



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT
Silver Spring, Maryland 20910

APR 06 2011

Matt Fleming, Director
Maryland Chesapeake and Coastal Program
MD Department of Natural Resources
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Annapolis , MD 21401

mett
Dear Mr. Fleming:

The Office of Ocean and Coastal Resource Management (OCRM), Coastal Programs Division (CPD), has completed review of Maryland's 2010 Coastal Zone Management Act (CZMA) Section 309 Final Assessment and Strategy received by OCRM on February 11, 2011. We commend you and your staff on your efforts. OCRM is pleased to inform you that we approve Maryland's Assessment and Strategy. OCRM further concurs with the State's designated priority levels for the nine enhancement areas.

The Maryland Coastal Management Program (MD CMP) is eligible for FY2011-2015 weighted formula funds to implement the work plan as presented in the State's Strategy. The MD CMP is also eligible to apply for Projects of Special Merit competitive funding to support those Strategies that focus on one or more of the priority enhancement areas objectives: Wetlands; Hazards; Cumulative and Secondary Impacts; and Ocean and Great Lakes Resources (including planning for offshore energy uses).

We appreciate the time and effort you and your staff put into this process, as well as your continued support and participation in the Enhancement Grants Program. We also appreciate your program's collaboration with CPD staff in completing the documents. OCRM looks forward to working together to achieve the goals you have set for Maryland, and again we offer our congratulations.

Sincerely,

JR
John R. King

John R. King
Chief, Coastal Programs Division



MARYLAND'S COASTAL ZONE ENHANCEMENT PLAN



Coastal Zone Management Act §309
Assessment and Strategy
2011-2015

Submitted
February, 2011

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



HEALTHIER BAYS, OCEAN AND COAST AND A BETTER FUTURE FOR MARYLAND'S COMMUNITIES

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LIST OF ACRONYMS

AEZ	Aquaculture Enterprise Zone
ARE	Aquatic Resource Education
BMP	Best Management Practice
BOEMRE	U.S. Bureau of Ocean Energy, Management, Regulation and Enforcement
BRAC	Base Realignment and Closure
CB-NERR	Chesapeake Bay National Estuarine Research Reserve
CCI	Coastal Communities Initiative
CCP	Chesapeake and Coastal Program
CELCP	Coastal and Estuarine Land Conservation Program
CMP	Coastal Management Program
CMSP	Coastal and Marine Spatial Planning
CSI	Cumulative and Secondary Impacts
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
D-FIRMS	Digital Flood Insurance Rate Maps
DHMH	Department of Health and Mental Hygiene
DNR	Department of Natural Resources
EPA	Environmental Protection Agency
EVA	Erosion Vulnerability Assessment
FEMA	Federal Emergency Management Agency
LiDAR	Light Detection and Ranging
LPPRP	Land Preservation and Parks & Recreation Plans
MARCO	Mid-Atlantic Regional Council on the Ocean
MCBP	Maryland Coastal Bays Program
MDA	Maryland Department of Agriculture
MDP	Maryland Department of Planning
MDE	Maryland Department of the Environment
ME2	Maryland Ecosystem Enhancement Program
MEA	Maryland Energy Administration
MEIRS	Maryland Electronic Inventory of Recreation Sites
MEMA	Maryland Emergency Management Agency
MGS	Maryland Geological Survey
NHT	National Historic Trail
NOAA	National Oceanic and Atmospheric Administration
OCS	Outer Continental Shelf
PFA	Priority Funding Area
POS	Program Open Space
RPC	Routine Program Change
SAMP	Special Area Management Plan
SHMP	State Hazard Mitigation Plan
TEA	Targeted Ecological Area
TMDL	Total Maximum Daily Load
USGS	United States Geological Survey

1. INTRODUCTION



"Through our work with the Chesapeake & Coastal Program, we are able to effectively partner with local land trusts to increase their capacity to foster land conservation throughout Maryland's coastal zone. Through this partnership, Maryland Environmental Trust has protected thousands of acres from future development through hundreds of conservation easements."

– Elizabeth Buxton, Director
Maryland Environmental Trust
2010

1. INTRODUCTION

From the Chesapeake Bay to the Atlantic Ocean, Maryland's extraordinary coastal resources contribute to its economy, environment and quality of life. With these remarkable resources comes an obligation of stewardship. Coastal resources must be protected and conserved, yet communities must be able to thrive economically. A balance is needed between the human demands and the conservation of the resources that makes Maryland such a unique place to live, work and play. Maryland's Chesapeake and Coastal Program works to achieve that balance.

NATIONAL ISSUES – LOCAL SOLUTIONS

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 Resource Management (OCRM), 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. In 2007 the State of Maryland consolidated the administrative and management functions of the CZMA and Environmental Protection Agency (EPA) Section 117 Awards as well as State's Chesapeake and Atlantic Coastal Bays Trust Fund to a single program – forming the Chesapeake and Coastal Program (CCP). By shifting from a decentralized, program-specific approach, to a more centralized objective-based approach, the program is better able to leverage core competencies from different programs, avoid duplicate efforts, leverage and efficiently prioritize resources to advance the goals of the CZMA.

HOW THE MARYLAND CHESAPEAKE AND COASTAL PROGRAM IS ORGANIZED

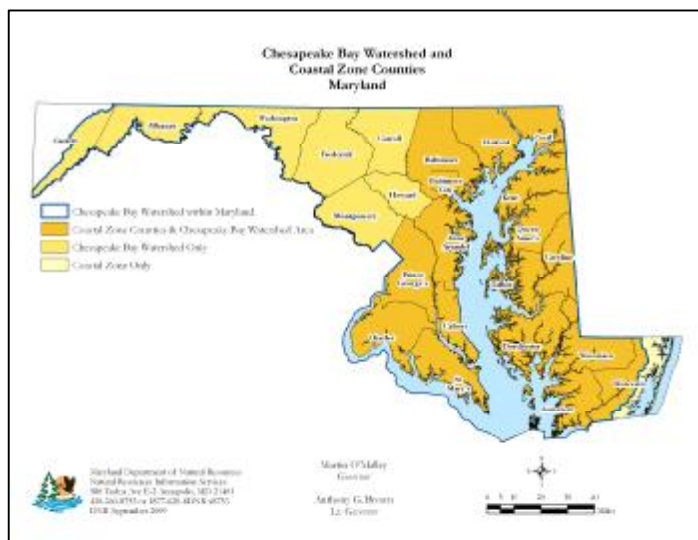
CCP, administered by the State Department of Natural Resources, is a partnership among local, regional and state agencies. It also collaborates with many private organizations such as local land trusts and economic development groups. Through this networked approach, no one agency or department is responsible for Maryland's entire coast. Rather, all partners help to ensure its proper management.

BUILDING ON SUCCESS: THE CHESAPEAKE AND COASTAL PROGRAM AT WORK

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. CCP 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, CCP constantly seeks ways to improve coastal management.

WHERE WE WORK

The Maryland coastal zone is comprised of 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 Maryland 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.



SUMMARY OF THE 2011-2015 ASSESSMENT AND STRATEGY

Section 309 of the CZMA 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. Maryland's Enhancement Plan includes the 2010 assessment of these issues. State priorities have been developed and the strategies outlined in this document will guide our program enhancement efforts over the next five years, from 2011–2015.

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 CCP 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 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	2010 Priority	2005 Priority	2000 Priority
Wetlands	Medium	Medium	Medium
Coastal Hazards	High	High	High
Public Access	Medium	Medium	Medium
Marine Debris	Low	Low	Low
Cumulative and Secondary Impacts	High	High	High

Special Area Management Planning	Low	Medium	Medium
Ocean Resources	High	High	Medium
Energy and Government Facility Siting	Medium	Low	Low
Aquaculture	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; 5) and the track record of addressing the topic in previous enhancement efforts.

HIGH PRIORITY ISSUES FOR CZMA SECTION 309 ENHANCEMENT FUNDS

Over the next five years, the CCP will use CZMA Section 309 funds to integrate coastal hazard and sea level rise adaptation planning and coastal and marine spatial planning into state and local management plans, programs and authorities. Strategies that will be undertaken include:

- § Improving the capacity at the local level for carrying out local adaptation and coastal growth and development planning through trainings, planning tools, local grants and technical assistance.
- § Updating State and local land acquisition programs to incorporate coastal habitat and sea level rise adaptation strategies.
- § Updating State-owned facility and infrastructure procedures to reduce greenhouse gas emissions and to minimize hazard and sea level rise impacts.
- § Integrating adaptation and mitigation strategies into natural resource management plans and procedures.
- § Applying coastal and marine spatial planning techniques to human use and resource management challenges throughout Maryland's coastal waters.
- § Developing guidance on the siting of offshore energy facilities in coastal and marine waters.
- § Identifying coastal and marine areas suitable for enhanced management or protection.
- § Exploring opportunities to conserve or establish water-dependent uses and working waterfronts.

DESCRIPTION OF THE 309 ASSESSMENT & STRATEGY DEVELOPMENT PROCESS

Beginning in January 2010, CCP staff initiated the Assessment and Strategy development by engaging the appropriate State and Local partners. Draft assessments were completed in July 2010, and meetings were held to discuss strategy development for the FY 2011-2015 strategy timeframe. In addition to the needs and gaps identified in the draft assessments and feedback received from partners, CCP staff consulted a number of additional resources outlining coastal management needs and program recommendations to identify strategy connections. Maryland's Enhancement Plan was developed with the guidance provided by John Kuriawa, Maryland's NOAA OCRM Coastal Program Specialist and thanks in part to the contributions of representatives from the following agencies, institutions and programs:

- § The Coastal and Watershed Resources Advisory Committee
- § 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

PUBLIC COMMENTS

Upon submitting Maryland's Enhancement Plan as a draft to NOAA's OCRM on October 1, 2010, CCP coordinated public review and comment through the CCP website, a November/December issue of the Program's *In The Zone* electronic newsletter and via the Coastal and Watershed Resource Advisory Committee (CWRAC). Established in 1976, CWRAC is an advisory committee comprised of representatives of local government, concerned local citizens, special interest groups, state and federal agencies and academic institutions. CWRAC acts as an independent advisory body to the Secretary of Natural Resources and to CCP on policy issues affecting the coastal areas of Maryland.

The public comment period for Maryland's Draft §309 Assessment and Strategy opened on October 29, 2010 and closed on December 3, 2010. CCP received official comments from the Maryland Department of Environment (MDE), two CWRAC members designated as lead §309 reviewers and the NOAA Office of Ocean and Coastal Resource Management (OCRM).

Comment Summary from MDE:

The reviewer suggested several revisions to better reflect the roles that MDE and DNR played in jointly developing a series of living shorelines workshops and enacting the Living Shorelines Protection Act of 2008. The reviewer also provided comments to clarify the suite of data used to develop targeting for an MOU designed to pursue an ecosystem approach to mitigation in transportation projects. The reviewer suggested several edits related to mitigation bank language in the wetlands assessment. Related to the "regulatory enforcement of wetland impacts" gap identified in the SAMP assessment, the reviewer provided an update that a significant amount of progress had been made to increase compliance and address this gap.

In response to the comments received from MDE, CCP incorporated many of the suggested edits into the program accomplishments section and the wetlands, coastal hazards and cumulative and secondary impacts assessments. CCP revised the priority needs and information gaps in the SAMP assessment to reflect recent progress made in Maryland to ensure compliance with wetland regulations.

Comment Summary from CWRAC:

Lead §309 reviewers from CWRAC provided comments and recommendations for CCP to: 1) conduct an analysis of geographic areas where sea level rise-related planning should be focused and where performance indicators could be developed to measure progress toward adaptation, 2) clarify the relationship between sea level rise adaptation and restoration activities, 3) and make edits to the Coastal Hazard and Climate Change Adaptation Planning strategy to better convey how proposed activities could help Maryland prepare for vulnerabilities related to future coastal growth and development. Additional comments from the reviewers were related to formatting and editing.

In response to the comments received from CWRAC, CCP identified several ways that the Program could geographically provide information about CZM-funded project progress, sea level rise vulnerability and associated progress toward reducing vulnerability. To demonstrate progress related to adaptation planning, CCP will prepare project summaries and/or Coastal Atlas data updates over the next several years as activities related to the *CoastSmart* Communities Initiative are undertaken. In response to comments about the relationship between sea level rise adaptation and restoration activities, edits were made to the Coastal Hazards and Climate Change Adaptation Planning strategy and will also be made to the Program website and the Coastal Atlas. These updates will clarify how the 2009–2011 NOAA Coastal Management Fellow's project improves the State's ability to adapt to the potential impacts of sea level rise and climate change through coastal habitat conservation and restoration efforts.

To respond to the comment about how the Coastal Hazards and Climate Change Adaptation Planning strategy could better address coastal sea level rise vulnerability related to growth and development, CCP made a series of edits. More information was included to describe the technical and financial assistance that would be made available through the *CoastSmart* Communities Initiative to support local government adaptation planning in areas where population is projected to increase over the coming decades. Additionally, information was added to the strategy describing specific facility and infrastructure site design and construction recommendations from Phases I and II Climate Change Strategies that will be pursued during this strategy timeframe.

Comment Summary from NOAA OCRM:

Comments received from NOAA OCRM pertained to: 1) edits and updates to the Wetlands enhancement area assessment, 2) ensuring that policies mentioned in the program accomplishments and assessment sections were consistent with those outlined in the 2010 Routine Program Change (RPC) document, 3) clarifying how key gaps and needs in assessments were or were not addressed in the strategies, 4) and edits and updates needed to provide more specific information describing anticipated outcomes and budgets in the two strategies.

In response to these comments, CCP worked with MDE to update the Wetlands assessment and coordinated with DNR staff involved with the RPC to ensure that policies in the Assessment and Strategy were consistent with the RPC document. CCP made a series of updates to several of the Assessment Area Prioritization sections to ensure that the program outcomes outlined in the two strategies were consistent with the descriptions of how the gaps and needs of individual assessments would be addressed. CCP edited both of the strategy work plans to outline more specific anticipated program outcomes, elaborate on the descriptions of activities associated with these outcomes and provide more details about the annual budget estimates for each outcome.

2. ACCOMPLISHMENTS



"Land planning decisions in coastal areas along the Chesapeake Bay shoreline are made primarily by local municipalities. Without support from the Chesapeake and Coastal Program, Queenstown and any other small municipalities wouldn't not have the necessary tools to help local communities prepare for future storm events and shoreline change and to protect our valuable water resources."

– Kathy Boomer
Queenstown Planning Commission
2010

2. SELECT ACCOMPLISHMENTS COMPLETED USING 309 FUNDS

This is the fourth 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 2005 was tied to advancing the management of 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 near shore 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.*

COASTAL HAZARDS

The goal of the Coastal Hazard Strategy during the 2006–2010 period was to integrate coastal hazard planning measures into the State and local level decision-making processes. Funding through CZMA has helped the CCP 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 CCP has undertaken a number of hazard related efforts accomplished through Section 309 funds.

Statewide Climate Change Adaptation Planning

In April 2007, the State established the Maryland Commission on Climate Change (MCCC) through Executive Order 01.01.2007.07. The principle charge of the MCCC was to develop a Plan of Action to address the drivers and causes of climate change; prepare for the likely consequences and impacts of climate change to Maryland, and establish firm benchmarks and timetables for implementing the Commission's recommendations. Early accomplishments included the passage of two bills in the 2008 legislative session – the Living Shorelines Protection Act of 2008 and administrative and enforcement provisions for the Chesapeake and Atlantic Coastal Bays Critical Areas Protection Program. The Living Shorelines Protection Act of 2008 established the requirement of living shorelines or softer shoreline erosion control practices, as the first option for shoreline erosion control projects. It is anticipated that this Act will reduce the level of threat to shoreline and beach resources due to shoreline hardening and erosion. The second bill updated the jurisdictional boundary for the Chesapeake and Atlantic Coastal Bays Critical Areas Act to take sea level rise and future shoreline position into critical area mapping, established regulatory authority for the Critical Areas Commission, and expanded the criteria for growth allocations to include provisions for coastal hazards. Both of these legislative accomplishments are addressed as part of CCP's November 2010 RPC request (<http://dnr.maryland.gov/ccp/pdfs/mdrpc.pdf>).

In August 2008, the MCCC released the State's Climate Action Plan which included 19 policy recommendations aimed at reducing the State's vulnerability to sea level rise and coastal storms. The guiding principles supporting the policies include promoting programs and policies aimed at the avoidance and/or reduction of impact to the existing built environment, as well as to future growth and development in vulnerable coastal areas; shifting to sustainable economies and investments and avoiding the assumption of the financial risk of development and redevelopment in highly hazardous coastal areas; enhancing preparedness and planning efforts to protect human health, safety, and

welfare; and protecting and restoring Maryland's natural shoreline and its resources, including its tidal wetlands and marshes, vegetated buffers, and Bay islands. The following is a summary of key implementation activities for those policy recommendations as of September 2010.

Policy Name	Implementation Accomplishments
Public Awareness, Outreach, Training & Capacity Building <i>ARWG-1</i>	<p>Numerous agencies and organizations are conducting activities in implementing this policy recommendation. DNR examples include:</p> <p><u>Trainings and Workshops</u></p> <ul style="list-style-type: none"> Coastal flooding and sea level rise forum on Kent Island Numerous living shorelines workshops for homeowners and industry professionals, in partnership with MDE Workshop for Communicating the Climate Change Message to Various Audiences Two-day Coastal Inundation Mapping Course in partnership with NOAA Coastal Service Center and the Coastal Training Program <p><u>Online Resources</u></p> <ul style="list-style-type: none"> Smart Green & Growing website <i>CoastSmart</i> Communities Online Resource Center Coastal Atlas <p><u>Other</u></p> <ul style="list-style-type: none"> Completed a compilation of State climate change planning and policy approaches, and identified best practices to enhance adaptation at the regional scale in the MARCO states
Local Government Planning Guidance <i>ARWG-2</i>	<ul style="list-style-type: none"> Completed sea level rise guidance documents for Worcester, Somerset and Dorchester Counties Awarded technical assistance and funding for 4 <i>CoastSmart</i> Communities projects: City of Annapolis, Anne Arundel County, Caroline County and the Town of Queenstown Launched the <i>CoastSmart</i> Communities Online Resource Center Online mapping tools made available through Maryland's Coastal Atlas
Future Adaptation Strategy Development <i>ARWG-3</i>	<ul style="list-style-type: none"> Maryland DNR and UMD Center for Environmental Science initiated the Phase II Adaptation & Response Working Groups in December 2009. The Phase II Strategy is anticipated for formal approval by the MCCC in November 2010.
Integrated Planning - State <i>FBEI-1A</i>	<ul style="list-style-type: none"> DNR participating in the State's Smart Growth subgroups to promote sea level rise and coastal hazard planning objectives in Smart Growth activities. MDOT, DNR, SHA, MDTA, MPA, MAA have/or are in the process of incorporating climate change into their strategic planning process. DNR "lead by example" workgroup formed to identify opportunities within DNR for planning and design of coastal infrastructure on State properties.
Integrated Planning - Local <i>FBEI-1B</i>	<ul style="list-style-type: none"> Created the <i>CoastSmart</i> Communities Initiative to provide financial and technical assistance to local municipalities for coastal hazards and sea level rise response planning. Awarded technical assistance and funding for 4 <i>CoastSmart</i> Communities projects: City of Annapolis, Anne Arundel County, Caroline County and the Town of Queenstown.
Adaptation-Stat <i>FBEI-2</i>	<ul style="list-style-type: none"> Implemented a system of performance measures for seven priority policy options through the Governor's Delivery Unit, ultimately tracking Maryland's steps for reducing its vulnerability to climate change and sea level rise.

Climate Change Insurance Advisory Committee <i>FBEI-5</i>	<ul style="list-style-type: none"> The Maryland Insurance Commissioner convened the Climate Change Insurance Advisory Committee (CCIAC) to advise the State of the risks that climate change poses to the availability and affordability of insurance. A draft report has been submitted to the Commissioner for review.
GIS Mapping, Modeling and Monitoring <i>FBEI-6</i>	<ul style="list-style-type: none"> Developed and released MD iMap Completed pilot project mapping of updated critical area boundaries for Baltimore and Talbot Counties Completed sea level rise vulnerability mapping based on land elevation for all but three areas: Harford County, Baltimore City, and Prince George's County Online mapping tools made available through Maryland's Coastal Atlas
Economic Development Initiative <i>FBEI-8</i>	<ul style="list-style-type: none"> DBED is implementing this policy recommendation in coordination with implementation of the MCCC's Mitigation Working Group (MWG) policy option CC-9, which is aimed at promoting economic development opportunities associated with reducing greenhouse gas emissions in Maryland.
Integrated Observation Systems <i>EBEI-2</i>	<ul style="list-style-type: none"> Released draft report on Chesapeake Bay Watershed Climate Change Impacts, which included key recommendations related to integrated observations systems Established partnerships with NOAA, EPA, U.S. Army Corps and U.S.G.S. to enhance coordination of federal, state, local, and regional observation systems to improve the detection of climate change and sea level rise impacts.
Adaptation of Vulnerable Coastal Infrastructure <i>EBEI-3</i>	<ul style="list-style-type: none"> The Maryland Historical Trust (MHT) completed the first phase of its analysis of Maryland's historical, archaeological and cultural resources vulnerable to sea level rise. MPA completed a Climate Change Vulnerability Assessment Report to estimate the effects of local sea level rise and storm surge for multiple scenarios for facilities owned, managed or planned. SHA and the MTA have developed a draft strategic plan for climate change adaptation, identifying short and long-term actions, a GIS application for identifying asset vulnerability, and began an infrastructure analysis.
Building Codes <i>FBEI-8</i>	<ul style="list-style-type: none"> Participated in the 2009 ICC Annual Conference and Codes Development Hearings Adopted 2009 International Codes into the MBPS along with the State of Maryland Performance Code (MPC) for industrialized/modular buildings. Subsequently, local code jurisdictions adopted the new version of the MBPS. Statewide training was conducted on the new MBPS. As required under Section 2 of the Omnibus Coastal Property Insurance Reform Act of 2009 (Act), Chapter 540 (House Bill 1353), DHCD conducted reviews and prepared a report to members of the Senate Finance Committee and House Economic Matters Committee (Members) on enhanced building codes for coastal regions that promote disaster-resistant construction. The report is scheduled for delivery to Members by October 1, 2010; the report will also be provided to planning boards of coastal counties.
Disclosure <i>EBEI-10</i>	<ul style="list-style-type: none"> Staff from DHCD, DNR, and OAG held a preliminary meeting to discuss suitable recommendations for a disclosure or advisory statement to inform prospective coastal property purchasers of potential impacts of climate change and sea level rise on the property being transferred.
Natural Resource Protection Areas <i>RRI-1</i>	<ul style="list-style-type: none"> Launched GreenPrint interactive website to map ecological land conservation priorities and track accomplishment of State funded land conservation programs Completed Phase I rollout of Blue Infrastructure identifying near-shore aquatic conservation targets DNR partnered with NOAA to host a workshop to begin identifying climate change adaptation strategies that could be addressed through land conservation efforts, and refine specific criteria for landscape and parcel level applications. DNR assisted in designing a Climate Change and Green Infrastructure course at the

	<p>National Conservation Teaching Center (NCTC).</p> <ul style="list-style-type: none"> DNR has begun developing a model to target the new priority areas using a marsh migration model and existing blue and green infrastructure priority areas.
<p>Forest and Wetland Protection <i>RRI-2</i></p>	<ul style="list-style-type: none"> DNR has begun developing additional land conservation targeting criteria that primarily focused on wetland protection under future sea-level rise scenarios. Completed the final near-shore Blue Infrastructure assessment and updated targeting criteria. These results have been integrated into natural resource protection efforts through land acquisition and project review.
<p>Shoreline and Buffer Area Management <i>RRI-3</i></p>	<ul style="list-style-type: none"> Jointly with MDE, developed and adopted final regulations to implement the Living Shoreline Protection Act of 2008. Updated the jurisdictional boundary for the Chesapeake and Atlantic Coastal Bays Critical Areas Act in the 2008 legislative session to take sea level rise and future shoreline position into critical area mapping. Conducted numerous living shorelines workshops for homeowners and industry professionals Developed the Living Shoreline Suitability Tool for Calvert, Somerset, and Worcester Counties.
<p>Resource-Based Economic Initiative <i>RRI-4</i></p>	<ul style="list-style-type: none"> Implementation of this policy is dependent on funding availability.
<p>Health Impact Assessments <i>HHSW-1</i></p>	<ul style="list-style-type: none"> Continued to consider implementation measures for this policy recommendation to evaluate the public health consequences of climate change and sea level rise-related projects and/or policies, in coordination with MWG policy option CC-11, which recommends the evaluation of climate change policy options to determine projected public health risks, costs, and/or benefits.
<p>Inter-Agency Coordination <i>HHSW-2</i></p>	<ul style="list-style-type: none"> DHMH continued to consider implementation measures for this policy recommendation to strengthen coordination and management across agencies responsible for human health and safety.
<p>Vector-borne Surveillance and Control <i>HHSW-9</i></p>	<ul style="list-style-type: none"> DHMH continued to consider implementation measures for this policy recommendation to develop a coordinated plan to assure adequacy of vector-borne surveillance and control programs.

Local Government Hazard Preparedness

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, CCP created the *CoastSmart* Communities Initiative 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. An updated version of the original Shorelines Online, 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 following are select local *CoastSmart* Communities projects funded through Section 309 during the 2006 – 2010 Period.

- § *City of Annapolis Sea Level Rise Adaptation and Response Plan: Vulnerability and Impact Assessment and the Policy Response Option Analysis (2010)*. The City of Annapolis is currently conducting an assessment of the City Dock area of the historic district and Eastport neighborhood for sea level rise and storm surge impacts. The assessment will include: the identification and mapping of areas susceptible to flooding now and in the future; identification of structural and non-structural options for protecting property identified in flood threatened areas; review of fixed and temporary flood barriers; identification of infrastructure modifications, such as storm drains and sewer pipes, and the installation of stormwater pumping stations; estimation of design and construction costs associated with various options for structural and non-structural protection of flood threatened areas; and the identification of short-term, mid-term and long-term planning goals.
- § *Town of Queenstown: Integrated Community and Watershed Design Project (2010)*. Queenstown is preparing an Integrated Community Design Document to address the growth in the town's planning area, ensuring it will be compatible with the town's rural waterfront village character. The Town's Draft Community Plan introduces for the first time the use of Category 4 Hurricanes for determining storm surge levels and sensitive areas. As a part of this project, criteria will be established requiring any development activity to directly address mitigation of sea level rise effects and to incorporate mechanisms to address climate change.
- § *Caroline County: Improving Caroline County's Floodplain and Stormwater Management (2010)*. Caroline County is utilizing funds to improve their Floodplain and Stormwater Management programs. The County is identifying flood prone areas, sea level rise impacts, and areas affected by storm surge to assist with the rezoning in the floodplain, as well as sharing the information with Caroline County Emergency Management for potential inclusion in future Hazard Mitigation plans.
- § *Anne Arundel County Sea Level Rise Strategic Plan (2010)*. Anne Arundel County is working through an interagency project team to conduct a vulnerability assessment to identify potential areas of sea level rise and storm surge inundation, assess trends and predict impacts of shoreline erosion, and develop complete inventories of resources at risk. The County proposes to take the findings of this work to develop a sea level rise strategic plan that establishes policies and a framework of priority actions to protect resources and minimize impacts.
- § *Town of Crisfield: Strategic Revitalization Plan for the Town of Crisfield and Technical Appendices (2008)*. In April 2005, Crisfield was designated as a Maryland Priority Place, a State program designed to assist communities and facilitate well-planned development and community revitalization by integrating smart growth principles in city efforts. This project supported the development of a Strategic Revitalization Plan (SRP) to guide the way for the future re-development, while outlining a strategy to maintain the vital coastal character, public access and protection of Crisfield's natural resources. The SRP includes a data inventory and analysis, stakeholder interviews, economic, market and natural resource analysis, design charrettes and

recommendations in order to explore economic development and redevelopment opportunities and infill scenarios for Crisfield's downtown and Somers Cove marina.

- § *Somerset County, Rising Sea Level Guidance (2008)*. Somerset County utilized funds to assess the County's vulnerability to sea level rise and to review and develop workable revisions to the County's plans, development codes, and regulations to mitigate the identified impacts. The recommendations address suggested modifications to the County's planning and regulatory mechanism, including the Floodplain Management Ordinance/Building Code, Zoning Ordinance, Subdivision Regulations, Comprehensive Plan, and Hazard Mitigation Plan.
- § *Worcester County, Sea Level Rise Response Strategy (2008)*. Following development of the Worcester County Sea Level Rise Inundation Model (2006) that depicts both the impact of gradual sea level rise inundation over time, as well as impacts associated with increased storm surge from episodic flood events, the County adopted its 2006 Comprehensive Plan. This Plan called for the development of a Sea Level Rise Response Strategy; directed future growth to areas outside of Category 3, Hurricane Storm Surge boundaries; and discouraged hard shoreline stabilization. This project utilized funds to support a planning consultant to assist Worcester County with the development of the Sea Level Rise Response Strategy, as called for in the Comprehensive Plan.
- § *Dorchester County, Sea Level Rise: Technical Guidance for Dorchester County (2008)*. With nearly 60% of Dorchester County lying within the 100-year floodplain, it is by far one of Maryland's most vulnerable counties to sea level rise. This project supported a review of all existing long-range and comprehensive planning documents, county codes, regulations, plans and ordinances to determine whether sea level rise or coastal hazard mitigation has been addressed in any of these documents and where it could be incorporated. Additionally, the report provides guidance and recommendations for public education and outreach, and a summary of financial and technical needs to facilitate implementation.

OCEAN RESOURCES

Under the Ocean Resources Enhancement Area, the Enhancement Plan focused on: (1) the creation of an Aquatic Resources Network that would enable the State to better understand and manage its aquatic and near shore resources, and (2) the development of a foundation that would serve as the institution for future ocean policy. The following is a selection of accomplishments completed using Section 309 funding within this Enhancement Area.

Aquatic Resources Network (Blue Infrastructure)

During the 2006–2010 strategy period, CCP used Section 309 funds to support the development and completion of Maryland's Blue Infrastructure Assessment (BI). Staff undertook and completed a detailed spatial assessment of coastal habitat, critical natural resources, and associated human uses in the tidal waters and near-shore areas of Maryland's coastal zone. CZMA funded staff worked with resource managers across the state, which included everything from oyster, clam and mussel habitats, submerged aquatic vegetation beds, access structures, to fish spawning and nursery areas. This new resource enabled the State to incorporate estuarine priorities into targeting and land use planning that complement the Green Infrastructure (GI) network.

The BI has been merged into the State's DNR environmental permit review process; the State's land conservation, management and stewardship review decision-making processes; and serves as one of the key components of the State's Coastal and Estuarine Land Conservation Plan (CELCP) land targeting network. The BI was used in the analysis of potential Marine Protected Areas – leading to the nomination the U-1105 Black Panther Historic Shipwreck Preserve on the Potomac River to the national system of Marine Protected Areas. In addition, the BI served as one of the data layers used for targeting as part of the Memorandum of Understanding between the Maryland Departments' of the Environment, Transportation and Natural Resources to provide more effective mitigation in transportation projects. The BI not only helps state managers target lands for protection and restoration, it is shared with local managers through the State's Coastal Atlas.

Ocean Planning

During the 2006–2010 period, Section 309 funding was used to position the CCP to proactively address emerging ocean management issues and to avoid the undesirable position of addressing these issues in a reactive manner. Maryland's ocean planning efforts to date have resulted in: the collection of site-specific ocean use and natural resource data; identification of knowledge gaps and research needs; a better understanding of the breadth of ocean uses and potential areas of conflict; and early discussions with stakeholder groups to establish a transparent ocean planning process.

In December 2006, Maryland partnered with the Gerard J. Mangone Center for Marine Policy at the University of Delaware to develop a report that examined the current status of, and issues involved in, the management of ocean resources used in Maryland's ocean zone (0 to 3 miles offshore). The product, *"Toward a Vision for Maryland's Ocean"*, addressed major ocean and coastal issues along Maryland's Atlantic border.

In 2009, Maryland joined the Mid-Atlantic States of New York, New Jersey, Delaware and Virginia to announce a new partnership, the Mid-Atlantic Regional Council on the Ocean (MARCO) that formally committed the states to address the region's priority ocean issues including offshore energy, climate change, water quality, and habitat protection. The states' governors, through the newly formed MARCO, advocated a unified position to leverage greater state influence on the management of offshore areas and to help guide federal and interstate actions and resources.

CCP also completed extensive work in the Ocean in 2010 to better prepare the State for the Local/State/Federal offshore renewable wind energy Task Force meetings and identify a RFI area. Maryland DNR worked with resource experts, user groups, The Nature Conservancy (TNC) and the Maryland Energy Administration (MEA) to compile data and information about habitats, human uses and resources in Maryland's Atlantic Ocean using Section 309 funding. In order to raise public awareness about offshore wind energy development and to expand the list of data, CZMA funded staff began working with stakeholders in 2010. Stakeholder outreach included two public open houses followed by stakeholder meetings and one-on-one interviews. To provide those stakeholders who were unable to attend the open houses an opportunity to access the information and to participate in the discussion, the CCP created a Virtual Open House website. The site provides access to all of the information displayed at the open houses and access to an online public comment database. Following the open houses, scoping meetings and one-on-one interviews were conducted with targeted stakeholders, such as commercial and recreational fishermen and resource managers to collect local community knowledge and to gather information on historical, current and future uses. Maps were distributed to stakeholders so that they could delineate areas of interest or concern in the ocean; and stakeholder meetings were held to review existing ocean maps and to edit and identify areas within a group setting.

CCP used the information gathered through the outreach activities to ensure that the RFI and leasing processes address the issues raised by the stakeholders and resource experts. Maryland has used this input to provide guidance during the identification of a draft planning area that may be considered for offshore wind energy development. As a direct result of this work, the U.S. Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) issued a Federal Register notice announcing an offshore renewable wind energy RFI area in the fall of 2010. The comment period for the Maryland RFI closed on January 10, 2011. At that time, BOEMRE received comments and nine indications of interest from eight parties wishing to obtain a commercial lease for a wind energy project (<http://www.boemre.gov/offshore/RenewableEnergy/StateActivities.htm#Maryland>).

CUMULATIVE AND SECONDARY IMPACTS

Under the Cumulative and Secondary Impacts Enhancement Area, the Enhancement Plan focused on advancing the goals of the CZMA at the local level. CCP accomplished this by providing a means for the State to work one-on-one with local governments through the Coastal Communities Initiative, later rebranded as the *CoastSmart* Communities Initiative. The Initiative was developed to: (1) identify potential changes to local codes, ordinances, policies, etc. that would enhance natural resource protection; and (2) to provide the technical and financial resources necessary to ensure the adoption of associated program changes at the local level.

With the signing of House Bill 1141 (the Water Resources Plan Element – WRE) that required local governments to include expanded Sensitive Areas and new Water Resources elements into their comprehensive plans by October 1, 2009, a portion of the Coastal Communities Initiative (CCI) and Section 309 funds were used to address local capacity issues of county and municipal responses to HB1141. Project outcomes are supported by Maryland's November, 2010 RPC request as it relates to meeting the water resource needs of existing and future development.

The following is a summary of those coastal communities assisted with CZMA funding and their status as of July 2010.

JURISDICTION	YEAR PARTNERED WITH CZMA	ADOPTION DATE
Town of Queen Anne	<i>Currently Supporting 10/1/2010 – 3/31/2011</i>	<i>Completion anticipated 2011</i>
Town of Ridgely	10/1/2008 – 9/30/2009	9/21/2009
Town of Elkton	10/1/2008 – 1/31/2009	1/20/2010
Town of North East	10/1/2008 – 10/31/2009	9/21/2009
Dorchester County	10/1/2008 – 9/30/2009	10/6/2009
Town of Hurlock	10/1/2008 – 9/30/2009	3/22/2010
Town of Vienna	10/1/2008 – 9/30/2009	9/14/2009
City of Salisbury	10/1/2008 – 12/31/2009	7/12/2010
Town of Snow Hill	10/1/2008 – 12/31/2009	3/9/2010
Town of Fruitland	1/1/2008 – 12/31/2008	3/10/2009
Wicomico County	1/1/2008 – 12/31/2008	9/15/2009
Worcester County	1/1/2008 – 12/31/2008	Requested and received an extension from MDP
Town of Sharptown	7/7/2007 – 6/30/2008	8/18/2008
Town of Federalsburg	5/1/2007 – 4/30/2008	9/29/2009
Town of Charlestown	7/7/2007 – 6/30/2008	11/17/2008
Kent County	10/1/2007 – 9/30/2008	9/21/2010
Town of East New Market	4/1/2007 – 9/30/2007	10/2010
Town of Secretary	4/1/2007 – 9/30/2007	6/1/2010

3. ENHANCEMENT AREA ASSESSMENTS



"Maryland has long been a leader in developing visionary land use planning tools that will help us sustain our green infrastructure... In a similar manner, the Coastal Atlas will now help us improve the way we care for and use our marine resources – our blue infrastructure."

- John Griffin, Secretary
MD Department of Natural Resources
2010

Coastal Zone Management Act §309
Assessment and Strategy
2011-2015
Submitted February, 2011



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*

RESOURCE CHARACTERIZATION

Pursuant to final 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 Wetlands since the last Assessment.

Wetlands type	Estimated historic extent (acres)	Current extent (acres)	Trends in acres lost since 2006 (Net acres gained & lost)	Acres gained through voluntary mechanisms since 2006	Acres gained through mitigation since 2006	Year and source(s) of Data
Tidal (Great Lakes) vegetated	Unknown, Estimated that 45–65% of original wetlands have been lost	240,028-261,309 acres	+100.7 acres ¹	115.69 acres	13.52	RAMS, NWI, DOQQ wetlands MDE March 2010 analysis
Tidal (Great Lakes) non-vegetated	N/A	N/A	N/A	N/A	N/A	Not available
Non-tidal/freshwater	1.2 million acres (tidal and nontidal)	517,075	+1,868.14 through regulatory program plus voluntary gains	1,752.4	294.07	RAMS, NWI, DOQQ wetlands MDE March 2010 analysis

¹ Reported wetland trend represents a cumulative total of net acres gained vs. net acres lost. Since 2006, the trend in wetland acres was a gain of 100.7. Recently-made updates to MDE's wetlands tracking database will enable the state to report more specific losses and gains in the coming year.

Provide a brief explanation for trends.

Several surveys of wetland acreage have been completed in Maryland since the early 1900s. Survey methods and wetland definitions have varied over the years, making an estimate of wetland trends nearly impossible. It is estimated that anywhere between 45 and 65% of the state's historic wetlands have been lost, much of that representing acres drained for agricultural use. Since the previous assessment, baseline wetland acreage increased due to recent efforts to re-interpret mapped information. The change in tidal wetland acreage from 2006 information represents use of two different map sources for this most recent report to estimate a range of acreage.

Identify ongoing or planned efforts to develop monitoring programs or quantitative measures for this enhancement area.

The Maryland Department of the Environment (MDE) is the lead for permitting and tracking voluntary restoration activities in wetlands and works to track regulated restoration (i.e., replacement wetlands without net water quality gains) activities. Over the coming years, MDE will be implementing measures to clarify quantitative wetland trends as a result of the re-interpreted wetland maps. Please reference the "Mapping/GIS/Tracking Systems" section of the management characterization, below on page 28, for more information about quantitative reporting measures for wetland monitoring. CCP plans to work with MDE in the coming years to evaluate and quantify the potential risks to wetlands due to the effects of sea level rise.

USE THE FOLLOWING TABLE TO CHARACTERIZE DIRECT AND INDIRECT THREATS TO COASTAL WETLANDS, BOTH NATURAL AND MAN-MADE. IF NECESSARY, ADDITIONAL NARRATIVE CAN BE PROVIDED BELOW TO DESCRIBE THREATS.

Type of threat	Severity of impacts (H,M,L)	Geographic scope of impacts (extensive or limited)	Irreversibility (H,M,L)
Development/Fill	Medium–High	Extensive	High
Alteration of hydrology	Low–Medium	Limited	Medium
Erosion	Low–High	Extensive, varies by region	High
Pollution	Low	Extensive	Low
Channelization	Low	Limited	Low
Nuisance or exotic species	Medium–High	Limited	Medium
Freshwater input	Low	Unknown	Unknown
Sea level rise/Great Lake level change	High	Extensive	High
Other: heritage resources	Medium	Limited	High

Development/fill. Development continues to be the primary threat to wetlands. Maryland is preparing for an increase of more than a million new citizens, with a substantial increase in population beginning in 2011 because of the Department of Defense Base Realignment and Closure (BRAC). Direct threats include conversion of non-tidal wetlands during development. Indirect threats to both tidal and non-tidal wetlands result from roads and land use change that result in increased fragmentation and storm water runoff. Development and fill in upland areas blocks the potential ability of a wetland/marsh to migrate in response to sea level rise. While MDE tracks and compensates impacts through programmatic and required permitted mitigation, due to increasing populations, the availability of mitigation sites is decreasing and the price for potential sites is increasing.

Alteration of hydrology. Development within Maryland's coastal watersheds is continuing at a rapid pace, increasing the amount of impervious surface. There is a trend by local governments toward implementing Low Impact Development (LID), infiltration practices, and other innovative storm water management (SWM) approaches that desynchronize floods. Improvements in SWM plans are offset by continued population growth that results in a net increase of impervious surface. This trend is expected to continue into the foreseeable future given projected population increases throughout the coastal zone. This may result in excess discharges to remaining wetlands or a loss of their recharge area.

The largest percentage of historic wetland loss can be attributed to agricultural conversion. Public Drainage Associations (PDAs) are corporate entities that can assess taxes on farmers to maintain ditches in palustrine wetlands. PDAs are not currently draining new palustrine wetlands. Wetlands drained typically were seasonal and palustrine, these soils would take years of periodic inundation to return to a wetland soil. PDA maintenance practices are becoming more environmentally friendly (e.g., management from only one bank, water control). In 2000, a PDA Task Force issued a series of best management practices to reduce nutrient export and increase habitat quality. These recommendations are currently being implemented.

Erosion. Coastal wetlands along Maryland's coast are particularly susceptible to erosion. Rates of erosion vary from region to region, with some stretches of shoreline experiencing over 8 feet of loss per year. Sea level rise in the Mid-Atlantic is partially to blame and over time will exacerbate erosion trends, along with the unconsolidated silts and clays that make up much of the coastal plain. Several efforts are underway to quantify the amount of marsh loss due to both erosion and sea level rise.

Pollution. Runoff from continued growth and development is currently leading to increased pollution in wetlands, creating a disturbance that allows for the introduction of non-native or invasive species. Additional resources are needed to implement BMPs and nutrient reduction plans that would address this issue.

Channelization. There is no new channelization in tidal wetlands. Maintenance of existing ditches for open water marsh management is allowed for fish to swim into all reaches of a marsh for the purpose of eating mosquito larvae. This type of channelization has less of an impact than historic PDA ditching, which eliminated some wetlands entirely by drawing the water table down and drying up the top soil. Maintenance of existing PDA ditches is allowed.

Nuisance or exotic species. Non-native *Phragmites* is an invasive species that can take over entire marshes and usually begins in areas with disturbed soils or altered hydrology. The plant can be laboriously removed by spraying with Glyphosate in the fall, burning the entire marsh, and repeating the spraying and burning processes the following fall. Maryland currently operates a technical assistance and cost-share program to assist property owners in managing *Phragmites*. In previous assessments nutria had been outlined as a threat. While their populations are now limited, nutria can cause large "eat outs" in wetlands, which over time become devoid of vegetation, enlarge, coalesce, and result in the formation of interior ponds. Once ponds reach one acre or more in size, further expansion of the pond is driven by erosion, particularly during storm events. Nutria have been identified as a particular concern in the Blackwater Wildlife Refuge on the eastern shore, where they were first identified in 1943. Since 1970, populations in the marsh have increased, as has the rapid degradation of marshes in the Refuge. The general scientific consensus is that nutria are not the major, or primary cause of marsh loss, but that they are a contributing cause, a catalyst, or a trigger, which may be accelerating marsh loss due to other on-going natural processes.

Sea Level Rise: Maryland's Climate Action Plan Scientific Assessment (August 2008) summarized the following: based on the IPCC projections, the rate of sea-level rise over the first half of the century is likely to range from 3.5 to 5.8 mm/year, with the average for the higher emissions scenario 4.7 mm/year versus 3.8 mm/year under the lower emissions scenario. Except in tidal freshwater environments or where there is a significant supply of mineral sediments, the survivability of coastal wetlands is likely to be marginal, at least under the higher emissions scenario. As sea level rises, the fate of coastal wetlands in Maryland will be determined largely by how the needed build-up of soils is

impacted by natural processes, human activities and the effects of the changing climate. Changes in the river runoff and shoreline erosion would affect the mineral sediment available for soils. Droughts could affect the accumulation of organic matter. More intense storms and greater storm surge could erode wetlands, but also transport mineral sediments onto the wetlands and affect accumulation of organic matter by the negative effects of salt-water intrusion on plant growth.

- § *For Maryland's Atlantic Coastal Bays:* Marshes are able to keep pace with 3 mm/year of sea-level rise; at 5 mm/year, their ability to do this would be marginal and depend on the frequency of storms to mobilize and deliver sediments; and, at 10 mm/year, there would be marsh loss to shallow open water.
- § *For the Chesapeake Bay:* Estuarine marshes on the lower Eastern Shore are already experiencing high rates of loss and their survival is considered marginal at 3 mm/year and subject to substantial loss under either of the accelerated rates; estuarine marshes in the northern portion of Chesapeake Bay and on the western shore are keeping pace with 3 mm/year, but would be marginal at 5 mm/year and subject to loss at 10 mm/year; and, tidal freshwater marshes and swamps accumulate both mineral sediment and large quantities of plant organic and are considered sustainable under accelerated sea-level rise assuming salinities do not increase and sediment supplies are maintained.

INDICATE WHETHER THE COASTAL MANAGEMENT PROGRAM (CMP) HAS A MAPPED INVENTORY OF THE FOLLOWING HABITAT TYPES IN THE COASTAL ZONE AND THE APPROXIMATE TIME SINCE IT WAS DEVELOPED OR SIGNIFICANTLY UPDATED

Habitat type	CMP has mapped inventory (Y or N)	Date completed or substantially updated
Tidal (Great Lakes) Wetlands	Yes, through MDE	1972
Beach and Dune	Yes, through MDE and NWI, DNR	1972, 1981-82, 1994
Nearshore	Yes, through MDE and NWI, DNR	1972, 1981-82, 1994

USE THE TABLE BELOW TO REPORT INFORMATION RELATED COASTAL HABITAT RESTORATION AND PROTECTION. THE PURPOSE OF THIS CONTEXTUAL MEASURE IS TO DESCRIBE TRENDS IN THE RESTORATION AND PROTECTION OF COASTAL HABITAT CONDUCTED BY THE STATE USING NON-CZM FUNDS OR NON COASTAL AND ESTUARINE LAND CONSERVATION PROGRAM (CELCP) FUNDS. IF DATA IS NOT AVAILABLE TO REPORT FOR THIS CONTEXTUAL MEASURE, PLEASE DESCRIBE BELOW ACTIONS THE CMP IS TAKING TO DEVELOP A MECHANISM TO COLLECT THE REQUESTED DATA.

Contextual measure	Cumulative acres for 2004-2010
Number of acres of coastal habitat restored using non-CZM or non-Coastal and Estuarine Land Conservation Program (CELCP) funds	106,798 acres of wetlands created, restored or enhanced.
Number of acres of coastal habitat protected through acquisition or easement using non-CZM or non-CELCP funds	Maryland has very diverse conservation easement and land acquisition programs that track acres and/or habitat type individually by program. The CMP is working with network and partner programs (e.g. Program Open

	<p>Space/POS and the Maryland Environmental Trust/MET) to better quantify the number of acres of coastal habitat protected using non-CZM or non-CELCP funds. Work to quantify trends will focus on identifying projects in annual POS acquisition reports that are located in the coastal zone and through GIS queries that may help to identify types of coastal habitats protected.</p> <p>Since the previous assessment state, local and municipal governments have protected the following number of acres of coastal habitat using non-CZM or non-CELCP funds: 16,482 acres through DNR; 3,978.78 acres at the coastal County level; and 341.06 acres at the municipal level. Additional acreages of coastal habitat has been protected through MET easements, but this work has been supported by CZM funds so is not reported.</p>
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MANAGEMENT CHARACTERIZATION

Pursuant to final 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 effectiveness of management efforts to address those problems described in the above section for the Wetlands Enhancement Area Objective since the last Assessment.

1. FOR EACH OF THE WETLAND MANAGEMENT CATEGORIES BELOW, INDICATE IF THE APPROACH IS EMPLOYED BY THE STATE OR TERRITORY AND IF SIGNIFICANT CHANGES HAVE OCCURRED SINCE THE LAST ASSESSMENT:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Wetland regulatory program implementation, policies, and standards	Yes	Yes – increase in staff for improved implementation.
Wetland protection policies and standards	Yes	Yes – increase in staff for improved implementation. Adoption of statewide policy for Targeted Ecological Areas.
Wetland assessment methodologies (health, function, extent)	Yes	Yes – pilot projects and monitoring strategy completed 9/10
Wetland restoration or enhancement programs	Yes	Yes – policy to accelerate restoration on State-owned public lands.
Wetland policies related public infrastructure funding	Yes	No
Wetland mitigation programs and policies	Yes	Yes – increase in staff for

		improved implementation. Development of the Maryland Ecosystem Enhancement Program
Wetland creation programs and policies	Yes	Yes – policy to accelerate wetland acres on State-owned public lands.
Wetland acquisition programs	Yes	No
Wetland mapping, GIS, and tracking systems	Yes	Yes – improvements underway
Special Area Management Plans	Yes	No
Wetland research and monitoring	Yes	Yes, pilot efforts and strategy
Wetland education and outreach	Yes	No

2. FOR MANAGEMENT CATEGORIES WITH SIGNIFICANT CHANGES SINCE THE LAST ASSESSMENT PROVIDE THE INFORMATION BELOW. IF THIS INFORMATION IS PROVIDED UNDER ANOTHER ENHANCEMENT AREA OR SECTION OF THE DOCUMENT, PLEASE PROVIDE A REFERENCE RATHER THAN DUPLICATE THE INFORMATION.

- a) *Characterize significant changes since the last assessment;*
- b) *Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and*
- c) *Characterize the outcomes and effectiveness of the changes.*

Regulatory Programs. In 2008, legislation was enacted to require fees for processing applications for activities in wetlands, waterways, and floodplains. Fees have allowed for the hiring of additional staff for more effective and efficient permit review. MDE also began development of a wetland monitoring strategy for various aspects of wetland management, including Clean Water Act requirements. An evaluation of the effectiveness of its compensatory mitigation programs was completed in 2007. Site visits, follow up, and record keeping have been greatly improved. Draft water quality standards and an overall wetland monitoring strategy for wetlands were completed and submitted to EPA in 2010. These draft water quality standards outline water quality sampling, handling and analytical protocols that will be conducted on a quarterly basis once approved by MDE and EPA.

Wetland Protection Policies & Standards. Since the previous assessment, staff support to implement wetland protection policies and standards has increased. Additionally, wetlands throughout the coastal zone have been more fully integrated in to DNR's land acquisition Targeted Ecological Area processes. This has led to greater consideration of wetland habitats in land acquisition projects.

Assessment Methodologies. A wetland monitoring strategy for Maryland was completed in 2010. The comprehensive strategy integrates wetland monitoring and assessment into other aspects of wetland management including wetland restoration, wetland preservation and watershed planning. While numerous meetings have been held to determine strategies for assessment methodologies, deficiencies still exist to collect data of sufficient quality to document wetland designated uses and water quality standards under MDE regulation and complete monitoring efforts. A rapid protocol for assessing compensatory mitigation sites was developed in 2007 and is currently in use.

Impact Analysis. As part of the analysis, approaches and tools for determining current wetland extent, condition, and function, and documenting the findings of impact analyses, are also essential.

Restoration/Enhancement Programs. The Chesapeake Bay 2000 Agreement set a goal to restore 25,000 acres of wetlands by 2010. Maryland's portion of the goal is to restore 15,000 acres of wetlands. "Restoration" was defined broadly under this Agreement to include creation, restoration, and enhancement projects to achieve a gain in wetland acreage and function. It is estimated that over 138,000 acres of wetlands were created, restored and enhanced Statewide from 1998-2009, most gains resulted from enhancement projects to eradicate *Phragmites* or nutria. In 2005, the goal was re-evaluated. Future wetland tracking activities will fall into three categories: acres gained (restored and created wetlands), function gained (enhancement projects such as *Phragmites* and nutria control, and rehabilitation projects such as ditch plugging) and protection (easements, POS purchases). Maryland's new goal for created and restored acres is approximately 8,000 acres from 2005-2010, bringing the acreage gain to 15,000 acres. An additional goal is to enhance or rehabilitate 35,000 more acres of wetlands. As of 2009, cumulative progress on the wetland goal using the revised tracking system was as follows: 8063 acres restored, 1179 acres created and 126,103 acres enhanced/rehabilitated in the Chesapeake Bay watershed.

The *Chesapeake Marshlands National Wildlife Refuge Complex Draft Environmental Assessment and Comprehensive Conservation Plan* was completed in 2005. The Plan provides a framework for management of the Chesapeake Bay National Wildlife Refuges and defines how the biological integrity, diversity and environmental health of refuge lands will be maintained. Poplar Island once covered over 1,100 acres, had eroded to a point where it had nearly disappeared, covering only 5 acres. Since the last Assessment, the Corps' Baltimore District, the Maryland Port Administration and other Federal and State agencies have come together to restore Poplar Island using dredged material from the Baltimore Harbor and Channels Federal navigation projects (only approach channels). Poplar Island is being restored to its former size and ecological function. Approximately 40 million cubic yards (mcy) of dredged material will be placed to develop 570 acres of wetlands and 570 acres of uplands.

During the previous assessment period, new sample drawings and guidance for shoreline stabilization practices were produced in 2007 and 2008. As a result of the Living Shorelines Protection Act of 2008, Maryland revised guidance and sample drawings for wetland creation were developed regarding shoreline stabilization practices for erosion control and habitat.¹ Practices and sample drawings were in the process of being updated again in 2010.

The Conservation Reserve Enhancement Program (CREP) for Maryland was reauthorized in 2004. The Program provides incentives to farmers to establish or extend watershed buffers and wetlands to protect water quality. Most recently, CREP has added the ability to purchase easements on tidal marsh in need of restoration. Landowners could receive \$375/ac for permanent easements on tidal marsh. The CREP program also had a change in funding with at least 5 times more funding in the last 2 years than in previous years. This year the Program received \$7 million. In 2008, another change was implemented by the Farm Bill and, has, subsequently made the CREP program more restrictive on public lands. CREP is no longer able to enroll publicly owned lands in the program, leaving more money to be enrolled on private lands.

Special Area Management Plans. No plans were completed during this period.

¹ Bosch et al. 2006. Constructed Wetlands for Shoreline Erosion Control: Field Assessment and Data Management. University of Maryland.

Education/Outreach. From 2007–2009, Maryland held eight Living Shoreline workshops for homeowners, four for shoreline contractors and one for local planning officials. A workshop for consultants was also held to provide expanded guidance on completion of applications. DNR's Aquatic Resources Education program has continued to promote wetland education through Project WET (Water Education for Teachers) and Project WOW (Wonders of Wetlands). In March 2010, 16 educators were trained in the WOW curriculum. In the fall of 2009, a set of the most popular WOW activities was aligned with the Maryland State Curriculum Standards and posted on the DNR Aquatic Resource Education (ARE) website. Additionally, ARE has continued to do wetland training for the State Envirothon competition. In 2006 an Aquatics field kit was created for Envirothon coaches to use while in the field with students. This kit includes equipment needed to delineate wetlands. In 2009, a presentation was created for Envirothon coaches to use during training for students.

Mitigation Banking. There are single entity mitigation banks, operated by local governments, and one entrepreneurial bank. Regulations and low wetland losses remain a disincentive for mitigation banking. Banking will be encouraged due to the benefits of establishing larger projects and improved monitoring and adaptive management capabilities. Follow up on mitigation projects increased during this assessment period to ensure that constructed projects become successful and effectively result in a no net loss of wetland acreage and function.

In 2008 the Army Corps of Engineers and the Environmental Protection Agency issued a joint federal rule (33CFR 325&332) that took on a more watershed approach to mitigation projects. This federal rule emphasized the use of ecological considerations and watershed planning to direct compensatory mitigation into areas that would provide the most environmental return. The rule encourages mitigation banking as the first option for consideration when offsetting environmental impacts.

In late 2008, Maryland followed North Carolina's lead and established the Maryland Ecosystem Enhancement Program. The program is a joint effort between the DNR, DOT, MDE and the Critical Area Commission and was designed to provide more timely and effective mitigation from transportation project impacts by using an ecosystem approach. Related efforts during the assessment period include the establishment of a program to create riparian forest buffers to offset stormwater impacts. By doing so, sites are targeted to provide the greatest ecological and economical return. Through the program, State transportation projects are mitigated on State land through targeting gaps in the green infrastructure, riparian buffers, and other ecologically sensitive areas.

Mapping/GIS/Tracking Systems. Maryland's tidal wetlands protection program began in 1970. Regulatory jurisdictional limits were depicted on official wetland maps created from aerial photographic interpretation. These maps were completed in 1972 using low-level aerial photography. By law, every property owner with land designated as regulated tidal wetland was notified by certified mail. These tidal wetlands maps have not been formally updated since 1972.

Since 1972, the boundaries of tidal wetlands have moved farther inland from a variety of factors such as shoreline erosion and sea level rise. Over time, the maps have become less accurate for their purposes of identifying limits of tidal wetlands and the notification of landowners indicating the presence of tidal wetlands on their parcels of property. This has resulted in less effective and efficient protection of tidal wetlands through the State program. Staff must spend additional time making formal amendments to the maps on a parcel-by-parcel basis for areas that are no longer tidal wetlands. The State currently lacks authority to regulate newly identified wetlands under the tidal

wetland statute due to inaccurate mapping. Some maps are in such poor condition that they have proven difficult to store.

Electronic maps were created from paper and/or mylar records to preserve these legally binding records. However, there is a need for a georeferenced data layer from the scanned image to allow for adjustments to the wetland boundary or overlay with other digital data layers.

Wetland maps exist for the entire State from the 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. 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. Maryland's Chesapeake and Coastal Program has supported additional shoreline data collection efforts including a *Comprehensive Shoreline Inventory* that seeks to capture baseline shoreline conditions throughout Maryland's coastal counties. Data from the survey are processed to create three GIS coverage, displayed as maps, which are viewable online at <http://ccrm.vims.edu/gisdatabases.html> and through the Program's Coastal Atlas mapper. Shoreline inventory data has captured some fringe marshes that may supplement fringe marsh information previously mapped. MDE has digital point locations of wetland impact and mitigation sites, and has begun creating digital polygons of the agency's own mitigation sites.

Core wetland areas are also identified in Maryland's Green Infrastructure Assessment, which was originally completed in 2001 and is currently being updated. The Assessment identified two million acres of green infrastructure land – the state's most important natural lands (e.g. forests, wetlands and other natural lands). The Assessment identified large contiguous blocks of natural land (hubs), interconnected by corridors to allow animal and plant dispersal and migration. Hubs and corridors were ranked within their physiographic region for a variety of ecological parameters and for development risk factors, as well as combinations of these.

Documenting changes in wetlands are also a key component of Maryland's tracking system. Wetland gains and losses from the regulatory program are tracked in a shared database with the U.S. Army Corps of Engineers and a database maintained by MDE. This latter database currently has limited capacity to produce reports, and improvements have been delayed for years due to lack of funds and available technical support. In 2005, MDE received a grant from EPA to complete substantial upgrades to its database and report on wetland acreage and functional gains and losses, wetland types, reporting by county and watershed, and various other parameters. Wetland gains from voluntary creation, restoration, and enhancement projects are also recorded in various levels of detail. Voluntary gain information is readily available by county and sponsoring program. The Chesapeake Bay Program is expanding its database to better report on acreage and functional wetland gains by watershed.

Upgrades to wetland tracking systems at MDE were made in 2010. MDE uses a Department-wide enterprise database system for regulatory actions, including, as of late 2009, wetland applications. Wetland application information, proposed and authorized losses, and gains through wetland mitigation are being migrated into this system from other systems and an internal Microsoft Access database. New regulatory gain and loss information is directly entered into the enterprise system. A GIS-based screening tool that yields a report on proximity of potential wetland impact sites with sensitive species, Tier II waters, watershed, 100-year floodplains, and historical sites will also be linked

to the enterprise system. Photographs, plans, and associated documents may be stored with each project in the system. Additional information related to wetlands data management can be found at: <http://www.mde.state.md.us/programs/Water/WetlandsandWaterways/AboutWetlands/Documents/www.mde.state.md.us/assets/document/wetlandswaterways/Final%20Strategy%20Report%20commentsNRCsaddr2.pdf>

INDICATE WHETHER THE CMP HAS A HABITAT RESTORATION PLAN FOR THE FOLLOWING COASTAL HABITATS AND THE APPROXIMATE TIME SINCE THE PLAN WAS DEVELOPED OR SIGNIFICANTLY UPDATED.

Habitat type	CMP has a restoration plan (Y or N)	Date completed or substantially updated
Tidal (Great Lake) Wetlands	Yes, through MDE Wetlands and Waterways Program	Ongoing
Beach and Dune	Yes, multi-partner effort in Ocean City area	Ongoing, revisited annually
Nearshore	Yes, near-shore restoration planning is conducted on a sector-by-sector (e.g. SAV, shorelines) basis	Ongoing, revisited annually

PRIORITY NEEDS AND INFORMATION GAPS

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the Coastal Management Program and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Select type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H, M, L)
Increased wetland monitoring	Regulatory, capacity	H
Increased planning to identify risks to wetland habitats as a result of increasing sea levels	Data, capacity	M
Strategies to increase wetland resiliency and maintain current extents as a result of climate change and sea level rise	Policy, data, communication & outreach	M

ENHANCEMENT AREA PRIORITIZATION

1. WHAT LEVEL OF PRIORITY IS THE ENHANCEMENT AREA FOR THE COASTAL ZONE (INCLUDING, BUT NOT LIMITED TO, CZMA FUNDING)?

High
Medium X
Low

Briefly explain the level of priority given for this enhancement area.

Maryland has a strong existing foundation for protecting and restoring wetlands but monitoring and program implementation efforts would benefit from an increase in staff. As projected rises in sea level rise are experienced throughout the coastal zone, increased loss of wetland habitat is expected and a concerted effort between multiple partners is needed to address this resource threat.

2. WILL CCP DEVELOP ONE OR MORE STRATEGIES FOR THIS ENHANCEMENT AREA?

Yes
No X

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

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 CMP already exist to increase implementation of living shoreline practices and target wetland protection areas and mitigation efforts. Over the coming strategy timeframe, the CMP plans to work with MDE to continue to evaluate the risks to wetlands related to climate change and sea level rise. Some of these efforts are planned for support in the Coastal Hazards and Climate Change Adaptation Planning strategy.

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*

RESOURCE CHARACTERIZATION

Pursuant to final 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 the Coastal Hazards since the last Assessment.

1. CHARACTERIZE THE LEVEL OF RISK IN THE COASTAL ZONE FROM THE FOLLOWING COASTAL HAZARDS.

(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*)

Type of hazard	General level of risk (H,M,L)	Geographic Scope of Risk (Coast-wide, Sub-region)
Flooding	H	Coast-wide
Coastal storms, including associated storm surge	H	Coast-wide
Geological hazards (e.g., tsunamis, earthquakes)	L	Coast-wide
Shoreline erosion (including bluff and dune erosion)	H	Coast-wide
Sea level rise and other climate change impacts	H	Coast-wide
Land subsidence	H	Coast-wide

2. FOR HAZARDS IDENTIFIED AS A HIGH LEVEL OF RISK, PLEASE EXPLAIN WHY IT IS CONSIDERED A HIGH LEVEL RISK. FOR EXAMPLE, HAS A RISK ASSESSMENT BEEN CONDUCTED, EITHER THROUGH THE STATE OR TERRITORY HAZARD MITIGATION PLAN OR ELSEWHERE?

In Maryland, flooding, coastal storms and storm surge, shoreline erosion, and sea level rise continue to be the most significant coastal hazard risk in Maryland. These hazards are considered a high level of risk, as explained below.

Flooding

Flooding is considered to be a high level risk as more than 13% of the state's surface area is in the floodplain and more than 7,000 miles of tidal shoreline are associated with the Chesapeake Bay and its tributaries in the coastal zone. Maryland is prone to three types of flooding: non-tidal flooding (flooding from rivers and streams), tidal flooding (flooding from tides and storm surges), and coastal

high hazard flooding (the addition of wave action to tidal flooding). Vulnerability to flooding in Maryland is not evenly distributed and several coastal counties are at a disproportionate risk of flooding compared to the rest of the state. To better identify and address flooding vulnerability, the State and its local and federal partners have put forth considerable financial resources to improve the State's digital elevation products by acquiring high-resolution elevation data (LiDAR) and complete more accurate risk modeling. Coastal zone areas with high flood vulnerability also happen to be forecasted for increased development in the future; especially in Dorchester, Somerset, Talbot, Caroline, and Worcester Counties.

Coastal Storms & Surge

Coastal storms and surge pose a high risk to Maryland due to the rather shallow depth (25 feet on average) of the Chesapeake Bay and its tributaries, narrow opening to the ocean at the mouth of the Chesapeake Bay, and relatively low-lying nature of land in the coastal zone. These factors increase the risk of coastal storm damage and storm surge inundation in Maryland's coastal zone, as exemplified by Tropical Storm Isabel in September 2003. During this storm event, the surge that pushed up the Chesapeake Bay increased as it traveled into narrow channels and tidal creeks, causing extreme flooding as far inland as Washington, D.C. Flooding from the storm was much greater than expected due to a combination of the Bay's basin shape and tide height, causing the surge to range from 4 to 8 feet throughout Maryland's portion of the Bay. Although the winds associated with Isabel were of the magnitude of a tropical storm, the storm surge that was pushed up the Bay was typical of a Category 2 hurricane. Although Maryland is generally spared from land falling hurricanes due to the orientation of the Mid-Atlantic coastline and the state's latitude, Maryland's coast is particularly vulnerable to episodic storm events that may in the coming years be driven and exacerbated by climate change and sea level rise. Any increase in storm frequency and intensity due to climate change could pose an increased threat to the state's low-lying coastal areas. The surge associated with a Category 1 hurricane, for example, could potentially inundate 40% or more of land areas within Dorchester and Somerset Counties, and Ocean City. Surge associated with a Category 4 storm, would affect over 65% of the land area in the above three areas.

Shoreline Erosion

Shoreline erosion studies completed by CCP and the Maryland Geological Survey (MGS) estimated that as much as 69% of Maryland's shoreline has undergone measurable recession over the last 50 years. Of the 69% of shorelines experiencing erosion, over 13% (839 miles) is eroding at a rate greater than 2 feet per year. The majority of shoreline erosion, 56% or 3,740 miles, occurs at a rate less than 2 feet per year. Shoreline erosion in Maryland results in a loss of public and private property, historic and cultural sites, recreational beaches, productive farmland and forested areas. Additionally, erosion carries approximately 5.7 million pounds of nitrogen and 4.2 million pounds of phosphorus into the Chesapeake Bay, significantly degrading water quality. Erosion also contributes approximately 11 million cubic yards of sediment into the Chesapeake Bay, intensifying the need for navigational dredging and diminishing water quality due to increased turbidity. Accelerating rates of sea level rise combined with increased development along the State's coastline has tended to prolong or exacerbate these erosion problems.

Sea Level Rise and Climate Change

Maryland's low-lying landscape in the coastal zone, combined with regional land subsidence, result in a relatively high level of risk to sea level rise and climate change. Maryland's coastal regions have been subsiding at about a rate of 6 inches per century (1.7 mm/year) and are expected to continue at this rate during this century. The average sea level in the region rose by about the same amount

during the past century, resulting in a 1-foot observed rise of the mean tidal level relative to the land. As a result, Maryland has experienced considerable shoreline erosion and deterioration of coastal wetlands, which are a critical component of its bays and estuaries. Current projections indicate that accelerated ice melting would increase the relative sea level along Maryland's shorelines by more than 1.2 feet by mid-century and 3.7 feet by late century if greenhouse gas emissions continue to grow.

3. IF THE LEVEL OF RISK OR STATE OF KNOWLEDGE OF RISK FOR ANY OF THESE HAZARDS HAS CHANGED SINCE THE LAST ASSESSMENT, PLEASE EXPLAIN.

Flooding

The August 2005 publication of "*An Assessment of Maryland's Vulnerability to Flood Damage*²" provided CCP with more specific flood risk data by summarizing results of a Level 1 analysis of the 100-year flood using FEMA's hazard vulnerability modeling software program, HAZUS-MH FLOOD. Model outputs enhanced understanding of the extent of risk to the built environment from riverine and coastal flooding and the scope of potential economic losses. Following this statewide effort, more accurate Level 2 HAZUS-MH FLOOD analyses were conducted for Ocean City (2006) and Dorchester County (2008). Results of these vulnerability assessments have been used for a variety of planning efforts.

In 2008, the Maryland Emergency Management Agency (MEMA) updated the State Hazard Mitigation Plan, which provides a comprehensive hazard analysis, risk assessment, mitigation strategies and implementation schedule designed to reduce the State's disaster vulnerability. The State of Maryland, in conjunction with FEMA, has also been systematically updating Flood Insurance Rate Maps (FIRMs) for communities over the past several years. The D-FIRMs will be GIS-compatible and will show flood risk at a property-by-property level. As of early 2010, DFIRMs have been completed for 3 of Maryland's 17 coastal jurisdictions; an additional seven have preliminary drafts that require formal adoption; and seven remain in production. Completed DFIRMs for Maryland's entire coastal zone jurisdictions are scheduled to be completed by 2013. The improvements in spatial accuracy provided by the new base map, and the availability of electronic floodplain information should greatly enhance the ability to use the maps for planning, permitting, and insurance applications. These flood maps will increase the state of knowledge related to level of flooding risk throughout the coastal zone, but do not take in to consideration future changes in flood levels that may result from sea level rise.

Shoreline Erosion

Since the previous assessment, CCP and the MGS worked to help resolve discrepancies found in historical erosion rates in Calvert County. MGS completed a comparison of digital shorelines, increased knowledge about the County's shoreline change, and as a result made recommendations to Calvert County Department of Planning and Zoning on moving forward with decisions related to shoreline erosion rates and setbacks in its coastal zone. An Erosion Vulnerability Assessment (EVA) was completed through a joint partnership between the Baltimore District U.S. Army Corps of Engineers, CCP, the MGS and the Virginia Institute of Marine Sciences. The EVA identifies shorelines that have demonstrated historic patterns of instability, and that currently support valued natural, social, or economic resources. As a planning tool, EVA defines a 50-year planning window projecting shoreline position in 50 years, locations where resources will be vulnerable, and locations where the opportunity for shoreline stabilization or restoration may have the greatest benefits. The products

² Maryland Department of the Environment (MDE) and the Eastern Shore Regional GIS Cooperative (ESRGC) at Salisbury University. *An Assessment of Maryland's Vulnerability to Flood Damage*. Annapolis, Maryland: 2005.

enhance the state's understanding of areas that may be at greater risk from shoreline erosion over time.

Coastal Storms & Surge

Since the previous assessment, a number of studies have increased the breadth of state-specific knowledge about storm surge risk and storm evacuation plans. Under the direction of FEMA's National Hurricane Program (NHP), the USACE Baltimore District is conducting a Hurricane Evacuation Study (HES) for Maryland's western shore and the USACE Philadelphia District is conducting a HES for the Delmarva Peninsula. These multi-year studies include hazard and vulnerability analyses for coastal communities considering different types of storm threats. Specific aspects of the analysis include assessments of storm surge and wind impacts, existing road and other transportation systems, vulnerable populations (e.g., demographics, behavior analysis), and shelters. Results of these studies provide the coastal management community a better understanding of coastal storm and surge risks as well as updated planning tools.

The 2008 State Hazard Mitigation Plan states that steady population growth and continuing near-shore development will increase the risk of human injury and property loss from coastal storms. The degree to which climate change will impact Maryland's exposure to more frequent or powerful storms depends heavily on storm tracks, which scientists are not yet able to predict for future decades. However, due to the orientation of the Mid-Atlantic coastline and the state's latitude, Maryland's coast is particularly vulnerable to episodic storm events that may in the coming years be driven and exacerbated by climate change and sea level rise. Any increase in storm frequency and intensity due to climate change could pose an increased threat to the state's low-lying coastal areas.

Sea Level Rise and Climate Change

In 2007, Maryland's CCP completed work on a statewide sea level rise vulnerability map based on high-resolution LiDAR data. This map provided a much clearer picture of the scope of lands vulnerable to sea level rise inundation. In August 2008, Maryland adopted a State Climate Action Plan which included a Comprehensive Assessment of Climate Change Impacts in Maryland and a Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change: Sea Level Rise and Coastal Storms. The Strategy recommends a suite of 19 actions to protect human health, safety and welfare; natural resources; and Maryland's built environment from the impacts of climate change and sea level rise. Implementation of key elements of the Strategy is currently underway.

The U.S. Environmental Protection Agency (EPA), in collaboration with the U.S. Geological Survey (USGS) and the National Oceanic and Atmospheric Administration (NOAA), examined the impacts of sea-level rise from climate change, with a focus on the Mid-Atlantic Region. In the 2009 report, *Coastal Sensitivity to Sea-level Rise: A Focus on the Mid-Atlantic Region*, several aspects of sea-level rise were examined for impacts to the natural environment and to human land development along the coast. In addition, the report addressed the connection between sea-level rise impacts and current adaptation strategies, and assessed the role of the existing coastal management policies in identifying and responding to potential challenges. The report finds that existing elevation data for the mid-Atlantic does not provide the degree of confidence needed for local decision making, the report called for a systematic nationwide collection of high-resolution elevation data to improve the ability to conduct detailed assessments in support of planning.

4. IDENTIFY ANY ONGOING OR PLANNED EFFORTS TO DEVELOP QUANTITATIVE MEASURES OF RISK FOR THESE HAZARDS.

Flooding

As discussed in question 3, above, new D-FIRMs are currently being developed that will identify flood risk at a property-level. D-FIRMs for Maryland's entire coastal zone are anticipated to be completed by 2013 and will help the state to quantitatively assess property-level risks from flooding.

Coastal Storms & Surge

The Chesapeake Bay Inundation Prediction System (CIPS) is being developed to improve the accuracy, reliability, and capability of flooding forecasts for tropical cyclones and non-tropical wind systems such as nor'easters. CIPS products provide modeled results, as well as visualizations of expected on-land storm-surge inundation along the Chesapeake Bay and its tributaries. An initial prototype has been developed by a team of government, academic and industry partners through the Chesapeake Bay Observing System (CBOS) of the Mid-Atlantic Coastal Ocean Observing Regional Association (MACOORA) within the Integrated Ocean Observing System (IOOS). The Chesapeake Sea Level Rise and Storm Surge Public Awareness and Response (CSSPAR) project team is collaborating on the modeling, analysis and mapping of sea level rise and storm surge effects in the Chesapeake Bay to better inform the public and policy makers. Maryland DNR has been active on CSSPAR project team. In 2010, the team worked with National Geographic to prepare and release the map entitled "Sea level, climate change, and the Chesapeake Bay" (side 1) and "Storms, climate change and Chesapeake Bay" (side 2). CIPS model results are printed on Side 2 of the map product.

CCP's *CoastSmart* Communities provides both technical and financial assistance to select coastal communities to incorporate coastal storm issues into planning and permitting activities. Through *CoastSmart* Communities, CCP has completed three local government vulnerability assessments to quantify local-level risk associated with sea level rise and coastal storms. Additionally, each assessment provides sea level rise adaptation planning and policy guidance. These projects have identified impacts such as the number of residential properties inundated under sea level rise scenarios and combined storm surge, estimated value of parcels at risk, and the number and location of critical and public facilities located in projected inundation areas. Two additional projects are currently underway.

Sea Level Rise and Climate Change

In December 2009, the Maryland Commission on Climate Change initiated development of Phase II of its Adaptation Strategy. The Phase II Strategy, scheduled to be released in December 2010, will outline and quantify sector-based adaptation strategies to reduce the impacts of climate change, including sea level rise, increased temperature and changes in precipitation to: bay and aquatic resources; human health; forest and terrestrial ecosystems; agriculture; water resources; and growth and land use. The Phase II Strategy will provide the basis for guiding and prioritizing state-level activities with respect to both climate science and adaptation policy. As discussed in *Coastal Storms and Surge*, above, *CoastSmart* Communities projects are assisting local governments with identifying impacts and quantifying local-level risk associated with sea level rise and coastal storms, as well as providing adaptation planning and policy guidance.

5. (CM) USE THE TABLE BELOW TO IDENTIFY THE NUMBER OF COMMUNITIES IN THE COASTAL ZONE THAT HAVE A MAPPED INVENTORY OF AREAS AFFECTED BY THE FOLLOWING COASTAL HAZARDS. IF DATA IS NOT AVAILABLE TO REPORT FOR THIS CONTEXTUAL MEASURE, PLEASE DESCRIBE BELOW ACTIONS THE CMP IS TAKING TO DEVELOP A MECHANISM TO COLLECT THE REQUESTED DATA.

Type of hazard	Number of communities that have a mapped inventory ³	Date completed or substantially updated
Flooding	17 – Statewide	Substantial updates to flood maps for the coastal zone began in 2004 on a county-by-county basis. Updates are scheduled to be completed by 2013 ⁴ .
Storm surge	17 – Statewide	Delmarva peninsula 2006 Western shore 2008
Geological hazards (including Earthquakes, tsunamis)	17 – Statewide	Ongoing monitoring and data analysis by the Maryland Seismic Network
Shoreline erosion (including bluff and dune erosion)	17 – Statewide <i>Calvert County update</i>	2003 2008
Sea level rise	17 – Statewide <i>Worcester County</i> <i>Somerset County</i> <i>Dorchester County</i> <i>Anne Arundel County</i> <i>City of Annapolis</i>	2007 <i>September 2008 update</i> <i>September 2008 update</i> <i>September 2008 update</i> <i>Est. Completion Spring 2011</i> <i>Est. Completion Spring 2011</i>
Great lake level fluctuation	N/A	N/A
Land subsidence	N/A	N/A

MANAGEMENT CHARACTERIZATION

Pursuant to final 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 effectiveness of management efforts to address those problems described in the above section for the Coastal Hazards Enhancement Area Objective since the last Assessment.

1. FOR EACH OF THE MANAGEMENT CATEGORIES BELOW, INDICATE IF THE APPROACH IS EMPLOYED BY THE STATE OR TERRITORY AND IF SIGNIFICANT CHANGES HAVE OCCURRED SINCE THE LAST ASSESSMENT:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Building setbacks/ restrictions	Y	Y
Methodologies for determining setbacks	Y	Y

³ For the purposes of this table "statewide" refers to a total of 17 possible communities in the coastal zone with a mapped inventory of the listed hazard (16 coastal counties and Baltimore City). In some cases, specific jurisdictions may have been updated more recently than the rest of the coastal zone; these are shown in *italics*.

⁴ www.mdfloodmaps.org

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Repair/rebuilding restrictions	Y Shoreline erosion control projects	N
Restriction of hard shoreline protection structures	Y	Y
Promotion of alternative shoreline stabilization methodologies	Y	Y
Renovation of shoreline protection structures	Y	Y, see alternative shoreline stabilization methodologies section
Beach/dune protection (other than setbacks)	Y	Y, see alternative shoreline stabilization methodologies section
Permit compliance	Y	N
Sediment management plans	Y	N
Repetitive flood loss policies, (e.g., relocation, buyouts)	Y	N
Local hazards mitigation planning	Y	Y
Local post-disaster redevelopment plans	N Locals draft and submit to MEMA	N
Real estate sales disclosure requirements	N	N/A
Restrictions on publicly funded infrastructure	Y	Y
Climate change planning and adaptation strategies	State and local	Y
Special Area Management Plans	N	N
Hazards research and monitoring	Y	N
Hazards education and outreach	Y	Y
Other (please specify)		

2. FOR MANAGEMENT CATEGORIES WITH SIGNIFICANT CHANGES SINCE THE LAST ASSESSMENT PROVIDE THE INFORMATION BELOW. IF THIS INFORMATION IS PROVIDED UNDER ANOTHER ENHANCEMENT AREA OR SECTION OF THE DOCUMENT, PLEASE PROVIDE A REFERENCE RATHER THAN DUPLICATE THE INFORMATION.

- Characterize significant changes since the last assessment;*
- Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and*
- Characterize the outcomes and effectiveness of the changes.*

Since the previous assessment, significant legislative, policy and research changes have occurred to address Coastal Hazards that were either directly funded through CZMA funds, developed in partnership with CZMA funded staff or coordinated through the network partnership.

Building setbacks/restrictions and Methodologies for determining setbacks. Amendments to the Chesapeake and Atlantic Coastal Bays Critical Area Law were passed in 2008. This update expanded the existing 100-foot buffer to 200 feet for all new subdivisions in the Resource Conservation Area of the 1000-foot Critical Area boundary. The legislative update now requires builders and home improvement contractors to comply with the Critical Area law, imposes stiffer penalties for violations of the law, and requires anyone who builds an illegal structure or clears illegally in the Critical Area to completely restore the site, pay fines, and mitigate for the violation prior to seeking any approvals for illegal work performed in the Critical Area. In addition, a digital mapping component was also added

that will result in updates to all Critical Area maps. The 2008 amendments required that the jurisdictional boundary maps be updated to reflect changes in tidal wetlands a result of historic sea level rise and that the maps be routinely updated every 12 year to account for additional change. The maps, State regulations, and local plans to reflect these changes are all in development. CZM supported the development of the mapping component using Section 306 funds.

Restriction of hard shoreline protection structures and Promotion of alternative shoreline stabilization methodologies. The State of Maryland passed the Living Shorelines Protection Act in 2008. This law now requires that living shorelines be considered as the first option for shore erosion control projects and that property owners demonstrate to the state's satisfaction that a living shoreline will not be successful prior to being granted approval for a hard stabilization permit. Maryland now waives permit fees for living shoreline projects. Additionally, the living shoreline regulations may address the renovation of shoreline protection structures and beach and dune protection measures. Initiated by BayStat, these changes were driven by CZM through collaborative efforts between DNR and MDE. Funds from both Section 306 and Section 309 were used to advance the passage and implementation of this Law.

Local Hazard Mitigation Planning. Since the 2004 completion of the Maryland State Hazard Mitigation Plan (SHMP) and associated mapping, the state updated the plan and continued to work with local governments to complete and/or update their own hazard mitigation plans. D-FIRM maps are in the process of being created that will result in more detailed evaluations of flood risk throughout the state. This effort has been supported through CZMA funded staff assistance during the update of the SHMP and implementation of local hazard mitigation plans.

Restrictions on Publicly Funded Infrastructure and Climate Change Planning and Adaptation. In August 2008, Maryland adopted a State Climate Action Plan which included a Comprehensive Assessment of Climate Change Impacts in Maryland and a *Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change: Sea Level Rise and Coastal Storms*. The Assessment was based on extensive literature review and model projections. A series of climate change and sea level rise planning and adaptation strategies were developed. Strategies include plans for how Maryland can reduce vulnerability to the existing and future built environments and coastal resources. CCP has also worked with a number of local governments to address sea level rise adaptation planning efforts. From these efforts, CCP has begun working with other state entities (Transportation, DNR Parks, etc.) to evaluate sea level rise vulnerability and to develop a lead-by-example policy that outlines how to reduce risk on publicly-funded infrastructure.

Climate change planning and adaptation strategies. Through Section 309 and other CZM funds, Maryland's CCP completed work on a statewide sea level rise vulnerability map based on high-resolution LiDAR data which outlines areas at risk to sea level rise inundation. Additionally, the development of a State Climate Action Plan was largely supported by Section 309 and other CZM funds. The Plan included 19 policy and programmatic recommendations in the *Comprehensive Strategy*, noted above, which are at varying levels of implementation.

Hazards Education and Outreach. CCP has developed a suite of outreach, education and training programs and products targeted to the promotion of alternative stabilization methodologies, specifically related to living shorelines. Through Section 309 and Section 306 funds, training curricula were developed for waterfront property-owners as well as marine contracting shoreline professionals to provide the latest information about shoreline management and design options, laws, and benefits.

Outreach and education materials and trainings have also been developed for sea level rise and climate change, some in partnership with the Coastal Training Program. As a result of these actions, more than 1,000 individuals have been provided with additional education opportunities about coastal hazards.

CCP has also used Section 309 and Section 306 funds to create and improve coastal mapping applications as part of CCP's Coastal Atlas that includes coastal hazard mapping tools. These tools have been used to evaluate shoreline projects, measure shoreline change and improve the delivery of coastal hazard data and information to local and federal governments, NGOs, and other project partners.

3. (CM) USE THE APPROPRIATE TABLE BELOW TO REPORT THE NUMBER OF COMMUNITIES IN THE COASTAL ZONE THAT USE SETBACKS, BUFFERS, OR LAND USE POLICIES TO DIRECT DEVELOPMENT AWAY FROM AREAS VULNERABLE TO COASTAL HAZARDS. IF DATA IS NOT AVAILABLE TO REPORT FOR THIS CONTEXTUAL MEASURE, PLEASE DESCRIBE BELOW ACTIONS THE CMP IS TAKING TO DEVELOP A MECHANISM TO COLLECT THE REQUESTED DATA.

Contextual measure	Number of communities
Number of communities in the coastal zone required by state law or policy to implement setbacks, buffers, or other land use policies to direct develop away from hazardous areas.	17 – Statewide ⁵ ; Critical Area
Number of communities in the coastal zone that have setback, buffer, or other land use policies to direct develop away from hazardous areas that are more stringent than state mandated standards or that have policies where no state standards exist.	2 - Calvert County bluff setbacks - Worcester County Comp Plan; directs development outside Category 3 storm surge

Priority Needs and Information Gaps

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through CCP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Hazard preparedness planning at the local level	Policy, data, capacity, training, communication & outreach	H
Statewide sea level rise and climate change adaptation planning and policies	Policy, legislation, data	H
Coastal hazards outreach & public awareness	Training, communication & outreach	H
Living shorelines	Training, communication & outreach	M

⁵ For the purposes of this table “statewide” refers to a total of 17 possible communities in the coastal zone with a mapped inventory of the listed hazard (16 coastal counties and Baltimore City).

ENHANCEMENT AREA PRIORITIZATION

1. WHAT LEVEL OF PRIORITY IS THE ENHANCEMENT AREA FOR THE COASTAL ZONE (INCLUDING, BUT NOT LIMITED TO, CZMA FUNDING)?

High x
Medium
Low

Briefly explain the level of priority given for this enhancement area.

With more than 7,000 miles of shoreline and intense coastal development, including large urban populations centers such as Annapolis, Baltimore and Ocean City, Maryland's coastal communities and natural resources are highly exposed coastal hazards. Almost 70% of the shoreline experiences chronic erosion, up to 60% of some counties lies within the 100-year floodplain, and the low-lying coastal areas have seen twice the global rate of sea level rise in the last century. These impacts will only be exacerbated by climate change.

2. WILL CCP DEVELOP ONE OR MORE STRATEGIES FOR THIS ENHANCEMENT AREA?

Yes x
No

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

Projected population growth and accompanying development in coastal areas, compounded by the anticipated impacts from climate change, make this enhancement area a high priority as more and more people, infrastructure and natural resources will be at risk. The State of Maryland has only recently begun implementing strategies to reduce vulnerability and build resilience within our natural and human communities. Effects of sea level rise and risks associated with coastal hazards are often observed at the local level. With the varying demands placed on local planning staff, available technical capacity and resources to implement adaptation strategies continues to be a concern. Providing essential resources through CCP will be a focus for reducing the risk these hazards pose to Maryland's coastal communities. Continued work is also needed to address state-wide policy, communication, and planning needs identified in the 2008 Maryland Climate Action Plan and address potential effects of sea level rise and climate change on our bay and aquatic ecosystems.

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*

RESOURCE CHARACTERIZATION

Pursuant to final 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 the Public Access since the last Assessment.

1. CHARACTERIZE THREATS AND CONFLICTS TO CREATING AND MAINTAINING PUBLIC ACCESS IN THE COASTAL ZONE

Type of threat or conflict causing loss of access	Degree of threat (H,M,L)	Describe trends or provide other statistics to characterize the threat and impact on access	Type(s) of access affected
Private residential development (including conversion of public facilities to private)	Medium to Low	Between 2006 and 2008, rampant development and market speculation likely resulted in lost opportunities for public access due to high property purchase prices and limited state resources. Since 2008, prices of waterfront land have fallen due to the economy. There may be new opportunities for public access in Maryland through redevelopment efforts.	Access for passive recreation (boating, fishing, beaches) and water dependent uses.
Non-water dependent commercial/ industrial uses of the waterfront (existing or conversion)	M	Maryland CCP completed a comprehensive shoreline inventory in 2005 that characterized types of waterfront use. A significant amount of waterfront is developed for non-water dependent residential and commercial/industrial use. The 2008 Final Report of the Maryland Working Waterfront Commission also summarized an assessment of major threats to waterfront access. A major issue for this sector is the conversion of waterfront land to residential or commercial uses that do not supply services to water-dependent industries (e.g. fisheries processing, supply, etc.).	Access for passive recreation (boating, fishing, beaches), access for commercial boat docking and unloading, access of property for water dependent uses and related service industries.
Erosion	M	Shore erosion is a considerable issue, the Maryland Geological Survey reported that over 69% of Maryland's 7,700-mile shoreline has undergone measurable recession over the last 50 years. Of the 69% of shorelines experiencing erosion, over 13% (839 miles) is eroding at a rate greater than 2 ft/yr. 56% of shoreline erosion (3,740 miles), occurs at a rate less than 2 ft/yr. This trend is likely to continue as increased shoreline erosion is driven by sea level rise and land subsidence.	Existing public access points (boat launches, parks, etc.) along the water are monitored to determine if stabilization action is needed

Sea level rise/ Great Lake level change	M	Projections that include accelerating the melting of ice would increase the relative sea-level along Maryland's shorelines by more than 1 foot by mid-century and 3 feet by late century. If sea level rises by 3 feet, most tidal wetlands would be lost—about 200 square miles of land would be inundated. Public access points along the shoreline, especially those in low-lying areas, would be at risk.	Low-lying beaches, parks, piers, boat access sites, loss of navigable waterways under low-lying infrastructure, and others
Natural disasters	L	Maryland is at low risk of loss of public access related to earthquakes and tsunamis. The risk of loss of public access, especially along the shoreline is related to increased episodic storm events and associated storm surge, erosion, and flooding, which is expected to increase with climate change.	Low-lying beaches, parks, piers, boat access sites, and others
National security	M	Maryland's coastal zone is located just outside Washington, D.C. and several military installations are sited throughout the coastal zone. Due to the Base Realignment and Closure (BRAC) process, population is expected to grow 12.5% between 2008 and 2020. New infrastructure and development related to several national security facilities will need to meet the needs of this growing population. Planning efforts to maintain public open space and access in affected areas will be necessary.	Opportunities for public land conservation and shoreline access in areas experiencing increased development as a result of BRAC
Encroachment on public land	L	Encroachment on public land is not generally a threat to public access. When it does occur it is primarily found when property boundary surveys are conducted and is handled on a case-by-case basis depending on the level and type of encroachment.	Small outbuildings, timbering encroachment

2. ARE THERE NEW ISSUES EMERGING IN YOUR STATE THAT ARE STARTING TO AFFECT PUBLIC ACCESS OR SEEM TO HAVE THE POTENTIAL TO DO SO IN THE FUTURE?

The main issues that have affected public access in Maryland are property prices and the availability of waterfront properties for purchase. While the high price of waterfront property in Maryland is not a new issue, the resulting continued lack of available waterfront land and the high cost to purchase continues to present a challenge to expand or maintain public access for both passive recreation and water dependent uses.

Two emerging areas within Maryland that have the potential to influence the statewide strategy for public access are sea level rise and new federal water trail initiatives. Over the last century relative sea level has risen a foot in the Chesapeake Bay due to local land subsidence and sea level rise. According to the Scientific and Technical Working Group from Maryland's Climate Action Plan, sea level is expected to increase 2.7 to 3.4 feet by the year 2100; as a result challenges to maintain public access to water – both commercial and recreational – will increase.

The increased focus on establishing National Historic Trails could present an exciting opportunity for leveraging resources and expertise to expand public access opportunities. It will be important to

establish a close coordination between these new initiatives and existing programs to avoid potential impacts on state and local resources (i.e. State lands, water access points, operations, maintenance and staff time).

3. USE THE TABLE BELOW TO REPORT THE PERCENT OF THE PUBLIC THAT FEELS THEY HAVE ADEQUATE ACCESS TO THE COAST FOR RECREATION PURPOSES, INCLUDING THE FOLLOWING. IF DATA IS NOT AVAILABLE TO REPORT FOR THIS CONTEXTUAL MEASURE, PLEASE DESCRIBE BELOW ACTIONS THE CMP IS TAKING TO DEVELOP A MECHANISM TO COLLECT THE REQUESTED DATA.

Contextual measure	Survey data
Number of people that responded to a survey on recreational access	1,550 ⁶
Number of people surveyed that responded that public access to the coast for recreation is adequate or better.	While 88.6% ⁷ of survey respondents felt that government action to provide public access to waterways was very or somewhat important, no data is currently available quantifying how many people feel that access to the coast for recreation is adequate or better. Maryland currently uses Land Preservation and Parks & Recreation Plans (LPPRP) to identify local priorities for increasing public access to the coast. Maryland's CCP coordinates with the States Boating Service, Park Service and Program Open Space to increase public access.
What type of survey was conducted (i.e. phone, mail, personal interview, etc.)?	The survey was conducted through mailing and by interview.
What was the geographic coverage of the survey?	The survey was conducted statewide and also included County staff as a portion of the demographic.
In what year was the survey conducted?	2003.

4. BRIEFLY CHARACTERIZE THE DEMAND FOR COASTAL PUBLIC ACCESS WITHIN THE COASTAL ZONE, AND THE PROCESS FOR PERIODICALLY ASSESSING PUBLIC DEMAND.

Two mechanisms are used to periodically assess public demand and the ability to establish or enhance public access. Periodic surveys are conducted to determine the amount of demand present and gain a better understanding of public support for public access development. In addition, the Maryland Department of Planning (MDP) and the Maryland Department of Natural Resources (DNR) regularly work at the state level and with local governments to develop Land Preservation and Parks & Recreation Plans (LPPRP). These plans evaluate existing parks and recreation priorities and programs, assess existing and future parkland acreage and recreational facility needs, and identify general and specific parks and recreation-related goals, needs, objectives and proposed priority projects. Based on a 2003 statewide survey commissioned by MDP and DNR to support Maryland's 2009 LPPRP and associated local plans, it was found that a large majority of Marylanders (88.6%) felt that government action to provide public access to waterways was very or somewhat important.

As part of the statewide 2009 LPPRP process, MDP and DNR completed an assessment of the capability of existing state land units to provide additional public recreational opportunities, including public access, into the future. In regions that represent sections of Maryland's coastal zone,

⁶ Maryland Department of Natural Resources, *Maryland Waterways Use: A Survey of Boaters and Marine Owner/Operators*, 2003.

⁷ Maryland Land Preservation, Parks and Recreation Plans (LPPRP)

opportunities for 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.

A periodic survey used to develop DNR's Waterway 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 has greater numbers of public access sites.

5. PLEASE USE THE TABLE BELOW TO PROVIDE DATA ON PUBLIC ACCESS AVAILABILITY. IF INFORMATION IS NOT AVAILABLE, PROVIDE A QUALITATIVE DESCRIPTION BASED ON THE BEST AVAILABLE INFORMATION. IF DATA IS NOT AVAILABLE TO REPORT ON THE CONTEXTUAL MEASURES, PLEASE ALSO DESCRIBE ACTIONS THE CMP IS TAKING TO DEVELOP A MECHANISM TO COLLECT THE REQUESTED DATA.

Types of public access	Current number(s)	Changes since last assessment (+/-)	Cite data source
(CM) Number of acres in the coastal zone that are available for public (report both the total number of acres in the coastal zone and acres available for public access)	Total approximate acres in the coastal zone: 4,142,440 State DNR Land: 255,616 acres MEIRS ⁸ County: 32,802.78 acres Municipal: 27898.06 acres	State DNR Land: +16,482 acres MEIRS County: +3978.78 Municipal: +341.06	DNR's Program Open Space tracking database MDP MEIRS database
(CM) Miles of shoreline available for public access (report both the total miles of shoreline and miles available for public access)	A comprehensive list of miles of shoreline available for public access sites occurring on state, county, and public right of way is not currently available or tracked.	N/A	Unknown (data not compiled)
Number of State/County/Local parks and number of acres	206 State DNR land management units	+ 31 State DNR land management units	DNR's Program Open Space tracking database; County and municipal data in MEIRS not tracked by year
<i>Continued, next page</i>			

⁸ Maryland Electronic Inventory of Recreation Sites (MEIRS) is an interactive database of statewide recreational sites maintained by the MDP with assistance from DNR.

Types of public access	Current number(s)	Changes since last assessment (+/-)	Cite data source
Number of public beach/shoreline access sites	Worcester County has approximately 30 miles of coastline on the Atlantic Ocean (9 miles of ocean beach in Ocean City and 21 miles of beach on Assateague Island). A comprehensive list of beaches and shoreline access sites occurring on state, county, and public right of way is not currently available or tracked.	None	Unknown (data not compiled)
Number of recreational boat (power or non-power) access sites	154 boat ramps listed in coastal counties on DNR's boat ramp locator website/Online Boating Guide and 235 boat ramps and slips listed in MEIRS.	+2 DNR boat ramps +52	Maryland's Online Boating Guide http://mddnr.chesapeakebay.net/fish/state2.html MEIRS database
Number of designated scenic vistas or overlook points	14 scenic byways are designated in coastal counties. Information about vistas or overlooks not currently tracked.	-11	State Highway Administration
Number of State or locally designated perpendicular rights-of-way (i.e. street ends, easements)	A list of perpendicular rights-of-way is not currently tracked or available.	N/A	Unknown (data not compiled)
Number of fishing access points (i.e. piers, jetties)	278 boat ramps or piers	Increase of 17 boat ramps or piers	2005 Public Access Guide: Chesapeake Bay, Susquehanna River, and Tidal Tributaries
Number and miles of coastal trails/boardwalks	Boardwalks are found in Ocean City, Havre de Grace, Chesapeake Beach, North Beach, Rock Hall, Cambridge, Solomon's Island, Annapolis, and Eastern Neck National Wildlife Refuge. Maryland has more than 600 miles of water trails 349 county trails listed in MEIRS	Increases in water trails, boardwalks, and trails	DNR Boating Services, MEIRS
<i>Continued, next page</i>			

Types of public access	Current number(s)	Changes since last assessment (+/-)	Cite data source
Number of dune walkovers	17	A comprehensive list of dune walkovers is not compiled annually, change since last assessment is unknown.	Assateague Island State Park
Percent of access sites that are ADA compliant access	6.5% of accessible DNR piers/boat ramps	+ 2.7%	DNR "Access for All" online accessibility listing
Percent and total miles of public beaches with water quality monitoring and public closure notice programs	All of Maryland's beaches (approximately 250) are considered for monitoring. Counties are responsible for monitoring and notification. Beach miles are not currently tracked by MDE.	No change on number of beaches monitored, and beach mile days are not tracked by MDE.	MDE's reported numbers to EPA for the Beaches Environmental Assessment and Coastal Health (BEACH) Act
Average number of beach mile days closed due to water quality concerns	In 2006, of 81 beaches monitored, 18 had at least one advisory or closure. In 2007, of 68 beaches monitored, 20 had at least one advisory or closure. In 2008, of the 71 beaches monitored, 10 had at least one advisory or closure. The average of these three years is 16 days. Data for 2009 and 2010 was not available.	Unknown (beach mile days are not tracked and MDE did not provide complete data for all years)	MDE's reported numbers to EPA for the Beaches Environmental Assessment and Coastal Health (BEACH) Act

MANAGEMENT CHARACTERIZATION

Pursuant to final 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 effectiveness of management efforts to address those problems described in the above section for the Public Access since the last Assessment.

1. FOR EACH OF THE MANAGEMENT CATEGORIES BELOW, INDICATE IF THE APPROACH IS EMPLOYED BY THE STATE OR TERRITORY AND IF SIGNIFICANT CHANGES HAVE OCCURRED SINCE THE LAST ASSESSMENT:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Statutory, regulatory, or legal system changes that affect public access	Y	Y
Acquisition programs or policies	Y	Y
Comprehensive access management planning (including GIS data or database)	Y	Y
Operation and maintenance programs	Y	N
Alternative funding sources or techniques	N	N
Beach water quality monitoring and pollution source identification and remediation	Y	N
Public access within waterfront redevelopment programs	Y	N
Public access education and outreach	Y	Y

2. FOR MANAGEMENT CATEGORIES WITH SIGNIFICANT CHANGES SINCE THE LAST ASSESSMENT PROVIDE THE INFORMATION BELOW. IF THIS INFORMATION IS PROVIDED UNDER ANOTHER ENHANCEMENT AREA OR SECTION OF THE DOCUMENT, PLEASE PROVIDE A REFERENCE RATHER THAN DUPLICATE THE INFORMATION.
 - a) *Characterize significant changes since the last assessment;*
 - b) *Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and*
 - c) *Characterize the outcomes and effectiveness of the changes.*

Statutory, regulatory, or legal system changes that affect public access

The Critical Area Act was passed by the Maryland General Assembly in 1984 to prevent further deterioration of the Chesapeake Bay's water quality and resources, and to guide development within the Critical Area. In 2008, as a result of a recommendation in the Section 309-driven *Climate Action Plan*, House Bill 1253 was passed. This bill gives the Critical Area Commission greater authority over the growth allocation process, grants rule-making authority to the Commission, further restricts impervious surface limitations, expands the critical area's "no build" buffer in agricultural areas and drastically increases the Commission's enforcement powers and the penalties for violating the law. Any new public access that occurs in Maryland's Coastal Zone, especially in the Critical Area, is subject to the new Critical Area regulations.

Acquisition programs or policies

Since the previous 309 Assessment, DNR's Program Open Space (POS) has implemented a new "POS Targeting" land conservation classification based on ecological priorities that also incorporates management priorities and public needs (recreational, historic, and cultural access; and resource-based economies). This new targeting classification established an ecological screen to select "Targeted Ecological Areas" (TEAs). Additional programmatic and parcel criteria are then used to screen and prioritize areas within these TEAs to identify where the majority of POS land acquisition

funds will be used for land conservation. Some State POS funds are also used to acquire high priority recreational, cultural, and historic sites, providing key Chesapeake Bay access points, trails connections, and state park in-holdings. By using this more refined analysis of updated ecological, management and public needs data, DNR has created a more transparent process where decisions are supported by science. As a result of Section 309 CZM funding, POS has been able to expand the project review and targeting system to include CCP coastal habitat and resource priorities through the State's new Blue Infrastructure.

CCP has also made progress in increasing public access opportunities through NOAA's Coastal and Estuarine Land Conservation Program (CELCP) since the previous assessment. In 2008 and 2009, two Maryland CELCP proposals ranked well enough in the national competition to receive federal funding to assist in the acquisition of two properties – Sellman at Jug Bay National Estuarine Research Reserve, and Ayers Creek – Holly Grove Swamp Phase II in Maryland's Coastal Bays. Continued work through this program will help to increase public access opportunities.

Comprehensive access management planning (including GIS data or database)

In 2006, CCP worked to develop an online, interactive GIS web mapping portal that provides access to comprehensive shoreline and water access data. This mapping portal, formally Maryland Shorelines Online, now Shorelines mapper, is the culmination of several CCP efforts including the comprehensive shoreline inventory, Arc-IMS mapping application development and shoreline change mapping. The portal provides data on both public and private water access structures throughout Maryland's coastal zone. As a result of this effort, there is a greater understanding of the types and locations of water access structures throughout Maryland.

DNR's Boating Services Unit has updated the boating and public access database that identifies public investments in water access infrastructure. This information is used to update a regional waterways and public access guide and has also been used to work with local government partners to identify priorities for new access in the coastal zone.

A Maryland Working Waterfront Commission was created during the 2007 legislative session to study and make recommendations for protecting and preserving Maryland's commercial fishing industry's access to coastal waters. This comprehensive effort to review working waterfront-related issues throughout the coastal zone provided the State with a significantly updated management and planning assessment for this industry. As a result of this effort, the state has a greater understanding of planning and management challenges associated with the preservation of working waterfronts.

Public access education and outreach

The Maryland Clean Marina Initiative recognizes and promotes marinas, boatyards and yacht clubs of any size that meet legal requirements and voluntarily adopt pollution prevention practices. Over the past several years, DNR's Boating Services Unit has increased stewardship education, outreach and messaging throughout the coastal zone to increase the number of designated "Clean Marinas", to encourage patronage of these facilities, and increase the number of boaters practicing clean boating practices. As of 2009 DNR had certified nearly 25 percent of Maryland's estimated 600 marinas as Clean Marinas or Clean Marina Partners. These education and outreach efforts geared to public access at marinas, boatyards and yacht clubs will continue to foster stewardship of coastal resources and water quality. CCP has worked closely with DNR's Boating Services to support this outreach effort. As a result, designations of Clean Marinas have increased. Boating Services has also increased its available technical assistance to local governments to work collaboratively at identifying public access

opportunities.

3. INDICATE IF YOUR STATE OR TERRITORY HAS A PRINTED PUBLIC ACCESS GUIDE OR WEBSITE. HOW CURRENT IS THE PUBLICATION AND/OR HOW FREQUENTLY IS THE WEBSITE UPDATED? PLEASE LIST ANY REGIONAL OR STATEWIDE PUBLIC ACCESS GUIDES OR WEBSITES.

Since 1999, DNR's Maryland Water Trails and Public Access Program has worked with project partners, including state, local and federal governments, to develop and promote water trails and public waterway access sites that provide recreational boating opportunities for people to enjoy. Maryland has a statewide water trails guide (<http://dnr.maryland.gov/boating/mdwatertrails/watertrails.asp>) that is updated as needed when new water trails are added or changes are made to existing trails. The guides for the water trails are available electronically via the web and some are available for purchase in hard copy form from DNR.

DNR's Boating Services currently maintains a website of public access maps for boat ramps found at (<http://dnr.maryland.gov/boating/boatramps.asp>) and the Maryland Park Service maintains an online, searchable database where users can locate boat launches in state parks throughout the state (<http://dnrweb.dnr.state.md.us/parksearch/parksearch.asp>). DNR's Fisheries Service maintains a list of freshwater fishing hotspots, including many in Maryland's coastal zone (<http://dnr.maryland.gov/fisheries/recreational/fwhot.html>). DNR also provides a listing of all ADA accessible features on public lands at (<http://dnr.maryland.gov/accessforall/>). Each of these sites is updated as needed.

The Chesapeake Bay Program and its partners developed and periodically update the regional "Chesapeake Bay, Susquehanna River & Tidal Tributaries" Public Access Guide that provides information on more than 600 major public access sites in the Chesapeake Bay region, including several sites in Maryland's Coastal Bays along the Atlantic Coast. Users can find sites offering opportunities for boating, fishing, wildlife observation and beach use. Copies of the guide can be requested via the Chesapeake Bay Program office.

In December 2006, the Captain John Smith Chesapeake National Historic Trail (NHT) was designated the first national water trail in the U.S. It stretches across 3,000 miles of the Chesapeake Bay and tributaries in Delaware, Maryland, Virginia and the District of Columbia. This water trail retraces John Smith's 1607-1609 voyages of exploration on the Chesapeake Bay. The National Park Service hosts a NHT website and a web-based access guide for the water trail (<http://www.nps.gov/cajo/index.htm> and <http://www.smithtrail.net/>, respectively).

PRIORITY NEEDS AND INFORMATION GAPS

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through CCP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Inter-governmental communication and coordination and site selection	Policy, Communication	M
Enhancing public access in areas that are underserved or that would protect cultural, water dependent uses or environmental heritage	Policy, Data	M
Improved ability to include public access as a component of projects involving waterfront lands	Regulatory, policy, training, communication and outreach	M

To support public access in Maryland, there is a need to continue and expand training, communication, and outreach so that more people, including public officials and leaders, recognize that shoreline and waterfront resources are limited and where appropriate should be accessible to all citizens. Ongoing resource-stewardship communication efforts targeted to the recreational boating community will help to ensure the long-term health of Maryland's coastal resources. Because of the fiscal aspects associated with setting valuable waterfront land aside for conservation and public access purposes, economics need to be an important consideration of all efforts to promote better public access and inter-governmental coordination site selection. Where possible, there is a need to enhance or create access opportunities in areas that are either underserved or that would protect water dependent uses (working waterfronts), cultural or environmental heritage.

Limited funding for waterfront public access highlights the need to help ensure that public access is considered during or made a part of all projects involving waterfront land. State or federal regulations that directly address the incorporation of public access in waterfront development or redevelopment projects would help to address the establishment of public access at more areas throughout the coastal zone.

ENHANCEMENT AREA PRIORITIZATION

1. WHAT LEVEL OF PRIORITY IS THE ENHANCEMENT AREA FOR THE COASTAL ZONE (INCLUDING, BUT NOT LIMITED TO, CZMA FUNDING)?

High _____
Medium X
Low _____

Briefly explain the level of priority given for this enhancement area.

Although there has been some continued success providing public access in the coastal zone, there is a recognized need for ongoing investment in efforts to maintain and increase public access opportunities. Several challenges exist to increasing public access, especially along the shoreline. These include the price of waterfront property, deepwater boating access, the amount of privately-held waterfront property and planning for public access during waterfront redevelopment. There continues to be a need to create or enhance public access in Maryland's coastal zone and some areas are better served than others.

2. WILL CCP DEVELOP ONE OR MORE STRATEGIES FOR THIS ENHANCEMENT AREA?

Yes _____
No X

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

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

CCP will continue to partner with many of these groups to identify opportunities to increase or enhance public access opportunities. CCP will continue to support public access stewardship and creation opportunities each year through a limited number of CZMA Section 306A and CELCP projects, support of communication efforts, and incorporate public access priorities in CMSP spatial planning efforts. CCP 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, CCP will include public access as a component of an overarching Comprehensive Ocean and Coastal Planning strategy 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.*

RESOURCE CHARACTERIZATION

Pursuant to final 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 Marine Debris since the last Assessment.

1. IN THE TABLE BELOW, CHARACTERIZE THE SIGNIFICANCE OF MARINE/GREAT LAKES DEBRIS AND ITS IMPACT ON THE COASTAL ZONE.

Source of marine debris	Extent of source (H,M,L)	Type of impact (aesthetic, resource damage, user conflicts, other)	Significant changes since last assessment (Y or N)
Land Based – Beach/Shore Litter	H	Aesthetic, resource damage, user conflict	N
Land Based – Dumping	M	Aesthetic, resource damage, user conflict	N
Land Based – Storm Drains and Runoff	M	Aesthetic, resource damage, user conflict	N
Land Based – Fishing Related (e.g. fishing line, gear)	M	Aesthetic, resource damage	N
Water Based – Fishing (Derelict Fishing Gear)	M	Resource damage, user conflicts	Y
Water Based – Derelict Vessels	M	Resource damage, user conflicts	N
Water Based – Vessels (cruise ship, cargo ship, general and recreational vessels)	L	Resource damage, user conflicts	N
Hurricane/Storm	M	Aesthetic, resource damage, user conflicts	N

PROVIDE A BRIEF DESCRIPTION OF ANY SIGNIFICANT CHANGES IN THE ABOVE SOURCES OR EMERGING ISSUES.

The sources of marine debris in Maryland's coastal zone have not changed significantly, but awareness and knowledge about the scope of water-based derelict fishing gear or debris from recreational boating has increased. As described further in Question 2 of the Management Characterization section, below, several targeted tributaries in the Chesapeake Bay were the focus of a 2009 effort to detect and remove derelict ghost crab pots.

DO YOU USE BEACH CLEAN-UP DATA? IF SO, HOW DO YOU USE THIS INFORMATION?

Beach clean-ups are conducted along tributaries – the Chesapeake Bay, Atlantic Ocean and Atlantic Coastal Bays – by a variety of groups including the Maryland Coastal Bays Program, DNR and non-governmental organizations. Some of these efforts record the type and quantity of debris removed.

DNR's Boating Services Unit uses reports about derelict and abandoned vessels to focus removal and clean-up efforts.

MANAGEMENT CHARACTERIZATION

Pursuant to final 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 effectiveness of management efforts to address those problems described in the above section for the Marine Debris since the last Assessment.

1. FOR EACH OF THE MANAGEMENT CATEGORIES BELOW, INDICATE IF THE APPROACH IS EMPLOYED BY THE STATE OR TERRITORY AND IF SIGNIFICANT CHANGES HAVE OCCURRED SINCE THE LAST ASSESSMENT:

Management categories	Employed by state/territory (Y or N)	Employed by local governments (Y, N, Uncertain)	Significant changes since last assessment (Y or N)
Recycling requirements	Y	Y	Y
Littering reduction programs	Y	Y	N
Wasteful packaging reduction programs	N	N	N/A
Fishing gear management programs	Y	Uncertain	Y
Marine debris concerns in harbor, port, marine, & waste management plans	Y	Y	Y
Post-storm related debris programs or policies	Y	Y	Y
Derelict vessel removal programs or policies	Y	N	Y
Research and monitoring	Monitoring – Y Research – N	N	N
Marine debris education & outreach	Y	Y	Y

2. FOR MANAGEMENT CATEGORIES WITH SIGNIFICANT CHANGES SINCE THE LAST ASSESSMENT PROVIDE THE INFORMATION BELOW. IF THIS INFORMATION IS PROVIDED UNDER ANOTHER ENHANCEMENT AREA OR SECTION OF THE DOCUMENT, PLEASE PROVIDE A REFERENCE RATHER THAN DUPLICATE THE INFORMATION.

- a) *Characterize significant changes since the last assessment;*
- b) *Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and*
- c) *Characterize the outcomes and effectiveness of the changes.*

Recycling Programs. Recycling programs in Maryland are conducted by all coastal counties and Baltimore City. The Maryland Department of the Environment (MDE) compiles recycling information submitted by cities and counties, publishes an annual Maryland Waste Diversion Activities report, and maintains a recycling web page. Previously, a statewide waste diversion goal of 40% by the year 2005 was set, consisting of a 35% recycling rate plus up to a 5% credit for source reduction activities. Maryland exceeded its statewide waste diversion goal in 2005 with a rate of 42.6%. The rate has continued to increase and, as of 2007, the rate is 47.5%. During Maryland's 2009 Legislative Session, State representatives passed House Bill (HB) 595 and strengthened Maryland government's recycling requirements by mandating the recycling of certain materials. HB 595 requires State agencies to

develop and implement recycling plans for aluminum, glass, paper and plastic by January 1, 2012.

Fishing Gear Management Programs. Aided by the Blue Crab Fishery Disaster funds, in late winter 2009, Maryland employed 352 commercial crabbers to participate in a derelict (ghost) crab pot removal program. The Program funded 233 boat captains and 119 crewmen to remove approximately 8,000 partial and whole ghost pots from targeted areas of the Chesapeake Bay. Efforts were guided by a side-scan sonar data base that indicates areas of the greatest concentration of derelict crab pots – generally at the mouths of tributaries.

Marine debris concerns in harbor, port, marine & waste management plans and Marine debris education & outreach. DNR's Clean Marina Program incorporates marine debris concerns into marina management plans and boater education. Since the previous assessment, the Program has certified 140 Clean Marinas, including Clean Marina Partners (smaller entities such as public boat ramps). Between January 2006 and June 2010, the Program distributed 33,100 petroleum control kits and approximately 23,000 clean boating tip cards. In 2007, with grant funding from NOAA's Marine Debris Prevention Program, the Clean Marina Program launched a Maryland Clean Boater Program. Between May 2007 and June 2010 the Program distributed approximately 18,000 Clean Boater Brochures or Clean Boater Kits which focus on containing marine debris. Program staff continues to address compliance assistance and permit review issues and identify opportunities to partner with marinas to install Best Management Practices.

Post-storm related debris programs or policies – Urban Stormwater Runoff/Management. On April 24, 2007, Governor Martin O'Malley signed the "Stormwater Management Act of 2007" (Act), which became effective on October 1, 2007. Prior to this Act, environmental site design (ESD) was encouraged through a series of credits found in Maryland's Stormwater Design Manual. The Act now requires that ESD, through the use of nonstructural best management practices and other better site design techniques, be implemented to the maximum extent practicable. MDE revised the 2009 Model Stormwater Management Ordinance and updated the "Maryland Stormwater Guidelines for State and Federal Projects" to reflect these changes.

Derelict Vessels Removal Programs or Policies. Derelict vessels continue to present challenges for marine debris removal efforts in Maryland's coastal zone. Between 2006–2010 the Derelict Vessels Removal Program received \$480,000 and 160 requests to remove derelict vessels. Of the 160 vessels, 124 were removed. New legislation will go into effect on October 1, 2010 to further reduce the number of days that a derelict vessel may remain at a private marina, on property operated by a private marina, or private boat yard or property operated by a private boat yard. The new legislation reduces that number of days to 30. The number of days a derelict vessel may remain without consent of the property owner of a private dock or at or near waters' edge on private property was also reduced to 30 days. Additional efforts to establish safe disposal sites for unwanted vessels, develop recycling programs for fiberglass vessels and increasing criminal and civil penalties for abandoning a boat in Maryland may also help to reduce the number of abandoned boats and derelict vessels in Maryland.

PRIORITY NEEDS AND INFORMATION GAPS

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Point-source debris reduction programs	Regulatory, training and communications and outreach.	M
Strict Regulation and Enforcement	Regulatory	L
Bottle Bill / Bag Bill	Regulatory	L

ENHANCEMENT AREA PRIORITIZATION

1. WHAT LEVEL OF PRIORITY IS THE ENHANCEMENT AREA FOR THE COASTAL ZONE (INCLUDING, BUT NOT LIMITED TO, CZMA FUNDING)?

High _____
Medium _____
Low X

Briefly explain the level of priority given for this enhancement area.

Maryland has a number of existing programs in place to meet marine debris reduction needs. These include programs geared to reducing marine debris at the source – such as recycling, Clean Marina and Clean Boater programs – as well as those targeted to clean up marine debris once it reaches the coast – such as the derelict boat and ghost pot programs, stream clean up efforts and post-storm related debris programs. 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.

2. WILL CCP DEVELOP ONE OR MORE STRATEGIES FOR THIS ENHANCEMENT AREA?

Yes _____
No X

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

In comparison to other Section 309 objectives, 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 CCP 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.*

RESOURCE CHARACTERIZATION

Pursuant to final 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 Cumulative and Secondary Impacts since the last Assessment.

1. IDENTIFY AREAS IN THE COASTAL ZONE WHERE RAPID GROWTH OR CHANGES IN LAND USE REQUIRE IMPROVED MANAGEMENT OF CUMULATIVE AND SECONDARY IMPACTS (CSI) SINCE THE LAST ASSESSMENT. PROVIDE THE FOLLOWING INFORMATION FOR EACH AREA.

Table 1. Projected population growth in Maryland's coastal zone and associated cumulative and secondary impacts⁹

Secondary Impacts

Geographic Area	Type of Growth or Change in Land Use			Rate of growth or change in land use (% change, average acres converted)				Types of CSI
	Historic Population	Projected Population		Projected Population Increase per yr (2010-2030)	Total Housing Units Authorized for Construction			Associated CSIs in County
County	2000	2010	2030		2006	2007	2008	
Anne Arundel	489,656	520,300	572,800	2625	1414	1831	974	increased invasive species, loss of stream buffers, habitat, wetlands
Baltimore City	651,154	644,850	677,700	1643	649	319	1080	increased nutrient and toxin loading
Baltimore County	754,292	801,750	849,000	2363	2217	1143	1528	increased nutrient and toxin loading
Calvert	74,563	91,750	105,100	668	305	333	252	loss of wetlands, habitat, farmland and open space
Caroline	29,772	34,100	46,000	595	194	91	91	loss of farmland, open space, wetlands
Cecil	85,951	103,850	155,000	2558	405	422	596	loss of forests, increased invasives

⁹ Table 1 is derived from a report prepared by the Maryland Department of Planning, December 2008.

Charles	120,546	144,950	204,200	2963	1327	908	706	<i>increased nutrient and toxin loading</i>
Dorchester	30,674	32,350	38,850	325	400	125	249	<i>loss of farmland, open space, wetlands</i>
Harford	218,590	248,450	283,600	1758	1344	993	636	<i>loss of forests, open space, stream buffers</i>
Kent	19,197	20,300	23,400	155	194	233	105	<i>loss of wetlands, habitat, farmland and open space</i>
Prince George's	801,515	862,800	960,800	4900	3033	2183	1306	<i>increased nutrient and toxin loading</i>
Queen Anne's	40,563	48,650	61,900	663	431	221	183	<i>loss of wetlands, habitat, farmland and open space</i>
Somerset	24,747	26,550	29,350	140	135	164	44	<i>loss of wetlands, habitat, farmland and open space</i>
St. Mary's	86,211	105,400	151,500	2305	759	939	555	<i>loss of wetlands, habitat, farmland and open space</i>
Talbot	33,812	36,950	42,100	258	578	480	315	<i>loss of wetlands, habitat, farmland and open space</i>
Wicomico	84,644	96,100	117,550	1073	1082	513	348	<i>loss of wetlands, habitat, farmland and open space</i>
Worcester	46,543	50,550	60,000	473	1071	419	230	<i>loss of wetlands, habitat, farmland and open space</i>

The information presented in this table summarizes the projected population growth between 2010 and 2030 and total housing units authorized for construction in 2006, 2007 and 2008 throughout Maryland's coastal zone. According to the Maryland Department of Planning (MDP), the population of Maryland's coastal zone is expected to increase by more than a half million people by 2030. The counties with the largest projected increase in population growth are Cecil (49%), St. Mary's (44%), Charles (41%), Caroline (35%) and Queen Anne's (27%).

In addition, it is expected that during the same time period, an additional 560,000 acres will be developed throughout the state, much of it in the coastal zone. This increase in development is expected to result in a variety of cumulative and secondary impacts – some of which are listed above – these include loss of wetlands, habitat, farmland, forests and open space; increased nutrient and toxin loading and impaired water quality; increased invasive species; loss of stream buffers and increased user conflicts.

2. IDENTIFY SENSITIVE RESOURCES IN THE COASTAL ZONE (E.G., WETLANDS, WATERBODIES, FISH AND WILDLIFE HABITATS, CRITICAL HABITAT FOR THREATENED AND ENDANGERED SPECIES) THAT REQUIRE A GREATER DEGREE OF PROTECTION FROM THE CUMULATIVE OR SECONDARY IMPACTS OF GROWTH AND DEVELOPMENT.

Sensitive resources	CSI threats description	Level of threat (H,M,L)
Wetlands	Habitat loss, draining/filling/hydrologic alteration, erosion, development/conversion, invasive species, reduction in lands available for wetlands to migrate in response to sea level rise	M
Farm lands	Conversion of farmland to development, nutrient loading, fragmentation, loss of rural identity	M
Forest lands	Forest habitat loss, parcelization, exotic and invasive species, fragmentation, conversion of forestland to development and associated loss of working forestland value	H
Streams/Rivers	Water quality degradation related to increased impervious surface and development – nutrient, sediment and toxic loading, habitat modification, stream flow modification, erosion	H
Shoreline and Critical Area Resources	Shoreline and near-shore habitat modification, increase in impervious surface leading to impaired water quality and resource degradation, loss of public access	M
Coastal Estuaries – Chesapeake and Atlantic Coastal Bays	Nutrient, sediment and toxin loading and habitat loss – associated impacts to living resources; conflicting uses; invasive species	H
Benthic Habitats – SAV, shellfish, etc.	Increased sedimentation, water quality degradation, conflicting uses	M
Historical and Archeological Resources; Water-dependent Uses	Loss and damage of resources, conversion of historical water-dependent uses and loss of cultural identity	M

MANAGEMENT CHARACTERIZATION

Pursuant to final 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 effectiveness of management efforts to address those problems described in the above section for the Cumulative and Secondary Impact Assessment Area Objective since the last Assessment.

1. FOR EACH OF THE MANAGEMENT CATEGORIES BELOW, INDICATE IF THE APPROACH IS EMPLOYED BY THE STATE OR TERRITORY AND IF SIGNIFICANT CHANGES HAVE OCCURRED SINCE THE LAST ASSESSMENT:

Management Categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Regulations	Y	Y

Policies	Y	Y
Guidance	Y	Y
Management Plans	Y	Y
Research, assessment, monitoring	Y	Y
Mapping	Y	Y
Education and Outreach	Y	Y

2. FOR MANAGEMENT CATEGORIES WITH SIGNIFICANT CHANGES SINCE THE LAST ASSESSMENT PROVIDE THE INFORMATION BELOW. IF THIS INFORMATION IS PROVIDED UNDER ANOTHER ENHANCEMENT AREA OR SECTION OF THE DOCUMENT, PLEASE PROVIDE A REFERENCE RATHER THAN DUPLICATE THE INFORMATION.

- a) *Characterize significant changes since the last assessment;*
- b) *Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and*
- c) *Characterize the outcomes and effectiveness of the changes.*

Since the previous assessment significant legislative, policy and research changes have occurred to address cumulative and secondary impacts related to water quality degradation as a result of growth and development related issues. Many of these efforts were either directly funded by CZMA funds, developed in partnership with CZMA-funded staff or coordinated through the network partnership.

- § *The Chesapeake and Atlantic Coastal Bays Trust Fund (SB 213) was passed in November 2007, allowing Maryland to accelerate Bay restoration by focusing limited financial resources on the most effective non-point source pollution control projects as identified in the State's Tributary Strategies and the 2-Year Milestones. Trust Fund monies generated through motor fuel tax and rental car tax in Maryland (up to approximately \$50 million/year) will be used as a dedicated source of funding to reduce nonpoint source pollution to the Chesapeake Bay and the Atlantic Coastal Bays.*
- § *Watershed Assistance Collaborative: in recognition that not all jurisdictions currently have the capacity to implement the anticipated level of funding envisioned with the Trust Fund, Maryland's State Agencies, the Chesapeake Bay Trust, University of Maryland Extension, the University of Maryland Environmental Finance Center, NOAA and the EPA joined together to establish the *Watershed Assistance Collaborative (WAC)*. This partnership provides services and technical assistance to local governments to advance nonpoint source reduction implementation projects. By leveraging resources of existing programs, the WAC provides coordinated capacity building opportunities (e.g. planning and design, watershed, and on-the-ground personnel assistance) to local implementers, to accelerate nonpoint source pollution reduction efforts.*
- § *Innovative Technology Fund was established to accelerate Bay restoration through the improvement of water quality in new and innovative ways. At the 2007 Chesapeake Bay Program Executive Council (EC) meeting, the State of Maryland and the Environmental Protection Agency (EPA) agreed to each pledge \$250K to support an Innovative Technology Fund to promote investments in technologies that could accelerate Bay restoration efforts.*

- § *2-year milestones* were adopted in May 2009 among Bay Jurisdictions that identifies specific, near-term actions that will be completed to keep the State on the pace to reach Bay restoration goals by 2020. For Maryland, the first 2-Year Milestones consisted of a suite of 27 specific and accelerated actions that will result in an additional reduction of 3.75 million pounds of nitrogen and 193,000 pounds of phosphorus from reaching the Bay by the end of 2011 beyond the reductions already recognized through existing programs. Maryland will complete 2-year milestones until the Bay's goals are reached in 2020.

- § *Stormwater Management Act of 2007.* On April 24, 2007, Governor Martin O'Malley signed the Stormwater Management Act that became effective on October 1, 2007. Prior to the Stormwater Management Act, environmental site design (ESD), was encouraged through a series of credits found in Maryland's Stormwater Design Manual. The Act now requires that ESD, through the use of nonstructural best management practices and other better site design techniques, be implemented to the maximum extent practicable.

- § *Living Shorelines Protection Act of 2008.* The State of Maryland passed the Living Shorelines Protection Act in 2008. This law now requires that living shorelines be considered as the first option for shore erosion control projects and that property owners demonstrate to the state's satisfaction that a living shoreline will not be successful prior to being granted approval for a hard stabilization option being permitted. Maryland now waives permit fees for living shoreline projects and has developed a suite of education and outreach training events for waterfront homeowners and marine contracting professionals to address gaps in living shoreline knowledge and implementation. Initiated by BayStat, these changes were driven by CZM through collaborative efforts between DNR and MDE. Funds from both Section 306 and Section 309 were used to advance the passage and implementation of this Law and deliver training opportunities. This legislation will result in improved shoreline management and the maintenance of natural shorelines. Regulations are being developed.

- § *Update to the Chesapeake and Atlantic Coastal Bays Critical Area Law.* An update to the Chesapeake and Atlantic Coastal Bays Critical Area Law was passed in 2008. This update expanded the existing 100-foot buffer to 200 feet for all new subdivisions in the Resource Conservation Area of the 1000-foot Critical Area boundary. This effort will also require buffer management plans and updated Critical Area mapping to be completed in the Critical Area. To support these efforts, education and outreach work has been undertaken and will continue into the next assessment to provide training about new requirements. CZM supported the development of mapping and local planning components of this Act using Section 306 and Section 309 funds. This update will result in better management of sensitive Critical Area resources and improved water quality in the near-shore environment.

- § *Smart and Sustainable Growth Act.* In 2009, Maryland passed the Smart and Sustainable Growth Act which clarifies the link between local comprehensive plans and local land use ordinances relating to rezoning, development patterns, land uses and policies and timing of comprehensive plan implementation. The bill defines the current requirement of "consistency" and the degree to which plans are or are not consistent with local land use ordinances. This "consistency" definition applies to special exceptions and the adoption of local ordinances and regulations, but also to other sections of state law when it must be consistent with local plans (e.g. municipal annexations, water and sewer amendments and Critical Area growth allocation). In addition to these consistency issues the Act also requires

Planning Commission and Boards of Appeal to complete an education course detailing these types of issues.

- § *Smart Growth Goals, Measures, and Indicators and Implementation of Planning Vision:* In 2009, Maryland passed this bill which requires local planning commissions or boards to submit annual reports to local legislative bodies that include specified smart growth measures and indicators and information on a local land use goal as part of the report. The annual report must state which ordinances or regulations were adopted or changed to implement the State's planning visions, especially related to growth located within and outside state priority funding areas (PFAs). The reports must also address development capacity analyses that are updated once every 3 years or when there is a significant zoning or land use change and the number of acres preserved using local agricultural land preservation funding.
- § *Sustainable Forestry Act:* In 2009, Maryland passed the Sustainable Forestry Act. Recognizing that tree and forest cover is the single most beneficial land use for protecting the Chesapeake Bay. This Act was designed to retain privately owned forest lands within the state. It directs retention of privately-owned forest lands under Maryland's land conservation programs; incorporates recognition of sustainable forestry management in local land use master plans; enhances forest land preservation under Maryland's Agricultural Land Preservation Foundation; establishes a Right to Practice Forestry in Maryland without undue legal interference; delineates comprehensive definitional terms attendant to forestry and related practices; creates the Sustainable Forestry Council within the Department of Natural Resources; expands the purposes of the Woodland Incentives Fund; authorizes timber revenues derived from State lands to be credited to the Woodland Incentives Fund; advances urban tree canopy funding strategies; permits Forest Conservancy District Boards to become fiscally self-sufficient; and sets forth innovative future strategies from renewable energy production to tax incentives. This Act will result in increased forest cover throughout Maryland's Bay watershed. This effort was not CZM funded or driven.
- § *Coastal Communities Initiative:* This CCP-driven and Section 309 funded effort supported a number of state-local government partnership efforts throughout the coastal zone during the previous assessment. Work was completed in several local jurisdictions to ensure that coastal and ocean waters meet living resource and human needs and to enhance the protection and management of Maryland's coastal resources. A number of policies were adopted to accomplish these objectives.

ADVANCING THE GOALS OF CZMA THROUGH THE COASTAL COMMUNITIES INITIATIVE

Partner	Project Title	Outcome	CZMA Grant Year
Anne Arundel County	Living Shorelines Video	Development of a Living Shorelines video to educate developers and waterfront property owners	2004
Caroline County	Improving Caroline County's Environmental Planning Program	Database improvements and critical area outreach to enhance planning capacity.	2004
City of Perryville	Master Plan Development, Local Official Training	Development of a Comprehensive and Master Plan that incorporates smart growth ideas to	2004

		revitalize the downtown	
City of Denton	Eastern Shore Pattern Book/ Greenbelt Plan Development	Development of a "Pattern Book" that will be a guideline of all new development and infill in Denton	2004
Charles County	Modifying Codes to Implement the Mattawoman Watershed Management	Modify applicable ordinances to support implementation of the Mattawoman Watershed Management Plan recommendations	2004
Worcester County	Refinement of TMDL Analyses to Predict the Impacts of New Development	Improvement of the development review process for the consideration of cumulative and secondary effects of development on achieving TMDLs	2004
City of Federalsburg	Federalsburg Codes Improvement Project	Update of Comprehensive Plan and review and revision of Town Code to incorporate natural resource protection elements	2004
City of Annapolis	Digitizing Critical Area Maps	Digitization of maps with updated streets and parcels to aid the planning staff determine Critical Area designations with ease and more accuracy	2004
City of Baltimore	Poppleton Green Design Project	Identification and implementation of green design techniques in a major redevelopment effort	2004
Calvert County	Enhanced Preservation of Forestland	Revisions of forestry worksheets and policies to comply with the new County Forestry Ordinance	2004
City of Queenstown	Comprehensive Development Plan	Comprehensive growth and redevelopment plan that builds upon the natural, cultural and historical attributes of the town	2004
Secretary and East New Market	Comprehensive Plan Revisions in Response to the New HB 1141 Requirements	Address new requirements of HB 1141, while additionally creating model Municipal Growth and Water Resources Elements	2005
Calvert County	Forest Resources - Assessment, Protection, Conservation and Enhancement	To identify gaps in existing local laws, policies and programs that affect forests, and to evaluate options for increasing/maintaining forest cover through existing mechanisms	2005
Kent County	Planning for Resource Protection (HB 1141)	Drafting of the Water Resources Element	2005
Town of Vienna	Community Waterfront Park: Buffer Management Plan and Educational Signage	Rendered Site Plan, Perspective Drawings, Planting Plan.	2005
Baltimore County	Waterfront Typology for Undersized Lots	Data Compilation and Pattern Book Development	2005
City of Salisbury	Strategic Revitalization Plan – North Prong of the Wicomico River	A Strategic Revitalization Plan for the North Prong of the Wicomico River was developed including water quality and urban housing.	2005
City of Bowie	Green Infrastructure Plan Update	Development of an action strategy that coordinates all pollution prevention, land acquisitions, forest mitigation and environmental stewardship projects with the	2005

		City's adopted Green Infrastructure Plan	
Cecil County	Pilot Watershed Management Plan Initiative for the Sassafras River	Development of a pilot Watershed Management Plan including stakeholders input.	2005
Queen Anne County	Kirwan and Goodhands Creek Watershed Management Plan	Development of a comprehensive watershed and shoreline management plan to protect two watersheds in Queen Anne's County	2005
Town of Queenstown	Comprehensive Development Plan for Queenstown Part II	A series of public meetings to develop redevelopment plans that conforms to the Vision statement using updated State-generated maps and projections based on the agreed upon Town vision	2006
Town of Crisfield	Strategic Revitalization Plan	The series of meetings to create a vision and revitalization plan for the town with citizen input.	2006
Town of Sharptown	Comprehensive Plan Update / Six-Year Review and Compliance with the New HB 1141 Requirements	Work with the town and public to draft language for the Municipal Growth Element and Water Resources Element and adopt ordinance	2006
Town of Federalsburg	Multi-Jurisdictional Planning for Growth and Resource Protection (House Bill 1141)	Evaluate the substantive and procedural requirements of HB 1141, and determine how to address these items, consistent with the specific goals, policies and land use recommendations of the new Comprehensive Plan.	2006
Town of Charlestown	Comprehensive Plan Update & Visioning for the Future (HB 1141)	A future vision that preserves and enhances the special waterfront qualities, and serve to provide a uniqueness of place	2006
Charles County	Design Commercial Component: Transfer Development Rights (TDR) Program	Final TDR analysis report including draft zoning text revisions and proposed TDR program revisions proposed for adoption.	2007
Fruitland	Comprehensive Plan Update/Six-Year Review and Compliance with the New HB 1141 Requirements	Update Comprehensive Plan to include Water Resources Elements	2007
Wicomico County	HB 1141 Requirements	Comprehensive Plan Revisions in Compliance with HB 2/Priority Preservation Element, HB 1141/Water Resources Plan Element, and HB 1160/Work Force Housing Element	2007
Town of Queenstown	Review and Revisions of Town Codes and Ordinances	Review and revise supporting development ordinances including the Land Development Ordinance for Queenstown, the Critical area, forest conservation, and floodplain and stormwater regulations	2007
Town of Forest Heights	Comprehensive Plan to Develop a Green	A sustainable "green infrastructure" throughout the Town of Forest Heights, and	2008

	Community	educate and encourage residents to adapt to behavioral changes by involvement in various projects.	
Baltimore City	Site Selection & Ownership Transfer Policies to Support and Protect Community-Managed Open Spaces	The Green Spaces Project to establish new selection guidelines and disposition policies for use by the BGS Land Trust, City of Baltimore and our future land bank to facilitate the transfer of vacant lots used as community-managed open spaces to a land trust for long-term protection and support.	2008
Town of Elkton	Comprehensive Plan Revisions for Compliance with HB 1141, Water Resources Element	Drafting of the Water Resources Element	2008
Town of North East	Comprehensive Plan Revisions for Compliance with HB 1141, Water Resources Element	Drafting of the Water Resources Element	2008
Town of Ridgely	Comprehensive Plan Revisions for Compliance with HB 1141, Water Resources Element	Drafting of the Water Resources Element	2008
Dorchester County	Comprehensive Plan Revisions for Compliance with HB 1141, Water Resources Element	Drafting of the Water Resources Element	2008
Town of Snow Hill	Comprehensive Plan Revisions for Compliance with HB 1141, Water Resources Element	Drafting of the Water Resources Element	2008
Town of Hurlock	Comprehensive Plan Revisions for Compliance with HB 1141, Water Resources Element	Drafting of the Water Resources Element	2008
City of Salisbury	Comprehensive Plan Revisions for Compliance with HB 1141, Water Resources Element	Drafting of the Water Resources Element	2008
Anne Arundel County	Anne Arundel County Sea Level Rise Strategic Plan	Vulnerability Assessment to identify potential areas of sea level rise and storm surge inundation, assess trends and predict impacts of shoreline erosion, and develop complete inventories of resources at risk.	2009
City of Annapolis	Sea Level Rise Adaptation and Response Plan: Vulnerability and Impact	Project will expand the geographic scope of the sea level rise study beyond City Dock to include an assessment of the Eastport	2009

	Assessment and the Policy Response Option Analysis	peninsula and adjacent flood-prone areas	
Caroline County	Improving Caroline County's Floodplain and Stormwater Management	Stormwater Management Ordinance will be updated and regulations, which are currently located throughout the Zoning and Subdivision Ordinances, will be updated and consolidated into one ordinance.	2009
Town of Queenstown	The Queenstown Integrated Community and Watershed Design	This project will develop an Integrated Community Design Document (ICDD). Development of this document will be accomplished by examining best development practices from around the world and by involvement of the community in community design workshops	2009
Town of Centreville	Corsica River Stormwater Utility	develop a stormwater utility to assure that long term funding is available to maintain quality stormwater treatment systems, improve existing stormwater treatment systems, and implement such systems where they do not exist	2009

PRIORITY NEEDS AND INFORMATION GAPS

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through CCP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Increased coastal resource protection	Regulatory, policy, data, training, communication & outreach	H
Improved preservation efforts for water-dependent uses, working waterfronts and cultural waterfront uses	Policy, capacity	H
Nonpoint source reduction strategies and strategy implementation	Regulatory, policy, capacity	M
State and local planning efforts to address cumulative and secondary impacts associated with growth and development	Policy, capacity	H

ENHANCEMENT AREA PRIORITIZATION

1. WHAT LEVEL OF PRIORITY IS THE ENHANCEMENT AREA FOR THE COASTAL ZONE (INCLUDING, BUT NOT LIMITED TO, CZMA FUNDING)?

High X
Medium
Low

Briefly explain the level of priority given for this enhancement area.

Many challenges still exist to address and reduce the cumulative and secondary impacts related to increasing growth and development throughout Maryland's coastal zone. The potential effects of conflicting uses, degraded water quality, converting land and waterfront uses, and habitat loss has the potential to significantly affect sensitive resources in the coastal zone.

2. WILL CCP DEVELOP ONE OR MORE STRATEGIES FOR THIS ENHANCEMENT AREA?

Yes
No X

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

Approximately 70% of Maryland's population currently resides in the coastal zone. The MDP projects that the population in the coastal zone is expected to increase by more than half a million people over the next 20 years and that at current rates, more than 560,000 acres will be developed throughout the state by 2030¹⁰. By 2020, it is possible that 3 million more people will live in the Chesapeake Bay watershed. Water quality may continue to decline, natural forest and wetland cover may continue to be lost, and existing rural and water-dependent land uses will be threatened by this anticipated growth. The state will need to address a number of these gaps and needs to improve its ability to conserve valuable coastal resources, existing historic and cultural waterfront uses and provide opportunities for future water-dependent uses. Therefore, while a strategy will not be developed exclusively for Cumulative and Secondary Impacts, CCP is including elements of these related challenges as a subset of its other broader strategies.

¹⁰ MDP's Plan Maryland *What Is It?* http://www.plan.maryland.gov/PDF/booklet/PlanMaryland_web.pdf.

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."*

RESOURCE CHARACTERIZATION

Pursuant to final 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 Special Area Management Planning since the last Assessment.

1. IDENTIFY GEOGRAPHIC AREAS IN THE COASTAL ZONE SUBJECT TO USE CONFLICTS THAT CAN BE ADDRESSED THROUGH SPECIAL AREA MANAGEMENT PLANS (SAMPs). ALSO INCLUDE AREAS WHERE SAMP HAVE ALREADY BEEN DEVELOPED, BUT NEW ISSUES OR CONFLICTS HAVE DEVELOPED THAT ARE NOT ADDRESSED THROUGH THE CURRENT PLAN. IF NECESSARY, ADDITIONAL NARRATIVE CAN BE PROVIDED BELOW.

Geographic Area	Major conflicts	Is this an emerging or a long-standing conflict?
Maryland's Coastal Bays	<p>Large seasonal populations and extensive development in a relatively small area threaten to destroy the environmental and economic benefits of the region.</p> <p>Outdated management plans for the region do not address emerging challenges such as ocean planning, green house gas projections, offshore energy development, TMDL implementation and emerging water quality and marine debris issues.</p>	<p>Long-standing</p> <p>Emerging</p>
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.	Long-standing and Emerging
Mattawoman Creek	Cumulative impacts from land development practices and suburban sprawl degrade water quality and coastal habitats that sustain some of the most productive anadromous fish and natural resource areas in the coastal zone.	Long-standing

MANAGEMENT CHARACTERIZATION

Pursuant to final 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 effectiveness of management efforts to address those problems described in the above section for Special Area Management Planning since the last Assessment.

1. IDENTIFY BELOW ANY SPECIAL MANAGEMENT AREAS IN THE COASTAL ZONE FOR WHICH A SAMP IS UNDER DEVELOPMENT OR A SAMP HAS BEEN COMPLETED OR REVISED SINCE THE LAST ASSESSMENT:

SAMP title	Status (new, revised, or in progress)	Date approved or revised
Maryland Coastal Bays Program Comprehensive Conservation and Management Plan (CCCP)	In Progress	Since 1995, the Maryland Coastal Bays Program (MCBP) and their associated watershed have been addressed by a special area plan as part of a Section 309 Strategy. Their CCCP was approved by the U.S. EPA as part of the National Estuary Program in October, 1999 and the MCBP is currently in the process of updating and revising it.

2. FOR MANAGEMENT CATEGORIES WITH SIGNIFICANT CHANGES SINCE THE LAST ASSESSMENT PROVIDE THE INFORMATION BELOW. IF THIS INFORMATION IS PROVIDED UNDER ANOTHER ENHANCEMENT AREA OR SECTION OF THE DOCUMENT, PLEASE PROVIDE A REFERENCE RATHER THAN DUPLICATE THE INFORMATION.
 - a) *Characterize significant changes since the last assessment (area covered, issues addressed and major partners);*
 - b) *Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and*
 - c) *Characterize the outcomes and effectiveness of the changes.*

Although Maryland has not pursued new federally-designated SAMPs in the last few assessments, steady progress has continued 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 (CCCP) 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. As of September 2004, 53.4% of the CCCP had been implemented and by 2009, this implementation rate had reached 63%. A third phase of CCCP implementation will end in 2014 and is expected to realize a number of on-the-ground efforts to restore the watershed and to finalize those actions affecting the water quality and wildlife within the bays.

Since 2005, citizen engagement in community clean-ups and volunteer science initiatives and community planning in the Coastal Bays region has steadily increased. CCP-led efforts (Section 306 and Section 309) supported the analysis and dissemination of projected sea level rise and inundation and living shoreline suitability mapping products for coastal Worcester County. This effort resulted in increased awareness and implementation of natural shoreline management techniques. CCP-led efforts also led to a successful FY10 CELCP project in the Coastal Bays region – Ayers Creek/Holly Grove Swamp Phase II – scheduled to be completed in late 2010 that will preserve 430 acres.

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 (Section 306 and Section 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*.

PRIORITY NEEDS AND INFORMATION GAPS

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy).

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Need to reduce natural resource and human use conflicts in the coastal zone and evaluate potential impacts from the effects of sea level rise and climate change	Training, Communication & Outreach to increase awareness and build local partnerships Policy and data to advance marine spatial planning	H
Long-term, continuous data collection and monitoring of coastal resources and watershed conditions.	Data, Capacity	M

ENHANCEMENT AREA PRIORITIZATION

1. WHAT LEVEL OF PRIORITY IS THE ENHANCEMENT AREA FOR THE COASTAL ZONE (INCLUDING, BUT NOT LIMITED TO, CZMA FUNDING)?

High
Medium
Low X

Briefly explain the level of priority given for this enhancement area.

Progress is well underway to achieve MCBP goals and implement the CCCP. Legislative changes have occurred to increase resource protection in the Critical Area, which includes the Coastal Bays and Mattawoman Creek areas. Preliminary work is also underway 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.

2. WILL CCP DEVELOP ONE OR MORE STRATEGIES FOR THIS ENHANCEMENT AREA?

Yes
No X

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

A strategy to conduct marine spatial planning activities to identify mechanisms that balances natural resource protection with human uses and that will subsequently guide decision making is being proposed in the Ocean Resources Enhancement area. The Ocean Resources strategy will take a multi-sectored analysis approach and in doing so will address many of the needs outlined in this enhancement area. Work will address coastal areas where natural resource, coastal-dependent uses, and the effects of climate change and sea level rise have the potential to result in immediate or future use conflicts. Therefore, CCP 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.*

RESOURCE CHARACTERIZATION

Pursuant to final 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 the Ocean/Great Lakes Resources since the last Assessment.

1. IN THE TABLE BELOW CHARACTERIZE OCEAN AND/OR GREAT LAKES RESOURCES¹¹ AND USES OF STATE CONCERN, AND SPECIFY EXISTING AND FUTURE THREATS OR USE CONFLICTS.

Resource or use	Threat or use conflict	Degree of threat (H,M,L)	Anticipated threat or use conflict
Beach sand and shorelines	Near-shore development, shoreline erosion, shoreline hardening, sea level rise	H	Habitat loss; erosion and/or encroachment on beaches and barrier islands due to effects of sea level rise and climate change impacts including increasing frequency of episodic storm events
Offshore and outer-continental shelf (OCS) sand and shoals, unique benthic ocean habitat	Use conflict between sand mining, artificial reef development, fisheries, wildlife, alternative energy development	H	Ocean sand mining resources within state waters projected to be depleted in the next few years; beach erosion exacerbated due to increased storm events; increasing threat to OCS benthic habitats (e.g., coldwater coral reefs, canyons, shoals) and organisms due to offshore energy development
Offshore energy development	Loss or physical alteration of habitat, potential use area conflicts	H	Loss or physical alteration of habitat from OCS development and land-based transmission; potential human use area conflicts
Underwater archaeological resources	Lack of user understanding of resource protection	L	User conflicts; impacts of sea level rise and increasing erosion
Live communities and species use	Habitat alteration and loss; development and non-point source pollution increasing recreational and commercial uses	H	Cumulative and increased effects of habitat alteration and loss, development and non-point source pollution, increasing human uses; impacts from geologic and/or geophysical surveys related to energy development; anticipated habitat, community

¹¹ For the purposes of this assessment, the Maryland CCP defines "ocean and/or Great Lakes resources" as the aquatic and near-shore resources in the Atlantic Ocean, Chesapeake and Atlantic Coastal Bays and tributaries within the coastal zone.

			or species shifts due to effects of sea level rise and climate change
Fisheries	Fishing pressure; fish blockages; loss or degradation of juvenile and spawning habitat; land-use and non-point source pollution	M	Stock depletion; non-native species; cumulative and increased effects of habitat alteration and loss, development and non-point source pollution, increasing human uses; anticipated habitat, community or species shifts due to effects of sea level rise and climate change

2. DESCRIBE ANY CHANGES IN THE RESOURCES OR RELATIVE THREAT TO THE RESOURCES SINCE THE LAST ASSESSMENT.

Beach sand and shorelines. Since the last assessment, the Living Shorelines Protection Act of 2008 was passed. This Law establishes living shorelines, or softer shoreline erosion control practices, as the first option to be considered for shoreline erosion control projects. It is anticipated that this Act will reduce the level of threat to shoreline and beach resources due to shoreline hardening and erosion. While the level of risk to beach sand and shoreline resources due to shoreline hardening is expected to decrease because of this legislation, the risk of erosion and/or encroachment on beaches, shorelines, near-shore habitats and barrier islands due to the impacts of sea level rise and climate change, including an increase in the frequency of episodic storm events, is expected to increase over time. The level of risk to beach sand, shoreline and near-shore habitat and resources due to continued near-shore development remains constant and is not anticipated to change significantly in the future.

Offshore and outer-continental shelf (OCS) sand and shoals, unique benthic ocean habitat. Currently utilized offshore sand resources are located north of the Ocean City Inlet, within the three-mile limit of state jurisdiction. These sands are committed to the reconstruction and periodic nourishment of Ocean City beaches along the Atlantic Coast. An increase in the frequency of strong storms has accelerated erosion of restored beaches. These factors have increased demands on the sand resources within state waters and the level of threat is expected to increase over time as state sources of offshore sand and shoals are anticipated to become depleted in the next few years. New sand sources are needed outside of state waters to meet this increased demand. While access to sand resources in Federal waters would help to address this use conflict, competition for use of bottom space is expected to increase over time as more human uses of our offshore areas are realized. Offshore energy development, artificial reef deployment, and fishing will demand bottom space where offshore sand and shoal resources are located and these areas must still be maintained to meet the needs of offshore fisheries and living resources. Increasing interest in offshore energy development also is expected to pose an increasing threat to OCS benthic habitats – such as coldwater coral reefs and canyons – and organisms.

Offshore energy development. Beginning in 2006, Maryland set a Renewable Portfolio Standard (RPS) that requires 20% of the state's electricity to be generated from renewable sources by 2022. Current land-based technologies would meet just 36% of this goal. Offshore wind would help to meet the remaining shortfall. Over the past couple of years, Maryland CCP has been actively engaged in state- and region-wide efforts to identify, characterize, map and evaluate offshore resources and human uses. Offshore energy development is a new, emerging use that will compete for space in Maryland's ocean and has the potential to result in loss or physical alteration of habitat and in use conflicts during project and transmission line siting.

Underwater archaeological resources. Since 2006, CCP has worked with the Maryland Historic Trust at the Maryland Department of Planning to better characterize and map underwater archeological resources in state waters, especially along the Atlantic Ocean coast. Casual vandalism by divers, fishing lines and nets, channel dredging and several other activities still threaten the state's underwater archaeological resources. However, it is expected that over the next few years, emerging threats to these resources may be related to competing ocean and Chesapeake Bay uses such as fishing, boating, recreation, and energy development. In addition, the effects of sea level rise and increased rates of erosion related to increased episodic storm events have the potential to negatively affect the state's underwater archaeological resources.

Live communities and species use. Threats still exist to many living resources due to the cumulative effects of near-shore habitat alteration, loss and development, and non-point source pollution that degrades water quality. Emerging coastal and ocean uses, such as offshore energy development, are expected to increase over time. These emerging uses and threats may result in use conflicts related to loss or physical alteration of habitat and/or community structures and create demand for space currently utilized by this resource as feeding grounds and migration routes. The potential risks that sea level rise and climate change pose to live communities and species may affect this resource significantly in coming years. Maryland's Phase II Climate Action Plan Strategy, to be released in December 2010, will outline and quantify sector-based adaptation strategies to reduce the impacts of climate change including sea level rise, increased temperature, and changes in precipitation to some of these bay and aquatic resources. The Phase II Strategy will provide the basis for guiding and prioritizing state-level activities with respect to both climate science and adaptation policy.

Fisheries. DNR is responsible for management of Maryland's fisheries resources in cooperation with the Chesapeake Bay Program, the Atlantic States Marine Fisheries Commission, and the National Marine Fisheries Service Mid-Atlantic Fisheries Management Council. Freshwater, estuarine, and migratory fish stocks are managed for sustainable fisheries, to enhance and restore fish or shellfish species in decline; to promote ethical fishing practices, and to ensure public involvement in the fishery management process. Fishery management plans exist for species that serve vital economic, recreational, ecological and sociological roles in Maryland. The integration of ecosystem processes into the management planning process is a relatively new directive and presents a complex challenge for managing Maryland's fisheries. Existing threats to fisheries resources include development and non-point source pollution, habitat loss and degradation (especially in juvenile and spawning areas), reduced stocks, fish blockages, and competition between different types of fishing and boating uses. Threats to fisheries resources in the future may include the loss of fishing use areas due to offshore energy development and potential habitat, community or species shifts due to the effects of climate change.

MANAGEMENT CHARACTERIZATION

Pursuant to final 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 effectiveness of management efforts to address those problems described in the above section for the Ocean/Great Lakes Resources Enhancement Area Objective since the last Assessment.

1. FOR EACH OF THE MANAGEMENT CATEGORIES BELOW, INDICATE IF THE APPROACH IS EMPLOYED BY THE STATE OR TERRITORY AND IF SIGNIFICANT CHANGES HAVE OCCURRED SINCE THE LAST ASSESSMENT:

Management categories	Employed in Chesapeake Bay/Significant Changes (Y or N/Y or N)	Employed in Coastal Bays/Significant Changes (Y or N/Y or N)	Employed in Atlantic Ocean /Significant Changes (Y or N/Y or N)
Comprehensive ocean/Great Lakes management plan or system of Marine Protected Areas	Y/Y	Y/N	N/N
Regional comprehensive ocean/Great Lakes management program	Y/Y	N/N	Y/Y
Regional sediment or dredge material management plan	Y/N	N/N	N/N
Intra-governmental coordination mechanisms for Ocean/Great Lakes management	Y/Y	Y/N	Y/Y
Single-purpose statutes related to ocean/Great Lakes resources	Y/Y	Y/Y	Y/Y
Comprehensive ocean/Great Lakes management statute	N/N	N/N	N/N
Ocean/Great Lakes resource mapping or information system	Y/Y	Y/Y	Y/Y
Ocean habitat research, assessment, or monitoring programs	Y/Y	Y/Y	Y/N
Public education and outreach efforts	Y/Y	Y/Y	Y/Y

2. FOR MANAGEMENT CATEGORIES WITH SIGNIFICANT CHANGES SINCE THE LAST ASSESSMENT PROVIDE THE INFORMATION BELOW. IF THIS INFORMATION IS PROVIDED UNDER ANOTHER ENHANCEMENT AREA OR SECTION OF THE DOCUMENT, PLEASE PROVIDE A REFERENCE RATHER THAN DUPLICATE THE INFORMATION.

- Characterize significant changes since the last assessment;*
- Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and*
- Characterize the outcomes and effectiveness of the changes.*

Since the previous assessment, significant legislative, policy and research changes have occurred to address Ocean and Great Lake Resources that were either directly funded through CZMA funds, developed in partnership with CZMA funded staff or coordinated through the network partnership.

Comprehensive ocean management plan or system of Marine Protected Areas (MPAs). While a comprehensive ocean management plan or system of MPAs does not currently exist in Maryland, significant work has been completed by CCP (Section 306 and Section 309) since the last assessment to inventory and assess coastal aquatic and near-shore resources. Since the previous assessment, Maryland has completed a resource inventory and a Blue Infrastructure assessment in the Chesapeake and Atlantic Coastal Bays, their tidal tributaries and the Atlantic Ocean to evaluate different types of

marine protected areas in the state. CCP is currently in the process of evaluating the potential for development of a comprehensive coastal marine spatial plan.

Additionally, in 2009, the Oyster Restoration and Aquaculture Development Plan was announced that proposed to (1) significantly increase Maryland's network of oyster sanctuaries in Chesapeake Bay, (2) identify large new areas open to leasing for oyster aquaculture in Maryland's Chesapeake and Coastal Bays and streamline the permitting process through Aquaculture Enterprise Zones (AEZs) and (3) identify areas off limits to leasing, allowing for a more targeted, scientifically-managed and sustainable public fishery.

Regional comprehensive ocean management program. In June 2009, the Governors of New York, New Jersey, Delaware, Maryland and Virginia signed the Mid-Atlantic Governor's Agreement on Ocean Conservation, formally establishing the Mid-Atlantic Regional Council on the Ocean (MARCO). This regional ocean management program is structured to foster a cooperative relationship for shared resources among the States. MARCO will strengthen efforts within each of the States to embrace a more comprehensive and ecosystem-based approach to the management of human activities across the region, from watersheds to offshore areas. This effort was a CZM-driven change (Section 306) and resulted in a multi-year action plan to address habitat, water quality, climate change and energy issues; implementation is currently underway.

Since the last assessment, mechanisms established to track and achieve Chesapeake 2000 Plan goals have change significantly. In 2008, the state CCP (core staff, Section 306) joined with other Chesapeake Bay watershed states to establish new 2-year milestone goals to meet nutrient and sediment reduction goals. In addition states established an independent evaluator program to monitor performance, provide advice, and hold the partners accountable for restoration goals.

Intra-governmental coordination mechanisms for Ocean (and Coastal) management. Offshore energy development is an emerging ocean use that will compete for space and has the potential to highlight a range of use conflicts. In the fall 2009, the Maryland Energy Administration (MEA) issued a Request for Expression of Interest and Information to offshore wind developers soliciting feedback about wind energy development potential in Maryland. As a result, CCP undertook intra-governmental coordination work with MEA to accelerate ocean planning and management. Through this intra-governmental effort, work began, to map, analyze and evaluate use trade-offs for potential wind energy development (Section 306 and Section 309). Building off of these efforts, DNR and CCP undertook intra-governmental coordination work with NOAA and the U.S. Bureau of Ocean Energy, Management, Regulation and Enforcement (BOEMRE) as part of the offshore renewable energy Local/State/Federal Task Force to identify a draft RFI area, evaluate potential use and natural resource conflicts and prepare a final RFI area for publication in the Federal Register in Fall 2010. BOEMRE received comments on the final RFI area on January 10, 2011 with nine indications of interest from eight parties wishing to obtain a commercial lease for a wind energy project.

In 2009, Maryland CCP also worked with The Environmental Law Institute to complete the "Maryland Offshore Energy Framework" report that evaluates whether and to what extent the State is prepared for anticipated offshore energy development activities, and subsequently identify where modifications or additional policies may be useful to address these needs (Section 306). To complete the evaluation and identify potential future action, CCP coordinated with the Maryland Public Service Commission and MEA.

CCP also continued working with network partners at the Maryland Department of Planning (MDP), MDE and within DNR to coordinate coastal management related to coastal and natural resources (e.g. living shorelines, coastal communities, fisheries and wetlands). CCP undertook work in 2008 and 2009 with the Maryland Department of Planning's Maryland Historic Trust (Section 309) to better identify submerged archaeological resources and gain a better understanding of resource management concerns.

Single-purpose statutes related to ocean/Great Lakes resources.

A number of single-purpose statutes related to ocean resources have been developed since the last assessment. Between 2005 and 2007, DNR Fisheries Service adopted regulations under Natural Resources Article 4-205.1 to expand a list of aquatic non-natives that prohibits the importation, possession and introduction of specified nonnative aquatic organisms – especially related to snakehead fish.

In 2006, House Bill 980 was passed and as a result regulations were developed under Natural Resources Article 4-903 to change diamondback terrapin size limits and their fishing season, and to create a fishery management plan. This regulatory action complemented other actions such as protection of spawning beaches and requiring turtle excluder devices in recreational crab pots in order to protect and stabilize populations statewide. A year later in 2007, HB 760 was passed establishing a commercial terrapin harvest moratorium.

In 2008, CCP core staff (funded through Section 306) worked with MDE to draft HB 973, entitled "The Living Shorelines Protection Act of 2008." The bill passed, now requiring that living shorelines be considered as the first option for shore erosion control projects in the Chesapeake and Atlantic Coastal Bays alike. Property owners must now demonstrate to the state's satisfaction that a living shoreline will not be successful prior to being granted approval for a hard stabilization option being permitted.

In 2009, DNR Fisheries Service was given the authority under Natural Resources Article, §4-219 to regulate bait. This authority expanded the existing ability of the Fisheries Service to list which finfish and shellfish that could be caught and sold for bait without a tidal fish license (commercial fishing license).

Ocean resource mapping or information system. Since the previous assessment, Maryland CCP has led the development of a statewide mapping tool that permits coastal resource managers throughout the coastal zone to visually analyze and explore data from a single mapping and data exchange system – the Coastal Atlas (Section 306 and Section 309). As a component of the intra-governmental coordination effort with MEA to map, analyze and evaluate use trade-offs for potential wind energy development, CCP has used the Coastal Atlas to develop an ocean mapping system to drive decision making about offshore wind energy. CCP has also used the Coastal Atlas to develop Estuaries and Shorelines Online mapping systems for all Chesapeake and Atlantic Coastal Bays resources, shorelines and coastal aquatic and near-shore priorities.

Ocean habitat research, assessment, or monitoring programs. In 2010, a Blue Infrastructure near-shore assessment was completed of coastal habitat, critical natural resources, and associated human uses in the tidal waters and the near-shore area of Maryland's coastal zone. The Blue Infrastructure serves as the resource assessment link between Maryland's terrestrial and aquatic environments and contributes to prioritization systems that target conservation and management activities and funds to maintain and improve coastal habitats. It was developed to incorporate estuarine priorities into

statewide targeting efforts and to complement the state's existing Green Infrastructure network. This effort was led by CCP using both Section 306 and Section 309 funds.

Since the last assessment, the Maryland Geological Survey completed a number of artificial reef assessment and monitoring surveys in the coastal zone and the DNR currently has an extensive water quality and natural resource monitoring program. The water quality monitoring program provides the state with near real-time data to assess fish kills, harmful algal blooms, the effects of storms and other short-term episodic events, and the opportunity to explore the problems facing coastal ecosystems. Beach and water quality monitoring programs continued throughout the coastal zone, but did not change significantly since the last assessment.

Public education and outreach efforts. Recognizing the need to communicate the values of and relationships between ocean and coastal resources, shoreline management activities, and state planning objectives to the public, CCP developed and conducted a number of education and outreach efforts. These include (1) the development of an ocean literacy curricula program in coordination with the Maryland State Department of Education to educate students and teachers about ocean resources and management (Section 306), (2) the development of the interactive Coastal Atlas mapping system and associated training programs (Section 306 and Section 309), (3) the development of waterfront property owner and marine contracting professionals living shorelines training programs (Section 306 and Section 309), (4) facilitated stakeholder meetings about regional MARCO ocean conservation objectives (Section 306), and (5) the development of offshore renewable energy open house and stakeholder mapping meetings (Section 306 and Section 309).

PRIORITY NEEDS AND INFORMATION GAPS

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through CCP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need Description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H, M, L)
Coastal marine spatial planning (CMSP) framework for local, state and/or regional efforts.	Regulatory, policy, capacity, data, communication & outreach	H
Trade-off and economic analyses, resource data and decision-support systems to inform CMSP	Data, capacity	H
Communication & outreach with management councils and stakeholder groups (MAFMC, fishing and boating industries, etc.)	Communication & Outreach	H
Statewide assessments for sea level rise and climate change impacts on bay and aquatic ecosystems	Regulation, policy, data	M

Gap or need Description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H, M, L)
Interagency coordination to develop consistent policies for offshore energy and compatible uses to streamline decision-making	Policy	M

ENHANCEMENT AREA PRIORITIZATION

1. WHAT LEVEL OF PRIORITY IS THE ENHANCEMENT AREA FOR THE COASTAL ZONE (INCLUDING, BUT NOT LIMITED TO, CZMA FUNDING)?

High X
Medium
Low

Briefly explain the level of priority given for this enhancement area.

This enhancement area covers a broad range of issues and resources currently being addressed by numerous agencies, management bodies and programs in the Atlantic Ocean, Chesapeake and Atlantic Coastal Bays and tidal tributaries of the state's coastal zone. Over the past couple of years, there has been an increased focus on the ocean and work has been undertaken to develop a regional ocean partnership in the Mid-Atlantic (MARCO) and initiate an offshore alternative energy task force. Progress has also made toward developing decision support systems (Coastal Atlas) for all coastal zone waters and completing marine protected area inventories and aquatic resource assessments to improve decision making about aquatic resource management (Blue Infrastructure near-shore assessment).

With the pressures of continuing coastal growth, increasing uses of our coastal waters, demand for offshore energy development, and the escalating effects of climate change, there are increasing demands being made on Maryland's coastal resources. Therefore, there is a need to evaluate the potential for CMSP to address competing uses and address threats to our ocean resources. Significant coordination will be needed among local, state, regional and federal governments as well as coastal resource stakeholders to evaluate and/or conduct state-level CMSP efforts and review the state's policies related to ocean resource protection and use.

2. WILL THE CCP DEVELOP ONE OR MORE STRATEGIES FOR THIS ENHANCEMENT AREA?

Yes X
No

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

The state's participation in a larger CMSP process will be dependent on extensive coordination with many coastal resource management partners and stakeholders, especially in the Chesapeake and Atlantic Coastal Bays and tributaries. Close collaboration with MARCO will be needed to update the partnership's action plan and undertake activities to address common coastal resource goals. Work is already underway to evaluate the potential needs for a CMSP process in Maryland and develop a

planning document identifying data and analysis needs and potential next steps. Additional work will be needed to implement these steps and identify a clear mechanism through which Maryland will participate in a CMSP planning effort in the Atlantic Ocean outside of the state's 3-mile jurisdiction. A strategy to address these needs using Section 309 funding will therefore be developed.

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.*

RESOURCE CHARACTERIZATION

Pursuant to final 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 Energy and Government Facility Siting since the last Assessment.

Excerpt from 2006 assessment for comparison with the table below: Maryland's energy facilities in the coastal zone include: five coal-fired, nine oil-fired, and three natural gas power plants, as well as, one nuclear power plant, three alternate fuel plants, one hydroelectric plant, and the nation's largest liquefied natural gas import and storage facility (which began receiving ships in 2003). Maryland's Public Service Commission (PSC) has sole authority over powerplants and overhead transmission lines.)

1. IN THE TABLE BELOW, CHARACTERIZE THE TYPES OF ENERGY FACILITIES IN YOUR COASTAL ZONE (E.G., OIL AND GAS, LIQUEFIED NATURAL GAS (LNG), WIND, WAVE, OCEAN THERMAL ENERGY CONVERSION (OTEC), ETC.) BASED ON BEST AVAILABLE DATA. IF AVAILABLE, IDENTIFY THE APPROXIMATE NUMBER OF FACILITIES BY TYPE.¹²

Type of Energy Facility	Exists in CZ (# or Y/N)	Proposed in CZ (# or Y/N)	Interest in CZ (# or Y/N)	Significant changes since last assessment (Y or N)
Oil and gas facilities	N	N	N	N
Pipelines	Y	Y	Y	Y A proposed natural gas pipeline supporting a proposed LNG facility
Electric transmission cables	Y	Y	Y	Y 3 transmission lines proposed
LNG	Y	Y	Y	Y 1 proposed LNG import and re-gasification facility, see above
Wind	Y	Y	Y	Y Currently limited to small- scale residential and commercial installations;

¹² Table 2.1, Cumulative Environmental Impact Report (CEIR-15), Maryland Power Plant Research Review, January 19, 2010

Type of Energy Facility	Exists in CZ (# or Y/N)	Proposed in CZ (# or Y/N)	Interest in CZ (# or Y/N)	Significant changes since last assessment (Y or N)
				increased activity to site offshore wind farms ¹³
Wave	N	N	N	N
Tidal	N	N	N	N
Current (ocean, lake, river)	N	N	N	N
OTEC	N	N	N	N
Solar	Y	Y	Y	Y Currently limited to small- scale residential and commercial installations
Coal-fired electric powerplants	5	N	N	N
Oil-fired electric powerplants	10	N	N	Y 1 additional powerplant
Natural gas-fired powerplants	3	N	N	N
Nuclear power plant	1 plant - Calvert Cliffs- with 2 existing reactors	Y	Y	Y A new reactor is proposed at Calvert Cliffs
Hydroelectric plant	1	N	N	N
Alternative fuel electric plants	3	Y	Y	Y

2. PLEASE DESCRIBE ANY SIGNIFICANT CHANGES IN THE TYPES OR NUMBER OF ENERGY FACILITIES SITED, OR PROPOSED TO BE SITED, IN THE COASTAL ZONE SINCE THE PREVIOUS ASSESSMENT.

Since Maryland's 2006 Assessment of Energy & Government Facility Siting in the coastal zone, changes in the energy landscape and infrastructure¹⁴ include:

LNG Pipelines and Facilities. A proposed AES Sparrows Point LNG facility would consist of an import and re-gasification facility located at the Sparrows Point Industrial Complex near Baltimore City, Maryland. Current plans have been designed to include a marine receiving terminal, three full containment 160,000 cubic meter storage tanks, and facilities to support ship berthing and cargo offloading. The associated LNG pipeline and facilities would interconnect with existing gas pipelines for interstate gas pipelines at a point near Eagle, Pennsylvania via the Mid-Atlantic Express, LLC pipeline. Additional connections would be planned along the route for local gas distribution companies and other entities. The new pipeline would be approximately 88 miles in length, and will

¹³ Maryland offshore wind energy RFI issued by U.S. BOEMRE

<http://www.boemre.gov/offshore/RenewableEnergy/StateActivities.htm#Maryland>

¹⁴ Cumulative Environmental Impact Report (CEIR-15), Maryland Power Plant Research Review, January 19, 2010

be routed along existing utility corridors to the maximum extent possible. Portions of the pipeline and the Sparrows Point LNG Facility would be sited in Maryland's coastal zone should the project move forward.

Regional Transmission Projects. Three major transmission projects are currently in various stages of review. In late 2008, Southern Maryland Electric Cooperative (SMECO) submitted an application to upgrade an existing 69-kV line to a 230-kV line along a 30-mile route. In February 2009, Pepco Holdings, Inc. (PHI) submitted an application for the first part of the proposed 230-mile long, 500-kV Mid-Atlantic Power Pathway (MAPP) project. This segment of MAPP would cross the Potomac River into southern Maryland from a substation at Possum Point, Virginia and run for 72 miles in existing rights-of-way to a substation at the Calvert Cliffs Nuclear Power Plant. Future parts of the project include crossing under the Chesapeake Bay and building a new 13-40-mile transmission right-of-way across Dorchester County to a substation near Vienna, Maryland and then eastward on existing right-of-way in Wicomico County to the Delaware State line.

Renewable Energy Resources. The use of renewable resources such as biomass, solar, wind, and hydroelectric energy continues to expand in Maryland. Beginning in 2006, Maryland set a Renewable Portfolio Standard (RPS) that requires 20% of the state's electricity to be generated from renewable sources by 2022. Current land-based technologies would meet just 36% of this goal. Offshore wind would help to meet the remaining shortfall. Work is now underway through a BOEMRE Local/State/Federal task force to evaluate and site offshore wind projects. This will require Maryland to evaluate and map resources on Maryland's Atlantic coast and Outer Continental Shelf and undertake marine spatial planning efforts. Small-scale wind energy projects in Maryland's coastal zone are also increasing. As a result, the state's Critical Area Commission is currently in the process of developing guidance for such renewable energy projects within the Critical Area.

Nuclear Power Generation Capacity. The existing Calvert Cliffs Nuclear Power Plant in Calvert County is currently seeking licensing approval for the construction of new nuclear generating capacity. The Power Plant Research Program (PPRP) reviewed an application requesting approval to construct Calvert Cliffs 3, a 1600 megawatt (MW) nuclear power plant at the existing Calvert Cliffs site. If Unistar receives all of its State and federal approvals and succeeds in commissioning Calvert Cliffs 3, it will likely be one of the first new nuclear facilities constructed in the U.S. in 30 years.

Alternative Fuel Electric Plants. The Fairfield Renewable Power Plant has been proposed by Energy Answers International, Inc. and would be constructed on the brownfield site vacated by FMC on the Fairfield Peninsula in Baltimore City. The 120MW power plant will burn fuel produced primarily from municipal solid waste, but supplemented with tire chips, auto shredder fluff and urban wood waste. The project is under review by the PSC and expects to start construction prior to the end of 2010.

3. DOES THE STATE HAVE ESTIMATES OF EXISTING IN-STATE CAPACITY AND DEMAND FOR NATURAL GAS AND ELECTRIC GENERATION? DOES THE STATE HAVE PROJECTIONS OF FUTURE CAPACITY? PLEASE DISCUSS.

In January, 2010, the Maryland Energy Administration published the *Maryland Energy Outlook* that summarizes estimates of existing in-state capacity and demand for natural gas and electric generation and addresses projections of future capacity. Overall energy demand in Maryland totaled 1,489 trillion British thermal units (BTUs) in 2007, or approximately 1.5% of all energy demand in the United States. Electricity consumption accounts for nearly half, or 46%, of all energy used in the State. By sector,

transportation uses 31% of total energy, industrial sector consumes approximately 12%, and the residential and commercial sectors use 29% and 28%, respectively. Electricity losses represent 31% of overall energy consumption¹⁵.

Maryland currently relies on imported energy resources to meet most of its energy needs. All petroleum and natural gas products are transported to Maryland via pipeline or through other entry points, such as the Port of Baltimore or Maryland's liquefied natural gas (LNG) facility, Cove Point, on the Chesapeake Bay's western shore. Maryland imports approximately 30% of its electrical energy from surrounding states and imports coal to generate electricity in-state. Nearly 60% of electricity generated in Maryland is coal-fired. Coal-fired power plants contribute approximately 5,000 MW to in-state summer peak capacity. Maryland also operates two nuclear power plants at Calvert Cliffs, which provide 1,735 MW of capacity and generate approximately 29% of the electricity produced in Maryland. Hydroelectric plants and other renewable resources contribute roughly 700 MW of capacity and approximately 4.5% of in-state generation¹⁶.

Maryland's population is expected to grow 12.5% between 2008 and 2020, due, in part, to the completion of the Base Realignment and Closure (BRAC) process, which will add thousands of workers and their families to the State in the coming years. New electrical capacity and new transmission and distribution infrastructure will be needed to meet the needs of its growing population. As part of Maryland's energy strategy to meet future energy needs, the state has set 2015 EmPOWER peak demand reduction goals and appears to be on track in meeting them. Maryland's energy generation fleet is relatively old. On average, Maryland power plants are 30 years old. In the past 15 years, 9 new power plants have come on line in Maryland, one coal fired power plant; two gas fired facilities; three cogeneration facilities; and three landfill gas facilities.

4. DOES THE STATE HAVE ANY SPECIFIC PROGRAMS FOR ALTERNATIVE ENERGY DEVELOPMENT? IF YES, PLEASE DESCRIBE INCLUDING ANY NUMERICAL OBJECTIVES FOR THE DEVELOPMENT OF ALTERNATIVE ENERGY SOURCES. PLEASE ALSO SPECIFY ANY OFFSHORE OR COASTAL COMPONENTS OF THESE PROGRAMS.

Maryland's Renewable Portfolio Standard (RPS) and the Greenhouse Gas (GHG) Emissions Reduction Act of 2009 will likely have the most influence on programs to advance alternative energy development.

Renewable Portfolio Standard. The RPS for Maryland requires that renewable sources generate 20% of Maryland's electricity by 2022, including 2% from solar. Renewable energy resources are classified in two tiers – tier 1 including solar, wind, certain biomass, landfill methane, geothermal, ocean, fuel cell, small hydropower, and poultry litter; and tier 2 including hydroelectric (larger than 30 megawatts (MW)) and waste-to-energy. As previously noted (Resource Characterization Question #2), current land-based technologies would meet just 36% of this goal. In order for Maryland to fulfill a large portion of its RPS through in-state generation, offshore wind energy and other ocean energy resources need to be considered and work is underway to evaluate the potential for such projects.

¹⁵ U.S. Department of Energy (DOE), Energy Information Administration (EIA), *State Energy Data 2007: Consumption* (latest data available), <http://www.eia.doe.gov/emeu/states/seds.html>

¹⁶ Maryland PSC, *Ten-Year Plan (2008-2017) of Electric Companies in Maryland*, http://webapp.psc.state.md.us/Intranet/psc/Reports_new.cfm

Greenhouse Gas (GHG) Emissions Reduction Act of 2009. This Act requires the State to reduce GHG emissions 25% from 2006 levels by 2020. The Act also directs the Department of the Environment to develop a comprehensive GHG reduction plan by 2012.

5. IF THERE HAVE BEEN ANY SIGNIFICANT CHANGES IN THE TYPES OR NUMBER OF GOVERNMENT FACILITIES SITED IN THE COASTAL ZONE SINCE THE PREVIOUS ASSESSMENT, PLEASE DESCRIBE.

Maryland's coastal zone supports significant federal infrastructure that uses airspace, land, and coastal waters. Federal infrastructure is a major part of Maryland's economy and in the coastal zone, several facilities include: Aberdeen Proving Grounds, Edgewood Arsenal, Fort George G. Meade, Naval Ship R&D Academy, U.S. Naval Academy, Patuxent Naval Airforce Center, Naval Surface Weapons Center, Andrews Airforce Base, several V.A. Medical Center locations, Patuxent Wildlife Research Center, and the USDA National Agricultural Research Center.

As a result of the 2005 Base Realignment and Closure (BRAC) decisions, Maryland will accommodate a significant expansion of the United States military installations in the coming years. As a result, Maryland is expected to become the future home to thousands of our country's federal civilian and military families. With the arrival of new residents, jobs, and national defense and security activities associated with this expansion, Maryland has both an enormous opportunity and a substantial obligation. While BRAC will bring the State job-growth, community and economic activity benefits, it will pose the challenges of providing the additional infrastructure, housing, education, and economic development necessary to support BRAC, and of reaping the benefits of expansion without compromising Marylanders' quality of life.

MANAGEMENT CHARACTERIZATION

Pursuant to final 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 effectiveness of management efforts to address those problems described in the above section for Energy and Government Facility Siting since the last Assessment.

1. DOES THE STATE HAVE ENFORCEABLE POLICIES SPECIFICALLY RELATED TO ENERGY FACILITIES? IF YES, PLEASE PROVIDE A BRIEF SUMMARY, INCLUDING A SUMMARY OF ANY ENERGY POLICIES THAT ARE APPLICABLE TO ONLY A CERTAIN TYPE OF ENERGY FACILITY.

Maryland's Chesapeake and Coastal Program submitted a request for a Routine Program Change to NOAA in November 2010 to update its enforceable policies. The descriptions provided below summarize some of the policies, but at the time of final Assessment and Strategy submission, the RPC had not yet been finalized. It should be noted that the summaries below highlight only some of the state's policies related to energy and facilities in the coastal zone and individuals should refer to the most current version of the state's policies, which CCP will post on its website. At time of submission, the latest draft could be found at: <http://dnr.maryland.gov/ccp/pdfs/mdrpc.pdf>

The draft enforceable policies that relate to energy facilities include:

Electricity Generation and Transmission. (1) Proposals for new power plants and transmission lines in the coastal zone must account for their impact on the physical, biological, aesthetic, and cultural features of the site and adjacent areas; identify contributions to air and water pollution; recommend mitigation opportunities; and adequately consider recommendations of the local government. (2) Proposals for new transmission lines must estimate the capital and annual operating costs of each alternative route considered and explain why each alternative route was rejected. (3) Utilities shall maintain the vertical clearances of overhead electric supply lines that cross water surfaces suitable for sailing. (4) Power plants in the coastal zone must be sited, constructed, and operated in a manner which minimizes their impacts on tidal wetlands, aquatic resources, terrestrial resources, significant wildlife habitat, public open space, recreational, and natural areas, air and water quality, and the public health, safety, and welfare. (5) The location, design, construction, and capacity of cooling water intake structures shall reflect the best technology available for minimizing adverse environmental impact, specifically impingement and entrainment losses.

Oil/Natural Gas Processing, Storage, and Transport. Proposed oil or natural gas facilities (pipeline, intermediate production or processing terminal, storage facility, operations base, or fabrication yard) are required to develop a statement of the probable economic, fiscal, and environmental impacts. A facility of this type in the coastal zone needs to inventory existing economic and environmental conditions at the project site and in the immediate area as well as identify and describe probable cumulative and secondary impacts of the proposed project on the environment and natural resources. Projects also need to evaluate alternatives to the facility and identify how adverse environmental impacts will be minimized.

2. PLEASE INDICATE IF THE FOLLOWING MANAGEMENT CATEGORIES ARE EMPLOYED BY THE STATE OR TERRITORY AND IF THERE HAVE BEEN SIGNIFICANT CHANGES SINCE THE LAST ASSESSMENT:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Statutes or regulations	Y	Y
Policies	Y	Y
Program guidance	Y	Y
Comprehensive siting plan (including SAMPs)	Y	Y
Mapping or GIS	Y	Y
Research, assessment or monitoring	Y	Y
Education and outreach	Y	Y

3. FOR MANAGEMENT CATEGORIES WITH SIGNIFICANT CHANGES SINCE THE LAST ASSESSMENT PROVIDE THE INFORMATION BELOW. IF THIS INFORMATION IS PROVIDED UNDER ANOTHER ENHANCEMENT AREA OR SECTION OF THE DOCUMENT, PLEASE PROVIDE A REFERENCE RATHER THAN DUPLICATE THE INFORMATION.

- Characterize significant changes since the last assessment;*
- Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts; and*
- Characterize the outcomes and effectiveness of the changes.*

Since the last assessment, changes have been made through 309 and other CZM-driven activities to update Maryland's Coastal Zone enforceable policies and program guidance, to greatly improve coastal-zone wide mapping and GIS capacity for project review, and develop education and outreach programs to provide information about energy facility siting.

Statutes or Regulations, Policies and Program Guidance. Maryland has made significant progress since the last assessment to develop and update RPS goals, update its coastal enforceable policies (as described above in Resource characterization #4 and Management characterization #1, above), and set GHG emissions reduction goals. In 2009, the MD CCP completed a law and policy analysis of offshore wind energy that provided guidance about the ability to manage, plan for, and oversee permitting, environmental review, and integration of offshore energy projects with Maryland's goals for energy and the coastal environment. In addition, S.B. 277 (Renewable Energy Portfolio Standard - Solar Energy) passed in 2010 and accelerates the amount of solar energy required in RPS goals. Together, these changes have improved the ability of the state to meet RPS and renewable energy goals and more clearly articulate goals and gaps related to offshore energy development.

Mapping or GIS. Since 2006, several significant, CZM-driven changes have occurred related to mapping and GIS used to review energy and government facility siting projects. Since 2006, Maryland's Power Plant Research Program has invested in a smart siting GIS mapping tool that compiles data for use in energy facility project review and has streamlined the review process. In 2008, Maryland launched the *iMap* project which uses a state-wide GIS base map to link all state and local data together for use in project review and as a result has led to the availability of consistent state-wide maps used for resource management. In 2009, an integrated Environmental Review Team was established at the Maryland Department of Natural Resources (DNR) and a GIS tool was developed to display data about key natural resource and habitat priorities. In 2010, CCP launched a Coastal Atlas Ocean mapper that displays data about Maryland's Ocean that it is being used to review potential offshore wind deployment areas.

Research, Assessment and Monitoring and Education and Outreach. CCP has identified offshore energy infrastructure development as a major emergent issue and has undertaken work to address the data, information and outreach necessary to begin a forward-looking planning process for siting of offshore wind. CCP launched the publicly-accessible Coastal Atlas and has held several open houses centered on offshore wind to provide data and information directly to Maryland's interested stakeholders.

PRIORITY NEEDS AND INFORMATION GAPS

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through CCP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description (see details below and Ocean Resources section)	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Control the Decision-making Context for Maryland Offshore Energy	Policy; Communication & Outreach	H

Update Coastal Consistency Provisions	Policy	H
Set Conditions for Use of Maryland's Waters	Policy	M
Improve Energy Regulation to Facilitate Offshore Renewables	Regulatory; Policy	H

Significant progress has been made to identify policy gaps for offshore energy and work is underway to update Maryland's enforceable policies. Through a partnership with the Environmental Law Institute, the Maryland Chesapeake and Coastal Program prepared a report that examined Maryland's existing laws and policies and identified potential changes and additions that can help create a Maryland Offshore Energy Framework and address deficiencies moving forward with future offshore energy siting. In addition, CCP has been actively engaged in work to evaluate options for offshore wind development in cooperation with the Maryland Energy Administration (MEA).

To improve the decision-making context for future offshore energy development in Maryland, there is a need to develop an interagency and stakeholder-informed plan about ocean uses. To address these needs, Maryland plans to move forward with marine spatial planning efforts and continue working with the MMS task force and interagency partners to plan for offshore renewable energy. Additionally, CCP will continue to work with other Mid-Atlantic states to develop standards for resource consideration as the offshore energy sector expands throughout the region.

Continued, next page

ENHANCEMENT AREA PRIORITIZATION

1. WHAT LEVEL OF PRIORITY IS THE ENHANCEMENT AREA FOR THE COASTAL ZONE (INCLUDING, BUT NOT LIMITED TO, CZMA FUNDING)?

High
Medium X
Low

Briefly explain the level of priority given for this enhancement area.

Due to recent developments in Maryland's offshore wind energy program – including the establishment of a MMS State/Federal Task Force, preliminary stakeholder engagement and ocean data review – and as expansions of U.S. military installations as a result of BRAC realignments are realized in the coming years, Maryland's coastal zone will be under increasing development pressure. As a result, this enhancement area has been identified as a medium priority.

2. WILL CCP DEVELOP ONE OR MORE STRATEGIES FOR THIS ENHANCEMENT AREA?

Yes
No X

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

In response to increasing interest in offshore wind and other energy and government facility siting in the coastal zone, there is a need to complete coastal and marine spatial planning work, address recommendations in the recently-completed Offshore Energy Framework, and continue to evaluate the cumulative and secondary impacts associated with land-based facility siting. At this time, it is anticipated that the work needed to address identified gaps and needs of this enhancement area are able to be addressed through a subset of activities outlined in the Comprehensive Ocean and Coastal Planning strategy. Therefore, a strategy is not proposed at this time.

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

RESOURCE CHARACTERIZATION

Pursuant to final 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.

1. GENERALLY CHARACTERIZE THE PRIVATE AND PUBLIC AQUACULTURE FACILITIES CURRENTLY OPERATING IN YOUR STATE OR TERRITORY.

Maryland's Aquaculture Program was established by the State Legislature in 1987 to encourage the orderly development of an aquaculture industry while ensuring that aquaculture operations do not adversely impact the state's wild stocks of fish and shellfish. Aquaculture practices in Maryland currently include:

Type of existing aquaculture facility	Describe recent trends	Describe associated impacts or use conflicts
Shellfish leases/lease of state lands – shellfish aquaculture on leased bottom	As of early 2010, there were 780 existing shellfish leases (e.g., hard clam, oyster) encompassing 7,541 acres in the Chesapeake Bay and coastal bays. This represents an increase in acreage, but not in the number of leases since the last assessment.	Use conflicts primarily arise in tidal waters, where recreational and commercial fishing and boating are primary uses of navigable waters. Lack of bottom available for leasing, financial resources, availability of spat and seed on oyster shell and enforcement are challenges to shellfish leases in Maryland.
Aquaculture permits – freshwater, indoor facilities, structures in public waters	As of early 2010, Maryland had 70 permits for aquaculture operations. 22 of these aquaculture permits were for operations conducted in the water column of tidal waters.	The primary impacts of concern related to activities occurring under aquaculture permits include the introduction of wastes, nutrients, and chemicals from the operation of intensive and fish culture systems.
Aquaculture Enterprise Zones (AEZs)	In 2010, two AEZs were being established representing 176 acres. AEZs are defined areas that the Department of Natural Resources	AEZs will help streamline the permitting process and address the issue of theft of oysters from leased bottom

	have pre-approved and identified through regulation as submerged bottom land available for Shellfish Aquaculture. AEZs will open to leasing, with 25% of area reserved for licensed watermen.	through focused enforcement efforts.
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MANAGEMENT CHARACTERIZATION

Pursuant to final 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 effectiveness of management efforts to address those problems described in the above section for Aquaculture since the last Assessment.

1. FOR EACH OF THE MANAGEMENT CATEGORIES BELOW, INDICATE IF THE APPROACH IS EMPLOYED BY THE STATE OR TERRITORY AND IF SIGNIFICANT CHANGES HAVE OCCURRED SINCE THE LAST ASSESSMENT:

Management categories	Employed by state/territory (Y or N)	Significant changes since last assessment (Y or N)
Aquaculture regulations	Y	Y
Aquaculture policies	Y	Y
Aquaculture program guidance	Y	Y
Research, assessment, monitoring	Y	Y
Mapping	Y	Y
Aquaculture education & outreach	Y	Y

2. FOR MANAGEMENT CATEGORIES WITH SIGNIFICANT CHANGES SINCE THE LAST ASSESSMENT PROVIDE THE INFORMATION BELOW. IF THIS INFORMATION IS PROVIDED UNDER ANOTHER ENHANCEMENT AREA OR SECTION OF THE DOCUMENT, PLEASE PROVIDE A REFERENCE RATHER THAN DUPLICATE THE INFORMATION.

- a) *Characterize significant changes since the last assessment;*
- b) *Specify if it was a 309 or other CZM driven change (specify funding source) or if it was driven by non-CZM efforts; and*
- c) *Characterize the outcomes and effectiveness of the changes.*

Maryland defines aquaculture as the commercial rearing of fish or aquatic plants and permitted activities may include the purchase, sale, possession, capture, production, breeding, transportation, and processing of such species. The majority of aquaculture activity in Maryland involves shellfish. Aquaculture planning and management in Maryland, especially as it relates to oysters, has changed significantly since the previous assessment. Changes include the enactment of the Aquaculture Shellfish leasing law (Senate Bill 271/House Bill 312), completion of the Maryland Oyster Restoration and Aquaculture Development Plan, the establishment of Aquaculture Enterprise Zones (AEZs), and the subsequent submission of a regulatory package. DNR Fisheries has been instrumental in driving changes in aquaculture management.

An oyster Environmental Impact Statement was initiated in 2004 to evaluate oyster restoration and industry revitalization alternatives. In 2007, the Oyster Advisory Commission found that the greatest opportunity for expanding the economic production of oysters in Maryland was through privatization and aquaculture. In September 2008, the Maryland Shellfish Aquaculture Plan was developed and published through the Maryland Department of Agriculture (MDA) in consultation with the Maryland Departments of Natural Resources (DNR), the Environment (MDE), Health and Mental Hygiene (DHMH), the Maryland Aquaculture Coordinating Council, and the Board of Public Works.

Recommendations from this plan and the Oyster Advisory Commission provided guidance on developing a sustainable shellfish industry while creating opportunity for prospective aquaculture shellfish growers in Maryland waters. As a direct result of these recommendations, Senate Bill 271/House Bill 312 was passed and made into law on March 24, 2009.

This law opened significant bottom previously off-limits to leasing for new aquaculture enterprise zones (AEZs), streamlined the shellfish lease process in the Chesapeake Bay and provided incentives for leasing operations to encourage growth in the shellfish fishery. A new policy is currently under development that will require current leaseholders to place at least 1 million oyster seed on ¼ of their acreage to maintain their lease.

Two AEZs in the Patuxent River were also established and mapped. CZM provided data to the Maryland Aquaculture Coordinating Council during the early stages of AEZ planning. The AEZs are pre-approved aquaculture lease areas that will be available for leasing beginning in 2010. The proposed establishment of these first state AEZs provides a streamlined process by which individuals can lease bottom and/or the water column without having to obtain their own permit.

In addition, the new legislation has helped to address several management and leasing challenges related to aquaculture in Maryland:

- § *Lack of bottom available for leasing.* Areas that were previously unavailable for leasing will be available, including bottom in several Eastern Shore counties.
- § *Financial resources.* Several funding sources will be made able to provide assistance to those getting started with aquaculture operations in Maryland. Some amount of training will be required before funding is made available.
- § *Larvae and spat on shell availability.* Larvae and spat on shell oysters will be made available from State hatcheries and private companies. DNR will help to establish several "remote-setting" facilities across the State where individuals can cooperatively set their own oysters using eyed larvae from hatcheries.
- § *Enforcement.* Theft of oysters from leased bottom has always been a great concern, particularly in the more remote areas of the lower Eastern Shore. DNR is working to address enforcement issues utilizing a variety of new methods including new monitoring technologies and a stricter penalty system and education/information prospectus of natural resource cases.

Additionally, in 2009, the Oyster Restoration and Aquaculture Development Plan was announced that proposed to (1) significantly increase MD's network of oyster sanctuaries in Chesapeake Bay,

(2) identify large new areas open to leasing for oyster aquaculture in Maryland's Chesapeake and Coastal Bays and streamline the permitting process through Aquaculture Enterprise Zones (AEZs), and (3) identify areas off limits to leasing, allowing for a more targeted, scientifically managed and sustainable public fishery.

Extensive education and outreach, aided by new maps of proposed changes, has taken place through oyster open houses and associated public comment periods to provide information on proposed changes and what effects it would have on aquaculture management in Maryland.

PRIORITY NEEDS AND INFORMATION GAPS

Using the table below, identify major gaps or needs (regulatory, policy, data, training, capacity, communication and outreach) in addressing each of the enhancement area objectives that could be addressed through the CMP and partners (not limited to those items to be addressed through the Section 309 Strategy). If necessary, additional narrative can be provided below to describe major gaps or needs.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Lack of data and information regarding success of triploid and disease-resistant oysters and natural mortality that would encourage private investment in oyster aquaculture	Data, Communication & Outreach	H
General lack of shell and available substrate material	Capacity	H
Need to identify oyster and/or clam aquaculture nutrient removal TMDL trading credit values	Policy	M
Research and studies to identify potential environmental and economic impacts of new oyster sanctuary network (e.g. from loss of filtering capacity, water quality improvement, etc.)	Data	M

Several gaps and needs must be addressed if aquaculture, especially oyster aquaculture, is to increase in Maryland's coastal zone. One of the more significant gaps is the general lack of Maryland-specific data and information about the success of triploid and disease-resistant oysters and their natural mortality. This data and information would help the state respond to concerns expressed by both wild harvestors and industry representatives that the potential return on investment is worth the high up-front cost and uncertainty of launching an aquaculture operation.

Another major issue is the general lack of shell and available substrate material. Over the past several years as oyster populations have declined, oyster processing plants have also declined. These processing plants currently supply the majority of available shell substrate to aquaculture leaseholders, with some shell also being imported from other states. As processing plants continue to close, available shell substrate is anticipated to decline as well. The alternatives – artificial substrates such as slag and concrete – are associated with much higher up-front costs, but last longer.

The continued health and expansion of shellfish aquaculture in Maryland depends on healthy water quality conditions. There are currently no recognized estimates of nutrient removal capacity for oyster aquaculture. Defining oyster and/or clam aquaculture nutrient reduction trading credits would help to close the gap between credit generation and purchase contracts. If oyster aquaculture trading credits were to be defined, they could help to spur aquaculture investment and protect the water quality upon which the industry depends.

Ongoing and future needs and interests related to increasing the success of aquaculture in Maryland include the need for increased support for oyster poaching enforcement on leased areas and the establishment of an Oyster Heritage and Seaside Heritage Program to encourage public/private shellfish sanctuary donations.

ENHANCEMENT AREA PRIORITIZATION

1. WHAT LEVEL OF PRIORITY IS THE ENHANCEMENT AREA FOR THE COASTAL ZONE (INCLUDING, BUT NOT LIMITED TO, CZMA FUNDING)?

High	_____
Medium	<u> X </u>
Low	_____

Briefly explain the level of priority given for this enhancement area.

Aquaculture remains a medium priority for the state. As described above, significant progress has been made over the past several years that has improved the state's ability to manage shellfish and expand aquaculture in Maryland. The framework needed to address aquaculture goals in the state are largely developed but additional work is needed to build on progress made in the past few years. Activities to help address potential use conflicts and adverse environmental impacts can support these efforts.

2. WILL CCP DEVELOP ONE OR MORE STRATEGIES FOR THIS ENHANCEMENT AREA?

Yes	_____
No	<u> X </u>

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

As noted above, significant changes have advanced the existing regulatory and management frameworks related to aquaculture and shellfish in Maryland. While there are still some gaps in terms of data, information and resources needed to accelerate aquaculture development in the state, Section 309 funding could best address these gaps by supporting marine spatial planning activities to consider site-specific areas where future aquaculture activities would be most effective. 309 funding will be sought to support the development of such a plan in the Ocean Resources enhancement area.

4. STRATEGIES



"With over 4,000 miles of coastline, we cannot wait to tackle this threat... Here in Maryland we are aggressively implementing initiatives to reduce greenhouse gas emissions that will provide benefits long into the future; however, we must also ensure our communities are "CoastSmart" now - ready, adaptive and resilient."

- Governor Martin O'Malley
2009

4. STRATEGIES

COASTAL HAZARDS AND CLIMATE CHANGE ADAPTATION PLANNING

STRATEGY OBJECTIVE: *To integrate coastal hazard and sea level rise adaptation planning into state and local management plans, programs and authorities.*

I. ISSUE AREA(S)

The proposed strategy or implementation activities will support the following priority (high or medium) enhancement area(s) (*check all that apply*):

- | | |
|---|--|
| <input type="checkbox"/> Aquaculture | <input checked="" type="checkbox"/> Cumulative and Secondary Impacts |
| <input type="checkbox"/> Energy & Government Facility Siting | <input type="checkbox"/> Wetlands |
| <input checked="" type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Marine Debris |
| <input checked="" type="checkbox"/> Ocean/Great Lakes Resources | <input type="checkbox"/> Public Access |
| <input type="checkbox"/> Special Area Management Planning | |

II. PROGRAM CHANGE DESCRIPTION

A. The proposed strategy will result in, or implement, the following type(s) 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. Describe the proposed program change(s) or activities to implement a previously achieved program change. 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 has taken important initial steps for coastal climate change adaptation planning and coastal hazards management. 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. The goal of the proposed Coastal Hazards Strategy is to lay the foundation for integrating coastal hazard and sea level rise adaptation planning measures and associated cumulative and secondary impacts related to growth and development into State and local decision-making processes. 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

During this assessment and strategy period, CCP 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.

III. NEED(S) AND GAP(S) ADDRESSED

With more than 7,000 miles of shoreline and intense coastal development, including large urban populations centers such as Annapolis, Baltimore and Ocean City, Maryland's coastal communities and natural resources are highly exposed to coastal hazards. Almost 70% of the shoreline experiences chronic erosion, up to 60% of some counties lie within the 100-year floodplain, and low-lying coastal areas have seen twice the global rate of sea level rise in the last century.

Projected population growth and accompanying development in coastal areas, compounded by the anticipated impacts from climate change, make this enhancement area a high priority as more people, infrastructure and natural resources will be at risk. The State of Maryland has only recently begun implementing strategies to reduce vulnerability and build resilience within our natural and human communities. By integrating and institutionalizing adaptation planning into coastal management decision-making frameworks, Maryland will reduce the vulnerability of the State's people, property and natural resources to the effects of coastal hazards and climate change.

As mentioned in the Coastal Hazard, Cumulative and Secondary Impacts and Ocean Resources program enhancement areas, several needs and policy gaps exist. These include:

- § Hazard preparedness at the local level
- § Statewide sea level rise and climate change adaptation planning and policies
- § Increased resource protection in the critical area
- § Coastal hazards outreach and public awareness
- § 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

IV. BENEFIT(S) TO COASTAL MANAGEMENT

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

State sea level rise and climate change planning. In the State's 2008 Climate Action Plan, the Adaptation and Response Working Group outlined a suite of adaptation policy recommendations aimed at reducing Maryland's vulnerability to sea level rise and coastal storms (Phase I). The Phase II

Strategy, released in January 2011, outlines sector-based adaptation strategies to reduce the impacts of climate change, including sea level rise, increased temperature and changes in precipitation to: bay and aquatic resources, human health, forest and terrestrial ecosystems, agriculture, water resources, and growth and land use. Providing a basis for guiding and prioritizing State activities with respect to both climate science and adaptation policy, the Phase II Strategy will result in reduced vulnerability for State lands, facilities and infrastructure, and will ensure that climate change and sea level rise are incorporated in to 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. Through work completed in the previous two 5-year assessment and strategy periods, CCP has laid a strong foundation to go to the next level of assessing risk, developing local policies and programs, and expanding our resource toolbox to better serve local governments in coastal hazard mitigation and climate change adaptation efforts. The *CoastSmart* Communities Initiative (CCI), launched in 2009, offers a framework for CCP to provide training for local government staff; 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. Proposed efforts undertaken during this strategy will permit CCP to expand local hazard preparedness to additional county and municipality jurisdictions.

V. LIKELIHOOD OF SUCCESS

Significant progress on coastal hazards and climate change adaptation has been achieved during the previous strategy timeframe. The adoption of the State's Climate Action Plan and Phase I Strategy provided the groundwork for addressing sea level rise adaptation. As a direct result, two important pieces of legislation were passed in the 2008 legislative session: the Living Shorelines Protection Act and administrative and enforcement provisions to the Chesapeake and Atlantic Coastal Bays Critical Areas Act. The latter effectively updated the jurisdictional boundary maps for the Critical Area by incorporating sea level rise and future shoreline position, established regulatory authority for the Critical Areas Commission, and expanded the criteria for growth allocations to include provisions for coastal hazards. The Climate Action Plan's Phase II Strategy provides a basis for guiding and prioritizing State climate change adaptation activities. Steps are already underway to incorporate sea level rise guidelines and policies into planning and management decisions within DNR. Specifically, 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.

Additionally, CCP 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 (refer to the Coastal Communities Initiative summary table on page 62 for examples). Through the Coastal Communities Initiative, more recently branded as the *CoastSmart* Communities Initiative, CCP 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, CCP has worked with other partners to leverage efforts.

Through the MDP, CCP 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 CCI projects and comprehensive plan reviews. By partnering with MEMA through the multi-agency Mitigation Advisory Committee, CCP has been able to provide feedback and help prioritize mitigation project and planning efforts to reduce vulnerabilities to hazards. Because CCP has built effective partnerships at the local level, especially through CCI, 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.

VI. STRATEGY WORK PLAN

Using the template below, provide a general work plan that includes the major steps necessary for achieving the program change and/or implementing a previously achieved program change. The plan should identify significant projected milestones/outcomes, a schedule for completing the strategy, and budget estimates. If an activity will span two or more years, it can be combined into one entry (i.e., Years 2-3 rather than Year 2 and then Year 3). While the annual outcomes are a useful guide to ensure the strategy remains on track, OCRM recognizes that these benchmarks may change some over the course of the five-year strategy due to unforeseen circumstances. The same holds true for the annual budget estimates. If the state intends to fund implementation activities for the proposed program change, describe those in the plan as well. Further detailing of annual tasks, budgets, benchmarks, and work products will be determined through the annual award negotiation process.

Total Years: 5

Total Budget: \$1,435,000

Final Outcome(s) and Products:

- 1) Complete needs assessments of local governments to ascertain what additional support they need to overcome challenges for moving forward with adaptation planning
- 2) Plans, policies, management changes and implementing ordinances at the local level that address coastal hazards and cumulative and secondary impacts associated with growth and development
- 3) Provide training, education and outreach opportunities to raise awareness about coastal hazards
- 4) Incorporate risk analysis results into the Coastal Atlas as one mechanism to raise public awareness at the regional, State, local level for SLR and other coastal hazards
- 5) Implementation and/or adoption of Maryland's Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change (Phases I and II).
- 6) Complete inventories of both local and State resources at risk to coastal hazards (infrastructure, cultural, critical facilities, natural resources, etc.)

Coastal community hazard assessments and CoastSmart Communities Initiative

Throughout the entire timeframe of this strategy, continued focus is needed to increase local hazard preparedness. Several of the outcomes identified in this strategy depend upon partnerships with local governments. A typical project with a local government is approximately one or two years in duration. Over the past several years CCP has effectively used the *CoastSmart* Communities Initiative as a mechanism to develop sea level rise planning program changes at the local level. CCP will use Section 309 funding and work with other State Partners to provide technical and financial resources to assist coastal communities with identifying specific opportunities (i.e., code changes, comprehensive plan amendments) for

incorporating coastal hazards and cumulative and secondary impacts associated with growth and development into local decision-making processes.

Years: 1–2

Description of activities: CCP will work with local and/or State government partners to develop and conduct a needs assessment that addresses the perceptions, obstacles and needs of coastal communities in order to put measures in place for becoming more resilient toward the negative consequences of climate change, including sea level rise and increasing coastal storms. The results of the needs assessment will help to inform efforts to pilot a *CoastSmart* Communities scorecard with local governments. Work will be conducted to roll out a *CoastSmart* Communities Scorecard, a self-assessment tool for communities to determine their current ability for addressing sea level rise and to provide guidance on specific adaptation strategies that can be incorporated into local planning frameworks and regulations.

Outcome(s):

- 1) *Needs Assessment*. A completed assessment of perception, obstacles and needs of coastal communities in order to put measures into place to prepare communities for becoming more resilient to climate change and sea level rise. CCP plans to coordinate with other agencies and programs, including the CB-NERR Coastal Training Program and Maryland Sea Grant to meet this outcome.

Budget: Year 1, \$10,000

- 2) *Piloted CoastSmart Communities Scorecard with Local Governments*. CCP will identify and work with 1– 3 communities to pilot and refine the scorecard for relevance and to improve the usability. The scorecard will be used to help identify management, planning and policy options for preparing communities for the effects of climate change and sea level rise. This tool will be instrumental in initiating CCI *CoastSmart* projects.

Budget: Year 2, \$10,000

Years 1–5

Description of Activities: On an annual basis, CCP will establish partnerships to deliver financial and technical assistance to local governments to promote the incorporation of coastal resource, coastal hazard and climate change adaptation planning and/or coastal management issues associated with growth and development into local planning and permitting activities via the *CoastSmart* Communities Initiative. 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.

Outcome(s):

- 1) *CoastSmart Communities Initiative projects*. Through work with local governments, CCP will develop data, model methodologies and approaches for local governments that update their land use and community plans, codes and ordinances to accommodate climate change, coastal hazards and cumulative and

secondary impacts associated with growth and development. In so doing, CCP 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: Years 1–2: \$135,000; Years 3–5: \$145,000; \$705,000 total over five years

Training, data support, and outreach

Year(s): 1–5

Description of activities: CCP will work to enhance and expand its toolbox of resources and services for coastal hazard mitigation and climate change adaptation. The *CoastSmart* Communities Online Resource Center will be enhanced through the development of training programs, the provision of data available through the Coastal Atlas and support of outreach programs. These activities will build the capacity to integrate data and mapping efforts, scorecard assessments and training program information into local comprehensive plans, hazard mitigation plans, emergency management plans, and other planning activities.

Outcome(s):

- 1) *Coastal hazard outreach and education.* CCP will work to integrate coastal hazards, climate change and sea level rise information into outreach efforts (e.g. conferences, workshops, websites, training and signage) to raise awareness about short- and long-term hazard risks.
- 2) *CoastSmart Communities training program.* CCP will work with partners to develop and provide training for local communities on how to conduct adaptation planning. Potential modules include local vulnerability assessment training, step-by-step training on completing the *CoastSmart* Communities self-assessment scorecard, *CoastSmart* Communities scorecard simulations, and coastal hazard and Coastal Atlas training.
- 3) *Coastal Atlas.* CCP will build on current mapping capabilities for determining hazard vulnerability in the coastal zone and refine the Coastal Atlas as updated technology and data becomes available. These 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. One example may include an evaluation of coastal flooding risk associated with storm surge under projected sea level rise inundation levels.

Budget: Year 1: \$30,000; Years 2–5: \$25,000; \$130,000 total over five years

State-level climate change and sea level rise adaptation

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. CCP 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).

Years 1–2

Description of activities: Work will be completed to develop guidelines and policies to incorporate sea level rise adaptation criteria into land-acquisition programs, on-the-ground restoration practices, and planning and environmental review programs. Work will ensure State investments in land, restoration efforts and/or facility improvements 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. Additionally, work will be completed to analyze potential 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; conduct health impact assessments; and develop additional adaptation strategies.

Outcome(s):

- 1) *Land investment policy and implementation criteria.* A significant amount of work has been completed to evaluate DNR land acquisition program's project criteria to determine mechanisms by which a greater breadth of coastal near-shore resources and sea level rise evaluations can be integrated into their decision-making processes. DNR adopted a new policy in October 2010 that it shall 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. Additional work is needed to implement this policy by more fully integrating sea level rise and coastal resources into land acquisition scoring and review mechanisms.
- 2) *Environmental review and comment criteria and guidelines.* Climate change and sea level rise will be integrated into existing environmental review and comment practices and planning efforts. This 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.

Budget: Year 1: \$128,000; Year 2: \$113,000

Years 3–5

Description of activities: Efforts will be focused on updating facility and infrastructure site design and construction procedures to avoid or minimize the anticipated impacts of climate change and reduce greenhouse gas emissions. These activities will work to ensure that the vulnerability of new public investments in facilities and infrastructure are reduced. Over this time period of the strategy, there will be multiple opportunities to integrate aspects of coastal climate change impacts into assessments and planning efforts related to natural resources. Work will be completed to assess the impacts of climate change to land and aquatic resources that the State manages and develop and integrate climate change adaptation and mitigation reduction strategies into natural resource management plans and programs.

Outcome(s):

- 1) *Institutionalized consideration of climate change.* By assessing potential resource impacts and integrating strategies to minimize risks into on-the-ground management practices, the State will be better prepared to manage its resources as current conditions change. This may include integrating consideration of climate change and sea level rise during the development of new or updated resource management assessments and strategic planning documents such as Maryland's Green Infrastructure Assessment, Wildlife Action Plan, Coastal and Estuarine Land Conservation Plan, Forest Resource Assessment and Strategy, Forest Stewardship Plans, Fisheries Management Plans, Land-Unit Plans, Tributary Strategies, Watershed Implementation Plans and Capital Improvement Budget Programming.
- 2) *State infrastructure investment policy.* CCP 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. A "lead by example" investment policy may be developed to guide State investments in areas particularly sensitive to effects of climate change (e.g. require consideration for locating development in areas prone to sea level rise, etc.) To expand the intent of the policy, legislation may be pursued to allow Maryland to condition local-projects that receive State funding assistance.

Budget: Years 3–5: \$113,000 annually; \$339,000 total over three years

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.

CCP 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).

CCP anticipates that the technical needs for this strategy exist either through in-house technical abilities or through partnerships with other agencies and the CB-NERR Coastal Training Program. However, there may be additional opportunities to partner with NOAA and the Coastal Services Center to deliver necessary training, modeling or assessment needs.

COMPREHENSIVE OCEAN AND COASTAL PLANNING

STRATEGY OBJECTIVE: *To improve the State's ability to make informed decisions that balance economic and environmental considerations by integrating coastal marine spatial planning (CMSP) into State and local management plans, programs and authorities and establishing the means to preserve existing and future water-dependent uses.*

I. ISSUE AREA(S)

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

- | | |
|---|--|
| <input checked="" type="checkbox"/> Aquaculture | <input checked="" type="checkbox"/> Cumulative and Secondary Impacts |
| <input checked="" type="checkbox"/> Energy & Government Facility Siting | <input type="checkbox"/> Wetlands |
| <input type="checkbox"/> Coastal Hazards | <input type="checkbox"/> Marine Debris |
| <input checked="" type="checkbox"/> Ocean/Great Lakes Resources | <input checked="" type="checkbox"/> Public Access |
| <input type="checkbox"/> Special Area Management Planning | |

II. PROGRAM CHANGE DESCRIPTION

A. The proposed strategy will result in, or implement, the following type(s) of program changes:

- ☐ 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. Describe the proposed program change(s) or activities to implement a previously achieved program change. 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's ocean and coast is a biologically diverse and busy place, with people living and recreating alongside a wide array of existing and emerging water-dependent industries. This complex interdependence of ecosystems and economies will grow with increasing uses of land, marine, and coastal resources. In response, states are building the capacity to use coastal and marine spatial planning (CMSP) as a tool to analyze and allocate spatial and temporal distributions

of human activities to achieve ecological, economic and social objectives.¹ This strategy will provide coordination and oversight for the State's CMSP efforts to identify the relationships between spatial planning policies and (1) natural resource management goals, (2) emerging human uses and (3) associated cumulative and secondary impacts related to growth and development in the State's coastal zone. Funded activities will build upon CCP's capacity to collaborate with Federal, State and Local partners, and existing mapping and planning capabilities, to support the development and application of regional- and place-based management plans that address compatible coastal uses, preserve important cultural and historic water uses, provide opportunities for new coastal industries and develop the tools necessary for implementation.

CCP will work with stakeholders to analyze and address State-specific challenges associated with water-dependent uses and increasing uses of our coastal environments and critical natural resources. CCP will evaluate how CMSP can be utilized as one tool to address these challenges and will conduct assessments and studies, complete mapping and analysis work and develop planning scenarios to guide future action. Proposed activities include:

- § Creating, compiling and incorporating spatial data into existing and/or new management plans.
- § Proactively identifying coastal and marine areas suitable for enhanced management or protection.
- § Exploring opportunities to conserve or establish water-dependent uses and working waterfronts.
- § Developing guidance on the siting of renewable energy facilities in coastal and marine waters and/or the coastal zone.
- § Evaluating the application of and/or implementing CMSP for coastal waters in Maryland in the context of existing plans and authorities or through new or updated frameworks.
- § Developing joint marine spatial plans with other governments in the region (other Mid-Atlantic states, federal agencies and local governments).
- § Updating existing or adding new coastal enforceable policies, legislation or guidelines.

During the FY 2011–2015 period, proposed program changes for this strategy include: (1) the coordination and development of a regional Mid-Atlantic ocean partnership CMSP action plan; (2) establishment of a program or mechanism to help preserve existing and create additional opportunities for water-dependent uses throughout the coastal zone; (3) development of a stakeholder-based framework for State ocean waters that addresses emerging offshore energy and natural resource issues to control the decision-making context for Maryland waters; and/or (4) development of a draft plan(s) and implementation strategies in the Chesapeake and Atlantic Coastal Bays to achieve compatible use goals and increase natural resource protections. 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. Work on CMSP-related outcomes of this strategy will be conducted in a manner so that they are consistent with the goals and objectives of the National Framework for CMSP, to the

¹ Ehler, C., and F. Douvre. 2009. Marine spatial planning: A step-by-step approach toward ecosystem-based management. Intergovernmental Oceanographic Commission and Man and the Biosphere Programme. IOC Manual and Guides, No. 53, IOCAM Dossier No. 6, Paris, UNESCO.

extent feasible.

III. NEED(S) AND GAP(S) ADDRESSED

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

Maryland's 16 coastal counties and Baltimore City contain 70% of Maryland's population and over 7,000 linear miles of shoreline. As a result, Maryland is particularly reliant on healthy coastal waters and resources. A wide range of marine uses – marine transportation, tourism and recreation, fishing and shellfish industries, marine construction, ship and boat-building, mineral extraction – drive the State's economy. However, these uses sometimes conflict with each other and new uses like renewable energy may present potential additional conflicts in the future. The proposed strategy will integrate coastal waterfront-dependent uses, coastal habitat conservation and the identification of compatible coastal uses in to planning efforts throughout the coastal zone and future CMSP work. In recent years, the State has experienced unprecedented growth along its shorelines resulting in associated increases in property values and coastal infrastructure. Some communities experiencing growth and development pressures strive to maintain water-dependent uses and rural landscapes at the core of their economic and cultural identity.

As mentioned in the Ocean Resources, Public Access, Aquaculture, Cumulative and Secondary Impacts and Energy and Government Facility Siting enhancement area assessments, several needs and policy gaps exist. These include:

- § Incomplete or lacking key spatial/baseline data and trade-off analyses to inform CMSP activities.
- § Enhancing public access in underserved areas or to preserve cultural heritage.
- § The need to control the decision-making context for Maryland offshore energy
- § Policies and plans to help maintain and preserve water-dependent uses.
- § State and local planning efforts to address impacts associated with growth and development, loss of public access, and competing human use and natural resource needs.

Furthermore, the effectiveness and implementation of Maryland's existing coastal resource policies and management rules (e.g. CZMA enforceable policies) could be enhanced through the evaluation of compatible coastal uses and completion of a CMSP. The existing rules outline general policies and standards, but these do not have a spatially explicit plan. A CMSP could also provide a mechanism for more coordinated implementation of these policies as well as improve the consistency of State and local review and decision-making on projects.

IV. BENEFIT(S) TO COASTAL MANAGEMENT

Protecting and sustaining Maryland's marine resources for the future, while allowing compatible uses in the right locations is critical. CMSP provides a tool and process that can help Maryland assess resource and use needs and achieve this balance in a comprehensive way. Management gaps continue to exist in addressing comprehensive siting for new, expanding, or conflicting uses of marine resources. CMSP can also improve the assessment and understanding of cumulative and secondary impacts across various sectors of activities occurring in and affecting the marine environment. By

doing so, this will allow CCP to identify spatial management goals and strategies that will help sustain coastal and ocean resources as well as coastal-dependent uses over the long-term. Finally, CMSP assists in coordinating not just the necessary spatial information, but also in setting and implementing the common goals, policies and management for marine and coastal activities and resources. This strategy will assist CCP in securing the necessary resources to develop and integrate CMSP into new or existing State and local management plans, programs and authorities and work to maintain a balance between resource use and resource management.

V. LIKELIHOOD OF SUCCESS

Discuss the likelihood of attaining the proposed program change and implementation activities. The state or territory should address: 1) the nature and degree of support for pursuing the strategy and the proposed change; and, 2) 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.

Because the program changes and implementation actions outlined in this strategy build upon existing work and collaborative partnerships already established and underway, there is a reasonably high likelihood of success. With the acquisition of baseline data, employment of new technologies (Coastal Atlas) and the increased use of partnerships, CCP has positioned itself to advance CMSP and other proposed program changes within Maryland. While current activities in the ocean have largely centered on offshore wind energy turbine siting, they have helped to establish a framework to build on for future efforts and to expand work into estuarine environments. Effective mechanisms for stakeholder participation, inter-governmental collaboration and data decision-support systems have already proven to be successful. The lessons from these efforts will be leveraged to pursue a more comprehensive CMSP process with the goal of reducing user and resource conflicts in both Maryland's Ocean and Bays. In addition, as CMSP is a priority of the President's Executive Order for the Chesapeake Bay, the Council of Environmental Quality's Interagency Ocean Policy Task Force and of the Mid Atlantic Regional Council on the Ocean (MARCO) – CCP will have the opportunity to collaborate with federal (e.g., BOEMRE, NOAA) and regional (e.g., Mid-Atlantic States, MARCO) partners.

Furthermore, in 2007, the Maryland General Assembly enacted Chapter 30, thereby establishing the Maryland Working Waterfront Commission that was comprised of State agency representatives, elected officials, resource-based industry development entities and local watermen. The Commission was tasked to evaluate and make recommendations about how the State could preserve the commercial fishing industry's access to public trust waters. This commission formally expressed their interest in working with CCP to address a working waterfront issue through a coastal community planning mechanism. Legislation related to increased critical area and living shoreline protection was also enacted during the previous strategy time frame and has built momentum for the proposed strategy goals. Several partners have expressed interest in collaborating with CCP to address working waterfront and water-dependent use outcomes of this strategy. They include the MDP, Maryland SeaGrant, DNR programs, the Maryland Agricultural and Resource-Based Industry Development Corporation and others. Through the Commission, the Maryland Watermen's Association was actively engaged in identifying long-term strategies to address water access challenges for the fishing industry in the State.

During the FY 2006–2010 strategy timeframe, CCP also discussed and solicited feedback about a number of ocean CMSP planning-related initiatives through its Coastal Watershed Resource Advisory Committee (CWRAC), agency-wide leadership and strategic planning teams, and inter-agency planning workgroups.

These groups – made up of agency, local and other State partners – have provided significant guidance and direction for Ocean and Bay spatial planning efforts. The proposed program changes in this strategy reflect these recommendations and would provide mechanisms through which goals and objectives of these different groups could be met. Therefore, if the existing momentum continues, the proposed program changes should be achieved within the next assessment and strategy timeframe.

VI. STRATEGY WORK PLAN

Using the template below, provide a general work plan that includes the major steps necessary for achieving the program change and/or implementing a previously achieved program change. The plan should identify significant projected milestones/outcomes, a schedule for completing the strategy, and budget estimates. If an activity will span two or more years, it can be combined into one entry (i.e., Years 2-3 rather than Year 2 and then Year 3). While the annual outcomes are a useful guide to ensure the strategy remains on track, OCRM recognizes that these benchmarks may change some over the course of the five-year strategy due to unforeseen circumstances. The same holds true for the annual budget estimates. If the state intends to fund implementation activities for the proposed program change, describe those in the plan as well. Further detailing of annual tasks, budgets, benchmarks, and work products will be determined through the annual award negotiation process.

Total Years: 5

Total Budget: \$961,600

The Final Outcome(s) and Products from this strategy will be:

- 1) Completed assessments for specific geographic areas and/or communities summarizing resource, human use and/or working waterfront and water-dependent use gaps and needs.
- 2) Development of a working waterfront and/or water-dependent use program or plan.
- 3) Draft spatial plans addressing compatible use goals and mechanisms.
- 4) New or updated authorities or methodologies that increase resource protections or address compatible uses in the coastal zone.
- 5) Updated land acquisition program that incorporate coastal habitat and sea level rise adaptation strategies

Three main objectives are proposed as part of this Comprehensive Ocean and Coastal Planning strategy: (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. While each objective outlines individual activities and outcomes, CCP will undertake work on each simultaneously using spatial planning techniques to achieve complementary outcomes.

In order to fully implement the proposed outcomes and program changes outlined in this strategy, it may be necessary to leverage §309 funds with other funding sources. CCP may work with MGS, MDP, Maryland SeaGrant and other DNR Units to match up additional resources to fill data gaps and develop plans for the outlined objectives.

Water-dependent use planning and working waterfronts initiative

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, CCP proposes to support development of a program and/or plan to assess these uses and identify and implement strategies to ensure they are compatible with coastal management

goals and maintain waterfront access for coastal economies. CCP will work with partners to conduct working waterfront assessments and inventories, develop a consensus definition for working waterfronts in Maryland, analyze methodologies for preserving and planning access and develop a working waterfront/ water-dependent use program or plan to ensure access is maintained for these types of uses and their supporting industries.

Years: 1–2

Description of activities: During years one and two, CCP will work with existing or establish new partners to conduct a coastal-zone wide assessment and inventory of existing and potential future water-dependent uses, working waterfronts and their supporting industries. CCP may determine planning goals on a geographic or community basis as needed to meet the needs of specific water-dependent industries. CCP may work to collect and/or create geospatial data on these types of uses to better focus its efforts to develop mechanisms for working waterfront preservation in subsequent years. Such data could be delivered via the Coastal Atlas to facilitate planning efforts. This work will result in a Statewide consensus definition of working waterfronts and water-dependent uses needed to identify and pursue specific authorities or mechanisms that could be used to address strategy goals.

Outcome(s):

- 1) Assessment and inventory of existing and emerging water-dependent uses, working waterfronts and their associated supporting industries.
- 2) Development of a consensus definition of working waterfronts and water-dependent uses in Maryland.

Budget: Year 1, \$50,000; Year 2, \$40,000

Year: 3

Description of activities: During year three, CCP will build off of the assessment and inventory of water-dependent uses and working waterfronts to analyze methodologies for preserving access for these uses and potentially their supporting/associated industries.

Outcome(s):

- 1) Suite of policy and planning tools for working waterfront preservation initiative.

Budget: Year 3, \$60,000

Years: 4–5

Description of activities: During years four and five, CCP will work with partners to develop a working waterfront and water-dependent use program or plan to ensure access is maintained for these types of uses and/or their supporting industries. To complete this, CMSP tools and methodologies will be evaluated and/or applied to ensure that multiple competing uses, stakeholder needs and resource management goals are balanced. This work will be undertaken in a manner consistent with the goals and objectives of the National CMSP framework to the extent feasible.

Outcome(s):

- 1) Maryland working waterfront and water-dependent use program and/or plan evaluated and developed based on CMSP principles to the extent practicable.

Budget: Year 4, \$40,000; Year 5, \$40,000

Ocean planning to support decision-making for Maryland offshore energy

Interest in CMSP and offshore renewable energy has increased over the past couple of years with the establishment of a national CMSP framework and regional ocean governance groups (MARCO in the Mid-Atlantic). Most recently, CCP worked with BOEMRE to develop and announce an RFI area for offshore wind development off Maryland's coast. As ocean uses continue to intensify and the potential risks to natural ocean resources increase as a result, a process is needed to evaluate and plan for multiple competing uses within State ocean waters. To address this, CCP proposes to support ocean planning efforts to develop a stakeholder-based planning framework and evaluate and develop a draft plan to address emerging offshore energy and natural resource issues. Particular attention will be paid to possible transmission pathways from an offshore renewable energy facility onto land. CCP will work with partners to conduct stakeholder engagement, develop compatible use goals and develop draft planning frameworks to support ocean planning off Maryland's coast. Maryland will engage State, regional and national partners to address human use and natural resource issues to ensure that efforts are consistent with the process and priorities described in the National Framework for CMSP to the extent feasible. Work will be undertaken to integrate these efforts into regional MARCO CMSP efforts. Activities described below may be coordinated and developed as part of the development of a regional Mid-Atlantic ocean partnership CMSP action plan.

Years: 1–2

Description of activities: During years one and two, CCP will conduct initial scoping, data collection, use assessment and education and outreach efforts to identify spatial planning goals within State ocean waters that support offshore renewable energy and natural resource management goals. This work will be undertaken in partnership with the Maryland Energy Administration. Related spatial planning and outreach work may also be undertaken to evaluate the need for waterfront access for offshore energy-development related industries in Maryland's coastal zone.

Outcome(s):

- 1) Establish partnerships and conduct stakeholder engagement and outreach efforts.
- 2) Complete an assessment and inventory of existing State ocean data and research, human use evaluations and develop new data to fill information gaps.
- 3) Develop spatial planning goals for Maryland ocean waters.

Budget: Year 1, \$50,000; Year 2, \$50,000

Years: 3–5

Description of activities: During years three through five, CCP will build off of initial scoping, data collection, use assessment and education and outreach efforts to identify, draft and/or implement plans, mechanisms and authorities to address spatial planning

goals identified in years one and two. Work will be undertaken to proactively identify areas of compatible uses. One example may include the identification of preferred areas within State waters where offshore wind energy infrastructure, such as transmission corridors, could be located that minimize natural resource impacts. CCP will partner with local jurisdictions, business development entities, State agencies and other appropriate partners to advance these goals and develop policies and recommendations for their implementation. This may include work to update existing or develop new coastal enforceable policies, legislation or guidelines that clarify State consideration of ocean activities.

Outcomes:

- 1) Complete a data analysis to determine potential use and resource trade-offs and identify potential transmission pathways.
- 2) Evaluate and develop a draft plan for ocean energy, human uses and resources within State waters and update existing or add new coastal enforceable policies, legislation, guidelines or management frameworks to set use conditions for Maryland's ocean.

Budget: Years 3–5: \$40,000 annually; \$120,000 total over three years

Bay resource and human use analysis

Maryland took several important steps during the previous assessment and strategy period to use mapping and analysis tools to address resource conservation and management challenges. Through the identification of the State's priority Blue Infrastructure, establishment of Aquaculture Enterprise Zones (AEZs) and updates to the Critical Area Law, Maryland has begun to explore how spatial conflicts throughout the Chesapeake and Atlantic Coastal Bays can be resolved through multi-objective spatial planning frameworks. Throughout the entire timeframe of this strategy, continued focus is needed to proactively use spatial planning techniques achieve enhanced coastal management, conservation and human use goals. CCP proposes to conduct stakeholder-driven spatial analyses to meet several objectives which may include, but are not limited to: the establishment of areas for future shellfish aquaculture, the identification of locations for water access and water-dependent industries, the conservation of coastal resources and the identification and/or conservation of areas where coastal habitats may migrate inland in response to sea level rise.

Years: 1–2

Description of activities: During years one and two, CCP will build upon spatial data collection and analysis and work completed as part of the Blue Infrastructure, the Coastal Atlas and a Chesapeake Bay CMSP pilot project initiated in the previous strategy. Work will be undertaken to fill data gaps needed to conduct spatial planning efforts. A work plan will be developed outlining major goals for this outcome. A significant amount of effort will be focused on conducting outreach with stakeholder groups and partners to communicate Maryland's goals for and applications for CMSP.

Outcomes:

- 1) Collect, compile and fill data gaps.
- 2) Conduct stakeholder communication and outreach.
- 3) Develop a CMSP work plan with associated objectives.

Budget: Year 1, \$118,000; Year 2, \$95,900

Years: 3–5

Description of activities: During years three through five, major data gaps will be addressed as they arise. CCP proposes to work with partners, which may include MDP and other DNR units, to apply spatial planning objectives to specific geographic areas to holistically evaluate resource, local government and human uses in planning frameworks and resource management plans (e.g. waterfront annexations, shellfish aquaculture, water trails, etc.). Technical and/or financial assistance may be provided to local governments and other partners to support efforts to apply CMSP, integrate it into policies and plans, develop guidance to support decision-making processes and/or implement aquatic and near-shore resource and human use goals outlined in the CMSP work plan. Work may be undertaken to incorporate these spatial plans and recommendations into the Coastal Atlas to facilitate stakeholder involvement and strategic planning. Work conducted under this outcome will be coordinated with the National CMSP Framework and regional partners to the extent feasible.

Outcomes:

- 1) Develop a coastal zone CMSP plan that informs and guides resource and land management decision making.
- 2) Update existing or add new authorities, policies, legislation or guidelines related to CMSP that will support resource management and planning in the coastal zone.
- 3) Designate new or update existing management or conservation areas based on the CMSP plan.
- 4) Draft spatial plans incorporated in to the Coastal Atlas.

Budget: Year 3, \$85,900; Year 4, \$105,900; Year 5, \$105,900

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.

Additional funding may be needed for CMSP efforts related to data acquisition and to create mechanisms for long-term preservation of working waterfronts. CCP anticipates that through collaboration with federal, regional, State, local and university partners as well as stakeholder groups, many fiscal and data needs may be addressed. However, there may be a need to apply for additional funding resources.

- 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).

CCP anticipates that, through in-house technical abilities and through partnerships with other agencies with related expertise, many of the technical needs for this strategy exist. However, there may be additional assistance needed from other planning and management bodies with successful working waterfront programs to accelerate such a program in Maryland and regional technical support will be needed to address CMSP goals outlined by the Ocean Policy Task Force.

VIII. PROJECTS OF SPECIAL MERIT (OPTIONAL)

If desired, briefly indicate what PSMs 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 PSMs and is simply meant to provide the CMPs the option to provide additional information if they choose. PSM descriptions should be kept very brief (e.g., undertake benthic mapping to provide additional data for ocean management planning). Do not do provide detailed project descriptions that would be needed for the PSM competition.

Maryland has identified CMSP and compatible use planning as a high priority need. In addition, the MARCO states are each taking steps that will aid in development of a marine spatial plan for ocean waters and will coordinate to ensure the plans are integrated across the Mid-Atlantic region. As MARCO moves forward, Maryland will also engage in national CMSP planning efforts and be responsive to the Ocean Policy Task Force's Coastal and Marine Spatial Planning (CMSP) process. Maryland also plans to enter in to a CMSP development agreement and develop and submit an ocean planning work plan.

A project of special merit may be developed to support regional ocean planning efforts by assisting with the key steps in that process that necessitate regional and inter-state coordination including:

- § Identifying regional objectives to meet climate change, habitat, water quality and offshore energy needs and action items
- § Identifying existing efforts that can help shape the marine spatial plan
- § Engaging stakeholders and the public
- § Consulting scientists and technical and other experts
- § Analyzing data, uses, services, and impacts
- § Develop and evaluate alternative future spatial management scenarios and tradeoffs
- § Develop coordinated and consistent draft CMSP approaches to plan implementation activities that enable regional objectives to be met with state-specific policy actions.

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

5-YEAR BUDGET SUMMARY BY STRATEGY

Strategy Title	Year 1 Funding	Year 2 Funding	Year 3 Funding	Year 4 Funding	Year 5 Funding	Total Funding
Coastal Hazard and Climate Change Adaptation Planning	\$303,000	\$283,000	\$283,000	\$283,000	\$283,000	\$1,435,000
Comprehensive Ocean and Coastal Planning	\$218,000	\$185,900	\$185,900	\$185,900	\$185,900	\$961,600
Total Funding	\$521,000	\$468,900	\$468,900	\$468,900	\$468,900	\$2,396,600