

# Final Evaluation Findings

## Maryland Coastal Management Program

October 2007 to August 2014

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## Executive Summary

The Coastal Zone Management Act requires the National Oceanic and Atmospheric Administration (NOAA) to conduct periodic evaluations of the performance of states and territories with federally approved coastal management programs. This evaluation examined the operation and management of the Maryland Coastal Management Program administered by the Maryland Department of Natural Resources, the designated lead agency, for the period from October 2007 to August 2014. The evaluation focused on three target areas: governmental coordination and public outreach, community resilience and coastal hazards, and coastal habitat and water quality.

The findings in this evaluation document will be considered by NOAA in making future financial award decisions concerning the Maryland Coastal Management Program. The evaluation came to these conclusions:

**Accomplishment:** The Maryland Coastal Management Program has demonstrated leadership in multiple regional planning efforts. For example, coastal program successfully advocated for the inclusion of two new goals addressing climate resilience and toxic contaminants in the 2014 Chesapeake Bay Agreement and through its ocean planning efforts, the program brought together diverse stakeholders to plan for the location of future large offshore facilities such as wind energy while minimizing user conflicts and impacts to natural resources.

**Accomplishment:** In 2013, the Maryland Coastal Management Program and Department of Defense signed a first-of-its-kind memorandum of understanding that clarifies and streamlines how the Department of Defense and the state will work together to protect the state's resources and avoid or minimize coastal use conflicts using the federal consistency provisions of the Coastal Zone Management Act.

**Accomplishment:** The state of Maryland is a national leader in climate change adaptation. The Maryland Coastal Management Program has led, and supported, the development of new state policies, the incorporation of climate resilience into ongoing planning and land acquisition efforts, and local government efforts to incorporate climate resilience into policies and plans.

**Accomplishment:** The Maryland Coastal Management Program provided much needed assistance to local communities, in partnership with the Critical Area Commission and Maryland Department of Planning, to update local critical area programs for 13 communities, resulting in better protection of critical habitat and water quality and ensuring local governments meet new requirements.

**Recommendation:** The NOAA Office for Coastal Management recommends that the Maryland Department of Natural Resources work with the state's Department of the Environment to improve and better integrate the federal consistency internal project review process, including improving transparency and application of Maryland's coastal policies to projects subject to federal consistency.

**Recommendation:** The NOAA Office for Coastal Management recommends that the Maryland Coastal Management Program develop a plan for the Coastal and Watershed Resources Advisory Committee, specifically for reinvigorating it with a redefined mission and goals by August 2016, or pursue its termination as an advisory committee.

**Recommendation:** The NOAA Office for Coastal Management recommends that the Maryland Coastal Management program work with partners to encourage long-term monitoring of the effectiveness of living shoreline and resilience projects, including pursuing approaches to quantify and characterize the impacts of projects.

**Recommendation:** The NOAA Office for Coastal Management recommends that the Maryland Coastal Management Program meet annually, at a minimum, with the Critical Area Program to discuss and strategically identify opportunities to collaborate and provide technical support, policy assistance, and coordination services to support local government land use programs and protect the Chesapeake Bay.

This evaluation concludes that the Maryland Coastal Management Program is successfully implementing and enforcing its federally approved coastal management program, adhering to the terms of the federal financial assistance awards, and addressing coastal management needs identified in section 303(2)(A) through (K) of the Coastal Zone Management Act.

## Program Review Procedures

The National Oceanic and Atmospheric Administration (NOAA) evaluated the Maryland Coastal Management Program in fiscal year 2014. The evaluation team consisted of Carrie Hall, evaluation team lead; TyAnn Lee, evaluator; John Kuriawa, site liaison; Randall Schneider, team lead for the Mid-Atlantic region; and Kim Penn, climate change coordinator from the NOAA Office for Coastal Management. The support of Maryland Coastal Management Program staff members was crucial in conducting the evaluation, and their support is most gratefully acknowledged.

NOAA sent a notification of the scheduled evaluation to the secretary of the Maryland Department of Natural Resources, published a notice of “Intent to Evaluate” in the *Federal Register* on June 13, 2014, and notified members of Maryland’s congressional delegation. The coastal management program posted a notice of the public meeting and opportunity to comment in *The Dispatch* on August 1, 2014.

The evaluation process included a review of relevant documents, a survey of stakeholders, the selection of three target areas, and discussions with staff members and stakeholders about the target areas. In addition, a public meeting was held on Tuesday, August 5, at 5:30 p.m. Eastern time at the Ocean Pines Library at 11107 Cathell Road, Berlin, Maryland, to provide an opportunity for members of the public to express their opinions about the implementation of the program. Stakeholders and members of the public were also given the opportunity to provide written comments. A summary of the written comments received and the NOAA Office for Coastal Management’s responses are included in Appendix A. NOAA then developed draft evaluation findings, which were provided to the coastal management program for review, and the program’s comments were considered in drafting the final evaluation findings.

Final evaluation findings for all coastal management programs highlight the program’s accomplishments in the target areas and include recommendations, which are of two types.

**Necessary Actions** address programmatic requirements of implementing regulations of the Coastal Zone Management Act and of the state coastal management program approved by NOAA. These must be carried out by the date specified. Failure to address necessary actions may result in a future finding of non-adherence and the invoking of interim sanctions, as specified in the Coastal Zone Management Act §312(c).

**Recommendations** are actions that the office believes would improve the program but which are not mandatory. The state is expected to have considered the recommendations by the time of the next evaluation or dates specified.

## Evaluation Findings

The Chesapeake and Coastal Services Unit, within the Department of Natural Resources, continues to successfully implement the federally approved Maryland Coastal Management Program. During this evaluation time frame, the coastal program has effected a major organizational realignment, which has increased its capacity to serve in a national, regional, and state leadership role in coastal management, particularly in ocean planning, habitat protection, water quality improvement, and coastal resilience. In addition, the program has had strong support from Department of Natural Resources leadership and the governor, and has built strong partnerships across the agency. The coastal program was cited by evaluation participants for its state and regional leadership across issue areas, and the program and staff members were commended for being “thought leaders,” “pushing issues ahead,” having “willingness to try new approaches,” “providing the glue” and “the infrastructure” for accomplishing large projects spanning multiple partnerships, being an “integral part of our ability to accomplish our goals,” and “constantly innovating.” Staff members were also described as the “go-to-guys for the establishment of new programs.”

### Government Coordination and Public Outreach

The Maryland Coastal Management Program is a regional leader in coastal management, with strong and productive working relationships with a wide range of partners, including federal and state agencies, local governments, nonprofits, and businesses.

#### *Ocean Planning*

The Maryland Coastal Management Program has taken a lead role in moving ocean planning forward through both the Mid-Atlantic Regional Planning Body and the Mid-Atlantic Regional Council on the Ocean (MARCO). Partners praised the coastal program for assuming leadership roles and actively participating with federal agencies and other states to conduct ocean planning.

In 2009, the five Mid-Atlantic governors created MARCO to address shared priorities: climate change adaptation, protection of important marine habitats, offshore renewable energy development, and water quality improvement. The coastal program has provided leadership and support for this effort, and at the time of the site visit, a senior staff member was serving a two-year term as MARCO’s chair. MARCO has undertaken a number of efforts, including the development of the Mid-Atlantic Ocean Data Portal, a first-of-its-kind, online toolkit that consolidates available data and allows users to visualize and analyze ocean resources and human use information such as fishing grounds, recreational areas, and energy sites. The Maryland Coastal Management Program also led a survey of recreational boating use to provide additional information for decision-makers. Stakeholders commended the program’s staff for their contributions to MARCO.

In 2010, the president issued the National Ocean Policy Executive Order that encourages states to set up regional planning bodies to conduct ocean planning. In April 2013, the Mid-Atlantic

Regional Planning Body was established with representation from eight federal agencies, the Mid-Atlantic Fisheries Management Council, and one tribe. Maryland's delegates are both Maryland Coastal Management Program staff members and one has served as co-chair of the planning body. The coastal program supported the creation of the Mid-Atlantic Regional Planning Body and helped set up the initial member meetings. As part of early planning efforts, members were responsible for collecting input on ocean planning from different sectors, and the program gathered input from the ports and shipping sector. In addition, through the staffing of both regional work groups, the program helps ensure that the regional bodies complement each other's work and are not duplicative.

Effective regional planning requires extensive investment to continue to engage with the public and stakeholders and to ensure that decision makers have access to best-available science and data to inform decision-making. Federal funding for regional ocean planning has recently decreased, but the Mid-Atlantic region has received extensive support from nongovernment sources of funding, including a \$2.1 million dollar grant from the Gordon and Betty Moore Foundation to advance the operational capacity of MARCO. The NOAA Office for Coastal Management recommends that the Department of Natural Resources and the Maryland Coastal Management Program seek ways to diversify and sustain funding for regional ocean planning efforts.

### ***Offshore Wind Energy***

Maryland has committed to obtaining 20% of the state's electricity from renewable sources by 2022. To help reach this goal, the Maryland Coastal Management Program has taken a leadership role in offshore energy planning. The program worked with the Environmental Law Institute, Maryland Public Service Commission, and Maryland Energy Administration to complete a report, *Maryland Offshore Energy Framework*, in 2009. The report identified where modifications or additional policies would be useful to address offshore wind energy development. To address concerns identified in the report, the coastal program helped the Maryland Energy Administration advance legislation, the Offshore Wind Energy Act of 2013, to address those issues. The legislation provides an exemption for qualified submerged renewable energy lines from an existing prohibition on building permanent structures within the Beach Erosion Control District as long as the project does not result in significant permanent environmental damage as determined by the Department of Natural Resources.

Since 2009, the Maryland Coastal Management Program has been working with resource experts, user groups, The Nature Conservancy, and the Maryland Energy Administration to compile data and information and map habitats, human uses, and resources in Maryland's Atlantic Ocean. Ocean planning tools were used to help identify areas most suitable for various types of activities in order to reduce conflict among uses, facilitate compatible uses, and minimize impacts to crucial ecosystem services. Based on these efforts, the coastal program was able to make recommendations to the Maryland Offshore Wind Task Force about a request for information regarding priority areas for offshore wind development from the Bureau of Ocean Energy

Management. The guidance will help avoid many natural resource and human use conflicts early in the siting process.

The coastal program and the Maryland Energy Administration were able to conduct outreach with potentially affected communities, in particular Ocean City, in order to understand and address community concerns. The early outreach in the process was seen as very beneficial, and groups such as fishers were thankful that wind energy would not be located in their high priority fishing areas. As part of the engagement process, the Maryland Coastal Management Program developed GIS models and conducted a participatory GIS workshop in partnership with NOAA to identify high priority areas for user groups such as fisherman.

In 2012, the Department of Natural Resources and the Maryland Energy Administration signed a memorandum of understanding establishing an Offshore Wind Development Fund Working Group whose members include the Maryland Geological Survey, Power Plant Research Program, and Wildlife and Fisheries. The work group oversees a \$30 million fund created with funds from a settlement agreement, negotiated as part of a utility merger. The fund is supporting numerous studies and the Maryland Coastal Management Program is directing the ecological baseline studies to assess the abundance, distribution, and diversity of marine mammals, birds, bats, and benthic habitats off the coast of Maryland. The state, along with federal partners, will use this information to inform coastal habitat protection.

Through MARCO, the Maryland Coastal Management Program also contributed to the development of the document, *A Guide to State Management of Offshore Wind Energy in the Mid-Atlantic Region*, completed in April 2013. This report, prepared by the Environmental Law institute, provides an overview of some of the states' key legal authorities and overarching priorities in offshore wind management, and identifies what types of information are needed in the context of coastal zone management to satisfy the various state permitting and licensing review processes. Energy development in the Mid-Atlantic is also being addressed through regional ocean planning. The coastal program contributed to the development and expansion of the Coastal Atlas and the MARCO Ocean Data Portal, providing access to data, information, interactive maps, and tools for improved decision-making. Partners cited the coastal atlas as being very helpful to their work in wind energy development but noted some redundancy with the Bureau of Ocean Energy Management's data; there was an opportunity to look for ways to share data across platforms.

### ***Chesapeake Bay Agreement***

The Maryland Coastal Management Program has demonstrated strong leadership in the region's efforts to continue to make progress in improving the Chesapeake Bay. The state of Maryland, with the Maryland Coastal Management Program taking a primary role, has provided policy and funding coordination, as well as assistance with implementation. To strengthen the Chesapeake Bay Agreement, the coastal program successfully advocated for two-year milestones, as well as climate resilience and reduction in toxic contaminants goals, in the 2014 agreement. The

program's role in implementing the Chesapeake Bay Agreement is discussed in more detail in the Coastal Habitat and Water Quality section.

### ***Federal Consistency Enforceable Policy Update***

The coastal program has successfully updated all of its enforceable policies, while also clarifying and simplifying them by relying upon narrative statements derived from the goals and standards articulated in statutes. The NOAA Office for Coastal Management commends the state for completing a significant update to its federally approved program.

#### ***EXAMPLE: MODEL FOR IMPROVED FEDERAL CONSISTENCY PROCESS***

*During NOAA's review of Maryland's routine program change requesting to update its enforceable policies, comments were received from the Department of Defense. This led to a series of meetings and negotiations over a nearly two-year period, which ultimately led to a memorandum of understanding with the department on how federal consistency is applied to Defense facilities and actions, including a list of de minimis and environmentally beneficial activities. This first-of-its-kind approach is a model for agreements between other state coastal management programs and federal agencies.*

*On May 8, 2013, the State of Maryland and Department of Defense signed a landmark agreement that clarifies and streamlines how they will work together to protect the state's coastal resources and avoid or minimize coastal use conflicts. The memorandum of understanding outlines how Defense facilities and projects that impact state coastal resources will meet the federal law requirements of the Coastal Zone Management Act. Top environmental leaders from Maryland, Navy, Air Force, Army, and NOAA attended the signing ceremony held at the Naval Academy in Annapolis. Governor Martin O'Malley praised the partnership as a way to help "strike a better balance between people and nature, ensuring the Chesapeake Bay's ecosystem—including birds, fish, wildlife, waterways and shorelines—maintains the resources it needs to thrive." In an April 2014 meeting, a senior Department of Defense staff member stated that there had been a significant time and cost savings through the use of the de minimis list for over 240 projects.*

The Maryland Department of the Environment has the responsibility for coordinating the federal consistency process for the state and collaborates with the Department of Natural Resources and the Maryland coastal program to implement the process. Although the State of Maryland has significantly improved federal consistency during the evaluation period, the evaluation team found that internal state agency coordination of the review of federal actions, licenses, and permits could be stronger and more transparent. The evaluation team heard from stakeholders that applicants were not always aware of the networked nature of the coastal program and the breadth of the state's coastal policies, since the primary focus of Maryland Department of the Environment reviews is wetland permitting. There are also opportunities to improve the public's accessibility to the consistency review process by providing more information online. The coastal program has developed a database (still in the testing phase during the site visit) to help guide permit applicants and federal agency partners through the federal consistency process, which should help streamline and clarify the process for all involved.

Improving the federal consistency process by making it more transparent and ensuring all coastal policies are addressed during a review is particularly important for larger projects. The NOAA Office for Coastal Management recommends that the Department of Natural Resources work with the Maryland Department of the Environment to explore opportunities to improve and better integrate the federal consistency internal project review process, including improving transparency and the application of Maryland's coastal policies to projects subject to federal consistency. In addition, as interest in large-scale ocean projects is increasing, the state may want to pursue the following enhancements to the federal consistency program: interstate consistency, expansion of listed activities, and consideration of geographic location descriptors.

### ***Coastal and Watershed Resources Advisory Committee***

The Coastal and Watershed Resources Advisory Committee is a 45-member committee, representing each of the 16 coastal counties and Baltimore city and various coastal interests, whose mission is to advise the Department of Natural Resources secretary on all matters referred to the committee by the director of the Chesapeake Coastal Service. During the evaluation period, committee membership and participation has declined at the same time that there has been a growth of other issue-specific advisory committees with missions that overlap with its own. The NOAA Office for Coastal Management recommends that the Coastal and Watershed Resources Advisory Committee be reinvigorated with a redefined mission and goals, potentially focusing on information exchange on coastal and watershed management priorities, and giving advice to the secretary, Bay cabinet, and others, as appropriate. If the committee is not reinvigorated by August 2016, the coastal program should pursue its elimination.

### ***Communication of Successes***

During the evaluation period, the Maryland Coastal Management Program undertook a major reorganization and expanded its oversight of state programs, enabling the program to bring together a wide variety of partners and funding sources to address key issues in the coastal zone. The changes have enabled the program to make Maryland a regional and national leader in addressing high priority issues, including climate resilience and protecting the Chesapeake Bay. The Maryland Coastal Management Program provides extensive information on specific projects and its programs but there is an opportunity to more effectively communicate how the program as a whole is providing leadership and moving the state, region, and nation forward in solving large-scale coastal management issues. The NOAA Office for Coastal Management encourages the coastal program to capitalize on opportunities to communicate the success of its multifaceted program in addressing large-scale coastal management issues.

### ***Grants Management***

The timeliness and completeness of grant performance reports, post-award actions, and applications has greatly improved during the evaluation period. However, a few regular subrecipients of Coastal Zone Management Act funds provide grant performance reports that are unsatisfactory. In general, these reports are deficient in providing detailed, specific, quantifiable

results and tangible outcomes aligned with project goals. The NOAA Office for Coastal Management recommends that the Maryland Coastal Management Program work directly with subawardees who produce incomplete or unsatisfactory reports to seek improvements consistent with federal performance-reporting guidelines.

**Accomplishment:** The Maryland Coastal Management Program has demonstrated leadership in multiple regional planning efforts. For example, coastal program successfully advocated for the inclusion of two new goals addressing climate resilience and toxic contaminants in the 2014 Chesapeake Bay Agreement and through its ocean planning efforts, the program brought together diverse stakeholders to plan for the location of future large offshore facilities such as wind energy while minimizing user conflicts and impacts to natural resources

**Accomplishment:** In 2013, the Maryland Coastal Management Program and Department of Defense signed a first-of-its-kind memorandum of understanding that clarifies and streamlines how the Department of Defense and the state will work together to protect the state's resources and avoid or minimize coastal use conflicts using the federal consistency provisions of the Coastal Zone Management Act.

**Recommendation:** The NOAA Office for Coastal Management recommends that the Maryland Department of Natural Resources work with the state's Department of the Environment to improve and better integrate the federal consistency internal project review process, including improving transparency and application of Maryland's coastal policies to projects subject to federal consistency.

**Recommendation:** The NOAA Office for Coastal Management recommends that the Maryland Coastal Management Program develop a plan for the Coastal and Watershed Resources Advisory Committee, specifically for reinvigorating it with a redefined mission and goals by August 2016, or pursue its termination as an advisory committee.

## Climate Resilience

The Mid-Atlantic coast is particularly vulnerable to the impacts of climate change and rising sea levels. The land area is subsiding, while sea level is rising at a faster rate along the eastern seaboard, causing shoreline erosion and deterioration of coastal wetlands. In addition, there is a trend towards increased heavier precipitation events in the region. The Maryland Coastal Management Program is a national leader in community resilience and coastal hazards, and serves as an example for federal agencies, states, and local governments in developing policy solutions and implementing adaptation actions. The coastal program has led and contributed to a large number of resilience and hazards efforts, and this section highlights some of the program's accomplishments. Throughout the evaluation period, the program has worked closely with the leadership of the Department of Natural Resources, the governor's office, and many other partners to improve the state's climate resilience.

### ***State Policies and Planning***

In 2007, the governor of Maryland created the Climate Change Commission, and Maryland Coastal Management Program staff members provided support and helped advance the scientific understanding of Maryland's vulnerability and helped the state plan to avoid or minimize the anticipated impacts. The commission released the *Climate Action Plan Interim Report* to the governor and general assembly in January 2008. The commission's report set the stage for other state actions, including the Maryland Greenhouse Gas Reduction Act in 2009 and two climate change adaptation strategies that are guiding state-level planning efforts: *Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change Phase I: Sea-Level Rise and Coastal Storms* (2008) and *Adaptation Phase II: Building Societal, Economic and Ecological Resilience* (2011).

The Maryland Coastal Management Program led the development of a new Department of Natural Resources policy, "Building Resilience to Climate Change," that calls for directing the department's investments in and management of land, resources, and assets to better understand, mitigate, and adapt to climate change. The policy built on the state's 2008 and 2011 strategies and established practices and procedures related to new land investments, facility siting and design, habitat restoration, government operations, research and monitoring, and resource planning. The goal of the policy is to lead by example, and encourage and educate others in the methods for managing natural resources and designing facilities with an understanding of the effects of climate change. The implementation of this policy is discussed further in the "Coastal Habitat and Water Quality" section.

Building on previous efforts, the governor of Maryland signed the Climate Change and Coast Smart Construction Executive Order in 2012. The order directs all state agencies to consider the risk of coastal flooding and sea level rise when they design capital budget projects and charges the Department of General Services with updating its architecture and engineering guidelines to require new and rebuilt state structures to be elevated two or more feet above the 100-year base flood level. The order also directs the Department of Natural Resources to work with the Maryland Commission on Climate Change, local governments, and other parties, as appropriate, to develop additional Coast Smart guidelines for the siting and construction of new and rebuilt state structures, as well as other infrastructure improvements such as roads, sewer and water systems, and other essential public utilities. Additionally, the executive order requests that the Critical Area Commission evaluate existing regulations and policies for state agency actions resulting in development on state-owned lands and consider the adoption of new or revised provisions that address climate change and the risk of sea level rise and other extreme weather-related impacts.

In response to the Climate Change and Coast Smart Construction Executive Order, the Maryland Coastal Management Program worked with other state agencies and local officials to develop Coast Smart Siting and Design Guidelines for state and state-funded infrastructure projects, which were released in early 2014. The guidelines are used as the framework to evaluate and guide state infrastructure investment decisions within Climate Change Impact Areas to protect

against the impacts of climate change. The guidelines require that new state structures, or reconstruction of substantially damaged state structures, should be avoided to the extent practicable in areas likely to be inundated by sea level rise within the next 50 years, and new state “critical or essential facilities” shall be located outside the 100-year floodplain. The guidelines also call for the protection of ecological features that may buffer a project from the impacts of future sea level rise. The U.S. Office of Housing and Urban Development used the guidelines to guide Community Development Block Grant funding allocated to the state to support redevelopment after Superstorm Sandy.

*Plan Maryland*, an executive plan that provides a framework to coordinate smart growth efforts and programs and serves as a guide to the economic and physical development of the state, was released in December 2011. Maryland Coastal Management Program staff members supported development of the plan and successfully advocated for the inclusion of a special planning area: climate change impact area. These areas include 50- and 100-year sea level rise inundation zones; 100-year floodplain; and Category 1-4 storm surge risk zones. The designation is optional, but climate change impact areas are currently being used by state agencies and local governments to identify vulnerable areas, as well as areas to target for implementation of climate change and sea level rise resilience measures. *Plan Maryland* is being used to facilitate the evaluation of state resource allocation and policies in climate change impact areas, as well as coordination with local governments.

In support of the plan, the coastal program developed the Climate Change Impact Area Mapper. The mapper is an online tool provided by the program for management decision-making, planning, and education purposes. The mapper brings together multiple data layers from different sources, including Maryland’s Coastal Atlas, to illustrate land areas in Maryland that are projected to be the most sensitive to anticipated changes in climate. The coastal program has used the mapper to assist a number of land trust partners and rural legacy sponsors in identifying priority parcels, and plans to use the tool to work with partners to create coastal resilience plans.

### ***CoastSmart Communities***

CoastSmart Communities provides coastal communities with tools, assistance, training, and funding to increase on-the-ground resilience to coastal hazards and sea level rise. The program helps local communities institutionalize the consideration of hazards by encouraging departments to work together and take future impacts into consideration in everyday decision-making. Because every community is unique, the program is designed to help communities implement their priorities.

As part of its efforts to support coastal community resilience, the Maryland Coastal Management Program initiated an interactive summit to help Maryland coastal communities adapt and respond to climate change in partnership with the Massachusetts Institute of Technology–U.S. Geological Survey Science Impact Collaborative and the Consensus Building Institute. In 2009, more than 170 mayors, county commissions, environmentalists, business leaders, and Maryland state officials came together for this interactive summit about community-level responses to

climate risks such as sea level rise and storm surge. Through an innovative negotiation session, the event showcased practical tools, resources, and incentives to help Maryland coastal communities become ready, adaptive, and resilient in the face of climate change and support implementation of Maryland's Climate Action Plan at the local level.

CoastSmart Communities has supported more than 50 state-local government partnership efforts and awarded over \$600,000 in funding to support projects in six coastal counties and 19 municipalities. The Maryland Coastal Management Program holds an annual grant competition to fund projects up to \$75,000. Communities are eligible to apply to modify ordinances, codes, plans, and programs; develop and implement new protection mechanisms for natural or cultural resources; adopt building code revisions; undertake comprehensive planning for vulnerable infrastructure; update emergency response and hazard mitigation plans, or enhance emergency management planning; and develop and institutionalize the consideration of sea level rise in project review processes. The coastal program provides on-the-ground expertise, planning guidance, training, and tools to support the local projects. CoastSmart enables communities to plan smart and reduce the vulnerability of property and life to sea level rise and other coastal hazards.

One of the coastal program's three evaluation metrics is to provide financial and technical assistance to 10 state agencies and coastal communities to incorporate sea level rise and climate change considerations into planning and management strategies between 2012 and 2017. At the end of two years, the Maryland Coastal Management Program is on track to meet this target, as four state agencies or coastal communities have incorporated sea level and climate considerations into planning and management strategies as a direct result of funding and technical assistance within the first two years.

The Maryland Chesapeake Bay National Estuarine Research Reserve's Coastal Training Program provides key support for the CoastSmart initiative. The training program's coordinator works with the CoastSmart Communities Planner to provide trainings and bring resources to local governments to build their capacity to integrate data and mapping efforts into local planning efforts and integrate sea level rise adaptation strategies into their local comprehensive plans, hazard mitigation plans, and emergency management plans. The coordinator also assists with an annual CoastSmart local government exchange event and has facilitated community self-assessment exercises using the CoastSmart Scorecard to help gauge how prepared communities are for coastal hazards and sea level rise.

**EXAMPLE: CALVERT COUNTY**

*The evaluation team heard from Calvert County regarding the benefits to the county of successfully obtaining several CoastSmart grants. To make it easier for citizens to comply with all regulations and to protect lives and property from coastal hazards, the county created an online shoreline development guide where citizens could type in their address and see a list of needed permits and the applicable websites. The county also developed a long-range Shoreline Development and Protection Plan that balances natural resource protection with protection of shoreline development and human life. The county partnered with CoastSmart to work with two*

*of the most flood-prone communities in the county, Cove Point and Broomes Island, to develop special area flood mitigation plans, making them eligible for federal recovery funding for Superstorm Sandy. As part of the project, the University of Maryland conducted flood risk assessments for the communities and the U.S. Army Corp of Engineers conducted elevation assessments on 90 structures. Throughout the project, planning staff members have briefed and engaged the planning commission in the internal review of the flood mitigation plans. The commission is becoming more informed of the threats facing Calvert County and moving forward, with the planners' encouragement, to help other communities within the county prepare. Building on the success of this project, the county applied for and received funding to develop a flood mitigation plan for Plum Point; prepare a flood preparedness plan for the county's historic and archaeological resources; develop a report on sea level rise predictions and elevation recommendations for the county's repetitive loss area; improve the county's Community Rating System rating; and administer a hazard mitigation grant to elevate homes.*

**EXAMPLE: BALTIMORE CITY**

*Baltimore City has successfully applied for CoastSmart grants for several years and worked with Maryland Coastal Management Program staff members to improve the city's resilience. The city conducted floodplain mapping and completed a Disaster Preparedness and Planning Project (DP3) which brought together the city's agencies to develop a hazards mitigation plan that meets the Federal Emergency Management Agency (FEMA) requirements. Usually FEMA requires an all-hazard mitigation plan, but in this new type of plan, the plan is broken out by structures and buildings, public services, and major infrastructure and includes climate change as a hazard. The planning process combined FEMA's hazard mitigation planning guidance with ICLEI's – Local Governments for Sustainability's Five Milestone Adaptation Framework. The planning process also included a community awareness campaign to educate and engage the public in learning about their risk to natural hazards and anticipated risks from climate change and to build support for plan implementation. As a result of the project and outreach, 29 communities asked the city for disaster planning assistance. City staff members also used the outreach events to better understand and identify vulnerabilities in communities. One question that kept being raised was how people could prepare, so the city developed a tagline to remind members of the public what they could do: "Make a plan, build a kit, help each other."*

*Baltimore has now moved to the implementation phase of addressing the 50 strategies and 231 actions in the plan. The city is building on the results of this project to prepare and submit an application for participation in the Community Rating System to reduce flood insurance rates for citizens. In addition, the city has a new project to develop a comprehensive system of metrics for tracking and evaluating the success of sustainability and resilience projects throughout the city. Staff members will also work to integrate resilience and adaptation planning into initiatives that address the mayor's priority goals.*

**Other Climate Resilience Projects and Initiatives**

- The Maryland Coastal Atlas, developed in 2009, is an online mapping and planning tool to allow state and local decision makers to visually analyze and explore data to assist efforts

to become more ready, adaptive, and resilient to the impacts of sea level rise and coastal storms. The shorelines mapping application allows users to access state shoreline erosion data, visualize coastal inundation from storms, and identify areas at risk to sea level rise, making it extremely useful in conducting risk and vulnerability assessments. Data products and technical tools currently available on the Coastal Atlas include statewide sea level rise vulnerability mapping, historic shoreline position and erosion rate calculations, a comprehensive coastal inventory, and the Erosion Vulnerability Assessment.

- “Integrating Water Quality and Coastal Resources into Marine Spatial Planning in the Chesapeake and Atlantic Coastal Bays” is a NOAA Coastal Fellow project that addresses how climate change should be considered in the selection and design of natural filter best-management practices. Natural filters are a natural habitat element that slows surface, subsurface, and ground water, consequently filtering pollutants as water flows downstream. Natural filters consist of riparian forests, grasses, vegetation, wetlands, and living shorelines. Climate impacts such as sea level rise, erosion, changes in precipitation patterns, rising temperatures, and ocean acidification will impact the design and functionality of natural filters. By assessing the climate vulnerability of natural filter practices, Maryland can invest in sites and designs that will reap water quality benefits over the long term.
- The King Tides Photo Initiative is an international initiative that Maryland joined in 2012 to engage citizens in documenting the impacts of king tides by taking pictures of high water and flooding around their neighborhoods. The initiative raises local awareness of coastal hazards and provides citizens and researchers with a glimpse of what future sea level may look like. The photographs are used in educational and outreach materials and will serve as a baseline as sea levels continue to rise and extreme events occur more frequently.

**Accomplishment:** The State of Maryland is a national leader in climate change adaptation. The Maryland Coastal Management Program has led, and supported, the development of new state policies, the incorporation of climate resilience into ongoing planning and land acquisition efforts, and local government efforts to incorporate climate resilience into policies and plans.

## **Coastal Habitat and Water Quality**

### ***Chesapeake Bay Agreement***

The Maryland Coastal Management Program has been a leader in supporting the Chesapeake Bay Agreement and working to preserve coastal habitat and improve water quality in the region. The coastal program brings together technical expertise across a wide range of skills and issues and across its programs and associated funding sources to more comprehensively address coastal habitat and water quality issues. The coastal program works with and brings together federal and state agencies, programs within the Department of Natural Resources, nonprofits, and businesses to maximize efforts to protect habitat and improve water quality.

In 2010, the Environmental Protection Agency (EPA) established pollution load limits (total maximum daily loads, or TMDLs) for nitrogen, phosphorus, and sediment entering the Chesapeake Bay. In response to the new TMDLs the seven Bay jurisdictions created individual watershed implementation plans with specific actions that will be taken to meet the pollution reduction goals by 2025. Coastal program staff members participated in the effort to develop and finalize Maryland's watershed phase I and phase II implementation plans. In addition, the coastal program successfully advocated for the Bay jurisdictions to develop two-year pollution reduction milestones to track and better assess near-term progress towards completing their restoration actions. Maryland has achieved both its 2010-2011 and 2012-2013 milestones, and the Maryland Coastal Management Program has played a critical role in achieving these milestones.

The Maryland Coastal Management Program chose to develop one of its three evaluation metrics around the state's milestones to reduce nitrogen, phosphorus, and sediment, and set targets for the program's contribution towards these milestones. After two years, the coastal program has already exceeded its five-year target for sediment and is on track to meet its five-year targets for nitrogen and phosphorus. EPA will be conducting a midpoint assessment process in partnership with the seven Bay watershed jurisdictions. The assessment will evaluate whether the load limits need to be revised, if the implementation actions attain load limits, and if the modeling tools used for determining progress need to be refined to better reflect the results of actions on the ground. The outcome of this assessment, in 2017, will provide the basis for a Phase III Watershed Implementation Plan, which will be developed concurrently in 2017 and will address reductions needed from 2018 to 2025 in Maryland.

In 2007, the Maryland General Assembly created the Chesapeake and Atlantic Coastal Bays Trust Fund which is guided by the BayStat agencies and the Scientific Advisory Panel. The Maryland Coastal Management Program played a critical role in setting up the fund and currently administers the funding. The fund is one of the region's most important funding tools targeting water quality and watershed restoration projects that reduce coastal nonpoint source pollution from entering the Chesapeake and Atlantic Coastal Bays. Funds come from a motor fuel tax and rental car tax and have provided over \$194 million dollars and leveraged over \$111 million to accelerate bay restoration through different initiatives, including the Watershed Assistance Collaborative, stormwater financing assistance, and Innovative Technology Fund.

The fund supports work through the Watershed Assistance Collaborative, created in 2008. Maryland's state agencies, the Chesapeake Bay Trust, University of Maryland Sea Grant Extension Program, University of Maryland Environmental Finance Center, NOAA, and EPA joined together to assist smaller jurisdictions with implementing larger-scale nonpoint source restoration and protection efforts. The partnership leverages existing resources and programs to provide services and technical assistance to communities and to build local capacity. The collaborative has leveraged over \$1.8 million in federal and private funds to assist 40 communities in the identification, design, and engineering of shovel-ready Bay restoration projects. The collaborative creates connections between communities and providers of technical assistance and funding, primarily through the efforts of five Sea Grant watershed restoration specialists. In addition, the

collaborative provides training through the Chesapeake Bay National Estuarine Research Reserve's Coastal Training Program, and stormwater financing and outreach through the University of Maryland Environmental Finance Center.

The Chesapeake Bay Trust, Center for Smart Growth, University of Maryland Environmental Finance Center, Maryland Sea Grant, NOAA, and EPA launched a stormwater financing and assistance program for local governments in 2011. This innovative program provides assistance to local governments to assess and develop sustainable financing options to improve local water quality. The collaborative has partnered with 10 communities to craft restoration finance strategies that best meet local needs. The evaluation team met with representatives of the Town of Berlin, population 4,000, who discussed how they used the program to complete a stormwater financing feasibility study and to conduct community outreach, including holding a stormwater photo contest. In 2013, the Town of Berlin Council unanimously passed legislation to create a stormwater utility, the first Maryland town not required by the state or federal government to manage stormwater to do so. The cost of managing stormwater is divided among the town's property owners, and the funds will help the town leverage federal and state grants for enhancements. The first project completed with the funds successfully addressed a highly visible local flooding issue for the town, while also benefiting regional water quality.

The Maryland Coastal Management Program also established the Innovative Technology Fund, a partnership between the Department of Natural Resources, the University of Maryland, and EPA. The fund supports the identification and development of innovative coastal nonpoint reduction technologies. The fund has invested \$1.1 million into 17 technologies developed by 16 Maryland-based companies. Stakeholders the evaluation team met with praised the coastal program for its success in creating a program to partner with local businesses and support new and innovative technologies to address water quality issues in the Chesapeake Bay region. Projects supported by the fund include

- AHPharma refining a radiant floor heat technology in chicken houses that decreases ammonia emissions by reducing litter moisture;
- NutriGrown formulating soil additive products that reduce nitrate leaching and nutrient runoff through slower, more consistent nutrient release;
- Smart Slope developing an extensive green roof substrate with recycled and waste materials, producing a sustainable substrate; and
- Shore Thing Shellfish testing the operational effectiveness of in-situ oyster setting to increase spat survivability, while reducing labor and cost.

### ***Living Shorelines***

The Maryland Coastal Management Program is a national leader in developing and implementing the concept of living shorelines. The Department of Natural Resources defines living shorelines as *“the result of applying erosion control measures that include a suite of techniques which can be used to minimize coastal erosion and maintain coastal process. Techniques may include the use of fiber coir logs, sills, groins, breakwaters or other natural components used in combination with sand, other natural materials and/or marsh plantings. These techniques are used to protect,*

*restore, enhance or create natural shoreline habitat.*” The program’s efforts led Maryland to pass the Living Shorelines Protection Act in 2008, which established living shorelines as the first option to be considered for shoreline erosion control projects. The act aims to reduce the level of threat to shoreline and beach resources caused by shoreline hardening and erosion. Because coastal wetlands provide a natural buffer against the impacts of these coastal hazards, preserving lands that may enable the inland retreat of coastal and nearshore wetlands can help the state maintain the long-term ecological functions of storm surge buffering, carbon sequestration, water filtration, wildlife habitat, recreation, and other values that wetlands provide.

The Maryland Coastal Management Program continues to promote new and innovative practices to enhance habitat and ensure healthy ecosystems, but acceptance of new practices remains a significant barrier. In 2013, the coastal program, including the Coastal Training Program, helped host a Mid-Atlantic Living Shoreline Summit to highlight the latest advancements in research, implementation, and innovative techniques; discuss local, state, and federal policies and regulations and barriers to implementation; and hold trainings for living shoreline professionals. Regulatory agencies are slowly becoming more comfortable with living shorelines and adjusting approaches and regulations to move towards shoreline practices that provide beneficial habitat. Higher permitting costs and longer time frames needed for additional engineering analysis and permit review continue to hamper full implementation of living shoreline projects.

The Maryland Coastal Management Program is also working to incorporate sea level rise considerations into habitat restoration and living shoreline projects such as at Ferry Point Park in Queen Anne’s County. The project was designed to restore lost wetland habitat, safeguard land and sea life habitat, enhance recreation, and protect the county economic hub of Kent Narrows from storm surge, erosion, wind, and weather. To date, the project appears to be performing well, but there is no long-term science-based plan in place to formally monitor the results of this innovative project over time. The state of Maryland is supporting a number of innovative projects, and monitoring the effectiveness of projects such as Ferry Point will likely provide valuable information to coastal managers and scientists to inform future decisions and projects. Monitoring will be needed to demonstrate whether projects are successful over the long-term and to identify issues. The NOAA Office for Coastal Management recommends that the Maryland Coastal Management program work with partners to encourage monitoring of the effectiveness of living shoreline and resilience projects, including pursuing approaches to quantify and characterize the impacts of projects. The coastal program could consider the NOAA Restoration Center’s Monitoring, Evaluation, Reporting, and Feedback Framework when developing and implementing monitoring protocols.

### ***Habitat Acquisition and Restoration***

During the evaluation period, the Maryland Coastal Management Program worked to ensure that state land acquisition priorities addressed coastal needs and would help the state adapt to sea level rise and the landward migration of coastal habitats. These multi-year efforts, which include the work of two NOAA fellows, have resulted in state policies that guide land investment for

coastal habitat protection that would be most effective and provide long-term climate adaptation benefits.

The Maryland Coastal Management Program successfully applied for a 2009 NOAA Coastal Fellow to develop a geospatial-based targeting model for climate adaptation that assessed the future location of wetlands under predictive sea level rise modeling. In early 2010, the Board of Public Works requested that all parcels being pursued for state conservation funding through the Department of Natural Resources' Program Open Space be reviewed for climate change vulnerability before the board's approval. The coastal program built on this project to develop a parcel-level evaluation form to aid in evaluating site attributes that support climate change adaptation, including storm surge abatement and resilience, mitigation, restoration opportunities, potential for carbon sequestration on-site, and future human ecology attributes.

The Maryland Coastal Management Program conducted a blue infrastructure assessment, an evaluation of coastal habitat, critical natural resources, and associated human uses in the tidal waters and nearshore areas of Maryland's coastal zone. The information was used to identify high priority ecologically important coastal areas and is available through the Coastal Atlas' Shorelines mapping tool for conservation partners and the public.

GreenPrint is a Department of Natural Resources tool that allows the state to prioritize the conservation of select ecologically valuable lands through the designation of targeted ecological areas. The Maryland Coastal Management Program, with the assistance of a NOAA Coastal Fellow, developed new considerations for climate change and key coastal resource priorities so that potential properties are now assessed for coastal habitat values and impacts, including sea level rise, storm surge, shoreline erosion, and wetland migration. The update includes no longer designating areas as targeted ecological areas, if the areas will be subject to sea level rise inundation, an estimated 2 feet by 2050, to avoid spending limited funding in areas likely to be submerged.

In 2013, the coastal program, in partnership with Program Open Space, established a first-of-its-kind coastal resilience easement. Coastal resilience easements are designed to protect areas that may be prone to high waters and storm surge by permanently eliminating development, restricting impervious surfaces, protecting areas that allow wetlands to migrate, and requiring periodic soil conservation and water quality plan updates. The easement provisions may include development setbacks in areas subject to sea level rise inundation by 2050, buffers to support high priority wetland adaptation areas, impervious surface limits to reduce runoff and pollution due to increased storm events, and review of shoreline stabilization projects. Landowners may also request development of a coastal resilience plan offering recommendations on land management practices to reduce vulnerability of their property to coastal hazards and improve the resilience of coastal habitats. The Department of Natural Resources has preserved 221 acres in Dorchester County along the Harriet Tubman Underground Railroad National Historical Park and Scenic Byway through coastal resilience easements.

The coastal program also works with the Department of Natural Resource's Maryland Environmental Trust to provide technical assistance and support to land trusts and local governments engaged in land acquisition and restoration activities. Stakeholders that the evaluation team met with valued the support from the coastal program and Department of Natural Resources, including the provision of information to map and rank potential acquisitions, assistance with designing easements, and information on new and innovative approaches to management of property to increase resilience. They also complimented the coastal program for moving land preservation in a new direction in regard to resilience.

The Maryland Coastal Management Program created an evaluation metric to track its five-year progress toward an objective of preserving and restoring the protective functions of nearshore marsh, beach, dune, and wetland habitats to reduce vulnerability. The coastal program is working with land trusts and state partners to meet the target of creating or protecting 750,000 square feet of nearshore habitat as a result of financial or technical assistance from the coastal program. After two years, this effort has created and protected only 150,000 square feet (3.4 acres) with an additional 13.8 acres remaining to be created or protected by 2017.

### ***Local Critical Area Program Updates***

Building on its work to identify high priority conservation areas and sea level rise adaptation projects, the Maryland Coastal Management Program worked with the Maryland Critical Area Commission and the Maryland Department of Planning, to identify mechanisms to increase coastal habitat protection and coastal resilience at the local level. The coastal program provided financial assistance to local governments and supported a planner at the Maryland Department of Planning to provide technical assistance to 13 communities on the Lower and Middle Eastern Shore, along with Somerset County, to update local critical area programs and ensure adoption of the resulting critical area. The strict water quality management requirements of the Critical Area Act also require close coordination with the Maryland Department of the Environment and Department of Natural Resources stormwater personnel. This work enabled jurisdictions to bring their ordinances into full compliance with the updated Critical Area law, passed in 2008, to better protect Maryland's coastal resources. This also provided an opportunity to develop a planning and outreach framework for integrating aquatic resource management objectives into required critical area updates and discussions. In 2012, the governor also signed an executive order requesting the commission to evaluate existing regulations and policies for state agency actions resulting in development on state-owned lands. The commission is to consider the adoption of new or revised provisions that address climate change and the risk of sea level rise and other extreme weather-related impacts.

The Critical Area Program is a valuable tool in protecting coastal habitat and water quality. Once adopted, local governments must also continue to provide oversight and enforcement. Given the importance of effective oversight and enforcement of the program throughout jurisdictions in the state, the NOAA Office for Coastal Management recommends a continued focus on identifying opportunities for the Maryland Coastal Management Program to provide technical support, policy assistance, and coordination services to the Critical Area Commission.

**Accomplishment:** The Maryland Coastal Management Program provided much needed assistance to local communities, in partnership with the Critical Area Commission and Maryland Department of Planning, to update local critical area programs for 13 communities, resulting in better protection of critical habitat and water quality and ensuring local governments meet new requirements.

**Recommendation:** The NOAA Office for Coastal Management recommends that the Maryland Coastal Management program work with partners to encourage long-term monitoring of the effectiveness of living shoreline and resilience projects, including pursuing approaches to quantify and characterize the impacts of projects.

**Recommendation:** The NOAA Office for Coastal Management recommends that the Maryland Coastal Management Program meet annually, at a minimum, with the Critical Area Program to discuss and strategically identify opportunities to collaborate and provide technical support, policy assistance, and coordination services to support local government land use programs and protect the Chesapeake Bay.

## Evaluation Metrics

Beginning in 2012, state coastal management programs began tracking their success in addressing three evaluation metrics specific to their programs. The evaluation metrics include a five-year target and provide a quantitative reference for each program about how well it is meeting the goals and objectives it has identified as important to the program.

### METRIC 1

**Goal:** Accelerate the recovery of coastal resources through improved water quality.

**Objective:** Annually reduce coastal nonpoint source pollution from entering Chesapeake, coastal, and ocean waters.

**Strategy:** Without clean water, the value of Maryland's coasts would be vastly diminished. Good water quality is essential for life and necessary for fishing, shellfishing, boating, swimming, and most of the other activities that draw people to Maryland's Chesapeake Bay and Atlantic coast. Pollution from sources of nitrogen, phosphorous, and sediment, which include agriculture, urban/suburban runoff, vehicle emissions, and many other sources, is currently the biggest pollution problem in our coastal waters and has disrupted the balance of our coastal and terrestrial ecosystems. Overcoming this barrier will require Maryland's Chesapeake and Coastal Service staff to work with local and federal partners to administer funding through new and innovative approaches that leverage the funds to the greatest extent possible, target the funds to the most cost effective locations and practices, engage the community at large, and hold everyone accountable. Implementation of best management practices is key in helping to reduce nonpoint source pollution impacts. With the Chesapeake Bay Program's regional Bay Model to help estimate nutrient and sediment reduction and the state's on-the-ground monitoring efforts,

we are able to show how much nonpoint source pollution we are reducing annually. The state is committed, through the BayStat process, to assuring that we continue to reduce our nonpoint source pollution into our coastal waters. The approach for meeting this goal and target is in the Annual Report to the Maryland General Assembly, “Chesapeake and Atlantic Coastal Bays Trust Fund SFY 2013 Annual Workplan”

([www.dnr.state.md.us/ccp/funding/pdfs/SFY13\\_TrustFundAnnualReport.pdf](http://www.dnr.state.md.us/ccp/funding/pdfs/SFY13_TrustFundAnnualReport.pdf)), which also provides a detailed look at specific projects and their nutrient and sediment reduction impacts.

**Performance Measure:** Pounds of nitrogen (N), phosphorus (P), and sediment (S) prevented from entering Chesapeake, coastal, and ocean waters as a result of financial and technical assistance from Maryland Chesapeake and Coastal Service over the five-year reporting period.

**Target:** 3.1 million pounds of N, 140,000 pounds of P, and 22.3 million pounds of S prevented from entering Chesapeake, coastal, and ocean waters as a result of financial and technical assistance from Maryland Chesapeake and Coastal Service over the five-year reporting period.

#### **First Year Results:**

- 2013: N - 1,337,478; P - 53,962; Sediment - 185,004,636

#### **Second Year Results:**

- 2014: N – 1,483,240; P – 58,748; Sediment – 182,335,789

#### **Cumulative Results**

- N- 2,820,718; P – 112,710; Sediment - 367,337,425

#### **Discussion:**

The Maryland Coastal Management Program has invested extensive resources in improving coastal habitat and water quality as discussed in the “Coastal Habitat and Water Quality” section. The coastal program already has met and greatly exceeded its target for sediment and has reached over 90% of its nitrogen target and over 80% of its phosphorus target. Although, the coastal program is making very good progress, the later gains may be more challenging to achieve as more cost-effective projects have been implemented first.

#### **METRIC 2**

**Goal:** Reduce Maryland’s vulnerability to future storm events, shoreline changes, and sea level rise.

**Objective 1:** Increase the number of state agencies and local governments prepared for the impacts of future storm events, shoreline changes, and sea level rise.

**Strategy:** With more than 7,000 miles of shoreline and intense coastal development, Maryland's coastal communities, public infrastructure, and vital facilities are particularly vulnerable to the effects of coastal hazards, especially as accelerated sea level rise and increased storm frequency and intensity amplify the effects of coastal flooding and shoreline erosion, reaching areas previously unaffected. Almost 70% of Maryland's shoreline experiences chronic erosion, up to 60% of some counties lie within the 100-year floodplain, and low-lying coastal areas have seen twice the global rate of sea level rise in the last century. Projected population growth and accompanying development in coastal areas, compounded by the anticipated impacts from climate change, make adaptation a high priority as more people, infrastructure, and natural resources will be at risk.

The State of Maryland has recently begun implementing strategies to reduce vulnerability and build resilience within our natural and human communities. By integrating and institutionalizing adaptation planning into coastal management decision-making frameworks, Maryland will reduce the vulnerability of the state's people, property, and natural resources to the effects of coastal hazards and climate change. Through the CoastSmart Communities Initiative, the Chesapeake and Coastal Service has worked to establish a foundation of risk and vulnerability assessments, policy and program development projects, and a suite of resources that support local governments in coastal hazard mitigation and climate change adaptation efforts. Chesapeake and Coastal Service staff will work to ensure continued progress and expand the resources available through the CoastSmart program in order to help Maryland's 114 coastal communities (16 counties, 98 coastal municipalities) prepare for future storm events, shoreline change, and sea level rise. In addition, technical and financial assistance may be made available to the following state agencies that have contributed their strategies to enhance Maryland's resilience to the consequences of climate change: Maryland Department of Transportation (MDOT), Maryland Department of Planning (MDP), Maryland Historical Trust (MHT), Maryland Insurance Administration (MIA), Department of Housing and Community Development (DHCD), Maryland Emergency Management Agency (MEMA), Maryland Department of Health and Mental Hygiene (DHMH), Maryland Department of Agriculture (MDA), Maryland Department of the Environment, University of Maryland, Maryland State Highway Administration (SHA), Maryland Port Authority (MPA), and Maryland Department of General Services (DGS). Further details of how these agencies are contributing to Objective 2.1 are contained in the 2011 Greenhouse Gas Emissions Reduction Act of 2009 (GGRA) Draft Plan (Chapter 8: Adaptation) ([www.mde.state.md.us/programs/air/climatechange/pages/air/climatechange/index.aspx](http://www.mde.state.md.us/programs/air/climatechange/pages/air/climatechange/index.aspx)). An updated plan is expected to be available in late 2012.

The approach for meeting this goal and target is described in Maryland's Coastal Zone Management Act §309 Assessment and Strategy 2011-2015 under Coastal Hazards and Climate Change Adaptation Planning.

**Performance Measure:** Cumulative number of Maryland state agencies and coastal communities that incorporate sea level rise and climate change considerations into planning and management

strategies as a result of financial and technical assistance from the Maryland Chesapeake and Coastal Service over the five-year reporting period.

**Target:** 10 Maryland state agencies and coastal communities incorporate sea level rise and climate change considerations into planning and management strategies as a result of financial and technical assistance from the Maryland Chesapeake and Coastal Service over the five-year reporting period.

**First Year Results:**

- Cumulative number of Maryland’s state agencies and coastal communities that have incorporated sea level and climate considerations into planning and management strategies: 2013 – 2

**Second Year Results:**

- 2014 - 2

**Discussion:**

The Maryland Coastal Management Program has undertaken numerous initiatives to improve climate resilience in Maryland as discussed in the “Climate Resilience” section. Through the CoastSmart Program the coastal program provides funding and technical assistance to local communities and is on track to meet the five-year target. In addition, the coastal program works closely with other state agency partners to incorporate sea level rise and climate change considerations into planning, policies, and decision-making. The program is on track to meet its target, although given the program’s level of effort in this area the numbers are very low.

**METRIC 3**

**Goal:** Reduce Maryland’s vulnerability to future storm events, shoreline changes, and sea level rise

**Objective 2:** Preserve and restore the protective functions of nearshore marsh, beach, dune, and wetland habitats to reduce vulnerability

**Strategy:** Maryland’s people, wildlife, land, and public investments are at risk from expected consequences of climate change, including sea level rise, increased storm intensity, extreme drought and heat waves, and intensified wind and rainfall events. Because of its geography and geology, the Chesapeake Bay region is ranked the third most vulnerable to sea level rise, behind Louisiana and Southern Florida. Historical tide records show that sea level increased approximately one foot in the Chesapeake Bay over the last 100 years. As a consequence of climate change, sea level is likely to rise at least twice as fast as it did during the 20th century, resulting in a potential 1-foot rise by 2050 and between 2-3 feet of rise by 2100.

In order to address these impacts, the Chesapeake and Coastal Service has developed new land conservation strategies to help preserve the long-term survival of coastal wetlands that provide natural storm surge buffering to communities as well as critical habitat for aquatic and terrestrial species. Targeting lands that may enable the inland retreat of our coastal and nearshore wetlands for restoration or protection can help the state maintain the long-term ecological functions of storm surge buffering, carbon sequestration, water filtration, wildlife habitat, recreation, and other functions that wetlands provide.

Chesapeake and Coastal Service staff will work with partners to advance the restoration and enhancement of critical nearshore marsh, beach, dune, and wetland coastal habitats through

- providing technical assistance to local governments, restoration professionals, and coastal communities;
- targeting, directing, and funding coastal habitat restoration projects;
- incorporating Maryland Blue Infrastructure and sea level rise inundation considerations into habitat restoration, conservation, and acquisition programs;
- using Maryland's GreenPrint and Blue Infrastructure data sets to assess how habitat can be better targeted for protection or enhanced management of coastal habitats, including mitigation or adaptation for impacts of climate change;
- providing assistance to state and local partners in making decisions and plans for future development, conservation, and restoration of coastal resources while reducing vulnerability to future storm events, shoreline change, and sea level rise;
- strengthening the effectiveness of Maryland's land trusts to permanently protect private land, increasing habitat quality and quantity; and
- assisting local land trusts with conservation acquisitions in fee simple, bargain sales and conservation buyer transactions, along with donated easements.

Meeting this goal and target will require a continued opportunistic approach, strong collaboration, and strategic leveraging of expertise and resources among the Maryland Coastal Management Program, the Chesapeake Bay National Research Reserve Program, Chesapeake and Coastal Service's Habitat Conservation and Restoration Division, Maryland Environmental Trust, and the Department of Natural Resources' Land Acquisition and Planning Division and other federal, state, and local partners.

**Performance Measure:** Number of square feet of nearshore habitat created or protected as a result of financial and technical assistance from the Maryland Chesapeake and Coastal Service over the five-year reporting period.

**Target:** 750,000 square feet of nearshore habitat created or protected as a result of financial and technical assistance from the Maryland Chesapeake and Coastal Service over the five-year reporting period.

**First Year Results:**

- Square feet of nearshore habitat created or protected:
- 2013 – 53,155 square feet

**Second Year Results:**

- 2014 – 32,080 square feet

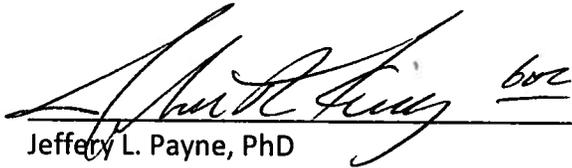
**Discussion:** The Maryland Coastal Management Program completed less than 12% of its 5 year target during the first two years. Based on progress to date the program may not be able to meet its target. Although final numbers are not in, the coastal program has been able to increase its numbers for the third year with at least 128,499 square feet of nearshore habitat created or protected.

## Conclusion

For the reasons stated herein, I find that the State of Maryland is adhering to the programmatic requirements of the Coastal Zone Management Act and its implementing regulations in the operation of its approved Maryland Coastal Management Program.

These evaluation findings contain four recommendations that must be considered before the next regularly scheduled program evaluation but which are not mandatory at this time. Recommendations that must be repeated in subsequent evaluations may be elevated to necessary actions.

This is a programmatic evaluation of the Maryland Coastal Management Program which may have implications regarding the state's financial assistance awards. However, it does not make any judgment about or replace any financial audits.



Jeffrey L. Payne, PhD

Acting Director

NOAA Office for Coastal Management

8/17/2015  
Date

## Appendix A: Response to Written Comments

**David L. Thomas**

**Baltimore County Department of Public Works**

Mr. Thomas provided information on the Maryland Coastal Management Program's work with Baltimore County. He stated that the county was currently involved with a coastal communities project (NOAA Award no. NA13NOS4190136) entitled Floodplain Area Resiliency Initiative through the Community Rating System (CRS). The Federal Emergency Management Agency (FEMA) recently published new Flood Insurance Rate Maps for the tidal areas of Baltimore County. These maps reduced the base flood elevations in many areas of the county's coastal communities, and the county was concerned about property owners dropping their flood insurance coverage and taking flooding less seriously, as well as the impact to building code requirements. When the NOAA CoastSmart Communities Program became available, the county saw it as an opportunity to bring in consultant assistance to do extensive community outreach, enhance their floodplain code, and use the FEMA CRS program as the incentive for all involved. The county had tried to do this several years ago and was not able to with the in-house resources at their disposal. The county is now able to retain consultant services with specific expertise in coastal floodplain management. The grant program will make it possible to apply for the FEMA CRS and initiate many programs to improve public health, safety, and welfare in the coastal zones, well beyond the minimum standards.

Without the NOAA-funded support, the county would not be able to take on this important project. NOAA's support is both critical and timely for Baltimore County.

In 2003, Baltimore County also participated in a Coastal Zone Management project funded by NOAA for a coastal zone hazard mitigation plan (NOAA Award No. NA17OZ1124). It was completed and turned over to the county emergency managers one month before Isabel hit Baltimore County.

**NOAA Office for Coastal Management's Response:** The NOAA Office for Coastal Management thanks Mr. Thomas for his comments.