Flood insurance.
Does Chesapeake Beach assist residents in interpreting the FIRM and Town flood studies to determine their property's floodplain status, and offer advice regarding elevation certificates and LOMA applications?	Yes
When was the last Community Assistance Visit conducted and, as of that date, was Chesapeake Beach found to meet the requirements for continued participation in the NFIP?	Approximately 3 – 4 years ago. We were found to meet the requirements.

Prioritization of Mitigation Actions

Requirement: §201.6(c)(3)(iii): *[The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

Once the mitigation actions and implementation plan were finalized, the Steering Committee developed specific criteria to prioritize the actions. Mitigation actions from the 2010 Plan that fell into the latter two categories: “In Progress” and “On-Going” were reprioritized. A new set of criteria was used and the Plan was revised to reflect the following three criteria to reflect changes in priorities. The criteria included: Social Considerations, Administrative Considerations, and Economic Considerations. The following questions were asked to evaluate criteria for project prioritization.

Social Considerations – Life/Safety Impact

- Will the project have minimal, direct or significant impact on the safety of residents, businesses, and properties?
- Will the proposed action adversely affect one segment of the population?
- Will the project be a proactive measure to reduce a particular risk or risks?

Administrative Considerations – Administrative/Technical Assistance

- Is there sufficient staff currently available to implement the project?
- Is training required for the staff to implement this project?

Economic Considerations – Project Cost

- What is the approximate cost of the project?

For each criterion, the level of importance (high, medium, or low) was determined and corresponding points were assigned, as indicated in Table 6.5

Table 7.5. Evaluation Criteria for Project Prioritization

Criteria	Points	High	Points	Medium	Points	Low
Life/Safety Impact	10	Significant impact on public safety for businesses, residents and/or properties	6	Direct impact on businesses, residents and/or properties	2	Minimal/negligible impact on businesses, residents and/or properties
Administrative/ Tech Assistance	5	No additional staff or technical support needed to implement action	3	Some administrative and technical support needed to implement action	1	Significant administrative and technical support needed to implement action
Project Cost	5	Low cost (<\$25,000)	3	Moderate cost (\$25,000-\$100,000)	1	High cost to implement (>\$100,000)

Points were then assigned to each action and totaled, to determine the ranking of actions as shown in **Table 7.6**. It should be noted that this Plan does not include a prioritization of projects within a category; i.e., there is no ranking of projects listed within the High Priority category.

Table 7.6 – Mitigation Projects Prioritization

Action ID	Project Description	Life/ Safety	Admin/Tech	Cost	Total Score
Ongoing Actions					
1	Continue to support a regular maintenance program for emergency generators at the county's critical facilities. Develop a regular maintenance program that includes a schedule to change filters, etc.	10	5	5	20
2*	Update Comprehensive Plan to include a Hazard Mitigation Section that provides an assessment of hazard vulnerability and appropriate mitigation recommendations	6	3	5	14
3	Continue to conduct routine inspections, regular maintenance, and annual tests on all emergency communications equipment, public address systems, and hazard alert sirens to ensure unhindered operation during an emergency event	10	5	5	20
4	Continue to ensure that a planned, coordinated, and effective public warning dissemination program exists at the local level and is well maintained.	6	5	3	14
5*	Utilize existing technical proficiency at the local level for conducting post-disaster damage assessments.	10	3	3	16
6	Ensure reconstruction activities are compliant with NFIP substantial damage/improvement requirements and existing codes.	10	5	5	20
7	Introduce NOAA Weather Alert radios in designated critical facilities across the county for situational awareness.	2	5	5	12
8	Continue to develop and distribute a public informational pamphlet related to the potential health and safety implications of various natural hazard events. Also place the information on the County website and COMCAST	2	5	5	12
9	Continue to conduct hazard response practice drills and emergency management training exercises on an annual basis	2	3	3	8
10*	Identify natural resources that provide natural mitigation such as wetlands, buffers, etc and make them a priority for conservation.	2	3	3	8
11	Develop and implement a post-disaster recovery plan.	2	3	5	10
12	Continue to work with local radio stations to promote continuity of public awareness and disaster preparedness.	2	5	5	12
13	Continue to maintain and replace county owned critical infrastructure.	2	1	1	4

Action ID	Project Description	Life/ Safety	Admin/Tech	Cost	Total Score
14	In flooded areas, conduct to conduct rigorous sampling and analysis of public and private drinking water supply sources immediately after an inundating flood event and issue boil water advisories as needed	6	3	3	12
15*	Work with local businesses and local industry owners to develop a continuity of operations plan.	6	3	5	14
16*	Continue to provide technical assistance to local residents and business owners in applying for hazard mitigation/assistance funds and identifying cost beneficial mitigation measures to incorporate into reconstruction activities	2	3	5	10
17*	Continue to ensure County and municipal compliance with local Stormwater Management Plans	2	3	3	8
18	Continue to ensure compliance with approved Erosion and Sedimentation Control Plans and continue to work with local farmers to implement BMPs	2	5	5	12
19	Continue to distribute a public summary of this hazard mitigation plan including relevant information on hazard-prone areas, hazard specific "do's" and "don'ts" and emergency contact information	2	5	5	12
20*	Maintain zoning ordinance provisions for protection of all hazard areas	2	5	5	12
21*	Continue to coordinate with the County, municipality and/or the Maryland Department of Transportation on the potential feasibility of replacing, removing, or enlarging those bridge and culvert stream crossings that are unable to pass the 10-year frequency flood flow	6	1	1	8
22*	Give high priority to undeveloped floodplain areas for preservation.	2	3	1	6
23*	Continue a community-specific stormwater maintenance program consisting of routine inspections and subsequent debris removal	2	3	1	6
24	Recommend to the Board of Education to develop and implement a natural hazards awareness curriculum.	2	5	5	12
New Mitigation Actions – 2017					
25	Reduce vulnerability to wildfires by providing public education on increasing buffers and defensible spaces.	2	5	5	12
26	Make recommendations to the state to develop a disclaimer for developing along the cliffs.	6	5	5	16

Action ID	Project Description	Life/ Safety	Admin/Tech	Cost	Total Score
27	Continue to encourage Calvert County citizens to be better prepared to face hazards by promoting and offering Community Emergency Response Team (CERT) training/classes to increase the number of citizen responders in the municipalities and population centers.	2	5	5	12
28	Continue to identify at-risk populations (elderly, homeless, persons with physical or mental disabilities) to various hazards and maintain records of those vulnerable populations and the types of assistance they may need before, during, or after a hazard.	2	5	5	12
29	Continue to conduct annual Training Exercises for all hazard events at least twice a year.	2	5	5	12
30	Continue the process to meet requirements to become certified as a Storm Ready Community (by the National Weather Service StormReady® Program).	6	5	3	14
31	Conduct seminars in schools on various hazards that could threaten the County and provide informational packets for students to take home.	6	5	5	16
32	Implement FEMA's Integrated Public Alert and Warning System (IPAWS) for sudden onset hazards such as tornados, thunderstorms, or flash floods.	6	5	5	16
33	Create a ReadyCalvert website for hazard education and preparedness to inform residents on what to do before, during, and after each potential hazard.	6	5	5	16
34	Continue to maintain relationships with the County School Board to enhance the County's shelter capabilities.	6	5	5	16
35	Develop a volunteer database to identify qualified shelter staff (nurses, teachers, retired military, police, or emergency services, etc.) to bolster the County's staffing capabilities.	2	5	5	12
36	Conduct data analytics of the County's emergency websites and media outlets to track the reach and efficacy of information including news posts, bulletins, and reading materials.	2	5	5	12
37	Develop an Emergency Management "Brand" to be the face of Emergency Preparedness and provide a trusted and reliable source of information to the public. Raise awareness of the County's Emergency Management Division and their roles and responsibilities.	2	5	5	12

Action ID	Project Description	Life/ Safety	Admin/Tech	Cost	Total Score
38	Work with the Board of Education to introduce and conduct tornado drills in schools and educate children and families about the growing threat of tornados.	2	5	5	12
39	Continue to coordinate with County PIO to develop a "pre-approved" set of releases to be disseminated to the public in a timely manner in the event of an emergency.	2	5	5	12

High-Priority Actions

The actions listed below received the highest scores (16-20) based on the ranking.

- Continue to support a regular maintenance program for emergency generators at the county's critical facilities. Develop a regular maintenance program that includes a schedule to change filters, etc.
- Continue to conduct routine inspections, regular maintenance, and annual tests on all emergency communications equipment, public address systems, and hazard alert sirens to ensure unhindered operation during an emergency event
- Ensure reconstruction activities are compliant with NFIP substantial damage/improvement requirements and existing codes.
- Utilize existing technical proficiency at the local level for conducting post-disaster damage assessments.
- Make recommendations to the state to develop a disclaimer for developing along the cliffs.
- Conduct seminars in schools on various hazards that could threaten the County and provide informational packets for students to take home.
- Implement FEMA's Integrated Public Alert and Warning System (IPAWS) for sudden onset hazards such as tornados, thunderstorms, or flash floods.
- Create a ReadyCalvert website for hazard education and preparedness to inform residents on what to do before, during, and after each potential hazard.
- Continue to maintain relationships with the County School Board to enhance the County's shelter capabilities

Deleted, Combined, and Removed Actions

Action items from the original 2010 Flood Mitigation Plan that have been completed, deemed infeasible, or merged/combined with another action item have been removed from this plan. Those actions are itemized, described, and justified in the table below.

Table 7.7 – Removed Actions from 2010 Plan

Action No.	Action	Status	Notes
6B	Encourage uninsured property owners in known flood hazard areas to purchase flood insurance through the NFIP	Removed	This item is covered in the FMP
6E	Establish a partnering relationship with the NWS to enhance the existing Flood Forecast and Warning System via the Advanced Hydrologic Prediction Services Program	Completed	
7	Coordinate with FEMA and MEMA regarding updating Calvert County's, North Beach's and Chesapeake Beach's Flood Insurance Rate Mapping via FEMA's Flood Map Modernization Program to include the expansion of previously unmapped areas and additional Base Flood Elevations	Completed	The County and Towns updated their FIRMS and floodplain ordinances in 2014.
10A	Make available for municipal use the digital natural hazard mapping files that were developed as part of this planning study	Completed	GIS maintains this.
10B	Conduct engineering inspections of county fire stations to determine mitigation retrofitting measures necessary	Completed	
10C	Encourage the owners/operators of private schools and daycares to develop and implement an emergency response plan	Completed	It is a licensing requirement in Maryland and is done through the Health Dept.
11A	Ensure municipal compliance with minimum NFIP floodplain development regulations	Removed	This item is covered in the FMP
12	Evaluate all manufactured homes to ensure their resistance to wind and flood hazards	Completed	This action refers to Hallowing Point Trailer Park. In 2015, the trailer park was removed from its location in the 100-year floodplain, eliminating the need to evaluate all manufactured homes to ensure their resistance to wind and flood hazards. To my knowledge there are no other manufactured homes in the 100-year floodplain.

13	Consider expanding the automated emergency alert community calling system (Code Red)	Completed	System upgraded to EverBridge
15B	Store in an easily accessible location and make available for public inspection, the community's Flood Insurance Rate Mapping and associated Flood Insurance Study	Completed	Website
16B	Workshops for local engineers, architects and contractors/builders on IBC and hazard resistant construction	Removed	
17	Dry floodproof known flood-prone structures in accordance with the general guidelines	Removed	This item is covered in the FMP
18	Store in an easily accessible location and make available for public inspection, this hazard mitigation plan and the FEMA guidance documents that were provided as part of the hazard mitigation planning program	Completed	
19A	Maintain natural hazard risk assessment and mitigation publications/materials at public libraries throughout the county	Completed	
19C	Develop a new, or revise an existing, Zoning Ordinance to include separate zones or districts for known hazard areas	Completed	
19E	Preserve the highest priority undeveloped steep slope areas via fee simple acquisition and/or permanent easement and retain as public open space for passive recreational uses. Less critical steep slope areas may be preserved/protected via local ordinance	Completed	The Department of Community Planning and Building protects steep slopes through development review and permit issuance (Article 8 of the Calvert County ZO). Outside the Critical Area, impacts to steep slopes of 25% or more are prohibited and inside the Critical Area impacts to steep slopes 15% or more are prohibited.
20	Wet floodproof known flood-prone structures in accordance with the general guidelines	Removed	This item is covered in the FMP
24B	Update and implement a comprehensive water resources management plan that analyzes the county's existing water resources supply and evaluates the county's anticipated water use demand	Completed	The Department of Community Planning and Building completed this action in 2010. The 2004 comprehensive plan was amended to include the Water Resources Element, which assesses existing drinking water resources and its supply and demand.
25A	Elevate known flood-prone structures in accordance with the general guidelines	Removed	This item is covered in the FMP

25B	Develop and implement a wetland protection program consisting of public education materials that highlight the functions and values of wetlands and local ordinance provisions that minimize/eliminate wetland disturbance	Completed	
26	Relocate and/or acquire known flood-prone structures in accordance with the general guidelines	Removed	This item is covered in the FMP
27	Preserve critical undeveloped forested areas via fee simple acquisition and/or permanent easement and retain as public open space for passive recreational uses. Less critical forested areas may be preserved/protected via local ordinance	Removed	This item is covered in the FMP
28	Coordinate with FEMA, MEMA, NWS, and any other appropriate entities on developing and implementing a natural hazard awareness curriculum in local schools	Not Feasible	Cannot control school curriculums
28A	Enroll in the Firewise Communities Program	Removed	Calvert is not in a wildfire zone
28B	Preserve high priority wetland areas via fee simple acquisition and/or permanent easement and retain as public open space for passive recreational uses. Less critical wetlands may be preserved/protected via local ordinance	Combined with 25B and removed	This item is covered in the FMP
29	Provide adequate shelters, with backup power, in various parts of the county to serve as refuge areas during floods and other hazard events	Completed	
30	Ensure that all documented information can be accessible from the county internet/intranet site. Provide pertinent public information on COMCAST	Removed	This material was covered under 15B
31	Follow the recommendations of the Chesapeake Bay Cliff Erosion Study Commission including the acquisition and relocation of willing property owners	Completed	Could be more properties in the future.

CHAPTER 8: PLAN MAINTENANCE



Update Process Summary

Requirement §201.6(c)(4)(i): [The plan maintenance process **shall** include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Once this Plan has received approval from the Maryland Emergency Management Agency (MEMA) and the Federal Emergency Management Agency (FEMA), the Plan will be adopted by the Calvert County Commission and its nine participating jurisdictions. This County Hazard Mitigation Plan Update is intended to be a 'living document'. Plan adoption is not considered the final step in the planning process, but rather as a first step to 'realization'. The plan monitoring and maintenance schedule is a cycle of events that involve periodic review, adjustments, and improvement. This Chapter establishes a method to monitor how the Plan will be evaluated and maintained in the future.

Monitoring, Evaluating, and Updating the Plan

In order to ensure that the Plan continues to provide a framework of reducing risk in the County, the Emergency Management Agency will take responsibility to convene an annual meeting of the Hazard Mitigation Plan Steering Committee. The Committee will comprise of the members who were involved in the preparation of the Plan Update as well as municipal representatives.

An annual report form is included at the end of this Chapter for each high priority County project, and for each municipality to provide an update to the County on the status of their mitigation

projects. This form will be distributed to all municipalities, requesting them to document the status of each hazard mitigation action for their jurisdiction. Each action proposed in the Mitigation Plan will be categorized as one of the following: completed, in progress, not started, modified, or cancelled. The Steering Committee will assist the Emergency Manager to prepare a status report of the mitigation actions based on the annual report forms from the municipalities as well as the County.

In addition to conducting an annual review of the Plan, the Steering Committee will review the Plan within 30 days after a disaster. Each goal and objective will be examined for its relevance and validity to the changing situation in each municipality and the mitigation actions will be reviewed to ensure that they address any recent issues that may have stemmed from disaster events. During quiet times, the Plan will be updated every five years to reflect the current risk, vulnerabilities, development trends, and as mitigation actions are implemented. While an annual report will be completed each year, any state and Federal mandates from MEMA and FEMA respectively, will be addressed in the five-year update. The municipalities will not be responsible for making any changes to the Hazard Mitigation Plan based on MEMA or FEMA requirements in between the five-year update.

Benefit-Cost Analysis

A benefit-cost analysis determines the cost effectiveness of a project to minimize damage or prevent damage from future hazard events. By determining the benefit-cost of the proposed mitigation project, it will provide the communities, as well as project developers, with additional knowledge about the feasibility of the proposed mitigation alternative. If the costs outweigh the benefits, then other alternatives that are more effective can be identified to accomplish the Plan's goals.

Continued Public Involvement

Requirement §201.6(c)(4)(iii): *[The plan shall include a] discussion of how the community(ies) will continue public participation in the plan maintenance process.*

The preparation of this Plan has involved the public throughout the process through public meetings and via the Internet and social media. Calvert County is dedicated to continuing to solicit public participation during the five-year update as required by FEMA. Copies of the Hazard Mitigation Plan Update will be provided to the public libraries and be placed on the County's website, along with a mechanism for submission for comments.

Requirement §201.6(c)(4)(ii): *[The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.*

As indicated in the Plan Integration section (Chapter 6), the Calvert County Floodplain Regulations; Calvert County Road Ordinance; Calvert County Stormwater Management Ordinance; The Broomes Island Flood Mitigation Plan; and The Cove Point Community Flood Mitigation Plan, among other documents, are identified for incorporation of hazard mitigation actions once the Plan is adopted. Each of these mechanisms will continue to be used to meet the intent of this Plan, as appropriate. Once the County adopts this Hazard Mitigation Plan Update, mitigation strategies discussed in this plan will be implemented via the aforementioned mechanisms as well as through the incorporation into the new planning mechanisms. Specific

options for incorporating hazard mitigation principles into each of these plans and ordinances have been made in Chapter 6, which may be incorporated as an amendment to the document.

Incorporation of Mitigation Actions into Existing Planning Mechanisms – Municipalities

Requirement §201.6(c)(4)(ii): *[The plan shall describe] a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate.*

Once the County Commission adopts the 2017 Calvert County Hazard Mitigation Plan Update, the Document Review section of Chapter 6 of this Plan Update should be reviewed and disseminated to various County agencies and municipalities that develop and implement specific plans and ordinances. Each participating municipality will be responsible for implementing the specific recommendations in the document review section of the Plan and incorporating these recommendations into their local planning documents such as comprehensive plans, zoning ordinances, land development, and subdivision regulations.

Plan Adoption

Adoption by the Local Governing Body

Requirement §201.6(c)(5): *[The local hazard mitigation plan **shall** include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., County Commission).*

Include adoption resolution from Calvert County here

Multi-Jurisdictional Plan Adoption

Requirement §201.6(c)(5): *For multi-jurisdictional plans, each jurisdiction requesting approval of the plan **must** document that it has been formally adopted.*

Include adoption resolutions from all municipalities in Calvert County here

Hazard Mitigation Plan Sample Annual Report Form

Progress Report Period _____ to _____

Next Plan Update _____

Project Title _____ Project ID # _____

Project Type: (select one)

County Project _____ Municipal Project _____

Responsible County Agency(ies) or Municipality _____

Address: _____

Contact: _____

Title: _____

Phone: _____

Email: _____

Project Description:

Project Status (select one)

Completed ____ In Progress ____ Not started/delayed ____ Modified ____ Cancelled ____

How many people were protected by this action? _____

Were there any structures mitigated? If so, how many? _____

Explain:

Obstacles/challenges/delays incurred:

Method to resolve obstacle/challenge/delay:

Next steps to be accomplished over the next reporting period:

**Hazard Mitigation Plan
Sample Annual Report Form**

Other comments:

Appendix A

Meetings

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Meetings and Agendas

Calvert County
FLOOD MITIGATION AND ALL HAZARDS MITIGATION PLAN UPDATE
Steering Committee Meeting #1
19 October 2016
10:30am-12 noon
AGENDA

Introductions

- County Staff
 - Community Planning and Zoning
 - David Brownlee, Tay Harris
 - Emergency Management
 - Al Jeffery, Shelly Gooding
- Steering Committee Members
- Consultants
 - Deepa Srinivasan, President, Vision Planning and Consulting, LLC
 - Mike Scott, ESRGC, Salisbury University

PowerPoint Presentation – Deepa Srinivasan and Ashley Samonisky

- Overview of the Flood Mitigation and Hazard Mitigation Planning Processes
- Schedule
- Deliverables

Discussion of Relevant Plans, Ordinances, and Programs - Deepa Srinivasan

Examination of 2010 Flood Mitigation Plan

- Goals and Objectives
- Mitigation Actions

Examination of 2010 All Hazards Mitigation Plan

- Goals and Objectives
- Mitigation Actions

Wrap-up

- Next steps
- 2nd Steering Committee Meeting and Public Meeting
- Questions

Adjournment

**Steering Committee Meeting #1 – 10/24/16 9:30am-11:30am
Courthouse Square Building, 205 Main Street, Prince Frederick**

Meeting Summary by Ashley Samonisky, Vision Planning and Consulting



Attendees were given a brief introduction to the Consulting firm contracted for the planning and update process, Vision Planning and Consulting. Introductions were given to the principal Vision contacts for working on the project, Deepa, Mike, and Ashley. Deepa discussed the integrated planning process, deliverables, and timelines for the two plans.

Committee members then examined each of the goals and objectives laid out in the 2010 plans for both the Flood Mitigation Plan and the All Hazards Mitigation Plan. Each goal and objective was evaluated line by line for clarity, cohesiveness, and relevance. Terminology was discussed, and suggestions made to help the plan be more comprehensible to the business sector and the general public.

Copious notes were taken to include all of the discussion and recommendations made by committee members. Steering committee members will be emailed notes/minutes once they have been compiled.

Tay provided an update on the FMP mitigation actions current standing so we can see what has been done, what is pending, and what is being deferred, and why. Next steps include compiling a similar list for the All Hazard MP's Mitigation Actions from the 2010 plan.

Next steps include scheduling the second Steering Committee meeting to discuss the Hazard Identification and Risk Assessment (by Dr. Mike Scott), updating the goals and objectives for review by the committee, and planning first public outreach meeting for mid-November or early December.

**Calvert County
FLOOD MITIGATION AND ALL HAZARDS MITIGATION PLAN UPDATE
Steering Committee Meeting #2
14 November 2016
11am -1pm
AGENDA**

Examine 2010 Flood Mitigation Plan

- Mitigation Actions

Examine 2010 All Hazard Mitigation Plan

- Mitigation Actions

Develop new mitigation actions

Wrap-up

- Next steps
- 3rd Steering Committee Meeting and Public Meeting - 28 November 2016
- Questions

Adjournment

SIGN-IN SHEET
 2nd Steering Committee Meeting
 Calvert County HMP/FMP
 14 November 2016

Name	Agency/ Municipality	Title	Phone No.	Email	Address
Andy Baldwin	DPW	Project Engineer	410-535-2104	balbaldin@co.cal.md.us	150 Main St. Prince Frederick, Md 20678
Jen Archer/Scri	DREERY POINT		301-758-0391	jen.arkr@comcast.com	5335 Bury 2nd Rd A US Beach HD 20732
Steve Farrell	Broomes Island		410-535-1442	stevf714@comcast.net	9345 River View Rd Broomes Is. MD 20615
Dr. Jeffrey Johnson	EM	Chief Designer	2791 410-535-1600	johnsonj@co.cal.md.us	
Dave Brownlee	CPB	Principal Env. Planr	410-535-1600 x 2338	dbrownlee@co.cal.md.us	150 Main St. P.F., MD 20678
John Johnson	TNB	Ten Engineer	410-535-5940	johnjohnson.net	P.O. Box 2540 FF 20679
Andrey Samonitsky	VPC	Planner		asamonitsky@vision-r.net	
Deepa Srinivasan	VPC	Pres		dsrinivasan@vision-r.net	
Hali Kilbourne	Ches. Bio Lab.	Professor	410-326-7200	kilbourne@americeeriv	461 W. Liberty St. Calvert PO Box 38 Seale, MD 20688
Tony Harris	CBPES	Planner	410-535-1600 x 250	tharris@co.cal.md.us	150 Main St., 2 nd Floor P.F., MD 20678

**Steering Committee Meeting #2 – 1/14/16 11:00am-1:00pm
County EOC, Courthouse Building, 175 Main Street, Prince Frederick**

Meeting Summary by Ashley Samonisky, Vision Planning and Consulting



The Steering Committee's focus for this meeting was to evaluate the Goals and Objectives and the Action Items for the Flood Mitigation Plan. There were a few new members attending the meeting so the committee began with a round of introductions and a brief review of the committee's purpose and an update from the last meeting.

Attendees were given handouts of the goals and objectives as well as the action items for their review and a discussion was held to gather input or recommendations on the content and verbiage of these documents.

Each action item for the Flood Mitigation Plan was reviewed independently for its current status (in progress, completed, deferred), relevance, and feasibility. Completed Items will be removed from the list, in progress and ongoing efforts will be rephrased to address work already completed, and items determined to be unfeasible will be removed.

Next steps include organizing the input and recommendations from this meeting, updating the action items to reflect those improvements, begin updating the plan itself, and preparing for the first public meeting.

The next Steering Committee meeting, November 28th from 12:30-3:00pm, will cover the risk assessment and the discussion of the Action Items for the Hazard Mitigation Plan.

**Calvert County
FLOOD MITIGATION AND ALL HAZARDS MITIGATION PLAN UPDATE
Steering Committee Meeting #3
28 November 2016
12:30pm - 3pm
AGENDA**

Review Hazard Identification and Risk Assessment

- Flood
- Other Hazards

Review mitigation actions from 2010 Hazard Mitigation Plan

Wrap-up

- Next steps
- Public Meeting - 28 November 2016
- Final Steering Committee Meeting (tbd)
- Questions

Adjournment

3rd Steering Committee Mtg
 Sign in
 28 Nov 2016

<u>Name</u>	<u>Agency</u>	<u>Email</u>	<u>Phone</u>
Steve Farrell	Broomes Island	stevelf714@comcast.net	410-535- 6442
Hali Kilbourne	UMCES-CBL	kilbourna@umces.edu	7209 410-326-7209
Andy Balchin	CCF DPW	balchin@ccf.org balchin@ccf.org	410-535-2204
Michael Scott	SU/ESRGC	msscott@salisbury.edu	410-713-2 824
Debra Suman	VPC	ds@suman@usnet-pend	240-823- 8719
Dave Brownee	CPB	brownd@co.cal.md.us	410-535-1100 x 2335
Jan Long	DPW	longj@co.cal.md.us	410-535-2204
Deepa Srinivasan	VPC	-	-
Ashley Samonisky	VPC	-	-

**Steering Committee Meeting #3 – 11/28/16 12:30pm-3:00pm
Harriet Brown Community Center, 901 Dares Beach Road, Prince Frederick, MD**

Meeting Summary by Ashley Samonisky, Vision Planning and Consulting



The Steering Committee was presented with the initial findings of the Hazard Identification and Vulnerability Assessment by Dr. Mike Scott of the Eastern Shore Regional GIS Cooperative (ESRGC). This presentation provided definitions of terms used throughout the process and gave basic background information on the various hazards Calvert County could potentially face.

In addition to examining the various types of hazards, special attention was paid to flooding, as this is the most common problem for the county. Dr. Scott discussed the process for generating the 1% chance flood area and the data sources used to come up with this estimate.

Using HAZUS, a special program designed by FEMA, Dr. Scott was also able to assign a dollar amount for the potential losses associated with a serious flooding event. Property exposures could reach over 14 million dollars in parts of Calvert County. Similar exposure estimates were generated for every hazard type listed in the plan; wind events, tornado, thunderstorms, extreme temperatures, drought, winter storms, hail, and earthquakes.

Committee members then discussed changing the prioritization (Low, Moderate, High) for these hazards based on the probability of them occurring. Some items were moved from high to moderate and some from moderate to low.

Finally, members were asked to mark-up maps showing the 1% flood area to include known or repetitive loss areas the county is currently facing that are not already represented on the map.

**2016 All-Hazards Mitigation Plan and Flood Mitigation Plan Update
Calvert County, MD**
Public Meeting
28 November 2016

Presented by:
Deepa Srinivasan, Vision Planning and Consulting, LLC
Dr. Michael Scott, ESRGC, Salisbury University



Project Purpose

To update the all-hazards mitigation plan and flood mitigation plan to improve Calvert County's resistance to natural hazards, including flooding, by identifying actions to reduce the impact of various hazards to people and property.

Key Players

- Calvert County Staff – Emergency Management, Community Planning and Building, GIS, etc.
- Hazard/Flood Mitigation Plan Steering Committee
- Municipalities
- Consultants
 - Deepa Srinivasan, President, Vision Planning & Consulting
 - Dr. Mike Scott, ESRGC- Salisbury University
- Public
- Maryland Emergency Management Agency (MEMA)
- Federal Emergency Management Agency (FEMA R3)

Steps in the Planning Process

- Reconvene 2009 Steering Committee and develop planning process (meetings)
- Assess hazards, risks, vulnerability
- Assess municipal capabilities
 - Existing Plans, Programs, Policies – Capability questionnaire
 - Plan Integration – Document Reviews
 - Local Codes and Zoning Ordinances
 - Current and Proposed Projects
- Develop goals and objectives and mitigation actions:
 - Preventative Measures
 - Projects
 - Natural Resource Protection
 - Outreach and Communication
 - Other Mitigation Actions

Steps in the Planning Process (cont'd)

- Write mitigation plan and prioritize projects (using Evaluation Criteria)
 - Social
 - Technical/Administrative
 - Economic
- Develop implementation plan
 - Priorities for Mitigation Actions
 - Short-, Medium-, or Long-Range
 - Potential Funding Sources
 - Responsible Entities
 - Target Completion Dates
 - Five-Year Plan Maintenance Cycle

Steering Committee Meetings

4 Steering Committee Meetings

- Meeting 1: October 2016
 - Planning process, schedule, deliverables
 - Goals and objectives
- Meeting 2: November 2016
 - Mitigation Actions
- Meeting 3: November 2016
 - Hazard identification and risk assessment
- Meeting 4: January 2017
 - Mitigation actions prioritization
 - Implementation strategy



Public Meetings

- **Public Meeting 1 (Nov 2016)**
 - Planning process, hazard identification, risk assessment
 - Goals and objectives
- **Public Meeting 2 (Jan 2016)**
 - Mitigation actions and projects
 - Prioritization criteria for mitigation projects

Goals and Objectives Flood Mitigation Plan

Prevention

Goal 1: Direct population concentrations away from known or predicted high flood hazard areas through appropriate regulations.

- Address hazard mitigation goals through existing plans and ordinances.
- Continue to examine the zoning ordinance, and include language to ensure that any new development does not increase the vulnerability to flooding and make changes if required.
- Continue to ensure that the current building codes, floodplain ordinances, wetland protection, and erosion and sediment control standards are properly enforced.

Goals and Objectives Flood Mitigation Plan

Prevention - cont.

- Continue to implement a multi-objective management approach that promotes public involvement & coordination of floodplain management with other community concerns such as economic development, housing, water quality, and recreation.
- Ensure continued coordination and notification procedures between departments within the County and municipalities that are responsible for implementing flood mitigation activities.
- Develop recommendations for wetlands, buffer zones, etc. in municipal ordinances.

Goals and Objectives Flood Mitigation Plan

Property Protection

Goal 2: Ensure new construction and reconstruction is resistant to flood damage.

- Encourage owners of high-risk, pre-FIRM residential structures to use retrofitting techniques to avoid repeated flooding.
- Support projects and programs to retrofit, relocate/acquire structures that are susceptible to repetitive flooding.
- Continue to emphasize the importance of flood insurance to residents through CRS and other efforts.

Natural Resource Protection

Goal 3: Protect natural resources and open-space within the floodplain and watersheds.

- Ensure all acquired properties are cleared of all structures, returned to their natural state, and remain in public ownership in perpetuity.

Goals and Objectives Flood Mitigation Plan

Emergency Services

Goal 4: Ensure continued coordination during emergencies.

- Continue to evaluate coordination, notification, and response procedures.

Goal 5: Ensure critical facilities are less vulnerable to flooding.

- Identify appropriate mitigation techniques for critical facilities in the floodplain currently and in the long term.

Structural Projects

Goal 6: Reduce potential disruption of the County's critical infrastructure during hazard events.

- Ensure regular maintenance of the County's critical infrastructure within the 100-year floodplain.
- Identify vulnerable existing critical facilities and infrastructure and encourage pre-disaster retrofit.

Goals and Objectives All-Hazards Mitigation Plan

Goal 7: Minimize future losses from all disasters by reducing the risk to people and property.

- Protect populations and properties in Calvert County susceptible to economic or physical loss from disasters consistent with the standards established in this Plan and the current Calvert County Comprehensive Plan.
- Provide protection of critical facilities/infrastructure vital to disaster response, such as fire and police, and those vital to the continuous operations of the county, such as hospitals and health care facilities, water and sewer facilities, electrical and other utility, and transportation systems.

Goals and Objectives All-Hazards Mitigation Plan

Goal 2: Support a balance between government regulation & enforcement, and personal awareness/responsibility for hazard mitigation, by emphasizing education and training for property owners, families and individuals.

- Continue to develop and support disaster preparedness education and awareness programs, targeting specific benefits to residents, visitors, businesses, and elected officials.
- Continue to develop economic incentive programs for both public and private sectors promoting benefits of structural retrofitting.

Goals and Objectives All-Hazards Mitigation Plan

Goal 3: Minimize losses and institute adequate regulations through proper land use regulations.

- Develop and support public and private projects and programs to retrofit, relocate, or acquire properties susceptible to repetitive flooding.
- Require systematic maintenance programs for stormwater management systems.
- Discourage new development in high hazard areas through appropriate regulations and land use planning.

Goals and Objectives All-Hazards Mitigation Plan

Goal 4: Reduce economic vulnerability and increase recovery capabilities of business and industry.

- Continue public education through collaborative programs with government, businesses and community organizations through seminars and online resources.

Goal 5: Emphasize pre- and post-disaster planning to decrease vulnerability of existing and new construction to loss.

- Promote to elected officials, builders, and existing and potential homeowners, the economic and safety benefits of designing mitigation features into new construction and retrofit of existing structures.
- Identify vulnerable existing critical facilities and infrastructure and encourage pre-disaster retrofit.

Goals and Objectives All-Hazards Mitigation Plan

Goal 6: Define the benefits of hazard mitigation principles through public education.

- Educate the public on higher standards of protection to structures and facilities from hazards.
- Identify and coordinate public information programs and events such as contests and festivals with public and private partners.
- Identify and seek multiple funding sources that will support hazard mitigation awareness and training programs.

Goal 7: Ensure hazard mitigation goals are consistent with existing County plans and ordinances.

- Incorporate hazard mitigation principles into new and existing plans and ordinances.

Plan Integration

Small Area Plans

- Cove Point Community Flood Mitigation Plan
- Brookes Island Flood Mitigation Plan
- Breezy Point/Need Estate Flood Mitigation Plan

County Plans and Ordinances

- Calvert County Floodplain Regulations
- Calvert County Soil and Erosion Control Regulations
- Calvert County Road Ordinance
- Calvert County Stormwater Management Ordinance

Schedule

Flood Mitigation Plan

- Hazard Identification and Vulnerability Assessment – October and November 2016
- Mitigation Strategy – November and December 2016
- Implementation Plan – January 2017
- Deliverables to County – January 2017

Hazard Mitigation Plan

- Hazard Identification and Vulnerability Assessment – October and November 2016
- Mitigation Strategy – November 2016 through February 2017
- Deliverables to County – May - June 2017
- Plan Approvals – MEMA and FEMA R3 – August 2017

Thank You!

**Calvert County
FLOOD MITIGATION AND ALL HAZARDS MITIGATION PLAN UPDATE**

**Steering Committee Meeting #4
9 January 2017
2pm - 4pm
AGENDA**

Finalize mitigation actions and implementation plan

Discuss prioritization

Wrap-up

- Next steps
- Draft plan
- Questions

Adjournment

**Steering Committee Meeting #4 – 01/09/2017 2:00pm-4:00pm
Harriet Brown Community Center, 901 Dares Beach Road, Prince Frederick, MD**

Meeting Summary by Ashley Samonisky, Vision Planning and Consulting



The Steering Committee was presented with the combined list of recommendations from the Small Area Plans, the recommendations from the 2010 plan, and the recommendations from the flooding issues identified at the first public outreach meeting. Of these recommendations, some of the small area ones echoed the county wide ones and as such were re-worded to include all areas suffering from the same problems and the redundant recommendations were removed. Additionally, some of the recommendations were determined to be infeasible and as such they were removed.

Next, the Steering Committee was asked to prioritize the remaining recommendations based on Life/Safety Impacts, Administrative/Technical Assistance, and Project Cost. The recommendations were assigned a numerical value based on High, Medium, or Low costs or impacts, and then totaled to determine the recommendations ranking.

Finally, a draft plan was circulated for Committee members to review and provide feedback.

Calvert County
ALL HAZARDS MITIGATION PLAN UPDATE

Steering Committee Meeting #5

13 April 2017

12:30-3:30pm

AGENDA

County Mitigation Actions

- Discussion and finalization
- Review/comments by Committee

Municipal Mitigation Actions

- Summary (Deepa Srinivasan)

Prioritization of County Actions

- Review of prioritization criteria
- Project prioritization

Plan Maintenance

Overview of Draft Plan

Wrap-up

- Next steps
- Questions

Adjournment

SIGN-IN SHEET
 6th Steering Committee Meeting
 Calvert County HMP
 13 April 2017

Name	Agency/ Municipality	Title	Phone No.	Email	Address
A L JEFFERY	Calvert County EMER. Mgr	Division Chief	410-535- 1600 x2781	JEFFERYAB@CO. CAL.MD.US	Courthouse
Shelly Gooding	Calvert Co EM	Em Spec.	410 535 1600 x 2332	goodings@ co.cal.md.us	175 Main St 20678
Mary Reilly	Neeld Estate		443-945- 3187	MDSBOWEN@ COMCAST.NET	2907 Beach Dr Hollywood
Dave Brownlee	CPB	Env. Princ Planner	410-535-1600 x2335	brwnldc@co.cal. md.us	150 Main St P.F.
Ashley Suboritsky	VPC	Consultant	888 872 9626	asamonitsky@ VISION-PC.NET	Fulton, MD
Deep Suman	VPC	President	2408938719	dsrinwasana@ VISION-PC.NET	Fulton, MD

**Steering Committee Meeting #5 – 04/13/2017 12:30pm-3:30pm
Harriet Brown Community Center, Prince Frederick, MD**

Meeting Summary by Ashley Samonisky, Vision Planning and Consulting



The Steering Committee met to finalize the mitigation actions developed for the County and municipalities. The actions had been emailed out prior to the meeting to ensure the Committee had time for review.

At the meeting, each action item was discussed to determine phrasing, efficacy, and implementation methods. Some action items were combined for clarification and efficiency. Actions relating to flooding were removed as they were elaborated on in the Flood Mitigation Plan. Recently completed actions were also removed.

This process reduced the final count of actions from 55 to 39 items. Additionally, Committee members ranked the actions by social, administrative, and economic impacts, which resulted in a numerical score that was used to prioritize the implementation of the actions.

An implementation plan was developed to determine Lead Agency, Timeline, Estimated cost and potential Funding Sources for each action item. Additionally, a list of the potential hazards mitigated by each item was included.

Finally, a draft plan was shared with the Committee members for review and comment. A copy of the draft plan was provided to the Emergency Management Division for review and comment as well.

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Appendix B

Press Releases and Public Involvement

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Press Releases, Public Notices, and Public Involvement

A requirement of the planning process is to not only solicit input from the public and stakeholders in developing the plans, but to keep them informed on the entire process as well.

Requirement §201.6(c)(1): *The Plan must document the planning process, including how it was prepared and who was involved in the process for each jurisdiction.*

In fulfillment of this requirement, a press release publicizing the Hazard and Flood Mitigation Public Meeting was sent to the following media outlets on November 22nd, 2016:

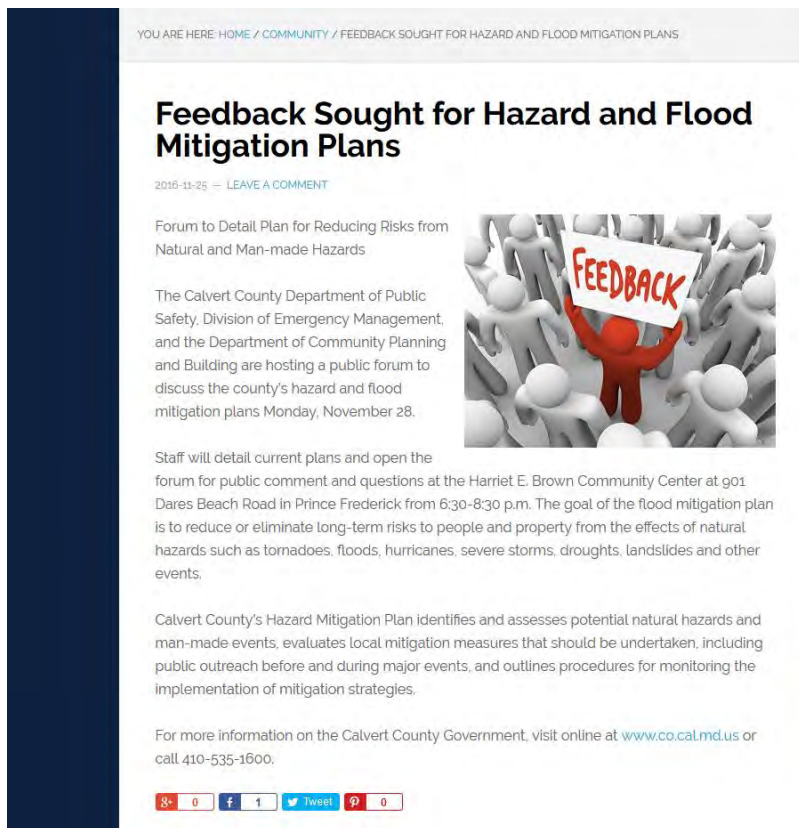
- Sandra Martin, Bay Weekly
- Margaret Tearman, Bay Weekly
- Kathy Knots, Bay Weekly
- Margit Miller, Calvert Beacon
- Sarah Fleischman, Calvert Recorder
- Meghan Cady, Calvert Recorder
- Tamara Ward, Calvert Recorder
- Diane Burr, Chesapeake Current
- Dandan Zao, County Times
- Rob Perry, Maryland Independent
- Christopher Olson, SoMd Breaking News Facebook page
- Vickie Kite Milburn, Southern Maryland This is Living
- Donnie Morgan, St. Mary's Enterprise
- Marty Madden, The Baynet
- Dawn Richardson, Town of North Beach
- Frank Dawson, WKIK-FM Radio
- T-Bone and Heather, WSMD/WKIK-FM Radio, WSMD/WKIK-FM Radio, WSMD-FM Radio

The release was published in the Beacon, the Recorder online, and Bay Weekly. A representative from the Calvert Beacon attended the first Public meeting, held on November 28th, and Tweeted throughout the presentation.

A notice was also posted to the Calvert County Government FB page where they have 3,700 likes(followers).



Calvert County Facebook Page



The Calvert Beacon, Online



Additionally, the slideshow presentations given during the first open, public meeting in November are posted to the Calvert County Floodplain Management Website for anyone to view.



The article written by the Calvert Recorder reporter can be found here; http://www.somdnews.com/recorder/news/local/county-seeks-public-input-on-flood-hazard-plans/article_df3b297c-0096-54a4-846c-8c061f0e1121.html



Public input of Hazard and Flood Mitigation Plans

STAFF PHOTO BY TAMARA WARD Dec 14, 2016



Calvert County residents examine maps identifying flood-prone and problem areas countywide at a public forum held Nov. 28 in Prince Frederick to discuss hazard and flood mitigation plans. STAFF PHOTO BY TAMARA WARD



Latest e-Edition



The Calvert Recorder

**Open Public Meeting #1 – 11/28/16 6:30pm-8:30pm
Harriet Brown Community Center, 901 Dares Beach Road, Prince Frederick, MD**

Meeting Summary by Ashley Samonisky, Vision Planning and Consulting



Dr. Mike Scott of the Eastern Shore Regional GIS Cooperative (ESRGC) presented the initial findings of the Hazard Identification and Vulnerability Assessment by. This presentation provided definitions of terms used throughout the process and gave basic background information on the various hazards Calvert County could potentially face.

In addition to examining the various types of hazards, special attention was paid to flooding, as this is the most common problem for the county. Dr. Scott discussed the process for generating the 1% chance flood area and the data sources used to come up with this estimate.

Using HAZUS, a special program designed by FEMA, Dr. Scott was also able to assign a dollar amount for the potential losses associated with a serious flooding event. Property exposures could reach over 14 million dollars in parts of Calvert County.

Similar exposure estimates were generated for every hazard type listed in the plan; wind events, tornado, thunderstorms, extreme temperatures, drought, winter storms, hail, and earthquakes. A Q&A session for the public was then held. Further clarification on terms, process, and what this means for residents was discussed. Residents and property owners then offered input on any concerns they currently have with their properties, neighborhoods/communities, and area points of interest.

The public was then asked to mark-up maps showing the predicted 1% flood area to include known or repetitive loss areas the county is currently facing that may not already be represented on the map.

28 Nov 2016
6:30 pm
Calvert County HMP/FMP
Open Public Meeting - Sign In

NAME	ADDRESS	EMAIL	PHONE
Angela Walkers		walteram@coxab.md.us	
Steve Farrell	9345 River View Rd Broomes, Island 20615	stevef714@comcast.net	410-535-1442
Al Jeffery			410 3 771
Al Jeffery	175 MAIN ST FE MD 20678	jefferb@co.cal.md.us	3246
Anne Jones	2903 Beach Dr. ^{Neck Estate} Huntingtown 20639	plumpt@comcast.net	410 610 8093
Jay Norris	2814 Beach R	Jaynorris@comcast.net	410 267 9572
Carol Moran	CHESAPEAKE DR Cove Point	tomncard@comcast.net	240-428 1306
JULIE METZ	3010 LIGHTHOUSE BLVD LUSBY, MD (COVE POINT)	jametz@smcps.org	410-326-8490
Ian Long	150 Mainst. Prince Fredericks, MD 20678.	longkhe@co.cal.md.us	410 535-2004
Heather Skyrn	4001 9th Street North Beach MD 20714	hskyr55@hotmail.com	443-975-5733
Edward T. Moran	Lusby Area		
Tamara Ward	Calvert Recorder		
Deepa Srinivasan	UPC	-	-
Ashley Samonisky	UPC	-	-

**Open Public Meeting #2 – 1/09/2017 6:00pm-8:00pm
Harriet Brown Community Center, 901 Dares Beach Road, Prince Frederick, MD**

Meeting Summary by Ashley Samonisky, Vision Planning and Consulting



Deepa Srinivasan of Vision Planning gave a presentation on the process used to update the Flood Mitigation Plan. Next, the updated list of mitigation actions, as well as the steps used by the Steering Committee to prioritize them, was presented to the public.

Additionally, Dr. Mike Scott of the Eastern Shore Regional GIS Cooperative (ESRGC) provided a brief presentation on the process for determining flood depth grids and generating the 10, 4, 2, 1, and .02% chance flood areas and the data sources used to come up with this estimate.

Using HAZUS, a special program designed by FEMA, Dr. Scott was also able to assign a dollar amount for the potential losses associated with a serious flooding event.

A Q&A session for the public was then held. Further clarification on terms, process, and what this means for residents was discussed. Residents and property owners then offered input on any concerns they currently have with their properties, neighborhoods/communities, and area points of interest.

2017 All-Hazards Mitigation Plan and Flood Mitigation Plan Update Calvert County, MD



Public Meeting
15 April 2017

Presented by
Deepa Srinivasan, Vision Planning and Consulting, LLC

Project Purpose

To update the all-hazards mitigation plan and flood mitigation plan to improve Calvert County's resistance to natural hazards, including flooding, by identifying actions to reduce the impact of various hazards to people and property.

Key Players

- Calvert County Staff – Emergency Management, Community Planning and Building, GIS, etc.
- Hazard/Flood Mitigation Plan Steering Committee
- Municipalities
- Consultants
 - Deepa Srinivasan, President, Vision Planning & Consulting
 - Dr. Mike Scott, ESRGC- Salisbury University
- Public
- Maryland Emergency Management Agency (MEMA)
- Federal Emergency Management Agency (FEMA R3)

Steps in the Planning Process

1. Reconstitute 2009 Steering Committee and develop planning process (meetings)
2. Assess hazards, risks, vulnerability
3. Assess municipal capabilities
 - Existing Plans, Programs, Policies – Capability questionnaire
 - Plan Integration – Document Reviews
 - Local Codes and Zoning Ordinances
 - Current and Proposed Projects
4. Develop goals and objectives and mitigation actions
 - Preventative Measures
 - Projects
 - Natural Resource Protection
 - Outreach and Communication
 - Other Mitigation Actions

Steps in the Planning Process (cont'd)

5. Write mitigation plan and prioritize projects (using Evaluation Criteria)
 - Social
 - Technical/Administrative
 - Economic
6. Develop implementation plan
 - Priorities for Mitigation Actions
 - Short-, Medium-, or long-range
 - Potential Funding Sources
 - Responsible Entities
 - Target Completion Dates
 - Five-Year Plan Maintenance Cycle

Steering Committee Meetings

Four Steering Committee Meetings

- Meeting 1: October 2016
 - Planning process, schedule, deliverables
 - Goals and objectives
- Meeting 2: Early November 2016
 - Mitigation Actions
- Meeting 3: Late November 2016
 - Hazard identification and risk assessment
- Meeting 4: January 2017
 - Mitigation actions prioritization
 - Implementation strategy



Public Meetings

- Public Meeting 1 (Nov 2016)
 - Planning process, hazard identification, risk assessment
 - Goals and objectives
- Public Meeting 2 (Jan 2016)
 - Mitigation actions and projects
 - Prioritization criteria for mitigation projects




Hazard Identification

Overall Risk Ranking



Hazard	Risk
Tornado	1
Coastal Storm Winds	2
Bombado	3
Severe Thunderstorm	4
Lightning	5
Earthquake	6
Winter Storm	7
Extreme Temperature	8
Hail	10
Drought	11

Coastal Storm Winds



Category	Wind Speed (mph)	Damage Potential
1	34-50	Very dangerous winds will produce some damage (wind-broken trees, heavy damage to shipping, roof damage, and damage to property, etc.)
2	50-74	Extremely dangerous winds will cause extensive damage (major roof loss, flying debris, downed power lines, etc.)
3	74-100	Disaster damage potential (extensive roof loss, downed power lines, etc.)
4	100-130	Catastrophic damage will occur (roof loss, downed power lines, etc.)
5	130-150	Catastrophic damage will occur (roof loss, downed power lines, etc.)

Coastal Storm Winds include hurricanes, tropical storms, & nor'easters. They have severe low-pressure centers and can generate high-level sustained winds, heavy precipitation, tornadoes, storm surge, wind-driven waves, & tidal flooding.


Tornado



Category	Wind Speed (mph)	Damage Potential
1	40-50	Light damage
2	50-60	Minor damage
3	60-70	Severe damage
4	70-80	Shocking damage
5	80-90	Catastrophic damage

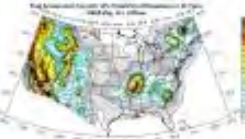
A tornado is a violent windstorm characterized by a twirling, funnel-shaped cloud extending to the ground.

Severe Thunderstorm



Severe Thunderstorms are caused when air masses of varying temperatures meet. This causes a rapid uplift of warm moist air that causes thunder, lightning, hail, strong winds, and heavy precipitation. Additionally can cause "straight-line winds" or a derecho.

Earthquakes



Earthquakes are motion or trembling of the ground produced by sudden displacement of rock in the Earth's crust. They can be caused by crustal strain, volcanism, landslides, and cavern collapse. Earthquakes are most common along tectonic plate boundaries and intra-plate weak points.

Winter Storms



Winter Storms are actually a combination of hazards that include; snow, sleet, freezing rain, strong winds, and below normal temperatures.



Hazard Vulnerability

Quantified Hazard vulnerability

Hazard	Annualized Losses	Expected Frequency	Potential Consequences
Coastal Storm Wind	\$1,148,254	Low	Medium
Flood	\$849,899	Medium	Medium
Tornado	\$270,437	Low	Medium
Severe Thunderstorm	\$97,904	High	Low
Earthquake	\$57,016	Low	Low
Lightning	\$38,387	High	Medium
Winter Storm	\$30,179	High	Medium
Drought	\$6,663	Low	Low
Hail	\$2,840	High	Low
Extreme Temperatures	\$74	High	Medium

Goals and Objectives

Hazard Mitigation Plan

Prevention

Goal 1: Minimize losses and institute adequate regulations through land use regulations.

- Identify and support public and private projects and programs to retrofit, relocate, or acquire properties as well as remove structures susceptible to repetitive flooding.
- Continue to implement systematic maintenance programs for stormwater management systems.
- Discourage new development in high hazard areas through appropriate regulations and land use planning.
- Enforce local, state and federal floodplain regulations and building standards for development in flood hazard areas.

Goals and Objectives

Prevention - cont.

Goal 2: Ensure hazard mitigation goals are consistent with all other County and Municipal plans and ordinances.

- Incorporate hazard mitigation principles into new and existing plans and ordinances.
- Integrate a hazard mitigation section into Calvert County Comprehensive Plan and Chesapeake Beach and North Beach Comprehensive Plans.

Goals and Objectives

Property Protection

Goal 3: Minimize future losses from all disasters by reducing the risk to people and property.

- Protect populations and properties throughout Calvert County that may be susceptible to economic or physical loss from disasters, consistent with the standards established in this Plan and other plans which have, or may be, adopted by the County or Towns.
- Provide protection of critical facilities/infrastructure vital to disaster response, such as fire and police stations, and those vital to the continuous operations of the County, municipalities and communities, such as hospitals and health care facilities, water and sewer facilities, electrical and other utilities, and transportation systems.

Goals and Objectives

Property Protection

Goal 4: Emphasize pre- and post-disaster planning to decrease vulnerability to loss of existing and new construction.

- Promote to elected officials, builders, and existing and potential homeowners, the economic and safety benefits of designing mitigation features into new construction and retrofit of existing structures.
- Identify vulnerable existing critical facilities and infrastructure and encourage pre-disaster retrofit.

Goals and Objectives

Public Education and Outreach

Goal 5: Support a balance between government regulation/enforcement, and personal awareness and responsibility for hazard mitigation, by emphasizing education and training for property owners, families and individuals.

- Continue to develop and support disaster preparedness education and awareness programs, targeting residents, visitors, businesses, and elected officials.
- Continue to develop economic incentive programs, for both public and private sectors, that promote structural retrofitting where and when it is determined to be the best option.

Goals and Objectives

Public Education and Outreach

Goal 6: Emphasize the benefits of hazard mitigation principles through ongoing public outreach activities.

- Educate the public on higher standards of protection to structures and facilities.
- Identify and coordinate public information programs and events such as contests and festivals with public and private partners.
- Identify and seek funding sources that will support hazard mitigation awareness and training programs.

Goal 7: Reduce economic vulnerability and increase recovery capabilities of business and industry.

- Continue public education and outreach on the topics of economic vulnerability and recovery through collaborative programs involving government, businesses and community organizations.

Goals and Objectives

Natural Resources

Goal 8: Protect natural resources and open-spaces that provide flood and other hazard mitigation.

- Encourage actions that protect natural resources while supporting community resiliency and hazard mitigation efforts.
- Coordinate natural resource preservation and land use planning to ensure that those natural resource areas, that are shown in this or other adopted community plans to provide hazard mitigation benefits, remain open spaces, and retain the natural benefits they provide.

Goals and Objectives

Emergency Services

Goal 9: Ensure continued coordination and linkages between local jurisdictions and neighboring county and statewide mitigation and resiliency activities to strengthen response and recovery efforts.

- Include local, regional, and statewide jurisdictions in trainings, drills, and exercises to strengthen interagency cooperation.
- Encourage open data and/or data sharing policies and agreements between municipal, county, regional and state jurisdictions to aid in hazard and emergency response, and prepare for Next Generation 911 implementation.

Goals and Objectives

Structural Projects

Goal 10: Protect infrastructure, and critical facilities to reduce potential disruption of regular activities during and after hazard events.

- Efficiently utilize resources to reinforce infrastructure, to withstand potential hazards, and to ensure continued use during and after an event.
- Coordinate with the Towns of Chesapeake Beach and North Beach to research, secure, and effectively use external, or additional, sources of funding to help make the infrastructure and critical facilities on which the residents, businesses and visitors of the County and Towns depend, more resilient to various hazards and events.

Mitigation Actions

Action	Project Description	Current Progress
1	Continue to support a regular maintenance program for emergency generators at the County's critical facilities. Develop a regular maintenance program that includes a schedule to change filters, etc.	On
2	Update Comprehensive Plan to include a Hazard Mitigation Section that provides an assessment of hazard vulnerability and appropriate mitigation recommendations.	On
3	Continue to conduct routine inspections, regular maintenance, and annual tests on all emergency communication equipment, public address systems, and hazard alert sirens to ensure operational capability during an emergency event.	On
4	Continue to ensure that a planned, coordinated, and effective public warning dissemination program exists at the local level and is well coordinated.	On
5	Update existing technical proficiency at the local level for conducting post-disaster damage assessments.	On
6	Ensure reconstruction activities are compliant with NFIP requirements (damage/prevention requirements and building codes).	Planned

Mitigation Actions

Action ID	Project Description	Hazard Mitigated
7	Initiate NOAA Weather Alert radio in designated critical facilities across the county for additional awareness.	All
8	Continue to develop and distribute a public informational pamphlet related to the public health and safety implications of various nature based events. Postulate the information on the County website and COMCAST.	
9	Continue to conduct hazard response drills and emergency management training exercises on an annual basis.	All
10	Identify national resources that provide hazard mitigation such as webinars, lectures, etc and make them a priority for consideration.	All
11	Develop and implement a public domain recovery plan.	All
12	Continue to work with local utility providers to provide continuity of public services and disaster preparedness.	All

Mitigation Actions

Action ID	Project Description	Hazard Mitigated
13	Continue to maintain and replace county owned critical infrastructure.	All
14	In flood-prone areas, conduct to conduct rigorous mapping and analysis of public and private drinking water supply systems immediately after an existing flood event and make last mile activities as needed.	Flood, Storm Surge, Hurricane Flooding
15	Work with local businesses and local utility network to develop a continuity of operations plan.	All
16	Continue to provide technical assistance to local residents and business owners in applying for federal mitigation/grant funds and identifying cost beneficial mitigation measures to incorporate into reconstruction activities.	All
17	Continue to ensure county and municipal compliance with local Stormwater Management Plans.	Flood, Storm Surge, Hurricane Flooding
18	Continue to ensure compliance with approved erosion and sedimentation Control Plans and continue to work with local business to implement BMPs.	Erosion, Flood

Mitigation Actions

Action ID	Project Description	Hazard Mitigated
19	Continue to update a public inventory of the hazard mitigation plan, providing current information on hazard-prone areas, hazard-specific "do's" and "don'ts" and emergency contact information.	All
20	Mention zoning ordinance provisions for protection of all hazard areas.	All
21	Continue to coordinate with the County, Maryland and the Maryland Department of Transportation on the potential feasibility of repairing, widening or widening these bridges and related storm drainage that are critical to pass the 10-year frequency flood flow.	Flood, Storm Surge, Hurricane Flooding
22	Give high priority to undeveloped flood-prone areas for preservation.	Flood, Storm Surge, Hurricane Flooding
23	Continue a voluntary specific administrative maintenance program consisting of routine inspections and subsequent work removal.	Flood, Storm Surge, Hurricane Flooding
24	Recommit to the State of Education to develop and implement a school building awareness curriculum.	All

Mitigation Actions

Action ID	Project Description	Hazard Mitigated
25	Reduce vulnerability to wildfires by promoting public education on increasing buffers and defensible spaces.	Wildfire
26	Make necessary motions to the state to develop a decision to develop along the cliffs.	Earthquake, Landslide, Erosion
27	Continue to encourage Calvert County citizens to enroll properties for low hazard by promoting and offering Community Emergency Response Team (CERT) training classes to increase the number of citizen responders in the municipalities and population centers.	All
28	Continue to identify at risk populations (elderly, business, persons who physical or mental disabilities) to reduce hazards and maintain records of these vulnerable populations and the types of assistance they may need before, during or after a hazard.	All
29	Continue to conduct annual training exercises for all hazard events at least once a year.	All
30	Continue the process to meet requirements to become certified as a Storm Ready Community by the National Weather Service StormReady® Program.	Tornado, Hurricane, Tornadoes, Tornadoes, Winter Storm, Flood

Mitigation Actions

Action ID	Project Description	Hazard Mitigated
31	Conduct seminars in schools on various hazards that could threaten the County and provide informational packets for students to take home.	All
32	Improve the County's Integrated Public Alert and Warning System (IPAWS) to include most hazards such as tornadoes, thunderstorms, or flash floods.	Tornado, Flood, Flood, Thunderstorm
33	Create a ReadyCalvert website for hazard education and preparedness to inform residents on what to do before, during, and after each potential hazard.	All
34	Continue to maintain relationships with the County Board Board to enhance the County's shelter capabilities.	All
35	Identify a suitable location to identify qualified critical staff (Police, Sheriff, Sheriff's Office, military police, or emergency services, etc.) to enhance the County's staffing capabilities.	All
36	Conduct data analysis of the County's emergency vehicles and create plans to track the health and efficacy of information including response time, location, and routing statistics.	All

Mitigation Actions

Action ID	Project Description	Hazard Mitigated
37	Develop an Emergency Management Team to be the line of Emergency Preparedness and provide a trusted and reliable source of information to the public. Make use of the County's Emergency Management Division and their roles and responsibilities.	All
38	Work with the State of Education to increase and expand disaster drills in schools and educate children and families about the growing threat of terrorism.	Terrorism
39	Continue to coordinate with County PIO to develop a "one approach" set of messages to be disseminated to the public in a timely manner in the event of an emergency.	All

Plan Integration

Small Area Plans

- Cove Point Community Flood Mitigation Plan
- Broomes Island Flood Mitigation Plan
- Breezy Point/Neeld Estate Flood Mitigation Plan

County Plans and Ordinances

- Calvert County Floodplain Regulations
- Calvert County Soil and Erosion Control Regulations
- Calvert County Road Ordinance
- Calvert County Stormwater Management Ordinance

Schedule

Flood Mitigation Plan

- Hazard Identification and Vulnerability Assessment – October and November 2016
- Mitigation Strategy – November and December 2016
- Implementation Plan – January 2017
- Plan Implementation – June 2017

Hazard Mitigation Plan

- Hazard Identification and Vulnerability Assessment – October and November 2016
- Mitigation Strategy – November 2016 through February 2017
- Deliverables to Calvert County – June 2017
- Plan Approvals – MEMA and FEMA R3 – August 2017

Thank You!

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Appendix C

Acronyms

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Acronyms

BFE – Base Flood Elevation

CENG – Constellation Energy Nuclear Group

CRS – Community Rating System

dFIRM – Digital Flood Insurance Rate Map

EAS – Emergency Alert Systems

EMS – Emergency Medical Services

EOC – Emergency Operations Center

FEMA – Federal Emergency Management Agency

FMP – Flood Mitigation Plan

FPE – Flood Protection Elevation

GIS – Geographic Information Systems

HMP – Hazard Mitigation Plan

ISDN – Integrated Services Digital Network

LNG – Liquefied Natural Gas

LOMA – Letters of Map Amendments

LOMR – Letters of Map Revisions

MEMA – Maryland Emergency Management Agency

NFIP – National Flood Insurance Program

NPG – National Preparedness Goal

HMA – Hazard Mitigation Assistance

SMECO – Southern Maryland Electric Cooperative, Inc.

THIRA – Threat Hazard Identification and Risk Assessment

TTY – Tele-Type Writer (Communications Device for the Deaf)

WATS – Wide Area Telephone Service

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