MARYLAND'S COASTAL ZONE ENHANCEMENT PLAN

Coastal Zone Management Act §309
Final Assessment and Strategy
2016-2020

Chesapeake & Coastal Service

Prepared by the Maryland Chesapeake & Coastal Service
for Federal CZMA §309 Program Enhancement Funding
Office of Ocean and Coastal Resources Management, National Oceanic &
Atmospheric Administration, U.S. Department of Commerce

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CZMA §309 ASSESSMENT & STRATEGY 2016-2020

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1. INTRODUCTION

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1. INTRODUCTION

In 1972 Congress responded to the rapid deterioration of coastal areas throughout the nation by passing the Coastal Zone Management Act, or CZMA. The main objectives of CZMA, administered by the National Oceanic and Atmospheric Administration's (NOAA) Office of Ocean and Coastal Management (OCM), are to "preserve, protect, develop, and where possible, restore or enhance the resources of the nation's coastal zone." The key feature of the Act was the creation of a partnership among federal, state, and local governments. The success of the Act is a direct result of the ability of states to work with local communities to design coastal management programs that address specific issues and priorities affecting local areas.

Maryland's Coastal Zone Management (CZM) Program was federally approved in 1978 in response to the passage of the CZMA, which provides funds to coastal states to develop and administer coastal zone management programs. The Program works to manage the resources within Maryland's coastal zone - the land, water and subaqueous land between the territorial limits of Maryland in the Chesapeake Bay, Atlantic Coastal Bays and the Atlantic Ocean, as well as the towns, cities and counties that contain and help govern the thousands of miles of Maryland shoreline. The coastal zone extends from three miles out in the Atlantic Ocean to the inland boundaries of the 16 counties and Baltimore City that border the Atlantic Ocean, Chesapeake Bay and the Potomac River up to the District of Columbia. This area encompasses two-thirds of the State's land area and is home to almost 70% of Maryland's residents.

Maryland's Program has played a dynamic role in helping the State Department of Natural Resources shape environmental policy for Maryland. Maryland's Program not only laid the groundwork for the historic Chesapeake Bay Agreement, but also contributed to the creation of Maryland's nationally recognized Critical Areas Program. In 2007, the State of Maryland consolidated the administrative and management functions of the CZMA programs, the Environmental Protection Agency (EPA) Section 117 Awards as well as State's Chesapeake and Atlantic Coastal Bays Trust Fund to a single program. In addition, to improve program identity and to recognize one of the State's most critical coastal resources, 'Chesapeake' was added to the program title. Maryland's CZM program is now known as the Chesapeake and Coastal Service (CCS hereafter). By shifting from a decentralized, program-specific approach, to a more centralized objective-based approach, the CCS is better able to leverage core competencies from different programs, avoid duplicate efforts, and leverage and efficiently prioritize resources to advance the goals of the CZMA.

HOW THE MARYLAND CHESAPEAKE AND COASTAL SERVICE IS ORGANIZED

CCS, administered by the State Department of Natural Resources, is a partnership among local, regional and state agencies. It also collaborates with many private organizations such as local land trusts and economic development groups. Through this networked approach, no one agency or department is responsible for Maryland's entire coast. Rather, all partners help to ensure its proper management. The other agencies that comprise the original networked program include: Maryland Department of the Environment (MDE), Maryland Department of Planning (MDP), Maryland Department of Agriculture (MDA), Maryland Department of Transportation (MDOT), and the Department of Housing and Community Development (formerly DECD). Since 1978, additional partnerships have been formed with Maryland Environmental Trust (MET), Maryland Emergency Management Agency (MEMA), Maryland Historical Trust (MHT), Maryland Energy Administration (MEA), Maryland Geological Survey (MGS), University of Maryland Center for

Environmental Sciences (UMCES), Towson University Center for GIS (TUGIS), Critical Area Commission, Maryland Coastal Bays Program, and University of Maryland Sea Grant Extension.
As noted above, CCS houses the state CZMA programs including the CMP and the Chesapeake Bay National Estuarine Research Reserve in Maryland (CBNERR-MD). These two programs in particular have aligned themselves more closely since the last assessment on a variety of issues related to stewardship, research, and coastal training. The CMP and Reserve programs are now organized within CCS as the Coastal and Marine Assessment Division. These programs work cooperatively to support land conservation efforts in the coastal zone and apply science, stewardship and innovative technologies to site management practices at Reserve sites. The strengthened partnership within the Coastal and Marine Assessment Division has also resulted in an increased level of collaboration and coordination with the Reserve's Coastal Training Program (CTP). Specifically, the two programs now closely align their efforts on *CoastSmart* (coastal flooding, climate change and sea level rise); managing the effects of development along the shoreline; and, watershed management and sustainability. Together, the State's CZM programs now deliver a high level of support and training for local partners on *CoastSmart* programs; resource management and shoreline and water quality improvement projects; and, evaluating and building capacity for restoration and conservation practices throughout coastal watersheds.

Over the past three decades, this partnership has helped Maryland work to reduce the environmental impacts of coastal development, resolve significant conflicts between competing coastal uses and provide critical assistance to local governments in coastal planning and resource protection. CCS conducts research, provides technical services and distributes federal and state funds to enable on-the-ground projects that benefit Maryland's coastal communities. Whether it's helping communities prepare for climate change, restore local waterways, protect habitats, foster clean coastal industries, or encouraging citizens to become caring stewards, CCS constantly seeks ways to improve coastal management.

CZMA SECTION 309 ASSESSMENT AND STRATEGY PROCESS

Section 309 of the Coastal Zone Management Act (CZMA) is known as the Coastal Zone Enhancement Program. Established with reauthorization of the CZMA in 1990, Section 309 is a voluntary grant program in which federal funds are made available to coastal states with federally approved coastal management programs. To receive funds, the programs must assess nine specified areas of coastal zone management as they relate to the state and identify which are of highest priority. The nine areas are: public access, coastal hazards, ocean resources, wetlands, marine debris, cumulative and secondary impacts, special area management planning, energy and government facility siting, and aquaculture.

Section 309 offers states the opportunity to enhance their current coastal management programs by developing improvements to core law authorities, creating new programs, and designing new funding sources. This enhancement program requires states to periodically conduct a needs assessment of nine coastal policy enhancement areas. This is the fifth Assessment and Strategy that the Maryland Program has submitted under CZMA Section 309.

In 1997, Maryland developed a three-year Assessment and Strategy that addressed each enhancement area and established one Section 309 protection priority: Cumulative and Secondary Impacts (CSI). Maryland's 1997 - 2000 Strategy for addressing CSI was organized according to several issue areas, including Growth Management and Sensitive Areas Protection, Riparian Forest Buffers, Nonpoint Source Pollution Control, and Economic Impacts of Growth and Land Use Change. The State determined that the other Section 309

areas were adequately addressed through existing management programs or were of low to medium priority.

In 2000, Maryland developed a five-year Assessment and Strategy that addressed each enhancement area and established two Section 309 priorities: Cumulative and Secondary Impacts and Coastal Hazards. The State determined that the other Section 309 areas were more appropriately addressed through existing management programs or were of low to medium priority.

In 2005, Maryland developed a five-year Assessment and Strategy that addressed each enhancement area and established three Section 309 priorities: Coastal Hazards, Ocean Resources, and Cumulative and Secondary Impacts. The overall goals of the 2006–2010 Section 309 Strategy were to: integrate coastal hazard planning into State and local programs and policies; improve the understanding and management of nearshore resources; develop a framework for future ocean planning and management efforts; and advance CZMA goals related to cumulative and secondary impacts at the local community level. The State determined that the other Section 309 areas were more appropriately addressed through existing management programs or were of low to medium priority.

And in 2010, Maryland developed a five-year Assessment and Strategy that addressed each enhancement area and established two strategies that addressed multiple Section 309 priorities: a Coastal Hazards and Climate Change Adaptation Planning strategy (Coastal Hazards, Cumulative and Secondary Impacts, and Ocean/Great Lakes Resources); and a Comprehensive Ocean and Coastal Planning strategy (Aquaculture, Cumulative and Secondary Impacts, Energy & Government Facility Siting, Ocean/Great Lakes Resources, and Public Access). The State determined that the other Section 309 areas were more appropriately addressed through existing management programs or were of low to medium priority.

SUMMARY OF THE 2016-2020 ASSESSMENT AND STRATEGY

Maryland's 2016-2020 Coastal Zone Enhancement Plan includes assessment of these issues over 2014-2015. State priorities have been developed and the strategies outlined in this document will guide our program enhancement efforts over the next five years, from 2016–2020.

The content that follows the introductory materials is divided into nine sections corresponding to the nine priority enhancement areas: Wetlands, Coastal Hazards, Public Access, Marine Debris, Cumulative and Secondary Impacts, Special Area Management Planning (SAMP), Ocean/Great Lakes Resources, Energy and Government Facility Siting and Aquaculture. Each of these nine sections contains the Assessment followed by the Strategies. At present, Section 309 funds available to CCS to pursue the program enhancement gaps and strategies detailed in this document amount to roughly $500,000 per year. As such, there are more activities included in this document than there is funding available through Section 309 and not all components proposed in Maryland's Coastal Zone Enhancement Plan are eligible for this source of NOAA funding. Projects will be chosen from the Plan annually as part of federal grant applications and leveraged with efforts in Section 306 and other funding sources. We pledge to fully draw upon all state and federal resources available to us to complete these projects, and to explore additional funding sources through grants, and other arrangements.

PRIORITIZATION OF ISSUES

Issue	2015 Priority	2010 Priority	2005 Priority	2000 Priority	1997 Priority
Wetlands	Medium	Medium	Medium	Medium	High
Coastal Hazards	High	High	High	High	High
Public Access	Medium	Medium	Medium	Medium	High
Marine Debris	Low	Low	Low	Low	Low
Cumulative and Secondary Impacts	Medium	High	High	High	High
Special Area Management Planning	Low	Low	Medium	Medium	Medium
Ocean Resources	High	High	High	Medium	Medium
Energy and Government Facility Siting	Medium	Medium	Low	Low	Low
Aquaculture	Medium	Medium	Medium	Medium	Medium

JUSTIFICATION FOR PRIORITIES

Priority rankings have been assigned to coastal management issues by considering: 1) the results of assessments developed for each coastal issue area; 2) opportunities for development of new or enhanced management approaches considered eligible for and best suited for CZMA Section 309 funding; 3) the contribution to the overall priorities of the program; 4) whether the issue is more appropriately addressed through existing management programs; and 5) the track record of addressing the topic in previous enhancement efforts.

HIGH PRIORITY ISSUES FOR CZMA SECTION 309 COASTAL ZONE ENHANCEMENT FUNDS

Over the next five years, the CCS will use CZMA Section 309 funds to enhance resilience to coastal hazards and climate change, improve management of coastal and ocean resources while addressing new and emerging uses, and ensure science is translating into decision-making.

DESCRIPTION OF THE 309 ASSESSMENT & STRATEGY DEVELOPMENT PROCESS

Beginning in October 2014, CCS staff initiated the Assessment and Strategy development by engaging the appropriate State and Local partners. Draft assessments were completed in February 2015, and meetings were held to discuss strategy development for the FY 2016-2020 strategy timeframe. In addition to the needs and gaps identified in the draft assessments and feedback received from partners, CCS staff consulted a number of additional resources outlining coastal management needs and program recommendations to identify strategy connections.

Maryland's Coastal Zone Enhancement Plan was developed with the guidance provided by John Kuriawa, Maryland's NOAA OCM Coastal Program Specialist. Concurrent with NOAA review, the CCS plans to solicit further review from the following agencies, institutions and programs:

- Maryland Department of the Environment
- Maryland Department of Planning
- Maryland Energy Administration
- Maryland Department of Transportation
- Maryland's Emergency Management Agency
- The State's Office of the Attorney General
- Maryland Geological Survey
- Critical Area Program

- Maryland's Fisheries Service
- Maryland's Forestry Service
- Maryland's Land Acquisition Programs
- Maryland's Boating Services
- The National Aquarium
- The Maryland Coastal Bays Program
- Mid Atlantic Regional Council on the Ocean

PUBLIC COMMENTS

Upon submitting Maryland's Coastal Zone Enhancement Plan as a draft to NOAA Office of Coastal Management (OCM) on May 15, 2015, CCS plans to coordinate public review and comment through the CCS website (http://dnr.maryland.gov/ccs/) and a June issue of the Program's *In The Zone* electronic newsletter.

The public comment period for Maryland's Draft §309 Assessment and Strategy was held between June 15, 2015 and July 15, 2015.

2. ACCOMPLISHMENTS

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2. SUMMARY OF RECENT SECTION 309 ACHIEVEMENTS

This is the fifth Assessment and Strategy that the Maryland Program has submitted under Section 309 of the federal Coastal Zone Management Act (CZMA). This section provides a brief summary of select accomplishments completed under the Section 309 Program since the last Assessment and Strategy. Maryland's Section 309 Strategy completed in 2015 focused on Coastal Hazard and Climate Change Adaptation Planning and Comprehensive Ocean and Coastal Planning.

COASTAL HAZARD AND CLIMATE CHANGE ADAPTATION PLANNING

The objective of the Coastal Hazard and Climate Change Adaptation Planning Strategy during the 2010–2015 period was to integrate coastal hazard and sea level rise adaptation planning into state and local management plans, programs and authorities.

The main goals of the Coastal Hazard and Climate Change Adaptation strategy were: (1) Coastal community hazard assessments and *CoastSmart* Communities Program; (2) Training, data support, and outreach; and (3) State-level climate change and sea level rise adaptation.

Funding through CZMA has helped the CCS play a leadership role in raising awareness and positioning the State and local governments to better address coastal hazards issues including the impact of climate change, sea level rise and coastal storms.

During this period, CCS has undertaken a number of hazard-related efforts accomplished through Section 309 funds.

2011-2015 Strategy Goal: Coastal community hazard assessments and CoastSmart Communities Program

CoastSmart Communities Program

The management of coastal development and the mitigation of coastal hazards are largely accomplished through local land use authorities, including building codes, planning and zoning, and subdivision controls. To provide the necessary assistance to local municipalities for coastal hazards and sea level rise response planning, CCS created the *CoastSmart* Communities Program to offer financial and technical assistance in identifying and implementing strategies to protect life and property.

In addition to supporting a local government grants program, Section 309 funding was instrumental in establishing the *CoastSmart* Communities Online Resource Center. The Online Resource Center, launched in June 2010, was developed to assist businesses, communities and local governments by providing access to available products and services that address the current risks associated with coastal hazards and the potential increased impacts of those hazards in the future due to climate change. A key feature of the Online Resource Center is the Shorelines mapping application of Maryland's Coastal Atlas, which was updated in 2015. The Shorelines mapper provides access to an interactive mapping tool to display historical rates of shoreline change, the Comprehensive Shoreline Inventory, storm surge inundation, areas at risk to sea level rise, and more.

The *CoastSmart* Communities Program provides financial and technical assistance to vulnerable coastal communities to help them identify, prepare for and reduce their risk to coastal and climate related impacts. Since 2009, CCS has supported more than 50 state-local government partnership efforts throughout the coastal zone and has awarded over $600,000 to support projects in six coastal counties and 19 municipalities.

During the 2010–2015 strategy period, CCS used Section 309 funds to partner with local governments on the following projects:

Community Partner	Project Title	Program Change	Adoption/Completion Date
Queen Anne's County	Addressing Southern Kent Island Priority Funding Area (PFA) Exception	Vulnerability Assessment for Update to Hazard Mitigation Plan and other Planning Processes as Updated	Expected June 2015 Start
Talbot County	Increasing Hazard Information Distribution in Talbot Co	Update Hazards Outreach Strategy to inform Emergency Preparedness and Planning	October 2014 Start
Snow Hill	Town of Snow Hill Zoning Ordinance and Map Update	Update Zoning Ordinance and Floodplain Ordinance	October 2014 Start
Prince George's County	Prince George's Coastal Flood Risk Reduction Program	Vulnerability Assessment to inform update to Hazard Mitigation Plan	October 2014 Start
Somerset County / Smith Island	Smith Island Community Visioning	Vision Plan	July 2014 Start
Baltimore City	Tracking of Coastal Adaptation Strategies in Baltimore City	Integration of Adaptation Strategies in many Existing Planning Processes	November 2014 Start
Calvert County	Planning for Sea Level Rise in Calvert County	Creation of a Small Area Flood Mitigation Plan and Sea Level Rise Vulnerability Assessment of Cultural Resources	January 2015 Start
Annapolis	Designing a Cultural Resiliency Plan for the City of Annapolis	Update to City Hazard Mitigation Plan and Comprehensive Plan	October 2014 Start
Critical Area	Local Framework for	Develop Guidance for	July 2014 Start

Commission	Climate Change Adaptation Strategies for CA Jurisdictions by the CA Commission	Local Governments to Incorporate Adaptation in CA Ordinances	
Centerville	Determine Equivalent Runoff Unit (ERU) for Implementation of Adopted Stormwater Utility Ordinance and Critical Area Ordinance Update for Town of Centreville	Updated CA Ordinance	July 2014 Start
Dorchester County	CA Ordinance Update	Critical Area Ordinance Update	July 2014 Start
Princess Anne	Town of Princess Anne Zoning Ordinance Update	Zoning Ordinance Update	July 2014 Start
Baltimore County	Floodplain Area Resiliency Initiative through the Community Rating System (Baltimore Co.)	Update Zoning Ordinance and Join FEMA's Community Rating System	May 2014 Start
Calvert County	Coastal Hazard and Natural Resources Planning in Calvert County	Creation of a Small Area Flood Mitigation Plan for Broomes Island	In Adoption Process
Baltimore City	Creating a Ready and Resilient Baltimore City: Implementation	Updating of Planning Processes Including Capital Improvement Plans and Energy Office Plan	October 2014
Talbot County	Creating Flood Resilience in Talbot County: Public Outreach and Community Rating System	Update to County Hazard Mitigation Plan and Application to Community Rating System	September 2013
Calvert County	Enhancing Coastal Protection in Calvert County	Creation of a Small Area Flood Mitigation Plan	December 2013
Baltimore City	Creating a Ready and Resilient Baltimore City	Updated Hazard Mitigation Plan	September 2013
Queen Anne's County	Queen Anne's Coastal Resources and Floodplain Management	Updated Floodplain Ordinance	September 2013
Talbot County	Creating Flood	Updated Floodplain	September 2013

	Resilience in Talbot County	Ordinance	
Queen Anne's County	Protection and Management: Coastal Resources in Queen Anne's County	Updated Critical Area Ordinance	September 2012
Calvert County	Calvert County Shoreline Development Guide and Plan	Shoreline Development Guide	December 2012
Various Lower Eastern Shore Communities / MD Dept. of Planning: Denton, Federalsburg, St. Michaels, Salisbury, Easton	Coordination of Local Planning and Protection	Updated Critical Area Plans	2011
Town of Cambridge	Cambridge Code and Ordinance Modification	Updated Code and Ordinance	2010
Talbot County	Coastal Management for Traditional Villages	Coastal Management Plan for Unincorporated Villages	2010
City of Annapolis	City of Annapolis Flood and Inundation Mitigation Strategies - Eastport Area	Vulnerability Assessment and Updated Mitigation Strategies	2010
Anne Arundel County	Sea Level Rise Strategic Plan Anne Arundel County - Final	Strategic Sea Level Rise Land Use Plan	2010
Town of Ocean City	Stormwater Utility Development for Ocean City	Stormwater Utility	2010

***CoastSmart* Program Collaboration with the Reserve Coastal Training Program (CTP)**

To better serve local governments in coastal hazard mitigation and climate change adaptation efforts, CCS and Maryland's Coastal Training Program (CTP) have partnered to provide training and financial and technical assistance to local governments; build capacity to integrate data and mapping efforts into local planning efforts; and provide tools and guidance for integrating sea level rise adaptation strategies into their local comprehensive plans, hazard mitigation plans, and emergency management plans. Specifically, the *CoastSmart* Program and CTP began working together to develop training curriculum development and events; to host an annual *CoastSmart* local government exchange event; and to conduct facilitated community self-assessment exercises with coastal communities using the soon to be released *CoastSmart* Communities Scorecard. This alignment has resulted in changes to planning approaches utilized by the State on a variety of issues. Link: http://coastaltraining-md.org

2011-2015 Strategy Goal: Training, data support, and outreach

Coastal Community Exchanges
Similar to previous community exchanges, CCS hosted day-long exchange workshops (held most recently in Annapolis in October 2014 and in Easton in December 2014), which provided opportunities for local planners to learn about state resources that are available to assist in hazard planning efforts and transfer program change information. This exchange differed from previous ones by offering a more interactive day with limited presentations. Participants were able to sit down with presenters for half the time to get a more in-depth understanding of how local projects were done, from a wide-range of perspectives (hazard mitigation, floodplain management, climate adaptation, etc.).

Launch of *CoastSmart* Communities Scorecard
During the 2010–2015 strategy period, CCS used Section 309 funds to develop and launch the *CoastSmart* Communities Scorecard to further assist communities in this effort to help local governments improve their ability to respond to coastal threats such as storm surge, flooding and sea level rise.

The *CoastSmart* Scorecard offers a simple method for assessing the risk and vulnerability of a local community to coastal hazards by using a ground-up and community-based approach. It is intended to provide: a facilitated, in-person discussion among local government departments; shared information on vulnerabilities and risks to relevant coastal hazards; awareness of strengths and weaknesses of hazard preparedness and planning; next steps for increasing resilience to short and long-term coastal hazards.

The Scorecard provides planning guidance in five major sectors: Risk and Vulnerability Assessment; People and Property; Infrastructure and Critical Facilities; Natural Resources; and Societal and Economic Impacts, and can be used to develop a custom made strategic planning and response guide.

Project of Special Merit: Shoreline Rates of Change and Shoreline Management: Anne Arundel and Baltimore Counties, Maryland
During the 2010–2015 strategy period, CCS used Section 309 funds, awarded through a Project of Special Merit, to begin updating the Shoreline Rates of Change data for Maryland's coast. It had been nearly two decades since the last revision and the data and information is becoming less useful in shoreline management. Since the last recorded shoreline change rate was calculated (1990), Maryland has experienced several large storms (Isabel, Sandy) that have likely changed the shorelines in a number of coastal counties. CCS worked with the Maryland Geological Survey to update shoreline change information for two coastal counties in Maryland: Anne Arundel and Baltimore. MGS added two recent, post-2000, shorelines to the original set of digital shorelines, ran the latest version of a shoreline rates-of-change program, and assigned generalized erosion rate categories to one of the recent shorelines. MGS worked cooperatively with CCS to upload the results of these three activities to Maryland's Coastal Atlas, disseminate and communicate the information to key stakeholders, and incorporate the work into shoreline management. Errors in shoreline positions will be addressed by comparing two post-2000 shorelines. This project served as a first step of a statewide shoreline change update for the remaining tidewater counties.

Climate Change and Conservation Practices: Targeted Ecological Areas
DNR has developed new conservation criteria and easement provisions to identify coastal habitats that may help Maryland proactively adapt to sea level rise and increased storm events associated with climate

change. Climate change targeting criteria was used to develop new conservation areas for "*GreenPrint*" and a parcel-level scorecard used to review land acquisition projects.

From 2009-2011, CCS supported a NOAA Coastal Management Fellow who targeted tools and techniques for sea level rise adaptation and response, such as the Sea Level Affecting Marshes Model (SLAMM)[1]. The purpose of this project was to develop new conservation criteria to identify coastal habitats (e.g. wetlands) that may help Maryland proactively adapt to sea level rise and increased storm events associated with climate change. DNR updated the *GreenPrint* Targeted Ecological Area designations to include coastal ecosystems, habitats for climate change adaptation and marsh migration, and areas for supporting commercial and recreational fisheries. DNR has used these updated conservation priorities to target Program Open Space land conservation projects.

Coastal Atlas Updates

CCS has used Section 309 and Section 306 funds to create, improve and populate coastal mapping applications as part of Maryland's Coastal Atlas, which includes wetland mapping tools. These tools have been used to evaluate wetland restoration projects, measure wetland change and improve the delivery of wetland data and information to local and federal governments, NGOs, and other project partners. DNR continues to distribute much of its GIS data and maps via free download over the internet. Wetland data are one of the most popular downloads. CCS has supported additional shoreline data collection efforts through previous CZMA funding, including a Comprehensive Shoreline Inventory that captured baseline shoreline conditions throughout Maryland's coastal counties in 2005, and we anticipate continuing these projects in the future.

2011-2015 Strategy Goal: State-level climate change and sea level rise adaptation

Maryland's Climate Action Plan and Phase I and II Adaptation Strategies

During the 2010–2015 strategy period, CCS used Section 309 funds to support DNR's Climate Policy and Planning Program Manager, Zoe Johnson. The Program Manager focused on implementing and/or adopting new or revised authorities and state-level guidelines to reduce sea level rise and climate vulnerability. A major focus of the Program Manager was to support the implementation of a number of the priority actions outlined in the Maryland Climate Action Plan's Phase I and II Strategies.

A key component of the Maryland's Climate Action Plan, released by the Maryland Commission on Climate Change (MCCC) in 2008, is the Phase I Adaptation Strategy for Sea Level Rise and Coastal Storms. A second strategy (Phase II) was released in 2011 as a compendium to the Climate Action Plan, outlining specific sector-based strategies to address changes in precipitation patterns and increased temperature and the likely impacts to human health, agriculture, forest and terrestrial ecosystems, bay and aquatic environments, water resources, and population growth and infrastructure. Together these two strategies lay out a compendium of 95 actions to adapt to climate change across a suite of social, environmental and economic sectors.

[1] The SLAMM model is a basic bathtub simulation based on elevation data that displays potential inundation at 0-2', 2-5' and 5-10' of sea level rise. The inundation breakouts roughly correlate to Maryland's projected inundation rates for years 2050 (0-2') and 2100 (2-5'). The dataset is a derivative of high-resolution topographic data LiDAR (Light Detection And Ranging). The resolution of Maryland's LiDAR is in 2-foot contours, which provides CCS with an estimate of future vulnerable resources.

Between 2008 – 2014, the State as a whole made substantial progress to implement high-priority elements of Maryland's Phase I and II Adaptation Strategies. Chapter 8 of Maryland's Greenhouse Gas Reduction Plan (2012), the Adaptation Update, provided detailed information on state agency implementation efforts to date, along with short, medium and long-term priorities for future action.

Tools, Guidance and Resource Development

- *Climate Change Impact Area Mapper* (http://www.dnr.maryland.gov/climatechange/mapper.asp). The mapper is an online map service which shows land areas in Maryland that are projected to be the most sensitive to anticipated changes in climate.
- *Updated Sea Level Rise Projections*
  Dr. Donald F. Boesch, UMCES President, convened a panel of highly qualified scientific experts on sea level rise drawn from Maryland and the Mid-Atlantic region (VA, DE, NJ, PA). A report detailing best estimates for MD was issued in June 2013. The "Best" estimate of mean sea level rise along Maryland's shorelines by 2050 (over the mean level in the year 2000) is 1.4 feet; based on present scientific understanding. It is unlikely to be less than 0.9 foot or greater than 2.1 feet. The "Best" estimate for mean sea level rise by 2100 is 3.7 feet; it is unlikely to be less than 2.1 feet or greater than 5.7 feet.

PlanMaryland – Climate Change Impact Areas

Climate Change Impact Areas are included as one of Plan Maryland's Areas of Special Designation. Climate Change Impact Areas include: projected 50 and 100-year Sea Level Rise Inundation Zones, 50-Year Erosion Vulnerable Zones, Category 2 Storm Surge Inundation Zones, Marsh Transition Zones, Temperature Sensitive Streams, Drought Hazard, and Wildfire Risk Areas. 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.

Coast Smart Executive Order

Governor O'Malley signed the Climate Change and "Coast Smart" Construction Executive Order in December 2012. The EO enacts a number of policy directives, including directing all State agencies to consider the risk of coastal flooding and sea level rise when they design capital budget projects and charging the Department of General Services with updating its architecture and engineering guidelines to require new and rebuilt State structures be elevated two or more feet above the 100-year base flood level.

Climate Change and Coast Smart Construction: Infrastructure Siting and Design Guidelines

The report (issued in response to directives outlined in executive order) recommends specific siting and design guidelines for State construction projects to protect against the impacts of climate change. The report recommends that Coast Smart practices also be applied to non-state buildings and infrastructure projects if partially or fully funded by the State, as well as projects on state lands. Recommended practices include:

- Increasing the elevation requirements for State buildings, and critical and essential facilities, such as 911 centers and fire stations;
- Increasing the setback requirements for State structures to avoid areas likely to be impacted by sea level rise within the next 50 years; and
- Protecting natural storm surge buffers on construction sites.

Coast Smart Council (House Bill 0615)
House Bill 615 codifies into law and builds on key provisions of Executive Order 01.01.2012.29 by creating a Coast Smart Council chaired by the head or designee of DNR, with membership comprised of the head or designee of DBM, MDE, DGS, MDP, MDOT, DBED, MEMA, Critical Area Commission, University of Maryland, and 5 members appointed by the Governor to represent local government, environmental, and business interests. The EO directs the Coast Smart Council to adopt siting and design criteria for state capital projects to address the impacts of sea-level rise and coastal flooding. The law also requires, by July 1, 2015, any state capital project involving the construction or reconstruction of a structure to comply with the siting and design criteria established by the Coast Smart Council. CCS staff are a part of the council.

Strengthening Climate Action in Maryland: EO 01.01.2014.14
On November 19, 2014, Governor Martin O'Malley issued Executive Order (01.01.2014.14), to expand the membership, mission and work of the Maryland Commission on Climate Change (MCCC). As one of four working groups organized under the MCCC, the EO establishes the following charge for the Adaptation and Response Working Group (ARWG):

- Strengthen and maintain existing State action plans to further address, prepare for and adapt to the consequences of climate change;
- Reestablish the Adaptation and Response Working Group, as needed;
- Convene regular Working Group meetings to ensure that sufficient progress is being made across all sectors and communities in Maryland; and
- Establish a comprehensive and accountable annual work plan that set annual goals and performance benchmarks, and prioritizes new and existing climate change adaptation actions and initiatives.

COMPREHENSIVE OCEAN AND COASTAL PLANNING

The objective of the Comprehensive Ocean and Coastal Planning Strategy during the 2010–2015 period was to improve the State's ability to make informed decisions that balance economic and environmental considerations by integrating spatial planning into State and local management plans, programs and authorities and establishing the means to preserve existing and future water-dependent uses.

Three main goals are of the Comprehensive Ocean and Coastal Planning strategy were: (1) Water-dependent use planning and working waterfronts initiative; (2) Ocean planning to support decision-making for Maryland offshore energy; and (3) Bay resource and human use analysis.

The following is a selection of accomplishments completed using Section 309 funding within this Strategy:

2011-2015 Strategy Goal: Water-dependent use planning and working waterfronts initiative

DNR Working Waterfronts Program and Inventory
The history, culture, and identity of Maryland's coastal communities are inextricably linked to the existence of the working waterfront. In order to assist with the preservation of existing and historic working waterfronts in Maryland, CCS is building from the work of the Maryland Working Waterfront Commission and collaborating with the Virginia Institute of Marine Science to conduct an inventory of working waterfronts throughout the state. Between November 2011 and October 2013, over 100 sites were inventoried and mapped, providing data on general and specific services, physical attributes, photographs,

and current viability status for each site. GIS data layers have been developed, and a mapping tool and website are under development. In September 2013, the first State Working Waterfronts Advisory Committee meeting was held in order to guide development of DNR's Working Waterfronts Initiative. The meeting brought together stakeholders such as the Maryland's Waterman's Association, Chesapeake Bay Maritime Museum, Coastal Heritage Alliance, Chesapeake Bay Seafood Industry Association, MARBIDCO, and others for feedback on the Inventory and guidance moving forward. (http://dnr.maryland.gov/ccs/workingwaterfronts.asp)

With guidance from the State Working Waterfronts Advisory Committee, CCS partnered with the University of Maryland Environmental Finance Center and the City of Cambridge to complete an economic and business analysis for the City of Cambridge. Cambridge was selected as a pilot community to develop a sustainable working waterfronts program. CCS will draw on this analysis when coordinating and distributing state-level resources to communities through the Working Waterfronts Program. Water-dependent business owners, watermen, aquaculturists, local and state planners, and other stakeholders were invited to participate in a Working Waterfronts Exchange in June 2015. The Exchange served as a venue to highlight working waterfront protection and revitalization activities in Maryland's Coastal zone; share ideas and lessons learned from other coastal states; connect communities; discuss best practices; and most importantly, launch Maryland's Working Waterfronts Program.

Improved Water Access

In 2013, the Maryland legislature passed HB 797. The aim of this legislation was to create and enhance recreational water access statewide. The resulting statute, (Chapter 140 - Transportation) took effect in October 2014 and requires the Maryland Department of Transportation (MDOT) to coordinate with local governments on capital construction or improvement projects that involve bridges or other transportation facilities that are adjacent to or cross waterways, to consider reasonable and appropriate measures to provide or improve non-motorized water access for recreational activity (i.e. paddling and fishing). This statute requires MDOT to consult with the Maryland Department of Natural Resources to establish standards and guidelines for identifying appropriate facilities to be considered under this statute and to identify best practices, and cost effective strategies for accommodating water access.

By 2030, population growth in Maryland will increase by more than half a million[2] and an additional 560,000 acres are anticipated to be developed throughout the state. Many of these changes may occur in the coastal zone. During the current evaluation period CCS addressed protection of coastal habitat in coastal landscapes and coastal and ocean habitats through a variety of relevant programmatic updates, state legislation and/or regulations and local partnership accomplishments. CCS staff provided research and technical support or assisted in the policy development for consideration by the Chesapeake Bay Cabinet, BayStat Sub Cabinet and State House. A summary of these changes and updates are provided below.

2011-2015 Strategy Goal: Ocean planning to support decision-making for Maryland offshore energy

[2] MDP

Offshore Renewable Wind Energy

Offshore energy development is an emerging ocean use that will compete for space and has the potential to highlight a range of use conflicts. Maryland has committed to getting 20% of the State's electricity from renewable sources by 2022. Working with the U.S. Department of Interior, Maryland identified an area 10 to 23 miles off the coast suitable for offshore wind turbines. This area holds the potential to supply 1,000 megawatts (MW) of electricity – enough to power more than 400,000 homes. CCS has worked with partners to: advance the siting and leasing process; prepare and compile comments about potential environmental impacts; prepare and compile comments about associated offshore transmission proposals; advance state legislation supporting offshore wind development; evaluate state and regional issues associated with the development of offshore wind; and, finally, to support studies that advance our understanding of natural resources and geophysical characteristics off the coast to inform the siting and leasing process. CCS continues to work with stakeholders to map out uses, update the Coastal Atlas and utilize ocean planning tools to continue to inform the process. Through the leadership and vision of former Governor Martin O'Malley, the Maryland Offshore Wind Energy Act of 2013 was passed, a key State legislative outcome related to advancing this effort.

Following the successful approval of the Settlement Agreement of the merger of Exelon and Constellation, Maryland has a $30M Offshore Wind Development Fund. In 2012, an MOU between DNR and MEA formally established an Offshore Wind Development Fund Working Group designed to coordinate program activities between agencies. Pursuant to this MOU, CCS is overseeing seven projects designed 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.

The document "A Guide to State Management of Offshore Wind Energy in the Mid-Atlantic Region" was also completed, providing an overview of some of the states' key legal authorities and overarching priorities in offshore wind management, and what types of information are needed in the context of coastal zone management to satisfy the various state permitting and licensing review processes.

Maryland Participation in the Regional Planning Body

In 2012, Governor O'Malley accepted the National Ocean Council's invitation to engage in collaborative regional ocean planning and designated two CCS representatives to participate on the Mid-Atlantic Regional Planning Body (Mid-A RPB). The creation of the Mid-A RPB is an important step for ocean and coastal stewardship and will complement Maryland's current efforts to improve the health of our ocean resources and coastal economy. The Mid-A RPB includes representatives from the six Mid-Atlantic States, nine federal agencies, Shinnecock Indian Nation and the Mid-Atlantic Fishery Management Council. The Mid-A RPB held its inaugural meeting on Sept. 24-25, 2013. The Mid-A RPB continues to meet via teleconference on a monthly basis, with several workgroups holding weekly or biweekly conference calls. The designated CCS Mid-A RPB Members and additional CCS staff attend and represent the priorities and concerns of the State of Maryland during these meetings. Work is underway to develop an Ocean Action Plan. Additional summaries regarding legislation and regulations that protect critical coastal habitats can be found on pages 60–66 of the FY 11–15 Section 309 Assessment.

MOU Between Maryland's CCS and the U.S. DoD Addressing Federal Consistency
The State of Maryland and the Department of Defense (DoD) entered into a first of its kind agreement to work together to protect and enhance Maryland's coastal resources, in a signing at the U.S. Naval Academy in Annapolis on May 8th, 2013. The Memorandum of Understanding (MOU) outlines how DoD facilities and projects will meet the federal law requirements of the Coastal Zone Management Act to ensure that their actions affecting these resources are consistent with the State's Coastal Policies.

Maryland's Enforceable Policy Update 2010-2011: Strengthening Coastal and Ocean Resource Management
In response to a 2007 Section 312 Assessment of Maryland's Coastal Program (CCS), Maryland submitted a Routine Program Change (RPC) to NOAA on November 19, 2010. On March 18, 2011, NOAA approved Maryland's RPC. The updated and clarified enforceable policies contained in the RPC are the result of a comprehensive review and update of the policies of the State of Maryland Coastal Management Program Document and past program changes. The enforceable policies are based on current legally binding provisions of Maryland law and articulate clear standards for federal consistency determinations and certifications. While Maryland's federal consistency process will continue to be guided by a number of considerations; any objections to a federal action will be based on the enforceable policies proposed in this RPC. Maryland hopes that by clearly articulating its enforceable policies, proponents of an action subject to federal consistency will be encouraged to engage in more meaningful early consultation with CCS.

2011-2015 Strategy Goal: Bay resources and human use analysis

Statewide *GreenPrint* Land Conservation Updated to Reflect Coastal Hazards and Resources
The State of Maryland has been a national leader in land conservation for more than forty years. Through Program Open Space (POS), the State acquires recreation and open space areas for public use. POS administers land conservation funds for open and recreational space through the State real estate transfer tax and from federal programs. Until 2012, the targeting system identifying land conservation priorities did not well incorporate coastal habitat priorities or sea level rise considerations. CCS worked to identify areas across the coastal zone where land conservation would most benefit coastal habitats and resources (through the Blue Infrastructure, or BI) and where land conservation would help the state best adapt to the landward migration of coastal habitats as a result of sea level rise. These efforts resulted in state policies guiding land investment about how and where coastal habitat protection would be most effective and provide long-term climate adaptation benefits. Supporting actions that contributed to this include the following:

In 2013, the BI and Priority Wetland Adaptation Areas were incorporated into *GreenPrint*, the State tool used for land conservation targeting. Wetland adaptation areas are also identified for protection through DNR's Coastal Resilience Conservation Easements, which provide additional buffers and other measures to increase the resilience of coastal habitats and reduce the impacts of hazards resulting from climate change. (http://www.greenprint.maryland.gov/documents/WhyGreenPrintLandsAreImportant.pdf)

Creation of New Easement Protecting Maryland Against Sea Level Rise
During the 2010–2015 strategy period, CCS used Section 309 funds to fund staff that worked to incorporate climate into conservation easements. Through a first-of-its-kind easement designed to protect coastal areas from the impacts of sea level rise and storm surge, the State of Maryland preserved 221 acres in Dorchester

County along the Harriet Tubman Underground Railroad National Historical Park and Scenic Byway. 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, all of which can help natural areas more quickly recover from flooding. CCS staff worked with Program Open Space to develop a Coastal Resilience Easement framework and acquire the State's first easement that was designed to address climate change impacts at the land-water interface.

Local Critical Area Program Updates

Following the completion of the Blue Infrastructure and Coastal Land Conservation and Sea Level Rise Adaptation projects, CCS worked with the Maryland Department of Planning (MDP) to identify mechanisms to increase coastal habitat protection and consideration of these project outcomes at the local level. CCS and MDP worked with 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 Ordinances. This work enabled jurisdictions to bring their ordinances into full compliance with current State law, criteria, and regulations 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

3. ENHANCEMENT AREA ASSESSMENTS

Coastal Zone Management Act §309
Assessment and Strategy
2016-2020

3. ENHANCEMENT AREA ASSESSMENTS

WETLANDS

SECTION 309 ENHANCEMENT OBJECTIVE: *Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands*

Phase I (High-Level) Assessment: *(Must be completed by all states.)*
Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

Pursuant to the Coastal Zone Management Act Section 309 Program Guidance provided by the National Oceanic and Atmospheric Administration's Office for Coastal Management, the following responses are provided to describe the extent, status and trends for Wetlands since the last Assessment.

RESOURCE CHARACTERIZATION:

1. *Using provided reports from NOAA's Land Cover Atlas[3] or high-resolution C-CAP data[4] (Pacific and Caribbean Islands only), please indicate the extent, status, and trends of wetlands in the state's coastal counties.*

Coastal Wetlands Status and Trends[5]		
Current state of wetlands in 2011 (acres)	**823,136.09 acres**	
Percent net change in total wetlands (% gained or lost)*	from 1996-2011	from 2006-2011
	-1.34%	**-0.20%**
Percent net change in freshwater (palustrine wetlands) (% gained or lost)*	from 1996-2011	from 2006-2011
	-1.27%	**-1.02%**
Percent net change in saltwater (estuarine) wetlands (% gained or lost)*	from 1996-2011	from 2006-2011
	-1.16%	**0.39%**

[3] http://www.csc.noaa.gov/ccapatlas/. Summary reports compiling each state's coastal county data are provided on the ftp site.

[4] http://www.csc.noaa.gov/digitalcoast/data/ccaphighres

[5] Maryland data was acquired using NOAA's Land Cover Atlas.

How Wetlands Are Changing		
Land Cover Type	**Area of Wetlands Transformed to Another Type of Land Cover between 1996-2011 (Sq. Miles)**	**Area of Wetlands Transformed to Another Type of Land Cover between 2006-2011 (Sq. Miles)**
Development	3.39	1.09
Agriculture	11.79	1.41
Barren Land	1.25	0.12
Water	3.21	0.60

2. *If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends of coastal wetlands since the last assessment to augment the national data sets.*

NOAA's Land Cover Atlas offers the most recent and high-resolution mapped inventory of Maryland's freshwater and tidal wetlands and therefore was the inventory used for this assessment. In 2010 the Maryland Department of the Environment (MDE) completed an inventory of state-specific land use/land cover via a grant from the U.S. Environmental Protection Agency, but these data are still being analyzed and are not currently available for use.

Wetland maps exist for the entire State of Maryland from the 2010 National Wetlands Inventory and on digital orthophoto quarter quads (DOQQs). These maps are at scales of 1 inch = 2000 feet and 1 inch = 600 feet respectively. There are also hard copy maps of the legal State tidal wetland boundary at 1 inch = 200 feet. While these data are more applicable and have been used for a number of Coastal Management Program planning applications (e.g. Blue Infrastructure, Wetland Adaptation and Nutrient Reduction and Spatial Planning projects) they were not used for this assessment because they are not as up-to-date as NOAA's Land Cover Atlas (2010) and guidance indicated a preference for using this resource.

MANAGEMENT CHARACTERIZATION:

1. *Indicate if there have been any significant changes at the state or territory level (positive or negative) that could impact the future protection, restoration, enhancement, or creation of coastal wetlands since the last assessment.*

Management Category	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	Yes
Wetlands programs (e.g., regulatory, mitigation, restoration, acquisition)	Yes

2. *For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:*

a. *Describe the significance of the changes;*
b. *Specify if they were 309 or other CZM-driven changes; and*
c. *Characterize the outcomes or likely future outcomes of the changes***.**

According to C-CAP data, between 1996 and 2010, the coastal portion of the state of Maryland experienced a net loss in total wetland area of 8,627 acres (or about 13.5 square miles). This equates to a rate of loss of approximately 1%. However, the greatest loss occurred between 1996 and 2006, with a loss of 11,520 acres (or 18 square miles). Conversely, between 2006 and 2010, there was a gain of nearly 3,000 wetland acres, indicating practices and policies implemented in the decade between 1996 and 2006 fostered greater protection of wetland habitats. This slight gain of total wetland acres in recent years corresponds to a decreased rate of loss of 0.2% between the full time period of 1996 to 2010.

The losses between 1996 and 2010 were most dominantly (60%) associated with agricultural activities, which depending upon the practices may or may not result in a permanent conversion. An additional 17% of these losses were attributed to development during this time frame, while a small amount of loss was associated with conversion to bare land (7%). Conversion to open water accounted for 16% of the total loss.

The losses between 2006 and 2010 saw less conversion to agricultural activities (43%) and more loss to development (34%). An additional 4% transformed to barren land. Interestingly, conversion to open water increased between the period from 2006 to 2010, with 19% of the wetlands being lost, presumably due to sea level rise.

Despite the overall net loss of wetland acres, the gain in acres between 2006 and 2010 suggests that the policy initiatives that the State of Maryland implemented during that time period to preserve, protect, and prioritize wetland areas for conservation and investment appear to be meeting the goals.

Since the last assessment, the State of Maryland has continued to move forward a series of policy initiatives that preserve, protect, and prioritize wetland areas for conservation and investment, with particular emphasis on protecting potential wetland migration areas. These changes were largely CZM-driven, facilitated via a 2009-2011 NOAA Coastal Management Fellow's project to target restoration tools and techniques, the *CoastSmart* Community Program, and CZM leadership on the Maryland Commission on Climate Change.

Maryland's Climate Action Plan. As mentioned in the previous assessment and in the summary accomplishments above, in April 2007 Governor Martin O'Malley signed an Executive Order charging the Maryland Commission on Climate Change to develop an action plan to address the causes of climate change and prepare for the likely impacts. The strategies provide the impetus for many state-level activities since the last assessment. Related to the Wetlands Enhancement Area there is a particular emphasis on the protection, restoration and acquisition of wetlands and wetland migration areas. Recent CZM-driven accomplishments relating to wetlands include: passage of the Living Shoreline Protection Act; continued growth of the *CoastSmart* Communities Program; revisions to the State's land acquisition program, *GreenPrint*, to target wetland migration areas in response to sea level rise; and, the designation of Climate Change Impact Areas in PlanMaryland, Maryland's recently adopted State Development Plan. Many of these initiatives were accomplished via 309-supported staff.

Coast Smart Construction Guidelines. On December 27, 2012 a "Coast Smart" Construction Executive Order was issued, enacting a number of policy directives to increase the resilience of the State's investments to sea level rise and coastal flooding. Included in these guidelines are a number of state policy measures relevant particularly to wetlands. For example, one recommended practice is "DNR should take steps to identify and assess key natural features, such as wetlands, vegetated and forested buffers, etc., that protect coastal communities and other built environments and prioritize and target, as appropriate, for conservation and restoration purposes." Also as a result of the Executive Order, on January 2015 the Critical Area Commission State Development Regulations outline new provisions related to climate change and sea level rise vulnerable areas, specifically all state development projects on state lands. The regulations require the preservation, protection, and maintenance of potential wetland migration areas within state-own lands, as well as consideration of the likelihood of inundation by sea level rise. These guidelines will be incorporated into all future CZM-supported *CoastSmart* community initiatives.

Coastal Atlas. CCS has used Section 309 and Section 306 funds to create and improve coastal mapping applications as part of Maryland's Coastal Atlas that includes wetland mapping tools. These tools have been used to evaluate wetland restoration projects, measure wetland change and improve the delivery of wetland data and information to local and federal governments, NGOs, and other project partners. DNR continues to distribute much of its GIS data and maps via free download over the internet. Wetland data are one of the most popular downloads.

Targeted Ecological Areas. From 2009-2011, CCS supported a NOAA Coastal Management Fellow who targeted tools and techniques for sea level rise adaptation and response, such as the Sea Level Affecting Marshes Model (SLAMM)[6]. The purpose of this project was to develop new conservation criteria to identify coastal habitats (e.g. wetlands) that may help Maryland proactively adapt to sea level rise and increased storm events associated with climate change. This modeling was the basis for 2011 updates to Maryland's *GreenPrint* Targeted Ecological Areas (TEAs). Based on CZM guidance, the *GreenPrint* TEAs now include potential wetland migration areas. DNR has used these updated conservation priorities to target Program Open Space land conservation and acquisition projects.

ENHANCEMENT AREA PRIORITIZATION:

1. What level of priority is the enhancement area for the coastal management program?

High	_____
Medium	__X___
Low	____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

[6] The SLAMM model is a basic bathtub simulation based on elevation data that displays potential inundation at 0-2', 2-5' and 5-10' of sea level rise. The inundation breakouts roughly correlate to Maryland's projected inundation rates for years 2050 (0-2') and 2100 (2-5'). The dataset is a derivative of high-resolution topographic data LiDAR (Light Detection And Ranging). The resolution of Maryland's LiDAR is in 2-foot contours, which provides CCS with an estimate of future vulnerable resources.

Although wetlands are a high priority for Maryland, enhancements to wetland management are not a high priority for 309 funds at this time. Numerous partnership efforts between MDE, DNR and the CCS already exist to increase implementation of living shoreline practices and target wetland protection areas and mitigation efforts. Pursuant to a series of State policies focused on building resilience to climate change, CCS will continue to prioritize the protection, restoration, and acquisition of wetland areas that help to buffer impacts of coastal flooding, sea level rise, and storm surge. CCS will continue to identify high priority protection areas; strategically and cost effectively direct protection and restoration actions; and promote and support sustainable shoreline buffer area management practices.

Over the 2015-2016 timeframe, CCS is partnering with The Nature Conservancy to complete a Coastal Resiliency Assessment. Staff are working with state, local, federal, and non-profit stakeholders to identify priority conservation and restoration areas along the land-water interface. This work will identify exiting natural infrastructure with resiliency benefits for coastal communities impacted by climate change. Natural infrastructure may include green and/or blue features such as tidal wetlands and marshes, vegetated buffers, SAV, oyster reefs, Bay islands, beaches and dunes. CCS will use the Assessment results to integrate risk-reduction values into current State restoration and conservation targeting efforts so that wetland conservation and restoration projects are designed and targeted to address coastal resiliency. Therefore, CCS has assigned a medium level of priority to wetlands because while significant progress has been made in some areas, wetlands role in resilience and coastal habitats is still important and is being integrated into other priority enhancement areas.

COASTAL HAZARDS

SECTION 309 ENHANCEMENT OBJECTIVE: *To prevent or significantly reduce threats to life and property by eliminating development and redevelopment in high-hazard areas, managing development in other hazard areas, and anticipating and managing the effects of potential sea level rise and Great Lakes level change*

Phase I (High-Level) Assessment: *(Must be completed by all states.)*
Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

RESOURCE CHARACTERIZATION:

1. **Flooding:** Using data from *NOAA's State of the Coast* "Population in the Floodplain" viewer[7] and summarized by coastal county through NOAA's Coastal County Snapshots for Flood Exposure,[8] indicate how many people were located within the state's coastal floodplain as of 2010 and how that has changed since 2000. You may to use other information or graphs or other visuals to help illustrate.

Population in the Coastal Floodplain			
	2000	**2010**	**Percent Change from 2000-2010**
No. of people in coastal floodplain[9]	233,261	284,477	22%
No. of people in coastal counties[10]	3,593,067	4,148,642	15.5%
Percentage of people in coastal counties in coastal floodplain	6.5%	6.9%	.4%

2. **Shoreline Erosion** (for all states other than Great Lakes and islands; for Great Lakes and islands, see Question 5): Using data from *NOAA's State of the Coast* "Coastal Vulnerability Index,"[11] indicate the vulnerability of the state's shoreline to erosion. You may use other information or graphs or other visuals

[7] http://stateofthecoast.noaa.gov/pop100yr/welcome.html. Note FEMA is in the process of updating the floodplain data. This viewer reflects floodplains as of 2010. If you know the floodplain for your state has been revised since 2010, you can either use data for your new boundary, if available, or include a short narrative acknowledging the floodplain has changed and generally characterizing how it has changed.

[8] www.csc.noaa.gov/digitalcoast/tools/snapshots

[9] To obtain exact population numbers for the coastal floodplain, download the Excel data file on the State of the Coast "Population in the Floodplain" viewer: http://stateofthecoast.noaa.gov/pop100yr/welcome.html. Summary population data for each coastal state is available on the ftp site.

[10] To obtain population numbers for coastal counties, see spreadsheet of coastal population and critical facilities data provided or download directly from http://www.csc.noaa.gov/digitalcoast/data/stics. Summary population data for each coastal state is available on the ftp site.

[11] http://stateofthecoast.noaa.gov/vulnerability/welcome.html (see specifically "Erosion Rate" drop-down on map). The State of the Coast visually displays the data from USGS's Coastal Vulnerability Index.

to help illustrate or replace the table entirely if better data is available. *Note: For New York and Pennsylvania that have both Atlantic and Great Lakes shorelines, fill out the table below for the Atlantic shoreline only.*

*Percentages and miles of shoreline in table are based upon *NOAA's State of the Coast* where Maryland's total shoreline adds up to approximately 1900 miles. The more recognized number for miles of shoreline is 3190.

Vulnerability to Shoreline Erosion		
Vulnerability Ranking	**Miles of Shoreline Vulnerable**[11]	**Percent of Coastline**[12]*
Very low (>2.0m/yr) accretion	757	39%
Low (1.0-2.0 m/yr) accretion)	20	1%
Moderate (-1.0 to 1.0 m/yr) stable	81	4%
High (-1.1 to -2.0 m/yr) erosion	87	4.5%
Very high (<-2.0 m/yr) erosion	985	51%

3. **Sea Level Rise** (for all states other than Great Lakes and islands; for Great Lakes and islands, see Question 5): Using data from *NOAA's State of the Coast* "Coastal Vulnerability Index",[13] indicate the vulnerability of the state's shoreline to sea level rise. You may provide other information or use graphs or other visuals to help illustrate or replace table entirely if better data is available. *Note: For New York and Pennsylvania that have both Atlantic and Great Lakes shorelines, fill out the table below for your Atlantic shoreline only.*

Coastal Vulnerability to Historic Sea Level Rise		
Vulnerability Ranking	**Miles of Shoreline Vulnerable**[11]	**Percent of Coastline**
Very Low	0	0
Low	39	2 %
Moderate	1044	54 %
High	847	43 %
Very High	0	0

4. **Other Coastal Hazards:** In the table below, indicate the general level of risk in the coastal zone for each of the coastal hazards. The state's multi-hazard mitigation plan is a good additional resource to support these responses.

[12] To obtain exact shoreline miles and percent of coastline, mouse over the colored bar for each level of risk or download the Excel data file.

[13] http://stateofthecoast.noaa.gov/vulnerability/welcome.html (see "Vulnerability Index Rating" drop-down on map). The State of the Coast visually displays the data from USGS's Coastal Vulnerability Index.

The responses below were determined primarily through information provided in the Maryland Hazard Mitigation Plan Update (2011). Saltwater intrusion data is not included in the state hazard mitigation plan so supplemental information was taken from the *Comprehensive Strategy for Reducing Maryland Vulnerability to Climate Change* (2008) and from personal communication with John Grace from MDE's Water Supply Program. Supplemental information on land subsidence was gathered from *Updating Maryland's Sea-Level Rise Projections* (2013), *Land Subsidence and Relative Sea-Level Rise in the Southern Chesapeake Bay Region* (2013) by Eggleston and Pope, and from personal communication with John Grace. While land subsidence is detailed in the state hazard mitigation plan, additional information was deemed necessary to document the true threat of the hazard. The state plan uses an equation that takes population and building density data into consideration when determining risk level. Land subsidence and saltwater intrusion pose higher levels of risk to areas of with low population and building density.

Type of Hazard	General Level of Risk[14] (H, M, L)
Flooding (riverine, stormwater)	High
Coastal storms (including storm surge)[15]	Medium high
Geological hazards (e.g., tsunamis, earthquakes)	Low
Shoreline erosion[16]	Medium high
Sea level rise[13,14,15]	Medium high
Great Lake level change[14]	N/A
Land subsidence	High
Saltwater intrusion	High
Other (please specify) Drought/High Wind/Winter Storm Tornado/Wildfire Thunderstorm (lightening and hail)	 Medium high Medium Medium low

5. If available, briefly list and summarize the results of any additional data or reports on the level of risk and vulnerability to coastal hazards within your state since the last assessment. The state's multi-hazard mitigation plan or climate change risk assessment or plan may be a good resource to help respond to this question.

The Maryland State All-Hazard Mitigation Plan Updated was completed in August 2011. The plan highlights all coastal hazards (include events such as: storm surge, tropical storms, Nor'easters), including sea level rise and storms, which pose a threat to Maryland's coastal zone. Overall risk is highest to flooding, coastal storms, sea level rise, and wind and winter storms. Summary hazard data illustrates the impacts of storms from 1950-2010. In those 60 years, coastal hazards accounted for 153 events, $725,247,211 worth of

[14] Risk is defined as "the estimated impact that a hazard would have on people, services, facilities and structures in a community; the likelihood of a hazard event resulting in an adverse condition that causes injury or damage." *Understanding Your Risks: Identifying Hazards and Estimating Losses. FEMA 386-2. August 2001*

[15] In addition to any state- or territory-specific information that may help respond to this question, the U.S. Global Change Research Program has an interactive website that provides key findings from the 2014 National Climate Assessment for each region of the country, including regions for the coasts and oceans, and various sectors. The report includes findings related to coastal storms and sea level rise that may be helpful in determining the general level of risk. See http://nca2014.globalchange.gov/.

[16] See NOAA State of the Coastal Vulnerability to Sea Level Rise Tool (select "Erosion Rate" from drop-down box) http://stateofthecoast.noaa.gov/vulnerability/welcome.html. The State of the Coast visually displays the data from USGS's Coastal Vulnerability Index.

property damage, $995,114 worth of crop damage, and nine deaths. For the specific coastal hazards, from 1993-2010, there was $40,291,512 annualized property damage and $40,346,796 annualized total loss.

This plan describes climate change as a potential 'amplifier' of existing natural hazards such as heat, flood, drought, etc. To determine the risk levels of all hazards, Maryland Emergency Management Agency (MEMA) used the following parameters: population vulnerability, population density, annualized events, deaths and injuries, annualized property damage, and annualized crop damage. Using NOAA NCDC Storm Events and NOAA-NHC SLOSH Model data, seven counties and Baltimore City ranked 'High' for coastal hazard risk; six counties ranked 'medium' for coastal hazard risk. Five counties ranked 'medium-low' for coastal hazard risk. In addition to episodic hazards, shoreline erosion is a critical problem facing Maryland's coastline. As of 2011, approximately 69% of the shoreline is experiencing some degree of erosion.

The State Hazard Mitigation Plan (2011) ranks hazards by incorporating population density and property damage. The following hazard risk ratings are taken directly from the hazards plan. The Eastern Shore of Maryland is at high risk to factors such as sea level rise, nuisance flooding, land subsidence, and winter storms. However, because of lower population and building density, the overall hazard ranking for the Eastern Shore is lower than the Western Shore. Coastal flooding, land subsidence, wind, and winter storms should still be taken into consideration as high priorities for a Coastal Zone Management Program 309 strategy.

For overall risk to coastal hazards, using the equation from the State Hazard Mitigation Plan (2011), the coastal counties that line the western shore of the Chesapeake Bay account for the highest-risk to property damage, population vulnerability, population density, and injuries and death. In addition to other coastal hazards, ASCE wind speeds pose highest risk to the Atlantic Coast and coastal bays habitat in six counties, with the highest risk level in Worcester and Somerset counties. Additionally, landslide poses a high risk to two coastal counties, Prince George's and Anne Arundel. Thunderstorms in general pose a highest threat to coastal counties on the western shore of the Chesapeake and medium to medium-low risk to counties on the eastern shore. While flood hazard includes riverine flooding as well as coastal flooding, coastal counties were rated as some of the most at-risk areas of Maryland. Every county in Maryland is between a medium to high risk ranking for flood hazard. Overall, Maryland's coastal zone is most at-risk to flooding, coastal hazard, winter storm, wind and drought; closely followed by wildfire, thunderstorm, and tornado.

MANAGEMENT CHARACTERIZATION:

1. Indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) have occurred that could impact the CMP's ability to prevent or significantly reduce coastal hazards risk since the last assessment.

Major statutes, regulations, and policy changes from the last 309 Assessment and Strategy include PlanMaryland, Sustainable Communities, and HB615. New modeling programs for sea level rise since the last assessment include updated sea level rise projections completed in summer 2013 by the Climate Change Commission.

Management Category	Employed by State or	CMP Provides Assistance to	Significant Changes Since

	Territory (Y or N)	Locals that Employ (Y or N)	Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these that address:			
elimination of development/redevelopment in high-hazard areas[17]	N	Y	N
management of development/redevelopment in other hazard areas	Y	Y	Y
climate change impacts, including sea level rise or Great Lake level change	Y	Y	Y
Hazards planning programs or initiatives that address:			
hazard mitigation	Y	Y	N
climate change impacts, including sea level rise or Great Lake level change	Y	Y	Y
Hazards mapping or modeling programs or initiatives for:			
sea level rise or Great Lake level change	Y	Y	Y
other hazards	N	N	N

2. Briefly state how "high-hazard areas" are defined in your coastal zone.

'High hazard' areas are defined by a formula in the Maryland All Hazard Mitigation Plan Update with the following parameters and weighting for the following equation:

- Population Vulnerability (PV) (weight .05)
- Population Density (PN) (weight 0.5)
- Deaths (D) (weight 1)
- Injuries (I) (weight 1)
- Annualized Property Damage (PD) (weight 1)
- Annualized Crop Damage (CD) (weight 1)
- Annualized Events (EV) (weight 1)

Jurisdiction Risk (RS) is calculated: RS = (0.5*(PV + PN)) + EV + I + D + PD + CD
Risk Levels:

0 = Low Risk
10 = Medium-Low
13 = Medium
16 = Medium-High

[17] Use state's definition of high-hazard areas.

19 = High

3. For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Since the last report, several significant policy changes have occurred to this enhancement area. Changes were a combination of 309 and other CZM-driven initiatives.

Coast Smart Construction Executive Order & Coast Smart Council. Former Governor Martin O'Malley signed the Climate Change and "Coast Smart" Construction Executive Order in December 2012. The EO enacts a number of policy directives, including directing all State agencies to consider the risk of coastal flooding and sea level rise when they design capital budget projects. House Bill 615 codifies the Coast Smart Council into law and builds on key provisions of the EO. 309-funded CCS staff are a part of the council.

Coast Smart Construction: Infrastructure Siting and Design Guidelines. The report issued in response to directives outlined in the EO above recommends specific siting and design guidelines for State construction projects to protect against the impacts of climate change. The report recommends that Coast Smart practices also be applied to non-state buildings and infrastructure projects if partially or fully funded by the State, as well as projects on state lands. The Coast Smart Construction Working Group, which includes CCS staff, continues to meet to develop specific recommendations for this review process. The outcomes will impact how and where the state invests in vulnerable areas.

Updated Sea Level Rise Projections. A report detailing the best sea level rise estimates for Maryland was issued in June 2013. The report was not CZM-driven, but its conclusions have been integrated into all climate change and coastal hazard planning efforts.

PlanMaryland – Climate Change Impact Areas. Climate Change Impact Areas are included as one of Plan Maryland's Areas of Special Designation and 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. PlanMaryland and Sustainable Communities program will help steer future development away from especially vulnerable areas and award communities for taking additional review of infrastructure and development in vulnerable areas.

FEMA Flood Insurance Rate Map Updates. FEMA is in the process of conducting a major coastal study for Region III that is resulting in updated Flood Insurance Rate Maps (FIRMs). The coastal study is not only resulting in digital FIRMs, but is updating the models and data behind the FIRMs. This study has caused the 1% chance event floodplain to change in many coastal counties. Some counties now have highest risk V-zones where none existed before, while in other cases communities are seeing smaller floodplains. The CZM program is directing efforts to communicate the risks of living and developing in a floodplain. Risks to flooding and sea level rise remain significant to low-lying coastal areas, regardless of the size of the FIRM. The CZM program may partner with other state agencies to communicate the importance of going above

and beyond minimum floodplain management requirements through program such as FEMA's Community Rating System that awards local governments by providing discounts to homeowners on flood insurance premiums.

Amendments to Critical Area Regulations. The Critical Area Commission has revised COMAR 27.02.05 'State Development Actions on State Owned Lands' to address climate change and the risk of sea level rise and other extreme weather-related impacts.

Moving forward, the Coast Smart Construction Working Group continues to meet to develop specific recommendations for this review process. The outcomes will impact how and where the state invests in vulnerable areas.

ENHANCEMENT AREA PRIORITIZATION:

1. What level of priority is the enhancement area for the coastal management program?

High	__X__
Medium	_____
Low	_____

2. Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.

Coastal hazards is a high priority enhancement area because of the high level of risk these events pose to Maryland's coastal communities. Additionally, there is a serious threat that this level of risk will only increase with the changing climate and sea level rise. Maryland's Coastal Zone Management Program is a critical nexus in a state agency network committed to helping Maryland build capacity and resiliency at the local scale, where hazards are most dramatically experienced. The extensive degree of damage from historic episodic hazards, including increases in nuisance flooding, warrant the dedication of time and resources to assist local governments in preparedness efforts.

From stakeholder engagement efforts, such as coastal community exchanges, informal stakeholder conversations, and formal discussions such as the NOAA 312 evaluation, requests come from the ground up for support in coastal hazard planning efforts. Stakeholders include local floodplain managers, environmental planners, land use planners, town administrators, economic development planner, and emergency managers. Stakeholders at the state level include the State Hazard Mitigation Officer, a natural resources planner who is the local liaison for the National Flood Insurance Program Coordinator for the state, other planners at Maryland Department of Planning and the Critical Area Commission, and partners at non-profits who work in the same area, including Eastern Shore Land Conservancy. Local planners regularly ask for information on how to plan for and visualize sea level rise, nuisance flooding, storm surge, stormwater issues, and other related hazards. Local planners are expressing an ever-increasing level of curiosity and concern for how to address these events in the context of not simply floodplain management, but also cultural and historic resources, environmental justice, and other especially vulnerable areas. Planning focus areas not only include the desire for long-term strategic planning, but also for information on

how to impact day-to-day decision making and permitting activities. The latter request requires detailed language to update current codes, plans, and ordinances.

Past storms such as Hurricanes Irene, Lee, Isabelle, and Sandy, along with other extreme weather events such as the derecho in summer 2012, illustrate the vulnerability of Maryland's shores to hazard events. These areas will only become more vulnerable as populations change and grow in coastal urban areas and we continue to feel the impacts of rising sea levels. Maryland's Coastal Zone Management Program is uniquely poised to continue assistance to local government and sister state agencies to further address coastal hazards and prepare for not only the next big storm, but the next nuisance flood.

Coastal hazards is listed as a high priority because of this key feedback from local partners, coupled with the expected increase in intensity and frequency of hazard events. Regardless of how communities talk about the changing climate, whether floodplain management and risk reduction or sea level rise adaptation, there are common themes in information asks of the Coastal Zone Management Program. Dedication of resources and staff to these issues will only become increasingly important for the resiliency and preparedness of Maryland's people, property, heritage, and shores.

Phase II (In-Depth) Assessment:
For any enhancement areas ranked as a high priority after the Phase I assessment, CMPs shall conduct a Phase II (in-depth) assessment using the appropriate Phase II assessment templates provided in Appendix B to further explore potential problems, opportunities for improvement, and specific needs. OCRM recommends CMPs select two to three enhancement areas for more in-depth assessment. However, CMPs should work closely with their OCRM specialist to determine what would be most appropriate for their program given their high priority needs and available resources. CMPs should keep in mind that the high priority needs identified in the Phase II assessment will not only be helpful for informing Section 309 strategies but will be used for other purposes as well. OCRM will rely on the needs identified to inform annual and strategic planning for NOAA's new integrated coastal office and also plans to share CMP high priority needs with other NOAA offices and programs. Therefore, CMPs should be as specific as possible when identifying needs.

IN-DEPTH RESOURCE CHARACTERIZATION:
Purpose: To determine key problems and opportunities to improve the CMP's ability to prevent or significantly reduce coastal hazard risks by eliminating development and redevelopment in high-hazard areas and managing the effects of potential sea level rise and Great Lakes level change.

1a. **Flooding In-depth** (for all states besides territories): Using data from *NOAA's State of the Coast* "Population in the Floodplain" viewer[18] and summarized by coastal county through NOAA's Coastal County Snapshots for Flood Exposure,[19] indicate how many people at potentially elevated risk were located within the state's coastal floodplain as of 2010. These data only reflect two types of vulnerable populations. You can provide additional or alternative information or use graphs or other visuals to help illustrate or replace the table entirely if better data are available. *Note: National data are not available for territories. Territories can omit this question unless they have similar alternative data or include a brief*

[18] http://stateofthecoast.noaa.gov/pop100yr/welcome.html
[19] http://www.csc.noaa.gov/digitalcoast/tools/snapshots

qualitative narrative description as a substitute.

2010 Populations in Coastal Counties at Potentially Elevated Risk to Coastal Flooding[20]				
	Under 5 and Over 65 years old		In Poverty	
	# of people	% Under 5/Over 65	# of people	% in Poverty
Inside Floodplain	60442	21	22893	8
Outside Floodplain	287819	79	286163	92

1b. **Flooding In-depth** (for all states besides territories): Using summary data provided for critical facilities, derived from FEMA's HAZUS[21] and displayed by coastal county through NOAA's Coastal County Snapshots for Flood Exposure,[22] indicate how many different establishments (businesses or employers) and critical facilities are located in the FEMA floodplain. You can provide more information or use graphs or other visuals to help illustrate or replace the table entirely if better information is available.

Critical Facilities in the FEMA Floodplain[44]						
	Schools	Police Stations	Fire Stations	Emergency Centers	Medical Facilities	Communication Towers
Inside Floodplain	34	10	14	0	3	12
Coastal Counties	1581	84	219	4	63	84

2. *Based on the characterization of coastal hazard risk, what are the three most significant coastal hazards[23] within the coastal zone? Also indicate the geographic scope of the hazard, i.e., is it prevalent throughout the coastal zone or are specific areas most at risk?*

	Type of Hazard	Geographic Scope (throughout coastal zone or specific areas most threatened)
Hazard 1	Flooding	Entire CZ with highest risk to Prince George's, Anne Arundel, Baltimore, Baltimore City, Cecil, Kent, Queen Anne's, Talbot, Dorchester, Wicomico, Somerset, and Worcester
Hazard 2	Coastal Storms	Entire CZ. High ranking in all except Calvert Harford (Medium-High ranking) and Caroline (Medium)
Hazard 3	Wind Hazard	Entire CZ. High ranking in Charles, Prince George's, Anne Arundel, Baltimore, Cecil. Medium-High in St. Mary's, Calvert, Harford, Kent, Queen Anne's, Dorchester, Somerset. Medium

20 To obtain exact population numbers for the coastal floodplain, download the excel data file from the State of the Coast's "Population in Floodplain" viewer.

21 http://www.fema.gov/hazus; can also download data from NOAA STICS http://www.csc.noaa.gov/digitalcoast/data/stics. Summary data on critical facilities for each coastal state is available on the ftp site.

22 http://www.csc.noaa.gov/digitalcoast/tools/snapshots

23 See list of coastal hazards at the beginning of this assessment template.

		ranking in Baltimore City, Talbot, Wicomico, Worcester

3. *Briefly explain why these are currently the most significant coastal hazards within the coastal zone. Cite stakeholder input and/or existing reports or studies to support this assessment.*

This information is directly from the Maryland All-Hazard Mitigation Plan Update (2011). The data was developed through the tool Hazus-MH and from a stakeholder engagement process lead by the Maryland Emergency Management Agency (MEMA). While sea level rise is not risk-mapped as the other hazards, it is a significant factor that exacerbates flooding, coastal storms (including storm surge), and shoreline erosion.

4. *Are there emerging issues of concern, but which lack sufficient information to evaluate the level of the potential threat? If so, please list. Include additional lines if needed.*

Emerging Issue	Information Needed
Sea Level Rise	This hazard will exacerbate all existing hazards. More information is needed to prioritize targeted vulnerable areas and to comprehensively develop adaptation strategies.
Shoreline Erosion	Along with SLR, will make the impacts of flooding, storm surge and other hazards more intense and dramatic. Better information is needed to accurately determine the highest rates of erosion and if changes in sea levels, water and winder patterns will alter erosion rates.

IN-DEPTH MANAGEMENT CHARACTERIZATION:

Purpose: To determine the effectiveness of management efforts to address identified problems related to the coastal hazards enhancement objective.

1. *For each coastal hazard management category below, indicate if the approach is employed by the state or territory and if there has been a significant change since the last assessment.*

Management Category	Employed by State/Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Change Since the Last Assessment (Y or N)
Statutes, Regulations, and Policies:			
Shorefront setbacks/no build areas	Y	Y	N
Rolling easements	N	N	N
Repair/rebuilding restrictions	Y	Y	N
Hard shoreline protection structure restrictions	Y	Y	Y
Promotion of alternative shoreline stabilization methodologies (i.e., living shorelines/green	Y	Y	Y

infrastructure)			
Repair/replacement of shore protection structure restrictions	Y	Y	Y
Inlet management	N	N	N
Protection of important natural resources for hazard mitigation benefits (e.g., dunes, wetlands, barrier islands, coral reefs) (other than setbacks/no build areas)	Y	Y	Y
Repetitive flood loss policies (e.g., relocation, buyouts)	N	Y	N
Freeboard requirements	N	Y	Y
Real estate sales disclosure requirements	N	N	N
Restrictions on publicly funded infrastructure	Y	Y	Y
Infrastructure protection (e.g., considering hazards in siting and design)	Y	Y	Y
Other (please specify)			
Management Planning Programs or Initiatives:			
Hazard mitigation plans	Y	Y	N
Sea level rise/Great Lake level change or climate change adaptation plans	Y	Y	Y
Statewide requirement for local post-disaster recovery planning	Y	Y	N
Sediment management plans	Y	N	N
Beach nourishment plans	Y	N	N
Special Area Management Plans (that address hazards issues)	N	Y	N
Managed retreat plans	N	N	N
Other (please specify)			
Research, Mapping, and Education Programs or Initiatives:			
General hazards mapping or modeling	Y	Y	N
Sea level rise mapping or modeling	Y	Y	Y
Hazards monitoring (e.g., erosion rate, shoreline change, high-water marks)	Y	Y	N
Hazards education and outreach	Y	Y	Y
Other (please specify)			

2. *Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the state's management efforts in addressing coastal hazards since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the state's management efforts?*

The best examples of the State's ability to be effective in managing the effects of coastal hazards are listed in the accomplishments sections. These include the dozens of local projects addressing the issue and describing the many changes that have occurred at the state level and that are documented in the Commission on Climate Change reports.

IDENTIFICATION OF PRIORITIES:

1. *Considering changes in coastal hazard risk and coastal hazard management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve its ability to more effectively address the most significant hazard risks. (Approximately 1-3 sentences per management priority.)*

   Management Priority 1: Hazard Preparedness at the Local Level
   Description: Strengthen partnerships with local governments to help initiate change in day-to-day decision making that will further incorporate hazard risk planning.

   Management Priority 2: Increase Resource Protection in Critical Area
   Description: Preserving natural resources in the Critical Area is a key component of maintaining and, in the future, increasing resiliency to coastal hazards.

   Management Priority 3: State and Local Planning Efforts for Development Pressures
   Description: Sea level rise and coastal hazard events are only threats when development and people are impacted. As the climate and development patterns change over time, it is critical to plan accordingly and keep people and investments as safe as possible.

2. *Identify and briefly explain priority needs and information gaps the CMP has for addressing the management priorities identified above. The needs and gaps identified here should not be limited to those items that will be addressed through a Section 309 strategy but should include any items that will be part of a strategy.*

Priority Needs	Need? (Y or N)	Brief Explanation of Need/Gap
Research	Y	Need a better scientific understanding of coastal environments to inform/improve local risk assessments and inform risk reduction strategies
Mapping/GIS/modeling	Y	Need for fine scale inundation data to sufficiently assist local floodplain, land use, and emergency planners
Data and information management	Y	New and updated hazards data will continually become available. Data will have to be carefully managed and integrated into existing or new platforms, such as the MD Coastal Atlas
Training/Capacity building	Y	Training can be used as a way to holistically increase the resiliency of the State by reaching local and state planners
Decision-support tools	Y	Need to educate a wide range of stakeholders, including elected officials, on hazard risk and vulnerability
Communication and outreach	Y	Need to effectively communicate the risks of hazards to coastal communities
Other (Specify)	Y	Address the challenge that low income and otherwise vulnerable communities will likely be disproportionately impacted by climate change

ENHANCEMENT AREA STRATEGY DEVELOPMENT:

1. *Will the CMP develop one or more strategies for this enhancement area?*
   Yes __X__
   No _____

2. *Briefly explain why a strategy will or will not be developed for this enhancement area.*

A strategy will be developed for this hazards enhancement area because of the significant threat hazard events pose to Maryland's coastal communities. There is a need to maintain a comprehensive strategy at the State level to assist local governments in planning for and addressing coastal hazards. There are many stakeholders who are already involved with this discussion at the state level. Each partner comes from a slightly different direction, floodplain management, public works, emergency management, land use planning. Developing a strategy could help develop consistent messaging around these areas. Additionally, a strategy could help identify priority geographic regions for targeting increasing communication and resources.

PUBLIC ACCESS

SECTION 309 ENHANCEMENT OBJECTIVE: *To attain increased opportunities for public access, taking into account current and future public access needs, to coastal areas of recreational, historical, aesthetic, ecological, or cultural values*

Phase I (High-Level) Assessment: *(Must be completed by all states.)*
Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

RESOURCE CHARACTERIZATION:

1. *Use the table below to provide data on public access availability within the coastal zone.*

Public Access Status and Trends			
Type of Access	**Current number**[24]	**Changes or Trends Since Last Assessment**[25] (↑, ↓, –, unkwn)	**Cite data source**
Beach access sites	Maryland's public beaches can be found along the Atlantic Ocean, Chesapeake Bay, and along various rivers and creeks. Beach access sites are not specifically tracked but they are captured under recreational amenities (i.e. swimming beaches) by DNR. See http://dnr2.maryland.gov/publiclands/Pages/activities.aspx?activity=Swimming Maryland's most popular public beaches are found along the Atlantic Coast - Ocean City has 10 miles of	– (Unchanged)	Maryland Manual Maryland Park Service Maryland DNR Public Access, Water Trails and Recreation Planning Program

[24] Be as specific as possible. For example, if you have data on many access sites but know it is not an exhaustive list, note "more than" before the number. If information is unknown, note that and use the narrative section below to provide a brief qualitative description based on the best information available.

[25] If you know specific numbers, please provide. However, if specific numbers are unknown but you know that the general trend was increasing or decreasing or relatively stable or unchanged since the last assessment, note that with a ↑ (increased), ↓ (decreased), – (unchanged). If the trend is completely unknown, simply put "unkwn."

	public beach and Assateague Island has 21 miles.		
Shoreline (other than beach) access sites	The State of Maryland does not maintain a comprehensive list of shoreline access sites (other than beach) since these sites are generally captured under data related to recreational water/boating access and/or fishing access sites.	Unknown	Maryland Park Service Maryland DNR Public Access, Water Trails and Recreation Planning Program Maryland Fisheries Service
Recreational boat (power or nonmotorized) access sites	There are 350 public recreational water/boating access sites in Maryland's Coastal Zone. Detailed information on all recreational water access sites can be viewed on the Maryland Online Water Access Guide at dnr.maryland.gov/boating/boatramps.asp	↑ (Increased) Since the last assessment DNR's Public Access, Water Trails and Recreation Planning Program has added information on non-motorized recreational water/boating access sites (i.e. soft launches) to the statewide database of public water access sites. As databases used to inventory access sites have changed, it is difficult to calculate specific change from the previous assessment.	Maryland DNR Public Access, Water Trails and Recreation Planning Program
Number of designated scenic vistas or overlook points	Throughout Maryland there are also approximately 65 picnic areas and scenic overlooks, minor rest areas, and county operated welcome centers available to the motorist. These facilities are located on the Maryland Official Highway Map, which is available at any welcome center. In addition, there are 12 state designated scenic byways in Maryland's Coastal Zone which provide additional access to scenic	– (Unchanged)	State Highway Administration

	vistas. Detailed information on these areas can be viewed at http://www.roads.maryland.gov/Index.aspx?PageId=250 or http://www.sha.maryland.gov/Index.aspx?PageId=97		
Number of fishing access points (i.e. piers, jetties)	There are 75 fishing access points (i.e. piers and jetties) in Maryland's Coastal Zone. This number does not include sites already counted as recreational boating access sites. Detailed information on Angler Access can be viewed at gisapps.dnr.state.md.us/PublicFishingAccess/index.html	↑ (Increased) - Since the last assessment DNR's Fisheries Service has created a statewide database of fishing access sites and has started to track the location and number of fishing access sites such as piers, jetties, and shoreline fishing areas. As databases used to inventory access sites have changed, it is difficult to calculate specific change from the previous assessment.	Maryland DNR Fisheries Service
Coastal trails/ boardwalks	No. of Trails/ boardwalks Maryland has an extensive statewide network of recreational trails. To date, Maryland has approximately 700 miles of water trails and approximately 820 miles of land trails located in the Coastal Zone. Boardwalks and waterfront promenades can be found throughout Maryland but the State does not specifically track the number of "boardwalks" because they are considered trail components and are captured under the State's recreational land trails data.	↑ (Increased) - Since the last assessment DNR has worked to develop a comprehensive inventory and database of public trails in Maryland. This effort resulted in creation of the Maryland Statewide Recreational Trails Atlas, new trail maps and other trail related products. For more information visit the following web sites: dnr.maryland.gov/land/MD_Trails/Trails_Inventory.asp dnr.maryland.gov/land/MD_Trails/DNR_Trail_News.asp dnr.maryland.gov/land/MD_Trails/DNR_Trail_Maps.asp	Maryland DNR Public Access, Water Trails and Recreation Planning Program Maryland DNR Land Acquisition and Planning

		dnr.maryland.gov/boating/mdwatertrails/	
Number of acres parkland/open space	State DNR Lands: 261,893 AC County & Municipal parkland/open space:105,087 AC	↑ (Increased) State parkland/open space increased by 6,277 AC County & municipal parkland/open space increased by 44,386 AC	DNR's Program Open Space tracking database County/municipal acres self-reported to MDP. *Acreage reporting may differ from past years due to the discontinuance of the MEIRS database.
	Total approximate acres in the coastal zone: 1,142,440 AC		
Other (please specify)			

2. *Briefly characterize the demand for coastal public access and the process for periodically assessing demand. Include a statement on the projected population increase for your coastal counties.[26] There are several additional sources of statewide information that may help inform this response, such as the Statewide Comprehensive Outdoor Recreation Plan,[27] the National Survey on Fishing, Hunting, and Wildlife Associated Recreation,[28] and your state's tourism office.*

26 See NOAA's Coastal Population Report: 1970-2020 (Table 5, pg. 9): http://stateofthecoast.noaa.gov/coastal-population-report.pdf

27 Most states routinely develop "Statewide Comprehensive Outdoor Recreation Plans", or SCROPs, that include an assessment of demand for public recreational opportunities. Although not focused on coastal public access, SCORPs could be useful to get some sense of public outdoor recreation preferences and demand. Download state SCROPs at www.recpro.org/scorps.

28 The National Survey on Fishing, Hunting, and Wildlife Associated Recreation produces state-specific reports on fishing, hunting, and wildlife associated recreational use for each state. While not focused on coastal areas, the reports do include information on saltwater and Great Lakes fishing, and some coastal wildlife viewing that may be informative and compares 2011 data to 2006 and 2001 information to understand how usage has changed. See www.census.gov/prod/www/fishing.html.

Maryland's Land Preservation and Recreation Plan (LPPRP) is prepared every five years to identify essential and contemporary issues impacting outdoor recreation and natural resource protection in Maryland. The Plan is developed using public input gathered through surveys, stakeholder meetings and thorough analysis of national, state and local issues impacting recreation and natural resource conservation.

The current LPPRP (2014 – 2018) helps guide future land conservation and development of outdoor recreation opportunities and builds upon the America's Great Outdoors Initiative to include proactive approaches to address critical issues identified in the planning process.

The LPPRP process is used to assess the existing supply of and demand for outdoor recreational opportunities and establish priorities for land conservation and outdoor recreation. The LPPRP identifies a number of key strategies and findings which concludes that there is high demand for access to water based recreation statewide and recognition that expanded water access is a priority at the federal, state, county, and local levels. The entire LPPRP can be viewed or downloaded at http://www.dnr.state.md.us/land/Stewardship/LPRP_2014-2018.asp

The Maryland Recreational Boating and Infrastructure Plan was initiated to assess statewide recreational boating facility needs and to help create a strategic response to various state and federal grant programs that fund boating access and to help target funding to projects that best meet user needs and ensure compatibility with the state's stewardship of natural resources. The plan resulted in a strategy to meet the infrastructure and capital needs of the recreational boating industry in Maryland while addressing the goals of various programs to restore waterways.

A survey used to develop the plan indicated that in more urbanized areas of Maryland such as the Baltimore Inner Harbor, Annapolis, and Anne Arundel County – public access was more limited, but there was also higher demand. In comparison, Maryland's Eastern Shore counties have a greater number of public access sites and, in general, this area has adequate public water access relative to the population and demand in the area.

In jurisdictions that are in the Maryland Coastal Zone, opportunities for creating additional access are limited or very limited. This is representative of the fact that a number of areas have limitations due to the presence of sensitive species and habitats, as well as the fact that many of the existing state land use areas already have existing public and shoreline access points. The full Maryland Recreational Boating Infrastructure Plan can be viewed or downloaded at http://dnr.maryland.gov/boating/studies_reports_plans.asp

In addition, in 2011 DNR produced Waterway Improvement Capital Programs, Benefits, Needs and Opportunities: A Response to the 2011 Joint Chairman's Report. This report outlines strategies for stabilizing and enhancing funds used to implement public water access projects in the state and provides a summary of new funding policies related to the Waterway Improvement Program that were implemented by the Department in 2011. This report can also be viewed at the web site noted above.

The Maryland Department of Planning has completed a set of projections for total and household populations thru 2040. This data indicates a general increase in populations for counties in the coastal zone. A detailed chart of this information can be viewed *at http://planning.maryland.gov/msdc/popproj/TotalPopProj.pdf*

3. *If available, briefly list and summarize the results of any additional data or reports on the status or trends for coastal public access since the last assessment.*

MANAGEMENT CHARACTERIZATION:

1. *Indicate if the approach is employed by the state or territory and if there have been any significant state- or territory-level management changes (positive or negative) that could impact the future provision of public access to coastal areas of recreational, historical, aesthetic, ecological, or cultural value.*

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	Y	Y
Operation/maintenance of existing facilities	Y	N	N
Acquisition/enhancement programs	Y	Y	Y

2. *For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:*
    a. *Describe the significance of the changes;*
    b. *Specify if they were 309 or other CZM-driven changes; and*
    c. *Characterize the outcomes or likely future outcomes of the changes.*

Public Access, Water Trails, and Recreation Planning (PAWT) Program. This program works with project partners (including state, local and federal governments, as well as boating and marine related interests) to plan, develop and promote public water access sites and water trails that provide water-based recreation opportunities for people to enjoy. This change was not driven by 309, however the PAWT Coordinator is supported in part with CZM funding and the program has been enhanced since the last assessment, assuming a larger role in CCS. The PAWT Program:

- Coordinates statewide planning and development of public water access and water trails, and promotes coastal stewardship, place-based access, and sustainable industry opportunities along Maryland's coast and inland waterways.
- Establishes and identifies Maryland's public waterway access infrastructure, tracks progress on goals and objectives related to public access, and implements projects that result in improved access to waterways.
- Provides technical and design assistance for the development of maps, guides, and other information that highlights and interprets water-based recreation areas.

- Informs access planning, economic development initiatives; and shoreline improvement for recreational and/or commercial uses through stakeholder engagement and by incorporating coastal hazard considerations into recreational and water access projects.

Improving Water Access. House Bill 797 (Transportation Projects – Transportation Facilities – Water Access, 2013), requires the Maryland Department of Transportation (MDOT) to consult with DNR when considering any reasonable and appropriate measures to provide or improve non-motorized water access for certain activities when developing a construction improvement project that is adjacent to or crosses a waterway. MDOT and DNR are required to develop guidelines, best management practices and cost effective strategies that could to accommodate certain water access. Since no additional funding was provided with this statute state and local agencies are expected to utilize existing resources. This change was not driven by 309 or other CZM changes, but outcomes related to this change will impact the CZM program, including:

- Increased collaboration and coordination requirement between MDOT and DNR regarding review, planning and implementation of certain non-motorized water access projects;
- Increased workload for MDOT, DNR, and local government staff to provide coordination, attend required workgroup meetings, develop recommendations and guidelines, conduct environmental reviews, ensure designs respond to both transportation and recreation needs, ensure timely response to stakeholder groups, and provide for adequate public input; and
- Potential increase in identification of water access sites for certain non-motorized uses.

3. *Indicate if your state or territory has a publicly available public access guide. How current is the publication and how frequently it is updated?*[29]

Public Access Guide	Printed	Online	Mobile App
State or territory has? (Y or N)	YES – Printed versions of the Chesapeake Bay Public Access Guide and various water trails maps are available by request and electronic versions can be viewed or downloaded from the web site listed below	YES	YES – Public water access sites are available through the DNR mobile app (Access DNR)
Web address (if applicable)	http://dnr.maryland.gov/boating/mdwatertrails/	http://dnr.maryland.gov/boating/boatramps.asp	http://dnr2.maryland.gov/Pages/dnrapp.aspx
Date of last update	Varies by publication	updated on a regular	unknown

[29] Note some states may have regional or local guides in addition to state public access guides. Unless you want to list all local guides as well, there is no need to list additional guides beyond the state access guide. However, you may choose to note that the local guides do exist and may provide additional information that expands upon the state guides.

		basis	
Frequency of update	As needed	Daily	Daily

ENHANCEMENT AREA PRIORITIZATION:

1. *What level of priority is the enhancement area for the coastal management program?*

High _____
Medium __X__
Low _____

2. *Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.*

Promoting public access to the shoreline and coastal zone and expanding opportunities for outdoor recreation is a CCS goal. While public access is a high priority in Maryland, there exist a number of robust programs that address this enhancement area with whom CCS already partners. Ongoing activities by the Maryland DNR Boating Services, Program Open Space, Fisheries Service; Maryland CCS; the Chesapeake Bay Program; the Maryland Coastal Bays Program; the National Parks Service; and local governments create public access opportunities through land acquisition, boating and fishing access, water trail development, and CZMA Section 306A construction and acquisition projects.

CCS will continue to partner with many of these groups to identify opportunities to increase or enhance public access opportunities. CCS will continue to support public access stewardship and creation opportunities each year through a limited number of CZMA Section 306A projects, support of communication efforts, and incorporate public access priorities in CMSP spatial planning efforts. CCS will assist in enhancing public access by identifying areas that would achieve multiple human use and resource benefits and facilitate compatible water uses. While a strategy will not be developed solely for this enhancement area, CCS will include public access as a component of an overarching *Coastal and Ocean Resources and Uses s*trategy to further identify and coordinate public access projects and work to maintain water-dependent use access.

MARINE DEBRIS

SECTION 309 ENHANCEMENT OBJECTIVE: *Reducing marine debris entering the Nation's coastal and ocean environment by managing uses and activities that contribute to the entry of such debris.*

Phase I (High-Level) Assessment: *(Must be completed by all states.)*
Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

RESOURCE CHARACTERIZATION:

1. *In the table below, characterize the existing status and trends of marine debris in the state's coastal zone based on the best available data.*

Source of Marine Debris	Existing Status and Trends of Marine Debris in Coastal Zone		
	Significance of Source (H, M, L, unknown)	**Type of Impact**[30] (aesthetic, resource damage, user conflicts, other)	**Change Since Last Assessment** (H, M, L, unknown)
Land-based			
Beach/shore litter	M	Aesthetic, animal and habitat impacts	Increase
Dumping	Unknown	Aesthetic, animal and habitat impacts	Unknown
Storm drains and runoff	H	Aesthetic, animal and habitat impacts	Increase
Fishing (e.g., fishing line, gear)	L	Aesthetic, animal and habitat impacts	Slight increase
Other (please specify)			
Ocean or Great Lake-based			
Fishing (e.g., derelict fishing gear)	H	Aesthetic, animal and habitat impacts	Slight increase
Derelict vessels	L	User conflicts	Unknown
Vessel-based (e.g., cruise ship, cargo ship, general vessel)	H	Aesthetic, animal and habitat impacts, resource damage	Unknown
Hurricane/Storm	M	Resource damage, user conflicts, animal and habitat impacts	Unknown
Tsunami	L	Resource damage, user	Unknown

[30] You can select more than one, if applicable.

		conflicts, animal and habitat impacts	
Other (please specify)			

2. *If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends or potential impacts from marine debris in the coastal zone since the last assessment.*

Overall, 63.2% of all items collected in Region 2 were from land based sources, 30.1% were from general sources, and 6.7% were from ocean based sources. Four of the five most collected items were from land based sources (Figure 1).

Figure 1: Top 5 Items Collected in Region 2

Type	Total Counted	Percentage
Straws	41,015	39.40%
Plastic bottles: beverage	14,382	13.80%
Plastic bags with seam < 1 meter	8,076	7.70%
Balloons	8,050	7.70%
Cotton swabs	6,177	5.90%
Tampon applicators	4,633	4.40%
Metal beverage cans	3,672	3.50%
Rope > 1 meter	2,578	2.50%
Plastic bottles: food	2,543	2.40%
Other plastic bottles	2,284	2.20%
Straps: Open	1,836	1.80%
Fishing Line	1,738	1.70%
Plastic bags with seam > 1 meter	1,567	1.50%

National Marine Debris Survey 2007

Recent exploration of offshore Canyons by NOAA has shown that there are significant amounts of marine debris in these fragile ecosystems. Many of these findings are of land based debris in the cold water corals found there.

MANAGEMENT CHARACTERIZATION:

1. *Indicate if the approach is employed by the state or territory and if there have been any significant state- or territory-level management changes (positive or negative) for how marine debris is managed in the coastal zone.*

Management Category	Employed by State/Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)

Marine debris statutes, regulations, policies, or case law interpreting these	N	N	N
Marine debris removal programs	Y	N	N

2. *For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:*
    a. *Describe the significance of the changes;*
    b. *Specify if they were 309 or other CZM-driven changes; and*
    c. *Characterize the outcomes and likely future outcomes of the changes.*

No direct changes to practices have occurred in Maryland since the last assessment. Maryland continues to have an Abandoned Boat and Debris Removal Program in place funded through boater registration, but this is neither 309 nor CZM-driven. There have also been ancillary improvements to marine debris removal through stormwater projects that are ongoing in the state, but these projects are not CZM-driven or funded. Maryland has participated in marine debris coordination efforts through the Trash Free Waters initiatives and NOAA's efforts to address regional marine debris management.

ENHANCEMENT AREA PRIORITIZATION:

1. *What level of priority is the enhancement area for the coastal management program?*

High _____
Medium __X__
Low _____

2. *Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.*

Two of the nations three TMDL's for trash, the Baltimore Harbor and the Anacostia River, flow into the Chesapeake Bay and to the Atlantic. The large population that lives in the Mid-Atlantic region creates a large land based source of marine debris, which has been increasing as of the last national Marine Debris Monitoring survey in 2007. As the population in Maryland and the rest of the Mid-Atlantic continues to grow, this source will continue to become more of an issue for wildlife, aesthetics, tourism, and as a vector for chemical pollution entering our marine ecosystems.

This issue has come up during public listening sessions for the Mid Atlantic Regional Council on the Ocean, which is attended by commercial and recreational fishing groups, environmentalists, developers, government representatives from all levels. Largest concern has come as to the effect of marine debris on fishing, marine animals, and tourism.

Maryland has a number of existing programs in place to meet marine debris reduction needs. Ongoing efforts that involve partnerships with DNR's Clean Marina and Boating programs and local jurisdictions to address marine debris concerns will help to address needs of this enhancement area. This enhancement area is not considered to be a high priority. Identified needs to address gaps in marine debris management will be addressed through existing programs and CCS will continue to partner with other programs to support marine debris reduction efforts.

CUMULATIVE AND SECONDARY IMPACTS

SECTION 309 ENHANCEMENT OBJECTIVE: *Development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources.*

Phase I (High-Level) Assessment: *(Must be completed by all states.)*
Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

RESOURCE CHARACTERIZATION:

1. Using National Ocean Economics Program Data on population and housing,[31] please indicate the change in population and housing units in the state's coastal counties between 2012 and 2007. You may wish to add additional trend comparisons to look at longer time horizons as well (data available back to 1970), but at a minimum, please show change over the most recent five year period (2012-2007) to approximate current assessment period.

Trends in Coastal Population and Housing Units				
Year	**Population**		**Housing**	
	Total (# of people)	% Change (compared to 2007)	Total (# of housing units)	% Change (compared to 2007)
2007	3,772,603	+3.92%	1,592,272	+2.85%
2012	3,920,579		1,637,633	

2. Using provided reports from NOAA's Land Cover Atlas[32] or high-resolution C-CAP data[33] (Pacific and Caribbean Islands only), please indicate the status and trends for various land uses in the state's coastal counties between 2006 and 2011. You may use other information and include graphs and figures, as appropriate, to help illustrate the information. Note that the data available for the islands may be for a different time frame than the time periods reflected below. In that case, please specify the time period the data represents. Also note that Puerto Rico and the Commonwealth of the Northern Mariana Islands (CNMI) currently only have data for one time point so will not be able to report trend data. Instead, Puerto Rico and CNMI should just report current land use cover for developed areas and impervious surfaces.

31 www.oceaneconomics.org/. Enter "Population and Housing" section. From drop-down boxes, select your state, and "all counties." Select the year (2012) and the year to compare it to (2007). Then select "coastal zone counties." Finally, be sure to check the "include density" box under the "Other Options" section.
32 www.csc.noaa.gov/ccapatlas/. Summary data on land use trends for each coastal state is available on the ftp site.
33 www.csc.noaa.gov/digitalcoast/data/ccaphighres. Summary data on land use trends for each coastal state is available on the ftp site.

Distribution of Land Cover Types in Coastal Counties		
Land Cover Type	**Land Area Coverage in 2010 (Sq. Miles)**	**Gain/Loss Since 2006 (Sq. Miles)**
Developed, High Intensity	222.38	7.51
Developed, Low Intensity	469.34	6.84
Developed, Open Space	306.09	1.95
Grassland	51.54	2.59
Scrub/Shrub	206.43	10.84
Barren Land	32.58	0.55
Open Water	2584.22	0.07
Agriculture	2072.70	-6.35
Forested	1745.84	-27.98
Woody Wetland	898.67	0.19
Emergent Wetland	355.27	3.73

3. Using provided reports from NOAA's Land Cover Atlas[34] or high-resolution C-CAP data[35] (Pacific and Caribbean Islands only), please indicate the status and trends for developed areas in the state's coastal counties between 2006 and 2011 in the two tables below. You may use other information and include graphs and figures, as appropriate, to help illustrate the information. Note that the data available for the islands may be for a different time frame than the time periods reflected below. In that case, please specify the time period the data represents. Also note that Puerto Rico and CNMI currently only have data for one time point so will not be able to report trend data. Unless Puerto Rico and CNMI have similar trend data to report on changes in land use type, they should just report current land use cover for developed areas and impervious surfaces.

Development Status and Trends for Coastal Counties			
	2006	**2011**	**Percent Net Change**
Percent land area developed	14.40	14.59	+0.19
Percent impervious surface area	5.09	5.18	+0.09

How Land Use Is Changing in Coastal Counties	
Land Cover Type	**Areas Lost to Development Between 2006-2010** (Acres)
Barren Land	889.6
Emergent Wetland	147.2
Woody Wetland	454.4
Open Water	166.4

34 www.csc.noaa.gov/ccapatlas/. Summary data on land use trends for each coastal state is available on the ftp site.

35 www.csc.noaa.gov/digitalcoast/data/ccaphighres. Summary data on land use trends for each coastal state is available on the ftp site.

Agriculture	4057.6
Scrub/Shrub	518.4
Grassland	761.6
Forested	6342.4

4. Using data from NOAA's State of the Coast "Shoreline Type" viewer,[36] indicate the percent of shoreline that falls into each shoreline type.[37] You may provide other information or use graphs or other visuals to help illustrate.

Shoreline Types	
Surveyed Shoreline Type	**Percent of Shoreline**
Armored	15%
Beaches	9%
Flats	12%
Rocky	2%
Vegetated	62%

5. If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the cumulative and secondary impacts of coastal growth and development, such as water quality and habitat fragmentation, since the last assessment to augment the national data sets.

There are no additional state-specific data or reports on the cumulative and secondary impacts of coastal growth and development, though many other agencies and entities have reports and data that address or summarize changing land uses and land cover in Maryland.

MANAGEMENT CHARACTERIZATION:

1. Indicate if the approach is employed by the state or territory and if there have been any significant state-level changes (positive or negative) in the development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources, since the last assessment.

Management Category	**Employed by State or Territory** (Y or N)	**CMP Provides Assistance to Locals that Employ** (Y or N)	**Significant Changes Since Last Assessment** (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	Y	Y

[36] http://stateofthecoast.noaa.gov/shoreline/welcome.html

[37] Note: Data are from NOAA's Environmental Sensitivity Index (ESI) Maps. Data from each state was collected in different years and some data may be over ten years old now. However, it can still provide a useful reference point absent more recent statewide data. Feel free to use more recent state data, if available, in place of ESI map data. Use a footnote to convey data's age and source (if other than ESI maps).

Guidance documents	Y	Y	Y
Management plans (including SAMPs)	Y	Y	N

2. *For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:*
    a. *Describe the significance of the changes;*
    b. *Specify if they were 309 or other CZM-driven changes; and*
    c. *Characterize the outcomes or likely future outcomes of the changes.*

Maryland Sustainable Growth Commission. Established by the Maryland General Assembly in 2010, the Sustainable Growth Commission makes recommendations on growth and development issues and celebrates smart growth achievements with an annual awards program. The commission operates under a specific statutory charge and is not 309- or CZM-driven. By studying current land use policies and their impact on growth, the Commission:

- Identifies regional growth and development issues for the Governor's Smart Growth Subcabinet;
- Recommends ways to collaborate on planning between state agencies and local governments and coordinate growth and development among jurisdictions;
- Reviews statewide efforts to implement the state growth plan, PlanMaryland, and the state plans for transportation and housing;
- Advises on the local impacts of state policies and laws, such as the 2012 Septic Law, the Chesapeake Bay TMDL Watershed Implementation Plan (WIP), and stormwater management requirements.

Maryland Phase II Watershed Implementation Plan. This is the second phase of the EPA required statewide Watershed Implementation Plans (WIPs). WIPs are the first phase of a major initiative to create a road map and accountability framework that will lead to the restoration of the Chesapeake Bay and clean local streams. Maryland's Phase I WIP, completed in December 2010, allocates allowable loads of nitrogen, phosphorus and sediment among different sources and identifies statewide strategies for reducing the levels of these pollutants that are impairing the Chesapeake Bay. Phase II is intended to provide more geographic detail to the implementation. This effort is CMP supported.

Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change, Phase II. Maryland's Climate Action Plan includes two land use adaptation strategies to guide state-level adaptation planning efforts. The first strategy, released in 2008, addresses the impacts associated with sea-level rise and coastal storms. The second strategy, released in 2011, addresses changes in precipitation patterns and increased temperature and the likely impacts to human health, land uses like agriculture and forest, water resources, population growth and infrastructure. MDP works with partner state agencies, including DNR and MDE, to determine how to help local governments plan for the impacts of climate change on Maryland cities, infrastructure and natural resources to reduce the vulnerability of residents, the economy and natural resources. This is in part CZM driven.

Sustainable Growth & Agricultural Preservation Act (SB 236). This 2012 law promotes greater accountability and predictability of development by establishing four tiers of growth – those areas which will be served by public sewer and those employing on-site waste disposal, or septic, systems. Local

jurisdictions are encouraged to map those areas. Residents in a community will know where their county or municipality is planning for major and minor subdivisions on septic. The Act represents a promise of the State to be a good steward of its rural, forested, resource and agricultural lands. It also renews the State's commitment to promote growth in areas that are planned for it and have the infrastructure in place for it.

Chesapeake Bay Agreement. In 2014, the Maryland Department of Planning (MDP) worked with state and federal agencies across the watershed, including DNR-CCS, to develop the amended Chesapeake Bay Agreement, which articulates the actions necessary to advance bay clean-up by 2025. Former Governor Martin O'Malley, 2014 chair of the Chesapeake Executive Council, joined the governors of Virginia, Delaware and Pennsylvania as well as the Washington, D.C. mayor and the U.S. EPA administrator in signing the agreement in Annapolis on June 16, 2014. The council committed to a new set of goals that will advance restoration and protection of the bay, its tributaries and the lands that surround the Chesapeake Bay. It responds to our changing climate and aims to maintain healthy watersheds, conserve land, foster stewardship, and improve environmental literacy. Relevant to the Cumulative and Secondary Impacts Enhancement Area, the agreement also includes several provisions that address land use issues, essential to ensure progress is not erased by land development and population growth. Since the 1983 agreement was signed, much of the Chesapeake Bay restoration efforts have been reactive to wasteful land development practices that increased pollution to the bay. The new agreement is proactive and calls for smart growth to reduce the loss of farms and ensure more people are served by top-of-the-line wastewater treatment plants.

Maryland Working Waterfronts Initiative. This initiative is a CZM 309 driven change. It is a new program implemented by Maryland's CZMP and Department of Natural Resources. The program aims to preserve and enhance working waterfronts throughout the state while balancing competing uses including coastal development, business, tourism and recreation. Technical assistance and/or grant funding is available for local planning/zoning assistance, purchased development rights/easements, infrastructure, and coordination with other state and local economic development programs. Through the Maryland Working Waterfronts Initiative, CCS staff will facilitate planning and implementation for working waterfront preservation and enhancement through federal-state-local networking and the release of Working Waterfront Enhancement Grants. Grants may address topics such as comprehensive planning, infrastructure financing, cultural and heritage protection, economic analysis and development, and natural resource restoration and protection. CCS seeks to integrate broader natural infrastructure and *CoastSmart* planning topics into the Working Waterfronts Initiative to ensure State resources are invested for long-term economic, cultural, and natural benefits.

ENHANCEMENT AREA PRIORITIZATION:

1. *What level of priority is the enhancement area for the coastal management program?*

High	_____
Medium	__X___
Low	_____

2. *Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.*

Many of the cumulative and secondary impacts that CCS is working to advance relate to land use, partnerships with local governments and impacts to coastal and ocean resources. While increasing growth and development throughout Maryland's coastal zone are of concern, CCS is working to address some of the landscape issues of most concern through other strategies. Therefore, this enhancement area is ranked medium.

SPECIAL AREA MANAGEMENT PLANNING

SECTION 309 ENHANCEMENT OBJECTIVE: *Preparing and implementing special area management plans for important coastal areas. The Coastal Zone Management Act (CZMA) defines a Special Area Management Plan (SAMP) as "a comprehensive plan providing for natural resource protection and reasonable coastal-dependent economic growth containing a detailed and comprehensive statement of policies; standards and criteria to guide public and private uses of lands and waters; and mechanisms for timely implementation in specific geographic areas within the coastal zone. In addition, SAMPs provide for increased specificity in protecting natural resources, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas, including those areas likely to be affected by land subsidence, sea level rise, or fluctuating water levels of the Great Lakes, and improved predictability in governmental decision making."*

Phase I (High-Level) Assessment: *(Must be completed by all states and territories.)*
Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

RESOURCE CHARACTERIZATION:

1. *In the table below, identify geographic areas in the coastal zone subject to use conflicts that may be able to be addressed through a special area management plan (SAMP). This can include areas that are already covered by a SAMP but where new issues or conflicts have emerged that are not addressed through the current SAMP.*

Geographic Area	Opportunities for New or Updated Special Area Management Plans
	Major conflicts/issues
Maryland's Coastal Bays	Large seasonal populations and extensive development in a relatively small area create a risk to the Coastal Bays region . The Coastal Bays Program has a comprehensive management plan with resource management and coordination actions and it was recently updated.
Atlantic Ocean	Emerging uses of ocean space (e.g. offshore wind energy development) will challenge planning and management efforts along Maryland's Atlantic coast and ocean waters to evaluate compatible uses and allocate space.
Mallows Bay, Charles County	DNR, Charles County, and numerous other partners are working on the nomination of Mallows Bay as the newest National Marine Sanctuary. Mallows Bay is situated 30 miles from Washington D.C. along the tidal Lower Potomac River off the Nanjemoy Peninsula of Charles County, Maryland. This shallow embayment, and the

	waters immediately adjacent, boasts the largest assemblage of shipwrecks in the Western Hemisphere, known as the "Ghost Fleet" of Mallows Bay. Mallows Bay is home to a diverse ecosystem whose synergy with the shipwrecks attracts recreational fishing and the beginnings of an ecotourism industry. Recreational use conflicts may arise during the nomination process, e.g. between kayakers and powerboat users, waterfowl hunting and non-consumptive recreation such as birding. Any uses that would potentially damage Mallow Bay's historic resources would present a conflict with NMS designation efforts.
Choptank River Complex	The Choptank River Complex was selected as one of the latest Habitat Focus Area under NOAA's Habitat Blueprint. Continued human population growth and land development threaten key habitats for fish and aquatic resources. The historical loss of wetlands in the upper Choptank River subwatershed is estimated to be 47,400 acres—approximately 11 percent of the total watershed area. Climate change and sea level rise, combined with land subsidence, further threaten losses of nearshore marshes and coastal environments. While the rivers and Bay have supported major annual seafood harvests in previous years, fishery resources are at risk. Native oysters in the Chesapeake Bay have declined dramatically over the past century due to overfishing, habitat loss (including poor water quality), and disease. Their populations are estimated to be less than one percent of historic levels. As filter feeders, oysters help clean the water; they grow in reefs that provide needed habitat for many Bay species.
Future Coastal Resilience Easement Properties	Through a Coastal Resilience Easement, designed to protect coastal areas from the impacts of sea level rise and storm surge, the State of Maryland preserved 221 acres in Dorchester County along the Harriet Tubman Underground Railroad National Historical Park and Scenic Byway. A new element under Program Open Space, 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 — all of which can help natural areas more quickly recover from flooding. The Lake Property features sensitive and important forests, farmlands and wetlands and includes habitat for the endangered Delmarva Fox Squirrel and Forest Interior Dwelling birds.
Smith Island, Somerset County	Over the past century, Maryland has seen approximately one foot of relative sea level rise and the disappearance of 13 bay islands. Smith Island, Maryland's lone offshore island in the Chesapeake Bay, lies twelve miles west of Crisfield and is accessible only by boat. The five mile by three mile island is comprised of three

	communities (Ewell, Rhodes Point, and Tylerton) with a total combined 2010 Census population of 276 people. According to scientists, from 1849 to 1987, Smith Island's acreage shrank from 11,033 acres to 7,825 acres, or by about 30 percent. A University of Maryland Center for Environmental Science report predicts seas will rise up to another 2.1 feet by 2050 around the Bay. The vast majority of the Bay's island group is less than 3 feet above sea level. On top of struggles with erosion and increasing threats from coastal hazards such as SLR and flooding, the island is struggling to enhance and grow its economy, attract more visitors, and stabilize its declining population.

2. *If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends of SAMPs since the last assessment.*

Maryland has not pursued new federally-designated SAMPs in the last few assessments. Although the list of geographic areas subject to use conflicts has grown in the last five years, Maryland has favored other mechanisms to assess the risks to and increase protections of critical coastal areas (e.g. Chesapeake and Atlantic Coastal Bays Critical Areas Law).

Progress continues to be made in Maryland's Atlantic coastal bays watershed since the Maryland Coastal Bays Program (MCBP) became a National Estuary Program in 1995. The MCBP Comprehensive Conservation and Management Plan (CCMP) – perhaps the closest example of a SAMP that Maryland currently has in place – was approved by U.S. EPA in October, 1999 and since that time the 500 + actions prescribed in the Plan are being implemented through a network of local, state, and federal program partners. By September 2004, 53.4% of the CCMP had been implemented. In 2009, 63%, and as of 2011, 78% of the CCMP had been implemented to some degree. As the program moved through the last year of scheduled implementation in 2014, the tracking and evaluation committee used this information to draft a second CCMP for years 2015-2025. The new CCMP was approved in August 2014. It has two phases (Phase I to be completed by 2019 and Phase II to be completed by 2025).

The State of Maryland also has a number of methods with which to assess the risks to and increase protections of critical coastal areas. The mechanism with the most far-reaching impact is the Chesapeake and Atlantic Coastal Bays Critical Areas Law, passed in 1984 and updated in 2008. This requires the 16 counties, Baltimore City, and 44 municipalities surrounding the Chesapeake and Atlantic Coastal Bays to implement a land use and resource management program designed to mitigate the damaging impact of water pollution and loss of natural habitat, while also accommodating the jurisdiction's future growth. The Critical Area Act recognizes that the land immediately surrounding the Bays and their tributaries has the greatest potential to affect water quality and wildlife habitat and thus designated all lands within 1,000 feet of tidal waters or adjacent tidal wetlands as the "Critical Area." Efforts that led to the 2008 update of the Critical Areas Act were in part CZM-driven (§306 and §309) as a direct result of recommendations made in the 2007 CZM-led *Interim Report to the Governor and Maryland General Assembly: Climate Action Plan*.

MANAGEMENT CHARACTERIZATION:

1. *Indicate if the approach is employed by the state or territory and if there have been any significant state- or territory-level management changes (positive or negative) that could help prepare and implement SAMPs in the coastal zone.*

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
SAMP policies, or case law interpreting these	N	N	N
SAMP plans	N	N	N

2. *For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:*
   a. *Describe the significance of the changes;*
   b. *Specify if they were 309 or other CZM-driven changes; and*
   c. *Characterize the outcomes or likely future outcomes of the changes.*

Maryland has not pursued new federally-designated SAMPs in the last few assessments and there have not been any significant changes that would help prepare and implement SAMPs in Maryland's coastal zone.

ENHANCEMENT AREA PRIORITIZATION:

1. *What level of priority is the enhancement area for the coastal management program?*

High _____
Medium _____
Low __X__

2. *Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.*

Progress is well underway to achieve MCBP goals and implement the CCMP. Legislative changes have occurred to increase resource protection in the Critical Area, which includes the Coastal Bays and the Choptank River Complex. CCS working with partners to achieve National Marine Sanctuary designation for Mallows Bay and is heavily engaged in MARCO and regional efforts to evaluate compatible natural resource and human uses off Maryland's Atlantic coast. While SAMPs can be an effective tool to address use conflicts, the need for regulatory support, marine spatial planning, and continuous data collection and resource monitoring is widespread throughout the coastal zone as opposed to a specific geographic area. Therefore, CCS does not plan to develop a strategy for this enhancement area.

OCEAN / GREAT LAKES RESOURCES

SECTION 309 ENHANCEMENT OBJECTIVE: *Planning for the use of ocean resources. For the purposes of Maryland's assessment on Ocean/Great Lakes Resources, characterizations, gaps, and management needs reflect Atlantic Ocean as well as Chesapeake and Atlantic Coastal Bays resources.*

Phase I (High-Level) Assessment: *(Must be completed by all states and territories.)*
Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

RESOURCE CHARACTERIZATION:

1. *Understanding the ocean and Great Lakes economy can help improve management of the resources it depends on. Using Economics: National Ocean Watch (ENOW),[38] indicate the status of the ocean and Great Lakes economy as of 2010, as well as the change since 2005, in the tables below. Include graphs and figures, as appropriate, to help illustrate the information. Note ENOW data are not available for the territories. The territories can provide alternative data, if available, or a general narrative, to capture the value of their ocean economy.*

Status of Ocean and Great Lakes Economy for Coastal Counties (2010)				
	Establishments (# of Establishments)	**Employment** (# of Jobs)	**Wages** (Millions of Dollars)	**GDP** (Millions of Dollars)
Living Resources	173	1,382	$41.7 Million	$116.1 Million
Marine Construction	144	1,508	$77.2 Million	$133.6 Million
Marine Transportation	371	19,977	$1.6 Billion	$3.5 Billion
Offshore Mineral Extraction	48	421	$22.3 Million	$60.4 Million
Tourism & Recreation	3,797	60,703	$1.1 Billion	$2.6 Billion
All Ocean Sectors[39]	4,580	84,489	$2.9 Billion	$6.5 Billion

[38] www.csc.noaa.gov/enow/explorer/. If you select any coastal county for your state, you receive a table comparing county data to state coastal county, regional, and national information. Use the state column for your responses.

[39] Using ENOW, the "all ocean sectors" also includes also ship and boat building in addition to the other specific industries listed in the table.

Change in Ocean and Great Lakes Economy for Coastal Counties (2005-2010)				
	Establishments (% change)	**Employment** (% change)	**Wages** (% change)	**GDP** (% change)
Living Resources	- 7%	- 35%	- 25%	- 19%
Marine Construction	- 10%	- 3%	33%	33%
Marine Transportation	50%	8%	23%	94%
Offshore Mineral Extraction	- 28%	- 27%	- 23%	- 25%
Tourism & Recreation	9%	< 1%	10%	24%
All Ocean Sectors	9%	- 4%	16%	51%

2. *In the table below, characterize how the threats to and use conflicts over ocean and Great Lakes resources in the state's or territory's coastal zone have changed since the last assessment.*

Significant Changes to Ocean and Great Lakes Resources and Uses	
Resource/Use	**Change in the Threat to the Resource or Use Conflict Since Last Assessment** (↑, ↓, –, unkwn)
Resource	
Benthic habitat (including coral reefs)	Increasing somewhat
Living marine resources (fish, shellfish, marine mammals, birds, etc.)	Increasing somewhat
Sand/gravel	Largely unchanged
Cultural/historic	Largely unchanged
Other (please specify)	
Use	
Transportation/navigation	Increasing dialogue regarding changes relevant to offshore

	energy development
Offshore development[40]	Increasing dialogue regarding changes relevant to offshore energy development
Energy production	Increasing dialogue regarding changes relevant to offshore energy development
Fishing (commercial and recreational)	Largely unchanged
Recreation/tourism	Increasing somewhat
Sand/gravel extraction	Largely unchanged, some discussion about potential change with emerging energy development
Dredge disposal	Largely unchanged
Aquaculture	Largely unchanged
Other (please specify)	

3. *For the ocean and Great Lakes resources and uses in Table 2 (above) that had an increase in threat to the resource or increased use conflict in the state's or territory's coastal zone since the last assessment, characterize the major contributors to that increase.*

Major Contributors to an Increase in Threat or Use Conflict to Ocean and Great Lakes Resources												
Resource	**Major Reasons Contributing to Increased Resource Threat or Use Conflict** (Note All that Apply with "X")											
	Land-based development	Offshore development	Polluted runoff	Invasive species	Fishing (Comm & Rec)	Aquaculture	Recreation	Marine Transportation	Dredging	Sand/Mineral Extraction	Ocean Acidification	Other (Specify - SLR)
Benthic habitat (including corals)	X	X	X	X	X				X	X	X	
Living marine resources (fish, shellfish, marine mammals, birds, etc.)	X	X	X	X	X					X	X	

[40] Offshore development includes underwater cables and pipelines, although any infrastructure specifically associated with the energy industry should be captured under the "energy production" category.

Underwater archaeological resources		X	X									X

4. *If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends of ocean and Great Lakes resources or threats to those resources since the last assessment to augment the national data sets.*

Since the last assessment, there has been a lot of focus on understanding resources and uses, as well as their interactions, through environmental studies and user mapping efforts. In particular, as noted in the accomplishments section, seven Ocean studies are underway through a partnership with MEA to help the state understand ocean resources so that they may be better considered in ocean energy decision making. Work is still underway on many of these research efforts, so reports and data are not yet finalized.

Related to understanding of resource use, CCS has hosted several participatory GIS (pGIS) meetings to map out recreational uses of geographic areas. The intent of this data collection effort is to understand how, when and where coastal areas are used for recreation to facilitate compatible uses and inform coastal decision making. The data results from the Atlantic Ocean and Choptank River pGIS sessions can be found on the Coastal Atlas.
http://gisapps.dnr.state.md.us/coastalatlas/iMap-master/basicviewer/index.html

MANAGEMENT CHARACTERIZATION:

1. *Indicate if the approach is employed by the state or territory and if any significant state- or territory-level changes (positive or negative) in the management of ocean and Great Lakes resources have occurred since the last assessment?*

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	Y	Y
Regional comprehensive ocean/Great Lakes management plans	Y	N	Y
State comprehensive ocean/Great Lakes management plans	N	N	N
Single-sector management plans	Y	Y	N

2. *For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:*

a. *Describe the significance of the changes;*
b. *Specify if they were 309 or other CZM-driven changes; and*
c. *Characterize the outcomes or likely future outcomes of the changes.*

Routine Program Change. In 2010, Maryland submitted a Routine Program Change (RPC) for an updated set of enforceable coastal policies reflective of current statutes, regulations and policies currently in place. Following that, on May 8, 2013 the State of Maryland and the Department of Defense (DoD) entered into a first-of-its-kind agreement to work together to protect and enhance Maryland's coastal resources, in a signing at the U.S. Naval Academy in Annapolis. The Memorandum of Understanding (MOU) outlines how DoD facilities and projects will meet the federal law requirements of the Coastal Zone Management Act to ensure that their actions affecting these resources are consistent with State policies. Additionally, as noted in other assessment sections, there have been updates related to offshore energy and other coastal resource management categories. These represent a significant change since the last assessment. At the local level, the CZMP provides assistance to locals on coastal resource management, especially as it relates to land conservation and Critical Area regulations. This work expanded significantly since the last assessment. Both the State and local work were 309- and other CZM-driven changes. The outcomes of this work has and will update the way that Maryland reviews project permit applications and proposed activities in Maryland's coastal zone and adjoining waters.

Regional Partnerships. Since the last assessment, there has been a lot of activity relating to regional ocean management planning, specifically through the Mid-Atlantic Regional Planning Body. A description of this work can be found at: http://www.boem.gov/mid-atlantic-regional-planning-body/
Some of this work was accomplished through 309- and other CZM-driven support. The outcomes of are anticipated to help target research and data collection, synchronize permit and lease coordination, and help address regional resource and use needs and strategies (e.g. sediment management, navigation).

3. *Indicate if your state or territory has a comprehensive ocean or Great Lakes management plan.*

Comprehensive Ocean/Great Lakes Management Plan	State Plan	Regional Plan
Completed plan (Y/N) (If yes, specify year completed)	N	N
Under development (Y/N)	N	Y
Web address (if available)	http://dnr.maryland.gov/ccs/	http://www.boem.gov/mid-atlantic-regional-planning-body/
Area covered by plan	N/A	Mid-Atlantic

ENHANCEMENT AREA PRIORITIZATION:

1. *What level of priority is the enhancement area for the coastal management program?*

High __X___
Medium _____
Low _____

2. *Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.*

   Increasing uses of our coastal and ocean environments, along with resource management changes are challenging the CCS to dedicate more focus to this enhancement area. Since the last assessment, ocean uses, stakeholder engagement and partnerships have increased dramatically. A broad range of stakeholders have been engaged on this issue - ranging from recreational users to local and regional partners to local businesses to resource managers. As a result, this enhancement area is being given a high level of priority.

Phase II (In-Depth) Assessment:
For any enhancement areas ranked as a high priority after the Phase I assessment, CMPs shall conduct a Phase II (in-depth) assessment using the appropriate Phase II assessment templates provided in Appendix B to further explore potential problems, opportunities for improvement, and specific needs. OCRM recommends CMPs select two to three enhancement areas for more in-depth assessment. However, CMPs should work closely with their OCRM specialist to determine what would be most appropriate for their program given their high priority needs and available resources. CMPs should keep in mind that the high priority needs identified in the Phase II assessment will not only be helpful for informing Section 309 strategies but will be used for other purposes as well. OCRM will rely on the needs identified to inform annual and strategic planning for NOAA's new integrated coastal office and also plans to share CMP high priority needs with other NOAA offices and programs. Therefore, CMPs should be as specific as possible when identifying needs.

IN-DEPTH RESOURCE CHARACTERIZATION:
Purpose: To determine key problems and opportunities to enhance the state CMP to better address cumulative and secondary impacts of coastal growth and development.

1. *What are the three most significant existing or emerging stressors or threats to ocean and Great Lakes resources within the coastal zone? Indicate the geographic scope of the stressor, i.e., is it prevalent throughout the coastal zone or are specific areas most threatened? Stressors can be land-based development; offshore development (including pipelines, cables); offshore energy production; polluted runoff; invasive species; fishing (commercial and/or recreational); aquaculture; recreation; marine transportation; dredging; sand or mineral extraction; ocean acidification; or other (please specify). When selecting significant stressors, also consider how climate change may exacerbate each stressor.*

	Stressor/Threat	**Geographic Scope** (throughout coastal zone or specific areas most threatened)
Stressor 1	Increased number of uses (including energy, recreation, aquaculture, etc.)	Throughout coastal zone waters, current focus on Atlantic ocean. Specifically in the ocean, the stressors are a result of a cumulative combination of all uses – existing and emerging – that is currently being driven by emerging energy uses. Offshore wind is emerging 10 miles offshore

		and other energy-related activities may be occurring in various areas off the coast. These changes are bringing into focus the number of uses and users that could potentially overlap as the ocean landscape changes.
Stressor 2	Cumulative effects of land and habitat change and loss/development	Coastal zone – primarily referring to Bay-related habitat changes.
Stressor 3	Loss or physical alteration of habitats	Coastal zone – primarily referring to Bay-related landscapes such as various coastal habitat lands (e.g. wetlands, forests, agriculture) and associated changes that occur as a result of land use changes or coastal hazards (e.g. erosion). In the ocean, the loss or physical alteration of habitats would be related to sand resources, or changes to bottom environment due to energy development.

2. *Briefly explain why these are currently the most significant stressors or threats to ocean and Great Lakes resources within the coastal zone. Cite stakeholder input and/or existing reports or studies to support this assessment.*

These three stressors represent combinations of those listed above. In each case the stressors are not due to a singular issue, rather, they are a result of a cumulative combination of stressors or changes. For instance, in bay-side environments cumulative effects of land and habitat change may be due to development or land use changes across a large landscape. In the ocean environment, the cumulative effects may be due to changes in energy development, maritime commerce and shipping, fishing, etc. While some impacts are seen locally, the cumulative effects of changes in impervious surface and land use quality result in degraded water quality elsewhere.

3. *Are there emerging issues of concern, but which lack sufficient information to evaluate the level of the potential threat? If so, please list. Include additional lines if needed.*

Emerging Issue	Information Needed
Ocean acidification, climate impacts	Several items were identified in a Task Force report: http://mddnr.chesapeakebay.net/mdoatf/documents/MDOATF_report_20150109.pdf

IN-DEPTH MANAGEMENT CHARACTERIZATION:

Purpose: To determine the effectiveness of management efforts to address identified problems related to the ocean and Great Lakes resources enhancement objective.

1. *For each of the additional ocean and Great Lakes resources management categories below that were not already discussed as part of the Phase I assessment, indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) have occurred since the last assessment.*

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Ocean and Great Lakes research, assessment, monitoring	Y	N	Y
Ocean and Great Lakes GIS mapping/database	Y	N	Y
Ocean and Great Lakes technical assistance, education, and outreach	Y	Y	N
Other (please specify)			

2. *For management categories with significant changes since the last assessment, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information.*
    a. *Describe significant changes since the last assessment;*
    b. *Specify if they were 309 or other CZM-driven changes; and*
    c. *Characterize the outcomes or likely future outcomes of the changes.*

Ocean studies and coordination. As noted in the accomplishments and Phase 1 assessment, Maryland has invested significantly over the past five years in ocean studies to understand resources and uses to inform planning and decision making. This is a direct result of CZM-driven changes. The likely outcomes of this work is more informed decision making, policy recommendations, and siting of ocean projects.

Coastal Atlas and MARCO Portal. Over the past five years, the CCS has driven work to advance collection of ocean data pertaining to resources and uses. These efforts were both 309 and 306 funded, along with other leveraged funds. Much of the data collected or compiled was also translated to the Mid-Atlantic MARCO data portal for use in regional ocean planning. On the estuarine side, CCS was also active in mapping resource data that included wetland migration areas, priority conservation areas, oyster and other benthic habitats, and working waterfronts. Each of these efforts is likely to result in improved coordination, enhanced support for water-dependent uses, and facilitation of compatible uses of our coastal and ocean environments.

3. *Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the state's or territory's management efforts in planning for the use of ocean and Great Lakes resources since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the state's or territory's management efforts?*

IDENTIFICATION OF PRIORITIES:

1. *Considering changes in threats to ocean and Great Lakes resources and management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve its ability to effectively plan for the use of ocean and Great Lakes resources. (Approximately 1-3 sentences per management priority.)*

Management Priority 1: Enhanced ocean coordination

Description: Since the last assessment, interest in the Mid-Atlantic ocean has increased dramatically due in part to an emerging number of offshore energy issues - namely, renewable wind energy development, transmission and oil and gas - and interest in understanding ocean resources and uses. Enhanced coordination is needed to ensure all partners are working together effectively.

Management Priority 2: Enhanced place-based resource planning

Description: Since the last assessment, there have been a number of changes in understanding the unique uses and needs of coastal resources at specific locations or centered around particular issues. For instance, there has been a focus on community-driven initiatives at Mallows Bay and increased focus on the resource-based issue of working waterfronts.

2. *Identify and briefly explain priority needs and information gaps the CMP has to help it address the management priorities identified above. The needs and gaps identified here do not need to be limited to those items that will be addressed through a Section 309 strategy but should include any items that will be part of a strategy.*

Priority Needs	Need? (Y or N)	Brief Explanation of Need/Gap
Research	Y	More information and research is always a need to support decision making
Mapping/GIS	Y	CCS relies upon mapping and GIS in many instances. This is an ongoing need and data and GIS are delivered through the Coastal Atlas and other portals
Data and information management	Y	There is a need to be able to improve how resource, use and management data will be used and applied to coastal decision making
Training/Capacity building	Y	Both training and capacity building is needed to ensure that not only CCS, but other entities responsible for coastal and ocean resource management, are well prepared for intensifying and emerging coastal and ocean uses

Decision-support tools	N	There are a number of decision-support tools that exist or that are being updated that will assist in meeting the needs identified above. No new tools are needed, rather, there will be work to enhance or utilize what exists.
Communication and outreach	Y	There is a need to continue and improve communication and outreach about coastal and ocean resources to build community engagement on the issue
Other (Specify)		

ENHANCEMENT AREA STRATEGY DEVELOPMENT:

1. *Will the CMP develop one or more strategies for this enhancement area?*
   Yes __X___
   No _____

2. *Briefly explain why a strategy will or will not be developed for this enhancement area.*

As noted in the Phase I assessment, increasing uses of our coastal and ocean environments, along with changes in resources and management approaches are challenging CCS to dedicate more focus to coastal and ocean issues. Since the last assessment, ocean uses, stakeholder engagement and partnerships have increased dramatically and continue to evolve to meet intensifying and emerging uses of and changes to our coastal and ocean environments. Focus is needed to ensure that our management, partnerships, and policies reflect current challenges and meet resource gaps and needs.

ENERGY & GOVERNMENT FACILITY SITING

SECTION 309 ENHANCEMENT OBJECTIVES: *Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities and Government facilities and energy-related activities and Government activities which may be of greater than local significance.*

Phase I (High-Level) Assessment: *(Must be completed by all states and territories.)*
Purpose: To quickly determine whether the enhancement area is a high priority enhancement objective for the CMP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the CMP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.

RESOURCE CHARACTERIZATION:

1. *In the table below, characterize the status and trends of different types of energy facilities and activities in the state's or territory's coastal zone based on best available data. If available, identify the approximate number of facilities by type. The MarineCadastre.gov may be helpful in locating many types of energy facilities in the coastal zone.*

Status and Trends in Energy Facilities and Activities in the Coastal Zone				
Type of Energy Facility/Activity	**Exists in CZ**		**Proposed in CZ**	
	(# or Y/N)	Change Since Last Assessment (↑, ↓, –, unkwn)	(# or Y/N)	Change Since Last Assessment (↑, ↓, –, unkwn)
Energy Transport				
Pipelines[41]	Y	↑	Y	↑
Electrical grid (transmission cables)	Y	↑	Y	↑
Ports	Y	↑	Y	↑
Liquid natural gas (LNG)[42]	Y	↑	Y	↑
Other (please specify)				
Energy Facilities				
Oil and gas	Y	–	Y	↑
Coal	N	–	N	_
Nuclear[43]	Y	↑	Y	–
Wind	Y	↑	Y	↑
Wave[44]	N	–	N	–

41 For approved pipelines (1997-present): www.ferc.gov/industries/gas/indus-act/pipelines/approved-projects.asp

42 For approved FERC jurisdictional LNG import/export terminals: www.ferc.gov/industries/gas/indus-act/lng/exist-term.asp

43 The Nuclear Regulatory Commission provides a coarse national map of where nuclear power reactors are located as well as a list that reflects there general locations: www.nrc.gov/reactors/operating/map-power-reactors.html

44 For FERC hydrokinetic projects: www.ferc.gov/industries/hydropower/gen-info/licensing/hydrokinetics.asp

Tidal[36]	N	_	N	_
Current (ocean, lake, river)[36]	N	_	N	_
Hydropower	Y	_	N	–
Ocean thermal energy conversion	N	_	N	_
Solar	Y	↑	N	–
Biomass	Y	↑	N	–
Other (please specify)				

2. *If available, briefly list and summarize the results of any additional state- or territory-specific information, data, or reports on the status and trends for energy facilities and activities of greater than local significance in the coastal zone since the last assessment.*

The Maryland Power Plant Research Program (PPRP) was established in 1971 to ensure demands for electric power are met while simultaneously protecting the State's natural resources. In 2014 PPRP published a Fact Book summarizing the current information on power generation in the State. This Fact Book was used to inform the forthcoming summaries on the status and trends of energy facilities and activities in Maryland's coastal zone.

3. *Briefly characterize the existing status and trends for federal government facilities and activities of greater than local significance[45] in the state's coastal zone since the last assessment.*

Energy Facilities. Coal is the primary fuel used to generate electricity in Maryland, with nuclear power being the second-largest generation source. Maryland's coal-fired power plants typically supply about half of the state's annual electricity generation, while power from the state's only nuclear plant—the dual-unit Calvert Cliffs facility—typically supplies about one-third of annual generation. Much of the remaining generation is supplied by natural-gas-fueled plants, hydropower plants, and other renewable resources.

Several major pipelines from the Gulf Coast region supply natural gas to Maryland markets. Maryland generates a larger portion of its electricity from coal and nuclear fuel than the United States as a whole. This is expected to change in the coming years as older coal-fired generators are retired and new natural gas-fired generators come online.

There are four main types of renewable energy resources in use in Maryland: wind, biomass, solar, and hydropower. Approximately 1,150 MW of generation capacity in Maryland comes from these resources, with hydroelectric accounting for the largest share. In 2004, Maryland's State Legislature established the Maryland Renewable Energy Portfolio Standard (RPS), requires that 20 percent of Maryland's Electricity be generated from renewable energy sources by 2022. The RPS has been amended numerous times over the past decade; the most recent significant legislation affecting the RPS was passed in 2013 to include offshore wind energy, described in further detail under the Management Characterization below.

[45] The CMP should make its own assessment of what Government facilities may be considered "greater than local significance" in its coastal zone, but these facilities could include military installations or a significant federal government complex. An individual federal building may not rise to a level worthy of discussion here beyond a very cursory (if any at all) mention).

Maryland's RPS also calls for 2 percent of renewable energy to come from solar energy. In order to achieve that goal, Former Governor O'Malley signed RPS – Solar Energy (SB 277) into law. This bill, which was a part of Former Governor O'Malley's 2010 Energy Agenda, increases the percentage requirements of the RPS that must be purchased from Tier 1 solar energy sources each year between 2011 and 2017. This will result in more residential and commercial solar installations in those years. As of late 2013, there were more than 5,400 in-state solar projects representing more than 150 MW of generating capacity in the state. Based on expected electricity consumption in 2020, about 1,150 MW of solar capacity is required to be operational in Maryland to meet the 2020 solar requirement, meaning that Maryland's solar generation must grow by about 30% per year.

Energy Transport. There are 13 electric distribution utilities in the State of Maryland that serve about 2.5 million electricity customer accounts. There are more than 2,000 miles of transmission lines operating at voltages between 115-kV and 500-kV. Under Maryland regulations, an electric company that is planning to construct a transmission line greater than 69 kilovolts (kV) in Maryland must receive a Certificate of Public Convenience and Necessity (CPCN) from the Maryland Public Service Commission (PSC) prior to the start of construction. The PSC considers impacts on Maryland's resources (e.g., land use impacts) and requires a thorough environmental and socioeconomic impact evaluation as part of the CPCN approval process for transmission projects in Maryland.

PJM Interconnection (PJM) is the Federal Energy Regulatory Commission (FERC) regulated regional transmission organization (RTO) that dispatches and coordinates the flow of bulk power across the District of Columbia and all or parts of the following 13 states: Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia. PJM routinely examines proposed transmission projects to determine if they are economically justified and would produce an overall system benefit. Authorized transmission upgrades to improve system reliability could potentially alleviate congestion costs in Maryland. PJM's 2013 Regional Transmission Expansion Plan authorized 10 transmission upgrades for Maryland and the District of Columbia, costing approximately $179.2 million. Also, Edison Electric Institute highlighted six ongoing transmission upgrades within Maryland totaling approximately $469 million. According to the Public Service Commission of Maryland's Ten-Year Plan (2014-2023) of Electric Companies in Maryland, there are 45 identified transmission enhancements accounting for more than 239 miles of upgrades.

Notable Projects in Maryland's Coastal Zone

Conowingo Hydroelectric Project Relicensing. In August 2012, Exelon Corporation (Exelon) applied for renewal of its license to operate the Conowingo Hydroelectric Project, which lies within the coastal zone. The current license was due to expire in September 2014, but this license was extended to September 2015 pending negotiations between Exelon, Maryland and other stakeholders. Since its construction in 1928, Conowingo dam has been trapping sediment, nitrogen, and phosphorus pollution in the reservoir behind the structure. For several years, the State of Maryland has worked with Exelon and FERC to identify issues that should be addressed in the relicensing of the facility, including addressing the sediment build-up behind the dam. Exelon officially filed its relicensing application with FERC on August 31, 2012. While the regulatory process plays out, the dam continues to operate under temporary "annual licenses", which restrict operation to the terms of conditions of the old license. Before Exelon can be granted a new long-

term license by FERC, Exelon must first secure the required Section 401 Water Quality Certification from the State and FERC must then issue a Final Environmental Impact Statement.

Dominion Cove Point Expansion Project. During this assessment period, Dominion Cove Point (DCP) located in Calvert County, Maryland submitted an application to allow Liquefied Natural Gas (LNG) export from its existing facility. The PSC reviewed the project due to its addition of a 130-megawatt generating station for onsite usage. Among other permits required for this project, DCP also submitted to the FERC an application to export LNG in April 2013. After completing their environmental assessment of this project, FERC granted authorization on September 29, 2014 and will result in the first LNG export facility on the east coast and the fourth to be approved by FERC. Construction began on October 30, 2014 with a proposed completion date of 2017. Construction costs are estimated at 3.8 billion dollars. Once completed, an estimated 5.75 million metric tons of liquefied natural gas may be annually exported.

Geological & Geophysical Surveys to Assess Oil & Gas Resources. In February 2014 the Bureau of Ocean Energy Management (BOEM), in cooperation with NOAA's National Marine Fisheries Service (NOAA Fisheries), and pursuant to the National Environmental Policy Act (NEPA), released a final Programmatic Environmental Impact Statement (PEIS) that evaluated potential environmental effects of proposed geological and geophysical (G&G) survey activities on the Mid- and South Atlantic Outer Continental Shelf (OCS). Following the issuance of a PEIS and formal Record of Decision, the Obama Administration approved the use of G&G surveys on the Mid- and South Atlantic Coast on July 24, 2014. Following this announcement, nine companies filed for permits to conduct G&G surveys along the Atlantic coast from the Delaware Bay to just south of Cape Canaveral and from the inner edge of Federal waters along that coastline to 403 miles offshore.

In response to these permit applications, Maryland and other affected coastal states requested from NOAA the right to review these BOEM permit application as unlisted activities under the Federal Consistency provision of the Coastal Zone Management Act. NOAA granted Maryland and other States this review authority primarily with respect to coastal impacts on commercial and recreational fishing. Following this decision, CZM staff has been communicating with G&G survey firms to help them construct their Coastal Consistency Certification. These Certifications will serve as the framework for reviewing G&G surveys to ensure that they are conducted in manner that prevents and minimizes coastal impacts and coastal use conflicts. As of late May 2015, Maryland conditionally concurred with Spectrum Geo and GXT. Maryland requested NOAA to remove its review request for CGG since the firm removed its proposed survey grid offshore Maryland. Maryland is expected to conditionally concur with the fourth G & G survey firm TGS by June 20, 2015.

MANAGEMENT CHARACTERIZATION:

1. *Indicate if the approach is employed by the state or territory and if significant state- or territory-level changes (positive or negative) that could facilitate or impede energy and government facility siting and activities have occurred since the last assessment.*

Management Category	**Employed by State or Territory** (Y or N)	**CMP Provides Assistance to Locals that Employ**	**Significant Changes Since Last Assessment** (Y or N)

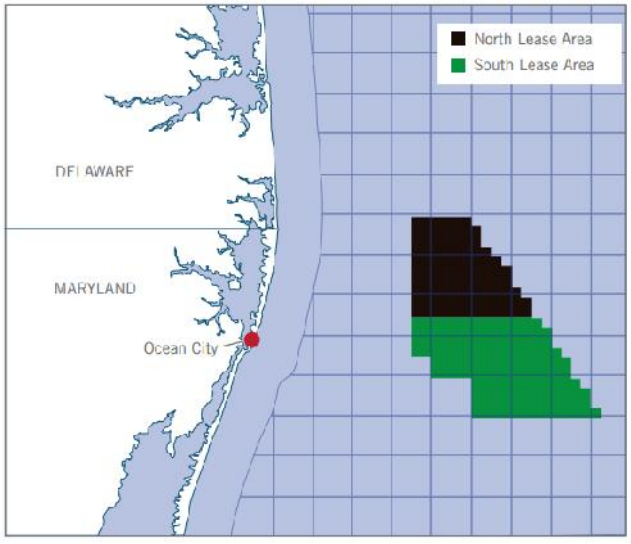
		(Y or N)	
Statutes, regulations, policies, or case law interpreting these	Y	Y	Y
State comprehensive siting plans or procedures	Y	Y	Y

2. *For any management categories with significant changes, briefly provide the information below. If this information is provided under another enhancement area or section of the document, please provide a reference to the other section rather than duplicate the information:*
    a. *Describe the significance of the changes;*
    b. *Specify if they were 309 or other CZM-driven changes; and*
    c. *Characterize the outcomes or likely future outcomes of the changes.*

Maryland Offshore Wine Energy Act of 2013. The most significant change to Maryland's energy activities since the last Assessment has been the development of offshore wind energy. The Maryland Offshore Wind Energy Act of 2013 created a mechanism to incentivize the development of up to 500 MW of offshore wind capacity, at least 10 nautical miles off of Maryland's coast. The Act creates a "carve-out" for energy derived from offshore wind within the state RPS. The carve-out requires that a portion of state electricity sales must come from offshore wind power facilities beginning in 2017 and for every following year.

BOEM held a lease sale on August 19, 2014 for the Wind Energy Area identified off Maryland's coast. The WEA shown in Figure 2 covers approximately 80,000 acres and is located about 10 nautical miles off the coast of Ocean City, Maryland. BOEM auctioned the Maryland WEA as two leases—referred to as the North Lease Area (32,737 acres) and the South Lease Area (46,970 acres). US Wind Inc. was the provisional winner of both leases and on December 1, 2014, the commercial wind energy leases went into effect. Though, as of May 2015 no development has taken place.

Figure 2: Maryland Wind Energy Lease Areas. Source: BOEM.



ENHANCEMENT AREA PRIORITIZATION:

1. *What level of priority is the enhancement area for the coastal management program?*

High	_____
Medium	__X__
Low	_____

2. *Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.*

Energy and Government Facility Siting continues to be a priority to Maryland's coastal management program because of the importance of providing safe and reliable energy to our coastal residents and stakeholders while still protecting out natural resources. In light of the offshore wind energy lease sale and the recent interest in oil and gas resources on the Mid-Atlantic Outer Continental Shelf (OCS) the CZMP will continue to work to safeguard the natural resources that fall within our management jurisdiction, and work to find management solutions to those activities that may have reasonably foreseeable impacts on our coastal economy and resources.

AQUACULTURE

SECTION 309 ENHANCEMENT OBJECTIVE: Adoption of procedures and policies to evaluate and facilitate the siting of public and private aquaculture facilities in the coastal zone, which will enable States to formulate, administer, and implement strategic plans for marine aquaculture

Phase I (High-Level) Assessment:

Pursuant to Coastal Zone Management Act Section 309 Program Guidance provided by the National Oceanic and Atmospheric Administration's Office of Ocean and Coastal Resource Management, the following responses are provided to describe the extent, status, and trends for Aquaculture since the last Assessment.

RESOURCE CHARACTERIZATION:

The majority of aquaculture activities in Maryland involve shellfish and are defined as "those activities which include the purchase, monitoring, bottom preparation, planting, sale, possession, harvest, production, breeding, transportation, and processing of shellfish in State waters on or in an area used for shellfish cultivation." Although shellfish aquaculture remains dominant, the following table displays the status and trends of all State aquaculture activities.

Type of Facility/Activity	Status and Trends of Aquaculture Facilities and Activities		
	# of Facilities	Approximate Economic Value	Change Since Last Assessment
Submerged Land Leases	As of December 2014, the State has issued 265 leases, encompassing about 3,788 acres in the Chesapeake and Coastal Bays.	Comprehensive statistics will be available in 2015. The USDA/NASS 2013 Aquaculture Census documented $6,158,293 in total aquaculture sales.	The number of shellfish leases has decreased since the last assessment due to a new policy established under 2009 legislation, which required the return or termination of inactive leases.
Water Column Leases	As of December 2014, the State has issued 53 leases, encompassing about 205 acres in the Chesapeake and Coastal Bays.	See above.	Water column leases are new to the State and provide the leaseholder rights to grow oysters from bottom to surface waters.
Aquaculture permits (includes freshwater, indoor facilities, structures in public waters, and state lands)	~ 85 permits have been issued. Of these permits, 35 Shellfish Nursery Permits were issued to growers raising shellfish seed for planting on their leases or for sale to other leaseholders; 50 permits were issued to non-shellfish facilities raising turtles, shrimp, tilapia, barramundi, corals,	See above.	Increase.

	ornamental fish and aquatic plants; and a few permits were issued to educational facilities.		
Aquaculture Enterprise Zones (AEZs)	2 AEZs of about 176 acres were established prior to restructuring of Maryland's lease laws in 2009. These areas were pre-approved by DNR and identified through regulation as submerged bottom land available for Shellfish Aquaculture. They were created to streamline the permitting process.	N/A	AEZ number and size has remained constant, but the AEZ framework is no longer needed. Maryland's AEZs were established to address the restrictions on leasing that existed prior to the 2009 lease law updates. Since passage of the new laws, the need for AEZs has been dramatically reduced.
Other			

1. *If available, briefly list and summarize the results of any additional state- or territory-specific data or reports on the status and trends or potential impacts from aquaculture activities in the coastal zone since the last assessment.*

Maryland Shellfish Aquaculture Conference (2011, 2013): Education and training opportunities were provided to shellfish growers. Conference materials include presentations on business, lease selection, and policy from DNR staff, State partners, and shellfish producers.

Maryland Shellfish Aquaculture Siting Tool (2013): This interactive online map viewer was designed by DNR's Fisheries Service to assist industry, resource managers, and others in planning and applying for shellfish aquaculture leases or similar projects while minimizing potential conflicts with existing commercial & recreational uses and environmentally sensitive areas. Its use does not guarantee that an aquaculture lease will be issued, but enhances transparency with stakeholders.

Bottom Culture Cost Analysis (2013): This educational report provides business and planning support to aquaculturists.

Maryland Aquaculture Coordinating Council Annual Report (2013): This report summarizes 2013 Council activities and the State's shellfish aquaculture status. Recommendations for Maryland's shellfish aquaculture industry are given based on Council meetings and stakeholder input.

Evaluation of the Use of Shellfish as a Method of Nutrient Reduction in the Chesapeake Bay (2013): The Chesapeake Bay Program's Scientific and Technical Advisory Committee (STAC) reviewed the use of shellfish as a best management practice (BMP) to improve Chesapeake Bay water quality. STAC reports estimates for nitrogen and phosphorus content in harvested oyster shell and tissue while acknowledging the need for further research to quantify denitrification and biodeposit burial benefits. This report lays the foundation for an intensive oyster aquaculture BMP.

Denitrification and nutrient assimilation on a restored oyster reef (2013), From Headwaters to Coast: Influence of Human Activities on Water Quality of the Potomac River Estuary (2014), and Comparative analysis of modeled nitrogen removal by shellfish farms (2014). A number of State partners are actively engaged in research on denitrification and nutrient assimilation in oyster reefs and aquaculture settings. These articles represent a few of the many investigations into the use of oysters to reduce eutrophication. These types of projects informed the STAC report listed above and encourage further research on the water quality benefits of shellfish.

USDA-NASS Aquaculture Census (2013): The U.S. Department of Agriculture (USDA) and the National Agricultural Statistics Service (NASS) completed a 2013 Census of Aquaculture, which expands on the aquaculture data collected from the 2012 Census of Agriculture and provides a summary of the aquaculture sector by state.

Fostering Shellfish Aquaculture Production in Maryland and Other States (2013): The Department of Legislative Services' Office of Policy Analysis released a report that 1) provides historical context related to aquaculture production; 2) discusses historical barrier to aquaculture in Maryland and the United States; 3) identifies and describes shellfish aquaculture programs and production statistics in Maryland and other states; and 4) presents policy considerations related to Maryland's updated shellfish aquaculture program.

Integrating Water Quality and Coastal Resources into Marine Spatial Planning in the Chesapeake and Atlantic Coastal Bays (2014): This report highlights potential oyster aquaculture opportunities for spat-on-shell/bottom, cage, and floating aquaculture based on environmental factors (i.e. bottom substrate, salinity, dissolved oxygen, etc.) and policy considerations (i.e. submerged aquatic vegetation, historic oyster reefs, pound nets, navigation channels, cultural/historic resources, etc.). Model outputs are available on ArcGIS Online and can be used to visualize potential coastal and marine conflict areas in Maryland's Chesapeake Bay.[46] Potential aquaculture conflicts were also explored by identifying recreational use areas in the Choptank River through a participatory GIS (pGIS) pilot workshop.[47]

Task Force to Study the Impact of Ocean Acidification on State Waters (2014): House Bill 118 was passed to develop an Ocean Acidification Task Force to analyze the best available science regarding ocean acidification and the potential effects of acidification on the ecology of State waters and on State fisheries; and make recommendations regarding potential strategies to mitigate the effects of acidification on State waters and on State fisheries. The Task Force's findings were published in January 2015. Ocean acidification threatens Maryland's aquaculture industry because increased acidity could impact larvae calcifications, which consequently impacts predation and survival.

MANAGEMENT CHARACTERIZATION:

A. *Indicate if the approach is employed by the state or territory and if there have been any state- or territory-level changes (positive or negative) that could facilitate or impede the siting of public or private aquaculture facilities in the coastal zone.*

[46] MD DNR. 2014. Oyster Aquaculture Opportunities. Website http://bit.ly/1qVq3IU

[47] MD DNR. 2014. Maryland Choptank River Recreational Use Map. Website http://bit.ly/1shCi2g

Management Category	Employed by State or Territory (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Aquaculture comprehensive siting plans or procedures	Y	N	Y
Other aquaculture statutes, regulations, policies, or case law interpreting these	Y	N	Y

B. *For any management categories with significant changes, briefly provide the information below:*
1) *Describe the significance of the changes;*
2) *Specify if they were 309 or other CZM-driven changes; and*
3) *Characterize the outcomes or likely future outcomes of the changes*.

Maryland's Oyster Restoration and Aquaculture Development Plan. The majority of aquaculture in Maryland involves shellfish; namely, Maryland's native oyster *Crassostrea virginica*. With drops in Maryland's native oyster population and an increase in caged and floating aquaculture practices in the Chesapeake Bay, the State recognized the need for a sustainable aquaculture industry with a streamlined permitting process. Maryland's Oyster Restoration and Aquaculture Development Plan was adopted in 2010 to make significant changes to the industry. This non-CZM driven effort led to a number of significant improvements between 2011 and 2015, including the creation of DNR's Aquaculture Division and leasing program; a joint application and general permit process with the U.S. Army Corps of Engineers; a detailed review and public notice procedure for evaluating applications and issuing leases; and a process to ensure that leaseholders are actively using leased bottom/waters, complying with State laws and regulations, and complying with FDA-National Shellfish Sanitation Program Model Ordinance requirements. These changes are expected to increase ease of entry into the industry through a more streamlined and transparent permitting process.

Siting Plans and Procedural Changes: DNR's Fisheries Service manages State aquaculture activities and provides assistance regarding siting plans, procedures, and policies to aquaculturists and other local stakeholders. Many siting plan and procedural changes were undertaken in 2011 when the commercial shellfish aquaculture permitting authority was officially consolidated within DNR. The Department became responsible for issuing all State permits, licenses, and leases for aquaculture activities, including water column leasing, submerged land leasing, and Shellfish Nursery seed production permitting for in-water structures. Following these changes, steps were taken at the State level to increase transparency through development of a Shellfish Aquaculture Siting Tool. CCS's Geospatial Information and Analysis Division supports these activities by running spatial analyses on proposed aquaculture activities prior to permit approval. These analyses ensure that permitted activities are not in conflict with other resource conservation and/or recreational activities in Maryland's Chesapeake Bay and coastal waters. CCS also assists the Fisheries Division in producing materials required by the U.S. Army Corps of Engineers before permit approval.

DNR also entered into several partnerships in support of the industry. First, an agreement between DNR and the U.S. Army Corps of Engineers' Baltimore District established a Regional General Permit-1 for commercial shellfish activities. This action streamlined the federal permitting process for projects equal to or under an established size threshold. Second, DNR entered into a partnership with the Maryland Agricultural and Resource-Based Industry Development Corporation (MARBIDCO) to establish and administer two shellfish aquaculture loan programs for leaseholders. This partnership outcome led to $3.4 million in loans that have been approved for 61 projects in 10 counties. Third, DNR partnered with University of Maryland Extension and the Oyster Recovery Partnership to provide hands on training in aquaculture production for watermen and other entrepreneurs through the Oyster Aquaculture Training and Education and Remote Setting Training Programs.

To address poaching and enforcement, Maryland Natural Resources Police (NRP) patrols shellfish aquaculture leases. Monitoring and law enforcement has increased in oyster sanctuaries through Maryland's Law Enforcement Information Network (MLEIN). Through this Network, which houses data layers managed by CCS staff, NRP officers now have access to a GIS layer of active shellfish leases.

The above siting and procedural changes are expected to increase ease of entry into the aquaculture industry and support participants through communication, transparency, enforcement, and education.

Statutes, Regulations, and Policies. The above plan and procedural changes resulted directly from implementation of the Oyster Restoration and Aquaculture Development Plan. Regulatory changes related to the Plan can be found in the July 2, 2010 Maryland Register.[48] In summary, Senate Bill 847/House Bill 1053 consolidated aquaculture permitting authority within DNR and identified DNR as a lead for staffing the Aquaculture Coordinating Council and Aquaculture Review Board; House Bill 966 required more reliable water quality testing by Maryland Department of the Environment to identify consumer risks from shellfish production areas; and House Bill 208 expanded shellfish leasing areas to allow leasing on barren areas within sanctuaries. This change was significant since prospective leaseholders target these areas for environmental benefits and added protection from poaching.

In 2012, House Bill 1306 reduced the time required to advertise a lease application, updated lease rent and application cost numbers, and further accelerated the aquaculture lease application process. This law also granted DNR authority to set specific size limits for farm-raised oysters harvested from private aquaculture leases. New policies protect wild oyster resources while providing flexibility to leaseholders to sell products that meet market demands. Lastly, in 2013, Senate Bill 464 updated the shellfish nursery permit requirements for land-based and in-water shellfish nursery operations. This law places limitations on commercial rearing of shellfish seed outside of leased areas and allows nursery operators to use small, in-water structures without a State lease. These regulatory changes have successfully supported a growing State aquaculture industry.

[48] Maryland Register. Vol 37, Issue 14, Friday, July 2, 2010. Available at http://dnr2.maryland.gov/fisheries/Documents/Oyster%20Packages%20September%202010.pdf

ENHANCEMENT AREA PRIORITIZATION:

1. *What level of priority is the enhancement area for the coastal management program?*

High	_____
Medium	__X__
Low	_____

2. *Briefly explain the reason for this level of priority. Include input from stakeholder engagement, including the types of stakeholders engaged.*

Maryland is committed to both oyster restoration and aquaculture development to address depleted populations, the ecosystems services they provide, and the economic benefit of an aquaculture industry. Natural oyster populations in the Chesapeake Bay sit at less than one percent of historic levels, and aquaculture represents a more controlled approach to increasing bivalve numbers for harvest. Significant progress has been made over the past several years to streamline the leasing process and support a growing industry through education and training opportunities. Aquaculture goals already exist through the Oyster Restoration and Aquaculture Development Plan, and these goals are addressed by the DNR Fisheries Service Aquaculture Division. The Fisheries Service was engaged throughout the course of this assessment because of their daily interaction with stakeholders, including lease applicants, lease holders, and the Aquaculture Coordinating Council.

Moving forward, shell supply and enforcement are two major issues that will need to be addressed for aquaculture expansion and industry support. Submerged land leaseholders require access to shells for bottom planting and spat-on-shell setting. This resource is in high demand, costly, and difficult to obtain. DNR will need to find ways to augment shell supply and evaluate the use of alternate materials for bottom stabilization and cultch material. Furthermore, more attention is needed on enforcement and lease protection outside of the oyster sanctuary boundaries. The Department plans on exploring the use of MLEIN to protect leases that fall outside of sanctuaries. While there is limited room for involvement by CCS in shell acquisition and enforcement, CCS can accelerate and support the growth of Maryland's shellfish aquaculture industry through activities related to coastal and marine spatial planning (CMSP), use conflict resolution, water quality improvement, and working waterfront support.

To date, CCS has supported oyster aquaculture expansion by identifying potential oyster aquaculture locations for bottom, cage, and floating practices; collecting coastal and marine use data (i.e. recreational use areas); evaluating the use of oyster aquaculture as a best management practice to help Maryland meet its water quality goals; and exploring watermen's issues through a State Working Waterfronts Initiative. Maryland's Working Waterfronts Program was developed following a 2008 report by Maryland's Working Waterfronts Commission and represents an opportunity to further address issues impacting aquaculture expansion. As the Working Waterfronts Program grows, financial and technical assistance may be provided to local governments and other partners to support aquaculture needs as they relate to working waterfronts planning, resource protection, economic development initiatives, and infrastructure. CCS will continue exploring opportunities to integrate aquaculture into statewide CMSP efforts, especially as aquaculture relates to use conflicts and water quality.

4. STRATEGIES

Coastal Zone Management Act §309
Assessment and Strategy
2016-2020

ENHANCING RESILIENCE TO COASTAL HAZARDS AND CLIMATE CHANGE

I. Issue Area(s)

The proposed strategy or implementation activities will support the following high-priority enhancement areas (check all that apply):

- ☐ Aquaculture
- ☐ Energy & Government Facility Siting
- ☒ Coastal Hazards
- ☐ Ocean/Great Lakes Resources
- ☐ Special Area Management Planning
- ☒ Cumulative and Secondary Impacts
- ☐ Wetlands
- ☐ Marine Debris
- ☐ Public Access

II. Strategy Description

A. *The proposed strategy will lead to, or implement, the following types of program changes (check all that apply):*

- ☐ A change to coastal zone boundaries;
- ☒ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement /understanding;
- ☒ New or revised local coastal programs and implementing ordinances;
- ☒ New or revised coastal land acquisition, management, and restoration programs;
- ☐ New or revised special area management plans (SAMP) or plans for areas of particular concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,
- ☒ New or revised guidelines, procedures, and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government, and other agencies that will result in meaningful improvements in coastal resource management.

B. Strategy Goal: ***Ensure that coastal hazards are addressed in local and state planning processes and that climate considerations are factored into decision making about nature-based infrastructure.***

Climate impacts are occurring in Maryland and will continue in the future, even as the State moves forward with actions that will reduce greenhouse gases and ultimately result in increased energy efficiency, a more sustainable economy, and cleaner air. Therefore, adaptation strategies, together with mitigation, are necessary to address climate change. These actions are by no means independent of each other, and any program or policy to mitigate the effects of climate change will complement steps to enhance the State's resiliency to coastal hazards and climate change.

Maryland's goal for this strategy is to ensure that coastal hazards are addressed in local and state planning processes and that climate considerations are factored into decision making about nature-based infrastructure.

C. *Describe the proposed strategy and how the strategy will lead to and/or implement the program changes selected above. If the strategy will only involve implementation activities, briefly describe the program change that has already been adopted, and how the proposed activities will further that program change. (Note that implementation strategies are not to exceed two years.)*

Maryland is already taking important steps to enhance the resilience of a broad spectrum of natural and human-based systems to the consequences of climate change. But to realize the changes needed to address the extent and degree of risk associated with climate change to public safety, vital coastal habitats, and public and private infrastructure, we must continue to develop tools and resources for conducting technical assessments and planning as well as the training measures that are needed to achieve the desired results. During this assessment and strategy period, CCS proposes to address coastal hazard and climate change adaptation planning in new geographic areas and through new approaches. These efforts will broaden efforts to reduce climate change and sea level rise vulnerabilities as the State prepares for expected cumulative and secondary impacts associated with growth and development. The proposed efforts will enhance State and local efforts to plan for and implement measures that reduce impacts related to coastal hazards. Proposed program changes will include:

- Implementing and/or adopting new or revised authorities that enhance the State's ability to meet coastal hazard, climate change, and sea level rise adaptation goals
- Revising or adopting new State guidelines, coastal enforceable policies, legislation and procedures that address sea level rise and climate change risk and adaptation strategies
- Integrating adaptation planning into local ordinances and comprehensive plans
- Enhancing land management and restoration programs to preserve and restore the protective functions of natural infrastructure features such as beaches, dunes, wetlands, and oyster reefs.
- Minimizing threats to existing populations, property, and infrastructure from both episodic and chronic coastal hazards through targeted conservation and restoration efforts.

III. Need(s) and Gap(s) Addressed

Identify what priority needs and gaps the strategy addresses and explain why the proposed program change or implementation activities are the most appropriate means to address the priority needs and gaps. This discussion should reference the key findings of the assessment and explain how the strategy addresses those findings.

Maryland has long addressed coastal hazards and climate change at the state and local levels. With more than 7,000 miles of shoreline and intense coastal development, including large urban populations centers such as Annapolis, Baltimore and Ocean City, countless coastal communities and natural resources still remain highly exposed to coastal hazards. Due to the State's broad coastal hazard and climate vulnerabilities, building resilience to coastal hazards remains a top priority. Addressing coastal hazards requires a shift in focus from the traditional disaster planning and management approach to a more comprehensive hazards adaption strategy which requires a long-range, coordinated effort involving numerous public and private sector partners. There is a great deal of attention focused on hazards due to several consecutive years of catastrophic events

nationally. Now is an appropriate time to identify and evaluate the full range of opportunities for reducing future disaster impacts.

This strategy will address the continuing need to assist additional state and local partners increase their resilience to coastal hazards, consider climate in decision-making, and make best use of an existing network of technical resources.

Specific needs and gaps include:

- Enhanced hazard preparedness and comprehensive resiliency planning at the local level
- Statewide sea level rise and climate change adaptation planning and policies
- Translation of state-level data and resiliency approaches to the local- or site-level scales
- Increased resource protection in the critical area
- A need to more actively engage citizens and community members in understanding coastal hazard vulnerability and risk through outreach and public awareness
- A need to formalize a broader network of coastal resilience partners to deliver necessary services, technical support and funding
- Statewide assessments for sea level rise and climate change impacts on bay and aquatic ecosystems
- State and local planning efforts to address cumulative and secondary impacts associated with growth and development
- Need for fine scale inundation data to sufficiently assist local floodplain, land use, and emergency planners
- Training that can be used as a way to holistically increase the resiliency of the State by reaching local and state planners
- Need to educate, and learn from, a wide range of stakeholders, including elected officials, on hazard risk and vulnerability
- Address the challenge that low income and otherwise vulnerable communities will likely be disproportionately impacted by climate change.

IV. Benefit(s) to Coastal Management

Discuss the anticipated effect of the strategy, including the scope and value of the strategy, in advancing improvements in the CMP and coastal management, in general.

This strategy proposes to work at both State and local community levels to ensure that a multi-faceted approach is taken to enhance the resilience of public and private investments and natural resources in the coastal zone to coastal hazards and climate change, enabling CCS to effectively address needs and gaps in both local and State-level hazard preparedness planning.

State sea level rise and climate change planning. Since its establishment in 2008, the State's Commission on Climate Change and the Adaptation and Response Working Group have outlined a suite of adaptation policy recommendations aimed at reducing Maryland's vulnerability to sea level rise and coastal storms and have continued to outline and advance sector-based adaptation strategies. This strategy will benefit coastal management by completing work to reduce vulnerability for State lands, facilities and infrastructure, and ensure that climate change and sea level rise are incorporated into State planning and management decisions.

Local hazard preparedness. Effectively mitigating the risks posed by coastal hazards to Maryland's people, infrastructure and natural resources often involves local land use decisions. Maryland's *CoastSmart* Communities Program, launched in 2009, continues to serve as the CCS's most effective and robust approach for delivering coastal hazard assistance to local partners. As the Program develops, one of the biggest benefits to coastal management is that plans are taking shape to evolve this program into a growing forum through which the CCS and a number of partners can deliver assistance on many fronts to increase the State's resilience to climate change and coastal hazard adaptation.

Enhancing state and local resilience through restoration. Natural features such as tidal marshes, wetlands, and vegetated buffers can enhance the resilience of Maryland's coastal zone by allowing the coastline to naturally cope with and adjust to the impacts of climate change. These features provide a multitude of benefits to coastal communities, including wave attenuation, sediment stabilization and the slowing of inland water transfer. Augmenting natural features can help protect inland areas from damaging storm surge, sea level rise, and other coastal hazards while providing habitat, water quality, and broader ecological benefits. In the 2014 Chesapeake Bay Agreement, signatories committed to increasing the resiliency of the Chesapeake Bay watershed, including its living resources, habitats, public infrastructure and communities, to withstand adverse impacts from changing environmental and climate conditions. The pursuit, design, and construction of targeted restoration and protection projects represents a significant adaptation strategy for both coastal communities and ecosystems. Proposed efforts undertaken during this strategy will ensure that state restoration, enhancement, and protection projects promote resiliency through targeted implementation and design. Lessons learned will be shared with county and municipality partners to ensure transferability to local planning. To tie this work together in the broader concept of resiliency, individual efforts will be advanced to begin implementing a resiliency master plan that was initiated in the previous strategy. To accomplish this, data and staff time will focus on evaluating how this is done within the confines of existing restoration program structures or identify changes needed to incorporate these future resilience needs.

V. Likelihood of Success

Discuss the likelihood of attaining the strategy goal and program change (if not part of the strategy goal) during the five-year assessment cycle or at a later date. Address the nature and degree of support for pursuing the strategy and the proposed program change and the specific actions the state or territory will undertake to maintain or build future support for achieving and implementing the program change, including education and outreach activities.

The significant progress in coastal hazards and climate change adaptation achieved during the previous strategy timeframe provides for a strong likelihood for success. Some of the work needed to advance this strategy is also described in the data-to-decision making strategy whereby data and the translation of data is a central theme toward advancing understanding of vulnerability and the steps needed to address these vulnerabilities.

At the state level, a second strategy (Phase II) of Maryland's Climate Action Plan was released in 2011 outlining specific sector-based strategies to address changes in precipitation patterns and increased

temperature and the likely impacts to human health, agriculture, forest and terrestrial ecosystems, bay and aquatic environments, water resources, and population growth and infrastructure. Together, the two strategies of the Climate Action Plan lay out a compendium of 95 actions to adapt to climate change across a suite of social, environmental and economic sectors. Between 2008–2014, the State as a whole made substantial progress to implement high-priority elements of Maryland's Phase I and II Adaptation Strategies. Chapter 8 of Maryland's Greenhouse Gas Reduction Plan (2012), the Adaptation Update, provided detailed information on state agency implementation efforts to date, along with short, medium and long-term priorities for future action.

In May 2015, Governor Larry Hogan signed into law the Maryland Climate Commission Act (MCCA) of 2015 establishing the Commission on Climate Change in the Department of the Environment to advise the Governor and General Assembly on ways to mitigate the causes of, prepare for, and adapt to the consequences of climate change; establishing the membership of the Commission; requiring the Commission to establish specified working groups; and requiring the Commission members and working group members to be appointed and the Commission to be convened on or before July 1, 2016. The MCCA includes 8 of 9 tasks outlined by the previous Executive Order 01.01.2014.14 Strengthening Climate Action in Maryland (Nov. 2014) including one calling for Maryland to, *"Deliver tools and assistance to local governments to support community-scale vulnerability assessments and the development and integration of specific strategies for enhancing resilience to the impacts of climate change into local plans and ordinances"* - a task which is at the heart of Maryland's *CoastSmart* Communities Program.

Support exists within the host agency, DNR, which has developed new conservation criteria and easement provisions to identify coastal habitats that may help Maryland proactively adapt to sea level rise and increased storm events associated with climate change. Climate change targeting criteria was used to develop new conservation areas for "*GreenPrint*" and a parcel-level scorecard used to review land acquisition projects. Additionally, a DNR policy was signed in October 2010, guiding the Department's investments in and management of land, resources and assets so as to better understand, mitigate and adapt to climate change. The policy establishes practices and procedures related to new land investments, facility siting and design, habitat restoration, government operations, research and monitoring, resource planning and advocacy. Through implementation of the policy, the agency is leading by example, encouraging others to plan for and to mitigate the effects of climate change.

Finally, CCS has effectively partnered with a number of local governments over the past several years to complete sea level rise and coastal hazard vulnerability assessments. As a result of these assessments, recommendations for responding to risk have been successfully integrated into local comprehensive plans and other planning and policy documents. Through the *CoastSmart* Communities Program, CCS has worked closely with local governments to provide technical and financial assistance to achieve coastal hazard planning objectives. Demand for this type of collaboration has exceeded the amount of available resources each year. Because of limited resources, CCS has worked with other partners to leverage efforts. Through the MDP, CCS has worked to integrate sea level rise and coastal hazard planning in to state-level Plan Maryland efforts and at the regional and local government level through *CoastSmart* grant projects and comprehensive plan reviews. By partnering with MEMA through the multi-agency Mitigation Advisory Committee, CCS has been able to provide feedback and help prioritize mitigation project

and planning efforts to reduce vulnerabilities to hazards. Because CCS has built effective partnerships at the local level, especially through *CoastSmart*, on-the-ground changes can be realized to reduce Maryland's vulnerability to coastal hazards. It is anticipated that the need for such work will continue throughout this strategy timeframe and will ensure a reasonably high likelihood of success.

Outreach and education conducted by CCS staff and partners through trainings, participatory workshops, web and print materials will build support at the local level and further ensure a high likelihood of success.

VI. Strategy Work Plan

Using the template below, provide a general work plan that includes the major steps that will lead toward or achieve a program change or implement a previously achieved program change. If the state intends to fund implementation activities for the proposed program change, describe those in the plan as well. The plan should identify a schedule for completing the strategy and include major projected milestones (key products, deliverables, activities, and decisions) and budget estimates.

Strategy Goal 1: *Coastal community hazard assessments and CoastSmart Communities Program*

Continued focus is needed to increase local hazard preparedness and to promote adaptation strategies for the projected impacts of climate change such as sea level rise and changes in precipitation patterns. CCS, through the *CoastSmart* Communities Program, will work to integrate coastal hazards preparedness and adaptation planning into existing local decision-making processes; cultivate a coastal resiliency network that collaborates with other State Partners to provide technical and financial resources to assist local communities; connect local communities with tools, information and resources; provide financial assistance to local communities through an annual RFP that furthers understanding, planning for and implementing risk reduction strategies; increase the relevancy and effectiveness of its coastal hazard planning and outreach efforts by aligning them with the elements and activities under FEMA's Community Rating System; incorporate long term monitoring data into local decision making processes; address socially vulnerable communities that will be disproportionately affected by coastal hazard impacts; and assess the impacts that coastal hazards will likely have on the State's economy; revenue's and investment decisions. Based on the local political, social, and economic landscape, *CoastSmart* is poised for the next five years to assist a broad range of planners in emergency management, floodplain management, land use planning, or other departments in local communities.

Total Years: 5

Total Budget: $744,000

Years: 1–5

Description of activities: Local government planners are seeking information; resources; adaptation options and implementation strategies for how their jurisdiction may respond to any number of sector areas in the hazard mitigation context; such as historic preservation, National Flood Insurance Program, emergency management, land use planning, and economic development. *CoastSmart* will offer guidance and support centered around understanding vulnerabilities and risks to coastal hazards, develop adaptation strategies, and implementing those strategies into everyday decision-making. Work will be conducted

to help more local communities determine their current ability for addressing coastal hazards and sea level rise and provide guidance on specific adaptation strategies that can be incorporated into local planning frameworks and regulations.

Major Milestone/Outcome(s):

1) *Coastal Resiliency Network.* CCS will formalize a *CoastSmart* network hub for local communities and include State Partners from CBNERR-MD; MDE; MEMA; MHT; DHCD; CBSSC and other relevant federal and local partners. *CoastSmart* takes a ground-up approach to helping increase Maryland's resiliency to coastal hazards and sea level rise. *CoastSmart* is poised to help translate the needs of local government to a number of different agency languages and make sure that state and federal resources can be effectively used by local communities. The network will serve as a basis for developing and integrating awareness about short- and long-term hazard risks and adaptation strategies and work to translate data into management approaches[49]. Over the next five years, outreach and training strategies will gradually increase an emphasis on green infrastructure for coastal resiliency, and strategic connections to stormwater management and water quality restoration. The Network will provide skill-based trainings, offer technical assistance, and develop resources that enable local communities to understand; plan for and implement strategies that enhance coastal resiliency. An essential component of the network will be to make sure that the long term monitoring data and information detecting change is incorporated into the decision-making process.
2) *CoastSmart Program Development and Training Curriculum.* CCS will continue to evolve the *CoastSmart* program by building out the State's technical assistance, resource, and tool offerings that comes with CCS' networked program approach. Outcomes from program development will include an integrated curriculum and resources for local communities to understand, plan, and implement strategies that promote and enhance community resiliency. Support from the CBNERR-MD Coastal Training Program will help to address the use of science in decision making related to building community resilience.
3) *Alignment of CoastSmart Communities Program with FEMA's Community Rating System (CRS).* CCS has found that gaining a more comprehensive understanding of the National Flood Insurance Program, as well as stormwater management issues, helps facilitate coordination among the many partners working in the coastal zone region. One helpful tool that crosses many resiliency languages is FEMA's Community Rating System. CRS is a program available to county and incorporated municipalities who participate in the NFIP. The program gives incentives to communities by providing a reduction in homeowner's flood insurance premiums where local governments go above and beyond the minimum NFIP requirements in any number of areas: floodplain management, emergency response, watershed-scale planning, education and outreach, and others. Additionally communities can earn points for incorporating future conditions, including sea level rise, in local regulations. CRS is a mechanism that promotes higher regulatory standards; enhanced outreach and integrated planning for

[49] This references the data-to-decision making strategy and represents one mechanism by which the milestones outlined in that strategy will be advanced.

risk reduction. This will include integrating the *CoastSmart* Communities Scorecard into the CRS application process.

4) *CoastSmart Communities Grant projects.* Through work with local governments, CCS will provide financial support, develop data, vulnerability and risk assessment methodologies, model methodologies and approaches for local governments that update their local plans (comprehensive, hazard mitigation, open space, etc.), codes and ordinances to accommodate climate change (floodplain, critical area, etc., coastal hazards and cumulative and secondary impacts associated with growth and development. In so doing, CCS will identify opportunities to work with partners to develop and provide model ordinance language. The outcome of these efforts will be to create new or revised guidelines, policies and/or authorities.

Budget: Year 1 = $128,000, Year 2 = $128,000, Year 3 = $156,000, Year 4 = $136,000, Year 5 = $136,000

Years 3–5

Description of Activities: The *CoastSmart* Program will enhance coastal resiliency efforts by linking conservation/restoration efforts focused on water quality, stormwater management and coastal hazard preparedness. The Coastal Resilience Assessment (CRA) will serve to help target specific communities and regions to do more site specific risk and social vulnerability assessments. The Coast Smart Construction Infrastructure Siting and Design Guidelines will be piloted with local communities for non-state buildings and infrastructure projects partially or fully funded by the State.

Major Milestones/Outcome(s):

1) *Applying the Coastal Resiliency Assessment to Local Communities*. The state-wide CRA will serve to target regions or communities where a more local site specific CRA can be conducted. Efforts will begin in summer 2015 in a community on the Lower Eastern Shore to pilot a community-level CRA. The assessment will provide understanding on vulnerabilities of both natural and built infrastructure specific to that community; through community engagement identify a suite of feasible adaptation options; and prioritize implementation of those strategies. The methods and the process used for the pilot will be documented and used as the basis for conducting community CRA in other vulnerable communities. An emphasis for the CRA will be for communities that are socially vulnerable and those that are interested in maintaining working waterfronts as key economic and cultural component of their community. A component of the local CRA should be to assess the impact that coastal hazards will have on local economies; revenue and investment decisions.
2) *CoastSmart Construction Infrastructure Siting and Design Guidelines*: In 2014 an Executive Order was signed recommending specific siting and design criteria for State construction projects to protect against the impacts of climate change. The *CoastSmart* program will work with local communities to promote and encourage that those guidelines be considered for projects that are partially or fully funded by the State. In addition, CCS will work – primarily through 306-funded efforts - to determine how state programs could reflect similar work.

Budget: Years 3-5 = $60,000 total over three years

Strategy Goal 2: ***Strengthen State-level climate change and sea level rise adaptation policy***
Continued work is needed to advance State policy and promote on-the-ground implementation of Statewide coastal hazard, climate change and sea level adaptation strategies. CCS will work to expand its public and private partnerships to support ongoing and planned efforts; conduct inventories of vulnerable resources and the built-environment (i.e., infrastructure, facilities); incorporate climate change adaptation strategies into State resource management plans; collaborate with federal partners to support regional and national adaptation planning; and implement and/or adopt priority recommendations of Maryland's Strategy for Reducing Maryland's Vulnerability to Climate Change (Phases I and II), as well as new climate adaptation planning requirements outlined in Executive Order 01.01.2014.14 and House Bill 514.
Total Years: 5
Total Budget: $125,000

Years 1–5
Description of activities: Develop broader public and private and state and local partnerships to strengthen and maintain existing State action plans to further address, prepare for and adapt to the consequences of climate change. Through participation with existing climate work groups, work will be completed to analyze potential and develop new mechanisms to institutionalize consideration of climate change and sea level rise through State policies, programs and decision-making processes; evaluate vulnerable coastal infrastructure and identify adaptation options and economic costs; update building code revisions and infrastructure design standards; and develop additional adaptation strategies.

Outcome(s):

1) *Develop and recommend short and longer-term strategies and initiatives to better address the consequences of climate change*. CCS will engage new public and private partnerships and foster new relationships with state and local governments through active staff participation on the Maryland Commission on Climate Change Adaptation and Response Working Group and Maryland's Climate Communication Consortium. Participation in these ongoing efforts will help to build capacity and extend reach of existing state-wide efforts to: 1) better address the consequences of climate change; 2) better communicate with and educate citizens about the urgency of the challenge and options to address it; and 3) strengthen and maintain existing State action plans to further address, prepare for and adapt to the consequences of climate change.
2) *Environmental review and comment criteria and guidelines*. Climate change and sea level rise considerations will be integrated into existing environmental review and comment practices and planning efforts. More specifically, CCS will work to develop Maryland Environmental Policy Act (MEPA) guidelines that require consideration of climate change factors, including both mitigation and adaptation. This will result in a Statewide effort to reduce vulnerabilities of projects and resources to these hazards and provide an opportunity to reduce these risks.

3) *Institutionalized consideration of climate change.* At a broader scale, CCS will work with Sister-State Agencies to review State planning, regulatory and fiscal programs to identify and recommend actions to more fully integrate the consideration of the impacts of climate change; including sea level rise, increased precipitation and temperature, and extreme weather. For planning, regulatory and fiscal programs that currently include climate considerations, quantify and assess performance and effectiveness; and recommend programmatic, regulatory or fiscal changes that would serve to enhance Maryland's preparedness and resilience to future climate change impacts; and ensure both wise and sustainable use of state fiscal resources; and Identify and recommend specific policy, planning regulatory and fiscal changes for existing programs that do not currently address climate change impacts.
4) *State infrastructure investment policy.* CCS will work with other State agencies to develop updated facility and infrastructure site design and construction criteria and procedures for State facilities and infrastructure investments, to ultimately reduce the vulnerability of public infrastructure to the impacts of climate change. An additional element of this outcome will be an analysis of State grant and loan programs to determine whether additional executive, legislative or administrative requirement would be necessary to guide allocation of State funding in coastal hazard or sea level rise vulnerable areas. Grant and loan programs to be analyzed may include: Local Capital Grant Recipients; Sustainable Communities Funding Programs; Bay Restoration Trust Fund; Waterway Improvement Fund; Clean Water and Drinking Water State Revolving Loan Funds; Community Health Facilities Grant Programs, as well as several others. Legislation may be pursued to allow Maryland to condition local projects that receive State funding assistance.

Budget: Year 1 = $35,000, Year 2 = $35,000, Year 3 = $10,000, Year 4 = $35,000, Year 5 = $10,000

VII. FISCAL AND TECHNICAL NEEDS

A. *Fiscal Needs: If 309 funding is not sufficient to carry out the proposed strategy, identify additional funding needs. Provide a brief description of what efforts the applying agency has made, if any, to secure additional state funds from the legislature and/or other sources to support this strategy.*

CCS anticipates that with Section 309 and 306 funding, as well as through collaboration with federal, regional, State, local and university partners, many fiscal and data needs may be addressed. However, there may be a need to apply for additional funding resources to address regional coordination of sea level rise adaptation planning and coordination efforts.

B. *Technical Needs: If the state does not possess the technical knowledge, skills, or equipment to carry out the proposed strategy, identify these needs. Provide a brief description of what efforts the applying agency has made, if any, to obtain the trained personnel or equipment needed (for example, through agreements with other state agencies).*

CCS anticipates that the technical needs for this strategy exist either through in-house technical abilities or through partnerships with other agencies and the CBNERR-MD Coastal Training Program.

However, there may be additional opportunities to partner with NOAA and the Office for Coastal Management to deliver necessary training, modeling or assessment needs.

VIII. Projects of Special Merit (Optional)

If desired, briefly state what projects of special merit the CMP may wish to pursue to augment this strategy. Any activities that are necessary to achieve the program change or that the state intends to support with baseline funding should be included in the strategy above. The information in this section will not be used to evaluate or rank projects of special merit and is simply meant to give CMPs the option to provide additional information if they choose. Project descriptions should be kept very brief (e.g., undertake benthic mapping to provide additional data for ocean management planning). Do not provide detailed project descriptions that would be needed for the funding competition.

None at this time for this strategy.

COASTAL AND OCEAN RESOURCES AND USES

I. Issue Area(s)

The proposed strategy or implementation activities will support the following high-priority enhancement areas (check all that apply):

- ☐ Aquaculture
- ☒ Energy & Government Facility Siting
- ☐ Coastal Hazards
- ☒ Ocean/Great Lakes Resources
- ☐ Special Area Management Planning
- ☒ Cumulative and Secondary Impacts
- ☐ Wetlands
- ☐ Marine Debris
- ☒ Public Access

II. Strategy Description

1) *The proposed strategy will lead to, or implement, the following types of program changes (check all that apply):*

- ☐ A change to coastal zone boundaries;
- ☒ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement/understanding;
- ☒ New or revised local coastal programs and implementing ordinances;
- ☒ New or revised coastal land acquisition, management, and restoration programs;
- ☐ New or revised special area management plans (SAMP) or plans for areas of particular concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,
- ☒ New or revised guidelines, procedures, and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government, and other agencies that will result in meaningful improvements in coastal resource management.

B. Strategy Goal: *This strategy will support planning and implementation efforts to address competing uses of coastal environments and emerging ocean and estuary use issues.*

Mallows Bay. The fragile and unique resources and ecosystems that comprise Mallows Bay are sensitive to a variety of factors including changing landscape and water conditions, rising sea levels and increased visitation pressures. In September, 2014, Maryland and a group of partners nominated Mallows Bay to the National Marine Sanctuary (NMS) system and it was accepted into an "inventory" of sites , then moved into a public scoping process. The goal of this portion of the strategy is to 1) lead and support community-driven stakeholder engagement; 2) develop and accept a NMS management plan reflective of resource management goals and community priorities; and, 3) ensure coastal resources are considered through development of an EIS. This work will be conducted as part of a larger site-coordinating and steering committee group.

Oceans and Estuaries. Maryland's ocean and estuary environments are experiencing continuously changing environments and facing an increasing number of uses. This strategy will support

planning and implementation efforts to address competing uses of coastal environments and emerging ocean and estuary use issues. Specifically, it will address 1) updated coastal policies that reflect new uses and geographic areas of concern; 2) strengthened state and regional partnerships to address resource and use issues; and, 3) enhanced planning and implementation of programs related to resource-dependent coastal economies (e.g. working waterfronts, tourism, public access, etc.).

C. *Describe the proposed strategy and how the strategy will lead to and/or implement the program changes selected above. If the strategy will only involve implementation activities, briefly describe the program change that has already been adopted, and how the proposed activities will further that program change. (Note that implementation strategies are not to exceed two years.)*

The proposed strategy is outlined to help the State and CCS address issues related to place-based planning (i.e., Mallows Bay, the Atlantic Ocean or other areas as they emerge), ocean policies, and working waterfronts. To reach these goals, CCS plans to provide program development support to build out the described strategy outcomes. Funds will be used to: [Mallows Bay] develop management plans, conduct outreach, address economic development, implement management actions, and develop interpretive materials; [Oceans/Estuaries] conduct policy reviews, mapping, stakeholder engagement, resource evaluation and management work and policy updates; and, [Working Waterfronts] fund an annual RFP for local working waterfronts, support interpretation and workforce development issues and host exchanges.

III. Needs and Gaps Addressed

Identify what priority needs and gaps the strategy addresses and explain why the proposed program change or implementation activities are the most appropriate means to address the priority needs and gaps. This discussion should reference the key findings of the assessment and explain how the strategy addresses those findings.

Mallows Bay. This strategy will help expand public access to Maryland coastal waters and to meet the need to engage the surrounding and user communities of Mallows Bay, complete an EIS and develop a community-driven management plan through a series of public-engagement steps. This strategy will address this work by gathering information both from site partners and surrounding communities and developing and implementing a site management plan in cooperation with partners that reflects the interests, needs and values of the community.

Oceans. Over the past several years there have been increases in ocean collaboration and in the number and intensity of ocean uses. There is a growing need to address new and emerging issues in the State's coastal policies addressing ocean resources and human uses. In addition, there has been significant effort focused on how compatible uses of ocean space and resources can be sustained as new and emerging uses arise or uses intensify. The proposed strategy will support work to update the State's coastal policies to reflect this new ocean reality by incorporating new and emerging issues into a routine program change (RPC) submission. By addressing this new approach to ocean collaboration to better understand how existing and/or new policies are reflected this is one of the most appropriate means to address the priority need and gap. Portions of this work may include

identification of geographic areas of focus that specify goals for particular types of areas (e.g. canyons, corals) and work to address how changes in ocean uses may affect local communities.

There is also the need to address this same gap through improved interjurisdictional coordination that support state efforts to the exploration and development of interjurisdictional agreements and interstate federal consistency review authorities to address ocean management challenges and resource needs.

This strategy will also address the need to collect commercial fishing map data. In cooperation with other state and regional partners, the program will work to collect data to fill existing gaps as well as understand how the existing coastal policies relate to Fisheries Management Plans, fishing effort and contributions to local economies. This meets the need to address a gap in data that allows the program to make more informed decisions about offshore uses and resources.

In addition to some of this work being carried out at the state level and with partners of CCS, some of this work will also be reflected in regional programs, partnerships and policies such as MARCO and the MidA RPB, such as interjurisdictional coordination actions that are detailed further in subsequent sections.

Estuaries, Working Waterfronts and Water Uses. As Maryland has embarked upon work to address working waterfronts and water uses throughout the State's waterways, CCS has developed approaches to facilitate compatible uses and support coastal economies. This strategy will address the need to expand this work to additional geographic areas and provide the necessary funding to support community-driven priorities for waterfronts and expand coastal tourism messaging and interpretation.

IV. Benefits to Coastal Management

Discuss the anticipated effect of the strategy, including the scope and value of the strategy, in advancing improvements in the CMP and coastal management, in general.

As ocean and estuarine uses and landscapes change, the need for better coordination and focus on resources and uses has become apparent. Greater coordination, especially on ocean issues, is needed. This strategy will benefit coastal management by making sure that the State, its policies and programs are more up-to-date on ocean priorities and goals. Work proposed to address specific places and issues including Mallows Bay and Working Waterfronts will benefit coastal management by focusing work to address the effects of cumulative and secondary impacts, public access and coastal uses in particular geographic areas.

V. Likelihood of Success

Discuss the likelihood of attaining the strategy goal and program change (if not part of the strategy goal) during the five-year assessment cycle or at a later date. Address the nature and degree of support for pursuing the strategy and the proposed program change and the specific actions the state or territory will undertake to maintain or build future support for achieving and implementing the program change, including education and outreach activities.

In recent years, CCS has worked to update its coastal policies, lay the groundwork for addressing working waterfronts, and capitalize on opportunities to partner in certain areas to address coastal management in a holistic manner. There is active and strong interest in pursuing work at Mallows Bay, a diverse advisory committee is engaged in advancing the working waterfront issue, and there is acknowledgement on many fronts that there is a need to enhance our ability to address ocean issues and competing and emerging issues in a comprehensive manner. CCS will continue to build support for these issues, engage the right partners and communities, and provide opportunities for partners and the public to participate in the proposed strategy.

VI. Strategy Work Plan

Using the template below, provide a general work plan that includes the major steps that will lead toward or achieve a program change or implement a previously achieved program change. If the state intends to fund implementation activities for the proposed program change, describe those in the plan as well. The plan should identify a schedule for completing the strategy and include major projected milestones (key products, deliverables, activities, and decisions) and budget estimates.

Strategy Goal 1: *Mallows Bay*. The goal of this portion of the strategy is to 1) lead and support community-driven stakeholder engagement; 2) develop and accept a NMS management plan reflective of resource management goals and community interests, needs and values; and, 3) ensure coastal resources are considered through development of the management plan and EIS.
Total Years: 5
Total Budget: $326,500

Years 1-2:

Description of activities and major milestones: The first two years of this effort will be focused on addressing requirements for a community-driven scoping process and completion of a management plan and EIS. Work will be undertaken to support community meetings, drafting a management plan reflective of local interests, needs and values that consider competing priorities, and, drafting of EIS documents.

Budget: Year 1 = $67,500, Year 2 = $62,500

Years 3-5:

Description of activities and major milestones: Upon completion of the management plan and EIS, work will be focused on supporting the adoption and implementation of these documents. For instance, it is envisioned that milestones might include: state implementation of the plan along with local/community, state and federal partners; and, implementation related to resource conservation, interpretation of the natural and underwater archaeological resources, enhancement of public access and analysis and support for economic development related to site and region development.

Budget: Year 3 = $71,500, Year 4 = $62,500, Year 5 = $62,500

Strategy Goal 2: *Ocean Resources and Uses*. This strategy will support planning and implementation efforts to address competing uses of coastal environments and emerging and

intensifying ocean use issues. Specifically, work will focus on updates to coastal policies, exploration and development of interjurisdictional agreements and interstate federal consistency review authorities, collection of data and information to inform decision making, and work that addresses ocean management challenges and resource needs.
Total Years: 5
Total Budget: $108,000

Years 2, 4:

Description of activities and major milestones: *Ocean Mapping.* Time and effort will be spent coordinating the development or updates of maps and collection or updates of data that reflect ocean uses and resources. These are expected to focus specifically on fishing activity and may also include other uses or natural resources that are identified as work continues in ocean collaboration off Maryland's ocean coast. This work will be conducted in cooperation with other Mid-Atlantic States and regional partners. Results of this work may include data that is used to guide decision making and updates of coastal policies that reflect current, intensifying and emerging ocean uses.

Budget: Year 2 = $3,000, Year 4 = $5,000

Years 1-3:

Description of activities and major milestones: *Coastal Policies, Ocean Uses and Interjurisdictional Coordination.* For the first three years of this strategy, there will be a concerted effort to assess and update the State's coastal policies to reflect current, intensifying and emerging ocean uses and address ocean uses and interjurisdictional coordination. The Program will coordinate with resource managers, federal consistency contacts and others in the State and Mid-Atlantic to identify gaps as well as common objectives and/or geographic areas that could be reflected in the coastal policies addressing resources, communities and uses. Milestones may include updated policies, updated guidance about review or management approaches for how data and information are considered. This work will be reflective of the new actions identified in the Mid-Atlantic Regional Ocean Action Plan.

For example, a process and approach for offshore transmission lines and issues related to offshore wind development could be addressed. The Program may examine how fishing, beach and sediment issues are considered, how community impacts are taken into account, and how partnerships would play a role in updates and feedback in proposed siting activities and then reflected in the coastal policies. Through such a review, gaps may be identified in policies, data and review processes that would then be addressed through this strategy.

Budget: Year 2 = $50,000, Year 5 = $50,000

Strategy Goal 3: *Working Waterfronts Program and Enhancement Grants for Water-dependent use planning.* In order to assist with the preservation of existing and historic working waterfronts and provide opportunities for new water-dependent uses to emerge that require water access, CCS has established a Working Waterfronts Program. CCS proposes to use Section 309 funding to offer Working Waterfront Enhancement Grants and to work with other State Partners to provide technical

and financial assistance to coastal communities that want to ensure access is maintained for water-dependent uses and their supporting industries. CCS will complete the coastal zone-wide assessment and inventory of working waterfronts and share the resulting data with Marylanders through the Coastal Atlas. CCS will engage stakeholders through outreach meetings and trainings including utilizing participatory GIS (pGIS) techniques to collect spatial data from local planners, watermen, recreational users, and other stakeholders to update the inventory and target future funds towards "prime" working waterfront areas. Meeting and/or training topics may also include emerging issues such as workforce development and fisheries co-operatives. These outreach exercises will serve as education opportunities while fostering local-state partnerships and identifying community needs that can be addressed through Enhancement Grants.

Total Years: 5

Total Budget: $812,500

Year: 1-5

Description of activities and major milestones: Working Waterfront Enhancement Grants. CCS will issue an annual Request for Proposals seeking projects from coastal communities interested in ensuring access is maintained for water-dependent uses and their supporting water-based industries. In doing so, CCS will establish partnerships to deliver financial and technical assistance to coastal communities that want to ensure access is maintained for water-dependent uses and their supporting industries. Grants may address comprehensive planning, infrastructure financing, cultural and heritage protection, economic analysis and development, natural resource restoration and protection, or a combination of these key working waterfront development elements. Activities needed to achieve program changes throughout coastal zone jurisdictions may remain consistent from years 1–5, but work and program changes will be completed in different areas. CCS may also work with existing or establish new partners to complete the coastal-zone wide assessment and inventory of existing and potential future water-dependent uses, working waterfronts and their supporting industries.

Budget: Years 1-5 = $162,500 annually

Year: 1-5

Description of activities: Community Outreach, Meetings, and Training. During years one to five, CCS will build off of the assessment and inventory by holding regional community outreach workshops to engage stakeholders in working waterfront planning. One to four outreach meetings will be held to ground-truth the Working Waterfronts Inventory, foster future Working Waterfronts Enhancement Grant proposals, and engage local stakeholders in discussions about working waterfronts status, trends, needs, and future opportunities for preservation and/or enhancement. CCS will utilize participatory GIS (pGIS) techniques to collect spatial data from local planners, watermen, recreational users, and other stakeholders to update the inventory and target future funds towards priority working waterfront areas. CCS will also draw on the Environmental Finance Center guiding framework to engage local partners in discussions that identify their working waterfront priorities, or "prime" areas. These outreach meetings will support stakeholders seeking financial assistance through the Maryland's Working Waterfront Enhancement Grants or other funding mechanisms.

Furthermore, regional discussions may lead to the re-evaluation of state priorities or prime areas. Outreach exercises and/or trainings will serve as education opportunities while fostering local-state partnerships.

Outcome(s):

1) One to four outreach meetings to ground-truth inventory data and engage stakeholders in discussions about working waterfronts status, trends, needs, and future opportunities for preservation and/or enhancement. Trainings may be held as needs are identified.

Budget: Year 1-5 = Up to $5,000 a year

VII. Fiscal and Technical Needs

A. Fiscal Needs: *If 309 funding is not sufficient to carry out the proposed strategy, identify additional funding needs. Provide a brief description of what efforts the CMP has made, if any, to secure additional state funds from the legislature and/or from other sources to support this strategy.*

CCS anticipates additional funding needs to support the potential development of Mallows Bay as a NMS. A steering committee may help to secure additional funds. CCS anticipates that additional funds will be necessary to ensure that regional goals are achieved. To this end, MARCO and the MidA RPB are working to or have already secured funds to accomplish some of this work. CCS also anticipates that a lot of the work described here will be supported by core staff and that resources are sufficient to address the identified goals. Related to working waterfronts, it is anticipated that additional funds may be sought to achieve individual community goals.

B. Technical Needs: *If the state does not possess the technical knowledge, skills, or equipment to carry out all or part of the proposed strategy, identify these needs. Provide a brief description of what efforts the CMP has made, if any, to obtain the trained personnel or equipment needed (for example, through agreements with other state agencies).*

It is anticipated that most technical resources are identified or mechanisms will be in place to complete this strategy. Some assistance or expertise related to working waterfronts and regional ocean goals can be gathered by establishing or strengthening partnerships.

VIII. Projects of Special Merit (Optional)

If desired, briefly state what projects of special merit the CMP may wish to pursue to augment this strategy. Any activities that are necessary to achieve the program change or that the state intends to support with baseline funding should be included in the strategy above. The information in this section will not be used to evaluate or rank projects of special merit and is simply meant to give CMPs the option to provide additional information if they choose. Project descriptions should be kept very brief (e.g., undertake benthic mapping to provide additional data for ocean management planning). Do not provide detailed project descriptions that would be needed for the funding competition.

None at this time for this strategy.

Data to Decision-Making

I. Issue Area(s)

The proposed strategy or implementation activities will support the following high-priority enhancement areas (check all that apply):

- ☐ Aquaculture
- ☒ Energy & Government Facility Siting
- ☒ Coastal Hazards
- ☒ Ocean/Great Lakes Resources
- ☐ Special Area Management Planning
- ☒ Cumulative and Secondary Impacts
- ☒ Wetlands
- ☐ Marine Debris
- ☐ Public Access

II. Strategy Description

A. *The proposed strategy will lead to, or implement, the following types of program changes (check all that apply):*

- ☐ A change to coastal zone boundaries;
- ☒ New or revised authorities, including statutes, regulations, enforceable policies, administrative decisions, executive orders, and memoranda of agreement /understanding;
- ☒ New or revised local coastal programs and implementing ordinances;
- ☒ New or revised coastal land acquisition, management, and restoration programs;
- ☐ New or revised special area management plans (SAMP) or plans for areas of particular concern (APC) including enforceable policies and other necessary implementation mechanisms or criteria and procedures for designating and managing APCs; and,
- ☒ New or revised guidelines, procedures, and policy documents which are formally adopted by a state or territory and provide specific interpretations of enforceable CZM program policies to applicants, local government, and other agencies that will result in meaningful improvements in coastal resource management.

B. Strategy Goal: *To lay the foundation for integrating spatial and scientific data into State and local decision-making processes.*

This strategy seeks to integrate and institutionalize, within state programs and authorities, the use of ecological, economic, cultural, stakeholder and other data to inform and support decisions on a broad range of ocean and coastal management issues. Work will be undertaken to increase the degree to which shoreline, ocean, and estuary data are used to inform decisions, guide project design and siting, frame policy development and shape land management programs.

C. *Describe the proposed strategy and how the strategy will lead to and/or implement the program changes selected above. If the strategy will only involve implementation activities, briefly describe the program change that has already been adopted, and how the proposed activities will further that program change. (Note that implementation strategies are not to exceed two years.)*

Through the State's FY 2011-2015 CZMA Section 309 Comprehensive Ocean and Coastal Planning strategy and Coastal Hazards and Climate Change Adaptation strategy, Maryland has undertaken

work to enhance data and understanding about coastal resources, human uses of ocean and coastal waters, and community vulnerabilities. As a result of the previous strategies and work completed between FY 2011-2015, the State already applies the wealth of data available to a number of major planning decisions. These include, but are not limited to: considering coastal hazards during land acquisition; targeting of new restoration projects; developing offshore energy resources; and employing Coast Smart Construction Guidelines. This strategy aims to initiate a series of program changes that will allow us to build upon our previous accomplishments.

The overarching goal of the proposed Data to Decision-Making Strategy is to lay the foundation for integrating spatial and scientific data into State and local decision-making processes. This strategy will outline a few specific program changes, but will also illuminate projects that will achieve a goal that might eventually lead to a program change. CCS recognizes the significant investment in a variety of data development efforts to date and will primarily focus on translation of this data to decisions and program changes and pursuing new or updated data only as necessary. Overarching program changes include:

- Assessing the holes in spatial data or analyses needs of existing data in order to support state and local policies, programs, and management plans addressing coastal hazards, cumulative and secondary impacts, wetlands, ocean resources, and energy siting;
- Creating, compiling, and incorporating spatial data into existing and/or new management plans, restoration targeting tools, and coastal hazards planning;
- Establishing a program or mechanism to help preserve existing and create additional opportunities for integrating the use of data into all CZM decision-making;
- Closing the feedback loop to ensure data and web-driven tools support the planning needs and objectives of coastal communities, state agencies, and local governments;
- Piloting initiatives that will showcase the use of data in management and decision-making processes.

During the FY 2016–2020 period, the proposed strategy goals include: (1) addressing resilience through restoration and conservation; (2) identifying opportunities to build long-term resilience of the Chesapeake Bay National Estuarine Research Reserve Properties; and (3) enhancing the data and stories on the Coastal Atlas. The mechanisms to achieve these proposed program changes may include new or revised authorities; new or revised State or local programs or implementing ordinances; new or revised coastal land acquisition, management and restoration programs; and/or new or revised guidelines, procedures or policies.

In addition, some of the work in this strategy may overlap and/or interface with issues and program changes identified in the ocean and coastal resources strategy. For example, there is a need to facilitate planning for working waterfronts as well as exchange knowledge and transfer best practices between working waterfront communities. We will assess how the Coastal Atlas is used for working waterfronts planning that addresses multiple water-dependent uses. It is anticipated that the combination of working waterfronts inventory, public access and recreational use data, and coastal hazards and natural resource data will be integral in the development of these plans. A story map will be created highlighting the successful policy, planning, and programmatic tools utilized by working waterfront communities and supported by CCS. These success stories will help inform other communities as to the policy and planning options available to them as well as help CCS

analyze which tools have been most effective.

Another example may be the use and evaluation of ocean data and how this can be used to update coastal policies related to ocean activities. In turn, this focus on ocean data would help to improve the management of resources and uses of the ocean environment.

III. Needs and Gaps Addressed

Identify what priority needs and gaps the strategy addresses and explain why the proposed program change or implementation activities are the most appropriate means to address the priority needs and gaps. This discussion should reference the key findings of the assessment and explain how the strategy addresses those findings.

A gap remains in CCS's ability to improve communication related to data and science translation amongst state programs and partners. There is a particular need to boost discussion about successful use of data to inform management decisions and clearly define what data can or should be used in certain planning actions. We believe we could fill this gap by showcasing examples of successful data to decision-making so that these stories may inspire similar utilization of data in other State and local decisions. There is also a need and interest in further addressing how Research Reserve data is applied in CCS projects and this strategy will work to address this gap.
As mentioned in the Coastal Hazards, Ocean Resources, Wetlands, Cumulative and Secondary Impacts, and Government Facility Siting enhancement area assessments, several needs and policy gaps exist that could benefit from more and better data. These include:

- Improving science translation into the hands of local communities, decision-makers, and the general public;
- Demonstrating what "resilience" looks like in an economic, planning, and development context;
- Updating existing or adding new coastal enforceable policies, legislation or guidelines to reflect data improvements;
- Utilizing data and information to avoid natural resource and human use conflicts.

IV. Benefits to Coastal Management

Discuss the anticipated effect of the strategy, including the scope and value of the strategy, in advancing improvements in the CMP and coastal management, in general.

CCS has had a long-established focus in collecting, developing, and distributing data to resource management partners, stakeholders, citizens and communities. One of the most successful examples of how coastal data is disseminated to these audiences is through the Coastal Atlas. While the Atlas has been an effective tool to share data and information, including that which has been collected from stakeholders themselves (e.g. recreational use data), more work is needed to move from data distribution to data application. The anticipated benefit to coastal management of this strategy is to move toward development of clear goals and outcomes for any data development that CCS pursues. Because Maryland utilizes geospatial and other data in many of its projects, it is anticipated that this work will have broad benefit to projects on many coastal management issues throughout the coastal zone.

V. Likelihood of Success

Discuss the likelihood of attaining the strategy goal and program change (if not part of the strategy goal) during the five-year assessment cycle or at a later date. Address the nature and degree of support for pursuing the strategy and the proposed program change and the specific actions the state or territory will undertake to maintain or build future support for achieving and implementing the program change, including education and outreach activities.

As noted above, CCS has identified that more work is needed to move from data development and distribution to data application and integration in a variety of coastal management challenges. To that end, CCS was successfully matched with a 2014-2016 Coastal Management Fellow to begin examining how to better utilize the State's coastal data and science in decision making. One of the first applications of this is focusing on the use of coastal hazards data for site planning at one of the State's Research Reserve sites where Coast Smart Construction guidelines are indicated and must be applied. Additionally, the fellow is also looking at how the State can improve the predictability of how stakeholder information - such as the recreational use data - is considered and integrated into planning and management.

In addition to these efforts, other CCS staff are working to translate coastal hazard, ocean, community, and habitat data and science into restoration and conservation practices, community resilience planning, and project siting. Due to these initial efforts and an increasing need to demonstrate how data and science are utilized, it is anticipated that there is a strong likelihood of success for this strategy. Further, there is strong support for beginning to work on program changes that demonstrate this data and science translation strategy. This strategy will work to outline consistent approaches and engage CCS and network partners to undertake data and science translation work. Some of these efforts will also more closely align with the CBNERR-MD program and regional ocean partner outcomes to meet the identified program changes.

VI. Strategy Work Plan

Using the template below, provide a general work plan that includes the major steps that will lead toward or achieve a program change or implement a previously achieved program change. If the state intends to fund implementation activities for the proposed program change, describe those in the plan as well. The plan should identify a schedule for completing the strategy and include major projected milestones (key products, deliverables, activities, and decisions) and budget estimates.

Strategy Goal 1: *Addressing Resilience through Restoration and Conservation*

Continued work is needed to advance State policy and promote on-the-ground implementation of Statewide coastal hazard, climate change and sea level adaptation strategies. CCS will work to conduct inventories of vulnerable resources and the built-environment (i.e., infrastructure, facilities); incorporate climate change adaptation strategies into State resource management plans; collaborate with federal partners to support regional and national adaptation planning; and implement and/or adopt priority recommendations of Maryland's Strategy for Reducing Maryland's Vulnerability to Climate Change (Phases I and II). The development of strategic restoration and conservation targeting frameworks can inform climate adaptation at multiple scales.

Total Years: 5
Total Budget: $383,000

Years: 1-5

Description of activities: DNR adopted a climate change policy in October 2010 to proactively seek the protection of lands that enhance the resilience of bay, aquatic and terrestrial ecosystems and/or mitigate the impacts of climate change through on-site carbon sequestration. Work will be completed to develop guidelines and policies to incorporate climate change adaptation criteria into land-acquisition programs, on-the-ground restoration practices, TMDL best management practices (BMPs), and planning and environmental review programs. These criteria will be rooted in the best available climate science and adaptation literature. Work will ensure that state investments in land and restoration efforts in the coastal zone will enhance the resilience of bay, aquatic and terrestrial ecosystems and/or mitigate the impacts of climate change by increasing on-site carbon sequestration or reducing coastal hazard impacts.

Outcomes:

1) *Coastal Resiliency Assessment.* A completed assessment of the coastal hazard risk and social vulnerability of coastal communities. Staff will evaluate the risk reduction benefits of existing natural infrastructure and establish priorities for conservation and restoration of natural features that enhance the resiliency of vulnerable coastal communities. CCS plans to coordinate with other agencies and programs to meet this outcome, including The Nature Conservancy, US Army Corps of Engineers, Maryland Department of Environment, Maryland Emergency Management Agency, Blackwater National Wildlife Refuge, The Conservation Fund, Eastern Shore Land Conservancy, Critical Area Commission, Maryland Forest Service, and local partners. The Coastal Resiliency Assessment will update DNR's restoration and conservation targeting process, inform the development of site management plans, and guide other on-the-ground projects so that climate impacts are considered throughout all facets of the decision-making process. The Assessment will result in a targeting framework grounded in climate science and natural and nature based feature research.
2) *Land investment policy and implementation criteria.* A significant amount of work has been completed to integrate coastal near-shore resources and sea level rise evaluations into the DNR Land Acquisition Program's decision-making processes. Furthermore, in 2013 DNR purchased its first Coastal Resilience Conservation Easement. CCS plans to continually pursue and review acquisitions for coastal resiliency benefits. Coastal resiliency priorities will be considered alongside the Sea Level Rise Adaptation Areas that were previously integrated into land acquisition scoring and review. To expand upon this successful model for the 2016–2020 strategy, work will be undertaken to identify how these data and approaches could be translated to other applications such as a Resiliency Master Plan, Maryland Commission on Climate Change work, CoastSmart Council evaluations and/or Critical Area discussions.
3) *Environmental review and comment criteria and guidelines.* Climate change and sea level rise will continue to be integrated into existing environmental review, comment practices, and planning efforts. This action will result in a Statewide effort to reduce vulnerabilities of projects and resources to these hazards and provide an opportunity to

identify mechanisms to reduce these risks.

4) *Restoration policy and design guidance*. Design and site selection of restoration and nature-based resiliency projects will become important adaptation responses to anticipated climate change stressors. CCS will work to integrate climate change into state restoration and BMP design guidance to ensure that state investments provide water quality, habitat, and coastal resiliency benefits over the long term. CCS will work with partners such as the Watershed Assistance Collaborative to explore climate impacts to green infrastructure function and implementation.

Budget: Year 1 = $115,000

Years: 2–5

Description of activities: CCS will explore and pursue restoration and shoreline enhancement opportunities that integrate multiple natural infrastructure components, such as oyster reefs and living shorelines, and provide risk reduction benefits to vulnerable coastal communities. Work will be conducted to connect state priorities and information to various stakeholders, including waterfront property owners, coastal restoration professionals, local governments, and coastal communities. This work will build off of the Coastal Resiliency Assessment developed in year 1.

Outcomes:

1) *Coastal Resiliency Restoration Demonstration.* Demonstration projects throughout tidal regions of the coastal zone will help CCS enhance coastal resiliency and communicate the benefits of blue and green infrastructure to local communities. CCS will work with other agencies and programs to identify, implement, and monitor priority restoration projects. Lessons learned from these projects will inform future restoration targeting. Funds from this strategy would be used to support staff to translate Resiliency Master Plan data to on the ground projects and project designs.
2) *Coastal Resiliency Assessment Outreach.* CCS will foster local partnerships and deliver restoration guidance to local governments to promote the use of natural infrastructure as a significant component of adaptation planning. Work will be conducted to communicate the results of the Coastal Resiliency Assessment to local partners and stakeholders through the Maryland Coastal Atlas. CCS will develop and provide regional trainings to share coastal resiliency spatial data with state and local planners such as State Park managers, *CoastSmart* Communities, or Working Waterfronts communities. Work will ensure that coastal resiliency data are integrated into decision-making.
3) *Coastal Resiliency Participatory Workshops.* CCS staff will develop and conduct participatory mapping workshops in 1 -3 communities to identify, map, and describe flooding hotspots or nuisance areas. Community input and mapping products will drive discussion about local green infrastructure needs, conflicts, or opportunities. CCS will explore the application of state natural infrastructure conservation and restoration priorities at a local scale by facilitating local planning discussions.

Budget: Year 2 = $67,000, Year 3 = $68,000 Year 4 = $7,000, Year 5 = $7,000

Strategy Goal 2: ***Identify Opportunities to Build Long-Term Resilience at the Chesapeake Bay National Estuarine Research Reserve sites***

Staff will evaluate the risk reduction benefits of existing natural infrastructure and establish priorities for conservation of natural and built features that enhance the resiliency and future use of Reserve properties, first starting with the Drawbridge Farm property at Monie Bay. CCS will coordinate with the Chesapeake Bay National Estuarine Research Reserve (CBNERR) throughout this process to identify priority infrastructure and opportunities to build resilience. The Assessment will inform the development of a 5-year site management plan for the Drawbridge property and be used to help guide management discussions at other sites as well.

Total Years: 2
Total Budget: $40,000

Years: 3-4

Description of activities and outcomes:

1) *Conduct Pilot Vulnerability Assessment*. The first portion of this effort will be to conduct an assessment of the Drawbridge Farm Property adjacent to the Monie Bay Reserve. In conjunction with CBNERR, staff will use the 2014 Climate Change and Coast Smart Construction Infrastructure Siting and Design Guidelines and results from SLAMM and storm surge modeling to determine which coastal hazards pose a threat to the existing infrastructure on the property. With input from the Reserve, CCS staff will conduct a GIS raster analysis to identify areas most at risk and create maps displaying vulnerable areas. This approach will be documented and in a manner similar to existing stewardship reviews, a template for site management considerations will be developed for transfer to other Reserve sites to inform management. Staff will work to transfer this assessment approach to other CCS and coastal sites and projects.
2) *Develop and Implement Site Plan*. CCS and CBNERR will use this assessment to inform the creation of a site plan for future management of the property. CCS and CBNEER will utilize this pilot assessment as a case study of data to decision-making. Since a critical data gap identified is the need to demonstrate what resilience looks like on the ground, it is anticipated that the Drawbridge Farm Property can serve as an implementable model for how sea level rise, storm surge, species, and ecological data can be used to inform how an area can adapt and respond to a changing climate. This approach will be a showcase for what some of the existing policies look like - for example, the Coast Smart Construction guidelines.

Budget: Year 3 = $20,000, Year 4 = $20,000

Strategy Goal 3: ***Coastal Atlas Data Translation***

CCS will build on current mapping capabilities available on the Coastal Atlas for determining hazard vulnerability in the coastal zone. Products and services available on the Coastal Service will provide a mechanism to ensure State and local planning considers shoreline, ocean, and estuary data. Integrating these datasets into decision-making will help reduce future impacts associated with shore erosion, coastal flooding, and sea level rise; address coastal use conflicts; protect State targeted ecological areas; and ultimately infuse data into natural resource decision-making. The following

activities and outcomes will not be developed independently. Rather, as projects are identified in other strategies, data and science will be considered as a component of each end goal and the CCS will work to highlight how the data and science contributed to the program change.

Total Years: 5

Total Budget: $120,000

Years: 1-4

Description of activities and outcomes:

1) *Evaluate Data Translation Approaches and Tailor Data to Management Needs*. Data products and services will provide a mechanism to further State and local planning to reduce future impacts associated with shore erosion, coastal flooding, and sea level rise.; ocean resources and coastal uses.
2) *Explore "Story Map" Options*. With the growing challenge of balancing resource conservation with allocation of space for existing and developing ocean and coastal uses, there is a growing need to present this spatially-referenced data in a user-friendly format. The current Coastal Atlas largely satisfies this need, but as seen with other State CZM Programs (such as the New York Department of State Geographic Information Gateway) and the Mid-Atlantic Regional Council on the Ocean (MARCO) Data Portal, mapping portals tend to be more useful if there is a clear connection between the data and the decisions those data were used to inform. In order to accomplish this strategy, CCS must first take stock of the current Coastal Atlas interface and determine a way to incorporate storytelling capabilities into the existing template. Currently, the mapping interface is hosted via Maryland iMap, which is a consistent template for all Maryland map services. To refine the existing capabilities, CCS will work with Maryland Department of Information Technology to identify ways to modify the existing template to accommodate greater storytelling capabilities.

Budget: Year 4 = $60,000

Year: 5

Description of activities and outcomes:

1) *Develop Story Map and Data Translation Template*. Work internally, and with a contractor if necessary, to develop a new online template to display the story map information. Ideally this template will be incorporated into the existing Coastal Atlas data portal interface. Optional templates are also available through the ArcGIS Esri website.
2) *Generate Story Maps*. We anticipate the mapping interface could be used to showcase examples or stories that highlight how CCS has used data to inform decision-making in the past, or how new data are envisioned to be used in ongoing coastal management projects. For example, one story could be to highlight the use of ocean data (e.g. commercial fishing, recreational diving, charter whale watching, etc.) to inform the siting of an offshore wind energy area. Story maps may also share the underlying drive for data collection or management decisions. For example, maps may highlight working waterfronts projects, success stories, or community needs through interviews, historical photographs, or exploration of the working waterfronts inventory.

Budget: Year 5 = $60,000

VII. Fiscal and Technical Needs

A. *Fiscal Needs:* *If 309 funding is not sufficient to carry out the proposed strategy, identify additional funding needs. Provide a brief description of what efforts the CMP has made, if any, to secure additional state funds from the legislature and/or from other sources to support this strategy.*

None at this time for this strategy.

B. *Technical Needs**: If the state does not possess the technical knowledge, skills, or equipment to carry out all or part of the proposed strategy, identify these needs. Provide a brief description of what efforts the CMP has made, if any, to obtain the trained personnel or equipment needed (for example, through agreements with other state agencies).*

The Mid-Atlantic and other coastal areas around the county have many examples of how to communicate data applications. CCS may need to capitalize on these examples, possibly in conjunction with Mid-Atlantic NOAA staff or others in OCM to create compelling stories. Further, there may be a need to work with a contractor to help in story map development.

VIII. Projects of Special Merit (Optional)

If desired, briefly state what projects of special merit the CMP may wish to pursue to augment this strategy. Any activities that are necessary to achieve the program change or that the state intends to support with baseline funding should be included in the strategy above. The information in this section will not be used to evaluate or rank projects of special merit and is simply meant to give CMPs the option to provide additional information if they choose. Project descriptions should be kept very brief (e.g., undertake benthic mapping to provide additional data for ocean management planning). Do not provide detailed project descriptions that would be needed for the funding competition.

None at this time for this strategy.

5-Year Budget Summary by Strategy

At the end of the strategy section, please include the following budget table summarizing your anticipated Section 309 expenses by strategy for each year.

Strategy Title	**Year 1 Funding**	**Year 2 Funding**	**Year 3 Funding**	**Year 4 Funding**	**Year 5 Funding**	**Total Funding**
Enhancing Resilience to Coastal Hazards and Climate Change	$163,000	$163,000	$186,000	$191,000	$166,000	$869,000
Coastal and Ocean Resources and Uses	$230,000	$278,000	$234,000	$230,000	$275,000	$1,247,000
Science to Decision Making	$115,000	$67,000	$88,000	$87,000	$67,000	$424,000
Total Funding	$508,000	$508,000	$508,000	$508,000	$508,000	$2,540,000

5. SUMMARY OF STAKEHOLDER AND PUBLIC COMMENT

Coastal Zone Management Act §309
Assessment and Strategy
2016-2020

SUMMARY OF STAKEHOLDER AND PUBLIC COMMENT

Stakeholder Engagement

As part of the development of this document, CCS worked with a variety of partners and stakeholders to discuss enhancement areas, needs and gaps in coastal management and how the Program could help fill some of these needs in a way that is complementary to other work underway. As such, feedback was collected through a variety of work groups and standing committees. Additionally, Maryland's 312 evaluation in August 2014 presented a timely opportunity to gather feedback about the Program's strengths, work and priorities. Feedback from these discussions was considered and is reflected in the document.

Specifically, feedback from the 312 identified that the Programs' Strengths were in Collaboration / partnerships / engagement; providing financial and technical assistance to local partners and outreach. Stakeholders identified that this work centered around two main issues: climate change/resilience/storm response and ocean planning and wind energy. Feedback was also gathered that the Program is challenged by major issues like resiliency and stormwater and splits in federal consistency responsibilities. This document strives to address some of this feedback through work proposed over the next five years.

Public Participation and Comment

Upon submitting Maryland's Coastal Zone 309 Enhancement Plan as a draft to NOAA's Office of Coastal Management (OCM) in May 2015, CCS plans to expand coordination of public review and comment through the CCS website (http://dnr.maryland.gov/ccs/) and a May/June issue of the Program's *In The Zone* electronic newsletter.

The public comment period for Maryland's Draft §309 Assessment and Strategy was held between June 1, 2015 and June 30, 2015. CCS discussed the draft with a number of partners and no major concerns needed to be addressed.