Virginia Coastal Zone Management Program

Section 309 Needs Assessment & Strategy

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I. Introduction

The Virginia Coastal Zone Management Program was established in 1986. The Department of Environmental Quality (DEQ) serves as the lead agency of a network of state agencies that administer state regulations and policies to protect and enhance coastal resources. Other agencies in the network include the Virginia Marine Resources Commission (VMRC), the Department of Conservation and Recreation (DCR), the Department of Game and Inland Fisheries (DGIF), the Department of Health (VDH), the Department of Forestry (DOF), the Department of Agriculture and Consumer Services (VDACS), and the Department of Historic Resources (DHR), Virginia Institute of Marine Science (VIMS), Virginia Department of Transportation (VDOT), Virginia Department of Mine Minerals and Energy (DMME) and eight Coastal Virginia Planning District Commissions (PDCs).

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

In 1997, Virginia developed a three-year Assessment and Strategy that addressed each enhancement area of Section 309 and identified five high priority areas (public access, hazards, cumulative and secondary impacts, SAMPs, and aquaculture). These areas were selected based on the recognized need for regulatory or program changes. Based on the highest priority of need and high likelihood for success, three strategies were developed for the FY'97-FY'99 period: SAMPs for Northampton and Southern Watershed Areas, and Aquaculture.

In 2000, Virginia developed a five-year Assessment and Strategy that identified five high priority areas with seven proposed strategies: 1. Wetlands: Wetlands Regulatory Programs Strategy; 2. Coastal Hazards: Dune Management Strategy; 3. Cumulative and Secondary Impacts: Shoreline Management Strategy and Clean Marina Program Strategy; 4. SAMP: Southern Watershed Area Strategy, and Dragon Run Area Strategy; and 5. Aquaculture: Aquaculture Management Strategy.

In 2005, Virginia developed a five-year Assessment and Strategy that identified six high priority areas including: 1. Wetlands; 2. Public Access; 3. SAMPS; 4. Aquaculture; 5: Coastal Hazards; and 6. Cumulative and Secondary Impacts. To address these priorities, the Coastal Program developed these six key strategies: A. Intergovernmental Decision-Making (CSI); B. Shoreline Management (CSI, wetlands, public access); C. Prioritizing Conservation Corridors (CSI, wetlands); D. Dragon Run SAMP Implementation (SAMP); E. Seaside of Virginia's Eastern Shore (SAMP); F. Management Initiatives for Shellfish Aquaculture (Aquaculture); and G. Administrative Actions: Data Collection, Indicator Development, Program Changes and the 2010 Coastal Needs Assessment and Strategy (Public Access and other areas).

This report presents Virginia's 2010 Assessment of the nine enhancement areas. The analysis and strategy preparation was completed using the National Oceanic and Atmospheric Administration's (NOAA) final Section 309 Guidance (February, 2009). Assessment questions prepared by NOAA helped to update and determine the current status of each enhancement area. Upon completion of the draft assessment, the Coastal Policy Team, comprised of the agencies noted above, met on February 17, 2010 to review and prioritize the nine assessment areas for the next five years of work through 2015.

The Coastal Policy Team used the criteria listed below to determine the priority for each area. Team members individually ranked each area on scoring sheets, considering each area on its own merits. Individual scores were combined and the overall ranking of the areas posted for reflection and discussion by Team members. The Team discussed whether arguments could or should be made to increase or lower the priority of any area, and then by consensus decided on the priority assigned to each area.

1. Feasibility: Could progress be made within the time and financial constraints? Is successful development of enforceable policies likely? Is adoption of enforceable policies likely?
2. Importance: Is there a significant threat in this enhancement area? How valuable (economically or ecologically) is the coastal resource?
3. Appropriateness for the Coastal Program: Is this an issue that other agencies are not addressing? Is there a need for coordination of efforts within Virginia?

With each criterion valued at up to 5 points, the assessment issues were ranked on a total scale of 1 to 15. Final ranking for all issues resulted in point scores of 9.22 to 12.2 and therefore eight issues technically ranked as "High" and one issue (Marine Debris) ranked as "Medium." Therefore all nine issues were eligible for strategy development. However, based on needs identified in the 309 assessment process and Coastal Policy Team discussion, the Virginia Coastal Zone Management Program was able to prioritize the issues further by taking into account the following things:

- The two highest ranking issues (CSI and SAMPs) would have strategies developed
- The 3rd ranked issue (Hazards) and the 5th ranked issue (Wetlands) would be considered through a CSI strategy on shoreline management.
- The 4th ranked issue (Aquaculture), while highly important, has had continuous 309 strategies since 1996. At this point, one of the most important policy development needs may be the appropriate allocation of submerged lands for shellfish aquaculture in light of other potential uses. In other words, coastal/marine spatial planning, which is being dealt with through the Seaside Special Area Management Plan as a pilot CMSP project for Virginia. The CSI strategy on working waterfronts should also help support aquaculture by preserving the necessary infrastructure.
- The 6th ranked issue (Energy & Government Facility Siting) would be absorbed in the Ocean Resources strategy through a marine spatial planning effort.
- The 7th ranked issue (Public Access) is not addressed but is under consideration for a 3 year Section 306 "Focal Area" because the needs are more in public access acquisition and construction rather than policy development.

- The 9th ranked issue (Marine Debris) would also be absorbed into the Ocean Resources Strategy because it is one of the issues that the Mid-Atlantic Regional Council on the Ocean, of which Virginia is a member, is addressing. The Ocean Resources strategy would complement and support MARCO efforts.

In summary, the Virginia CZM Program will focus its attention and efforts on the following three issues over the next five years:

1. Cumulative and Secondary Impacts of Growth and Development
2. Special Area Management Plans
3. Ocean Resources

The Virginia Coastal Zone Management Program has solicited input from its partners and constituencies to develop strategies to address specific issues in each of these high priority areas that are deemed appropriate for Virginia CZM action. Focus groups were convened for each category, Ocean Resources (Marine Spatial Planning and Marine Debris) on March 24, 2010 and Coastal Resources (CSI, SAMPS) on March 31, 2010. These meetings led to additional strategy work group meetings: MSP and Marine Debris as part of Ocean Resources on June 2, 2010; Working Waterfronts as part of CSI on June 30, 2010; Land and Water Quality Protection as part of CSI on July 1, 2010; and Seaside SAMP on June 17, 2010. From these meetings, potential strategies have been developed and are included immediately following the assessments in this document.

The Virginia CZM Program also conducted a public review and comment period from December 1, 2010 through January 3, 2011. During this time an announcement of the opportunity to review and comment on the draft Section 309 Assessment and Strategy document was made in the Virginia Regulatory Town Hall web site as well as on the Virginia CZM web site. A pdf version of the draft Section 309 Assessment and Strategy document was made available for review from the Virginia CZM web site. Written comments that were received during this time frame are included in an appendix at the end of this document.

II. SUMMARY OF COMPLETED 309 EFFORTS (2006-2010)

	Year 1 FY 06	Year 2 FY 07	Year 3 FY 08	Year 4 FY 09	Year 5 FY10	Total
Program Implementation (Administrative Actions)	$20,000	$67,898	$70,000	$62,344	$30,000	$250,242
CSI: Intergovernmental Decision-Making	$158,000	$70,000	$50,000	$38,350	$98,000	$414,350
CSI: Shoreline Management	$150,000	$150,000	$150,000	$191,590	$150,000	$791,590
CSI: Conservation Corridors			$71,000	$93,716	$153,000	$317,716
SAMP: Dragon Run	$69,000	$56,000	$50,000	$14,000	$25,000	$214,000
SAMP Seaside		$52,102	$75,000	$80,000	$80,000	$287,102
Aquaculture & BMPs	$139,000	$140,000	$70,000	$56,000		$405,000
TOTAL	$536,000	$536,000	$536,000	$536,000	$536,000	$2,680,000

Program Implementation

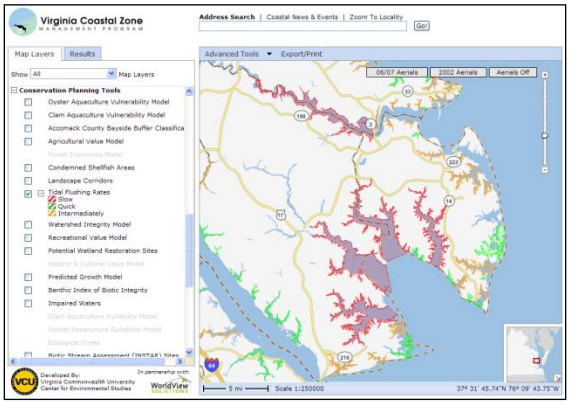
This portion of Section 309 funds, although not a separate strategy, was used to support administrative actions related to Virginia's Section 309 Needs Assessment and Strategy. A portion of the funds were used for contractual services from the Environmental Law Institute (ELI) to analyze past routine program changes regarding fisheries, sand dunes and beaches, wetlands, and state implementation of Clean Water Act and Clean Air Act provisions, and to prepare program change packages for submission to NOAA. NOAA approved Virginia's submission in June, 2010. Other funds were used for additional contractual services from ELI for a special study of potential impacts to Virginia's coastal environment from offshore energy development activities and the possible need for program changes related to these activities. In addition, funding was provided in years two and three to support one half of a Virginia CZM program staff position to manage the shoreline and conservation corridor portions of the Section 309 Strategy. In year four, funds were allocated to the Institute for Environmental Negotiation at the University of Virginia to assist in developing the 2010 Section 309 Needs Assessment.

Cumulative and Secondary Impacts

STRATEGY: Intergovernmental Decision-making

This strategy focused on identifying and minimizing coastal resource use conflicts, and creating stronger linkages between local land use plans and state and federal water use policies by exploring intergovernmental agreements to proactively consult the Coastal Geospatial and Educational Mapping System (Coastal GEMS), a tool-based Web resource, to view and analyze the state of Virginia's coastal resources in the face of increasing coastal development. Additionally, by providing the most up-to-date data to all stakeholders in the coastal zone through Coastal GEMS, all interested parties could help identify additional information (i.e. gaps) needed to better manage our coastal resources which could lead to modifications of the current regulatory structure.

During this 309 funding cycle the following actions toward Coastal GEMS expansion enhancement and promotion were undertaken:



The Coastal GIS Coordinator met with VCU and WorldView Solutions to facilitate workflow involved in maintaining, enhancing, and marketing Coastal GEMS. Over 20 data layers were either updated or added to Coastal GEMS during FY2007-2008. These data include: *Conservation Lands, Important Bird Areas, Essential Wildlife Habitat, Condemned Shellfish Areas, Private Oyster Leases, Constructed Oyster Reefs, Clam Aquaculture Vulnerability Model, Oyster Aquaculture Vulnerability Model, Tidal Flushing Rates and layers associated with the VCLNA (Recreational Value Model, Watershed Integrity Model, Agricultural Value Model, Forest Economics Model).* Data layers were processed for effective display on Coastal GEMS and then uploaded to a test IMS site where CZM staff could review symbology before they were added to the Coastal GEMS application.

Instead of developing a separate Coastal GEMS Advisory Committee, it was decided that the Coastal GIS Coordinator would utilize the existing coastal policy team and other ad-hoc advisors to identify and prioritize geospatial projects.

Addtionally, a Coastal GEMS training program was created and implemented. This program included a presentation about Coastal GEMS and why/how it was created, a live demonstration of the Coastal GEMS site tailored to the specific needs of the audience, and a handout with information about Coastal GEMS and available data layers. Information regarding GEMS training was posted to the GEMS website and publicized to CZM partners. Nine formal GEMS training sessions were also conducted during FY2007-2008.

Finally for Coastal GEMS, the development of MOU's and official data sharing agreements was explored, but ultimately deemed unnecessary due to existing willingness and support of partners to provide data and promote Coastal GEMS. The Coastal GIS Coordinator produced coastal resource maps and made GIS based calculations for CZM staff to utilize in meetings and presentations and for articles in the CZM magazine and produced maps as requested for CZM partners.

In addition to the enhancements to Coastal GEMS, this strategy included a two-year pilot project (FY06 & FY07) with the Middle Peninsula Planning District Commission (MPPDC) for applying GEMS as a tool to manage use conflicts. From this, the York River Use Conflict Roundtable was established among a cross section of representatives of varying, and often conflicting, uses of the York River. The Committee worked in small groups to analyze a York River study reach that consisted of comprehensive maps of the existing uses, demographics, and designations of the York River waterfront. This resulted in creation of a matrix of all identified use conflicts in preparation for the next phase of the project to frame the public policy question "Who should manage use conflict?" A York River Use Conflict Policy Recommendation

Committee was established, comprised of Roundtable members as well as state agency representatives to develop appropriate tools and policies. The Committee addressed known issues and conflicts affecting the study area to ensure that a comprehensive analysis of the issues had been achieved. The Committee arrived at seven recommendations for consideration by the Gloucester County Board of Supervisors:

Recommendation 1 –Develop and adopt a Coastal Living Policy to educate and inform County residents.
Recommendation 2 –Denote the County's Land, Air and Water territorial boundaries in the County's Comprehensive Plan and supporting maps.
Recommendation 3 –Take no action for now regarding aquaculture within the County's jurisdiction.
Recommendation 4 –Develop and adopt a policy for the protection of working waterfronts.
Recommendation 5 –Develop and adopt a Waterfront Outdoor Lighting Ordinance.
Recommendation 6 –Develop and adopt a policy restricting floating homes within the County.
Recommendation 7 –Develop and implement a master plan for public access infrastructure to ensure safe and equal water access for all user groups to the waterways within the County.

All recommendations were adopted by Gloucester's Board of Supervisors, and the county has established a "Coastal Community Committee" to address implementation. Currently, the Board is considering adoption of a draft Coastal Living Policy to pave the way for further action. Technical work and other products from the York River Use Conflict Committee are being incorporated in the comprehensive plan as it is updated. Examples include denotation of county's land, air and water territorial boundary.

STRATEGY: Shoreline Management

Waterfront development has altered Virginia's shoreline, often in ways that can be detrimental to habitats and water quality. In particular, many low energy shorelines have been hardened with revetments and bulkheads where less damaging techniques for managing shoreline erosion could have been employed. In many of these cases shoreline erosion could have been managed through a "living shoreline" approach that maintains, or even expands, the habitat and water quality protection benefits of natural shorelines.

This strategy built on progress made during the previous 309 Strategy to integrate riparian and near-shore management objectives and improve shoreline management practices. As a result of this strategy, the various agencies involved in shoreline management are now better able to promote living shoreline techniques and reduce the cumulative and secondary environmental impacts of waterfront development on shorelines. The strategy included a number of components:

- A "Living Shoreline Summit," (held December, 2006) with peer reviewed proceedings, to advance the use of this management technique
- Revised "Wetlands Guidelines" to be used by the Virginia Marine Resources Commission, the Virginia Institute of Marine Science, local wetlands boards and others to guide decisions about shoreline and tidal wetlands management.

- Improved data in the form of local shoreline inventories and evolution reports to support more informed shoreline management decisions and provide background for local shoreline plans to be developed in the future
- Research to document the habitat value of living shorelines and to improve their design
- Guidance for local governments to use in shoreline management planning
- Outreach materials for land use decision-makers, landowners and contractors on living shoreline advantages and design principles
- A training program for contractors and local government staff on living shoreline practices
- A report on improving management of Virginia's dune and beach resources, including proposed revisions to the Coastal Primary Sand Dunes and Beaches Act
- Changes to the Coastal Primary Sand Dunes and Beaches Act by the Virginia General Assembly to expand the legislation to cover the entire coastal zone (submitted to and approved by NOAA as a Routine Program Change)
- Revisions to the Coastal Primary Sand Dunes and Beaches Guidelines
- A peer-reviewed manuscript ***Using Science to Create Dune and Beach Protection Policy in Virginia*** published in the Journal of Coastal Research.

STRATEGY: Conservation Corridors

Population growth and development in many urban and suburban areas of Virginia's coastal zone has resulted in significant habitat fragmentation and the loss of many wetlands and riparian buffers that help protect water quality. For this reason, the Virginia CZM Program has invested in the development of conservation corridors throughout the coastal zone beginning with a model system created in the Hampton Roads planning district which prioritizes areas for preservation and restoration based on a number of data layers and local input.

During this 309 funding cycle additional work was conducted to update the Hampton Roads conservation corridor network. The original green infrastructure network (FY2004 Task 51) was updated by incorporating more current data into the geographic information systems (GIS) model. There were also several discussions with a diverse group of stakeholders that led to improvements in the green infrastructure plan. The change between the original green infrastructure network and the update that was finalized in this project was also analyzed. A *Vulnerability to Development* model was also created in order to predict where future growth will occur in the region and how the green infrastructure network will be impacted. This gives planners a tool to prioritize land acquisitions in the face of limited funding. The project also analyzed the potential impact of sea level rise on the green infrastructure network. Additionally, an updated parks and recreation database was created in GIS.

To expand this system to a network of identified and locally accepted conservation corridors for Virginia's entire coastal zone, additional 309 projects were contracted for FY2009 and FY2010. Focused in Northern Virginia (Task 97.02) and Middle Peninsula (Task 97.01), these projects are

designed to identify green infrastructure and develop public policy recommendations. Anticipated outcomes for these grants include: mapped conservation corridors, analysis on the benefits of corridors for pollutant removal and carbon sequestration, an educational fact sheet on the practical uses and benefits of green infrastructure, public policy recommendations and their endorsement, an analysis on the economic impacts of conservation easements, and possible routes for the Potomac Heritage National Scenic Trail.

Finally, in FY08, the Middle Peninsula Planning District Commission conducted a project to analyze the effects that a change in Virginia Department of Health (VDH) Sewage Handling and Disposal Regulations in 2000 has had on development patterns within many Virginia localities. The regulations allowed new engineered onsite sewage disposal system (OSDS) technologies to be installed on "marginal lands," or land that that would not normally support a traditional gravity fed septic systems. This change has resulted in erratic development patterns inconsistent with comprehensive planning goals of the affected localities.

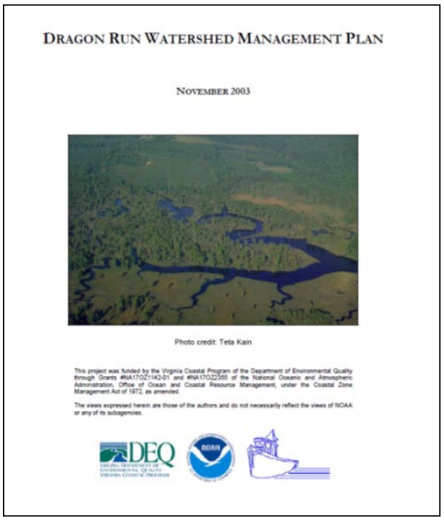
To inform local elected officials and local planning staff of various consequences of existing land use planning and to encourage the need for additional or amended public policy as it relates to land development and OSDS, this project inventoried and mapped permitted engineered OSDS across the Middle Peninsula. MPPDC staff worked closely with VDH to collect spatial data of engineered OSDS permitted from 2004-2008. This project was a continuation of a previous CZMA grant (NA17OZ2335 Task 84), where OSDS installed and permitted from 2000-2004 were inventoried and mapped. Therefore, data from the previous project was combined with data collected in this year's project in order to generate both county and town maps of OSDS proliferation from 2000-2008 within the Middle Peninsula.

Through an assessment of the maps, MPPDC staff found that within the Middle Peninsula [from 2000-2008] there were 1,208 installed OSDS and 2,006 permitted OSDS awaiting installation; this infrastructure equates to approximately $57,852,000.00 in total private sector investments. From this analysis MPPDC staff can work with local elected official and local planning staff to convey the implications of these land use development issues and policies.

Special Area Management Plans (SAMPs)

STRATEGY: Dragon Run

The Virginia CZM program has been investing in the Dragon Run watershed through a Special Area Management Plan (SAMP) since 2001. The Dragon Run SAMP mission has been to support and promote community-based efforts to preserve the cultural, historic and natural character of the Dragon Run, while preserving property rights and the traditional uses within the watershed. The Dragon Run Watershed Management Plan developed through this effort was originally adopted in 2003 by Essex, Gloucester and King and Queen Counties.


DRAGON RUN WATERSHED MANAGEMENT PLAN

NOVEMBER 2003

Photo credit: Teta Kain

During the 2006-2010 grant cycle, the SAMP focused on three areas of implementation: 1) new zoning and comprehensive plans, 2) public access/conservation lands management and 3) sustainable economic development practices.

Land-use planning has been an instrumental component of the Dragon Run SAMP. Assisting the watershed localities with developing tools to facilitate the long-term protection of the watershed through compatible and consistent comprehensive plan and zoning ordinance language has been integral to SAMP goals. During this grant cycle, the SAMP has focused on working with county planning staff, planning commissions, boards of supervisors and comprehensive plan steering committees to integrate language recommendations into planning tools. Based on Dragon Run SAMP recommendations, King and Queen County adopted revised zoning ordinance language to reconfirm its commitment to recognize the Dragon Run as a significant area. Gloucester County has included a substantial section on the Dragon Run in its draft comprehensive plan based on the SAMP recommendations and is hoping for plan adoption in the summer 2011. Essex County has included Dragon Run recommendations in the working draft of their update to the comprehensive plan and hopes to adopt the plan in Spring 2011. Middlesex County adopted a comprehensive plan that includes some of the Dragon Run land-use recommendations, and has recognized the importance of other land-use tools recommended by the SAMP, including Agricultural and Forestal Districts, Purchase of Development Rights (PDR), Transfer of Development Rights and the use of conservation easements by private landowners.

As public access opportunities have increased throughout the Dragon Run watershed, understanding public and private rights for access and reducing the potential for conflict between public resource users and private landowners is becoming increasingly important. MPPDC staff developed a code of conduct that is based on the Public Trust Doctrine as it pertains to the public's right for ingress and egress of waterways such as the Dragon Run. This guidance was integrated into a brochure and its principles were conveyed to public access entities, such as the Middle Peninsula Chesapeake Bay Public Access Authority. Additionally, these entities were asked to apply the code of conduct to their holdings in the watershed. Specifically, four of these entities adopted site specific management plans that included the code of conduct in 2008 and early 2009 (see next section).

Public and non-governmental organizations (NGOs) acquiring conservation lands in the Dragon Run Watershed have become increasingly successful. It has since become a priority to assure that these entities are managing their acquired lands in such a way that is consistent and compatible with the Dragon Run watershed management plan. Therefore, the SAMP, via coordination with managing entities and related partners, developed four management plans (Dragon Bridge – CBNERRs and Dragon Flats – TNC) utilizing Dragon Run Steering Committee conservation holding management recommendations both of which were accepted. MPPDC also drafted management plans for the Middle Peninsula Chesapeake Bay Public Access Authority (PAA) and the Friends of Dragon Run. The Friends of Dragon Run adopted its plan in early October 2008 and the PAA adopted in February 2009.

To promote the sustainability of traditional industries, such as farming and forestry, the Dragon Run SAMP identified a biodiesel partnership as a feasible watershed program. This partnership includes the role of portions of the biodiesel chain, including the soybean farmers, fuel distributors, biodiesel refinery, private fleets and school bus fleets to support the mission of sustainability of agriculture. Substantial work has been completed on the partnership, particularly gaining the commitment of the watershed school boards in using biodiesel in their fleets. The multiple prongs of the program include: 1) a purchase program for the schools and private industry, 2) education regarding utilizing blend levels to manage cost and 3) watershed education and market to expand the market. All of these aspects combined are aimed to provide both direct and indirect economic benefit to the watershed farming community.

The SAMP also initiated development of the Dragon Run Estate Planning Network Initiative (DREPNI). The purpose of the initiative is to provide collaboration between estate planning stakeholders to create a conservation hub in the Dragon Run watershed. Currently, 20,645 acres (or 23% of the Dragon Run Watershed) have been protected during this initiative. The majority of that acreage has been protected since the DRSC/SAMP started focusing on conservation planning in early 2006.

Finally, research through the Dragon Run SAMP, focused on gaining a quantitative understanding of conservation easements and their current fiscal impacts on Middle Peninsula localities, has clarified information on potential benefits that conservation easements provide to localities through their local composite index. In clarifying composite index calculations, the SAMP has identified a path for increased state funding for local schools based on the total value of land held within a county, less the easement value. This establishes quantitative proof that the locality is not as wealthy as it would be without the easement designation on land values, thus making the locality eligible for additional support for local schools. This information will supplement upcoming discussions among stakeholders in the Dragon Run watershed as well as within the Middle Peninsula region aimed at development of policy options and recommendations to address land conservation and its local fiscal impacts.

To date, all six Middle Peninsula commissioners of revenue have significantly increased their comprehension of the impact of conservation easements to their local tax base and its impact on the aid received from the state via the Composite Index. At least five have updated their valuation process to adequately and consistently account for the impact of the conservation easements. At least one of the commissioners of revenue has already had a dialog with the firm preparing the county's reassessment to discuss the assessment of conservation easements. At least one has changed is administrative policies to better coordinate between the clerk's office and the commissioner's office due to this project.

Essentially, as a result of the SAMP governances have changed to be more efficient.

Additionally, interest in the model is being observed statewide. Lead conservation entities, like Piedmont Environmental Council, are starting to try to implement some of the recommendations from this project in other parts of the state. MPPDC staff has been invited to regional and statewide events to make presentations on the findings and recommendations.

STRATEGY: Seaside Special Area Management Plan

The Seaside SAMP strategy began in Year 2 (FY 2007) with two land-based projects and one water-based project. In the first land-based project Accomack County (Task 96.03) took the bold step of developing and adopting an Atlantic Preservation Area Ordinance that mirrors the protections afforded by the Chesapeake Bay Preservation Act. This protection now extends down the entire Seaside length of the Eastern Shore. The second project was establishment of CommunityViz software in both counties (Accomack and Northampton) that allowed them to project build-out of all lots give current zoning conditions. Results showed that current zoning would allow for nearly a tripling of current population – a concept that shocked many county planners however the Boards of Supervisors have still not acted on this information. The first water-based project was a grant to the Virginia Institute of Marine Science (VIMS) (Task 96.01) to assess high priority estuarine areas (blue infrastructure) on the Seaside where multiple resources (e.g. oysters, SAV) were co-located or closely grouped.

In Year 3 (FY 2008), the Seaside SAMP Project Team was established consisting of the CZM Manager, The Nature Conservancy (TNC), VIMS, the Marine Resources Commission

(MRC), representatives of the shellfish cultivation industry, and the Eastern ShoreKeeper. The overriding goal of the team is to design a management strategy that will maximize ecological and economic productivity of this extremely dynamic barrier island lagoon system. As barrier islands roll over on themselves and each new storm changes the bathymetry of this shallow area, conditions for bird nesting and foraging, shellfish and SAV growth change. Through grants to TNC, VIMS, and the ShoreKeeper (Tasks 96.01, 96.02 and 93.04 respectively), the Seaside SAMP Team is reviewing and analyzing existing spatial data to map current and potential future conditions as well as possible. Spatial analyses were conducted for bird nesting, foraging and resting areas; current and potential shellfish grounds and SAV beds; and heavily used recreation areas. Important bird habitats were widely distributed across the barrier island lagoon system with highest concentrations on edges of barrier islands and marshes. Maps are available in the final report. For shellfish and SAV, current distributions were mapped in relation to public (Baylor) shellfish grounds. Map analysis revealed that only 63 percent of the public grounds on the seaside are appropriate for wild clams and oysters and only 32 percent is appropriate for SAV restoration. It also revealed that while the current extent of SAV is only 20 km^2, the potential area is 131 km^2. Recreational use was more difficult to determine scientifically and to map definitively. However, results did reveal a pattern of use on the barrier island beaches, especially those places where beaches have washed over the islands completely or where they wrap around the tips of the islands to provide easy boat access from the western side of the island. Most boaters stayed close to channels near major launch sites. On the southern end of the system, there was a slight trend toward more divergent use of the marshes as boaters have less defined options for getting out to the inlets. Rather clear patterns were noted for fisherman departing from the E. Shore National Wildlife Refuge and Wachapreague and recreational boaters departing from Chincoteague tended to remain within that Bay.

In Year 4 (FY 2009), which was not underway until June 2010, the Seaside SAMP Team is targeting three representative areas for more in-depth spatial analyses of bird, shellfish and SAV data. The three areas are Central Hog Island Bay, South & Magothy Bays and Chincoteague Bay. The team will develop spatially explicit draft conservation and restoration objectives for oyster and eelgrass habitats. VIMS will conduct a statistical comparison between current use designations and those suggested by habitat suitability assessments with tin the three target study areas.

As the spatial data emerges, it has become clear that a large proportion of the public Baylor grounds (37%) are no longer productive for public shell fishing and that, at times, shellfish growers may be underutilizing their leased areas and would benefit from leasing other areas if we had a more nimble, flexible leasing system. What is needed is a dynamic management system that matches the dynamics of this ecological system. The Seaside SAMP has evolved into a complex “marine spatial planning” effort that could serve as a pilot for larger geographic areas.

In Year 5 (FY 2010) which will begin in winter 2010/11, the Project Team will seek to broaden its representation and begin to bring information to the public and solicit public response to various management options as they are developed.. The Seaside SAMP will extend for two additional years into FY 2011 and 2012.

Aquaculture

Strategy #1: Aquaculture BMP Provisions in Permits

This strategy was originally planned as a two-year, $50,000 effort in years 3 and 4 (FY 08 and 09). Instead it was a two-year $28,000 effort in years 1 and 2 (FY 06 Task 92.03 and 07 Task 92.03). Through grants to the Virginia Institute of Marine Science, this strategy completed development of a set of Best Management Practices for shellfish farming (including clams, oysters and any other shellfish that are likely to be cultivated in Virginia in the near future) for all of Virginia's waters. The shellfish aquaculture industry in Virginia continues to grow and shellfish farmers recognize their responsibilities to be good stewards of the environmental resources upon which their industry depends. At the same time, increasing coastal development and water-related activities contribute to user conflicts and misunderstandings surrounding the industry. In an effort to reduce these conflicts and better explain the shellfish cultivation process, an environmental code of practices (ECP) and best management practices (BMP) for the industry were developed by VIMS staff with input from industry and other interested individuals.

After two years in development, with public input sessions and draft documents mailed to industry participants, two separate documents were created. The first, "Environmental Code of Practices for the Virginia Shellfish Culture Industry," lays out the basic principles upon which all shellfish aquaculture should be based. It also served as the base from which the second document was developed. The second document is the "Best Management Practices for the Virginia Shellfish Culture Industry." This document identifies area of concern and offers suggested best management practices designed to minimize environmental or societal impacts by the culture industry. In addition, both the ECP and BMP received official endorsements from the Virginia Department of Agriculture and Consumer Services (VDACS), the VDACS governor-appointed Aquaculture Advisory Board, and the Virginia Farm Bureau Federation Aquaculture Advisory Committee. Both of these final documents were mailed to over 125 shellfish growers, along with a cover letter encouraging the voluntary adoption of the ECP and BMP principles. The industry and legislators were not receptive to including these BMPs as permit or lease conditions. Since these BMPs were developed and distributed to industry, they have been generally well-followed. In addition, on the Eastern Shore where shellfish cultivation is most extensive, the Eastern ShoreKeeper continues to monitor cultivation practices and work with growers to ensure the BMPs are followed.

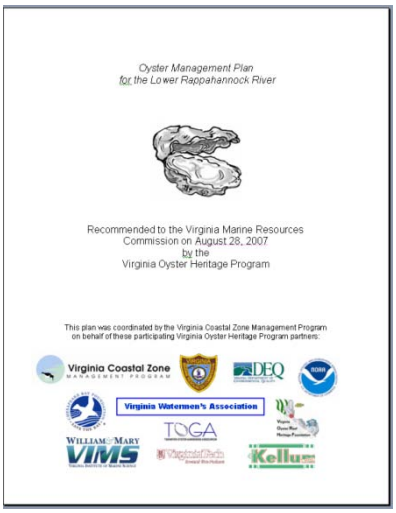
Strategy #2: Re-evaluation of Public Use of Baylor Grounds & Creation of Aquaculture Enterprise Zones

This strategy sought to identify and develop options to ensure adequate space for shellfish aquaculture and continue the development of information necessary to manage aquaculture activities in order to avoid conflicts with other permissible uses of state waters and State-owned submerged lands. This included re-enactment of the water column leasing legislation (which had lapsed due to the failure of the General Assembly to appropriate funds for its implementation) and the consideration of opportunities for the public use of Baylor Grounds and "unassigned grounds" for aquaculture activities. Unfortunately, given the current economic recession the GA has never funded the water column leasing program. Finally it sought to develop options for

local ordinances designed to manage land use adjacent to areas designated for aquaculture and stimulate the creation of aquaculture enterprise zones.

The first step, taken in Year 1 (FY 2006 Task 92.01), was for VIMS to make adjustments to the "Aquaculture Use Suitability Model" developed under the previous Section 309 strategy. VIMS used GIS software to map high medium and low risk areas for shellfish aquaculture in Gloucester, Accomack and Northampton Counties. The original model considered basic physical and biological conditions necessary for aquaculture such as water depth, salinity, shellfish condemnation areas, and the presence of submerged aquatic vegetation. This new model includes the potential impacts from current land use by incorporating the local zoning that is adjacent to growing areas. Final products included a set of easy to understand maps and GIS shape files now available on the Virginia CZM Program's "Coastal GEMS" site. Also in Year 1, VIMS developed a report summarizing potential management options for promoting shellfish aquaculture. Key among them was the concept of developing "aquaculture enterprise zones."

With pervasive difficulty in the restoration of wild oysters, it became important to provide adequate opportunity for the production of cultivated shellfish. In response to the VIMS options report and the dire situation of wild shellfish, Delegate Albert Pollard (D – Lively) introduced legislation authorizing the Marine Resources Commission to establish aquaculture enterprise zones for the propagation of commercial shellfish. This law was fully enacted in March 2010. Under this law the Commission may set a single fee for the application and use of the zones.


Oyster Management Plan
for the Lower Rappahannock River

Recommended to the Virginia Marine Resources Commission on August 28, 2007 by the Virginia Oyster Heritage Program

This plan was coordinated by the Virginia Coastal Zone Management Program on behalf of these participating Virginia Oyster Heritage Program partners:

Virginia Coastal Zone MANAGEMENT PROGRAM
DEQ
Virginia Watermen's Association
TOGA
WILLIAM & MARY VIMS
Kellum

In addition to the work above, the Virginia CZM Program reconvened the Oyster Heritage Program partners to resolve shellfish conflict issues on the lower Rappahannock River. Since the Baylor Grounds were surveyed and established in the late 1800's the management of these areas has historically included harvest restrictions and the transplantation of shell and seed. Recent management efforts under the Oyster Heritage Program included the establishment of brood stock reefs and designation of adjacent harvest areas. Watermen began to argue arduously for the opening of those sanctuary areas to harvest. In response, the OHP partners developed a new management plan that incorporates a 3-year rotational harvest of 3 areas below the Route 3 bridge and 3 areas above the bridge. It also created a 4 inch maximum size limit on oysters and a buy-back program for those larger oysters so that they could be placed back on sanctuary reefs. The plan was adopted by the Marine Resources Commission and remains in effect. Part of the rationale for this plan was derived from the work completed in FY 2001 Task 92.04, Economic Analysis of Rappahannock Oyster Plan

Although this Section 309 strategy proposed identification of suitable areas within the Baylor grounds (as well as in "unassigned" subaqueous bottom), the conversion of public Baylor grounds to any other uses coastal zone-wide was deemed too politically charged. Thus the decision was made to test this concept in a smaller geographic area where support for shellfish cultivation was strong. The chosen area was the Seaside of Virginia's Eastern Shore. So this

strategy was essentially moved to the Seaside Special Area Management Plan (Seaside SAMP). This will allow for a slower, more incremental approach to test the concept in Virginia.

Finally, to address impacts to the local aquaculture industry based on a myriad of factors including disease, predation, water quality and the transition of many coastal communities toward increased development of their waterfront areas, the Middle Peninsula Planning District Commission working with Mathews County (FY 2008 Task 92), created an Aquaculture Working Waterfront Steering Committee consisting of commercial and hobby oyster and clam farmers, county planners, and the maritime foundation within Mathews County. This committee identified current challenges within the industry, shared business models, and discussed how the industry could be supported or enhanced by the county. Along with the information gathered from committee members, MPPDC staff researched how other coastal communities in the United States had dealt with similar issues and organized a matrix of public policy options that may be feasible in Mathews County. MPPDC staff also conducted an economic assessment of the current seafood and aquaculture industry in the Middle Peninsula. Finally MPPDC staff worked to create an educational DVD, titled *Mathews Working Waterfront for the 21st Century*, which focused on the economic and cultural tradeoffs of community scenarios and the public policy options that may enhance working waterfront industries. After careful review of the matrix, economic assessment and education DVD by committee members, MPPDC staff updated the Mathews Board of Supervisors at their monthly meeting. Though supportive of the direction the project was going the Board asked for costs associated with the public policy options before actually considering the options.

In addition to suggesting public policy options to strengthen aquaculture-working waterfront infrastructure to enhance sustainability, MPPDC staff worked with County Planners and their consultants to develop model comprehensive plan language that reinforces the County's commitment to its working waterfronts.

III. ASSESSMENT

Wetlands

Section 309 Enhancement Objective

Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands

Resource Characterization

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Please indicate the extent, status, and trends of wetlands in the coastal zone using the following table:

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**
Tidal (Great Lakes) vegetated	750,000-1,250,000[1]	222,368[2]	+0.35[3]	Unknown	0.35
Tidal (Great Lakes) non-vegetated	350,000 – 650,000	116,198	-12	Unknown	0
Non-tidal/ freshwater	1,000,000-1,250,000	908,584[4]	-513[5]	Unknown	2044

2. If information is not available to fill in the above table, provide a qualitative description of information requested, including wetlands status and trends, based on the best available information.

[1] Wiggins, Harold J. *Historic Trends in Wetlands Protection in the State of Virginia.* Virginia Journal of Science, Volume 43, Number 1B, Spring 1992. All figures for historic estimates are based on estimates of 1780s wetlands extent cited in Wiggins, 1992.
[2] Center for Coastal Resources Management, Digital Tidal Marsh Inventory Series, 1992. Comprehensive Coastal Inventory Program, Virginia Institute of Marine Science, College of William and Mary, Gloucester Point, Virginia, 23062.
[3] VIMS Permitting, 2009 Citation. http://ccrm.vims.edu/wetlands/copyright.html.
[4] U. S. Fish and Wildlife Service. Publication date (found in metadata). National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. http://www.fws.gov/wetlands/
All Table data for non-vegetated tidal wetlands and non-tidal wetlands are taken from the NWI.
[5] "*Virginia Performs,*" Agency Performance Measures Report. Virginia Department of Environmental Quality, 2008. http://vaperforms.virginia.gov/agencylevel/src/KeyAtGlance.cfm

The Tidal Marshes Inventory (TMI) and National Wetlands Inventory (NWI) acreage used for current acreage of tidal and non-tidal wetlands respectively was mapped over the course of the last 30 to 40 years. The TMI was developed between 1972 and 1990 with identified wetlands confirmed by on–the-ground visits. The NWI uses remote data consisting of imagery generated between 1970 and the present.

While many voluntary activities throughout the coastal zone in Virginia are leading to restored wetlands, there is no one comprehensive data source for tracking voluntary restoration or creation of wetlands. Various non-governmental groups and federal government entities are known to have restored, purchased, or otherwise protected through easements many acres of tidal as well as non-tidal wetlands in the coastal zone, including the Department of Defense, The Nature Conservancy, Chesapeake Bay Foundation, Elizabeth River Project and other private environmentally interested groups. The Department of Game and Inland Fisheries has also worked to facilitate and effect the voluntary creation and protection of significant acreage of non-tidal wetlands. So, in order to report on the contextual measures below, some mechanism to capture the restored or protected acres must be developed.

3. Provide a brief explanation for trends.

No net loss of wetlands through regulatory programs and a net gain of wetlands through voluntary programs is part of Virginia statute and policy. Compensation for non-tidal wetland impacts is required for essentially all projects. Additionally, the revised Wetlands Mitigation-Compensation Policy and Supplemental Guidelines adopted by the Virginia Marine Resources Commission (VMRC) in 2005 for tidal wetland impacts eliminated a previous threshold of 1,000 square feet for non-commercial projects requiring permit approval, leading to substantially less allowable loss of tidal wetlands.

The law and associated policy, however pertains only to wetlands lost through known, legal activities subject to the permitting process, not illicit unpermitted losses, or losses due to natural causes. For non-tidal wetlands, DEQ has instituted a compliance program that inspects for unpermitted losses due to permittees exceeding allowable, permitted impacts or for sites that have filled wetlands without obtaining permits. In the past two years DEQ has found and required compensation for over 35 acres of nontidal unpermitted impacts.

Trends provided for losses of tidal wetlands are drawn from the Virginia Institute for Marine Science (VIMS) permit database of Joint Permit Applications for impacts to tidal wetlands. Data for 2006, 2007 and six months of 2008 were verified in the field by VIMS staff. Data for the second half of 2008 and 2009, however, were taken directly from permit applications and were not verified in the field. Site visits were conducted for 10-20% of all projects reviewed. VIMS notes that Joint Permit Application reviews frequently identify apparent inaccuracies in these numbers with regard to project impact “footprints” and wetlands resources impacted. Also, actual total losses may not be reflected by data in the VIMS Joint Permit Application database if project modifications submitted immediately prior, or during a public hearing, are not reported to VIMS. Furthermore, actual losses due to construction may not be precisely reflected by VIMS data as construction inspections, if performed, are not reported to VIMS. Finally, detailed mitigation plans for tidal wetlands losses may not be part of the Joint Permit Application

submissions, leaving VIMS unable to verify that mitigation required for “no-net loss” policy has been appropriately planned for tidal wetlands.

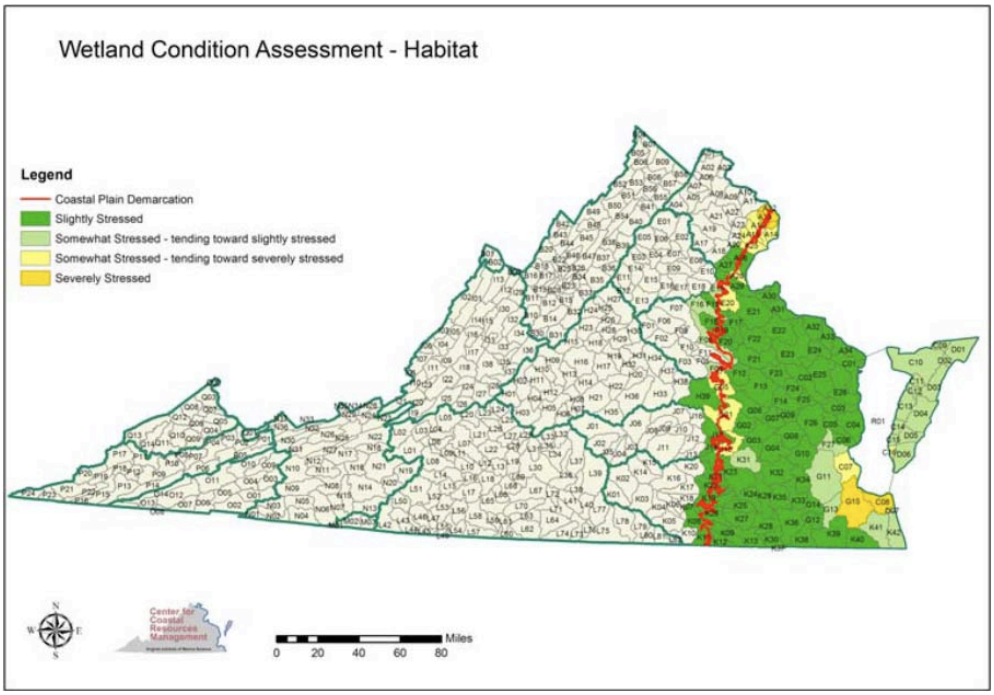
So, in total the above constraints call into question the accuracy of any gains and losses related to tidal wetlands.

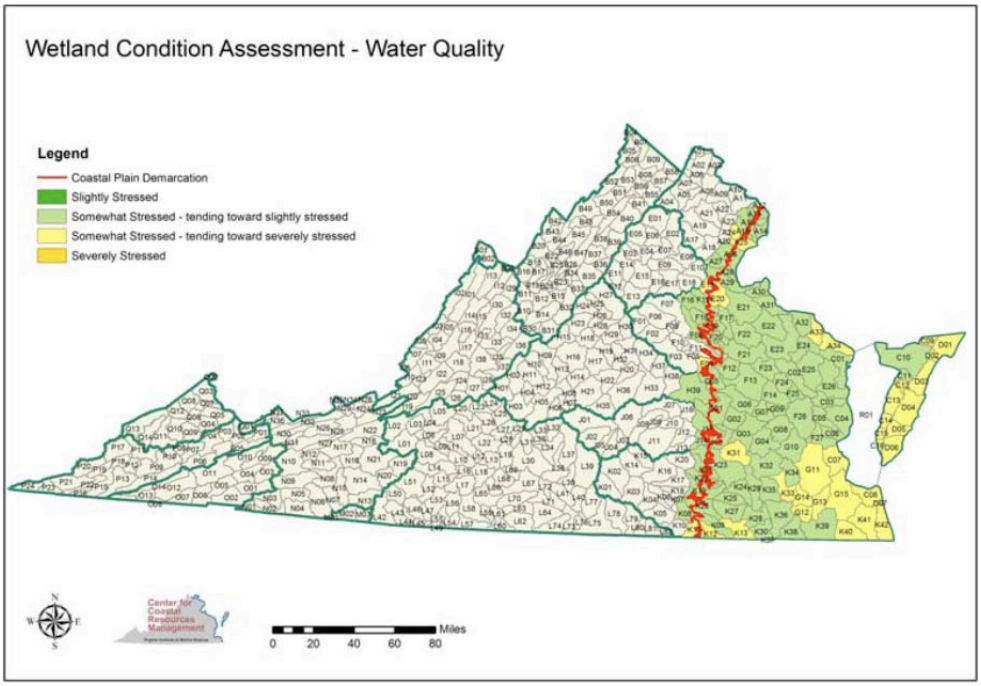
4. Identify ongoing or planned efforts to develop monitoring programs or quantitative measures for this enhancement area.

Wetlands Condition Assessment

Through funding from the EPA Wetlands Program, DEQ wetland managers and VIMS scientists have been working together to determine the status of wetland resources in Virginia, in terms of overall quality of wetlands in each watershed, beginning in the Coastal Plain. Using this information, Virginia can track changes in wetland acreage and function, target certain watersheds and help determine the effectiveness of compensatory mitigation replacing lost wetland acreage and function. Virginia DEQ has developed a long-term strategy for wetland monitoring and assessment that provides a framework for an ongoing assessment of the status of the Commonwealth's wetland resources and the success of both our wetland regulatory and voluntary programs.

Average habitat wetland condition and average water quality wetland condition per 14 digit HUC has been completed to assess overall condition of wetlands in Coastal areas and throughout Virginia. Since 2003, the overall wetland monitoring and assessment strategy has been to establish baseline conditions in various broad contexts, such as land use, watershed, and wetland type.





As additional data are collected, Virginia will use this sequential survey information to look at changes in wetland quantity and quality over time. This temporal analysis will be accomplished by continuing to refine the wetland database with information on wetland losses and gains in each watershed using the permit tracking database, as well as periodically conducting wetland quality assessments in select watersheds to make inferences on wetland condition. This, in turn, will allow for management decisions to be made that could provide additional protections for watersheds experiencing significant declines in wetland quantity and/or quality. For instance, monitoring information could be used to identify exceptional value wetlands for greater protection through permitting programs. Conversely, degraded wetlands could be identified as candidates for targeting wetland restoration projects.

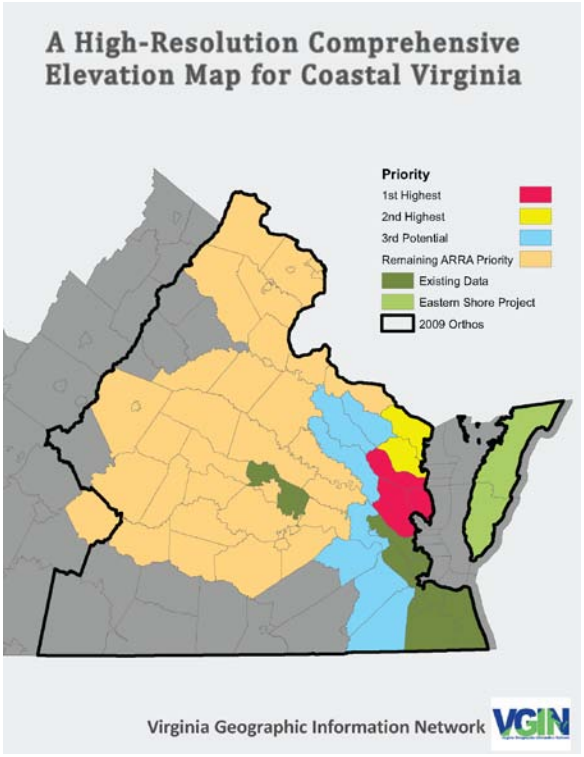
These monitoring objectives are designed to support regulatory decision-making, allow reporting of wetland condition, and provide information for policy development.

LIDAR Coverage

The Virginia Geographic Information Network (VGIN) of the Virginia Information Technologies Agency (VITA) has proposed a collection of high-resolution Light Detection and Ranging (LIDAR) data, and the creation of bare earth DEM datasets, in priority coastal areas of Virginia. The project will collect existing and acquire new high resolution LIDAR data for all of the area estimated likely to be impacted by rising sea levels as identified in the final report of the Governor's Commission on Climate Change.[6, 7]

[6] Governors Commission on Climate Change website: http://www.deq.state.va.us/info/climatechange.html
[7] FY2010 National Map Proposal, Virginia Geographic Information Network, Virginia Information Technologies Agency.

The Governor's Commission on Climate Change report suggested that Virginia agencies and localities should plan for at least a 2.3 foot rise in sea level, with an expected range of 2.3-5.2 feet in local areas. The report also identifies LIDAR data along with additional processing and application development as providing essential capabilities for states and localities in planning for specific sea level rise scenarios, street level storm surge predictions, identifying critical 'at risk' infrastructure, and other planning needs.



5. 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	H	E	H
Alteration of hydrology	M	E	H
Erosion	M	E	M
Pollution	L	L	M
Channelization	L	L	M
Nuisance or exotic species	H	E	M
Freshwater input	M	L	M
Sea level rise/Great Lake level change	H	E	H
Lack of freshwater	H	M	H

Development/Fill

Development pressures remain the greatest threat to wetlands in Virginia. While no net loss policies require mitigation to offset elimination of wetlands through development, the impact of construction and particularly residential construction continues to be of great concern. While DEQ tracks performance of non-tidal wetlands mitigation and takes corrective actions when mitigation has failed or not been performed, tracking of in-lieu fees and mitigation for tidal wetlands remains a challenge. The fill of tidal wetlands and hardening of shoreline due to development also has significant consequences related to the threat of sea level rise described below. In some cases, developed land can reduce the migration capacity of wetlands that would otherwise allow for adaptation to rising high-water lines. Existing data does not provide sufficient information regarding the elevation or condition of land in and around developed wetlands areas expected to be affected by sea level rise.

Nuisance or Exotic Species

Invasive species are non-native plant, animal, or microbial species that cause, or are likely to cause, economic or ecological harm or harm to human health.[8] Invasive species pose the second greatest threat to Virginia's native plant and animal species, and the economic loss due to invasive species in the U.S. is estimated ate over $137 billion.[9] Coordination of efforts to address invasive species was codified by the Virginia General Assembly in 2009.

Phragmites Australis, an invasive wetlands grass, is one example of an exotic species requiring continued action. Although several control efforts have been undertaken, the plant still poses a significant threat throughout Virginia's native wetland systems. Work supported by multiple partners, including the Virginia CZM has documented the extent of Phragmites on Virginia's Eastern Shore, Rappahannock River, and Back Bay. Mapping efforts will continue in 2010. These efforts have lead to outreach, education and targeted control by landowners and local, state and federal agencies. Phragmites is highly destructive of native wetland ecological services and values and demands continued attention.

Sea Level Rise

Sea level rise presents the greatest emerging threat to wetlands in Virginia. With conservative estimates of sea level rise in excess of two feet, the inundation of a very significant percentage of wetlands is likely. Virginia, however, unlike some other coastal states does not currently have any estimate of current or potential future losses in wetlands acreage based on elevation data. Though non-tidal wetlands may be affected and/or converted to tidal wetlands, the impact of sea level rise is expected to primarily affect tidal wetlands.

The elevation and condition of wetlands, and adjacent uplands, will determine in part the ultimate consequences of projected sea level rise. Elevations are not, however, currently mapped

[8] Executive Order 13112: Invasive Species. February 3, 1999.
[9] Pimentel, D., L. Lach, R. Zuniga, and D. Morrison. 2000. Environmental and economic costs of nonindigenous species in the United States. BioScience 50:1 53-65.

with sufficient precision to allow for a meaningful analysis, though current Light Detection and Ranging (LIDAR) technologies would offer the necessary level or resolution. A resilient shoreline may be able to adapt to sea level changes as wetlands migrate to appropriate areas thus mitigating some of the potential loss in acreage. It is unknown however, where shoreline conditions would allow for such adaptation.

6. (CM) 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 Wetlands	Y	1970 – 1990
Beach and Dune	Y	2005, 2006
Nearshore	N	
Non tidal wetlands	Y	2003 – present

Coastal GEMS

The Coastal GEMS Application is an online inventory of water and land based natural resources developed by the Virginia CZM Program to be a "gateway to Virginia's coastal resource data and maps." Among other data layers, GEMS includes wetlands features from various sources. Interactive spatial data and detailed descriptions are available for the following:

- Tidal and non-tidal wetlands
- Chesapeake Bay dunes
- Beaches above high water
- Submerged aquatic vegetation

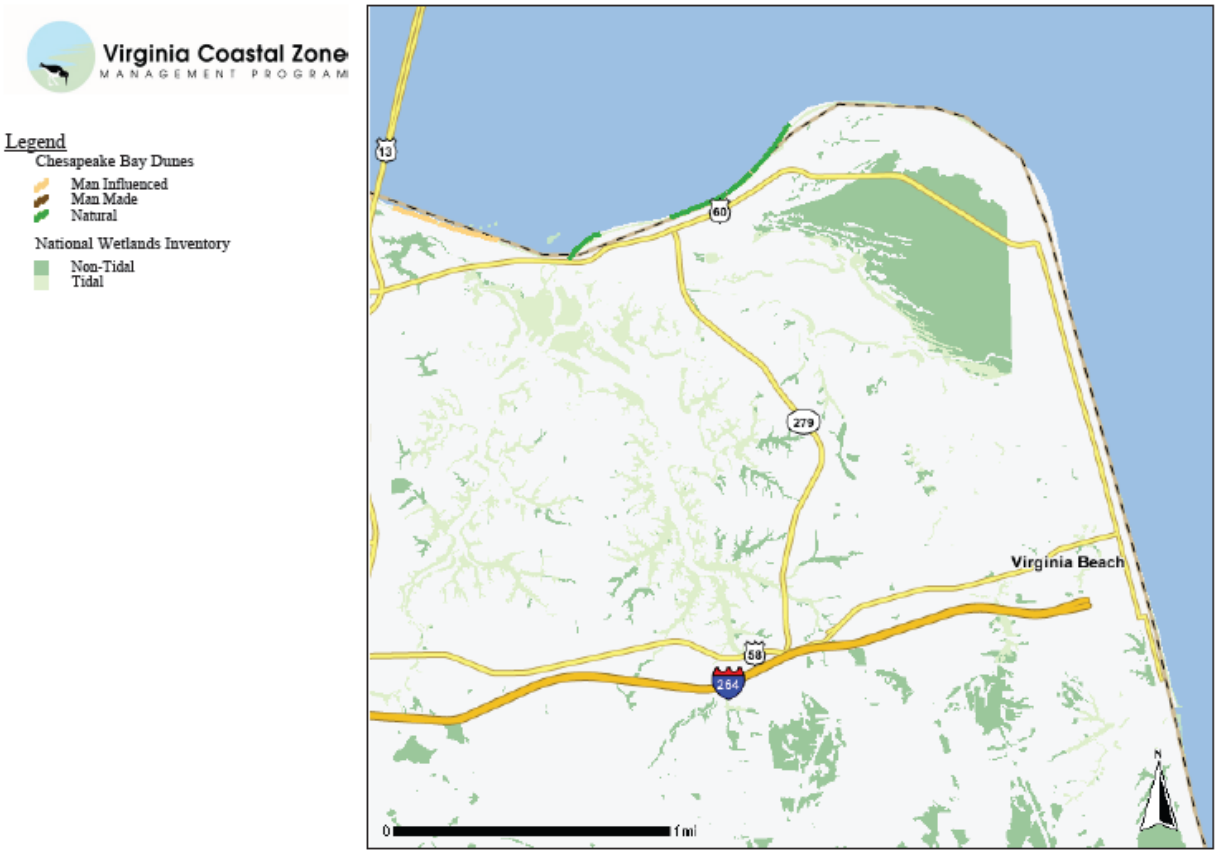
The source for wetlands data is the National Wetlands Inventory (NWI) maintained by US Fish and Wildlife Service. As mentioned previously, the NWI uses imagery generated over a greater than thirty-year inventory. While imagery for parts of the coastal zone has been generated within the past five years, imagery for other parts of the coastal zone has not been generated since the 1980s.

The Chesapeake Dunes spatial data shows primary and secondary sand dunes located along the shores of the Chesapeake Bay. The source of the data is the Chesapeake Bay Dune Systems study completed by VIMS, Shoreline Studies Program between 1998 and 2006. That research was funded by Virginia CZM.

The beaches above high water spatial data was developed in order to determine the extent of supratidal beaches (beaches above mean high water) that were, at the time, unregulated. Virginia's coastal localities that were outside the purview of the Dunes and Beaches Act (non-jurisdictional localities) were analyzed to determine the extent of their beaches. The Non-jurisdictional Beach Assessment data was collected between 2005-2006. In 2008, the Virginia General Assembly expanded the Coastal Primary Dunes and Beaches Act to cover the entire coastal zone, thus providing regulatory protection of supratidal beaches.

Chesapeake Bay Subaqueous Vegetation (SAV) beds mapping data was generated by VIMS from aerial photography flown in 2007. It is a portion of the full SAV dataset that extends back to 1971. While naturally occurring SAV beds have been absent from Virginia's seaside (Atlantic coast) since the 1930's, spatial data also exists for locations where eelgrass seeds have been disbursed by VIMS under the CZM's Seaside Heritage Program.

A Coastal GEMS map of the primary/secondary dunes and wetlands:



Tidal Marsh Inventory

Beginning in the 1970s, the VIMS Wetlands Advisory Program started mapping all tidal wetlands in support of the 1972 Virginia Wetlands Act. Work on developing the Tidal Marsh Inventories continued through the 1990s, with publications on a county-by-county basis. In 1990, a large-scale effort within the Comprehensive Coastal Inventory Program (CCI) created a GIS coverage of all marshes delineated in the Tidal Marsh Inventory Series.

Digital Shoreline Coverage

From 1989 to 1991, the CCI at VIMS developed spatial GIS data of the shoreline as a basic boundary layer for most analysis in coastal Virginia. USGS 7.5 minute, 1:24,000 scale, topographic maps were used to digitize the high water line.

Shoreline Situation Reports

Using TMI data, Shoreline Situation Reports (SSR) for Tidewater cities and localities were developed by VIMS in the 1970s. These reports have been the foundation for shoreline management planning in Tidewater Virginia cities and localities for more than 20 years. CCI has developed new protocols for collecting, disseminating, and reporting data relevant to shoreline management issues of today. With support from the Virginia CZM Program 309 funds, revised SSRs are being generated on a county-by-county basis using a new GIS shoreline database. The reports are now referred to as the Virginia Shoreline Inventory.

7. (CM) 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	Tidal: 0 Non-tidal: Unknown
Number of acres of coastal habitat protected through acquisition or easement using non-CZM or non-CELCP funds	Tidal: 0 Non-tidal: Unknown

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

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	Y	Y
Wetland protection policies and standards	Y	N
Wetland assessment methodologies (health, function, extent)	Y	Y
Wetland restoration or enhancement programs	Y	N
Wetland policies related public infrastructure funding	N	N
Wetland mitigation programs and policies	Y	N
Wetland creation programs and policies	Y	N
Wetland acquisition programs	Y	N
Wetland mapping, GIS, and tracking systems	Y	Y
Special Area Management Plans	Y	Y
Wetland research and monitoring	Y	Y
Wetland 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.**
    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.**

Tidal Wetland Regulatory Program Changes

With Virginia CZM Program funding, the Virginia Marine Resources Commission (VMRC) revised the Wetlands Mitigation-Compensation Policy and Supplemental Guidelines in 2005 to eliminate a 1,000 square foot threshold for non-commercial projects requiring permits.

Additionally the Policy revisions recognized the potential for use of in-lieu fees to fund wetland restoration or creation projects as a last form of mitigation to be used to offset permitted wetland losses.

Another significant change occurred in 2008 when the Virginia Institute of Marine Science (VIMS) reduced its efforts to field verify the accuracy of all joint permit applications for permitted wetlands losses with on-site visits. Currently, on-site visits are performed for only 10-20% of applications. VIMS has redirected its advisory efforts to focus more on training for local wetland board members and staff.

Wetland Assessment Methodologies

As described above DEQ and VIMS have been working together on wetland mapping and assessment. As part of this, the VIMS Center for Coastal Resources Management has developed a multi-level tidal wetland inventory and assessment methodology for the estuarine segments of the York River. This methodology will provide VMRC and Virginia Department of Environmental Quality (DEQ) with the ability to report the current extent and condition of those estuarine wetlands. The methodology also provides a means for assessing three basic ecological functions of habitat, water quality and erosion protection for individual tidal wetland polygons from the National Wetlands Inventory. The methodology is intended to serve as a prototype for expanded investigations into other watersheds in the future.

From 2006 – 2008, CZM funded three VIMS grants, which include measures of tidal wetlands function. In 2006 and 2007, "Shoreline Management: Better Sill Design" Phases I and II researched the impacts of shill design on Chesapeake Bay shoreline health. In 2008, the "Living Shoreline Design and Construction Guidance Manual" project was funded to produce design and construction guidance for contractors, coastal managers, planners, local governments, homeowners and anyone else interested in sound management of Virginia's shorelines, including assessment of ecosystem functions.

As discussed, however, gaps exist in extent mapping, particularly with regard to tracking of actual tidal wetlands creation resulting from mitigation requirements and the use of in-lieu fees paid for mitigation. Additionally, voluntary wetland creation tracking for tidal wetlands is not managed by any one program, leaving Virginia unable to report on net gain commitments associated with Chesapeake Bay 2000 Agreements. For voluntary wetland creation, the issue of tracking gaps also pertains to non-tidal wetland areas. The wetlands database used by DEQ lacks the functions of current GIS technology so tracking precise location and extent of created wetlands is challenging. In order to better understand and report on these wetland issues, the Virginia CZM program worked with VIMs to develop a proposal for NOAA funding through the "Modernizing and Improving State Coastal Zone Management Information Systems" grant opportunity. If funded, the project should significantly expand the capability of VIMS to track and manage wetlands impacts. Although not funded in 2010, the Virginia CZM Program intends to revise and resubmit the proposal as future grant funding opportunities become available.

Special Area Management Plans (SAMPs)

Since the last Assessment, the Virginia CZM Program has funded Special Area Management Plans in the Middle Peninsula and Virginia Seaside. The Seaside SAMP includes significant focus on goals with implications for wetlands. For more information, see the SAMP Section of this assessment.

3. (CM) 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	N	N
Beach and Dune	N	N
Nearshore	N	N
Other (please specify)		

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)**
Mapping of shoreline LIDAR elevations	Data	H
Tracking of actual mitigation efforts for permitted tidal wetlands losses	Data	H
Coordinated, statewide tidal and non-tidal wetlands extent data management	Data, Capacity	H
Restoration and acquisition program	Capacity	H

The 2005 Assessment of wetlands strategies found that there was a strong need for mapping and related data. Specifically, the Assessment found that there was a need for a higher level of field verification of wetland restoration and creation, and a need for a dynamic mapping tool for identification of various wetland types and conditions. No such mapping tool exists for current wetlands and as described above the lack of elevation data is particularly urgent with regard to sea-level rise. Overall, field verification of restored wetlands has actually declined. There is also a continued need for additional funding for wetlands acquisition and public outreach regarding the impact of development and fill.

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 _____

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

The interagency Coastal Policy Team reviewed and ranked this issue at its February 17, 2010 meeting according to the following criteria: feasibility; importance and appropriateness. Up to 5 points were allotted to each of the three criteria so that a maximum score would be 15. Scores from 0-4.99 are considered low priority; 5–9.99 is medium priority and 10-15 is high priority. Wetlands received a score of 11.50.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes _____
No ___✓___

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

An identified priority need for wetlands was for the development of a database and reporting process for tracking coastal wetlands in Virginia. A project to address this need was submitted for funding under NOAA's "Modernizing and Improving State CZM Information Systems", but was not accepted. The project will be resubmitted as a project of special merit under the cumulative and secondary impacts shoreline strategy rather than developed as a separate strategy.

2000 Assessment		2005 Assessment		This Assessment (2010)	
High	✓	**High**	✓	**High**	✓
Medium	____	Medium	____	Medium	____
Low	____	Low	____	Low	____

Coastal Hazards

Section 309 Enhancement Objective
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
Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

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	M	Sub-region

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?

Flooding

There is a high risk of flooding in the coastal zone due to generally low elevations and flat topography. These natural conditions are exacerbated by development encroachment on waterways and coastlines, as well as impervious surfaces associated with development. Additional flooding in the coastal zone is associated with riverine flooding and the loss of non-tidal wetlands. Flood risk in Virginia's coastal zone is documented on FEMA Flood Insurance Rate Maps, and has been assessed through the state Hazard Identification and Risk Assessment

planning process as well as through local and regional hazard mitigation plans as required under the Disaster Mitigation Act of 2000.

Coastal storms

Coastal storms such as hurricanes, tropical storms, and nor'easters present a high level of risk in the coastal zone due to Virginia's position on the eastern seaboard. Some areas of the coastal zone will flood in any storm, while the threat to other areas is storm-specific. Vulnerability to coastal storms has been assessed through local and regional mitigation plans.

Shoreline erosion

Shoreline erosion presents a high risk in the coastal zone. Virginia has a large amount of shoreline along both the Chesapeake Bay and Atlantic Ocean, as well as along numerous tidal creeks. Areas with more open fetch are particularly vulnerable to shoreline erosion. Sea level rise and boat traffic are other factors that have led to increased erosion along Virginia's shoreline. Detailed shoreline evolution reports have been prepared for several coastal localities by the Shoreline Studies Program at the Virginia Institute of Marine Science, and reports for several other localities are planned. These evolution reports are developed using historical and current aerial images. Additionally, the Center for Coastal Resources Management at the Virginia Institute of Marine Science has prepared shoreline inventories for some areas. These inventories were conducted through on-the-ground documentation of current conditions.

Sea level rise and other climate change impacts

Sea level rise presents a high risk in Virginia's coastal zone, and is of particular concern locally in part due to post-glacial rebound. During the last glacial maximum, the weight of the ice caused depression of the earth's surface in northern North America, while un-glaciated areas further south experienced some uplift. Since the end of the glacial period, previously glaciated areas in the north have experienced rebound or uplift, while other areas such as Virginia have experienced downward movement and decreasing elevations above sea level. Sea level rise is capable of exacerbating flooding, shoreline erosion, and the effects of coastal storms. Sea level rise has been documented by NOAA tide gauges, which indicate that sea level rise in the Chesapeake Bay is occurring at twice the global average rate.

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.

The state of knowledge of risk has improved for many of these areas since the last assessment due to the completion and/or updates of state, regional, and local hazard mitigation plans. Scientific data regarding sea level rise and its potential impacts has become more common, and the issue is now more commonly discussed in planning at the state and local level than at the time of the previous assessment. For instance, the issue was addressed in the report from the Governor's Commission on Climate Change, released in December 2008, and has been addressed in some local comprehensive plans and emergency management plans The Virginia

CZM Program has provided three years of funding to three coastal regions to examine these issues and develop local responses to anticipated sea level rise and storm surge. The Northern Virginia, Middle Peninsula and Hampton Roads regions have each assembled advisory workgroups of relevant stakeholders. In addition to various mapping and data gathering initiatives, the groups have each developed a regional framework for local policy to deal with coastal hazards, working in concert with the hazard mitigation planning process. The public's awareness of climate change impacts such as sea level rise and frequency and intensity of storms has also increased, in part because of communication strategies developed through these regional efforts.

Some major insurance companies have reacted to climate change trends as well, and will no longer write new property insurance policies in parts of Virginia's coastal zone. The companies limiting new policies in Virginia's coastal zone represent 55% of the private insurance providers in the mid-Atlantic region of the United States. Other insurers have chosen to increase deductibles for damage caused by coastal storms.

A November 2009 nor'easter caused extensive flooding and damage equivalent to a Category 1 hurricane in the Hampton Roads region of Virginia. Seven homes were destroyed and 166 sustained major damage. Virginia Dominion Power reported that approximately 357,000 customers in Hampton Roads and the Richmond area lost power as a result of the storm. Additionally, six deaths were indirectly attributed to the storm. Preliminary damage estimates suggested over $50 million in individual assistance and more than $18 million in public assistance. President Obama has declared the event a major disaster, making the region eligible for federal disaster aid.

4. Identify any ongoing or planned efforts to develop quantitative measures of risk for these hazards.

In 2008, three planning districts in the coastal zone were awarded grant funds from the Virginia CZM Program to carry out climate change adaptation studies. These assessments are being conducted by the Northern Virginia Regional Commission, Middle Peninsula Planning District Commission, and Hampton Roads Planning District Commission. The Northern Virginia Regional Commission project involves conducting a sea level rise risk assessment for the region and uses LIDAR data to map various sea level rise scenarios. The Middle Peninsula PDC project seeks to quantify and qualify the anthropogenic and ecological impacts of climate change from an economic perspective. The Hampton Roads PDC project involves collection and analysis of information on climate change and associated ramifications, identification of data gaps and areas for future study, presentations and discussions to facilitate prioritization of climate change issues, and development of a framework for mitigating and adapting to climate change within the region.

FEMA is in the process of updating its Flood Insurance Rate Maps, which will provide an updated and more accurate quantitative measure for flooding. Additionally, a few localities are obtaining LIDAR data. This detailed elevation data is useful for accurately identifying flood-prone areas and estimating the impacts of storm surge and sea level rise. However, complete,

consistent, and accurate LIDAR data is needed for the entire coastal zone in order to effectively quantify these risks.

The Virginia Institute of Marine Science, funded through the Virginia CZM Program, has completed detailed shoreline evolution reports for several coastal localities. Similar reports for some other localities are planned or currently being conducted. Additionally, shoreline inventory reports have been conducted for several localities.

The Shoreline Studies Program at the Virginia Institute of Marine Science, funded through a grant from the National Fish and Wildlife Foundation, is currently developing a Shoreline Management Plan for Mathews County, VA. This plan will make specific recommendations for eroding shorelines throughout the county, and will include cost estimates for recommended management strategies.

The Center for Coastal Resources Management at the Virginia Institute of Marine Science conducted a study of tidal wetlands for the Lynnhaven River watershed in southeast Virginia, using a simplistic geospatial elevation model to quantify the potential loss of wetlands under various sea level rise scenarios. The study revealed that using conservative estimates of sea level rise, nearly all tidal wetlands would be lost by the year 2100. This study documents where and how much potential loss of both wetlands and upland land area could be experienced given current and projected rates of sea level rise.

The Center for Coastal Resources Management at the Virginia Institute of Marine Science conducted a study of shallow-water tidal habitats and their vulnerability to climate change. The study used a model that incorporated anticipated sea level rise, water temperature and salinity projections, and coastal development in order to forecast the distribution of key coastal habitats within the next 50 to 100 years. The project was intended to inform management and planning efforts by identifying areas at significant risk for changes to habitat components, as well as areas with significant potential to support critical habitat components in the future. Maps were created that depict the projected threat to shallow-water and tidal wetlands, tidal marshes, estuarine beaches, submerged aquatic vegetation, and vulnerable developed lands. These maps, as well as the final report from the project, can be accessed from the following site: http://ccrm.vims.edu/research/climate_change/index.html.

Under the Disaster Mitigation Act of 2000, localities are required to have hazard mitigation plans in place in order to apply to federal non-emergency disaster funds. These plans are in place in Virginia's coastal localities and are updated in accordance with the Act. Several coastal localities are planning to begin updating these in 2010.

The Virginia Department of Emergency Management (VDEM) has created storm surge hazard maps for more than 20 coastal localities. The maps identify areas which would be inundated during Category 1, 2, 3, and 4 hurricanes. These maps are based on data from the 2008 Hurricane Evacuation Study, a joint effort by VDEM, FEMA, the U.S. Army Corps of Engineers, and coastal localities. These maps, except for those for northern Virginia localities, are available at: http://www.vaemergency.com/threats/hurricane/stormsurge.cfm.

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	Date completed or substantially updated
Flooding	80	Varies
Storm surge	27	2008-ongoing
Geological hazards (including Earthquakes, tsunamis)	18	Varies
Shoreline erosion (including bluff and dune erosion)	37	Varies
Sea level rise	30	2009-2010
Land subsidence	0	N/A

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

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	N
Methodologies for determining setbacks	Y	N
Repair/rebuilding restrictions	Y	N
Restriction of hard shoreline protection structures	N	N
Promotion of alternative shoreline stabilization methodologies	Y	Y
Renovation of shoreline protection structures	N	N
Beach/dune protection (other than setbacks)	Y	Y
Permit compliance	Y	N
Sediment management plans	Y	Y
Repetitive flood loss policies, (e.g., relocation, buyouts)	Y	N
Local hazards mitigation planning	Y	Y
Local post-disaster redevelopment plans	N	N
Real estate sales disclosure requirements	Y	N

Management categories	**Employed by state/territory** (Y or N)	**Significant changes since last assessment** (Y or N)
Restrictions on publicly funded infrastructure	N	N
Climate change planning and adaptation strategies	Y	Y
Special Area Management Plans	Y	Y
Hazards research and monitoring	Y	Y
Hazards 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.**

Promotion of alternative shoreline stabilization methodologies

The Virginia Institute of Marine Science has promoted living shorelines through shoreline management planning, funded through a variety of sources including the coastal program, Chesapeake Bay Trust, and National Fish and Wildlife Foundation. Living shorelines allow wetlands to migrate inland with rising sea levels. As a result of shoreline management planning efforts, the number of permits issued for living shorelines has increased. In 2008, VIMS received a grant from the Virginia CZM Program to develop a living shoreline design and construction guidance manual.

The Virginia Marine Resources Commission, also with funding assistance from the Virginia CZM Program, has recently revised its Tidal Wetlands Mitigation Policy to ensure that even small impacts to wetlands receive adequate compensation. The Virginia CZM Program has also worked with VIMS to provide better data for individual shoreline management decisions by funding county shoreline inventories and shoreline evolution studies as described above. During the five year period since the previous assessment, the Virginia CZM Program has provided approximately $800,000 in funding for projects related to alternative shoreline stabilization and shoreline management.

Beach/dune protection (other than setbacks)

In February 2008, changes to the Coastal Primary Sand Dunes and Beaches Act (§ 28.2-1400-1420) were approved by the Virginia General Assembly. Under the original Act, nine localities were permitted to enact a primary sand dune zoning ordinance and require permits for activities impacting dunes and beaches. The recent changes expand the number of coastal localities

permitted to do this to more than 45. The legislative changes are result of research funded by the Virginia CZM Program.

Sediment management plans

A shoreline management plan for Mathews County, VA is currently being conducted by the Shoreline Studies Program at the Virginia Institute of Marine Science. This study is funded by the U.S. Army Corps of Engineers.

Repetitive flood loss policies

No significant change. Areas of Gloucester County that experience persistent flooding were recently purchased by the county using FEMA grant funds. The VA Department of Emergency Management also gives grants to communities for buyouts of repetitively flooded properties. Additionally, there has been increased usage of FEMA repetitive loss funds in Virginia's coastal zone in recent years because of major storms such as Hurricane Isabel in 2003 and Hurricane Ernesto in 2006.

Local hazard mitigation planning

Hazard mitigation plans have been prepared for Virginia localities as required by the Disaster Mitigation Act of 2000. Many initial plans were completed after the 2005 coastal assessment, and plans are updated in accordance with the Act. Several Virginia localities are planning to begin updates in 2010. These plans address hazards such as coastal storms, flooding, and shoreline erosion. They assess vulnerability to these hazards and identify mitigation strategies.

Climate change adaptation and strategies

As discussed above, three planning districts in the coastal zone were awarded grants from the Virginia CZM Program to perform climate change adaptation studies. Additionally, the final report of the Governor's Commission on Climate Change, released in December 2008, includes recommendations for adaptation to unavoidable impacts of climate change. Recommendations set forth in the report include incorporating sea level rise and storm surge into planning efforts for coastal zone localities, and promoting living shorelines to increase the adaptability of tidal wetlands to rising sea levels.

Additionally, the Virginia CZM Program has recently funded numerous projects related to living shorelines and promoting alternative shoreline stabilization strategies. These projects are described above (under "promotion of alternative shoreline stabilization methodologies"). These accomplishments have laid the groundwork for further promotion of living shorelines and shoreline management planning during the next five years through a series of projects to be funded under Virginia's Section 309 program.

Special Area Management Plans

Special Area Management Plans (SAMPs) are used in Virginia, but their primary purpose is not hazard management. For more information on the use of SAMPs in Virginia's coastal zone, refer to the SAMP section of this assessment.

Hazards research and monitoring

Several hazards research and monitoring initiatives are described above. Additionally, the Virginia CZM Program funded efforts by the Virginia Institute of Marine Science (VIMS) to measure dune and beach changes. The findings of this study were published in a March 2009 report entitled "Dune Monitoring Data Update Summary, available at: http://web.vims.edu/physical/research/shoreline/docs/Dune_Monitoring_Update.pdf.

Another ongoing project at VIMS has involved using computer modeling to provide street-level predictions of storm surge flooding along the Chesapeake Bay shoreline. Project leaders estimate that street-level predictions will be possible within five years. Emergency managers will then be able to use this information to alert individual neighborhoods about appropriate protective measures and possible evacuation during hurricanes and nor'easters. This project is not funded by the Virginia CZM Program.

Hazards education and outreach

The VA Department of Transportation, VA Department of Emergency Management, and Hampton Roads Emergency Management Committee published a Virginia Hurricane Guide, which includes basic information about hurricanes as well as evacuation procedures, public shelters, an emergency kit checklist, and a list of additional resources. This brochure was released in early 2009 and is available at: http://www.vaemergency.com/threats/hurricane/2010_Va_Hurricane_Evacuation_Guide.pdf.

In September 2009, the Virginia Institute of Marine Science published a brochure called "A Guide to Shoreline Management Planning for Virginia's Coastal Localities" using funds from the Virginia CZM Program. The guide is available at: http://web.vims.edu/physical/research/shoreline/docs/ShoreMan_Brochure.pdf.

The Virginia Department of Environmental Quality (DEQ) received a grant from the Virginia CZM Program in 2009 that will fund climate change education for the general public. DEQ will develop a brochure listing ten things Virginians can do in their everyday lives to help reduce greenhouse gas emissions. This publication was recommended in the report from the Governor's Commission on Climate Change. Additionally, DEQ will develop a climate change-related curriculum for environmental educators, including a PowerPoint, handouts, and speaker notes.

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.

For CMPs that use numerically based setback or buffers to direct development away from hazardous areas report the following:

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 development away from hazardous areas.	All communities in Virginia's coastal zone are required to implement a 100 foot buffer from all perennial waters under the Chesapeake Bay Preservation Act
Number of communities in the coastal zone that have setback, buffer, or other land use policies to direct development away from hazardous areas that are more stringent than state mandated standards or that have policies where no state standards exist.	Four

For CMPs that do not use state-established numerical setbacks or buffers to direct development away from hazardous areas, report the following:

Contextual measure	Number of communities
Number of communities in the coastal zone that are required to develop and implement land use policies to direct development away from hazardous areas that are approved by the state through local comprehensive management plans.	N/A
Number of communities that have approved state comprehensive management plans that contain land use policies to direct development away from hazardous areas.	N/A

<u>Priority Needs and Information Gaps</u>

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)
LIDAR elevation data and more accurate		

mapping of flood risk areas	Data	H
Shoreline management planning	Policy, Data, Capacity, Communication/outreach	H
State level policy and guidance for integrating climate change adaptation into local planning; Enabling legislation for localities to take action. Action on the part of high risk areas (those with LiDAR) to integrate hazard planning more comprehensively into land use planning and take steps to mitigate the potential impacts of increased hazards from Climate Change and SLR.	Policy, Communication/outreach	H
Outreach and education for general public regarding sea level rise and other climate change impacts	Communication/outreach	M
LIDAR professional at the state level to provide training for other state and local employees	Capacity	M
Collaboration of emergency managers and land use planners on coastal hazards issues	Communication	M
Continued research on climate change impacts for improved planning	Data, Capacity	M
Continued outreach to residents in high risk areas	Communication/outreach	M
Increased staff capacity at the local level to monitor and enforce compliance with building restrictions and other regulations	Capacity	M
Funding for state and/or local purchase of high risk properties to prevent further development	Capacity	M
Elevated priority of coastal hazards issues among the general public	Communication/outreach	M
Continued research and monitoring related to tidal wetlands and living shorelines	Data, Capacity	M

A high priority data gap that exists in Virginia's coastal zone is LIDAR data. There is a need for consistent, high-resolution elevation data across the entire coastal zone in order to better identify areas prone to flooding, storm surge, and sea level rise. Most current hazard maps are based on topographic maps and Digital Elevation Model data, which are course-grained in nature and cannot produce maps that are as detailed and accurate as those produced using high-resolution LIDAR data. Three coastal localities in Virginia – Virginia Beach, Alexandria, and Poquoson – have independently obtained LIDAR data. Additionally, the Northern Virginia Regional

Commission (NVRC) was able to acquire LIDAR data from the U.S. Department of Defense specifically for use in the CZM-funded climate change adaptation project discussed above. However, NVRC is permitted to use this data only for map production and cannot share the data layers with localities. There is a need for state-funded acquisition of LIDAR data for the entire coastal zone. Other coastal states, such as Maryland, have funded coast-wide LIDAR acquisition.

Shoreline management planning is a high priority need as well. The Virginia CZM Program has invested heavily in this area since the last assessment and plans to continue doing so during the next five year period. Major work is needed on shoreline management to reduce shoreline erosion and loss of wetlands through the development of living shorelines. Shoreline management planning includes assessment of underlying geology and morphology, quantifying historic and recent shoreline change, mapping existing structures and current shore conditions, assessing existing marine resources, analyzing general wave climate, analyzing storm surge and sea level rise, and developing site-specific shore management strategies. Before effective shoreline management plans can be developed, shoreline evolution reports and shoreline inventories such as those described above need to be completed for all communities under the plan, in order to recommend the appropriate suite of shore protection strategies. Results of current research on living shorelines will add to the knowledge base for developing shoreline management plans. Shoreline management plans provide a venue to make recommendations geared toward implementation of living shorelines where appropriate.

Another high priority need is state level policy and guidance for localities on integrating climate change adaptation strategies into local planning. Virginia is a Dillon's Rule state, meaning that localities have only powers that are expressly granted to them through state-level enabling legislation. Virginia localities often will not or cannot act independently of the state or go beyond state-mandated minimum requirements. Thus, there is a need for state-level enabling legislation so that localities which desire to go beyond state requirements for climate change-related planning and policy may do so. Some localities have begun to incorporate climate change considerations into their comprehensive plans. All Virginia localities, especially those in the coastal zone, should be required to do this. Additionally, the state should provide guidance to localities for developing locally appropriate policies and programs related to climate change mitigation and adaptation.

When educating local officials and community members about climate change, it is important to do so in a locally appropriate manner. In Virginia, attitudes about climate change may vary greatly among different regions. In the Hampton Roads region, local officials are currently very interested in learning about climate change and how to communicate the issue to citizens. This is largely due to the impacts of the November 2009 nor'easter discussed earlier in this section. Similarly, in northern Virginia, planning for sea level rise is on the radar for local officials and hazard mitigation planning is becoming more common. In the more rural Middle Peninsula region, however, many citizens are still highly skeptical of climate change or believe that it is not an issue that should be dealt with by local governments. Addressing public apathy is an important issue in the Middle Peninsula region.

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	

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

The interagency Coastal Policy Team reviewed and ranked this issue at its February 17, 2010 meeting according to the following criteria: feasibility; importance and appropriateness. Up to 5 points were allotted to each of the three criteria so that a maximum score would be 15. Scores from 0-4.99 are considered low priority; 5–9.99 is medium priority and 10-15 is high priority. Coastal Hazards received a score of 12.04.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes	
No	✓

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

The highest priority need identified in the strategy was for high resolution elevation data for the entire coastal zone. LIDAR data for some localities is currently being developed and other localities are likely to acquire this data during the upcoming strategy period. Shoreline management planning was also identified as a high priority, but is being addressed as a Cumulative and Secondary Impacts Strategy. Enabling legislation for localities to address climate change was identified as the third high priority, but in discussion with strategy workgroup members it was decided that this would not be a major impediment to local action. Based on these issues, it was decided that a Coastal Hazards strategy was not necessary.

2000 Assessment		2005 Assessment		This Assessment (2010)	
High	✓	**High**	✓	**High**	✓
Medium		Medium		Medium	
Low		Low		Low	

Public Access

Section 309 Enhancement Objective
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 value

Resource Characterization
Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

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 on waterfront, shoreline or other coastal areas (including conversion of public to private facilities)	H	Trends include: - Displacement of traditional access points; the decline in access for commercial fishing is approaching critical. - A recent trend along the coast has been the "privatization of the shoreline." For example, marinas for public boat access are being redeveloped into condominium complexes with private boat access. Similarly, subdivisions that don't provide centralized access to water bodies, but instead allow multiple, individual water access sites, jeopardize the visual integrity of the resource. This is particularly significant along Virginia's designated scenic rivers. Loss of access points along the coast due to private residential development has also been significant. - The high cost of land in coastal areas makes public lands acquisition very difficult. - Development pressure in the coastal zone is drastically reducing areas	Boating (motorized and non-motorized); Hiking; Working waterfronts (seafood businesses and marina loss); Trails and public access as a whole; Loss of habitat; Loss of wildlife resources; Loss of native species; Loss of all public access, or degraded public access, where private development occurs.

		available for open space. - Reduction in public access adds pressure to maintain and control use of existing public access sites. - Private homeowners express concerns about visual and physical impacts of public access. Some call this the not-in-my-backyard (NIMBY) issue, meaning that people may not want the public to have access near their private homes. Also, sometimes developers don't want public access sites within the viewshed of their residents.	
Use or conversion of the waterfront for non-water dependent commercial and/or industrial uses	M to H	- Displacement of traditional access points; the decline in access for commercial fishing is approaching critical. - Conversion may be more likely in rural areas where housing costs are low, compared to other more urbanized areas where the conversion from commercial to residential use is more likely. - Many similar threats and trends as above.	Working watermen; Loss of public access sites as a whole; Hiking; Boating.
Erosion	M to H	- Erosive forces depend on the river, surrounding topography, type of access, and appropriate design of the access. Access does not necessarily equate with high erosion and the impacts should be evaluated on a case-by-case basis. But where erosion is an issue, it is slowly eroding away the public access footprint. - Climate change and increasing storm frequency are accelerating erosion, and may significantly increase the loss of beach areas and access points. They also affect the quality of public access, especially Bayside, where there is little to	Public access points; All boating access and launch points; Bayside wildlife viewing sites.

		no attempt to slow the rate of runoff from large storm events; - Sedimentation of estuaries/ tributaries is another result of continued poor erosion control. Lack of enforcement of watercraft no-wake zones throughout coastal tributaries, particularly along smaller, navigable waters, is exacerbating this problem. - More development creates more runoff. As the coastal groundwater table is shallow, run-off is more immediate than in other areas. Stormwater management efforts in coastal areas are insufficient to manage the increased runoff from development.	
Sea level rise/ Great Lake level change	M to H	- This is a long term concern and should be considered in planning all types of access and developments along Virginia's coast. - Virginia will likely lose 30% of its coastal area wildlife viewing sites, especially on the Eastern Shore - The Dept. of Game and Inland Fisheries (DGIF) conducted a study on the impacts of sea level rise on boat access facility change. There is a need to map sea level rise to determine all threats and impacts. - Islands are rapidly shrinking. For example, Tangier Island is shrinking so quickly due to sea level that its mural map has to be updated every two weeks. - See the *Coastal Hazards* Assessment area for additional information on sea-level rise.	Public access points; Conserved lands; Islands in the Chesapeake Bay; Impact on open water boating public access sites; many sites will disappear completely. Loss of lands and flooding of sites. In some areas, this will happen gradually. In other areas, rapidly.
Natural disasters	L to M	There may be some temporary impacts like those associated with Hurricane Isabel, but some events will have a greater	Some public access sites are flooded or destroyed and need to

		impact than others. Effects of natural disasters will increase significantly as climate change accelerates.	be rebuilt.
National security	L	Several public access sites on or near military bases get closed down during a high level of alert. National security has cut back on the ability to take groups out on the Bay Bridge Tunnel (to the Eastern Shore). Also national security has eliminated all access to four of the islands on the Eastern Shore.	Public access sites near military facilities.
Encroachment on public land	L to M	- The degree of encroachment depends on the location and locality being evaluated. - Sedimentation of navigable waters reduces their navigability. - VA Dept. of Transportation (VDOT) road endings serve as 30-ft wide public access portals. However, new abutting home owners try to close off these road endings to block public access via existing public right-of-ways	Public boating access and walking trails; VDOT public road endings at the water's edge.
Other: Dredging	M to H	Expanded maintenance dredging is urgent for targeted small, unmarked channels throughout the coastal zone.	All boating access; Coastal property values.
Other: Lack of Funding	H	Lack of funding is a huge issue right now; longevity of this matter is currently unclear. Federal funds for building more water access sites are tied to motorized boats (Wallop-Breaux motorboat fuel tax); this means that paddlers are underserved. Federal funds for dredging will focus primarily on the most heavily trafficked waterways. Federal funds for trail construction are also tied to motorized trails (tax from	All aspects of public access.

		fuel)--30% of projects must be used for motorized trails, which should not be located adjacent to waterways. Funding from the Land and Water Conservation Fund—which can be used for acquisition and development of public access sites—has declined to very low levels in last few years. (See the *Acquisition programs or policies and Alternative funding sources or techniques* for additional information on this topic).	
Other: Railroads	L to H	In some areas, railroads that run parallel to the waterway can restrict public access.	

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?

Climate Change

Climate change is causing the "window" of use for public access sites to shift from spring and summer to more year-round. As mentioned above, sea level rise has the potential to significantly decrease the overall number of public access sites. Furthermore, the balance of conserved lands and open space, private development, and public access will shift dramatically with sea level rise, an increase in storm events, and with other associated impacts of climate change.

Private residential development

There is an increasing trend toward private residential development in traditional maritime and rural communities. In addition, the lack of commitment to maintaining navigable waters and smaller tributaries is impacting on-water public access for both recreation and commerce.

Water trails

Several new water trails have been developed in Virginia, and there is significant potential for further development of water trails. A water trail is defined as "a stretch of river, a shoreline, or an ocean that has been mapped out with the intent to create an educational, scenic, and challenging experience for recreational canoeists and kayakers.[10]" The Capt. John Smith Chesapeake National Historic Trail, managed by the National Park Service, is the first water trail in the nation and is located throughout Virginia's coastal areas and is part of the Chesapeake Bay Gateways Network (www.baygateways.net). The John Smith Trail website is: www.smithtrail.net. There are eleven water trails in Virginia's coastal area, according to the John Smith trail website.

[10] Definition from North American Water Trails, Inc.

Non-motorized boat launches

There has been an increase in the number of non-motorized boat launches throughout Virginia, as well as a considerable need to increase non-motorized boat launches throughout Virginia's coastal zone. Additionally, there is a need for areas for recreational users to take boats on beaches. Although the demand is increasing for these facilities, a funding mechanism is lacking to put these structures in place at a comprehensive scale. Currently, a fee collected from the licensing of motorized boats provides funding for motorized boat launches. However, non-motorized boat users aren't required to register their boats, and as a result, there is no dedicated funding source for providing non-motorized boat launches. Some state agencies, such as the Dept. of Game and Inland Fisheries (DGIF), have worked to put in non-motorized boat launches especially where localities are able to help provide funding or assistance. DGIF policy does not allow for a portion of The Federal Aid in Sport Fish Restoration Act (Dingell-Johnson Act) revenue to go to non-motorized boat launches.

There is a need to address this programmatically by creating a dedicated funding source for non-motorized boat launches. The Dept. of Conservation and Recreation (DCR) only constructs boat ramps in state parks. DGIF installs and maintains motorized and some non-motorized boat launches, though the agency receives no direct funding for non-motorized boat launches (although DGIF does receive funding from the registration of motorized boats, these funds go to boater safety and titling programs).

Increased difficulty in obtaining public access points

Although gaining public access to coastal areas has been identified as a top priority for Virginians, many state agency and regional Planning District Commission (PDC) employees noted that it is increasingly difficult to gain access due to several reasons including:

- Increased private residential development in coastal areas provides little to no public access allowances, or if access is allowed, it is often associated with a fee.
- There is a lack of funding and dedicated resources – including staffing at state agencies – to promote public access, including identifying and acquiring public access sites. For example, there are currently no dedicated staff members to support public access at state agencies, although public access has consistently ranked as a top priority by citizens in the Virginia Outdoors Plan Survey (see below under *Contextual Measures* for additional information). Additionally, many localities, agencies and organizations are restricting programming for public access and related infrastructure due to a lack of funding. Dedicated funding sources are drying up, such as SAFETEA-LU grants, which helped establish the DGIF Birding and Wildlife Trail. All tourism projects may now be cut from this funding source due to greater focus on transportation projects. This means that projects such as the VA Birding and Wildlife Trail would no longer be considered eligible under Commonwealth Transportation guidelines for SAFETEA-LU grants.
- The cost of land has risen significantly in Virginia's coastal zone, making obtaining lands for public access and recreation more difficult. For example, the average price per acre on Virginia's Northern Neck is $300,000 - $350,000, and localities and agencies frequently don't have funding to purchase property for public access.

- The perceived threats associated with public access are a continuing challenge. Many situations have been noted where neighbors have complained about potential public access points due to fear of increase in noise, visual impacts, trash, pollution or parking concerns, and, as a result, the public access sites were not developed. In some cases, the lack of an established or funded maintenance entity fueled these concerns.
- Landowners are less likely to make their land available for public recreational use due to a lack of resources for trails creation and maintenance of public amenities. As grant sources become scarcer, landowners have stated that they have fewer resources to maintain public access points on their land, and as a result some landowners have removed public facilities such as trails from their lands.
- The cost of providing and developing public access is very expensive, and state agencies report that it is becoming harder to develop such facilities as budgets are cut and less grant funding is available.
- Although there is a burgeoning increase in water trails, especially in public awareness of those trails, state agencies assert that there is a great need to develop and maintain waterside facilities. Needed amenities include restrooms and camping facilities, as well as additional water access points to get on and off the water to use onshore facilities.
- State agencies report that regulatory requirements have gotten stricter and budgets tighter in recent years, and as a result it is more difficult to put public access sites in place. Regulatory requirements that have become more strict include stormwater management regulations, especially for parking lots, which increase the cost of developing public access and other facilities. Additionally, the Bay Act regulations for parking lots and access support facilities now require more planning, effort, and design for developing and maintaining public access sites.
- Maintenance and management funds have been greatly reduced, and as a result it is difficult to maintain the level of providing public access. For example, DCR had a 14% reduction in funding in the last 15 months. State agencies project that additional cuts in state agency budgets are anticipated, which may result in closure of facilities and a loss of public access.

Opportunities to increase public access

New public access sites can emerge with private development, but a cost or fee is usually associated with this type of access. Occasionally, abandoned sites along the coastal zone allow for public access sites to be developed, but these are rare. There is an opportunity to work with developers to create public access points in new residential development sites. However, negative perceptions and fears about the potential impacts of public access need to be addressed. Increased public outreach and communication could address homeowner concerns. Hearing and addressing residents' concerns and ideas at the onset of developing a public access site could also be effective. For example, if resident's concerns might be alleviated by providing adequate trash and recycling receptacles and lighting.

There is a significant opportunity to increase the number of public access sites at the local level with new development. Localities often have the greatest awareness of the need and opportunities in specific locations, and there is a need to increase mechanisms for localities to acquire new public access sites. Mathews County, located in the Middle Peninsula of Virginia, has been noted by several people for doing an excellent job of maintaining access for the public,

particularly with regard to tourism sites. Alternately, there is a need to reduce development in coastal areas to preserve open space and public access sites.

Partnering tourism and land conservation with recreational opportunities could provide additional public access sites. State agency staff noted that increasing partnerships with groups like the Virginia Tourism Corporation could be beneficial in this regard.

There is an opportunity and a need to develop regional solutions to problems that are larger than local jurisdictional lines. Regional planning is taking place at a greater scale both in Virginia and other coastal states to address coastal and public access needs and planning. At the same time, the Chesapeake Bay Preservation Act requires 84 of Virginia's localities to address public access in their comprehensive planning processes. This could be an opportunity to increase public access sites at the local level.[11]

Public Access Authorities, Road Ending Opportunities, and Working Waterfronts

There are currently two Public Access Authorities (PAAs) in the state of Virginia: 1) the Middle Peninsula Chesapeake Bay Public Access Authority (MPCBPAA), which was created in June of 2003; and 2) and the Northern Neck Chesapeake Bay Public Access Authority (NNCBPAA), which was created in 2005. The PAAs are charged with identifying sites, both privately and publicly owned, with high potential for public access and developing mechanisms to transfer those sites to the Authority for management or ownership. Both the development of the PAAs and many of their implementation activities have been supported with Virginia Coastal Program Section 306 funding. To date, the MPCPPAA has acquired thousands of acres of land for public access. One way the MPCPPAA has had success in requesting and gaining public access sites is through conducting direct outreach to landowners of large parcels. However, it was noted that there is a need for increased capacity and staff (at the state agency or PAA level) for inquiring about public access sites with property owners.

In 2008, the Virginia General Assembly passed legislation allowing ownership transfer of VDOT road endings to the localities, primarily through the PAAs, and these sites may now be developed into public access points (see the *Management Characterization* section below for more detail on this statute). There has been considerable discussion in determining whether a former road ending would be leased or transferred to PAAs from VDOT, and this method of gaining public access points has had varying degrees of success. In Virginia's Middle Peninsula, there are over 300 road endings, and the first transfer of a road ending is currently in process in Gloucester County. The MPCBPAA is working with the counties to identify what their priorities are for public access, and to work on acquiring those road endings for public access points from VDOT. Potential conflicts associated with public access at road endings have been noted, including parking and access, maintenance, trash collection and illegal dumping at ends of roads, as well as a need for increased funding and staffing to address these possible problems.

The MPCBPAA will work over the next several years to identify policy problems and opportunities for resolving challenges related to public access, as well as to help local

[11] For additional information, see the website: http://www.dcr.virginia.gov/chesapeake_bay_local_assistance/theact.shtml

governments prioritize community needs for public access and to preserve the maritime character of coastal communities. If the Coastal Zone Management Act of 1972 is amended with the Working Waterfront Preservation Act of 2009, the legislation will require communities to conduct a comprehensive planning process around working waterfronts and public access (see the section below under *Statutory, regulatory, or legal system changes that affect public access* for additional information). The PAA will utilize the planning tool they have developed with local jurisdictions for implementing goals identified by communities for working waterfronts and public access, which will also meet the requirement outlined by this statute if it is amended. In addition, this model will be available for utilization by other coastal communities as needed.

The needs identified by communities working to preserve working waterfronts are intertwined with public access needs, and goals can frequently be met by projects that address both sets of issues. For example, preserving or developing a public boat ramp may provide access for commercial fisherman as well as by kayakers. There is an opportunity to utilize economic development tools to meet both sets of goals as well.

3. (CM) 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 for the State of Virginia**
Number of people that responded to a survey on recreational access	2,011 responses to the Virginia Outdoor Plan (VOP) survey in 2006
Number of people surveyed that responded that public access to the coast for recreation is adequate or better.	50.2% indicated there is a need for additional public access (2006 VOP survey)
What type of survey was conducted (i.e. phone, mail, personal interview, etc.)?	Mail survey
What was the geographic coverage of the survey?	Statewide
In what year was the survey conducted?	2006

Contextual measure	**Survey data for the Middle Peninsula**
Number of people that responded to a survey on recreational access	214 responses to a public access survey conducted by the MPCBPAA
Number of people surveyed that responded that public access to the coast for recreation is adequate or better.	Zero because this specific question was not asked on the survey.
What type of survey was conducted (i.e. phone, mail, personal interview, etc.)?	Survey monkey (website)
What was the geographic coverage of the survey?	Virginia- Lower Chesapeake Bay and tributaries area.
In what year was the survey conducted?	2008

4. Briefly characterize the demand for coastal public access within the coastal zone, and the process for periodically assessing public demand.

Statewide

As indicated by the 2006 Virginia Outdoors Plan (VOP) survey, there is a very high need to meet recreational demands. As populations grow in the coastal area and as sea level rises, the planning for public access will become more important. Virginia assesses the need for public access via the VOP statewide survey conducted approximately every 5 years. The VOP website is: http://www.dcr.virginia.gov/recreational_planning/vop.shtml.

As part of the high demand for recreation, there is strong demand for increased access to the Coastal Zone within Virginia. Localities and state agencies report that a significant number of citizens want additional boat ramps, an increase in the number of public access facilities, trails, and access to the water bodies including beaches and rivers throughout Virginia's coastal areas. There is an opportunity to conduct an outdoor survey that is specific to the coastal zone, including the Chesapeake Bay area, to assess demand and needs (see the *Priority Needs and Gaps* section for more on this idea).

With regard to the Birding and Wildlife Trail, the DGIF conducted an assessment survey that showed that 95% of trail users were satisfied with the experience.

Middle Peninsula

Respondents identified a lack of every type of public access in the survey area –79.3% of respondents stated that "overall lack of public water access sites" was the biggest threat to public access to Middle Peninsula waterways and the Chesapeake Bay, and 96% of respondents said that public access was a concern to them. The MPCBPAA annually, biannually and tri-annually works to assess public access within the Middle Peninsula.

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 access (report both the total number of acres in the coastal zone and acres available for public access)	**827,286.89** acres of Conservation Lands in the Coastal Zone. **5,108,634.9** acres of total land area in the coastal zone.[12] Approximately **400,051.6**	+	DCR

[12] Information from DCR - Natural Heritage using census data.

	acres are open to the public.		
(CM) Miles of shoreline available for public access (report both the total miles of shoreline and miles available for public access)	Approximately **10,211.9** total miles of shoreline, with **1,516.3** miles available for public access.[13]	N/A	DCR
Number of State/County/Local parks and number of acres	Approximately **933** parks and **103,165.21** acres.	+ parks - acres	DCR
Number of public beach/shoreline access sites	44 public beaches are monitored by the Dept. of Health 5 beaches in the Northern Neck area, 2 shoreline access points	+ (1 additional beach in the Northern Neck)	VA Dept. of Health
Number of recreational boat (power or non-power) access sites	233 21 in the Northern Neck	same	2005 update of the Chesapeake Bay Public Access Guide
Number of designated scenic vistas or overlook points	There are 74 scenic vista/overlooks on the coastal phase of the VA Birding and Wildlife Trail including the estuarine river sites, of these, 33 are Bay or Seaside overlooks.	+	DGIF
Number of State or locally designated perpendicular rights-of-way (i.e. street ends, easements)	Not tabulated for entire state 300 in Middle Peninsula Public Access Authority jurisdiction	-	Middle Peninsula Public Access Authority jurisdiction
Number of fishing access points (i.e. piers, jetties)	153 total fishing access points		DCR for acreage

[13] VIMS Virginia shoreline GIS data were used to calculate total shoreline length, including coast line and intertidal rivers (including the Potomac River up to Fairfax County). Shoreline excluded "state owned tidal lands" along the Eastern Shore in the calculation, using the Conservation Lands Database (VA-DCR). Public shoreline was derived by using Conservation Lands attributed as "open" or "seasonal" to extract or "clip" the corresponding shoreline segments.

	1 in Northern Neck		2005 update of the Chesapeake Bay Public Access Guide NNPDC
Number and miles of coastal trails/boardwalks	N/A for state 2 in Northern Neck	N/A for state	
Number of dune walkovers	N/A	N/A	
Percent of access sites that are ADA compliant access	N/A	N/A	
Percent and total miles of public beaches with water quality monitoring and public closure notice programs	70 miles of shoreline and 44 public beaches (100% of public beaches) are monitored. *note that this doesn't apply to rivers, but only ocean areas.	100% of public beaches had water quality monitoring during the previous assessment for 34 Beach/Shoreline Access Sites.	Dept. of Health
Average number of beach mile days closed due to water quality concerns	In 2009, 14 total advisories were posted for 9 (out of 44 beaches) with a total of 51 days under advisory. 51.5 total miles of beaches had swimming advisories posted in 2009.	In the previous assessment, 34 Beach Mile Days of Advisories (2004)[14] were reported.	Dept. of Health

[14] These are beach advisories, not closures. There were no beach closures due to water quality.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

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	N
Comprehensive access management planning (including GIS data or database)	Y	Y
Operation and maintenance programs	Y	N
Alternative funding sources or techniques	Y	Y
Beach water quality monitoring and pollution source identification and remediation	Y- The Department of Health monitors beaches (however, monitoring is only conducted for ocean beaches, not river beaches). Remediation is not conducted for pollution sources that are identified (no funding identified for this work).	N
Public access within waterfront redevelopment programs	N	N
Public access education and outreach	Y Y - Regionally- Middle Peninsula Chesapeake Bay Public Access Authority and Virginia Sea Grant developing a public access database and information clearing house	Y
Other (please specify)	Y – see below under "Other" section for descriptions	

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 and regulatory system changes that affect public access

A bill was introduced to Congress in March of 2009, the Working Waterfront Preservation Act of 2009 (S. 533), to amend the Coastal Zone Management Act of 1972 to establish a grant program to ensure waterfront access for commercial fisherman and other purposes. This bill could have considerable benefit to rural and coastal governments with relation to public access and preservation of working waterfront infrastructure. Many states are concerned about losing the character of coastal communities as well as preservation of public access as working waterfront infrastructure is lost due in part to private residential development. This amendment would introduce a framework for coastal states with a new grant program to address many of the issues that are affecting coastal communities (see below under *Public Access Authorities* for more information on working waterfronts). Fine to note this and leave it in, but the gist is to note state and local regulatory changes (as below)

Regionally- Middle Peninsula Chesapeake Bay Public Access Authority: Regulation number 33.1-223.2:17, states that the Commonwealth Transportation Board may transfer interest in and control over certain highways, highway rights-of-way, and landings. Specifically this allows the VA Dept. of Transportation to transfer road endings to Public Access Authorities (see above under *Public Access Authorities* for more information on road endings).

Acquisition programs or policies and Alternative funding sources or techniques

Funds from the Coastal and Estuarine Land Conservation Program (CELCP), which is part of the Omnibus Lands Act, are distributed through the Virginia CZM Program. These funds have been utilized to acquire hundreds of acres for public access and preservation in Virginia's coastal zone. This program is administered through a competitive process for projects up to $3 million maximum, which have to be matched dollar for dollar. For example, in September 2007, a federal grant from CELCP permitted the MPCBPAA to acquire and open to public access 357 acres in the Dragon Run watershed, and then another 209 acres in the watershed in 2008. The MPCBPAA is developing land management plans for the preservation tracts with stakeholder input, which will incorporate passive and low-impact recreational opportunities, forest and habitat management, water quality monitoring, and educational opportunities.

In late 2009, Governor Kaine met the goal of preserving 400,000 acres of open space by the end of the decade. According to DCR, 427,477.84 acres of land have been conserved as of January 2010, of which 91,948.07 are in the coastal zone.[15] As part of Governor Kaine's land conservation efforts, thousands of acres of land have been placed in conservation easements,

[15] Information on coastal conserved lands from DCR – Natural Heritage.

although many of these private lands don't allow for public access. Six new state forests, two new state parks, three new wildlife management areas, and 13 natural area preserves are also being created.

The Land and Water Conservation Fund (LWCF) is a Federal matching reimbursement grant program for the acquisition and/or development of public recreation areas and facilities that must be maintained in perpetuity as such. In Virginia, the program is administered by the Department of Conservation and Recreation in partnership with the National Park Service. Eligible grantees include public entities: towns, counties, cities, park authorities and state agencies. For boat and fishing access facilities and related support facilities previously eligible for funding under both the LWCF and the Dingell Johnson Act (also known as Federal Aid in Sport Fish Restoration Act and "Wallop Breaux"), as amended, now LWCF will not provide funding. However, LWCF assistance may be available for facilities related to motor boating, sailing, canoeing, kayaking, sculling, etc. LWCF assistance may also be used for fishing piers platforms, and their associated trails, provided the long-term commitment of the program can be upheld by the sponsoring entity and the assisted area can serve as a viable recreation area. Since 2003, the LWCF has received significant cuts in funding. The current outlook is that LWCF program funding could gradually increase over the next several years. (See below for the *2010 LWCF* proposed budget.)

There are a several initiatives that may lend funding support for acquiring public access points. These are proposed for the 2010 Dept. of the Interior (DOI) budget (from the Bureau of Land Management website[16]) including the *Protecting Treasured Landscapes*, which would offer funding for protecting areas, some of which have been identified, to enhance users' experience and understanding of special natural areas. The proposed DOI budget also includes the *Land and Water Conservation Fund* (LWCF) at $420 million (including $120 million for U.S. Forest Service), with full funding of LWCF at $900 million by 2014. Finally, the *Cooperative Endangered Species Conservation Fund* includes grants to States to support conservation of threatened and endangered species through a cost effective program, where funds are leveraged by States, who can in turn distribute this funding to tribes, municipalities and private landowners.

Other land acquisition programs include donations from landowners to state agencies such as the Dept. of Game and Inland Fisheries, the Nature Conservancy, or the Virginia Outdoors Foundation. These parcels, often placed under conservation easements, are sometimes able to be utilized for public access. However, the easement mechanism is more frequently utilized to prevent future development on the conserved lands. Additionally, wetlands banking has been discussed as a possible program in Virginia. The first wetlands banking site, a 7.5 acre tract along the Southern Branch of the Elizabeth River in Chesapeake, Virginia, was developed in 2005. Other coastal wetlands banking sites include the Cedar Run Wetlands Bank in Prince William County, the Julie J. Metz Wetlands Bank in Woodbridge, the North Fork Wetlands Bank in Haymarket and the Dover Farm Wetland Mitigation Bank.[17]

On May 12, 2009, President Barack Obama signed an Executive Order that recognizes the Chesapeake Bay as a national treasure and calls on the federal government to lead a renewed

[16] BLM website: http://www.blm.gov/wo/st/en/info/newsroom/2009/may/NR_090517.html
[17] Information from the National Mitigation Banking Association at the website: http://www.mitigationbanking.org/mitigationbanks/index.html

effort to restore and protect the nation's largest estuary and its watershed. The Chesapeake Bay Protection and Restoration Executive Order (EO) established a Federal Leadership Committee that will oversee the development and coordination of reporting, data management and other activities by agencies involved in Bay restoration.[18] New funding may be available for public access sites in the coastal zone as a result of the EO; however, it focuses on federal lands, so although the ultimate recommendations and goals may promote greater state provision of public access, there may be a need to explore how the need for public access in Virginia overlaps with federal sites (especially those not currently providing access, but having site conditions that could accommodate access).

Comprehensive access management planning (including GIS data or database) and Public Access Education and Outreach

Regionally, the Middle Peninsula Chesapeake Bay Public Access Authority (MPCBPAA) and Virginia Sea Grant, with the National Sea Grant Law Center, are developing a public access database and information clearing house website. The MPCBPAA partnered with Sea Grant to receive funding for this resource. This website is geared to identify problems and solutions, including the rights of the public, and all information around public access in the Middle Peninsula. This website could be expanded to cover Virginia's entire coast. Sea Grant, who will house and manage the website, is building the capacity into the website to expand it for all coastal communities' utilization.

DCR and DGIF have several new GIS datasets that provide significant new data to localities. Additionally, some of the Planning District Commissions are utilizing the data sets.

Some of the DCR websites for public access and conserved lands include:

Land Conservation Data Explorer (which includes public access)
http://www.vaconservedlands.org/gis.aspx

Conservation Lands data download page
http://www.dcr.virginia.gov/natural_heritage/cldownload.shtml

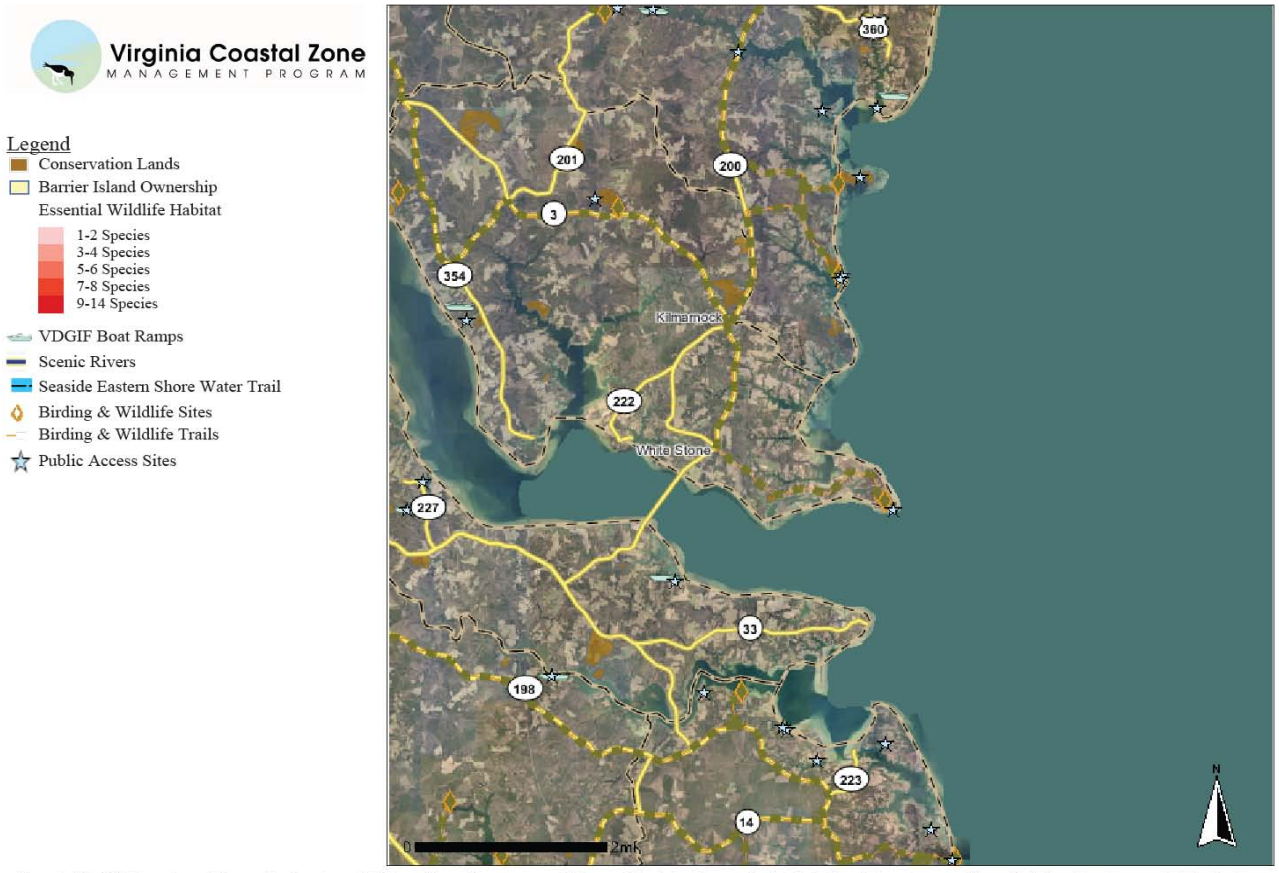
VA Outdoors Plan (maps at the end of the regional analysis sections)
http://www.dcr.virginia.gov/recreational_planning/vop.shtml

Although still under development, a beta version of the Virginia Trails and Routes inventory (existing and proposed facilities) is available for planners. Contact Jennifer Wampler, Jennifer.wampler@dcr.virginia.gov, for this information.

There has been an increase in the number of people requesting public access data, and people are also asking questions more frequently of state agencies. State agencies, such as DCR, have seen an increase in requests for maps and data, as well as university-based projects requesting research around public access in Virginia.

[18] From the website: http://executiveorder.chesapeakebay.net/page/About-the-Executive-Order.aspx

The Coastal GEMS website, developed with CZM funding, has been identified as an excellent resource for mapping public access. A need has been expressed to increase the awareness of the website. Below is an example of a Coastal GEMS map with recreational and other map features from the website:
http://www.deq.virginia.gov/coastal/coastalgems.html



The Center for Coastal Resources Management at VIMS has developed Sea Level Rise Planning Maps which can be viewed at the website:
http://ccrm.vims.edu/gis_data_maps/static_maps/index.html.

The James River Association is developing an interactive web map for the James River. For more information, see the website: http://jamesriverassociation.org/.

Operation and Maintenance Programs

There have been funding cuts for operation and maintenance across the board at public access sites.

Beach water quality monitoring and pollution source identification and remediation

In 2005, 48 beaches were monitored by the Virginia Department of Health (VDH). Since that time, funding has been restricted and not all beaches are able to be monitored. Additionally, some of the beaches are no longer accessible and have reverted to private use or use by a few individuals, rather than a large percentage of the public, and monitoring is no longer conducted on them. Bacteria levels in beach water are monitored at all 44 public beaches on the Chesapeake Bay and Atlantic Ocean during the swimming season (May-September).

The VDH monitors 22 beaches in the city of Virginia Beach, and 27 miles of coastline. VDH estimates on a busy summer day that about 10,000 people use any one of those 22 beaches. VDH measures nine beaches in the City of Norfolk, with between 1,000 to 10,000 people using the beaches on a busy summer day. The remainder of the beaches monitored in Virginia are more localized to the Chesapeake Bay region, and have between 500 to 1000 people using them per day. VDH focuses on beaches with the highest use or the potential for possible problems for monitoring.

Although VDH doesn't conduct remediation of identified pollution sources, the agency does work with Virginia Tech to conduct source water identification work. Additionally, the Dept. of Environmental Quality (DEQ) works with VDH on their TMDL (Total Maximum Daily Load) program. In 2000, the Clean Water Act was amended to including recreational beaches, and as a result, DEQ will examine pollution sources for those beaches. Water quality assessments started examining water body use for beaches for the first time after this point, including wadeable waters in the ocean and estuarine waters. In 2006, one beach was under consideration for developing a TMDL. Three other beaches that were tested at that time, but were considered to have sufficient mitigation efforts.

New public access and outdoor recreation facilities

The Dept. of Conservation and Recreation (DCR) is currently in the planning stages for new additional State Parks; however, it is unknown when these Parks will be constructed as future funding is uncertain. Currently, funding is lacking for staff to develop these lands into state parks for the public to visit. The new state parks in the coastal zone or along intertidal rivers include the Middle Peninsula State Park in Gloucester County, Widewater State Park in Stafford County, and Powhatan State Park in Powhatan County along the James River.

According to DCR, a conceptual plan for the James River Heritage Trail is under development by the agency. This braided trail system will encompass the river and its banks from the headwaters in the Allegheny Mountains to its confluence with the Chesapeake Bay. The heritage trail is unique because of the emphasis on interpretation and potential for outreach to school groups. The trail is already in use by paddlers as well as by bicyclists and hikers in urbanized areas. Both banks of the river as well as the riverbed could contribute to a managed corridor that will enhance the natural resource and provide a host of outdoor activities. Improvements associated with the trail will afford access to the river and encourage outdoor exercise and adventure as well as provide opportunities to interpret the historical context and encourage visitors to nurture this natural resource.

Scenic River designation field studies have been completed on 56 miles of the Blackwater River from Proctors Bridge to the North Carolina line. The local governing Boards passed resolutions endorsing designation of the qualifying river segment. The localities are contacting legislative sponsors to submit the bill to the 2010 General Assembly. After acceptance by the General Assembly, the Governor signs the bill designating the river as a Virginia Scenic River. The Scenic River program raises the awareness of scenic rivers and helps protect their intrinsic qualities of scenic, recreational and historic attributes, and natural beauty. It is anticipated that the Blackwater will be one of 4 river segments designated in 2010 to celebrate the 40th anniversary of the Scenic River Program.

Planning District Projects:

1. The City of Hopewell obtained 25 acres adjacent to the Appomattox River Regional Park in Prince George to enhance public access at the park.
2. Two piers were constructed at the Patrick Copeland and Weston Manor sites in Hopewell.
3. Isle of Wight County recently acquired the Stoup property on the west side of the James River Bridge. This site provides public access to the river. The county's parks and recreation department is preparing a master plan for the property.
4. A new public access site in King and Queen County called the Thurston Haworth Recreational Area is approximately 150 acres located on the Dragon Run.
5. The City of Franklin recently completed the Blackwater Boat Landing in partnership with the Virginia Dept. of Game and Inland Fisheries.
   (2007 *Virginia Outdoors Plan)*

Other issues

The VA Recreation Saltwater Fishing Fund has funds generated from fishing license fees for increasing public access for fishing in saltwater areas. However, $300,000 of this Fund has been redirected to the VA Marine Resources Commission for marine officers staffing. The hope was expressed for the funding to return to the Fishing Fund for its original purpose and that alternate funds be garnered for marine officer staffing.

There is an effort to work through the Coastal Zone program for a social media campaign for using native plants for shoreline restoration. There is an opportunity to expand this effort.

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.

See above for information on the Middle Peninsula Chesapeake Bay Public Access Authority and Virginia Sea Grant public access database and information clearing house. A printed public access guide for the public's right for public ingress and egress is available for the Dragon Run Watershed in the Middle Peninsula that was developed as part of the Special Area Management Planning process for that area. (See the *Special Area Management Plan* Assessment section for additional information.) Additionally, a Blueways water trail map is available for the Middle Peninsula area online.

The DGIF maintains a website with public boat launch facilities with a description for each site. DCR maintains a website with state parks and other statewide recreation points. The DCR Virginia Outdoors Plan has several maps at the end of the regional analysis sections (website link above in the *Education and Outreach* section). Additionally, DCR is developing a database that will help manage all map and access type information.

DCR is updating the agency website to include additional information on water trails and public access. This information will better integrate and serve the localities and planning district commissions in the coastal zone area of the Commonwealth.

The Chesapeake Bay Program maintains a Chesapeake Bay Online Public Access Guide which was updated in 2005. The online version of this guide may be found at the website: http://www.chesapeakebay.net/publicaccess.aspx. The Chesapeake Bay Program also maintains a printed Public Access map, which was updated in 2005.

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)
1. Mapping and Website: There is a need to improve mapping at multiple scales and across many agencies and organizations, which will help planning at many different levels. Two different levels of mapping (with the same data sets, but with two different websites) are needed for public access within the state: the first is for the public, and the second is for professional planners at the local and state level. Specific needs for mapping are: a) create a comprehensive and accessible statewide public access website; coordinate and compile existing public access data sources and websites into a more accessible and comprehensive format. b) identify and prioritize where more access is needed by the public at a regional scale. A starting point would be to see what data is currently available, and to see what the data gaps are for mapping. More comprehensive maps, using better databases, could help identify public access needs. Also, needs could be identified through regional surveys for specific information. Public decision-making around priority areas for public access could follow from this point at the regional level. c) specify the type of public access on the maps (i.e. hiking, boat ramp, etc.) with different symbols and more in-depth information. An opportunity was expressed to identify which lands that are listed as public lands but that aren't open to the public, such as Nature Conservancy preserves, on public access maps so the public doesn't try to inadvertently visit a closed site. d) ensure that public access mapping is current and	Data, communication and outreach, and possibly regulatory	H*

accessible – that all public access sites are mapped. A digital format would be the most helpful for this type of comprehensive mapping system. e) train additional people in GIS mapping systems, particularly at the locality and PDC level, so they are able to access public access information from GIS-based mapping websites; f) promote online information so the public, policy makers and planners can utilize it, especially to reveal needs and gaps. Promote these websites to: 1) Localities, PDCs, and citizens so people know what kind of public access is available in their region, and 2) planning offices and officials for research, policy development and to get the information to the public regarding public access. g) help people learn how to access information such as the Land Conservation Data Explorer, Coastal GEMS, etc. Increase public awareness on these online data systems, and develop tools for users to have enough GIS familiarity to use them. h) develop new policy as needed to create new public access areas, based on what the data reveals as gaps in public access. State agencies could consider partnering with each other and groups like the Virginia Tourism Corporation to create this important resource.		
2. Non-motorized boating: Non-motorized boating needs funding for all related infrastructure such as parking, signage, restrooms, camping, and ramps which are needed throughout coastal areas and along rivers. Non-motorized boat launches have been identified as a particularly strong need. Opportunities exist for localities to match funding, particularly as tourism increases, for non-motorized boat facilities and infrastructure. Land-to-water and water-to-land trails are needed. Additionally, there is a need to identify and acquire sites for beached boat access.	Regulatory and capacity; could provide a funding mechanism for boat launches	H*
3. Field Work and Mooring site identification: Field work is greatly needed for assessing conditions of public access sites, for identifying new sites for acquisition, and to enhance public access outreach and communication. *Assessing conditions of public access sites.* An opportunity was identified at the state level for utilizing volunteers to conduct field work (or to ground-truth) public access sites at the local level, perhaps with coordination through Planning District Commissions, to assess the condition of public access sites, and	Capacity, data, communication and outreach.	H*

to identify needs and gaps on the ground at access sites. Universities and community colleges students could further be utilized to conduct this work as well. A common set of criteria could be used to quantify the condition of the public access site as well as future needs. There is a need for this as access sites either change hands, become private, or are no longer accessible, though they are currently noted as being public in Public Access guides. It is unlikely that state employees will be able to conduct this work due to a current (and likely foreseeable) lack of funding in travel and time available of state employees, hence the recommendation for volunteers to fulfill this function. However state or local staff would need to manage and coordinate volunteer programs and data collection. Managing the volunteers and the data they collect cannot be accomplished without dedicated staff time. There is a need for increased capacity and staff (at the state agency or Public Access Authority level) for direct outreach to property owners about the possibility gaining public access sites. A specific need is to identify potential areas for public mooring, particularly around the Middle Peninsula. As public access sites are lost and as private residential development increases, there may be a future need to develop a public mooring system. It will also be necessary to determine who should use them (for example, should users have access to the mooring on a first come, first served basis?), and where the public mooring would be located.		
4. Dredging: Dredging master planning is needed, particularly priority areas for dredging for recreational and commercial activity. The US Army Corps of Engineers dredges creeks on a rotational basis for commercial activity, but the level of dredging is currently not sufficient. Currently, Stimulus funding is increasing dredging coastal areas, but future dredging activity may be decreased due to a potential future lack of funding. The Public Access Authorities may develop dredging master plans to look at priorities for dredging areas locally and regionally.	Capacity	H*
5. Preservation/ Tourism: Preservation of the maritime and coastal community heritage and character is needed through a regulatory framework or mechanism. It was noted that once maritime structures (such as fishing, baiting and boating buildings) are gone, they are gone forever, and their presence is a hallmark presence in traditional	Regulatory	H*

maritime communities.		
6. Point source pollution: Additional funding is needed for addressing point source issues that are identified in beach monitoring. Solutions to point sources are often known, but funding is often lacking to investigation and response to pollution source. Funding for remediation of pollution sources is needed as well.	Data, Capacity, Outreach	H*
7. Conservation: There is a need for funding to identify lands for conservation, especially where species may be preserved, and funding to increase public awareness. Public awareness efforts could include contacting potential conservation landowners, educating owners regarding the need for land conservation, and the program DGIF (and other organizations and agencies) maintains for landowners to place their land in conservation easements (which allow for public access) and recreation programs. There is a need for purchases and easements for conservation lands.	Capacity, Outreach	H*
8. Planning: There is a need to map and plan for sea level rise across the state.	Data, Capacity, Outreach	H*
9. Local Staff: There is a need for dedicated, full-time GIS staff members at local governments and PDCs. It is important for these staff members to know what public access information is available and how to utilize it.	Data, Capacity, Outreach	H*
10. Acquisition and Infrastructure: There is a very strong need to identify and acquire public access sites, as well as the infrastructure needed to support those sites. Funding and support is strongly needed for the outright purchase of public access sites, as well as for needed infrastructure. Infrastructure and facilities for public access could include trails, boating access, camping, restrooms, floating platforms, wildlife viewing structures, interpretive signage, etc which are needed at both public and private public access sites. Examining the needs and wants of all coastal communities, as well as for the region as a whole, to determine priorities for implementation is needed (the last need could be partially met if Working Waterfront legislation is passed as an amendment to the Coastal Zone Management Act which would require planning by all coastal communities around public access and working waterfronts). Potential public access sites could be identified through examining the results of the VA Outdoors Plan Survey (managed by DCR), which indicates that there is a significant need for better access for boating, fishing, beaching and hiking, as well as	All	H*

to develop new facilities, and finally (third priority by the public) is to enhance existing facilities.		
11. Outreach: A public education and outreach program is needed to educate the public about their right to public access and how it is connected to the Public Trust Doctrine (see *Virginia* Code § 1-200, and *Virginia Code § 28.2-1205 for additional information*.) For example, many citizens are unaware that they are able to walk along the shoreline for purposes of fishing and fowling, even though in Virginia, property rights are extended to the low water mark. (Precedent-setting case law includes: Illinois Central Railroad v. Illinois, 146 U.S. 387 (1892). Martin v. Waddell (1842) 41 U.S. (16 Pet.) 367, 410. Pollard=s Lessee v. Hagen (1845) 44 U.S. (3 How.) 212, 228-29. Commonwealth of Virginia v. City Of Newport News 158 Va. 521, 164 S.E. 689 (1932) Evelyn v. Commonwealth of Virginia Marine Resources Commission, 46 Va. App. 618, 621 S.E.2d 130 (2005) Palmer v. Commonwealth of Virginia Marine Resources Commission, 46 Va. App. 78, 628 S.E.2d 84 (2006)	Education and Outreach	M – H
12. Funding: Operating funds are needed for Public Access Authorities, as well as funding for dedicated staff time to carry out PAA activities. Funding is needed across the board for obtaining new public access sites, operation and maintenance of existing sites, and staffing to support public access in Virginia. Additionally, funding for staff time is needed to address potential conflicts associated with public access at road endings.	Capacity	M – H
13. Surveys: Conducting a specific Outdoor Survey specific to the coastal zone. This should include addressing the problems of homeowners concerns around public access to identify residents' ideas and concerns and to create outreach and awareness tools to help address those concerns.	Education and Outreach	M – H
14. Partnering/ Transparency: PDCs are restricted from sharing data provided to them by local governments. More transparency is needed, or more education in regards to freedom of information, so that localities will share data "still under development" without fear of lawsuits.	Data, Capacity, Outreach	M
15. Legal Assistance: There is a need for legal assistance for researching titles and legal land documentation to determine the correct and current ownership of properties being considering for purchase or	Data, outreach	M

leasing through localities or the Public Access Authorities. For example, in one case a County thought they owned land that was going to be used for a boat ramp or fishing pier, but the Dept. of Game and Inland Fisheries ended up being the actual owner, and the site wasn't developed. One possibility could be to partner with Virginia law schools, to have law students perform this work as independent studies or internships.		
16. Planning: Marine spatial planning will need to be undertaken by local governments related to potential user conflicts and various activities that are taking place to allocate space and use in marine areas.	Data, Capacity	M

* The Virginia CZM Program recognizes that the majority of needs listed above have been assigned a high ranking. The public access issue will be addressed through the working waterfronts strategy and therefore gaps and needs will receive prioritization through implementation of this strategy.

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

The interagency Coastal Policy Team reviewed and ranked this issue at its February 17, 2010 meeting according to the following criteria: feasibility; importance and appropriateness. Up to 5 points were allotted to each of the three criteria so that a maximum score would be 15. Scores from 0-4.99 are considered low priority; 5–9.99 is medium priority and 10-15 is high priority. Public Access received a score of 10.88.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes _____
No ___✓___
Briefly explain why a strategy will or will not be developed for this enhancement area.

The issue of public access will be addressed through the CSI, Working Waterfronts strategy by coupling efforts to retain or enhance public access to regionally identified coastal areas for recreational as well as commercial water-dependent activities.

2000 Assessment		2005 Assessment		This Assessment (2010)	
High	✓	**High**	✓	**High**	✓
Medium		Medium		Medium	
Low		Low		Low	

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

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. In the table below, characterize the significance of marine 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, economic, human health/safety, wildlife/habitat, resource damage	N
Land Based – Dumping	M	Aesthetic, economic, human health/safety, wildlife/habitat, resource damage, user conflict	N
Land Based – Storm Drains and Runoff	H	Aesthetic, economic, human health/safety, wildlife/habitat, resource damage	N
Land Based – Fishing Related (e.g. fishing line, gear)	L to M	Aesthetic, economic, human health/safety, wildlife/habitat, resource damage	N
Ocean Based – Fishing (Derelict Fishing Gear)	M to H	wildlife/habitat, boating safety, resource damage	N
Ocean Based – Derelict Vessels	M	Aesthetic, boating safety, resource damage, user conflict	N
Ocean Based – Vessel Based (cruise ship, cargo ship, general vessel)	M	Aesthetic, resource damage, user conflict	N
Ocean Based – Tire Reef	L	Aesthetic, resource damage	Y
Hurricane/Storm	M to H	Aesthetic, wildlife/habitat, resource damage	N

If information is not available to fill in the above table, provide a qualitative description of information requested, based on the best available information.

Land-Based

According to data from the International Coastal Cleanup program conducted annually in Virginia by Clean Virginia Waterways, land-based activities accounted for approximately 95% of the marine debris items collected during the 2009 cleanup. These volunteer cleanup events are held on Virginia's beaches as well as inland rivers and tributaries. In Virginia, most land-based debris is attributable to littering. Cigarette butts were the most commonly collected debris item in 2009, followed by food- and beverage-related items (including bottles, cans, plastic and paper bags, food wrappers, cups, lids, caps, straws, and stirrers). Balloon litter and fishing line, two items that present a risk of wildlife entanglement, ranked as the 17th and 18th most common items found along Virginia's beaches and waterways in 2009. While mass releases of balloons are illegal in Virginia, balloon debris is found more frequently on beaches than in or around other state waterways. Since balloons can resemble jellyfish, they present a potential ingestion hazard for wildlife. Strings and ribbons on balloons also present an entanglement hazard for wildlife. Cigarette litter, often resulting from roadway, sidewalk, and parking lot litter washing into waterways, presents a unique ingestion hazard to wildlife because it is floatable and toxic. Other potential sources of land based debris are stormwater runoff and combined sewer overflows.

Severe storm events can cause a massive influx of debris into Virginia's waterways, wetlands, and coastal areas. In such storm events, building materials and household items generate a high volume of debris.

Ocean-Based

Approximately 5% of the debris items collected during the 2009 coastal cleanup were attributable to ocean-based activity. These items included derelict fishing gear such as rope, netting, and other gear that were discarded or lost from vessels and eventually washed ashore. Two derelict gear items of specific concern in Virginia are unattended and unmarked "ghost" crab pots and discarded clam netting. These items present threats to wildlife and boating safety. A winter 2008-2009 program resulted in the recovery of more than 8,600 derelict crab pots in the Chesapeake Bay. The crab pots had trapped and killed several thousand animals, including crabs, fish, and turtles. Discarded clam netting is particularly an issue in Virginia's Eastern Shore region. A program funded by the Virginia CZM Program from 2004 to 2007 involved a survey of discarded netting in the Eastern Shore region and networking with the local shellfish aquaculture industry in order to promote environmental Best Management Practices. These programs are described in more detail later in this section.

Impacts

The impacts of marine debris in Virginia include aesthetic impacts, resource damage, economic impacts, threats to human health and safety, threats to wildlife and habitat, user conflicts, and boating safety. Economic impacts include cleanup costs and lost revenue from tourism. Threats to human health and safety include combined sewer overflows and sharp beach debris. Threats to

boating safety include discarded clam netting, which can get wrapped around boat rotors and cause engine damage.

2. Provide a brief description of any significant changes in the above sources or emerging issues.

Waste Tires

The Artificial Reef Program, which is managed by the Virginia Marine Resources Commission, used scrap tires in the construction of artificial reefs off the coast of Virginia Beach in the 1970s. The tires were cut in half and banded together with stainless steel bands. The bands over time have rusted and been disturbed, causing loose tires to float to the surface. Because of typical Atlantic storm patterns these tires have often washed up on the shore in North Carolina. The Virginia Department of Environmental Quality's Waste Tire Program estimates that the artificial reefs include one million tires.

A waste tire dump site also exists in Hoskins Creek, a tidal creek in the town of Tappahannock. An estimated 4,000 to 5,000 tires are located at this site.

Stormwater Management

There is growing interest in Virginia's urban areas in developing a Total Maximum Daily Load (TMDL) standard for floatable trash and litter items, modeled after similar TMDLs in place in California communities.

Regional Cooperation

In 2009, the Governors of New York, New Jersey, Delaware, Maryland, and Virginia created the Mid-Atlantic Regional Council on the Ocean (MARCO) as their commitment to a new comprehensive, regional approach to coastal and marine issues, including marine debris.

3. Do you use beach clean-up data? If so, how do you use this information?

The annual International Coastal Cleanup in Virginia is coordinated by Clean Virginia Waterways at Longwood University. The annual cleanup data is available for the use of the Virginia CZM Program, US Coast Guard, Virginia State Parks, National Park Service, stormwater managers, media, educators, and other entities interested in understanding litter and aquatic debris issues.

Many regional and local cleanup efforts in Virginia are organized by local governments and non-profit organizations. These cleanups are not necessarily organized under the International Coastal Cleanup or Clean Virginia Waterways and cleanup data are not necessarily available.

The Coastal Program and other agencies can use cleanup data to identify both specific sites and specific debris items (e.g. cigarette filters, balloons) that need to be addressed through pollution prevention and outreach programs.

Clean Virginia Waterways now has 15 years of cleanup data (1995 to 2009) and will be doing trend analysis. The findings of this analysis will be publicized to media, state agencies, and others.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

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
Fishing gear management programs	Y	N	Y
Marine debris concerns in harbor, port, marine, & waste management plans	Y	Y	N
Post-storm related debris programs or policies	Y	Y	N
Derelict vessel removal programs or policies	Y	N	N
Research and monitoring	Y	Y	Y
Marine debris education & outreach	Y	Y	Y
Waste tire management	Y	N	N

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 requirements

Recycling requirements for localities
Effective July 1, 2006, the Virginia General Assembly established a two-tiered recycling mandate. Localities or solid waste planning units/regions with population densities of less than 100 persons per square mile or with unemployment rates of 50% above the state average are required to meet a 15% mandatory recycling rate. All other localities are required to meet a 25% recycling rate. In 2008, Virginia's statewide recycling rate was 38.5%.

Recycling requirements for state agencies
Released in 2009 by Governor Tim Kaine, Governor's Executive Order #82 directs state agencies to reduce waste, as well as water use, energy use, and travel. At minimum, individual agency waste reduction policies should address reducing the use of paper and other office supplies, reducing the use of disposable supplies, and recycling of white paper, mixed paper, plastic, batteries, printer cartridges, and aluminum. When relevant, the policy should address recycling of motor oil and antifreeze. Additionally, the inclusion of provisions for composting is encouraged. Despite the November 2009 election of Governor Bob McDonnell, this Executive Order will remain in effect until it expires in July 2013.

Littering reduction programs

Keep Virginia Beautiful
After years of dormancy, Keep Virginia Beautiful (KVB) is being reinstated. The organization's board has begun implementing a three-year strategic plan, and is currently seeking an Executive Director. The goals of this statewide organization are litter prevention, waste reduction, recycling, education, and beautification. KVB seeks to provide a framework for better collaboration and coordination on these issues between the public, private, and nonprofit sectors, and also between local, regional, and state government agencies. KVB will provide support for local litter prevention and recycling programs, which are often underfunded and inconsistent. KVB's strategic plan is available online at:
www.greenquestllc.com/uploads/KVB_Mission_Exploration_Session_4_01.29.09_v3.0E.ppt

Fishing gear management programs

Derelict crab pot program
A program funded by NOAA through the Virginia Marine Resources Commission and implemented through the Virginia Institute of Marine Science made significant progress in removing derelict crab pots from the Chesapeake Bay. From December 2008 to March 2009, the program paid out-of-work watermen to use side-imaging sonar units to detect and retrieve abandoned crab pots and other debris. The program is the largest of its kind in the nation and as of 12/20/10 more than 17,700 derelict pots have been recovered since the program began in 2008. . In addition to crab pots, participants recovered peeler pots, eel pots, nets and other marine debris bringing the total number of items removed during this period to 20,625. Participants covered over 1,500 square kilometers but could not reach many shallow areas estimated to harbor additional pots. Next year's program will be adjusted to include more

shallow-draft vessels that can reach these pots. The program is slated to end in the spring of 2011 and efforts are underway to identify mechanisms to address the problem once removal ceases.

Information on the 2009-2010 derelict crab pot program, including an interactive debris location map, can be viewed online at: http://ccrm.vims.edu/marine_debris_removal/index.html

Fishing line recycling program
The Virginia Department of Game and Inland Fisheries (DGIF) and the Virginia Marine Resources Commission (VMRC) have launched a monofilament fishing line recycling program across the Commonwealth. Recycling containers have been installed at public boat launches at several lakes, rivers, and coastal waters. Anglers and boaters are encouraged to deposit used monofilament fishing line into the containers. Currently, there are 77 recycling sites across the state. A map of sites is available at: http://www.dgif.virginia.gov/fishing/fishing-line-recycling/

Marine debris concerns in harbor, port, marine, and waste management plans

No significant change. The Virginia Clean Marina Program at the Virginia Institute of Marine Science - a partnership of the Virginia CZM Program, VA Department of Environmental Quality, VA Department of Conservation and Recreation, VA Department of Health, VA Marine Resources Commission, VA Department of Game and Inland Fisheries, Virginia Sea Grant, and NOAA - is a voluntary recognition program for marinas that take initiative to protect coastal resources. Marinas are certified based on their compliance with a set of pollution prevention practices, including solid waste management and boater education. There are currently 65 marinas certified by the Clean Marina Program, and 32 others have pledged to work toward certification.

Derelict vessel removal

No significant change since last assessment. Virginia has no specific program or funding for the removal of derelict vessels, but legislation and procedures for removal are in place.

Derelict military vessels
A fleet of derelict military vessels, known as the James River Ghost Fleet or James River Reserve Fleet, is anchored in the James River near the city of Newport News. The vessels were initially placed in the James as part of the National Defense Reserve Fleet program in the 1940s and 50s. These vessels contain hazardous content such as fuel oil, lead, and asbestos. Since 2001, approximately 75 vessels have been removed from the James and recycled for scrap or otherwise disposed of. As of November 30, 2009, 25 vessels remain at the site. The federal Maritime Administration (MARAD) has been handling the removal of these vessels. One of the ships, a 700-foot oil tanker, broke loose from its moorings during a nor'easter in November 2009 and drifted until it ran ashore about a half-mile downstream. MARAD currently plans to free the ship in January 2010 and return it to the fleet.

Waste tire management

No significant change. The Virginia Department of Environmental Quality's Waste Tire Program began locating tire dumps with a statewide survey in 1993. Since then, the Program has located over 1,200 dump sites across the state, totaling more than 25 million tires. To date, more than 1,100 of these sites have been cleaned up. The site at Hoskins Creek in Tappahannock has been partially addressed, with the tires on land having been removed but the tires in the water remaining on-site because there is uncertainty about how much damage might be caused by retrieving them. The tire reef problem in the Atlantic Ocean has not been addressed for a number of reasons, including the more pressing nature of land-based dumps which attract mosquitoes and present a fire risk, lack of information about the situation, and uncertainty about agency responsibility for the problem.

Funding for waste tire removal is in limited supply at this time. The Waste Tire Program is funded by a state-imposed fee of $1.00 for every tire purchased in the Commonwealth. However, this funding source has recently been tapped into for other state budget needs, and as a result funding for waste tire removal projects is suffering.

Research and monitoring

Derelict gear
Research and monitoring is an important component of the VIMS derelict crab pot program discussed above. The impacts of derelict crab pots and fishing gear on wildlife, boating safety, and commercial and recreational fishing in the Bay were assessed. During the winter 2008-2009 program, information such as the locations of derelict crab pots and the number of animals trapped inside recovered crab pots was recorded.

Debris monitoring
Ocean Conservancy's National Marine Debris Monitoring Program monitored debris in two Virginia sites from 2001 to 2006 as part of an EPA-funded program that included dozens of coastal sites in the U.S. The Virginia sites were located at Back Bay National Wildlife Refuge and Chincoteague Island National Wildlife Refuge. Monitoring at these sites began in 1997, but the EPA-funded study only analyzed debris trends over a five-year period.

Education and outreach

Clean Boater Program
The Virginia Clean Marina Program added the Clean Boater Program, intended to educate boaters about pollution resulting from boating activity and recognize boaters who take steps to reduce their impact. Individuals may take a Clean Boater pledge. A Clean Boater Program brochure, which includes information about the program, clean boating tips and resources, and a Clean Boater Pledge form, was developed using funding from the Virginia CZM Program.

Boater education video
The state is beginning to phase in education and certification requirements for recreational boaters. As part of this effort, the Clean Marina program produced a short educational film called

"Bling My Boat," which addresses marine pollution and debris issues. The film was produced using funds from the Virginia CZM Program and the Chesapeake Bay Restoration Fund.

Networking with Eastern Shore aquaculture industry
From 2005 to 2007 the Virginia Eastern Shorekeeper program, funded by the Virginia CZM Program, involved networking with local shellfish aquaculture companies and independent growers in order to promote voluntary environmental Best Management Practices (BMPs) for the clam industry, including ways to limit clam net litter on the shoreline. An earlier grant from the Virginia CZM Program to the Eastern Shorekeeper program funded a survey of the extent of discarded netting in the area, and a report that proposed recommended BMPs for the clam aquaculture industry.

Litter awareness campaigns
In conjunction with the annual International Coastal Cleanup in Virginia, Clean Virginia Waterways is working with teachers and informal educators to incorporate litter prevention and awareness lessons into curriculums.

Virginia's Litter Prevention Program (run by the Virginia Department of Environmental Quality) coordinates the distribution of annual grants to localities for recycling and litter prevention activities, provides information and guidance on litter prevention and recycling topics, and works with localities, local litter prevention program managers, and environmental groups on improving awareness of how litter damages the environment.

Lesson plans
"Pollution Solutions" is a curriculum supplement that has 19 lessons about litter and pollution prevention based on the Standards of Learning for grades K-12. It was developed by the Virginia Resource Use Education Council and funded by the Virginia Litter Control and Recycling Fund for use in classroom presentations by local litter prevention and recycling program managers, classroom teachers, and informal educators (such as employees at state parks, Soil and Water Conservation Districts, etc.).

"Virginia's Water Resources: A Tool for Teachers" by Clean Virginia Waterways is a Virginia-specific curriculum packet full of information and activities for teachers. It supports interdisciplinary and problem-based teaching about watersheds, water quality, stewardship, and management issues. Several of the lessons are focused on the sources and impacts of litter and marine debris, as well as solutions to these problems. It is correlated to Virginia's Standards of Learning and supports the Chesapeake 2000 Agreement's goal to "provide a meaningful bay or stream outdoor experience to every school student in the watershed before graduation from high school."

Plastic bag litter
Plastic bag litter has negatively impacted the cotton farming industry in eastern Virginia. Bags become entangled in farm machinery and crops, and cannot be separated from cotton during the ginning process. This results in diminished quality of the cotton and ultimately affects farmer income. Additionally, bags present an ingestion and entanglement hazard to wildlife. Legislation was introduced to the Virginia General Assembly in 2008 that would have banned the use of

single-use plastic bags in stores. This legislation was withdrawn in early 2009, however, in favor of a pilot plastic bag recycling program in Isle of Wight County. The county received a grant from the Virginia Department of Environmental Quality which is being used to establish plastic bag drop-off sites, implement consumer education and outreach projects, and purchase a baler so that bags can be baled and sold for recycling.

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)
Continued education and outreach for general litter prevention and recycling, as well as specific concerns	Communication/Outreach	H
Increased state involvement in and coordination of marine debris issues	Capacity	H
Continued funding for removal of derelict fishing gear	Capacity	H
Analysis of tire reef issue and funding/program for cleanup	Data, Capacity	M
Formal program and funding for derelict vessel removal	Capacity	M

One major need for marine debris reduction is continued and expanded education and outreach. A large portion of marine debris is a result of individual behavior, and public education campaigns about the impacts and sources of marine debris could be an effective way to reduce debris. Possible goals of education and outreach initiatives include increasing public awareness of regulations related to waste disposal (such as dumpster maintenance and balloon release laws), options for recycling (such as where recycling facilities are located), and Best Management Practices for waste disposal. Another effective strategy may be working with the fast food industry to educate consumers about reducing waste, because many of the most commonly found debris items in Virginia are related to convenience foods. There is also a need to educate people about the connection between land-based litter and marine debris, as well as about the negative impacts that even small debris items such as cigarettes can have. Budget cuts can have a significant impact on education and outreach programs, as things like signs and brochures are often cut as a result of low funding.

In Virginia, much of the work that is done related to marine debris, such as cleanups and monitoring, is carried out by nongovernmental organizations. There is a need for increased state agency and local government involvement in the issue. Developing a state plan for addressing marine debris issues could help address the needs outlined here, as well as future needs.

Additionally, the MARCO alliance as discussed previously in this section and elsewhere in this assessment has identified marine debris as an issue to be addressed through a regional approach. A marine debris action plan developed through MARCO could help address the topic at a multijurisdictional scale.

The waste tire reef issue described above is unique among marine debris concerns in that it is the result of a program that was funded and implemented by a state agency. There is a need for cooperation between the Virginia Marine Resources Commission and the Virginia Department of Environmental Quality in assigning responsibility for the problem and cleanup. There is a need for assessment of the location, extent, and impacts of the tires. Additionally, there is a need for an operational plan and funding source to carry out the removal of the tires.

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 _____

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

The interagency Coastal Policy Team reviewed and ranked this issue at its February 17, 2010 meeting according to the following criteria: feasibility; importance and appropriateness. Up to 5 points were allotted to each of the three criteria so that a maximum score would be 15. Scores from 0-4.99 are considered low priority; 5–9.99 is medium priority and 10-15 is high priority. Marine debris received a score of 9.22.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes _____
No ___✓___

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

Education, derelict fishing gear, and increased state involvement in marine debris issues were identified as high priority issues. After consideration of these issues, it was decided that they could be better addressed through the Ocean Resources strategy rather than through a separate Marine Debris Strategy. Key reasons were that: 1) a portion of the staff support for the Ocean Resources Strategy could be dedicated to marine debris issues, and that these issues did not warrant a position dedicated to marine debris issues alone; 2) Marine debris often ends up in the ocean becoming an ocean resources issue and marine debris is one of the four issues identified as high priority for the mid Atlantic region.

2000 Assessment		2005 Assessment		This Assessment (2010)	
High	____	High	___	High	___
Medium	_✓_	**Medium**	_✓	**Medium**	_✓_
Low	____	Low	___	Low	___

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

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

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:**

Virginia's coastal zone continues to absorb a disproportionate amount of the Commonwealth's population growth. While the coastal zone constitutes only 24 percent of the state's land area, it contains 63 percent of Virginia's total population. According to the Virginia Profile 2009, the fact that people in Virginia are moving away from central cities to the surrounding suburban areas will likely lead to an increase in the number of metropolitan areas as well as further expansion of existing metro area boundaries. The water quality impacts of this growth are magnified by a trend toward development types characterized by an increasing impervious cover per person ratio. For example, in the Chesapeake Bay watershed, impervious cover increased at a rate five times faster than population growth between 1990 and 2000. Coastal resource management issues regarding the cumulative and secondary impacts of growth include the loss or fragmentation of identified blue and green infrastructure and the degradation of coastal waters.

In addition, waterfront development in more rural localities, although slowed somewhat by the economic downturn, continues to threaten sensitive coastal resources. Impacts include the loss of habitat and water quality protection functions provided by riparian buffers and fringe marshes. Rural land use patterns have also been affected by changes in state regulations regarding the placement of alternative (engineered) septic systems. In the absence of adequate land use controls, sensitive areas with high water tables that were previously considered unsuitable for development because of limitations of onsite wastewater treatment options are now being developed. The result is more sprawling development, often in environmentally sensitive areas.

According to the EPA report *Development Growth Outpacing Progress in Watershed Efforts to Restore the Chesapeake Bay*, there has been a shortage of up-to-date information on development patterns, meaning these factors aren't able to be taken into consideration in pollution reduction goal-setting. The same report also concluded that population growth is outpacing progress in efforts to reduce nutrient and sediment loads from developed lands.

Further, as coastal areas are experiencing dramatically increased demand for residential development in places considered attractive for retirement, such demand can result in positive effects on local economies and tax revenue, yet requires services and resources that may not be compatible with the nature and character that attracted development in the first place. In

particular, the historic industries that support the functionality of many bucolic waterfront communities are often disadvantaged by impacts of new development.

Access to resources upon which fishing, shellfish and related industries depend, is becoming more and more limited, or is being lost outright as development privatizes waterfront land. Traditional maritime occupations and industries face pressure from rising costs driven by the changing land values, which in turn are driven by new development and development potential. As real estate markets respond to these pressures, the resources needed by traditional maritime industries may be converted to other uses suited to the new development. These resources include, most importantly, access to the water itself. And since small and large maritime businesses are highly interdependent, the diminution of one may negatively impact many others.

Localities with working waterfronts face many similar challenges – such as insufficient information and organizational capacity to respond to these changes. A coordinated "Working Waterfront" strategy would focus on select coastal communities with working waterfronts. This strategy is aimed to help communities understand the long-term costs associated with loss of working waterfronts, develop new policy tools to help them manage the increasing growth pressures, and build their capacity to retain working waterfronts for future generations.

Geographic area	**Type of growth or change in land use**	**Rate of growth or change in land use** (% change, average acres converted, H,M,L)	**Types of CSI**
Suburban areas of Northern Virginia, Richmond and Hampton Roads	Residential and Commercial development with increased levels of impervious cover	In Northampton Co., 5,892 acres of PCAs currently fall within a non-compatible zoning type; 4,705 acres of PCAs fall within a non-compatible proposed zoning type. Similar analysis to be replicated in other coastal zone localities.	Habitat loss and fragmentation of priority conservation areas, stream degradation, water quality impacts
Rural counties with waterfront on the Chesapeake Bay and its tributaries	Waterfront Development	4,694 shoreline permit applications since 2005	Loss of riparian buffers and fringe marshes
Rural localities – Areas not served by centralized wastewater treatment	Single family residential and small commercial using engineered onsite sewage disposal	From 2000-2008, there were 1,208 engineered OSDS installed in the Middle Peninsula and 2,006 permitted	Water quality impacts, habitat loss and fragmentation, erratic land development

	systems (OSDS)	OSDS were awaiting installation.	patterns
Northern Neck, Middle Peninsula, Hampton Roads, Eastern Shore	Growth pressures on publicly accessible marinas	Number of crab licensees reporting harvests declined by 33 percent between 2003 and 2007. Shift toward part-time status as watermen need to rely on other means of income	Increased density in development patterns with more impervious surface area leading to additional loss of habitat and natural cover and greater impacts on water quality

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. If necessary, additional narrative can be provided below to describe threats.

Sensitive resources	**CSI threats description**	**Level of threat** (H,M,L)
Priority Conservation Areas	Suburban development, rural development with alternative septic systems	H
Tidal Wetlands – fringe marshes	Waterfront development – shoreline hardening; sea level rise	H
Coastal waters and living inhabitants (e.g. finfish and shellfish)	Nonpoint source runoff causing water quality degradation (turbidity, hypoxia, anoxia)	H

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

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	N
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.**

Regulations

Coastal Primary Sand Dunes and Beaches Act expansion

In 2008, legislation was passed that expanded the scope of the Virginia Coastal Primary Sand Dunes and Beaches Act from nine localities to the entire coastal zone. Research conducted and reported by the Virginia Institute of Marine Science (VIMS) informed the policy recommendations to expand the protected areas. Due to this legislation, localities now have the power to create ordinances to manage their dunes and beaches. (Section 309 CZM-driven change)

Total Maximum Daily Loads (TMDLs)

Total Maximum Daily Loads (TMDLs) are plans to restore and maintain the water quality of impaired waters. TMDL refers to maximum amount of a pollutant a waterbody can assimilate and still meet water quality standards.

In 2008, the Virginia Department of Environmental Quality (VA DEQ) released a report on the water conditions in Virginia from 2001 through 2006, the most recent report available. (VA DEQ submits a report to the US EPA every even-numbered year.) Among the key findings from the 2008 report: The impaired area in rivers and streams increased from 9,002 miles in 2006 to 10,543 in 2008, and impaired area in estuaries decreased from 2,216 square miles in 2006 to 2,182 in 2008.

The US EPA has begun the process of establishing a TMDL for the Chesapeake Bay, as its waters continue to be impaired. The target date for creating a TMDL is December 31, 2010. The Chesapeake Bay TMDL will address all segments of the Bay and its tidal tributaries that are impaired. As with all TMDLs, a maximum aggregate watershed pollutant loading necessary to achieve the Chesapeake Bay's water quality standards will be identified. This aggregate watershed loading will be divided among the Bay states and major tributary basins, as well as by

major source categories. (Non-CZM-driven change)

Stormwater Regulations

The Virginia Soil and Water Conservation Board (Board) adopted final regulations for Parts I, II and III of the Virginia Stormwater Management Program (VSMP) Permit Regulations on December 9, 2009. On January 14, 2010, the Board suspended Parts I, II and III of the VSMP in response to petitions to extend the public comment period. While the VSMP regulations remain suspended, a Regulatory Advisory Panel (RAP) was formed and met on July 23, 2010. The RAP identified five areas of the VSMP regulations that needed further evaluation. These areas were: grandfathering, offsets/credits, water quality, water quantity, and local government criteria. The RAP has created subcommittees to evaluate these areas and is presently considering proposed modifications to the regulations. The target for completion of the RAP's review and recommendations is April 2011.

Under the proposed regulatory changes, developers will have to install stormwater management features like retention ponds and rain gardens to promote infiltration. The changes would also set limits on the amount of phosphorus that can leave a site, and give localities more flexibility in setting their permit fee schedules, in order to pay for program costs. (Non-CZM-driven change.)

VDH OSDS Regulations Regarding Engineered Systems

A change in Virginia Department of Health (VDH) Sewage Handling and Disposal Regulations in 2000 allowed engineered onsite sewage disposal system (OSDS) technologies to be installed on "marginal land," or land that would not normally support a traditional gravity fed septic system. This change effectively gave the VDH power to regulate development. In 2009 the General Assembly passed House Bill 1788, and the VDH promulgated Emergency Regulations for Alternative Onsite Sewage Systems (12VAC5-610-20) which immediately preempted local-level ordinances regulating the installation, operations and maintenance of alternative systems. With no allowance of a trial period for these emergency regulations, local government authority was usurped leaving them unable to assess actual effectiveness of the new rules. (Non-CZM-driven change.)

Policy

Executive Order 13508—Chesapeake Bay Protection and Restoration

In May 2009, President Obama issued an order to protect and restore the Chesapeake Bay through shared federal leadership, planning and accountability; restoration of Chesapeake Bay water quality; agricultural practices designed to protect the Bay; reduction of water pollution from federal lands and facilities; research on climate change adaptation; expansion of public access to the Bay and conservation of landscapes and ecosystems in the Bay watershed that merit recognition for their historical, cultural, ecological or scientific values; and identification of critical living resources of the Chesapeake Bay.

Governors' Land Conservation Goals

In 2006, former Governor Tim Kaine announced his intention to protect an additional 400,000 acres of land by the year 2010. This resulted in a greatly increased rate of land protection via conservation easements. By the end of his term as governor, 427,477.84 acres had been conserved with 91,948 of these acres occurring within the Coastal Zone. Likewise, Governor Bob McDonnell has set the same goal of protecting 400,000 acres of land by the end of his term in office.

Guidance

Draft Wetlands Guidelines and Coastal Primary Sand Dunes/Beaches Guidelines (309)

The Virginia Institute of Marine Science (VIMS) produced a Section 309-funded report entitled "Recommendations to Update the Act and Complete the Oversight of Virginia tidal Shoreline" to inform Virginia's regulatory approaches to dunes and beaches. A key recommendation of this report was to expand the definition of a coastal primary sand dune by incorporating additional plant species into the Act. This report resulted in legislation that expanded dune and beach protection to all of Virginia's coastal zone, protecting an additional 1,300 estuarine beaches and 75 miles of shoreline from shoreline hardening and other coastal development. (309-driven change)

Regional Blue and Green Infrastructure and Conservation Corridor Planning Initiatives

The George Washington Regional Commission (GWRC) obtained a grant to use GIS to quantify the amount of impervious surface relative to green infrastructure, and work to with local governments to solicit public option on conservation efforts. The GWRC initiated a regional land use scenario planning process, which complements its strategy for defining a regional “vision” and its related plans to engage community stakeholder and citizen groups in a regional visioning process that will unfold in 2010. (306 Focal Area and 309-driven change)

Middle Peninsula PDC Alternative Septic system inventory

Middle Peninsula Planning District Commission (MPPDC) staff worked closely with VDH to collect spatial data of engineered OSDS permits from 2004-2008, which revealed that within the Middle Peninsula (from 2000-2008) there were 1,208 installed engineered OSDS and 2,006 permitted OSDS awaiting installation. While the inventory was conducted by the MPPDC, OSDS is an issue that affects Virginia’s entire coastal zone. This is an important issue because these systems enable greater land development in the coastal zone, and render health-oriented land use policies ineffective. (309-driven change.)

CBPA: Checklist for Advisory Review of Local Ordinances

In December 2001, the Chesapeake Bay Local Assistance Board (CBLAB) amended the Chesapeake Bay Preservation Area Designation and Management Regulations (Regulations) to reduce CSIs and better protect the Bay’s water quality and habitat. Local governments incorporated these revised regulations by December 31, 2003. The Regulatory change included

a provision that CBLAB undertake a compliance review process to be conducted on a schedule of every five years. The Compliance Review process began in 2003 and the first cycle of evaluations is nearly complete. As a result of this process, local compliance with the revised Regulations and local code provisions has greatly accelerated. In addition to conducting Compliance Reviews, the Department of Conservation and Recreation's (DCR) Division of Chesapeake Bay Local Assistance has recently initiated an Advisory Code and Ordinance Review of the 84 Tidewater jurisdictions covered by the Chesapeake Bay Preservation Act. In June of 2009, the CBLAB approved a Checklist for Advisory Review of Local Ordinances. This checklist is being used as a tool during the Advisory Review process to identify provisions that address water quality protection measures of minimizing impervious cover and land disturbance and maintaining indigenous vegetation. The checklist contains numerous examples of requirements that may be contained within a locality's land development ordinances. Based on this review, localities may choose to modify ordinances and processes to address development standards that benefit water quality. The information gained from the advisory review will also be used by DCR staff during the next formal evaluation of the local Bay Act Program implementation that occurs every five years.

The initiatives discussed above were driven by the Chesapeake Bay Preservation Area Designation and Management Regulations (Regulations). Only minimal CZM funding was provided to assist with local compliance on certain aspects of the Regulations, including funds for implementation of septic pump out programs, a grant for a PDC to work with several localities to initiate the code and ordinance review process, and a grant to a private conservation organization to assist two localities with code and ordinance reviews and recommended ordinance amendments. (Non-CZM-driven change).

Chesapeake Bay and Virginia Waters Clean-up Plan

Submitted to the General Assembly by Virginia's Secretariat of Natural Resources in 2007, this comprehensive plan addresses all sources of pollution to Virginia's waters. The plan summarizes the status of impaired waters in Virginia, sets objectives for impaired waters clean up, and enumerates several steps to achieve a quantifiable pollution reduction. (Non-CZM-driven change.)

Healthy Waters Initiative

Healthy Waters, launched in 2009, is a multi-organizational effort developed and managed by the Virginia DCR and the Center for Environmental Studies at Virginia Commonwealth University in coordination with the Virginia DEQ, the Virginia DGIF, and the Virginia CZMP. Healthy Waters assesses streams to prioritize stream protection and to integrate protection into land use decision-making and voluntary conservation efforts. Stream health is assessed using INSTAR, a dynamic and interactive mapping and data visualization application that utilizes information on fish, macroinvertebrates, and other living aquatic resources. The initiative's goals are to prevent degradation and have a positive effect on all of Virginia's water systems. It is also designed to raise awareness about the need to protect streams, creeks and other waters before they become impaired. For more information see: http://instar.vcu.edu/ (non-CZM-driven change)

Research, Assessment, Monitoring

Living Shoreline Research and Monitoring

Living shoreline research and monitoring was a strategy identified in the previous Section 309 assessment. In 2006, the Virginia and Maryland Coastal Zone Management Programs, the National Estuarine Research Reserve Systems, and several other organizations held a Living Shoreline Summit in order to help stakeholders learn and share information about all aspects of living shorelines. VIMS has produced a large number of outreach materials on living shoreline design, implementation, and other considerations, and in October 2008, held a workshop entitled "Putting Nature To Work: How to Design and Build Living Shoreline Projects". (CZM-driven change)

Shoreline Inventories and Evolution Studies **(309)**

The Shoreline Inventory Reports, formerly known as Shoreline Situation Reports, are an important resource for local and state planners and regulators of Tidewater Virginia. The data collected enhances their ability to make decisions regarding coastal construction, land use planning, and implementation of environmental legislation. The data collected for the inventory supports the development of a number of essential management tools including spatial models and shoreline management plans.

With CZM funding, VIMS has conducted research to show the evolution and morphology of the shoreline and beach/dune systems over time. VIMS produced reports for localities across the coastal zone detailing these changes, and demonstrating how human-made changes have affected shoreline evolution. (CZM-driven change)

Mapping

Blue and Green Infrastructure Mapping

In FY2008, Virginia CZM funded development of the Priority Conservation Area (PCA) dataset created through a partnership between the Department of Game and Inland Fisheries, the Department of Conservation and Recreation-Natural Heritage and VCU-Center for Environmental Studies. This dataset guides green infrastructure protection efforts by highlighting unfragmented habitat and identifying potential links between contiguous patches, exemplary aquatic communities, wetlands, habitat for rare species and/or special wildlife features. While the PCA has tiered values, all areas identified within the dataset represent important opportunities for conservation.

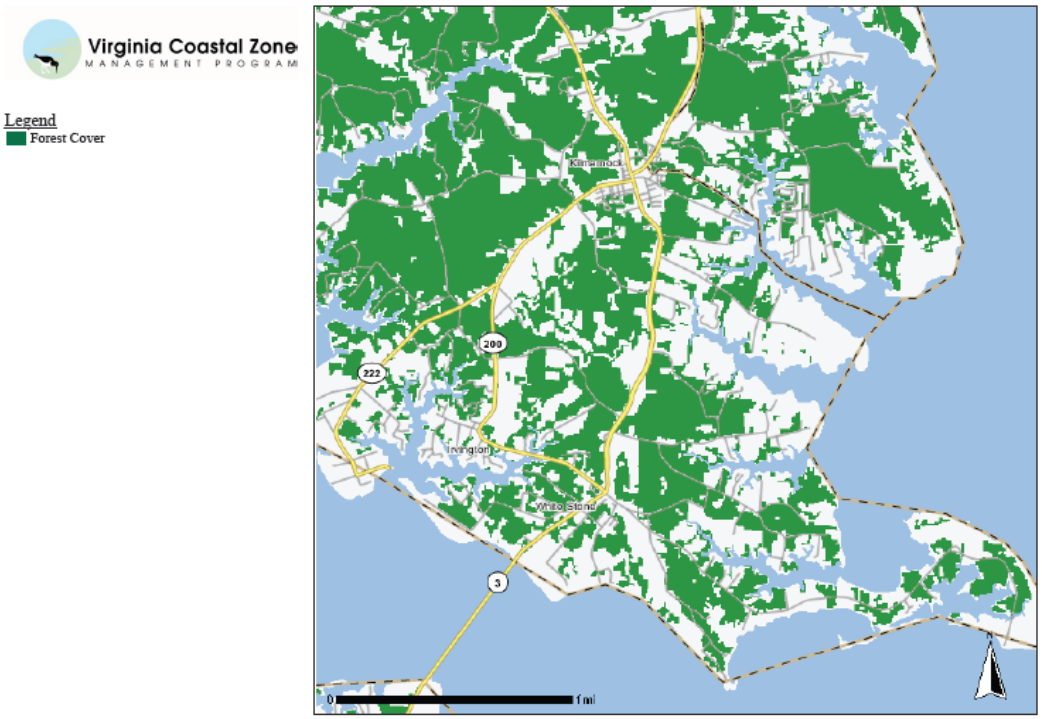
Also in FY2008, the George Washington Regional Commission (GWRC) undertook a project to create blue and green infrastructure plan for the Region. This plan served as a framework for blue and green infrastructure planning in local comprehensive plans, as well as raised local awareness of various environmental mapping systems and datasets. GWRC staff produced a series of maps to identify areas that merit local and regional conservation attention. GWRC also aided local adoption of the use of Community Viz, a popular GIS-based analytical and visioning

tool used by many local governments for evaluating alternative local land use plan. (306 Focal Area)

Coastal GEMS improvements

Led by the Virginia Coastal Program with CZM funding, the Virginia DEQ has created a powerful mapping tool that summarizes all available data layers for the coastal region. Data includes layers on water features, shoreline features, land features, wildlife, recreational features, conservation planning tools, conservation planning examples, and reference layers. This mapping tool can be accessed at: http://www.deq.virginia.gov/coastal/coastalgems.html (306 & 309-driven change)

Sample map of forest cover created using Coastal GEMS:



Education and Outreach

Virginia NEMO

The Virginia Commonwealth University (with funding from the VA CZMP), Virginia Department of Conservation and Recreation's Division of Soil and Water, Chesapeake NEMO (Chesapeake Bay Program), and the Virginia Cooperative Extension Program continue to lead the development and implementation of a coordinated, collaborative approach to delivering technical assistance to localities to help them achieve VDCR, VCZM and associated Bay Program goals.

The approach, called the Virginia Network for Education of Municipal Officials (VNEMO), is a request-based program to provide local decision makers with the information, tools and capacity

to make informed local land use decisions. Through the network approach, the Virginia NEMO Program assists the focus and prioritization of limited resources, taking advantage of a wide range of expertise available, and increases the reach of messaging. It helps minimize the duplication of services, competition for time in front of local boards, and conflicting messages.

VNEMO partners currently include:

- Virginia Commonwealth University;
- Virginia Department of Conservation and Recreation Divisions of
    - Soil and Water,
    - Chesapeake Bay Local Assistance,
    - Natural Heritage;
- Virginia Coastal Zone Program;
- Chesapeake Network for Education of Municipal Officials;
- National Fish and Wildlife Federation;
- Virginia Tech and the Virginia Cooperative Extension Community Viability Program;
- Virginia Department of Forestry;
- Coastal Planning District Commissions;
- Soil and Water Conservation Districts;
- Southern Environmental Law Center;
- Center for Watershed Protection;
- Watershed Groups.

The Chesapeake Bay Program Local Government Advisory Committee has partnered with the USEPA to develop a Circuit Rider Program to advance local assistance and implementation of project to improve water quality. The Circuit Rider award was given to the Center for Watershed Protection (www.cwp.org), which is partnering with the VNEMO Program to expand capacity to deliver services to communities in the Bay watershed. (310-driven change)

Living Shoreline Outreach and Training

CZMP has created outreach materials to help inform landowners, contractors and others about the problems with hardened shorelines, the value of living shorelines and options for constructing living shorelines. (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 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)
Protection of Identified Blue and Green Infrastructure	Policy, capacity, communication & outreach	H
Expansion of Green Infrastructure Planning	Policy, capacity, communication & outreach	H
Living Shoreline Promotion through local shoreline management plans	Policy, capacity, communication & outreach	H
Development of targeted public policy options for managing engineered OSDS (eg. Land use development tools)	Policy, capacity, data , communication	H
Public Access and Market Data (Working Waterfronts)	Data	H

While major progress has been made during the current 309 and 306 focal area initiatives, important steps remain in order to take full advantage of these gains. Much has been done to identify important coastal resources on the land and in the water (blue and green infrastructure) and to incorporate this information into local comprehensive plans. More work remains, however, in educating local officials on the local land management mechanisms available for protecting these resources.

Likewise, efforts to improve shoreline management and promote the use of living shorelines have been very successful, but there is a remaining need to develop local shoreline management plans.

Fostering improved local understanding of the available management options for OSDS, and better record-keeping on the location of systems will aid in development of public policy options that promote land use planning approaches to best protect unique and sensitive coastal resources as well as allow for locally and regionally desired growth patterns.

Improving the quality of coastal waters remains a major resource management issue. A number of significant federal, state, regional and local efforts are underway to address this topic. In addition, various Virginia CZM Program initiatives have been, and will continue to be, targeted at this issue. Given this level of on-going effort by multiple agencies and organizations, it may be more appropriate for Virginia CZM 309 efforts to focus on the other key issues identified through this assessment.

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 _____

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

The interagency Coastal Policy Team reviewed and ranked this issue at its February 17, 2010 meeting according to the following criteria: feasibility; importance and appropriateness. Up to 5 points were allotted to each of the three criteria so that a maximum score would be 15. Scores from 0-4.99 are considered low priority; 5–9.99 is medium priority and 10-15 is high priority. Cumulative and secondary impacts received a score of 12.2.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes ✓

No _____

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

Cumulative and Secondary Impacts received the highest rank among all nine of the coastal management issues. CSI covers many concerns throughout Virginia's coastal zone and therefore, warrants several proposed strategies to address the extent of the issue. Strategies under CSI proposed in this funding cycle address the following: Shoreline Management, Land and Water Quality Protection and Working Waterfronts.

2000 Assessment		2005 Assessment		This Assessment (2010)	
High	✓	**High**	✓	**High**	✓
Medium		Medium		Medium	
Low		Low		Low	

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

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. **Identify geographic areas in the coastal zone subject to use conflicts that can be addressed through a special area management plan (SAMP). Also include areas where SAMPs 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?
Seaside of Virginia's Eastern Shore	Conflicts arise among shellfish cultivation, wild fisheries harvest, recreation, habitat restoration and conservation.	Both emerging and long-standing
Lower Rappahannock	Shellfish cultivation; wild fisheries; recreation; conservation; habitat restoration; navigation	Emerging issue due to inability of shellfish farmers to secure more growing areas and continued decline in wild fisheries harvests.
Dragon Run	Growth pressures	Long-standing
Richmond/Crater	Growth pressures on preservation of green infrastructure	Emerging

Seaside

Virginia's Seaside SAMP addresses the challenges facing the vast system of barrier islands, bays, and salt marshes found in Northampton and Accomack Counties on Virginia's Eastern Shore. Use conflicts on the Seaside include commercial shellfish cultivation, wild shellfish harvesting, recreation, habitat restoration and conservation. The area is also a hemispherically important area for many migratory shorebirds, wading birds, waterfowl and beach nesting birds. Among other threats, waterfront development and sea level rise present threats to ecologically important waters. The current system for managing the various uses of habitat relies upon leasing of submerged lands not included in maps created in the 1890's (Baylor Grounds), which were set aside for public oystering. Under the current system, the only underwater lands available for expansion of shellfish cultivation are the "unassigned lands." The dynamic nature of this barrier island lagoon system (with its shifting islands, marshes and seafloor) is not conducive to the current static leasing system. Furthermore, much of the public Baylor Grounds are bereft of oysters.

Because these use conflicts are shared across political boundaries, they will likely require a regional solution with integrated efforts by local communities, non-profit organizations and other private stakeholders. Sea level rise is also threatening many of these resources and is expected to only intensify the use conflicts. To resolve use conflicts, anticipate the full impact of sea level rise and develop adaptive solutions, continued work is needed to develop a flexible, dynamic management plan. In other words what is needed is a "marine spatial planning" approach. Some additional mapping may be required and ultimately the management plan needs to include enforceable policies that will reduce use conflicts preserve the sustainability of this system – both ecologically and economically.

Good progress has been made on mapping since 2008 and work is continuing through FY 09 and FY 10 grants but more will need to be done during the 2011 -16 309 Strategy time frame to involve the public and finalize a true marine spatial plan for the Seaside.

Lower Rappahannock

The lower Rappahannock River has been the site of major oyster restoration efforts since 1999. As those efforts continued over the past decade it has become clear that oyster cultivation may be the best way to increase oyster biomass in this system. Doing so may create conflicts with traditional wild harvest areas, recreational use and other uses of the area. The best approach to ensuring the lower Rappahannock achieves its maximum utility and sustainability for all uses may be development of a "marine spatial plan" as is underway for the seaside. In other words, a SAMP for the waters of the lower Rappahannock may be helpful.

Dragon Run

The Dragon Run SAMP focuses on Essex, King and Queen, Middlesex, and Gloucester Counties, which are situated in Virginia's Middle Peninsula. While some of the challenges that prompted the creation of the Dragon Run SAMP have been alleviated, other challenges still exist today. Though the SAMP has provided significant attention to the traditional lifestyle supported

by the watershed, it is apparent that ongoing education of decision-makers because of election turnovers is an essential task and challenge of the future. Additionally, the Dragon Run area continues to search for the appropriate balance between long-term planning for the watershed and the protection of private property rights.

One particular challenge that has arisen is the need to balance the benefits of conserving private property watershed lands with the fiscal loss to localities of property tax revenues from those lands. Conservation of private watershed lands occurs through the placement of perpetual easements on the land, or through assumption of ownership of the land by tax exempt entities. While localities may perceive this conservation as a net loss, due to lost property tax revenues, this is not necessarily the case in each locality. Dragon Run SAMP research has discovered that total tax benefit or loss related to number of conservation easements is determined on a case-by-case basis in each locality. Depending on the locality's approach to calculating its composite index, it may receive greater benefit through state funds for education or experience a net loss. As a result, the importance of continuing education for local decision-makers about the long-term benefits provided by land conservation tools is even more emphasized. This is particularly so in regard to consistency in interpretation of tax laws.

Implementation of Green Infrastructure Inventories

Several Planning District Commissions (PDCs) in the Coastal Zone have developed inventories of green infrastructure. The value of this work for developing actionable policy can be greatly improved by building local government capacity to involve green infrastructure inventories in local regulation. In the Richmond-Crater PDCs, where such an inventory was jointly developed, a SAMP has been suggested as a means of administering a capacity building program for local governments in the region. Incorporation of the green infrastructure inventory in local Comprehensive Planning efforts and zoning ordinances could provide assistance to local governments responding to continued growth pressures anticipated for the region.

Marine Spatial Planning

Marine spatial planning represents a significant opportunity for managing regional and inter-jurisdictional resources and potential use conflicts. SAMPs have been suggested as a mechanism for involving stakeholders and policy makers from multiple levels of government in a planning process that would leverage marine spatial data to create regional planning. Integrated blue crab management policy between Maryland and Virginia have been discussed as one specific challenge for which a SAMP may be useful in implementing marine spatial planning. Please see the "Ocean Resources" section of this Assessment for more on Marine Spatial Planning.

Management Characterization
Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

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**
Seaside	New	Began in FY 08
Dragon Run	Completed	

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.**

Dragon Run

The Middle Peninsula Planning District Commission (MPPDC) received grant funding for the development of the Dragon Run Special Area Management Plan in FY 2005 and FY 2006. Anticipating future growth pressures and conflicts involving the development of privately owned land and the watershed's cultural, historic, and natural character, the Dragon Run SAMP seeks to balance demands by improving the tools available to manage the environmental, social, and economic resources of the watershed. To achieve these goals, the MPPDC worked to publicize the adoption of the Dragon Run Steering Committee's Watershed Management Plan by Essex, Gloucester, and King and Queen Counties. The MPPDC also worked to address the concerns of landowners opposing the adoption of the Watershed Management Plan in Middlesex County.

The plan's recommendations include land use and resource preservation, education and landowner stewardship, sustainable economic development, and implementation monitoring. The SAMP's stakeholder-based approach increases the likelihood that localities and stakeholders will implement the plan's recommendations. The SAMP has been instrumental in providing more collaboration and consistency across jurisdictions, as well as awareness and opportunities for cooperation within the watershed community and local stakeholder groups.

Policy outcomes from the Dragon Run SAMP include land-use regulation, conservation acquisition management programs, partnerships for clean energy, and a network for conservation

estate planning, and public access regulation. Specifically, the Dragon Run SAMP has generated the following outcomes:

- Model comprehensive plan and zoning amendments for each of the four watershed counties has lead to revision of the zoning ordinance in King and Queen County and the inclusion of a significant section on the Dragon Run in the Gloucester County Comprehensive Plan. Essex and Middlesex Counties have also indicated that model language will be included in their Comprehensive Plans, both currently in the process of being revised.

- Between 2006 and 2008, land management plans drafted by MPPDC for conservation land were adopted by several NGO's holding significant amounts of land in the Dragon Run watershed, including The Nature Conservancy, Chesapeake Bay National Estuarine Research Reserve of Virginia and Friends of the Dragon Run. The Middle Peninsula Chesapeake Bay Public Access Authority (MPCBPAA) is expected to adopt a final plan as an enforceable policy.

- A report funded by the Dragon Run SAMP lead to the formation of the Biodiesel Partnership, comprised of local farmers, school superintendents, representatives from municipal school bus fleet management and the biodiesel supply chain. Resolutions implementing increased use and production of biodiesel by county school bus fleets were adopted by each of the four Dragon Run watershed counties.

- Increased collaboration and education efforts through the Dragon Run Estate Planning Network Initiative have lead to the creation of a number of conservation easements in the watershed, each with its own enforceable policy. Most recently, approximately 11,000 acres in the Dragon Run watershed were acquired by The Nature Conservancy and subsequently sold to "The Forestland Group" subject to a conservation easement limiting development to 40 home sites and protecting 100-foot buffers on all of the streams and wetlands on the property.

- Information and research regarding the rights permitted by the Public Trust for riparian areas, such as the Dragon Run developed by MPPDC staff and presented to Middle Peninsula Public Access Authority was adopted as an appendix to each of the four Conservation Acquisition Management Plans.

Seaside

The Seaside Special Area Management Plan grants (FY 07 – 10) commenced in fall of 2009. They are focusing on the collection and synthesis of GIS data layers. Eventually the SAMP will focus on developing a management plan and enforceable policies for use of the submerged lands of the seaside bays. This effort is building upon the prior work of Virginia CZM's Seaside Heritage Program and the current American Recovery & Reinvestment Act grants to The Nature Conservancy, the Virginia Institute of Marine Science and the Virginia Marine Resources Commission that continues those oyster, SAV and bay scallop restoration efforts. The SAMP is being coordinated by the Virginia CZM Program with help from staff of The Nature

Conservancy. Primary partners in the SAMP to date include VIMS, VMRC, Eastern ShoreKeeper and local shellfish aquaculturists.

Five CZM grants were funded in support of this effort. First, the "Estuarine Blue Infrastructure: Priority Conservation Areas for the Seaside of Virginia's Eastern Shore" project, conducted by VIMS from September 2009 through March 2010, examined various data sources to develop a combined assessment for Seaside resource sensitivity. Using GIS and a range of data sources, the project identified areas of particular ecological importance as well as great significance to the aquaculture industry, restoration of the scallop population, and the continued need for sustainable natural heritage resources. The data is intended to encourage local governments to plan for long-term preservation of ecologically rich waters threatened by development and climate change pressures.

Second, "An Investigation of a Hemispherically Important Migratory Staging Area for Whimbrel Along the Seaside of the Delmarva Peninsula" project, undertaken by the Center for Conservation Biology from August 2009 to March 2010, investigated the significance of the lower Delmarva Peninsula as a Fall staging area for migrating whimbrel. Synthesizing information from satellite transmitter tracking and other existing data, the study provides context for the lower Delmarva Peninsula as potentially one of the most significant staging areas for whimbrel in the western hemisphere. The study has produced an inventory of known concentration areas and recommendations for local policy affecting those areas.

Third, "The Seaside Special Area Management Plan: Project Team Administration and Avian Distribution Evaluation" project, conducted by The Nature Conservancy (TNC) from September 2009 to March 2010, manages several tasks for Phase I (October 2009 to March 2010) of an overall three-phase SAMP Strategy. As the CZM's primary administrative contact, TNC schedules, coordinates and expedites communications, meetings and other activities involving SAMP project participants and stakeholders. Additionally, TNC serves as bird conservation specialist, analyzing and interpreting appropriate existing public data regarding waterbird nesting, foraging and migratory distributions on the seaside. TNC provides the Project Team with recommendations for which areas are most sensitive to what types of disturbances and at what times of year.

The broader SAMP Strategy Project Team on this effort is lead by the Virginia CZM Program and includes VIMS, VMRC, Virginia Eastern Shorekeeper and Terry Brothers Seafood. The Virginia CZM Program Manager heads the project, providing leadership, guidance and continuity of purpose with previous Seaside initiatives, especially the Seaside Heritage Program. The Phase 2 grant proposal (FY 2009) was submitted to NOAA in March 2010 and is further refining and field verifying spatial data, engaging in wider stakeholder/sector contacts and interviews, defining and mapping a matrix of preferred stakeholder/sector/resource uses, and examining alternative spatial configurations and allocations. The Phase 3 grant proposal will be submitted at a later date, after evaluation of spatial data, stakeholder/user input and collaboration with Project Team members.

Fourth, the "Recreational Use Survey & GIS Layer" project, conducted by the Virginia Eastern SHOREKEEPER®, Inc., is developing spatial data for recreational use, based on existing and

new data being collected by the Shorekeeper. Data collection techniques include written surveys of recreational users as well as aerial surveys. This project began in fall 2009 capturing recreational use of the Seaside over the Labor Day weekend and will extend through the summer 2010 season.

Fifth, the "Spatial Information Analysis and & Interpretation for Shellfish Grounds and SAV Beds" project, conducted by Virginia Institute of Marine Science from October 2009 to March 2010, evaluated the current status and trends related to:

1. productivity of natural oyster beds in the seaside bays, including the effectiveness of restoration efforts over the past 15 years;
2. productivity and habitat utilization by shellfish aquaculture, including potential growth areas;
3. restoration of submerged aquatic vegetation, along with future restoration targets; and
4. loss of habitats due to erosion, subsidence, channel diversion and island movements.

These evaluations use existing geo-spatial data layers, aerial photography, field ground-truthing data and input from experts and stakeholders. VIMS is producing geo-spatially referenced data that will be used to produce draft maps reflecting current and potential use within the coastal bays for native shellfish restoration (including sanctuaries and shellfisheries enhancement), shellfish aquaculture and submerged aquatic vegetation (SAV) restoration. These maps will include demarcation of areas currently designated for uses that have now become inappropriate due to environmental change (e.g., former oyster grounds that are no longer viable as a result of 1.5 ft of sea level rise since their original survey). VIMS will also coordinate with TNC to include data related to water bird nesting, foraging and migratory distributions, and with the Shorekeeper to include recreational use data in the region. The maps resulting from this initial phase show areas of overlapping and competing projected uses by the various activities and designations in the seaside bays.

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 (for Seaside SAMP only)	**Type of gap or need** (regulatory, policy, data, training, capacity, communication & outreach)	**Level of priority** (H,M,L)
Natural Resource Data Synthesis	Data	H*
Public Access and Aquaculture Data Synthesis	Data	H*
GIS Analysis	Data	H*
Stakeholder Engagement	Capacity, Policy	H*
Locality preparedness	Communication & Outreach	H*

Outreach	Communication & Outreach	H*
New spatial management policies	Regulatory, Policy	H*

* The Virginia CZM Program recognizes that all needs listed above have been assigned a high ranking. SAMP will be addressed through the Seaside SAMP strategy and will therefore receive prioritization of needs and/or information gaps through implementation of this strategy.

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 _____

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

The interagency Coastal Policy Team reviewed and ranked this issue at its February 17, 2010 meeting according to the following criteria: feasibility; importance and appropriateness. Up to 5 points were allotted to each of the three criteria so that a maximum score would be 15. Scores from 0-4.99 are considered low priority; 5–9.99 is medium priority and 10-15 is high priority. Special area management planning received a score of 12.11.

2. Will the CMP develop one or more strategies for this enhancement area?

   Yes ✓
   No _____

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

A Seaside SAMP Strategy will be developed that continues the effort begun in fall 2009. The initial effort in the 2006 – 2010 5 Year Section 309 Strategy focused on data collection and analysis. The continued effort through FY 2011 and 2012 will focus on generation of management options, public input on those options and promotion of adoption of the most politically feasible and optimal option.

2000 Assessment		2005 Assessment		This Assessment (2010)	
High	✓	**High**	✓	**High**	✓
Medium		Medium		Medium	
Low		Low		Low	

Ocean Resources

Section 309 Enhancement Objective
Planning for the use of ocean resources

Resource Characterization
Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. In the table below characterize ocean resources 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**
Critical Ocean Habitats: cold water corals, canyons, migration corridors, sand shoals)	Damage from ship traffic, fishing gear, energy project exploration, construction and operation	H	As offshore activities increase, habitats are more likely to be damaged. Climate change may result in shifts of habitat locations and ocean acidification may destroy corals
Fisheries	Habitat loss, overfishing, expansion of caged aquaculture, excess capacity in fisheries	H	Water quality, secondary impacts on watersheds, habitat loss, alternative energy infrastructure siting, climate change
Energy Development Projects: Wind, Oil & Gas	Withdrawal of federal moratorium on offshore oil and gas development	H	Potential offshore natural gas development; increased demand for domestic oil. Two major wind farms have been proposed off Virginia's coast. Proper siting is critical.
Sand	Impact to sand resources exists due to mining (efforts are taken to identify areas for mining with the least impact on benthic and fishery resources).	M	Severe storms may increase need for sand dredging for beach nourishment which could have associated benthic and fishery resource impacts

2. Describe any changes in the resources or relative threat to the resources since the last assessment.

Habitat loss

Habitat necessary for fish, bird, marine mammal and sea turtle breeding, foraging and migration is under threat from coastal development, secondary impacts on watersheds, sand mining, dredging, trawling, shipping, and infrastructure for oil and gas extraction, and wind and hydrokinetic energy. Current and potential use conflicts abound. Deep sea or cold water corals have been recently identified in the Mid-Atlantic Ocean and need to better mapped and protected. In addition, while the offshore canyons are known to provide important habitat for various marine species, more needs to be known about them before additional human uses are allowed in those areas. Since the last assessment, researchers have found even more evidence of the importance of the Virginia coast, particularly the Eastern Shore, to migratory birds. Of particular note is the recent work on red knots and whimbrels which are heavily relying on the Eastern Shore as a stopover habitat where they feed and gain significant weight to fuel their incredibly long migrations to points as far as Alaska and Tierra del Fuego, South America. Much more research is needed to truly understand their migration routes and their habitat needs to ensure these bird populations' precipitous declines do not continue.

Overfishing

Overfishing remains a threat to some fisheries, while in others, incomplete data provide only a vague picture of what is happening in a population. Safeguards are in place to prevent overfishing theoretically, but between incomplete data, complications caused by multi-jurisdictional management responsibility, enforcement difficulties and economic drivers, sustainable harvesting is not a guarantee.

Expansion of caged aquaculture

Use conflicts arise between recreational boaters and waterfront property owners who find shellfish aquaculture cages unsightly, and a threat to navigation, however this activity is usually conducted near shore, not out in the open ocean. (*For more information, see Aquaculture assessment.)* Depending on the scale and type of aquaculture, other types of user or ecological conflicts may occur. Shellfish aquaculture may provide ecological benefits, including water filtration. Cultivation of shellfish or macroalgae in cages tied to energy project structures may provide additional value to an energy development project.

Excess capacity in the fisheries

Currently, some fisheries have high levels of excess capacity (such as blue crabs, summer flounder, sea scallops). Excess capacity jeopardizes the economic viability of fisheries and can lead to overfishing. A fishery disaster was declared in the Chesapeake Bay blue crab fishery by the U.S. Secretary of Commerce in 2008 and Virginia is now administering a NOAA program to buy back commercial crabbing licenses. In November of 2009, the Virginia Marine Resources Commission bought back 359 commercial crab licenses in order to aid the species

rebuilding effort. The license buyback translated to 75,441 crab pots taken out of use, and almost 20% reduction in the overall number of pots. Additionally, the New England Fishery Management Council is taking action to address excess capacity in the sea scallop fishery in Amendment 15 to the fishery management plan by considering options to allow permit stacking and leasing.

Future Threats

Energy infrastructure

The federal moratorium on oil and gas development in the Mid-Atlantic was lifted in 2006, which could present a threat to fisheries, cold-water corals and other marine life from exploration techniques, direct damage and potential oil spills. Governor McDonnell came into office in January 2010 and has expressed his interest in offshore oil and gas development. Interest and plans for developing alternative energy infrastructure as a means of reducing greenhouse gas emissions and dependence on foreign oil have greatly increased since the 2005 Section 309 assessment. Wind energy development could have some undesirable impacts on marine habitats and species, including birds, marine mammals and sensitive benthic habitats if they are not appropriately designed, located, and operated. Additionally, offshore wind or hydrokinetic energy development may limit or preclude existing human uses of the ocean including fishing, shipping, recreational boating, and sand mining. Both types of offshore energy development (renewable and non-renewable) would increase maritime traffic which may pose a threat to migrating marine mammals and sea turtles. However turbines and oil & gas rigs can attract fish and increase fishing opportunities. Appropriate siting is key and that will prove difficult without better data than is currently available.

Climate change

Changes to oceans caused by climate change are probably occurring faster than humans are able to react to them. According to the US Ocean Commission's "*An Ocean Blueprint for the 21st Century*," possible future threats include:

- sea level rise, increasing the likelihood of coastal flooding and submergence of coastal wetlands;
- ocean temperature increase, harming species that depend on eelgrass because of reductions in eelgrass which requires colder water temperatures (although this may be mitigated by increased CO2 levels);
- a changing distribution of fish species due to changing ocean conditions;
- increased variability in salinity due to more extreme weather patterns;
- greater stream flows in the winter and spring, increasing the amount of sediment washed into the water and thereby leading to hypoxia; and
- higher CO2 concentrations, promoting the growth of harmful algae such as dinoflagellates;
- ocean acidification, leading to reduced growth rates of shellfish and corals and potential loss of the ability to form a shell or a reef.

Information on specific species

SAVs

In 2005, there was a massive SAV die-off in the Chesapeake Bay, which was attributed to a very warm summer, leading to excessively high water temps that the grasses could not withstand. Eutrophication due to stormwater runoff has also been a stressor on SAV. While the SAV beds are far from restored, there have been some improvements. Between 2007 and 2008, SAV increased by 18%. Restoration efforts have been extremely successful on the ocean side of the eastern shore where there are fewer pollution sources. Collaborative efforts by NOAA, Virginia's Coastal Zone Program, VIMS, VMRC, The Nature Conservancy and hundreds of volunteers have produced the world's largest successful sea grass restoration project. Where seeds have been planted, beds have grown rapidly, with planted areas expanding to over 2,400 acres. The bay side has not fared as well, due to problems with water quality and clarity.

Blue Crabs

The blue crab fishery has been struggling since 1993, having been unresponsive to harvest cuts. Virginia entered into an agreement with Maryland in 2008 in an attempt to reverse the decline. Both states implemented new regulations to close harvesting seasons early and reduce catches of female blue crabs by 34%. Since the regulations took effect June 1, 2008, initial scientific evidence has shown that blue crab populations have increased significantly above the interim biomass target. One year after implementation, blue crab numbers were above the target population threshold for the first time in 16 years. The agreement continued through 2009. This was an important fishery for Virginia to take action on because it is among Virginia's most valuable fisheries. Currently it is a $25 million fishery, although it has historically been as high $60 million.

Habitat loss is a major component of blue crab population decline. Juvenile crabs depend on sea grass beds, which have been dying off since the 1950s due to poor water quality.

Horseshoe crabs

Horseshoe crabs are harvested for use as bait for eel and conch fisheries and also to provide blood for the biomedical industry to produce Limulus Amoebocyte Lysate, an important tool in the detection of contaminants in drugs and medical devices. Due to concerns over the importance of their eggs as an important food source for red knots and other migrating shorebirds on the Atlantic seaboard, the horseshoe crab fishery has been subject to extensive regulation over the last ten years. Current landings and survey data indicate their population status has improved and remained relatively stable over the last five years. The intent of current regulations is to protect horseshoe crabs that have high likelihood of spawning in the Delaware Bay. Harvesting male and female horseshoe crabs is prohibited from January 1 through June 7 in the Delaware Bay, and is restricted to 100,000 males per state from June 8 through December 31. No more than 40% of Virginia's quota may be landed from ocean waters and those landings must be comprised of a minimum male to female ratio of 2:1. The fishery is not completely rebuilt, but is improving.

In order to improve horseshoe crab management, the ASMFC has collaborated with NFWF to establish an Adaptive Resource Management model, which would approach natural resources management from the perspective of managing ecological interactions. The model is currently under peer review, and expected to inform addendum VI of the Interstate Fisheries Management plan for 2010.

Oysters

The wild oyster fishery in Virginia has shown little improvement over the past five years, and has basically collapsed. Two diseases are hurting the population: MSX (caused by the parasite *Haplosporidium nelsoni*) and Dermo (caused by the parasite *Parkinsus marinus*) and both have been found to be more virulent in high salinity, warm, drought conditions. The disease infects oysters more than a year old, but tends to kill them when they are too small to market. There is still some oyster harvesting occurring, though it is currently less than 100,000 bushels per year, compared with annual harvests that were once 3 to 5 million bushels.

In 2007, a blue ribbon panel assembled by the Virginia Secretary of Natural Resources issued a report making several recommendations to restore oyster populations. These included increasing state funding for Virginia Marine Resource Commission oyster restoration efforts to $2.5 million per year, expanding hatchery capacity, training commercial fishermen in aquaculture, implementing a rotational harvest system, creating sanctuaries closed to harvest in perpetuity, and implementing a size limit on harvested oysters. VIMS research has shown that some older oysters are surviving MSX and Dermo, meaning that natural selection may allow the oyster population as a whole to survive. However, this can only occur if the disease-resistant oysters are allowed to reproduce and pass on their genes. Therefore, protecting them from harvest is imperative. There is considerable interest by agency staff and resource stakeholders in finding ways to improve conditions for expanded oyster aquaculture to reduce pressure on wild stocks and provide alternative employment for members of Virginia's fishing communities.

Sea Scallops

Sea scallops are the state's most valuable fishery, and are harvested offshore, in federal waters, so are regulated by the federal government. The use of closed areas in the rotational management strategy has been highly effective at optimizing biological yield in the fishery and reducing effort by maximizing catch per unit of effort.

Menhaden

Regulatory responsibility for menhaden is still under the authority of the General Assembly, which placed a harvest cap on the fishery for the first time ever in 2006 in response to the Atlantic States Marine Fisheries Commission's (ASMFC) management plan. The cap was extended through 2013 with the approval of Addendum IV by the ASMFC. Since the cap was put in place only four years ago, it is too early to determine its effect. The quota was partially intended to prevent the expansion of harvesting, and in this aspect it has been successful. The fishery was not considered to be overfished—the quota was a preventative measure, not one prompted by crisis conditions.

However, that determination was made from a single species perspective. Measuring fishery health from an ecosystem perspective yields different results. Menhaden serve multiple functions in ecosystems—they are filter feeders, as well as an important forage species. Preliminary results from a 2009 VIMS assessment using a multi-species predator-prey model indicated that the fishery still is not overfished, but getting close to the threshold of being overfished. The ASMFC 2010 Action Plan includes goals to work with the scientific community to develop ecological reference points for menhaden, as well as to monitor the fishery for consistency with management parameters and state compliance.

The Chesapeake Bay menhaden research effort, established by Addendum II to the Interstate Fishery Management Plan in 2005 and supported through federal and state resources, continued in 2008. Its goal is to determine the status of menhaden in the Bay, assess whether localized depletion is occurring, and support future menhaden management decisions.

American Shad

The American shad fishery has collapsed and continues to be under harvest moratorium, as it has since the mid 1980s. In 2009, the Virginia Department of Game & Inland Fisheries, US Fish and Wildlife Service, Virginia Marine Resources Commission, Interstate Commission on the Potomac River Basin, and Potomac River Fisheries Commission collaborated on a program to restore American shad. Eggs were harvested from the wild, incubated and hatched in a USFWS facility, then used to stock the James, Rappahannock, and Potomac Rivers.

Black Sea Bass

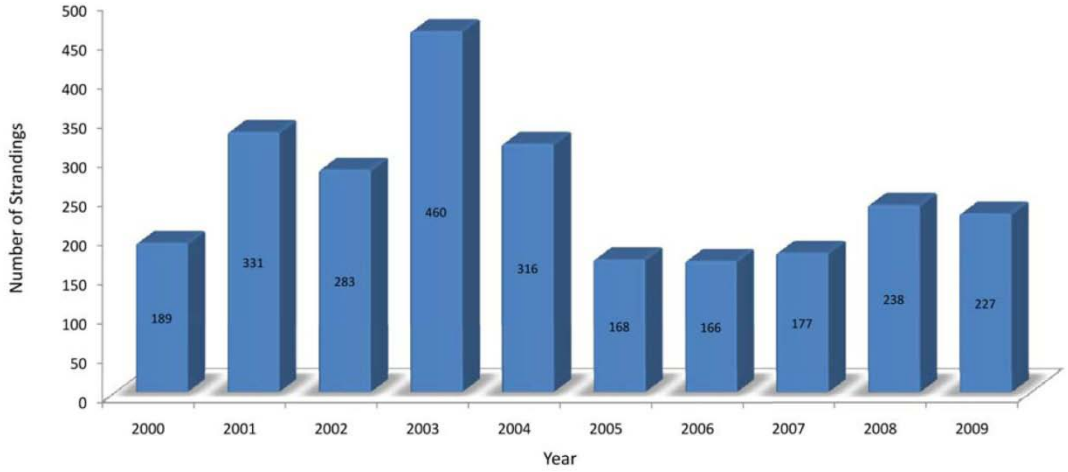
Black sea bass are jointly managed by the Atlantic States Marine Fisheries Commission and the Mid-Atlantic Fishery Management Council. In Virginia, the quota for Black sea bass has been cut every year for the past five years in an effort to rebuild the population to a stable point. The fishery tends to be data poor. Excess harvests have been terminated, and the species was declared rebuilt by the National Marine Fisheries Service in 2008. In November 2009, ASMFC approved commercial quota transfer between states for black sea bass quotas.

Sea Turtles

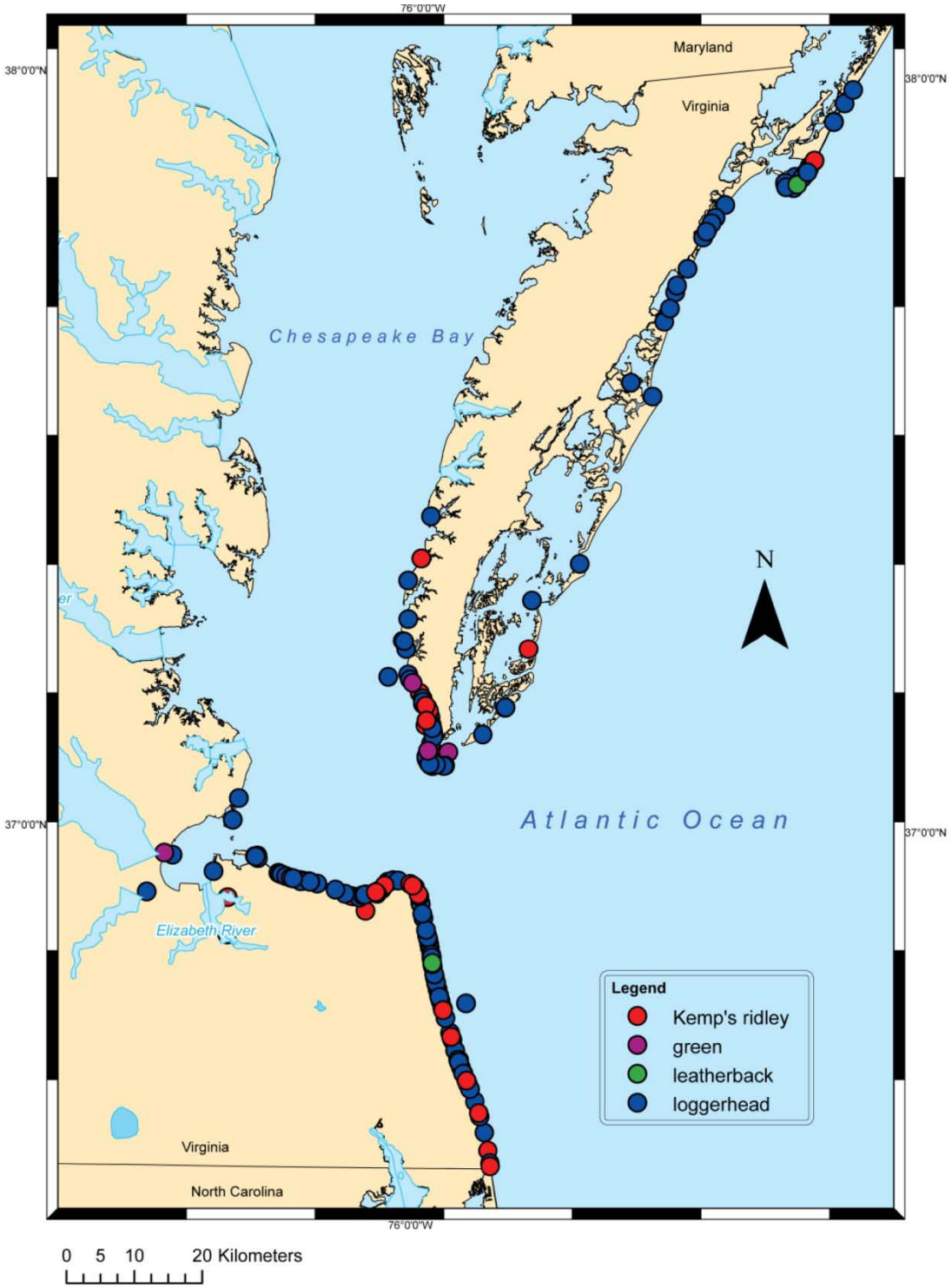
Five of the seven species of sea turtles existing in the world today occur in Virginia's coastal waters and all are on the endangered species list. They are loggerheads (the most commonly found in Virginia), green turtles, Kemp's ridleys, leatherbacks, and an infrequent hawksbill.

Sea turtles still have high levels of mortality. The number of mortalities caused by commercial fishing gear is down because of regulations put in place by NOAA Fisheries. To stop turtles from getting tangled, modified leaders on fixed pound nets and turtle excluder devices in mobile trawl gear are now required. Aside from fishing nets, sea turtles also face threats from ingesting balloons and other floating marine debris, from boat collisions, and the loss of sea grass habitat.

According to the Virginia Aquarium which operates the Virginia Marine Mammal and Sea Turtle Stranding Response Program, “Marine mammal and sea turtle strandings in Virginia were again at high levels during 2009. These remain some of the highest levels per mile of coastline for any state in the country.” In 2005 there were 168 strandings, in 2006 166, in 2007 177, in 2008 238, and in 2009 227 (graph below).



Yearly frequency of sea turtles strandings, 2000-2009. Note: These data do not include information from VIMS, which handles and records strandings from about 15% of Virginia' coastline.



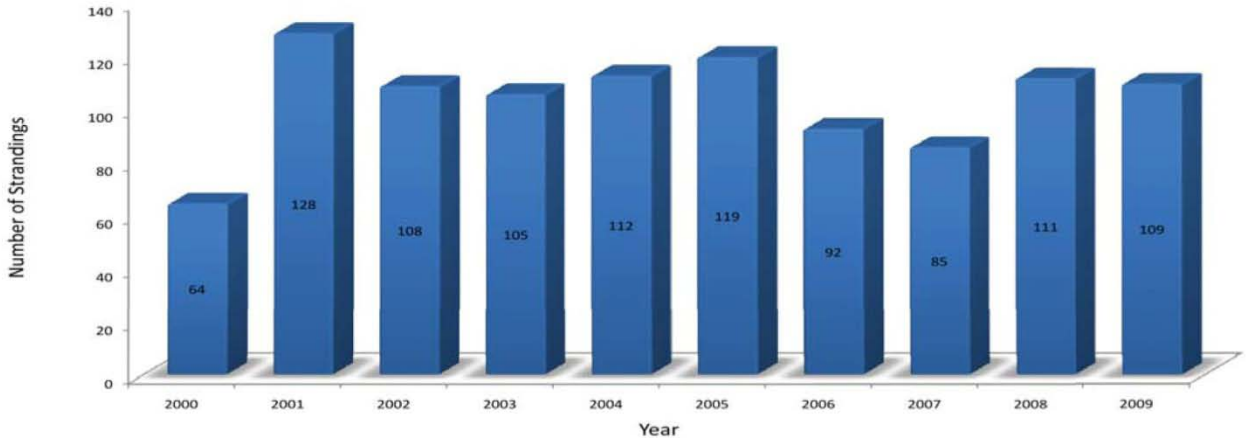
Spatial distribution of sea turtle strandings recorded by the Virginia Aquarium & Marine Science Center Foundation Stranding Response Program in 2009. Note: These data do not include information from VIMS, which handles and records strandings from about 15% of Virginia' coastline.

Marine Mammals

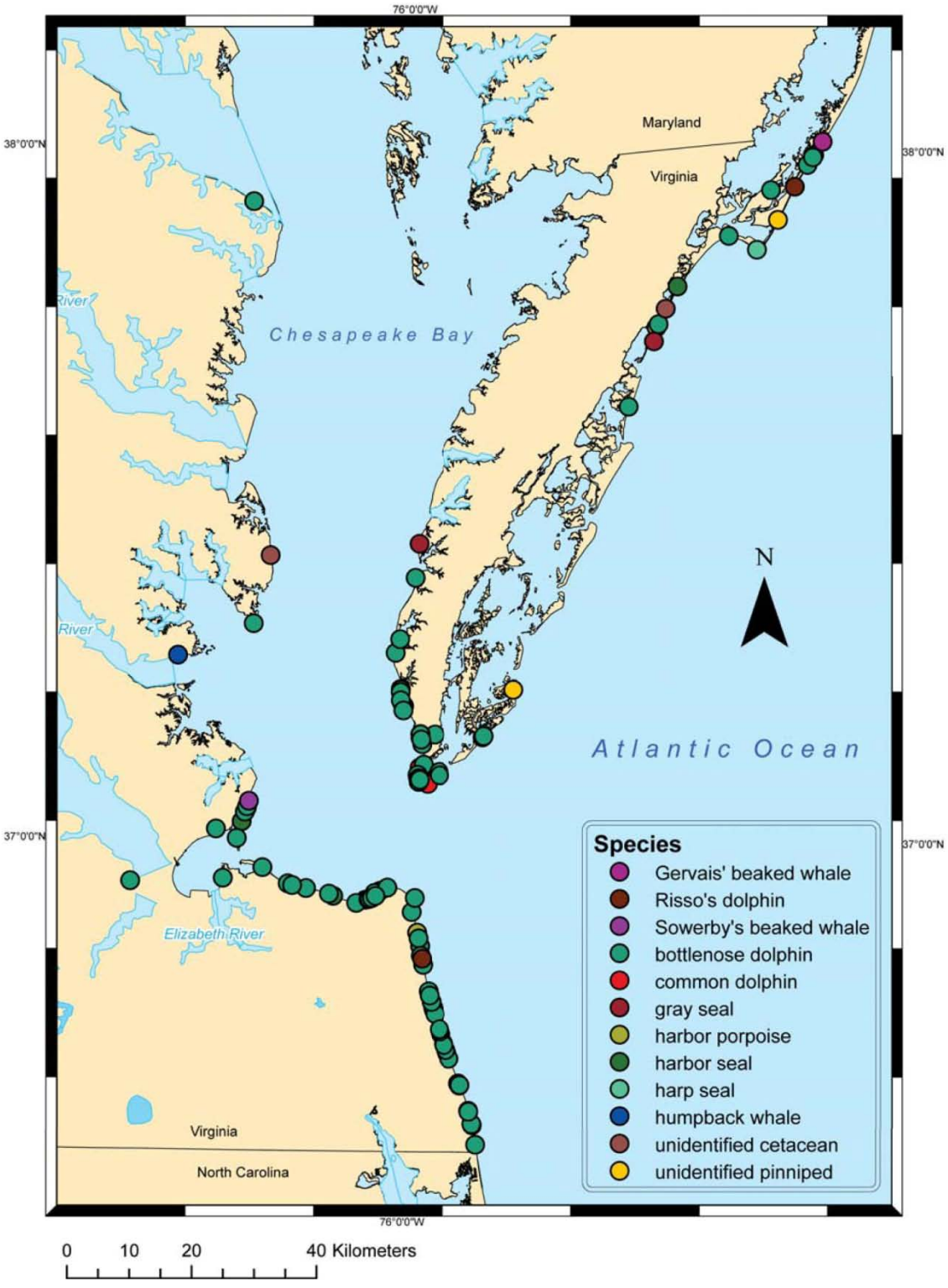
Commercial fishing presents a number of threats to marine mammals: Manatees and large whales are susceptible to vessel strikes and entanglement in nets and buoys lines; seals and smaller cetaceans like dolphins can become entangled in gill nets and discarded fishing line, and through depredation of baited hooks. In order to help mitigate these threats, Take Reduction Teams (TRTs) were established to bring stakeholders together to find ways to lessen the negative impacts of commercial fisheries on marine mammals and sea turtles. TRTs currently in the Marine Mammal Take Reduction Program include: the Atlantic Large Whale TRT, Atlantic Offshore Cetacean TRT, Atlantic Trawl Gear TRT, Bottlenose Dolphin TRT, False Killer Whale TRT, Gulf of Maine Harbor Porpoise TRT, Mid-Atlantic Harbor Porpoise TRT, Mid-Atlantic TRT, Pacific Offshore Cetacean TRT, and Pelagic Longline TRT. These teams meet to discuss gear modifications and fishing practices, and to create Take Reductions Plans, containing specific recommendations.

Another significant change since 2005 is the creation of a speed limitation on shipping traffic, the first of its kind. In 2008, the National Marine Fisheries Service (NMFS) established regulations to implement speed restrictions of no more than 10 knots applying to all vessels 65 ft (19.8 m) or greater in overall length in certain locations and at certain times of the year along the east coast of the U.S. Atlantic seaboard. This speed restriction is intended to prevent collisions with the endangered North Atlantic right whale, of which only 300-400 remain. In Virignia, the restriction is active from December to March 20 miles outside the mouth of the Chesapeake Bay. Measuring effectiveness has been difficult, because it appears that many ships are ignoring the speed restriction.

According to the Virginia Aquarium, which operates the Virginia Marine Mammal and Sea Turtle Stranding Response Program, “Marine mammal and sea turtle strandings in Virginia were again at high levels during 2009. These remain some of the highest levels per mile of coastline for any state in the country.” In 2005 there were 119 strandings, in 2006 92, in 2007 85, in 2008 111, and in 2009 109.



Yearly frequency of marine mammal strandings, 2000-2009. Note: These data do not include information from VIMS, which handles and records strandings from about 15% of Virginia' coastline.



Spatial distribution of marine mammal strandings recorded by the Virginia Aquarium & Marine Science

Center Foundation Stranding Response Program in 2009. Note: These data do not include information from VIMS, which handles and records strandings from about 15% of Virginia' coastline.

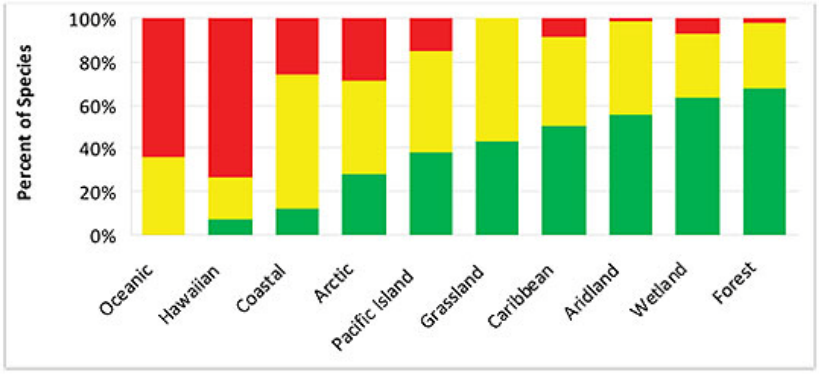
Migratory Birds

Virginia's coast is hemispherically important for migratory shorebirds, waterbirds, songbirds and raptors. Fortunately some of the most important migration corridors and stopover habitats are in conservation ownership. The Nature Conservancy (TNC) owns all or part of 14 of the 18 barrier islands off of Virginia's Eastern Shore, the others are owned by state and federal government agencies. Virginia's Eastern Shore hosts over 250 species of birds throughout the year, including raptors, songbirds, and pelagic birds. Uses in areas outside the conserved lands can present conflicts, such as incompatible agricultural practices and development, incompatible recreation, overfishing, and invasive species. The Virginia CZM Program and others have funded many studies by TNC and The Center for Conservation Biology at the College of William and Mary (CCB) on migratory patterns to help better identify critical stopover locations needed by birds. Studies have shown that Virginia's Eastern Shore is heavily used by migratory birds that migrate as far as Central and South America and the Arctic.

Tracking and studies done by CCB and TNC have uncovered some surprising data about whimbrels. During spring migration, whimbrels congregate in dense gatherings in the barrier island lagoon system of the lower Delmarva Peninsula to feed on fiddler crabs to build up energy reserves before migrating to their breeding grounds. Previously, it had been assumed that whimbrels from the Delmarva Peninsula flew only to the Hudson Bay; tracking revealed that they travel much further. For example, research conducted by the CCB in 2008 uncovered a previously unknown and unexpected migratory route when a whimbrel was recorded flying to Alaska and back.

The red knot is an important species that has been declining in recent years. Since the late 1980s, red knot populations have declined by approximately 90%, which has led to an application to the US Fish and Wildlife Service for fast track consideration for federal listing under the Endangered Species Act. The Delaware Bay is an important stopover for red knots, where they rely on horseshoe crab eggs for food. However, egg density is declining, leading to higher mortality in adult red knots. Surveys conducted by the CCB and TNC from 2005-2008 have shown that the Virginia Barrier Islands are more important to the species' survival than previously realized. Here, red knots do not eat horseshoe crab eggs, raising questions about red knot conservation efforts. Red knots are also the prey of peregrine falcons, which puts additional pressure on their population.

Relative Vulnerability of U.S. Bird Species by Habitat



Red=high vulnerability Yellow=medium vulnerability Green=low vulnerability

Source: http://www.stateofthebirds.org/summary

Bird Species Vulnerability

Many of the coastal species that show medium or high vulnerability to climate change are coastal seabirds. These species are vulnerable to climate change because they rely on marine food webs and because they have low reproductive potential. Beach-nesting Black and American oystercatchers and specialized Saltmarsh sparrows are among the most vulnerable coastal birds because they rely heavily on limited, low-elevation coastal habitats. Virginia's coast is particularly important for American oystercatchers and Saltmarsh sparrows.

Oil and Gas

In 2005, the Virginia General Assembly ordered a study on the possibility of offshore exploration for natural gas. The report from this study was released in January 2006. Later in 2006, the Virginia General Assembly stated its policy toward offshore natural gas exploration for the first time in Title 67-300 of the Code of Virginia, which supports offshore exploration for gas in areas further than 50 miles from the coast. In 2008, the federal moratoria on new offshore oil and gas development were lifted. An area off Virginia's coast is the only proposed location in the Atlantic for oil and gas development under the 2007-2012 Outer Continental Shelf Leasing Program. For more details on oil and gas, see the *Energy and Government Facility Siting* section.

Sand

Sand resources may become more and more valuable as sea level rises and the demand for beach renourishment increases. When siting wind farms, it will be important to determine the compatibility of extracting sand resources in the vicinity of offshore wind farms.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

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: Intra-governmental coordination mechanisms for Ocean management**

Management categories	**Employed by state/territory** (Y or N)	**Significant changes since last assessment** (Y or N)
Comprehensive ocean management plan or system of Marine Protected Areas	Y	Although Virginia has no comprehensive state ocean management plan, the Virginia CZM Program nominated sites for inclusion in the National System of Marine Protected Areas and seven were approved for inclusion. These are the blue crab sanctuary, 4 waterfront Natural Area Preserves and 3 waterfront State Parks
Regional comprehensive ocean management program	Y	Virginia joined MD, DE, NJ and NY to form the new Mid-Atlantic Regional Council on the Ocean. The five governors agreed to action items dealing with habitat protection, renewable offshore energy, climate change and water quality
Regional sediment or dredge material management plan	N	N
Intra-governmental coordination mechanisms for Ocean management	Y	The Mid-Atlantic Regional Council on the Ocean established 6/2009

Single-purpose statutes related to ocean resources	Y	Restrictions on Horseshoe crab harvest, establishment of Menhaden harvest cap, limitation on ship speeds
Comprehensive ocean management statute	N	
Ocean resource mapping or information system	Y	Work is just beginning to add ocean resource data layers to Virginia CZM's Coastal GEMS internet mapping system and in 2009 Virginia CZM funded The Nature Conservancy to produce a map of Mid-Atlantic "ecological Marine Units"
Ocean habitat research, assessment, or monitoring programs	Y	NEAMAP and Ecosystem-based management, Take Reduction Plans and monitoring
Public education and outreach efforts	Y	MARCO website, Virginia CZM website and magazine, VMRC citizen advisory committees

Intra-governmental coordination mechanisms for Ocean management

MARCO

The Mid-Atlantic Regional Council on the Ocean brought together governors from New Jersey, New York, Delaware, Maryland, and Virginia in June 2009 to coordinate state action on coastal issues. Four categories of action were identified, with specific objectives identified for each:

Habitat protection: 1) Protect the region's major offshore canyons from harmful or damaging activities. 2) Identify other key Mid-Atlantic habitats and migratory pathways at risk from harmful or damaging activities and seek appropriate protection measures. 3) Create a regional internet mapping system to identify for decision-makers those areas which may be ecologically compatible or incompatible with certain activities due to the presence of key habitats. 4) Create Mid-Atlantic marine habitat protection and restoration policies to guide the management of key priority habitats and habitat types.

Offshore renewable energy: 1) Develop and finalize shared research and monitoring protocols for assessing the construction and operations impacts of energy development on ocean and coastal resources, and identify appropriate opportunities for integration into permitting conditions. 2) Define regulatory steps, time frames, and potential barriers to the development of the region's offshore renewable energy resources and identify appropriate coordinating measures. 3) Complete a comprehensive offshore use map and decision-support tool to facilitate siting of renewable energy projects to minimize adverse impacts to other ocean users and ecological communities.

Climate change: 1) Identify key infrastructure that is vulnerable to sea level rise and increased flood hazards at a coarse scale. 2) Acquire the data needed to assess regional vulnerability to climate change and sea level rise impacts to infrastructure and coastal habitats. 3) Create a regional/national GIS server to store and deliver the data needed to plan/make decisions. 4) Facilitate information exchange regarding infrastructure vulnerability and coastal habitat and shoreline management. 5) Initiate sea level rise adaptation measures to collectively reduce the region's vulnerability to climate change and sea level rise.

Water quality: 1) Promote greater and smarter federal investments for infrastructure upgrades to region's wastewater treatment infrastructure. 2) Reduce the amount of human-derived debris and floatables that enter waterways and the ocean. 3) Improve delivery and expand data collected on water quality to better predict impairments and assess the effectiveness of efforts to improve water quality. 4) Develop an agenda to address atmospheric sources of nitrogen and toxins that contaminate the region's marine waters.

Bi-state Fishery Management Plans

Virginia and Maryland have collaborated on fishery management plans for blue crab, striped bass, summer flounder, and bluefish. Virginia has also cooperated with Maryland on oyster issues, including an Environmental Impact Statement to look at the introduction of a nonnative species of oyster. The EIS prepared by the US Army Corps of Engineers concluded that nonnative oysters should not be introduced.

Single purpose statutes related to Ocean resources

Magnuson-Stevens Reauthorization Act of 2006

The reauthorization created new requirements for fisheries managers. Catch limits are now set by councils and scientific committees, whereas before councils would set quotas using the best available science. Scientific committees are now much more central to the decision-making process. Accepted Biological Catch numbers cannot be exceeded.

Menhaden harvest cap

Most rules concerning fisheries come from regulations, not laws, but legislation was employed to put a harvest cap on Menhaden in 2006, due to expire 2010.

Ocean habitat research, assessment, or monitoring programs

Northeast Monitoring and Assessment Program (NEAMAP)

NEAMAP grew out of an Atlantic States Marine Fisheries Commission resolution in October 1997 to begin development of a coordinated fisheries-independent sampling program in the Northeast region. The initial focus of NEAMAP is on nearshore trawl surveys, which provide important information for the completion of more accurate stock assessments. There are currently several states that conduct long-term trawl surveys in nearshore areas, and the National Marine Fisheries Service conducts a bottom trawl survey in federal waters. However, there are sampling gaps in Atlantic waters. Current NEAMAP projects focus on filling gaps in trawl survey coverage and facilitating the exchange of information through the Trawl Swap Program.

Improvements in the collection of fisheries-independent data and linkage of these data to fisheries dependent data will provide long-term improvements in Atlantic coast fisheries management. NEAMAP is working to help coordinate and disseminate partners' fisheries-independent data as well as to develop a plan for collecting new data through the NEAMAP program.

Ecosystem Based Fisheries Management

Chesapeake Bay managers, supported by Maryland Sea Grant, are exploring the development of Ecosystem Based Fisheries Management Plans for five species (Menhaden, American Shad, Blue Crabs, Striped Bass, and Eastern Oysters), a shift away from the long-used single species management plans. Begun in 2009, the project will create issue briefs on topics pertinent to each species by early 2010, which will form the basis of their management recommendations.

Ocean resource mapping or information systems

"Ecological Marine Units": Benthic Habitat Classification System

The Nature Conservancy has undertaken a two-year project to establish a publicly available baseline of marine spatial data that includes geophysical, biological and some human use information. A new benthic habitat classification system that integrates biological and physical data to define "ecological marine units" was created with funding assistance from the Virginia CZM Program. Additionally, with CZM funding, TNC produced maps showing important areas of particular relevance to Virginia for eight species.

MARCO Online GIS mapping portal

Virginia CZM initiated and is funding a project with MARCO and The Nature Conservancy to create an internet mapping system (based on Coastal GEMS) which can display ocean data layers for the entire Mid-Atlantic. Enhanced access to marine data and eventually decision support tools, will inform regional scale marine spatial planning and provide a framework to support ecosystem-based management approaches.

Commercial harvest monitoring systems

Fishermen are required by law to report catches, including information on what they caught and when, the fishing gear used, and the number of people in their crew. This information goes into a database which can be used to spatially map recreational and commercial catches. It is used to track the status of populations, and evaluate the effectiveness of management measures. To ensure accurate reporting, the database is complemented by an extensive auditing system. Fishermen keep their own extensive records. Buyers are required to keep records. Combined with law enforcement reports, 85% of harvests are accounted for.

Public education and outreach efforts

MARCO website

The Mid-Atlantic Regional Council on the Ocean established a website in June 2009 in conjunction with the signing of the Mid-Atlantic Governors' Ocean Conservation Agreement. There was also a press event as part of the June Summit. The website is hosted by the New Jersey CZM Program and can be viewed at: www.midatlanticocean.org .

Virginia CZM website and magazine

The Virginia CZM Program also hosts a website with MARCO information which can be viewed at http://www.deq.virginia.gov/coastal/ocean.htm . A 2010 edition of the Virginia CZM magazine will contain an article on ocean issues.

VMRC citizen advisory committees

VMRC has many citizen advisory committees, which engage in public outreach when changes to fisheries management plans are made. There are committees for oysters, clams, finfish, and blue crabs, and are each made up of about 20 recreational and commercial fishermen.

Other

Non-binding technical advice on LAPs (Limited Access Programs)

NOAA issued a technical memorandum on LAPs in 2007. LAPs confer privileges to an individual, community, or region to catch a set amount of fish.

Minerals Management Service Taskforce

Significant changes are taking place in identifying areas in state and federal waters for offshore wind resource areas, and this could have multiple impacts on ocean resources. Recently MMS established a task force of local, state and federal officials to identify issues with wind development in federal waters off Virginia Beach.

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;

   c) Characterize the outcomes and effectiveness of the changes.

The most significant change affecting ocean resources has been the creation of MARCO. This is a CZM-driven change. Although MARCO is relatively new (created in 2009), the organization has already held a summit with representatives of the governors from all of the participating states, where the Ocean Conservation Agreement was signed. This agreement outlined goals and objectives to be formulated into an action plan with deadlines. A stakeholder workshop was held in December 2009. MARCO Management Board meetings were held in May 2010 and August 2010. The August meeting included a day of meetings with federal agency representatives including NOAA, EPA, USFWS, USGS, Coast Guard and ACOE. It is still too early to judge the effectiveness of the creation of MARCO.

Descriptions of other changes are also included in the table above.

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.

Gap or need Description	**Type of gap or need** (regulatory, policy, data, training, capacity, communication & outreach)	**Level of priority** (H, M, L)
Lack of habitat/biological data, leading to an incomplete knowledge of ocean habitats (including canyons, corals, sand shoals and migration corridors for marine mammals, sea turtles and birds) and what level of human uses are compatible with their protection. These types of data layers need to be added into the state's Coastal GEMS portal and the new MARCO regional portal.	Data	H
Lack of human use data, leading to an incomplete knowledge of favored fishing locations, boat traffic patterns and other uses and whether or not these uses are compatible with habitat protection and energy development. These types of data layers need to be added	Data	H

into the state's Coastal GEMS portal and the new MARCO regional portal.		
Need to engage in comprehensive marine spatial planning that allows an ecosystem-based management approach to accommodating various future uses such as energy production, conservation, recreation, shipping, military activities, etc.	Data, communication and outreach, policy	H
Need staff to assist with new MARCO efforts	Capacity	H
Need to complete a comprehensive assessment and inventory for sand resources in Virginia. This could entail compiling sand resource assessments and data from the last 20+ years, and creating comprehensive GIS-compatible maps and data layers. This mapping information is needed for future planning of beach nourishment and other activities, including identifying past and future dredging areas. Need to identify the potential impacts from sand mining activities across the coastal zone.	Data, communication and outreach	M to H
Need to better understand and prepare for impacts of climate change on ocean resources, particularly ocean acidification	Data, regulatory, communication and 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 __✓__
   Medium _____
   Low _____

   Briefly explain the level of priority given for this enhancement area.
   The interagency Coastal Policy Team reviewed and ranked this issue at its February 17, 2010 meeting according to the following criteria: feasibility; importance and appropriateness. Up to 5 points were allotted to each of the three criteria so that a maximum score would be 15. Scores from 0-4.99 are considered low priority; 5–9.99 is medium priority and 10-15 is high priority. Ocean Resources received a score of 10.41.

2. Will the CZM Program develop one or more strategies for this enhancement area?

   Yes __✓__
   No _____

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

Ocean Resources reached a high priority status for the first time this year. This was largely driven by the Pew Oceans Commission and US Ocean Commission reports, the formation of the Mid-Atlantic Regional Council on the Ocean and most recently the July 2010 Executive Order containing the Final Framework for Coastal and Marine Spatial Planning. Given the state of the oceans and the increasing demand on them for new uses such as energy development, the time was deemed appropriate for a 5-year strategy on ocean resources.

2000 Assessment		2005 Assessment		This Assessment (2010)	
High		High		**High**	✓
Medium	✓	**Medium**	✓	Medium	
Low		Low		Low	

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

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

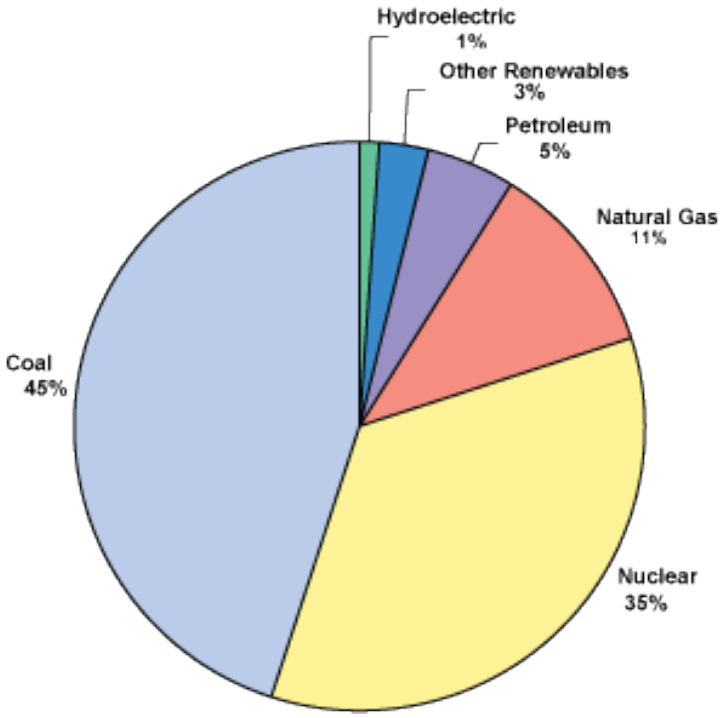
1. **In the table below, characterize the types of energy facilities in your coastal zone (e.g., oil and gas, Liquefied Natural Gas (LNG), wind, wave, Ocean Thermal Energy Conversion (OTEC), etc.) based on best available data. If available, identify the approximate number of facilities by type.**

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	No production facilities exist. The Yorktown refinery is located along the York River (with access to the Chesapeake Bay) and has a throughput capacity of 70,000 barrels of crude oil per day.[19]	Y	Y	Yes – federal moratorium on offshore oil and gas development lifted; proposed Lease Sale 220 (the name it is referred to by the Minerals Management Service) in federal waters off VA shore potentially beginning in 2011 or 2012.
Pipelines	Y	N	Y	Yes – Hampton Roads Crossing natural gas pipeline started operation in December 2009.
Electric transmission cables	Y	Y	Y	Yes – Discussions have started about offshore electric transmission cables for offshore wind and upgrades to the on-shore transmission system.

[19] From the website: http://www.wnr.com/Refining.aspx

LNG	No production facilities; one on-shore storage facility; LNG tankers pass through state waters	N	N	N
Wind	N (although there are measuring towers at Quinby and at Port Isabel near Tangier Island and on the Chesapeake Bay Light tower.)	Y 2 major offshore wind developers are seeking leases about 12 miles off of Virginia Beach	Y	Y
Wave	N	N	Y	N
Tidal	N	N	Y	N
Current (ocean, lake, river)	N All hydro facilities are in the Piedmont or farther west.	N	Y	N
OTEC	N	N	N	N
Solar	Y	Y	Y	Y
Other: Algae bio-fuel			Y	Y
Other: Energy Efficiency and conservation	Y	Y	Y	Significant opportunity to increase utilization of energy efficiency and conservation efforts across the state and the coastal zone

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.



*This graphic is provided to offer a baseline for **electrical power generation in Virginia in 2005** for comparison with assessment information below, and is the most current graphic available from DMME. Total = 78,943,045 megawatt-hours.*[20]

Wind

Wind and biofuels are actively emerging as viable energy sources throughout Virginia. Currently wind development is being sited onshore and nearshore, and the potential for offshore wind development continues to be recognized as significant. Extensive research is currently taking place regarding offshore wind potential. New wind facilities include one to two wind turbines being constructed at Port Isabel near Tangier Island in the Chesapeake Bay, and two companies have requested leases for offshore wind turbines in federal waters. It would likely be several years before these wind energy projects would be constructed (see the section below under *Management Characterization* for additional information on this topic).

The Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) formed a taskforce of federal, state and local government officials on December 8, 2009 to manage the offshore wind leasing process. The Virginia Marine Resource Commission (VMRC) is looking at the potential for renewable energy, particularly wind, in state waters in Virginia (see the

[20] From the website: http://www.dmme.virginia.gov/DMR3/energyresources.shtml

section below under *Policies* for additional information on this topic). At the same time, there is a new Governor's Task Force to look at commercial offshore wind development opportunities in Virginia.

There is a growing market for small residential and commercial-size wind systems, and there is a strong potential for community-scale projects of 1 to 5 megawatts in state waters in Virginia. Areas along the coastal zone have a stronger potential for wind systems than inland areas.

Coal

As a whole, a significant amount of coal is shipped in and out of the Port of Hampton Roads at Norfolk. On the facility side of coal, Old Dominion Electricity Cooperative has proposed a new 1,500 megawatts coal fired power plant in Surry County, which would be Virginia's largest coal-burning plant. Concern has been expressed over this plant, particularly around expanding the use of coal and its associated environmental impacts instead of increasing the use of renewables in the state, and around maintaining air quality standards in the Hampton Roads area. The region may currently be at the limit for air quality attainment, and there are concerns that if the plant is constructed and air quality standards are no longer met, transportation funding could be limited for the region.

Regarding coal exports and imports, changes are taking place at some terminals which could affect their ability to serve as a conduit for imported coal to power plants, including to Dominion's Chesapeake Gap and Chesterfield facilities. The amount of coal exported through Hampton Roads has fluctuated over the last five years, and will be determined by the broader economic recovery and demand overseas. The coal market will be affected by carbon regulations as a whole, but the impact on the Hampton Roads region will be indirect.

Biomass/ biofuels

There may be some biomass development in the coastal region, both in direct electricity production and an increase in wood pellet production for export and domestic use. Additional biomass energy techniques are currently in research and development, such as growing algae as a water quality improvement strategy, with the algae used to produce liquid fuels or a solid coal-substitute fuel product. (See below under *Research* for additional information on this topic).

Nuclear

Dominion Nuclear applied to the Nuclear Regulatory Commission (NRC) for an Early Site Permit to reserve sites to add two reactors to its current two-reactor North Anna Power Station facility in Louisa County (while the current site in Louisa County is outside the Coastal Zone, the North Anna is a coastal river). A Draft Environmental Impact Statement (DEIS) was submitted that considers three additional sites for the expansion, one in Virginia at the existing Surry Power Station along the James River. This permit would reserve the selected expansion site for up to 20 years, and potentially allow site preparation and preliminary construction.

The Commonwealth completed reviews of the Draft Environmental Impact Statement (March 3, 2005) and Supplement to the DEIS (September 8, 2006) for the NRC Early Site Permit at the North Anna Power Station in Louisa County. Virginia's review of the Federal Consistency Certification for the ESP was completed on November 21, 2006. The Commonwealth conditionally concurred with the consistency certification provided Dominion obtain and adhere to all applicable permits and conduct an Instream Flow Incremental Methodology study (IFIM). The IFIM was completed and on October 28, 2009 a MOA between Dominion and the Department of Game and Inland Fisheries was signed committing Dominion to funding for the restoration and enhancement of the North Anna and Pamunkey River watersheds should the new Unit 3 be constructed.

On March 18, 2009, the Office of Environmental Impact Review submitted the Commonwealth's response to the Draft Supplemental Environmental Impact Statement prepared by the NRC for the Combined License (COL) for the proposed Dominion Virginia Power North Anna Power Station Unit 3. A Federal Consistency Certification has not been submitted for the COL. Currently, Dominion has not made a final decision on whether to pursue the new reactor construction.

Infrastructure

Various electrical transmission lines have been built in the coastal areas in recent years. One of the biggest proposed lines is under the Potomac River and the Chesapeake Bay, the MAPP (Mid-Atlantic Power Pathway) line, which has been controversial due to concerns over loss of farm land, potential impacts to forests, viewsheds and property values, health and safety risks, loss of open space and public areas, impacts to Native-American sites and rare, and threatened and endangered species. The proposed line would run from Possum Point, Virginia, near Fredericksburg, and then run east to Maryland before going out to the ocean, eventually returning onshore at New Jersey. There is an additional electrical transmission line crossing under the York River from York County to Gloucester.

Two companies are discussing developing a North-South electrical cable to link offshore wind projects together which would run from North Carolina and Virginia to New York and New Jersey. This line would be a shorter transmission line to the grid for transporting wind energy.

There is a Natural Gas Pipeline crossing Hampton Roads from Newport News to Craney Island in Portsmouth. Additionally, there is a planned expansion at Cove Point, Maryland by Dominion Power for an existing liquefied natural gas (LNG) import facility. With regard to the proposed expansion at Cove Point, on July 2, 2008 the Commonwealth responded to a Draft Supplemental Environmental Assessment and Federal Consistency Certification prepared by the U.S. Coast Guard for LNG Ship Transit in United States Waters (Chesapeake Bay). Virginia noted that it has no objection to the proposed increase and found it consistent with the enforceable policies of the VA Coastal Zone Management Program.

Additional infrastructure will be needed to support new wind energy projects, including transmission cables. Currently, the state has the opportunity to attract new wind-energy related businesses with the anticipated expanded markets for wind-energy production in the state, and an

increase in manufacturing capacity will enhance this potential. There is a need to increase the capacity for creating infrastructure, manufacturing, and installation components for renewable energy projects that will be developed in Virginia's coastal zone in the near future. The capacity for high-voltage wind facilities to tie into the grid is being examined, particularly in looking at what the highest capacity to tie into the grid is, and upgrades that would be needed. The city of Virginia Beach is looking at adaptive reuse of vacant industrial properties to build wind farm components including turbines and blades, such as the Ford plant in Norfolk as it has deep water access. According to the 2007 Virginia Energy Plan, General Electric has a facility in Salem that makes turbine components.

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.

Oil and Gas

On October 1, 2008, the federal Outer Continental Shelf (OCS) Moratorium on offshore oil and gas exploration expired. The Minerals Management Service (MMS) of the U.S. Department of Interior (DOI) is in the process of considering a lease-sale of lands off the Virginia Coast for the purpose of oil and gas exploration and eventual production. The sale was first listed in the last five year plan. In January 2009, public responses to the notice of information were received and a general scoping for an environmental impact statement will soon be issued. The BOEMRE estimates that this area may contain 130 million barrels of oil and 1.14 trillion cubic feet of natural gas.

Currently, DOI is also updating its five-year plan for 2010–2015 under the Outer Continental Shelf Land Act (OCSLA). Secretary of Interior Ken Salazar suspended the update process to receive public comment and review the policy regarding offshore oil and gas development. Secretary Salazar has stated he will issue the results of this analysis and a decision on whether, and if so how, to proceed with the new 5-year plan, including Virginia Lease Sale 220, during the summer of 2010.

While Virginia has stated its support for gas exploration only, the MMS authorizes lease-sale for both oil and gas together. In the past, Virginia legislators and others have discussed the possibility of the Commonwealth receiving revenue from the lease-sale, but Congress has recently rejected legislation that would allow states to share in the revenue. Currently, the leasing of exploration and development rights off the Virginia coast is scheduled for 2011.[21]

In 2005, the Virginia General Assembly commissioned a study on offshore natural gas exploration. As a result, the report "Study of the Possibility of Exploring for Natural Gas in the Coastal Areas of the Commonwealth" was released in January 2006. The 2006 Virginia General Assembly passed Title 67-300 of the Code of Virginia, which enumerated state policy toward offshore gas for the first time. The Title supports exploration for natural gas only, in areas no

[21] Information from the Virginia Conservation Network website: http://www.vcnva.org/anx/index.cfm/1,284,0,0,html/Offshore-Drilling

closer than 50 miles from the shore. In March 2010, the General Assembly passed HB787, which changed this policy so that both exploration and production, for both oil and gas, are now allowable. The new legislation maintains the stipulation that these activities must occur at least 50 miles from the shore.

Governor-elect Robert McDonnell sent a letter on December 23rd, 2009 to U.S. Interior Secretary Ken Salazar asking him to allow for the exploration of oil and gas off Virginia's coast, urging him to avoid any further delay in granting offshore leases, now scheduled for 2011.

Minerals Management Service staff have noted that the process to develop the Lease Sale 220 off of Virginia's coast will take longer than November of 2011. Therefore, if the lease sale goes forward, it would take place at a later date.

As of May 2010, the US Department of the Interior had suspended plans for offshore drilling near Virginia. Public comments are no longer being accepted and a series of public meetings regarding Lease Sale 220 were cancelled. This has occurred in the wake of the sinking of the Deepwater Horizon rig off the coast of Louisiana, which has been responsible for the leak of hundreds of thousands of gallons of oil into the Gulf of Mexico.

Natural Gas

According to the 2007 Virginia Energy Plan, Virginia's natural gas utilizes serve more than a million residential (approximately 37% of households) and 90,000 commercial natural gas customers. Virginia produces about 85 billion cubic feet of natural gas per year and has a demand of approximately three times that amount (with demand on the rise). New infrastructure will be needed to meet the demand for natural gas, which grew 30% between 1997 and 2007 in the Virginia Natural Gas service area—twice the national average.[22]

The state recently received a grant for developing infrastructure for utilizing propane as an alternative fuel.

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.

Renewable Energy rebates and initiatives

Virginia has received significant funding under the American Recovery and Reinvestment Act of 2009 (Recovery Act), and the Commonwealth is using a portion of it to support renewable energy development. Programs include: $38 million total in rebates for solar thermal, photovoltaic panels, and small-scale wind, to help grow the deployment of these technologies; $10 million will be available for wind and solar energy for local governments; $13 million in rebates will be available for state facilities; and an additional $15 million for conservation. The

[22] From the website: http://www.dmme.virginia.gov/vaenergyplan.shtml

rebates are for systems installed in or after 2009. The rebates allow up to $2000 a watt for solar photovoltaic systems, $1500 a watt for wind, and $1000 per watt equivalent for solar thermal. There is a 30% federal tax credit for renewable energy systems. The website for further information on rebates is *www.dmme.virginia.gov*.

Under the Recovery Act, the Navy is purchasing $25 million in solar photovoltaic systems in their Hampton Roads facility, and $100 million worth of solar energy around the country.

Research and Renewable Energy Goals

- $10 million in research is being directed toward biomass and waste-to-energy projects, through April 12, 2012.
- There is a 15% renewable energy standard to be met by electricity producers by 2025. Investor-owned electric utilities can receive an enhanced return on their investment under this program.
- There is a focus to meet the goal to increase baseline in-state energy production by 20% by 2017 with "clean fuel" (including fuels with lower environmental impact such as solar, wind, biomass and other renewable sources of electricity, non-petroleum liquid fuels such as biofuels, and potentially including nuclear).
- The first ethanol plant under construction in Virginia is in Hopewell using hulless barley, which can be grown in the wintertime and can have beneficial water quality impacts. Although this is not located in the coastal zone, Hopewell is located on the intertidal James River. The future impact this ethanol plan may have on renewable energy production (for cellulosic material to be grown, as well as siting of future production plants) is significant for the coastal areas.

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.

NASA is looking to the possibility of installing two large wind turbines at Wallops Islands, with construction likely in 2010. The Navy will be installing over $25 million worth of solar photovoltaic systems on Navy facilities in Hampton Roads, Virginia (as mentioned above in the *Renewable Energy rebates and initiatives* section).

The Navy at Naval Station Oceana is looking at five sites in Virginia and North Carolina for the location of a 2,000 acre "outlying" landing field facility.

Fort Monroe will close in 2011. On November 6, 2009 the Commonwealth completed the review of the DEIS and Federal Consistency Determination submitted by the Army, which evaluates the environmental and socioeconomic impacts of closing the installation and disposing of the 570-acre federal fee-owned property and considers reasonable reuse alternatives. The document also considered the cumulative impacts of potential reuses of approximately 290 acres of the property that will revert to the Commonwealth. Virginia noted that it has no objections to

the proposed closing and concurs that it is consistent with the VA Coastal Zone Management Program.

Management Characterization

Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

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.**

The State has enforceable environmental permitting and control requirements for energy facilities. Permit requirements exist for facilities involving State–owned submerged lands and leasing authority (SB 1350, 2009) for renewable energy facilities on State-owned submerged lands. The permit authority for tidal wetlands and coastal dunes/beaches would also apply. Local Governments have the first permitting authority for wetlands specifically. Additionally, the Virginia Energy Plan was issued in 2007 (see the section below under *Policies* for additional information on SB1350 and the Energy Plan).

In December of 2008, the Environmental Law Institute prepared a report, funded by CZM FY 2006 Task 1.06), entitled *Virginia Offshore Energy Development Law and Policy Review and Recommendations: An Evaluation of Implementation of Virginia Laws to Address Coastal Impacts of Potential Energy Development Activities.* The report assessed the strength of Virginia's enforceable policies to manage energy development and made recommendations regarding the state's capacity to respond to concerns related to offshore energy proposals. Key among them were:
"1. We found that Virginia's laws and policies are generally sufficient to address anticipated environmental impacts from proposed offshore energy development, and are comparable to those of other coastal states that anticipate such development on a case-by-case basis.

2. However, Virginia has not adopted laws and policies that affirmatively assist in facilitating offshore energy development review.

3. Virginia also could benefit from information gathering and from policies that could allow advance identification of suitable areas for offshore energy transmission and support facilities.

4. In addition, Virginia has a number of articulated energy policies that are not reflected in enforceable legislation or regulations in ways that would ensure the desired outcomes in federal or state permitting."

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 (under development for wind)	Y
Mapping or GIS	Y	Y
Research, assessment or monitoring	Y	Y
Education and outreach	Y	Y
Other (please specify)	Y	Natural Gas Conservation and ratemaking Efficiency Act (2008) – encourages natural gas companies to promote energy efficiency and use alternative rate design strategies.

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.**
   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.**

Statutes or regulations

The Energy Policy Act of 2005 was signed into law in August of 2005. According to the Minerals Management Service (MMS), this law grants the MMS new responsibilities over Federal offshore alternative energy and alternate uses of America's offshore public lands, also known as the Outer Continental Shelf (OCS). Section 388 of the Act provides an initiative to increase alternative energy production on the OCS. It gives the Secretary of the U.S. Department of the Interior the authority to:

- grant leases, easements, or rights-of way for alternative energy-related uses on Federal OCS lands;
- act as a lead agency for coordinating the permitting process with other Federal Agencies; and,
- monitor and regulate those facilities used for alternative energy production and support services.[23]

[23] From the website: http://www.mms.gov/ooc/PDFs/EnergyPolicyActof2005andMMS.pdf

There are new federal permitting rules affecting offshore wind permitting from the Minerals Management Service (MMS) as of June 29, 2009. Two new offshore wind projects are being considered in Virginia currently, and they will need to comply with the new MMS federal permitting regulations if approved.

Several localities across Virginia, especially counties, have created wind siting ordinances developing mechanisms for permitting wind. Counties reported to not potentially allow wind turbines include Patrick County and Tazewell County, which have passed ordinances that prevent all tall structures. The City of Virginia Beach has passed a wind ordinance for where home or commercial scale wind generation can take place by-right. Other coastal communities with wind ordinances include the city of Suffolk and the City of Chesapeake, which is considering an ordinance in the spring of 2010 regarding small wind turbines as an accessory use.

The State Corporation Commission (SCC) approved a natural gas conservation and rate "decoupling" plan for Virginia Natural Gas (VNG) in December of 2008. The approved conservation programs provide incentives to residential customers of VNG to reduce the amount of natural gas they consume. The rate "decoupling" plan guarantees the company a certain level of revenue whether or not customers use less natural gas. Over the initial three years of the plan, VNG anticipates spending approximately $6.6 million on various conservation programs. The programs include monetary incentives to customers to replace furnace filters, purchase efficient water heaters, and conduct seasonal home energy audits. The SCC directed the company to include in its conservation program a significant incentive to customers to install programmable thermostats.[24]

In 2009, regulations were amended so that investor-owned electricity facilities can utilize a rate-of-return on their investment for conservation and energy efficiency.

Ongoing statutes are being developed by state and federal agencies to require improved technologies around wind energy, such as lighting, rotor shape, etc. Changing and improving technology will have an impact on wind-related regulations in terms of what can and should be expected from a developer. In addition, there is continuing research about how these technologies might affect wildlife. Scientific standards are changing as new technology is emerging. There is an additional need for research into offshore impacts of wind energy, and adjustments will be made as lessons continue to be learned from developed wind energy projects.

Policies

The Virginia Energy Plan was issued in 2007. The purpose of the Virginia Energy Plan is to "chart a path forward that will provide for reliable energy supplies at reasonable rates and increase the use of conservation and efficiency measure in Virginia. The Plan has been developed in accordance with 2006 legislation (Title 67 of the Code of Virginia) that set out energy policy statements and objectives and directed the Department of Mines, Minerals and

[24] from the State Corporation Commission website: http://www.scc.virginia.gov

Energy (DMME) to develop a ten-year state energy plan."[25] The Plan is to be updated every five years, and updates will be available on the DMME website at www.dmme.virginia.gov.

The plan establishes four primary goals for Virginia:

1. Increase energy independence, with an emphasis on conservation and clean fuel technologies, by:
    - Reducing the rate of growth of energy use by 40 percent. This will reverse the projected growth in per capita energy use and result in a nearly level per capita energy use per year.
    - Increasing Virginia's indigenous energy production by 20 percent.
2. Expand consumer energy education to overcome barriers to implementing energy-efficiency and conservation actions.
3. Reduce greenhouse gas emissions by 30 percent by 2025, bringing emissions back to 2000 levels.
4. Capitalize on economic development opportunities through business expansion and increased research and development in areas of strength, including alternate transportation fuels, nuclear technology, coastal energy production, and carbon capture and storage.[26]

The Mid-Atlantic Regional Council on the Ocean (MARCO) is an effort that in June 2009 brought together governors from New Jersey, New York, Delaware, Maryland, and Virginia to coordinate state action on coastal issues. The governors identified four categories of action, with specific objectives for each (see the *Ocean Resources* Assessment section for additional information, as well as the website: www.midatlanticocean.org).

The MARCO objectives for offshore renewable energy are: 1) Develop and finalize shared research and monitoring protocols for assessing the construction and operations impacts of energy development on ocean and coastal resources, and identify appropriate opportunities for integration into permitting conditions. 2) Define regulatory steps, time frames, and potential barriers to the development of the region's offshore renewable energy resources and identify appropriate coordinating measures. 3) Complete a comprehensive offshore use map and decision-support tool to facilitate siting of renewable energy projects to minimize adverse impacts to other ocean users and ecological communities.

Additionally, there is an Ocean Policy Task Force under the Council for Environmental Quality which is interested in federal policy through regional partnerships, and MARCO is participating in this effort by participating in conference calls and commenting on the "Interim Framework for Effective Coastal and Marine Spatial Planning."

The Governors of Virginia, Maryland, and Delaware have signed a Memorandum of Understanding to create a partnership called the Mid-Atlantic Offshore Wind Partnership to

[25] From the Virginia Energy Plan
[26] From the DMME website: http://www.dmme.virginia.gov/vaenergyplan.shtml

cooperate on issues related to development of offshore wind resources and the associated economic development.

As a result of the 2009 Virginia General Assembly House Bill 2175, the Department of Environmental Quality (DEQ) is developing a permit-by-rule for community-scale wind systems less than 100 megawatts without a combustion engine, and a permit for renewable energy media of less than 20 megawatts with a combustion engine. Projects over 100 megawatts undergo a permitting process through the State Corporation Commission. A Regulatory Advisory Panel (RAP) is currently develop the standards for this permit-by-rule, which will establish criteria an applicant needs to meet for constructing and operating a wind energy facility, including environmental and historic resources considerations. The permit-by-rule requirements should be finalized in 2011 after it undergoes an extensive review process. The RAP will develop permits-by-rule for other renewable energy sources after it completes its work on wind; the Panel is addressing land-based wind projects first, and then will address water-based wind projects.

The Virginia Marine Resources Commission (VMRC) currently has a permitting process in place for wind projects based in state waters, although there are no wind energy projects currently located offshore in Virginia. This VMRC permitting process includes a review by the US Army Corps of Engineers.

VMRC is conducting a statutorily-mandated (SB1350) mapping and leasing study for renewable energy located in state waters. SB1350 requires VMRC to determine if areas of state-owned submerged lands are suitable for wind energy development. The bill also provides VRMC with the authority to lease subaqueous lands for the purpose of generating electrical energy from wave or tidal action, currents, offshore winds, or thermal or salinity gradients, and of transmitting energy from such sources to shore. The bill requires that any leases require a royalty to be appropriated to the Virginia Coastal Energy Research Consortium (VCERC). Specifically, the bill directs VMRC to:

- Identify 100 acres suitable for use by the VCERC as a research site; and
- Determine whether sufficient and appropriate subaqueous land exists in state territorial waters to support the generation and transmission of electrical or compressed air energy from offshore wind;
- Consult with the VCERC, other state agencies, conservation and industry representatives, and other interested parties, as appropriate;
- Identify areas where resource and use conflicts would preclude offshore wind development;
- Identify and evaluate other potential resources that require further analysis in remaining areas to determine suitability for offshore wind development;
- Develop leasing and permit requirements.

The Virginia CZM Program has been assisting VMRC with this study by providing GIS support. The findings of this VMRC study will be presented to the Virginia General Assembly in the spring of 2010.[27] Any update here?

Program Guidance

In 2008, the Virginia General Assembly added the Virginia CZM Program to the Board of Virginia Coastal Energy Research Consortium's (VCERC). See the section below under *Research* for information on the activities of VCERC around renewable energy.

Virginia Senate Bill 262, which enacted the Virginia Energy Plan in 2006, assigned the Department of Mines, Minerals and Energy (DMME) responsibility for developing a numerical scoring system to help evaluate the suitability of specific sites within the Commonwealth for wind and solar energy systems. The Virginia Renewables Siting Scoring Systems (VRS3) was consequently designed by researchers at James Madison University for use by government decision makers in Virginia to aid land use planning related to wind and solar energy. According to the VRS3 website, although developers, private citizens, businesses, and non-profit groups may use the VRS3, the features and methods of these tools are designed to facilitate land use planning and land use decision-making.[28] This tool was released in May 2009, with a training for Planning District Commission staff members; researchers will examine how the tool is being utilized in the coming months.

The U.S. Fish and Wildlife Service is currently drafting a guidance document regarding wildlife issues at wind energy projects. The Virginia DEQ is considering this guidance as they are developing the permit-by-rule regulation for wind energy projects.

Comprehensive siting plan (including SAMPs)

See the Assessment areas *Special Area Management Plans* and *Ocean Resources* for additional information on comprehensive siting and marine spatial planning.

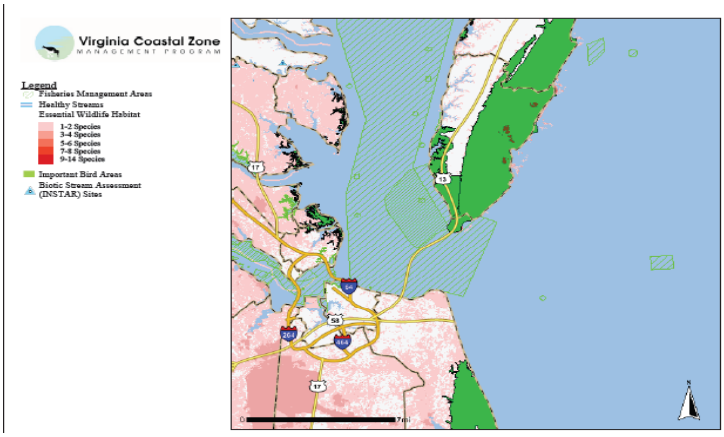
Mapping or GIS

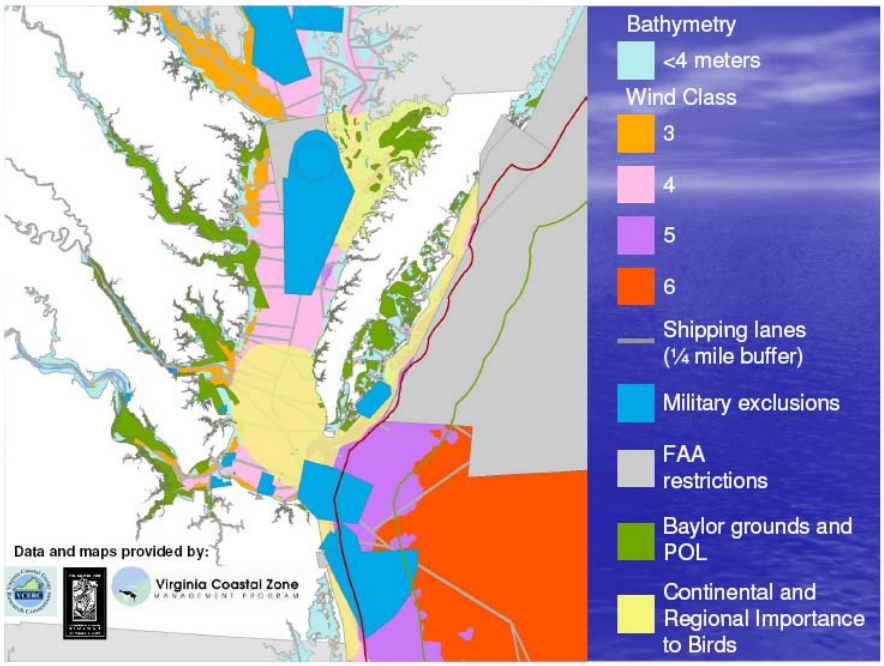
"Wind areas" (areas with high potential for wind power) have been identified by the Virginia Wind Energy Collaborative housed at James Madison University which has been gathering information on wind speed for several years. Funded by the DMME, the Wind Energy Collaborative created wind maps depicting areas in Virginia with high wind potential.

The Nature Conservancy has been active with coastal mapping as well as with mapping ocean resources. The Virginia Coastal Energy Research Consortium (VCERC) is working to create an interactive online GIS mapping tool for public use in partnership with James Madison University, Virginia Institute of Marine Science, Old Dominion University and Virginia Tech -

[27] Information from the Virginia Marine Resources Commission
[28] VRS3 website: http://vrs3.cisat.jmu.edu/index.html

Advanced Research Institute. The Virginia CZM Program has created extensive mapping resources, including Coastal GEMS, and an example of a GEMS map is below.





This map of offshore wind energy resource considerations was produced by Virginia CZM for a VMRC presentation on SB1350.

Research, assessment or monitoring

There are a number of new areas of research related to Energy and Government Facility Siting in Virginia including:

- The Virginia Institute of Marine Science at the College of William and Mary is conducting research on growing algae in the Chesapeake Bay or open Ocean, as well as other algae research, through STATOIL funding (a Norwegian energy company).

- The Chesapeake Bay Commission issued its "Biofuels in the Bay" report in 2007 which looked at biofuels and water quality in the Chesapeake Bay. The Report suggested that corn-based development could have negative effects, but cellulostic-based biofuels could have positive effects (utilizing wood, grasses, etc.). Poultry waste can be used to generate electricity and for transportation fuels, and research is being conducting at Virginia Tech on this topic.
- Two research projects at Old Dominion University concern the utilization of algae for generating energy: one examines the potential of growing algae in ponds, and another examines algae as a way to clean up nutrients before they pollute surface waters.
- The Hampton Roads Service District is looking at sewage treatment as a way of creating bio-diesel and reducing the need for petroleum. The VCERC has been involved in this research.
- As is mandated in the Virginia Energy Plan, the research focus for the Virginia Coastal Energy Research Consortium (VCERC) is on offshore winds, waves and marine biomass. VCERC is a group created in 2007 by the General Assembly. Their work has been broken down into four major work projects with each project involving multiple universities in a collaborative effort. The topics for research, with links available at the website www.vcerc.org/research.htm, are below:[29]
    - Feasibility-Level Design and Economic Assessment for a Reference Baseline Offshore Wind Power Project;
    - Preliminary Mapping of Offshore Areas Suitable for Offshore Wind Development, with Identification of Excluded Areas to Avoid Potential Conflicts, and Mapping of Offshore Benthic, Pelagic and Avian Habitats;
    - Evaluation of Economic Development Impact of Commercial Offshore Wind Power Development and Associated Workforce Training and Entrepreneurial Development Needs, and Preliminary Planning for Ocean Test Bed;
    - Feasibility-Level Design and Economic Assessment for a Biodiesel Algae Culture System.

  VCERC is also developing comprehensive siting plans for potential sources of renewable energy, and analyzing offshore renewable energy resources. This effort includes modeling the economic viability of offshore wind projects, particularly wind energy sites up to 12 miles offshore. Wind developers are utilizing this research for the potential siting of wind projects in offshore Virginia.
- The Center for Conservation Biology at William & Mary is conducting a Virginia CZM funded project to develop a framework for evaluating the impacts of wind farms on migratory birds.
- Virginia Tech is creating a report on wind and algae potential.
- MARCO has conducted significant research into offshore renewable energy (see the section under *Policies* for additional information).

[29] From the website: http://www.vcerc.org/research.htm

- NASA is conducting a wind study on turbines at their Wallops Island facility.
- A carbon footprint analysis is being conducted for the Norfolk and Chesapeake region with Dept. of Energy funding in the winter to spring of 2010.
- Old Dominion University has plans to relocate its biofuel research facility from Hopewell to Virginia Beach. This facility focuses on research for algae-based biodiesel; a grant has been applied for that would increase size of the facility substantially.

Education and Outreach

The Virginia Coastal Energy Research Consortium (VCERC) conducts significant education and outreach activities around biomass from algae, renewable energy, and wind and wave energy resources with key stakeholder groups, the public, as well as in school systems. Many have stated that the educational and outreach efforts of VCERC have led to wide-spread support of renewable energy throughout the coastal zone, particularly in the Hampton Roads area where VCERC has examined, researched and addressed issues such as navigation and jet traffic and conducted follow-up outreach efforts.

The Mayor of the City of Virginia Beach has established an Alternative Energy Task Force, which has been meeting since May of 2009 and will finalize its recommendations in 2010. In addition, the City of Virginia Beach created a Green Jobs Task Force working with local schools and colleges to create an Alternative Energy Academy for research and development and training technicians. The focus of the Academy is to increase the regional training and capacity for installing alternative energy systems, including for home energy audits and retrofits. To date, block grants have been received for this program. Finally, the City of Virginia Beach sponsored a workshop for mid-Atlantic offshore wind tech companies in May of 2009.

Other

A reduction in property taxes has been considered in Virginia at the locality level for residential, municipal, or commercial properties that meet LEED or similar green building standards or meet Energy Star standards. This has not yet gone into effect, but an enabling state law was adopted by the 2009 General Assembly.

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)
1. Research for wind facilities: Need research into both state and federal coastal and offshore waters suitable for wind development, including consideration of potential impacts on habitat, marine flora and fauna, wildlife onshore and nearshore, as well as socioeconomic and infrastructure impacts. Data is needed on bird, marine mammal and sea turtle migration corridors, feeding and nursery areas, threatened and endangered species, and distribution and abundance. This information is needed in the near future, as offshore renewable energy projects are being considered. Avian, fisheries and marine mammal data is particularly important for siting wind farms. Turbines may set up vibrations or electrical fields around cables from offshore wind turbines to land; data is needed around whether they are emitting soundwaves or electromagnetic waves that are disrupting the echo-location capability of marine mammals and fin fish. Exploration for and mapping of cold water corals is needed to ensure their protection. There is a need to develop greater scientific consensus on how to protect wildlife occurring near offshore wind energy projects. There is a need for different sites for longitudinal research and testing of underwater conditions; this research could be co-located at wind testing platforms. Currently, a buoy located near the Chesapeake light tower in state waters is gathering data, but a more robust instrument is needed to gather data. This need is connected to SB1350 regarding assessment of subaqueous lands for suitability for wind resources.	Data	H

Research is also needed into how other coastal states are addressing the siting of offshore wind and other renewable energy projects. (For example, Rhode Island and New Jersey have conducted extensive assessments with contractors for offshore renewable energy projects.)		
2. Regulations for offshore wind: The most advanced scientific research should inform the development of new regulations for offshore wind energy projects. There is also a need to consider local governments and local jurisdictional planning issues as offshore and nearshore regulations are being developed for wind energy projects.	Regulatory	H
3. Research on algae-based fuel: Need additional research into best development methods and potential impacts of algae-based fuel, including its potential beneficial impacts on water quality.	Data	H
4. Research for offshore gas: Need research into ocean areas where offshore oil or gas development could happen and potential impacts on habitat, wildlife onshore and offshore, aquatic organisms, geology, and other related issues.	Data	H
5. Research for both wind and oil/gas facilities: Need to map human uses that may conflict with energy facilities. These include recreational and commercial fishing areas.	Data, Outreach	H
6. Promoting behavior changes: Need to increase energy efficiency and conservation measures across Virginia and in the coastal zone. Efforts by localities are needed, as well as at the state level, to decrease the overall demand for electricity consumption in the state.	Regulatory, Capacity, Outreach	H
7. State Oversight: There is a strong need at the state level for additional capacity to address new energy development across the state and in the coastal zone. A new staff position could provide the coordination and communication needed for new energy facilities, specifically for their impacts on infrastructure, and marine flora and fauna.	Capacity	H
8. Research into national defense conflicts: Need additional research into potential conflicts between military defense radar systems and offshore wind projects, including radar of the Dept. of Defense and the Federal	Data, capacity, outreach	H

Aviation Administration. Research is needed into how other countries are addressing this problem, which could limit offshore wind development.		
9. Research on climate change impacts: Energy and Facility Siting will be strongly impacted by sea level rise (particularly the required coastal infrastructure for renewable energy projects). There is a need to increase data gathering and planning around climate change and sea level rise, including hazard identification and developing tools to relocate and redirect energy and government facility development out of hazard areas. Mechanisms need to be found to offset the cost of redirecting development. Hampton Roads has been identified as the second most vulnerable region in the country to climate change and sea level rise, second only to New Orleans, and this vulnerability needs to be accounted for in the siting of renewable energy infrastructure.	Data, Capacity	H
10. Develop partnerships: Need public and private partnerships, including state investments and infrastructure, to attract renewable energy developers, suppliers and manufacturers to Virginia, and to keep the current momentum going around wind policy development and data collection.	Capacity and outreach	M
11. Training: Need more training or retraining for renewable energy development. The Hampton Roads area offers a good place for this training with its industrial and educational facilities. Industrial and skilled labor that can participate in ship building, repair, and offshore marine work are the same types of labor needed for the anticipated increase in renewable energy development work.	Education, capacity and outreach	M
12. Integration of Research: Examine how wind and algae-based energy areas relate to other areas of the ocean research, such as the work of VCERC. Explore data overlaps in mapping and other resources. Build and expand on The Nature Conservancy's ocean habitats classification and prioritization work.	Outreach, Data	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 _____

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

The interagency Coastal Policy Team reviewed and ranked this issue at its February 17, 2010 meeting according to the following criteria: feasibility; importance and appropriateness. Up to 5 points were allotted to each of the three criteria so that a maximum score would be 15. Scores from 0-4.99 are considered low priority; 5–9.99 is medium priority and 10-15 is high priority. Energy and Government Facility Siting received a score of 11.11.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes _____
No ✓
Briefly explain why a strategy will or will not be developed for this enhancement area.

Energy siting is high priority however; the siting issue of most importance for the next five years is likely the siting of energy activities in marine waters. Therefore this issue area will be addressed as part of a larger marine spatial plan that will allow Virginia to consider energy siting comprehensively along with other coastal water and ocean uses and so has been merged into the Ocean resources Strategy.

2000 Assessment		2005 Assessment		This Assessment (2010)	
High		High		**High**	✓
Medium		**Medium**	✓	Medium	
Low	✓	Low		Low	

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

Purpose: To determine the extent to which problems and opportunities exist with regard to the enhancement objective.

1. Generally characterize the private and public aquaculture facilities currently operating in your state or territory.

Type of existing aquaculture facility	**Describe recent trends**	**Describe associated impacts or use conflicts**
Private Hatcheries	Increase in the number of hatcheries. There are 9 operational hatcheries in Virginia currently, of which at least 3 are new since 2005, and the larger hatcheries represent an investment of approximately $500,000 to start. There has been an overall increase in the number of oyster hatcheries, as well as the number of hatcheries expanding into "grow-out" operations. Clam hatcheries experienced a very successful year in 2009. The acquisition of shellfish seed continues to be an important issue for the industry. In the past, there was a substantial lack of seed supply with the growth of the aquaculture industry. Currently, Virginia hatcheries cannot produce enough seed for all of the oysters or clam growers, so seed is imported to meet demand. There are importation regulations with VMRC about how seed can be imported due to concerns of diseases that could be imported including the parasites MSX and Dermo, and other concerns exist	This has been a positive trend as it has stabilized oyster production capacity. Additionally, there has been an increase in the availability of clam seed, which fueled an increase in production with a possible recent overplanting in clams. See the sections below under oyster aquaculture and clam shellfish aquaculture for additional impacts and use conflicts.

	about importing clam seed. As growers are required to get a permit for any seed that is imported into the state for oysters and clams, there was an overall decrease in importation of seed in 2009 as more oyster and clam seed is being produced instate at hatcheries. According to a VIMS/ Sea Grant report, "the oyster industry in Virginia has continued to expand its hatchery capabilities, reportedly producing 26.7 million seed oysters for sale or planting during 2007. Virginia's oyster hatcheries saw a more than eighteen-fold increase in the number of seed and larvae sold between 2007 and 2008. 84% of the seed planted by Virginia growers was purchased from a hatchery. The growers surveyed in early 2008 projected an additional 14% increase in oyster seed production during that year to an estimated 30.5 million. With the initiation of large-scale 'spat–on-shell' oyster planting in Virginia (see below for more information) during 2008, the entire hatchery-volume picture changed, as existing firms became active in purchasing not just clutchless seed, but large quantities of eyed larvae for spat-on-shell development." The survey also found that hatcheries were predicting an additional four-fold increase in sales in 2009.[30]	
Public Hatcheries	Two public research hatcheries are owned by the Virginia Institute of Marine Science (VIMS), both capable of raising multiple species. For example, both hatcheries did extensive research on the Asian oyster, but that	The research being conducted at the public hatcheries will likely continue to be utilized by aquaculturists and private hatcheries.

[30] *Virginia Shellfish Aquaculture Situation and Outlook Report Results of 2008; Virginia Shellfish Aquaculture Crop Reporting Survey* by Tom Murray of Virginia of Sea Grant Marine Extension Program and Mike Oesterling of Virginia Institute of Marine Science from June 2009.

	species is now no longer being considered as a viable option in Virginia. The VIMS hatchery on the Eastern shore of Virginia is now looking into scallop restoration options. The VIMS hatchery at Gloucester Point (main campus) houses the largest oyster selective breeding program in the country, and has had a significant role in the growth of oyster aquaculture over the last decade. While scallop restoration and hatchery efforts are still small in scale, there is a potential for them to grow in coming years, particularly for restoration efforts. Meanwhile, the advantages of domesticated strains of oysters for aquaculture have proven themselves, and such improvement is continuing incrementally.	
Finfish aquaculture	There are a few facilities currently attempting finfish aquaculture, with a focus on baitfish, including summer flounder and particularly spot. In some facilities, spot are caught with nets in the water and then held until they are sold for bait (which can yield a high return). Some of these facilities are not capable of hatching spot, but they are holding facilities for wild-caught spot. These closed system facilities, which are located on land near coastal areas, would like to have the potential to spawn and rear the spot. However, at least one facility has been spawning, rearing, and selling privately-produced spot for commercial sales for the past couple years, yet overall production numbers remain low. Some aquaculturists are working to grow finfish for food, but it has not yet become a large industry.	The principal use conflict that arises with shore-based finfish aquaculture is around the water quality of their effluent. Since the fish must be fed, the water they discharge from their systems is presumably higher in nitrogen, phosphorus (and possibly carbon) than their intake waters. They are required to have a discharge permit from the Dept. of Environmental Quality, so presumably if they don't violate their permit, this is not a significant problem.

	Some aquaculturists have examined the possibility of growing black-sea bass as well as cobia in farms at Saltville and on the Eastern Shore. There are also two research hatcheries for fish, one at VIMS and one at the Virginia Agricultural Seafood Research and Extension Center in Hampton.	
Crayfish aquaculture	There are two modestly-sized facilities that do pond aquaculture of crayfish. These are not marine facilities.	Closed system aquaculture done entirely on uplands is generally not considered to pose a use conflict. However if the facility is pulling in ambient seawater and discharging that water with an increased nutrient and chemical load due to feeding and medicating the crayfish, pollution impacts could occur.
Spat-on-shell oyster growing	According to a VIMS/ Sea Grant report, spat-on-shell oyster growing, also called remote setting, is a method of oyster cultivation in which oyster larvae are added to tanks containing aged oyster shells in a controlled environment on land, rather than in open Chesapeake Bay waters. After the larvae attach, or set, on the oyster shells and metamorphose into seed or spat oysters, the resulting spat-on-shell planted within a week in the Bay where the spat will grow naturally until ready for harvest.[31] This method of oyster cultivation has increased since the previous assessment.	Spat-on-shell growing takes place more frequently on the western shore of the Chesapeake Bay. The primary advantage of spat-on-shell cultivation is that it requires less labor and fewer materials than single-oyster cultivation, thereby making it a more economically feasible option for producing oysters. Because spat-on-shell cultivation produces oysters grown in clumps (similar to wild-caught oysters), the primary product is oysters for shucking rather than single oysters for half-shell consumption. For this reason, remote setting is not meant to take the place of single-oyster culture (which produces consistent, high-quality, half-shell oysters) but to complement it with a means of large-scale production of local oysters for use by Virginia's oyster processors. The industry forecast for continued growth of eyed larvae for spat-on-shell is clear. Growers estimate that eyed-larvae purchases for culture will increase nearly four-fold during 2009 to an estimated 1.66 billion eyed

[31] Information from a June 2009 report, the *Virginia Shellfish Aquaculture Situation and Outlook Report Results of 2008 Virginia Shellfish Aquaculture Crop Reporting Survey* by Tom Murray of Virginia Sea Grant Marine Extension Program and Mike Oesterling of Virginia Institute of Marine Science.

		larvae.[2] Ultimately, the market for eyed larvae could easily reach an order of magnitude higher. The lack of infrastructure in spat-on-shell cultivation may result in fewer use conflicts than cultivation of single oysters, which require cages and may be submerged or on the surface of the water, but use more of the water column than spat-on-shell in which growing only takes place on bottomland. Remote setting is currently occurring in areas where oyster aquaculture has traditionally taken place; if it expands considerably, potential use conflicts could result around the shoreline handling and shallow-water nursery facility stage in spat-on-shell cultivation.
Oyster shellfish aquaculture	There has been a significant increase in oyster hatcheries and oyster aquaculture activities in the past three years, and the majority of production is concentrated in the Chesapeake Bay. Oysters reach market size in 18 months, before diseases impact the oysters at two years of age. The oyster aquaculture industry is expected to continue to expand significantly. Oysters generally sell for 2 to 3 times the price of clams. While there is a well-established clam industry in Virginia, operating both on the Bayside and Seaside of the Eastern Shore, grossing approximately $50 million dockside, (compared to approximately $27 million in 2003 according to the Virginia Agricultural Statistics Service) the industry has shifted to start growing a significant number of oysters, both through spat-on-shell and single oyster growing (which are grown initially as larvae in a	Oyster aquaculture may have more of a visual impact than clams due to the surface equipment and water column utilization used for oyster growing, and there may be more impact on boaters. There have been use conflicts over the number of floats used in oyster growing, preserving viewsheds, and other issues. Alternately, it has been reported that some private landowners are requesting leases from VMRC in a defensive mode to exclude large-scale aquaculture activities and preserve their view. (See the section below under *Priority Needs and Gaps* for suggestions on VMRC addressing the leasing of subaqueous lands more effectively.) There has been funding, referred to as the "crab disaster funds," available for crabbers to receive training and to transition to become oyster growers in the past year (for additional information, see the section below under *Program Guidance*). The private industry has

	hatchery, and then grown out in cages or floats, and are geared to the half-shell market) techniques.	speculated how this program will affect the supply and demand of oysters, and whether it will cause a drop in the price of oysters due to an increase in supply as the overall number of growers increase.
Clam shellfish aquaculture (and shellfish aquaculture overall)	Expansion of the industry and resulting management issues is a trend. Although there was some contraction of the industry in 2001-2002, the industry has grown significantly since that time. According to a 2009 VIMS/ Sea Grant report, there was a "small decline in clam plantings and sales but continued growth in oyster aquaculture. More than 185 million farmed clams--worth $27.3 million--were sold by Virginia growers in 2008--down 13 percent from an estimated 2007 sale of 212 million clams. About 9.8 million farmed oysters went to market in 2008-up from 4.8 million in 2007, and surpassing the industry prediction of 7.3 million."[32] The shellfish industry is working more actively to be seen as a good neighbor, and to be recognized as a "green industry" for the environmental benefits of growing shellfish such as algae removal, fine sediment filtering and habitat formation (in the case of oysters). Some major traditional wild harvest seafood businesses are now getting involved in aquaculture. Currently the demand outpaces supply, and the primary market is out-of-state. However, there have been concerns	The majority of the clam industry is located along the Eastern Shore of Virginia, both bayside and seaside. Several areas–particularly for clam aquaculture–are being planted too densely which could be an issue of too many clams per square foot, too many nets on one growers farm, or too many farmers within a region of a creek or tributary. There have been some reports of concerns that creeks have become unnavigable as there are too many clam nets in them. As there is an increase in hatchery capacity and revenue, there is an increase in the overall number of clams that are being planted. There isn't monitoring of the total number of nets being used in clam growing or the total number of shellfish being grown (although this is shifting with new VMRC reporting regulations; see below under *Regulations* for more information). Small tidal creeks are prime clam aquaculture locations, and many of these creeks are being over-crowded with clam growing equipment. However, clamming may become more self-regulating (either by industry or by the growth capacity of the clams) as clam growth and production is actually going down due to the large volume of clams being planted and issues with disease and food availability. There may be too many clam growers as well,

[32] *Virginia Shellfish Aquaculture Situation and Outlook Report Results of 2008; Virginia Shellfish Aquaculture Crop Reporting Survey* by Tom Murray of Virginia Sea Grant Marine Extension Program and Mike Oesterling of Virginia Institute of Marine Science from June 2009.

	about the market getting saturated with too many growers (although some say this may be true for half shell, but the market for spat-on-shell for shucking is virtually unlimited). Wild harvesting continues to decline, and farmed harvest continues to increase and fill the gap. Oyster and clam aquaculture may have less overall impact than wild harvesting.	with some reporting that the market is saturated with too many clams and the price is thus negatively affected. On the seaside of the Eastern Shore, there is competition for leased space. The grounds have changed over time so the quantity of the bottomland has decreased as a whole, and the quality of some of the grounds have changed so that certain areas are no longer usable (see the section below on *Research* for information on the Baylor Grounds). Some areas have seen an increase in complaints about the visual impacts and user conflicts regarding aquaculture facilities, particularly on the Eastern Shore, which is experiencing significant residential growth. Homeowner complaints and concerns will likely increase with the increase in oyster farming as the equipment that is needed is frequently more visible than for clam aquaculture is (however clam aquaculture equipment, including PVC demarcation poles and clam netting which is sometimes exposed at very low tides, is often visible as well). There have been some homeowners and a Homeowners Association protesting the application of a lease for new clamming operations in small creeks in recent years. Conversely, there has been a move to recognize the importance of traditional maritime activities and working waterfronts. Some report that as most aquaculture facilities are advertised, conflicts are generally addressed before a facility is put in. This will continue to be an issue in the future. There has been an associated impact on commercial aquaculture from land agriculture, particularly polluted water

		runoff from agricultural (chiefly tomatoes) fields. Shellfish are extremely sensitive to copper which is sometimes used as a fungicide by tomato growers.
Bay Scallop cultivation	Bay scallops are starting to be cultivated for restoration purposes on the Seaside of the Eastern Shore. Bay scallops require attachment to eelgrass at early growth stages and thus cannot survive without it. Because the CZM funded Seaside Heritage Program has successfully restored eelgrass on the Seaside, it may be possible to once again support a population of bay scallops. American Recovery Act funds through NOAA are being used to explore this possibility.	The impact of reintroducing the bay scallop would be positive both ecologically and economically. A viable population that could eventually be sustainably harvested will provide jobs and income as well as an economic reason to support protection and expansion of eelgrass beds. However eelgrass and scallop habitats cannot co-exist with clam farms and so would present a use conflict to be resolved.
Algae production	All shellfish hatcheries are growing their own algae, but a significant portion of it is dying and there are problems with long-term cultivars. This has been an important issue since mid-2008. (See the section below under *Research*, particularly on ocean acidification, for additional information on this topic.)	Additional research is needed on reasons for algal death and ways to maintain steady production of algae.
Oyster gardening	There is an increase in the overall number of people doing oyster gardening, or growing oysters recreationally, throughout Virginia's coastal areas. VIMS estimates about 2,000 people in the state are currently growing between 1,000 to 5,000 oysters each, for environmental purposes (water quality improvement and restoration) and personal consumption. The Tidewater Oyster Gardeners Association estimates that there were approximately 1000 oyster gardeners in 2005.	As additional research and information on oyster gardening is available, more people are growing oysters for both recreation and restoration purposes.

Management Characterization
Purpose: To determine the effectiveness of management efforts to address those problems described in the above section for the enhancement objective.

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
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.

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.

Aquaculture regulations

The U.S. Food and Drug Administration (FDA) has suggested a new regulation that, beginning in 2011, raw oysters originating in the Gulf of Mexico during warm-weather months must be treated before they can be sold to consumers. In addition, the FDA considered new regulations that as of 2011, unprocessed oysters (and possibly clams) may not be sold during warm months due to concerns over deaths from the vibrio-bacteria that occurs during warm months. The proposed regulation has currently been withdrawn. However future federal regulations could be imposed regarding shellfish handling and marketing.

In part as a result of CZM program efforts, on October 7, 2009, Governor Tim Kaine announced a new regulation to protect important shellfish habitat areas and the sustainability of Virginia's

aquaculture industry by providing additional protection for these waters on the Eastern Shore. The DEQ regulation is intended to ensure that the best wastewater disposal methods are evaluated, resulting in the least environmental impact. The proposal is intended to reduce condemnations on the Eastern Shore so more waters may be protected for clam and oyster production, including aquaculture. According to the Governor's website, growth and changing land uses on the Eastern Shore have increased the frequency and amount of wastewater discharged from businesses and localities into seaside waters.[33] However, shellfish growers have stated that seaside regulations should be expanded to the western side of the Chesapeake Bay so that they would apply to all of Virginia's waters, as good water quality is a necessity for shellfish operations.

Since the previous assessment, there are now permits required for shellfish growers at the state level. Oyster and clam growers are now required to obtain permits and report their harvest data, including locations they are farming under new regulations adopted by Virginia Marine Resources Commission (VMRC) as of November 2007. There has been more participation every year from growers in reporting, although VMRC currently doesn't have a dedicated staff person to enforce the mandatory reporting program. In addition, oyster gardeners (recreational growers) are required to obtain a permit for growing, although it is a free permit from the Habitat division of VMRC. This recreational growing permit was instituted in 1998, and is not a new permitting requirement since the previous assessment.

A new regulation was developed by the Fisheries division at VMRC in 2007 which is a more streamlined and quicker process for getting general permits for cage (container) aquaculture (Reg.# 4VAC20-1130-10 (2007). Prior to this, subaqueous permits were required, which was a longer permitting application process that went through the Habitat division at VMRC

VMRC drafted a legislative amendment, *Water Column Leases for Aquaculture Purposes*, which authorized VMRC to "lease the water column above certain state-owned bottomlands for aquacultural purposes." On April 15, 2004, the Virginia General Assembly approved the amendment to Chapter 16, Title 28.2 of the state code. However, this "3-D regulation" was never funded, and the amendment "sunsetted" and is no longer applicable. The use conflicts were partially resolved as regulations for cages moved to the Habitat division of VMRC, as referenced above, and this regulation replaces the "3-D regulation." However, the use conflict of using the whole water column from the bottom-up remains.

Aquaculture policies

The U.S. Environmental Protection Agency (EPA) is currently directing the Chesapeake Bay states and the District of Columbia to develop and implement a "pollution diet" for the Chesapeake Bay and its tidal waters known as a Total Daily Maximum Load (TMDL), with expected completion in December of 2010. The EPA may allow states to consider aquaculture as a means to reduce pollution and meet TMDL goals. For additional information, see the website: http://www.epa.gov/chesapeakebaytmdl/

[33] http://www.governor.virginia.gov/MediaRelations/MediaLibrary/galleries.cfm

Several coastal counties are updating their Comprehensive Plans, and aquaculture is figuring prominently in the Plan revisions in several locations. Northampton County, located on the Eastern Shore, recently developed a new zoning code as part of their comprehensive plan revision with shellfish aquaculture being recognized as a by-right use, although some wetlands or minor special use permits may still be required in specific conditions. Aquaculture is being recognized as a significant issue that needs to be addressed in local policies and planning. The Mathews County Aquaculture Working Waterfront Steering Committee, which was funded by the CZM program, has developed eight innovative recommendations which are currently being considered by the Mathews County Board of Supervisors. These recommendations involve policy changes for expanding and supporting aquaculture on the land and in the water. In Gloucester County, the York River Use Conflict study, which was funded by the CZM program, addressed aquaculture and use conflict issues. The recommendations of the Use Conflict study were adopted by the Board of Supervisors as new public policy to protect, preserve and accommodate aquaculture and working waterfronts in the York River. The Mathews County Aquaculture Working Waterfront Steering Committee used many of these recommendations in their work.

There may be a conflict in the future between how local governments wish to use offshore submerged land and existing offshore uses. As space becomes more crowded and there is greater competition to gain access to subaqueous lands, there may be conflicts between state agencies and local governments regarding jurisdiction of the lands. Multi-jurisdictional marine planning will likely increase as some localities have zoning ordinances that identify and reference water zoning, and other localities are exploring and using a variety of police power tools for marine planning and zoning (including Urbanna and King and Queen Counties). As a whole, permitting and taxation issues will grow in significance in the future around shellfish aquaculture operations.

The nexus between water quality and upland land use is recognized as becoming increasingly important. If a coastal community decides that working waterfronts are of primary importance, then land use policies and activities may need to change to increase water quality. For example, there may need for a requirement that no livestock are allowed in creeks near the coast, as well as increased enforcement of regulations around failing septic systems. Local governments may need to protect water quality more under health, safety, and welfare provisions. Alternately, local jurisdictions may develop “public relocation areas” where a locality may lease subaqueous lands from VMRC and manage it as an in-water business park where, for example an aquaculture facility could temporarily utilize it as a holding facility for shellfish (particularly if a water use violation occurs in the area an aquaculturist cultivates shellfish in, or if an area becomes contaminated, these public relocation areas could be used without the aquaculture facility shutting down entirely).

Aquaculture program guidance

Some shellfish growers report that clam nets are still released into the open ocean, and that some growers pick up the discarded nets of other growers to properly dispose of them. This is of concern as they pose a threat to wildlife and boaters, as well as to the “responsible neighbor” approach that many growers are working to maintain with adjacent landowners by properly

discarding used clam nets. There has been extensive research, funded by CZM and others, into the issue of derelict clam nets. This research has had positive impacts, including gaining data about the location of derelict nets and presenting the data to various groups of people and growers. Although most groups have increased their awareness of the problems with nets, it remains a problem (for more information on this and suggestions for next steps, see the *Priority needs and gaps* section, as well as the *Coastal Debris* Assessment section).

A 2008 report, *Best Management Practices for the Virginia Shellfish Culture Industry*, was developed in September of 2008, with CZM funding through its Seaside Heritage Program, and it has the potential to have a significant positive impact within the industry. More time will be needed to determine the guide's long-term effectiveness in providing program guidance and concrete on-the-ground results, but it has been very effective as an educational tool to date. For example, according to a 2006 report prepared by the Virginia Eastern Shorekeeper, there was a 41% reduction in the amount of clam net found on the barrier island beaches of the Eastern Shore of Virginia over the period of time from spring 2004 to autumn 2006.[34] The guide is voluntary for industry to utilize, but it was endorsed by Governor Kaine's appointed aquaculture advisory board, the Farm Bureau, and Virginia Dept. of Agriculture and Consumer Services (VDACS), and it has received strong buy-in from growers. One advantage for growers to utilize the BMPs is that they can market themselves as a "clean operation" or a "green operation". The guide may be viewed on the website: www.vims.edu/adv/aqua.

The Environmental Quality Incentives Program (EQIP), a program of the Natural Resource Conservation Service, is a voluntary conservation program for farmers and ranchers that promote agricultural production and environmental quality as compatible goals. EQIP offers financial and technical help to assist eligible participants install or implement structural and management practices on eligible agricultural land, including incentives for reducing nitrogen in water through BMPs. More information may be found on the website: http://www.nrcs.usda.gov/PROGRAMS/EQIP/

A manual was published in 2009 for spat-on-shell aquaculture, *A Practical Manual for Remote Setting in Virginia*, which is available at the website: http://web.vims.edu/adv/aqua/index.html. There is also a training program (as mentioned above under the *Resource Characterization* section) for individuals transitioning from crabbing to oyster growing, which utilizes the "crab disaster funding" that has been available since 2006. A new cage aquaculture manual is currently being developed as part of this program, which will be available in the spring of 2010. Approximately 10 people a year have been trained in spat-on-shell and cage aquaculture growing techniques; this year expanded to 100 people participating in the training program as there was a funding increase in 2009. This funding will be available for two more years, at $500,000 each year, and significant participation is expected for the remaining two years of the training program.

Research, assessment, monitoring

Significant aquaculture research has been conducted since the previous assessment on topics such as spat-on-shell growing methods, carrying capacity, restoration, the health of shellfish,

[34] http://www.deq.state.va.us/coastal/documents/task11-07-04a.pdf

disease resistance breeding, business modeling development, industry expansion and monitoring by the Virginia Institute of Marine Science (VIMS), Virginia Sea Grant Marine Extension Program, the Virginia Tech Seafood Aquaculture Lab in Hampton and other agencies and organizations. There have been expanded efforts to restore shellfish for ecological restoration to the Chesapeake Bay since the previous assessment as well.

In the previous assessment, it was noted that the Virginia Agricultural Statistics Service (VASS) completed a 2003 survey on commercial aquaculture, collecting information on amounts harvested, gross profits, and projected growth for the next year. Since that time, the survey moved to the USDA National Agricultural Statistics Service, which was conducting a statewide aquaculture survey starting in the spring of 2009. The purpose of the survey was to reference the 2008 production year and measure changes in size and scope of the industry since the last state aquaculture survey was conducted in 2003. The survey is intended to be conducted once every five years and the information is supposed to help with legislative, regulatory and marketing decisions at the state level. In September of 2009, according to the Virginia Aquaculture Association website,[35] the Virginia Aquaculture Survey was stopped due to budget cuts. There was an update on the extent of the budget cuts at the November 2009 Virginia Aquaculture Conference in Williamsburg, Virginia, and it doesn't appear that the study will continue in the near future.

The June 2009 *Virginia Shellfish Aquaculture Situation and Outlook Report Results of 2008; Virginia Shellfish Aquaculture Crop Reporting Survey,* by Tom Murray of Virginia Sea Grant Marine Extension Program and Mike Oesterling of Virginia Institute of Marine Science, yielded significant information into sales and recent trends within the aquaculture industry (see the Resource Characterization report above). Below are charts from the report regarding the number of shellfish planted and sold in Virginia from 2005-2008.

[35] http://www.virginiaaquaculture.org/News.html

Figure 1: Number of Hard Clams Planted in Virginia (2005-2008)

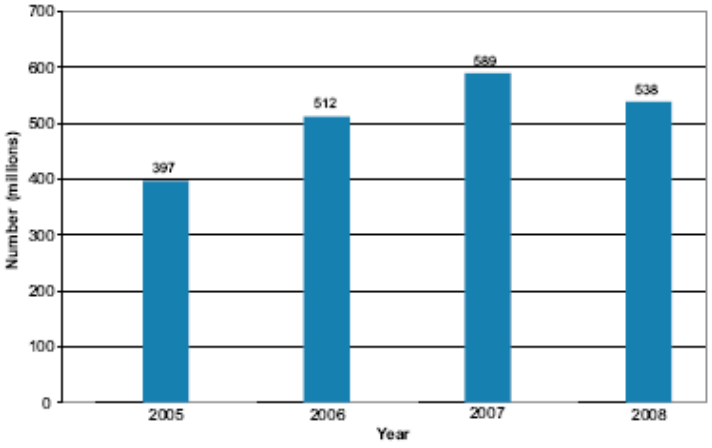


Figure 2: Number of Hard Clams Sold in Virginia (2005-2008)

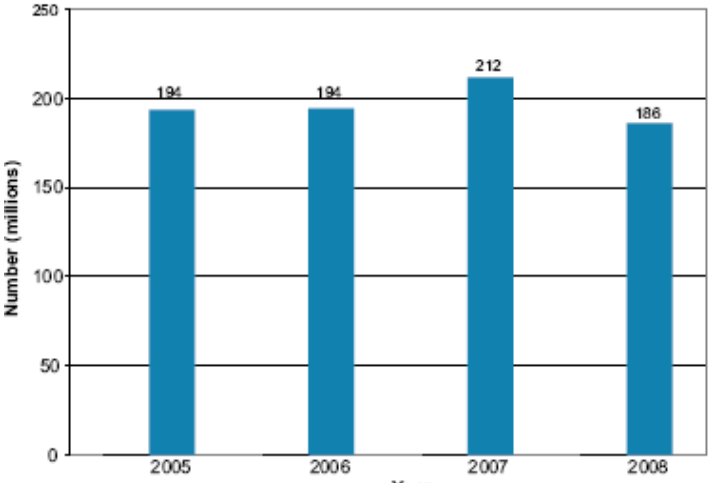


Figure 4: Clam Prices Reported by Virginia Growers (2005-2008)

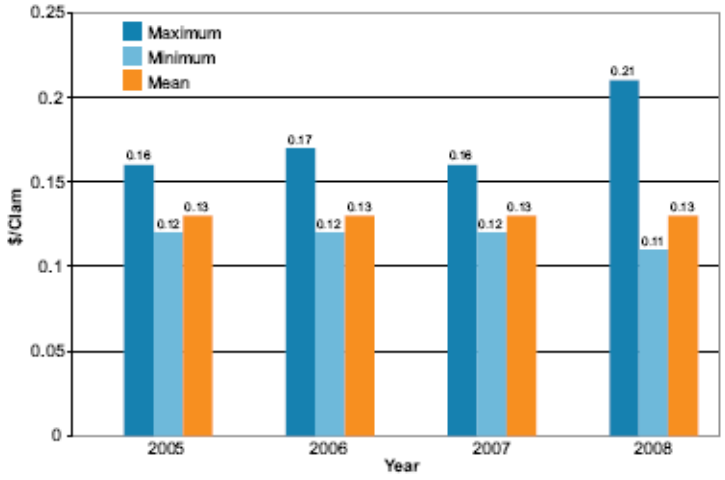


Figure 6: Number of Oysters Planted by Virginia Aquaculturists (2005-2008)

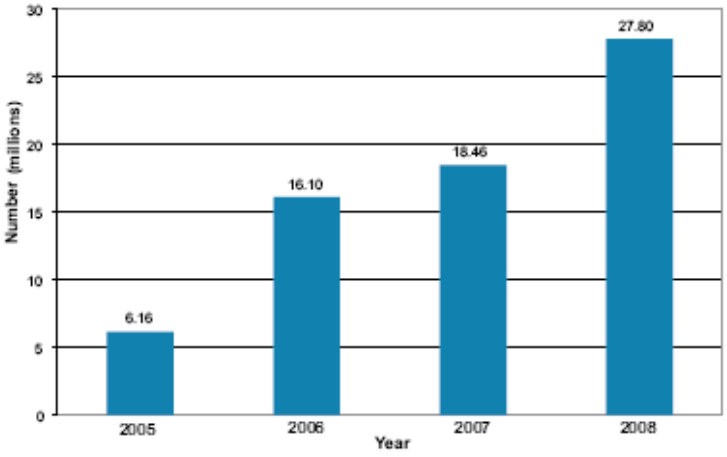


Figure 7: Number of Aquacultured Market Oysters Sold by Virginia Growers (2005-2008)

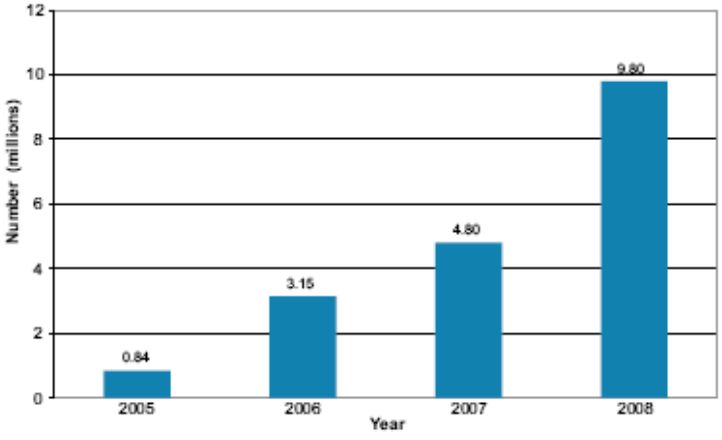
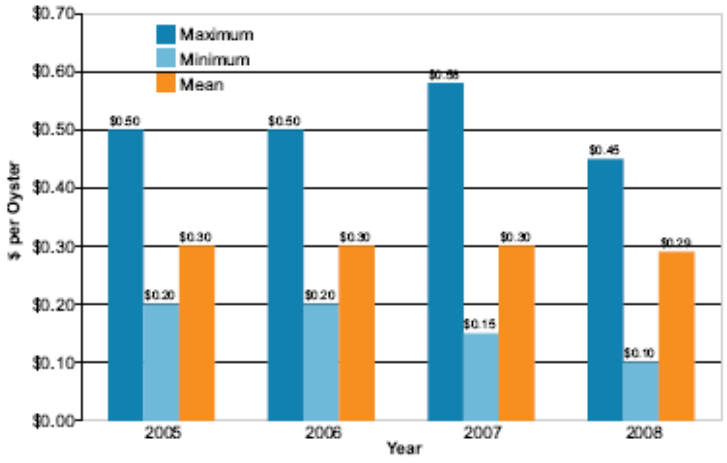


Figure 8: Reported Market Prices for Virginia Aquacultures Oysters (2005-2008)



Other new research includes:

- The Virginia Joint Legislative Audit and Review Commission (JLARC) called for a study of aquaculture beginning in 2009 under the topic area "Economic Potential of Virginia's Seafood Industry."
- There have been efforts to maintain and preserve working waterfronts, especially on the Middle Peninsula (see the section below under *Priority Needs and Gaps* for additional information).
- There has been enhanced funding from NOAA to VIMS to continue or expand oyster monitoring with regard to the success of oyster restoration efforts and reef restoration modeling, including the effects of cownose ray predation. Cownose rays pose a significant threat to shellfish aquaculture as they feed on clams and oysters (especially those grown with spat-on-shell cultivation methods), and some restored oyster reefs have been damaged due to ray predation. Although many aquaculturists have increased on-site protection methods such as augmenting nets and stakes, rays continue to be a threat. In addition, there has been an effort to try to increase the edibility profile for rays to increase the market and thus fishing of rays.
- Virginia Tech completed a two-part study, *Economic Implications of Alternative Management Strategies for Virginia Oysters and Clams,* in 2008 with CZM funding on the economics and choices for promoting aquaculture, including concepts of enterprise zones, permitting choices and potential reassessment of public grounds.
- An economic impact study was conducted within DEQ, with CZM funding, focusing on development with a discussion about opening the Baylor grounds as Enterprise Zones (see the *Priority Needs and Gaps* section for more information about Baylor grounds), as well as discussion around reorganization and changes to Baylor grounds. There have been no draft policy changes at this point, however the concept of reassessing use of Baylor grounds is being considered under the seaside Special Area Management Plan.
- Other studies have been conducted around the Baylor grounds as well, including basic mapping of the grounds to determine what grounds are suitable and optimal for oyster and clam growth. These include the 2008 CZM-funded study by the Center For Coastal Resources Management, Virginia Institute Of Marine Science, *Shellfish Aquaculture Suitability Within Baylor Grounds of the Lower Rappahannock River;* and the 2008 study by G. Santopietro, *An Economic Analysis of Proposed Management Plans for the Public Oyster Grounds of the Rappahannock River, which is available at the website: http://www.deq.state.va.us/coastal/documents/task92-04-06.pdf.* The final reports were made to the Virginia Coastal Management Zone Program, and are available from the CZM website.
- Additional CZM funded studies include the 2007 *Shellfish Aquaculture Vulnerability Model* Report by VIMS and the 2008 *Identification of Management Strategies for Promoting Aquaculture in Virginia* Report by VIMS.
- There is ongoing research regarding nutrient removal by oysters, including the 2006 report *Nutrient Assimilation Credits: Opportunities from Enhanced Native Oyster Production* by Kurt Stephenson, Bonnie Brown, Leonard Shabman, and Darrell Bosch, through the Chesapeake Bay Targeted Watersheds Grant Program of the National Fish and Wildlife Foundation.

Aquaculture facilities are currently not allowed on Baylor grounds, in areas that interfere with riparian rights, nor in areas with submerged aquatic vegetation (SAV). The Baylor grounds have been set aside as public bottomlands in perpetuity, as they were determined to have oysters or shellfish growing on them during a survey conducted in the late 1880's. However, there has been considerable discussion recently about the need to reexamine the protection of the Baylor grounds, or to reassess their status, given so few oysters remain on those grounds and vast areas of Baylor are barren.

Part of the discussion among state agencies has called for a resurvey of the Baylor Grounds as a step toward redefining or declassifying them as public grounds. There is more support for opening the Baylor grounds up on the Eastern Shore as there is more pressure to identify additional grounds for shellfish aquaculture activities.

Many growers state that all desirable lands have already been leased on the seaside of the Eastern Shore. This is especially urgent for clams, as hard clams have fairly specific environmental requirements for higher salinity, while oysters can tolerate less salinity. However, in the western Shore, the issue of opening up the Baylor grounds is a more contentious political issue. Others have stated that they would like to see "sanctuaries" being created on Baylor Grounds.

Some people have declared that up to one-third to one-half of the Baylor grounds might be suitable for shellfish aquaculture. Others have stated that there is a strong need to conduct a comprehensive survey of the viability of existing Baylor grounds for the purpose of oyster and shellfish growing and restoration. This will continue to be a widely discussed and researched topic in the near future. In the 2010 General Assembly session, Delegate Lynwood Lewis introduced HJ 74 regarding a Study on Eastern Shore bottomland habitat. This bill requests the Virginia Institute of Marine Science to study management options for state-owned submerged lands on the seaside of the Eastern Shore. Additionally in 2010, Delegate Albert Pollard introduced HB 138 which authorizes the Virginia Marine Resources Commission to establish aquaculture opportunity or enterprise zones (at the local level) for the propagation of commercial shellfish.

Several CZM-funded studies on use conflicts focused on resolving conflicts between shellfish farming and other uses of shallow, nearshore waters. The first study looked at shorebird foraging versus clam farming (with grants to VIMS and the William and Mary, Center for Conservation Biology in 2004 - 2006). Through grants to VIMS and the Middle Peninsula Planning District Commission (MPPDC) in 2006 - 2008, a third study looked at all potential conflicts among near-shore uses using suitability modeling and matrices. VIMS reviewed uses from a state perspective and MPPDC from a local perspective of Gloucester County.[36] Finally, the CZM program funded surveys of submerged aquatic vegetation distribution and abundance with grants to VIMS in 2007, 2008 and 2009. All of these studies point to the need for what many are now calling "marine spatial planning" which can be regarded as a subset of "special area management planning." Clearly federal, state and local governments and all stakeholders need to work together, area by area to create management plans that allow for efficient sustainable use of coastal waters.

[36] From the website: http://www.deq.virginia.gov/coastal/sf2008magshellfishsquaculture.html

The success of submerged aquatic vegetation (SAV) restoration on the seaside of the Eastern Shore is beginning to create a fear of use conflicts by shellfish growers. This a large part of the rationale for the Virginia CZM Program to continue the Seaside Special Area Management Planning (SAMP) largely as a marine spatial planning effort that seeks to accommodate multiple uses such as SAV/oyster/bay scallop restoration, shellfish cultivation, recreation and marine area conservation. A separate project is being funded around designating priority estuarine conservation zones throughout all Virginia coastal waters. Climate change must also be considered in marine spatial planning as species usual habitats may shift northward.

Asian oysters faced an unknown future at the time of the last assessment. The US Army Corps of Engineers conducted an Environmental Impact Statement (EIS) around Asian oysters, with VIMS conducting the research. The EIS did not endorse the use of Asian oysters in any form. Sterile Asian oysters had been used by growers, but now the use of Asian oysters has been formally denied.

During the past few decades, some individuals and corporations have used their privately leased submerged land to grow out hatchery or nursery-reared oysters and hard clams. There has been significant recent growth in noncommercial oyster gardening. VIMS estimates about 2,000 people in the state are growing between 1,000 to 5,000 oysters each, for environmental purposes (water quality improvement) and personal consumption, which cumulatively constitute a significant economic impact. Disease-resistant oyster seed is purchased from commercial hatcheries, and floats are either purchased as a unit or built from purchased materials.

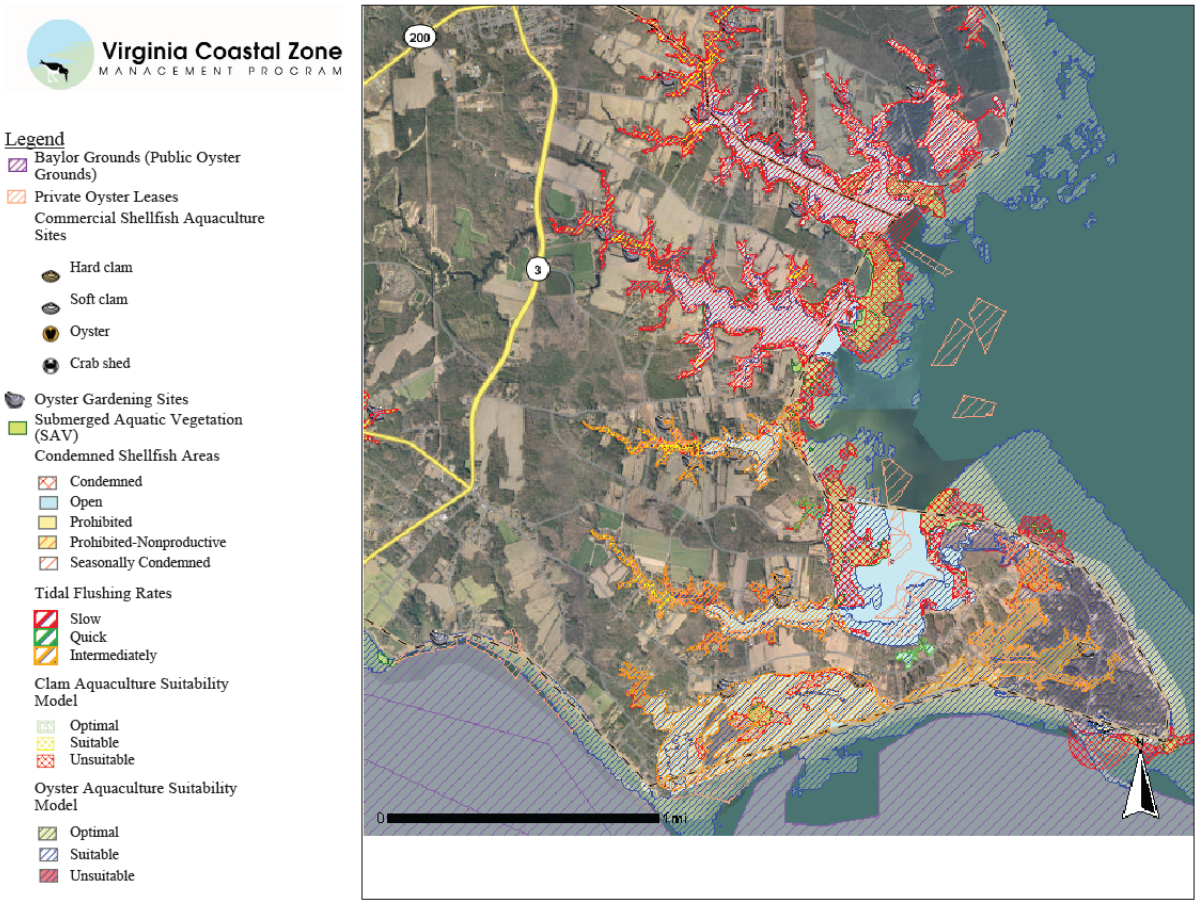
While there has been some research into ocean acidification, there is a strong need for additional research. The industry is threatened by acidification, and measurable changes have been recorded this year (see below under *Priority Needs and Information* for additional information). Cherrystone Aquafarms recorded a 0.2 pH drop in ocean water and a 0.5 pH drop in the Chesapeake Bay, both becoming more acidic, at their facilities in the past two years. Cherrystone has reported crashes in algae culture when algae stopped growing in 2008, which could have significant ramifications as algae is a food source for shellfish larvae. Cherrystone has communicated with scientists and growers around the region and world, who have also reported similar problems, including that algae has been failing. Other Virginia hatcheries have also reported similar problems. Other significant impacts of rising carbon dioxide levels and ocean acidification include:

- shellfish shells dissolving (which would affect all similar marine fauna that form calcium carbonate as their shell or exoskeleton, including many small organisms at the base of the ocean food chain);
- shellfish may begin to significantly dissolve before they can grow to a significant or harvestable size; and
- as pH changes, nutrients will have varying degrees of availability to shellfish.

Mapping

Mapping through the CZM-funded Coastal GEMS program has been a significant change since the last assessment. Coastal GEMS contains a large number of map layers relevant to shellfish aquaculture issues, including public oyster grounds, privately leased grounds, shellfish

aquaculture permit sites, SAV distribution, clam and oyster suitability and vulnerability, tidal flushing rates, condemned shellfish grounds, state constructed oyster reefs, oyster gardening sites, protected uplands and many more. It has been a very effective tool for building a more comprehensive understanding of Virginia's coastal zone. Below is an example of a Coastal GEMS map with aquaculture and other map features from the website: http://www.deq.virginia.gov/coastal/coastalgems.html



Other new aquaculture mapping includes:

- The Tidewater Oyster Gardeners Association (TOGA) has mapped the location of the private oyster gardens, available in this report from the TOGA website: http://wmpeople.wm.edu/site/page/vspain/togafolksdointheirthing
- The Center for Coastal Resources Management at VIMS has developed an Aquaculture Vulnerability Model Interactive Map, which was CZM funded and available on Coastal GEMS but can also be viewed at: http://ccrm.vims.edu/gis_data_maps/interactive_maps/aquaculture_vulnerability/aquaculture_vulnerability_model.html.

Aquaculture education & outreach

The abandoned clam net awareness program has been effective (as mentioned above under *Program Guidance*), although growers report that derelict nets continue to be a problem. Additionally, the BMP guide involved industry leaders, and VDACS has embraced the BMP guide as policy they want to use for shellfish aquaculture in Virginia (available at the website: http://web.vims.edu/adv/aqua/MRR%202008_10.pdf?svr=www).

A statewide aquaculture listserve is maintained, and education and outreach is conducted through that resource. Mike Oesterling of the Sea Grant Marine Extension program holds an annual shellfish culture forum looking at hot topics within the industry. Additionally, the Virginia Aquaculture Association hosts an annual aquaculture meeting and conference. Finally, VIMS and Sea Grant circulate shellfish aquaculture outlook reports to industry, agencies and localities. These are available on the website: www.vims.edu/adv/aqua. The Tidewater Oyster Gardeners Association (TOGA) is an active resource for education and outreach for non-commercial oyster gardeners. VDACS maintains a Virginia Aquaculture Advisory Board, as well as a staff member that serves as the State Aquaculture Coordinator. Finally, the East Coast Shellfish Growers Association is an active resource for the industry, although it does not have a strong membership base in Virginia. The Virginia Shellfish Growers Association was dissolved several years ago.

Many colleges and universities such as Old Dominion University, Virginia Tech, and VIMS (at William and Mary) are offering courses and training in aquaculture, and doing research that is grant or industry-funded. For example, the Aquaculture Genetics and Breeding Technology Center at VIMS offers a 6-month paid Oyster Aquaculture Training program where four participants spend an intense training period working with the breeding program.

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)
1. Marine Spatial Planning: Several needs have been expressed regarding marine spatial planning, increasing aquaculture opportunities and preserving working waterfronts, and examining areas in which shellfish aquaculture takes place. These include:	Regulatory, Policy, Data, Capacity, Communication & Outreach	H*

• Comprehensive plans and zoning tools for localities need to reflect water-based territorial boundaries to afford local governments a correct representation of spatial areas under their jurisdiction as localities need to be aware of their offshore boundaries to effectively manage various uses. • A comprehensive and aggressive effort is needed to preserve and protect working waterfronts among localities, perhaps through a working waterfronts training effort for local officials to find a way to share and replicate the model that Mathews County is developing. Additionally, education and dialogue is needed to address some of the issues of homeowner complaints around the visual impacts of aquaculture activities and to highlight the importance of traditional maritime activities and to preserve working waterfronts. • Shellfish aquaculture should be recognized as a "right by use" and an activity that should be encouraged. There is a need for a policy stating what the interest of the State is in aquaculture so that when some of the questions arise with private property rights and public bottom, a statewide policy or statement regarding aquaculture can be considered (such as a right-to-farm statement), which would make the management of aquaculture more straightforward. • There is a strong need to update the current Virginia Marine Resources Commission (VMRC) fee structure and lease program, and to make them more efficient in the immediate to near future. A mechanism needs to be developed for releasing specific areas from large parcels held in lease from the VMRC, to free up more bottomlands for diverse activities, and to address inactive bottom leases. This could happen through withdrawing some long-held inactive leases, examining how other coastal states manage bottom resources, allowing an individual to keep a portion of the leased grounds for the operations they are interested in and to make the rest of the grounds available for re-leasing to others, and to enforce and verify that lease holders are actually using the bottomland (which is currently self-reporting; only a small portion of the leased grounds were considered "active" by VMRC in a recent study). Additionally, the cost of leasing bottomland should be reexamined. The cost is $1.50 per acre per year to lease land, but clam growers can produce $60,000 of gross profits every 2-3 years per acre. Other states have significantly higher use fees for leasing, and there is a need for VMRC to explore increasing leasing fees. To help increase shellfish viability, increasing leasing fees should be directed toward protecting water quality, reducing cost/increasing availability of seed, and increasing growth rates through research.		

• Re-characterization of the Baylor grounds is needed to inform policy development and next steps, and a public dialogue is needed around this issue. There is a need to update the method in which subaqueous grounds are leased and to examine the grounds that are currently available for leasing. Although small changes have been made, there hasn't ever been a comprehensive revision of leasing regulations, particularly with consideration of the best sites for shellfish farms. • There is a need to connect aquaculture with local land-use decision-making and the state's capacity to manage good water quality, and knowledge is needed of that linkage throughout Virginia's entire coastal zone. Aquaculture could become an indicator for all water-based industries with setting the standard for good water quality. In addition, to determine the best locations and scale for aquaculture, there is a need to better understand the economic, ecological and social consequences of both the scale and distribution of facilities. • Expand funding for current aquaculture suitability modeling is needed with a focus on the impact that development would have on aquaculture for the western shore, especially for using this risk assessment for expanding aquaculture within the comprehensive planning process of localities. The project, which could be housed at VIMS, could further be expanded to look at the suitability and risk assessment for what areas are the most suitable for aquaculture in Virginia's coastal zone.		
2. Nutrient removal by shellfish aquaculture: There is a need to gather data and information about shellfish aquaculture and the resulting scale of nutrient removal that is currently occurring, specifically to understand the details of and gaps around how large scale shellfish aquaculture affects nutrient removal and nutrient dynamics within a body of water. These issues are important in several arenas, including providing information to property owners adjacent to aquaculture sites, understanding effects on eutrophication, understanding how nutrient removal might play into a "nutrient trading credit" system, and how other marine species are influenced by shellfish aquaculture. For example, on a single clam farm, significant amounts of algae grow on the nets. The clams filter nutrients and absorb some nitrogen, but the algae uptakes the rest. However, clam growers need to remove the algae after they harvest the clams, and the algae may end up on an adjacent homeowner's beach, which could upset the homeowner. Further research may indicate methods the clam farmer could use to put the algae on land for agriculture, to compost it, or to otherwise utilize it in a beneficial way.	Data	H*

There is a need to explore how aquaculture could help meet pollution prevention and Chesapeake Bay Total Daily Maximum Load (TMDL) goals through nutrient uptake.		
3. Impacts of shellfish aquaculture: Data is needed on the effects of shellfish aquaculture farms on surrounding ecosystems, on competing uses for the creeks in which clam aquaculture takes place, and the overall effects on the creeks. Once the negative effects are known, marine zoning could address some of these issues –such as allowing shellfish aquaculture to exist only in certain areas and to occupy only a certain percentage of space. Use conflict studies need to be conducted, particularly around riparian land practices and clam culture.	Regulatory, Policy, Data & Capacity	H*
4. Clean waters: There is a need for additional regulation to cover all Virginia waters to promote and protect clean waters, similar to the recent discharge regulation adopted by the Department of Environmental Quality for the Eastern Shore (see the section above under *Regulations* for additional information),	Regulation and Policy	H*
5. Research on breeding: There is a need to continue the progress in oyster breeding and domestication to achieve higher gains and increase the suitability of oysters for cultivation.	Data	H*
6. Funding BMPs: There will be a need for a cost-share program or to find grant funding options if aquaculture BMPs are made a requirement for growers.	Regulatory, Capacity	H*
7. Taxing aquaculture as agriculture: There is a need to examine taxation on aquaculture activities, as aquaculture is a form of agriculture and land-use taxation applies to other agricultural operations. The land-use taxation policy should be extended for aquaculture (where it is currently inferred), but should explicitly state that aquaculture is exempt under land-use taxation.	Regulatory	H*
8. Education support: There is a need for an Sea Grant? extension agent for aquaculture that is dedicated to education and outreach. This person could be housed at VIMS, VMRC, or VA Tech (or another location). This position is needed as a resource for questions on starting hatcheries, and for other information needs.	Training, Capacity, Communication & Outreach	H*
9. Research on acidification: There is a strong need for research into ocean acidification, a significant threat to the industry.	Data, Regulatory, Capacity, Education and Outreach	H*

10. Research on Economic Impacts and Policy: There is a need to examine the potential impacts on the industry of FDA regulations on the potential ban on raw shellfish, as well as exploring alternatives to a full ban. There is a need by the industry to know about new regulations in advance.	Data	M – H*
11. Research on breeding: There is an overall need to lower the price of shellfish seed, enhance seed availability, and increase growth rates of shellfish through breeding research.	Data, Capacity	M – H*
12. Discarded Nets: There is a need for more growers to utilize the BMP guide that has been developed, and to find a way to make sure that clam nets are properly clean up and not discarded into the ocean. There is a strong need for research into the potential to recycle clam nets (similar to the sheets of polyethylene used to grow tomatoes that are now recycled). Enforcement is needed to ensure that the nets aren't allowed to float loose into the ocean, which could be a safety hazard to boaters. Although a program was tried in which the nets were tagged with the growers information, the tags were frequently ripped off. A new system is needed to make sure the nets are disposed of properly, and recycled if possible.	Regulatory, Education, Outreach	M – H*
13. Research on algae: More baseline research is need on water quality monitoring to determine sources of impacts to algae health, and routine monitoring of various types of algae health as its is connected to successful shellfish aquaculture.	Data, Education	M – H*
14. Research on eel grass: There is a need to research aquaculture and eel grass preservation. A greater number of areas have been set aside for eel grass preservation and restoration in recent years, and there is a perceived threat to aquaculture due to this restoration effort. However, it isn't known whether the eel grass will adversely affect clam aquaculture activities as eel grass growers at deeper levels than the clam nets are generally set, and it hasn't appeared to have a detrimental effect on either clam aquaculture or on eel grass restoration to date. There is a potential for conflict between the increasing oyster aquaculture activity and eel grass restoration efforts though. There is a need to map grass beds to look at effects on and compatibility with aquaculture activities. More research is needed to see what marine flora might be compatible with shellfish aquaculture and restoration efforts. Cherrystone	Data, Education	M - H*

Aquafarms has a series of photos of clam beds which initially had a small amount of zostra eel grass growing and over the years, developed a thick solid mass of zostra around clam beds, indicating the two may be compatible.		
15. Research on harvesting methods: Data is needed into what harvesting methods are currently used with shellfish aquaculture, and to examine how new harvesting methods affect water quality and habitats.	Data	M
16. Policy review of transport: There is a need for review and clarification of existing policies that affect the movement and transport (interstate and interregional) of aquaculture organisms. The current review of regulations has happened on a piecemeal basis especially regarding the importation of various aquaculture organisms and within the state. Clarification of the system and suggestions for synthesis existing regulations is needed, and more coherent and comprehensive policy is needed for aquaculture activities, especially as the industry aquaculture expands.	Regulatory, Policy, Data & Capacity	M
17. Promotion and funding: There is a need for programs to promote aquaculture, with marketing and advertising for the aquaculture industry and its products. There is a need for increased funding to the aquaculture industry for research around the potential environmental benefits of shellfish aquaculture and as well as funding for increased advertising. For example, Canadian aquaculturists just received $1 million for new research, and Florida has several programs to support aquaculturists.	Capacity, Outreach	M
18. Education and outreach: There needs to be an increase in the release of information regarding the distribution of wild oysters on the Eastern Shore as there isn't widespread knowledge of the level of accuracy of existing data about the persistence of wild oyster populations. There may be a need to look at the historic distribution of oysters to conduct spatial mapping the persistence of oysters over time, although researchers aren't sure if the data would support this study. SAV distribution, restoration and protection has become an issue as well, and more data is needed on that topic.	Data & Capacity	L

* While the majority of needs listed above are ranked high, further assessment and prioritization of how to address them is dependent upon additional staff resources and increased program capacity.

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 _____

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

The interagency Coastal Policy Team reviewed and ranked this issue at its February 17, 2010 meeting according to the following criteria: feasibility; importance and appropriateness. Up to 5 points were allotted to each of the three criteria so that a maximum score would be 15. Scores from 0-4.99 are considered low priority; 5–9.99 is medium priority and 10-15 is high priority. Aquaculture received a score of 11.54.

2. Will the CMP develop one or more strategies for this enhancement area?

Yes _____
No ✓

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

Virginia CZM has focused on aquaculture for several rounds of Section 309 5-year strategies. Virginia currently has a good regulatory framework for promoting aquaculture and the industry is moving ahead at a reasonable pace. The last remaining aquaculture management issue is securing adequate space for the industry to grow. This means ensuring sufficient waterfront for hatcheries and other related facilities as well as submerged lands (for clams) and either submerged land or water column for oysters. The issue of waterfront accessibility will be explored through the CSI: Working Waterfronts Strategy. The issue of additional appropriate space for shellfish cultivation is being explored through the Seaside SAMP Marine Spatial Plan. The Seaside SAMP will allow Virginia to test various management options on a smaller scale and in a location that generally has very strong support for its shellfish aquaculture industry.

2000 Assessment		2005 Assessment		This Assessment (2010)	
High	✓	**High**	✓	**High**	✓
Medium		Medium		Medium	
Low		Low		Low	

IV. STRATEGY

Cumulative and Secondary Impacts

Working Waterfronts

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)*:

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

II. 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.

The proposed program change will establish a coastal zone-wide Working Waterfronts plan for Virginia that will serve to guide communities in protecting, restoring and enhancing their water-dependent commercial and recreational activities. The strategy to develop this program change is designed to help communities with existing water-dependent commercial infrastructure understand the long-term costs associated with the loss of working waterfronts, develop new policy tools to help them manage the increasing growth pressures, and build capacity to develop working waterfronts as a thriving component of local economic development.

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

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.

Coastal areas are experiencing dramatically increased demand for residential development. This demand often results in the need for services and resources that are not compatible with the nature and character of the community that attracted the development in the first place. As a result, historic industries that support the functionality of many waterfront communities become disadvantaged by impacts of new development. Localities with working waterfronts often lack sufficient information and/or organizational capacity to effectively respond to the changes presented by increased growth and development.

By providing initial grant funds to VIMS/Sea Grant, the strategy draws upon expertise in comparative economic analyses to identify the long-term economic impacts of incoming development versus the maintenance and enhancement of existing water dependent commercial activities. This first step will lay the foundation for development of a working waterfront plan for Virginia's Coastal Zone, to guide communities in decision making and policy development to retain the water-driven elements of their economic structure and cultural heritage.

IV. Benefit(s) to Coastal Management

Discuss the anticipated effect of the program change or implementation activities including a clear articulation of the scope and value in improved coastal management and resource protection.

The desired benefit of this strategy is to arrive at a coastal zone-wide plan for Virginia that will serve to guide communities in protecting, restoring and enhancing their water-dependent commercial and recreational activities. The planning process will help derive a clear consensus definition of water dependent commercial activities and working waterfronts. It will inventory existing working waterfront infrastructure throughout the costal zone and identify threats and opportunities for preservation. The plan will include examples of policy tools for local government adoption that will allow for restoration, enhancement and retention of working waterfront areas. One or more community demonstration projects included in the strategy will exhibit both victories and challenges to development of a working waterfronts plan and approaches to implementation.

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.

The working waterfronts issue received a high level of support from the Virginia Coastal Zone Management Program Coastal Policy Team as demonstrated in the group's high ranking of the need for strategy development in this area. Eight coastal Planning District Commissions (PDCs) are represented on the team with four PDCs participating in the working waterfronts strategy planning group: Accomack-Northampton, Hampton Roads PDC, Middle Peninsula PDC and Northern Neck PDC. These PDCs have significant working waterfront infrastructure and have confirmed their support through direct participation in developing a working waterfront strategy and planning process.

Support from the Coastal Policy Team has been fostered by more than a decade of investment in working waterfronts-related issues by NOAA and the Virginia CZM Program. This investment spans from shellfish and habitat restoration to policy development and local government capacity building.

From 1999-2001, the Oyster Heritage Program has constructed over 80 sanctuary reefs and 1000 acres of harvest area in Virginia's coastal waters. From 2002-2008 the Seaside Heritage Program has restored approximately 1400 acres of seagrass beds on Virginia's seaside, approximately 4.9 acres of oyster reefs have been constructed on public oyster beds in Accomack County, and just under 5 acres of oyster reef have been constructed in Northampton County.

In 2002, the Virginia CZM Program funded the onset of continued staff support for implementation of the Middle Peninsula Chesapeake Bay Public Access Authority Act. The act establishes a Public Access Authority for the Middle Peninsula region to set aside access sites for economically viable recreational activities and public access sites. To date the MPCB Public Access Authority holds title to approximately 850 acres of public access sites in the region, including Gloucester, Essex and King and Queen Counties.

In 2006, the Northern Neck Chesapeake Bay Public Access Authority was formed and is currently working to increase public access to the Chesapeake Bay through the Northern Neck region. The NNCB Public Access Authority entered into a contract in June 2010 with the Norfolk Army Corps of Engineers to create a Shallow Draft Dredging and Sediment Plan that will be completed by September 30th of this year. This plan will estimate dredging costs for all federal designated navigation channels in the three member counties of the NNCBPAA (Lancaster, Northumberland and Westmoreland), attempt to pair creeks with similar dredge cycles to reduce mobilization and de-mobilization costs, and investigate local options on how to create a funding mechanism to be able to have resources available to dredge the channels and keep the creeks open so local watermen can continue their work.

In 2006, the Virginia CZM Program supported the York River Use Conflicts project which served to frame existing and emergent issues and identify policy needs surrounding conflicts affecting local government ability to maximize use of their waterfront. To help address this, the York River Use Conflict Committee developed seven recommendations to help Gloucester County preserve the coastal identity that makes its waterfront community unique. In February 2009, the Gloucester County Board of Supervisors unanimously approved the recommendations and the county is now working to implement them.

In 2007, the Virginia CZM Program funded the Middle Peninsula Shallow Water Dredging Master Plan Framework to provide a comprehensive and sustainable approach to the on-going dredging needs for access to waterways of the Middle Peninsula.

Also that year, the Virginia CZM Program supported the "Working Waterways and Waterfronts 2007" national symposium in Norfolk to share local, state and national-level initiatives that address water access. A key outcome of the symposium was development of a structure for communicating among the diverse constituencies involved in working water front issues.

In 2008, the Virginia CZM Program funded the Middle Peninsula Aquaculture and Local Policy Development project to identify public policy needs for aquaculture-working waterfront sustainability (economic effectiveness of uses including jobs, business sales, and fiscal revenue). Through dialogue with local elected officials the project also explores other economic tradeoffs or competing economic interests of existing local public policy.

Through this level of continued interest and investment in protecting the necessary aquatic infrastructure as well as fostering initial decision-making capacity, the Virginia CZM Program and its partners have laid the groundwork to successfully address working waterfront-related issues in Virginia.

In addition, an approved working waterfronts plan would position Virginia to receive funding for acquisition of commercial waterfront sites and plan implementation if the currently proposed legislation HR 2548, *The Keep America's Waterfronts Working Act* is passed and funds are appropriated.

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:	Five Years
Total Budget:	$250,000
Final Outcome(s) and Products:	Virginia Working Waterfronts Plan including examples of policy tools for local adoption

Years One and Two: FY 2011-2012

Description of activities: Develop a clear consensus definition among planning district commissions (PDCs) of water-dependent commercial activities and working waterfronts. Given the significant economic and demographic variability between the regional planning districts, localized public and stakeholder engagement is warranted and envisioned. It should be noted that, based upon community engagement to-date, it is likely that regional variations will emerge in defining what working waterfronts means in diverse communities. The community visioning and development effort will therefore be a central component of this strategy from inception to completion. As part of the strategy coordination, Virginia Sea Grant Extension Programs will facilitate overall outreach and consensus building among and between regions. In addition, the necessary infrastructure for working waterfronts will also be defined and critical working waterfront infrastructure throughout the coastal zone by PDC identified. Existing public access data will be queried and used to identify and differentiate those public access sites that may serve a dual function as working waterfront infrastructure from those public access sites not suitable for this extended use. One or more areas where a county Board of Supervisors or Town Council supports the working waterfront concept with a resolution and is willing to conduct a demonstration project will be selected. A comparative valuation between new development and retention, restoration and enhancement of existing water-dependent enterprises will be conducted as well as an assessment of methods and opportunities to integrate public access and working waters in appropriate venues.

Outcome(s): Establish foundation for working waterfront plan development and planning process.

Budget: $100,000

Year Three FY 2013

Description of activities: Develop policy tools via research of successful working waterfront policies in neighboring states and workgroup assessment to enable localities to address retention of working waterfronts. Policy examples include but are not limited to public financing, comprehensive plan changes, ordinances and overlay zones, zoning and taxation. A one-day workshop will be conducted to provide a forum for information exchange and query among stakeholders in water-dependent industries.
Outcome(s): Continued development of the components of a working waterfronts plan for Virginia.

Budget: $50,000

Years Four and Five FY 2014 – 2015

Description of activities: Completion of Virginia Working Waterfront Plan
Outcome(s): A Coastal Zone-wide plan to guide Virginia communities in retaining the working waterfront as a viable means of locally sustainable economic development will be finalized. An approved plan would also position Virginia to receive funding for acquisition of working waterfront sites if proposed legislation (HR 2548, *The Keep America's Waterfronts Working Act*) is passed and funds are appropriated.
Budget: $100,000

VII. Fiscal and Technical Needs

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

Partnering with the VIMS/ Sea Grant Extension program will bring additional resources to the strategy, both financial and technical. The program's coastal community development program is one possible source of additional financial support to assist in implementing the strategy.

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).*

The VIMS/Sea Grant Extension program's marine business and coastal community development program has personnel experienced in financing and evaluating working waterfront feasibility.

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.

Shoreline Management

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)*:

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

II. 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.*

The previous Section 309 Shoreline Management Strategy provided $791,590 for various initiatives to promote the use of living shorelines. Outcomes included changes to policy documents, state legislation, education of government officials, contractors and waterfront property-owners, and new living shoreline design guidance. Support was also provided for data acquisition to help improve local decision making. This strategy will build on these successes by providing support for development of local shoreline management plans. These plans are widely recognized as the most effective policy to promote living shorelines. In addition, funds in year 1 will be targeted at implementing the recommendations of a study mandated by the Virginia General Assembly to find ways to streamline the regulatory process for living shorelines and promote this method of shoreline management. As a result, the anticipated outcomes of this strategy will be both new policies (in the form of locally adopted plans and changes to state regulations) and implementation of previous program changes from the last strategy.

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

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.

The Assessment identifies the loss of the water quality protection and habitat values of wetlands as a key cumulative and secondary impact of waterfront development. Fringe marshes are often impacted by traditional shoreline erosion management techniques (bulkheads and rock revetments), either during construction or as a result of sea level rise and wave scouring after construction. Previous Section 309 efforts to improve shoreline management and promote the use of living shorelines have been successful, but more work remains. The promotion of living shorelines through the development and use of local shoreline management plans is shown as a high priority need in the Assessment. Previous policy changes have provided a framework for encouraging the use of living shorelines over traditional techniques, but local shoreline management plans are needed in order to advance implementation of these policies. Additional resources are needed in order to take full advantage of the progress made during the last strategy and to adopt to shoreline management policies at both the state and local levels.

IV. Benefit(s) to Coastal Management

Discuss the anticipated effect of the program change or implementation activities including a clear articulation of the scope and value in improved coastal management and resource protection.

In Virginia, shoreline management decisions affecting important coastal resources such as riparian buffers, tidal wetlands, beaches, and nearshore habitats are made by local wetland boards, with oversight by the Virginia Marine Resources Commission (VMRC) and with technical assistance from the Virginia Institute of Marine Science (VIMS). Wetlands boards react to projects proposed by individual property-owners, who often request shoreline erosion control projects that are not the most appropriate for their given shoreline situation and may negatively impact coastal resources. During the Assessment period, VIMS was forced to scale back its project review function and while still providing an alternative analysis for proposed projects, conducts site visits on only about 15 percent of those projects. This shifts more of the responsibility of recommending appropriate shoreline management techniques to local wetland boards and their staff. Reliance on local citizen boards and staff with multiple local government responsibilities often results in a lower level of expertise than was available through the scientific staff at VIMS. Local shoreline management plans provide a means for the shoreline management experts at VIMS to recommend management techniques for each reach of local shoreline in advance of project proposals. They provide not only a tool for localities to review the appropriateness of proposals, but up-front guidance to waterfront property-owners and contractors as to the preferred management technique for specific shorelines. The result should be better project proposals from project proponents and a more informed decision process for those responsible for project review.

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.

During the past Section 309 Strategy significant effort and resources were dedicated to promoting the use of living shorelines. In addition to policy changes, research, and training/outreach initiatives, improved data on shoreline conditions was acquired to support more informed shoreline management decisions. State-level shoreline managers and scientists are in agreement that developing local shoreline management plans based on this data are a priority for improving shoreline management and that their use is the next logical step in promoting living shorelines. The reduction in proposal reviews and site visits by VIMS scientists has highlighted the need for technical advice on a reach basis. Local governments are now more receptive to plans because of this change in technical support from VIMS.

Interest in developing and adopting local shoreline management plans is also heightened by the requirements of the Chesapeake Bay Preservation Act (CBPA). The CBPA Regulations require that a shoreline management plan be adopted as a component of each local comprehensive plan. The regulations also only allow alteration of the Resource Protection Area buffer for shoreline management if the technique employed is based on "best available technical advice". There is general agreement from the Department of Conservation and Recreation's Division of Chesapeake Bay Local Assistance that the shoreline management plans funded through this strategy would help meet both of these needs.

The 2010 session of the Virginia General Assembly passed Senate Joint Resolution 35, which requested that VIMS study tidal shoreline management in the Commonwealth. In completing the study VIMS was directed to identify regulatory innovations that would increase the use of living shorelines and make recommendations to achieve the sustained protection of tidal shoreline resources. Funding is included in the first year of the Section 309 Shoreline Strategy to advance the recommendations from VIMS, which will be presented to the 2011 session of the General Assembly.

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:	Five Years
Total Budget:	$720,000
Final Outcomes and Products:	Streamlined permitting process, local shoreline management plans, inventories, and evolution reports.

Year One: FY 2011

Description of activities: Living Shorelines State Policy Development - The strategy will provide support the Virginia Institute of Marine Science (VIMS) to implement the recommendations of Senate Joint Resolution 35 (2010 Virginia General Assembly), which requested that VIMS identify regulatory innovations that would increase adoption of living shorelines. The VIMS study recommended development of a streamlined general permit for living shorelines, guidance on integrated shoreline management, and a policy preference for living shorelines. As of January, 2011 the Virginia General Assembly was considering legislation that would address each of these study recommendations, plus require all coastal zone localities to adopt the shoreline management guidance from VIMS into their comprehensive plans. Regardless of the outcome of this proposed legislation, this strategy will advance shoreline management policy in Virginia.
Outcome(s): It is anticipated that VMRC will adopt a streamlined permitting process to encourage the use of living shorelines and to encourage integrated shoreline management practices.

Budget: $30,000

Years One – Five: FY 2011-2015

Description of activities: Local Shoreline Plan Development - The majority of this strategy will focus on supporting development of local shoreline management plans, which will promote the use of living shorelines where appropriate. Shoreline Management Plans comprise 5 major elements: a shoreline inventory, a shoreline evolution study, recommendations for shoreline management options using cost effective geospatial decision tools, a general cost estimate and schematics for specific types of shoreline treatments, and background review on the state of the shoreline including general geology and characteristics of the coastal land use. The content of these plans have been selected based on a needs assessment conducted by VIMS with local and state agency participation, as well as in consideration on current and new legislation under consideration in the Virginia General Assembly. The plans will be intended for inclusion in local comprehensive plans and will be used for shoreline management decisions. In order to develop these plans, baseline data in form of local

shoreline inventories and shoreline evolutions reports is necessary. This information was collected for some localities during the previous Section 309 Shoreline Strategy, and is available for 24 of the 36 counties. Additional reports are necessary in order to provide broader coverage of Virginia's coastal zone.

Outcomes: VIMS will use the budgeted funds to develop both baseline data (shoreline inventories and shoreline evolution reports), as well as complete several shoreline management plans. Summary of major coastal management milestones to be accomplished under this activity include the completion of the first cycle of state-wide Shoreline Inventory Reports for Virginia and the completion of the state-wide Shoreline Evolution Report Series. Specific products include 5 updated Shoreline Evolution Reports that expand existing efforts to include small tributaries beyond primary shoreline, 8 new Shoreline Evolution Reports that will include all primary and secondary shoreline, and 9 new Shoreline Inventories. Ten (10) Shoreline Management Plans will be developed using these and/or prior completed baseline reports. Selection of target localities for specific activities was based on funds available, product demands, currency of existing data and products, and county size and location.

Benefits: Legislation currently being considered by the Virginia General Assembly would require incorporation of shoreline management guidance into local comprehensive plans. These plans are expected to be adopted by local governments in compliance with new legislation

Budget: $690,000

VII. Fiscal and Technical Needs

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

It is anticipated that this strategy, at the recommended funding level, will result in new state level policy to encourage living shorelines, new local shoreline management plans and background information for future shoreline management plans. By itself, however, it will not provide adequate funding to provide data and plans for all of Virginia's coastal localities. In order to prepare as many plans as possible, the Virginia CZM Program and VIMS will encourage localities to provide some level of matching funds.

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).* **N/A**

VIII. P*rojects 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.*

- Develop a database and reporting process for tracking wetlands in Virginia (a proposal was submitted, but not selected, for NOAA's "Modernizing and Improving State CZM Information Systems Grant")
- Develop a Virginia Erosion Vulnerability Assessment (VIMS would develop an EVA tool for Virginia similar to the one they developed for Maryland)
- Develop additional local shoreline management plans

Land & Water Quality Protection

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)*:

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

II. 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.

The anticipated program change resulting from this strategy aims toward improved land use approaches and development policies that are consistent with increased nutrient reduction goals proposed by the Chesapeake Bay TMDL, Virginia's WIP, and revised Virginia storm water management regulations. The strategy will analyze the local consequences of these storm water control requirements across three regional types (urban, transitional and rural) and develop tools to enable localities to meet these requirements while avoiding natural resource impacts or unforeseen adverse consequences.

In light of changing Federal and State regulations associated with nutrient loading, local nutrient goals, storm water management and TMDLs, initial grant funds will be offered to two coastal PDCs representing the geographies of urban, suburban and rural areas to evaluate and recommend new policy approaches and solutions for specifically identified local issues relating to water quality. This opportunity offers (as a pilot project) a comprehensive review of the impacts of new legislation and the identification of new policy changes that may be needed to advance sustainable community development in a new regulatory environment. Identifying and addressing these issues at the regional and local level is the most appropriate way to arrive at locally successful approaches to effective water quality improvements. Also, by initiating the project through a pilot program, one or two coastal regions serve as research and testing grounds, thus allowing other coastal regions and localities to implement resulting policies in later years of the 309 funding cycle.

In addition, the strategy will address other regionally specific issues related to land use and water quality as identified by each participating planning district. For example, the Hampton Roads Planning District Commission has identified interest in exploring the need for legislation to enable localities to require replacement or preservation of trees beyond the existing limits of 10-20 percent tree canopy in order to protect or restore water quality.

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

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.

Growth and development in Virginia's coastal zone continues to increase at a rate that is disproportionate with the rest of the Commonwealth. Water quality impacts associated with urban growth are further magnified by development trends characterized by increasing impervious cover. Rural land use patterns have also been impacted by recent changes in state regulations. These changes now allow placement of alternative septic systems in sensitive areas (with high water tables) enabling.

Virginia's water quality goals set forth in the *Chesapeake 2000* Agreement will not be met by 2010 because impaired segments of the Chesapeake Bay remain identified in Virginia's Clean Water Act section 303(d). Therefore, EPA has established the development of a federal Total Maximum Daily Load to address nutrients (N and P) and sediment for the

Chesapeake Bay and its tidal tributaries to achieve restoration. Virginia is working toward meeting these goals. However, many Virginia localities lack sufficient information and/or organizational capacity to effectively respond to the cumulative and secondary impacts associated with proposed Chesapeake Bay clean up requirements.

IV. Benefit(s) to Coastal Management

Discuss the anticipated effect of the program change or implementation activities including a clear articulation of the scope and value in improved coastal management and resource protection.

The desired benefit of this strategy is to arrive at a coastal zone-wide approach (Urban, Suburban and Rural) for sustainable community development recognizing a new federal, state and local regulatory environment. Facilitating pilot projects with three representative government frameworks allows the remaining Virginia Coastal Zone localities to have tools to achieve their local goals. The pilot approach will include examples of policy tools, research approaches and enabling authority clarification, for local government to consider as part of the cumulative and secondary impacts solutions associated with proposed Chesapeake Bay TMDLs and Watershed Implementation Plans (WIPs) correlated with clean up requirements. The strategy will also entail regular meetings of all 8 Coastal PDCs at which information on the pilot projects is shared so that all coastal localities can benefit from this strategy.

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.

The Virginia CZM Program's involvement in addressing this issue began nearly 20 years ago. In 1992, the Southern Watershed Area Management Plan (SWAMP) was ranked as a high priority in CZM's Coastal Needs Assessment and Strategy, and first received funding under Section 306 that same fiscal year. Through this project a set of conservation corridors was identified in the Southern Watershed Area (SWA) which has proven to be a valuable planning tool for the Cities of Chesapeake and Virginia Beach as well as a principal model for conservation corridor development throughout Virginia's coastal zone. With Virginia CZM program support, the entire coastal zone will soon have a comprehensive network of conservation corridors developed throughout the Commonwealth, upon completion of the final two regions in fiscal year 2010 (see section of past efforts in Assessment for details).

Furthermore, the program began supporting research and data collection for onsite sewage disposal systems (OSDS) in the Middle Peninsula region in fiscal year 2008. The current strategy builds upon that work by identifying key concerns with the proliferation of OSDS and focusing on policy based solutions.

Now, as Virginia positions to respond to the Chesapeake Bay cleanup requirements, draft legislative proposals are being prepared to address clean up issues within the coastal zone. This draft legislation becomes the first salvo of a new regulatory paradigm facing local and state government in Virginia. Municipal governments and Soil and Water Conservation Districts will develop and implement program changes for centralized municipal waste water issues, agriculture, onsite wastewater disposal, and storm water. Virginia local governments are administrative arms of the state government and will respond to Bay related mandates. As long as localities are directed to address water quality issues, there will be program changes and implementation activities.

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:	Three Years (MPPDC Pilot)
Total Budget:	$150,000
Final Outcome(s) and Products:	Issue identification, analysis and policy development.

Years One - Three: FY 2011 – 2013 Pilot Studies Rural

Description of activities: In light of changing Federal and State regulations associated with Bay clean up-nutrient loading, nutrient goals, clean water, OSDS management, storm water management, TMDLs, etc, staff from the Middle Peninsula Planning District Commission (MPPDC) will develop a rural pilot project which aims to identify pressing coastal issue(s) of local concern related to Bay clean up and new federal and state legislation which ultimately will necessitate local action and local policy development. Achieving the local nutrient loading goals will be a priority, therefore, MPPDC staff will focus on developing, assessing, and articulating the development the enforceable policy tools necessary to assist localities with the reduction of nutrient loadings by evaluating and assessing a series of environmental factors anticipated to support, clarify, prepare, and maximize locality or regional participation proposed in the Chesapeake Bay TMDL Phase II Watershed Implementation Plan. MPPDC anticipates, among other enforceable policy changes, local land use program changes necessary to address the expansion of the nutrient credit exchange program for on-site water treatment systems. Chesapeake Bay clean

up will have a very strong nexus to local land use policy, water quality protection, and fiscal concerns associated with the proliferation of new engineered septic systems. Staff has identified many cumulative and secondary impacts that have not been researched or discussed within a local public policy venue. Year 1-3 will include the identification of key concerns related to coastal land use management/water quality and Onsite Sewage Disposal System (OSDS) and community system deployment. Staff will focus on solution based approaches, such as the establishment of a regional sanitary sewer district to manage the temporal deployment of nutrient replacement technology for installed OSDS systems, assessment of land use classifications and taxation implications associated with new state regulations which make all coastal lands developable regardless of environmental conditions; use of aquaculture and other innovative approaches such as nutrient loading offset strategies and economic development drivers.

It is anticipated that the services of VNEMO will be required to address stormwater and nutrient loading issues as another condition identified within Chesapeake Bay TMDL Phase 1 Watershed Implementation Plan. New storm water regulations will be needed, nutrient management plans for municipal and or county owned lands are anticipated as well. These issues, among others will ultimately require new local tools and enforceable policy. Staff will partner with VNEMO to facilitate collaborative public decision processes to evaluate the successes of the identified approaches.

Budget: $150,000

Total Years: Three Years (HRPDC Pilot)
Total Budget: $270,000
Final Outcome(s) and Products: Comprehensive plan evaluation and applicable policy development

Year One: FY 2011 Pilot Studies Suburban

Description of activities: During year 1, the Hampton Roads Planning District Commission will select one or two transitional localities experiencing high suburban growth such as Isle of Wight County or Suffolk. HRPDC will work with this locality to evaluate the effects that the Chesapeake Bay TMDL and Virginia's Storm water Regulations will have on development. HRPDC staff will evaluate the existing Comprehensive Plan of the selected locality for compatibility with the regulatory requirements and develop policy recommendations as needed. Staff will partner with VNEMO to facilitate development of policy recommendations.

Outcome(s): Evaluation of local Comprehensive Plan and impacts of regulations. Identification of tools to evaluate the impacts of alternative development scenarios and development of policy to resolve identified conflicting issues.

Budget: $40,000

Year One: **FY 2011 Pilot Studies – Urban**

Description of activities: During year 1, the Hampton Roads Planning District Commission will select one urban locality faced with the challenge of encouraging sustainable redevelopment and an increasing need for stormwater retrofits. HRPDC will work with this locality to evaluate the effects that the Chesapeake Bay TMDL and Virginia's Stormwater Regulations will have on redevelopment and the need for stormwater treatment retrofits. HRPDC staff will evaluate the existing Comprehensive Plan of the selected locality for compatibility with the regulatory requirements. HRPDC staff will assist the locality in identifying retrofit and redevelopment opportunities that maximize the protection of existing green infrastructure and identify any potential for restoration opportunities. Staff will partner with VNEMO to evaluate impacts of regulations and identify policy recommendations.

Outcome(s): Evaluation of local Comprehensive Plan and impacts of regulations. Identification of tools to evaluate the impacts of alternative development scenarios and develop policy recommendations as applicable. Identification of retrofit opportunities that enhance green infrastructure.

Budget: $50,000

Years Two – Three: FY 2012 – 2013 Continued Pilot Studies

Description of activities: HRPDC will continue to provide technical support to the selected localities. During years 2 and 3, currently available land management tools will be evaluated for their potential to affect land use patterns in accordance with locally identified priorities. Tools to be evaluated might include development of comprehensive storm water management plan, authority to require greater tree canopy, no discharge marine zone designation, use-value taxation, transfer of development rights, and conservation subdivision design.

Outcome(s): Propose changes to comprehensive plan and develop comprehensive storm water management plan

Budget: $180,000

Total Years: Two Years
Total Budget: $277,400
Final Outcome(s) and Products: Implementation Projects

Years Four and Five FY 2014 - 2015

Description of activities: All coastal PDCs, and localities that have worked with their PDCs on issues related to the pilot studies, will have an opportunity to receive funds for implementation projects based on tools and policies developed in years 1-3. Results from previous strategy years will be disseminated to the other PDCs and localities

throughout the coastal zone through reports, web products and presentations at coastal zone–wide events such as the 2012 and 2014 Virginia CZM Coastal Partners Workshop.

Budget: $ 277,400

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.*

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).*

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.

Special Area Management Planning

Seaside SAMP

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)*:

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

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.***

The Seaside SAMP Strategy proposes to develop, in essence, a Marine Spatial Plan for the Seaside's barrier island lagoon system. This is an 80 mile long, 1-5 mile wide swath of shallow water that abounds with birds, finfish, shellfish and once again, underwater grasses. The area is renowned for its clam growing industry which is now valued at about $50 million per year. It's also increasingly recognized for its ecotourism value due to the vast number of birds and other fascinating sights as well as its allure for kayakers.

The program change will require adoption by the Marine Resources Commission of a new approach to leasing state-owned bottom for shellfish cultivation, for providing more suitable areas for public shell fishing and for preserving areas for habitat protection and recreational uses. The current system of hard, immovable boundaries has been in place since

the late 1800's and now that new uses have emerged and suitability of areas for various uses has shifted, we need to adopt a more dynamic, flexible system that can allow use boundaries to shift as the environment changes and human needs and uses change.

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

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.

The Seaside SAMP will address the need for some further GIS analysis, stakeholder engagement, locality preparedness, outreach and new spatial management regulations or policies as described in the Assessment.

IV. Benefit(s) to Coastal Management

Discuss the anticipated effect of the program change or implementation activities including a clear articulation of the scope and value in improved coastal management and resource protection.

Benefits of the Seaside Special Area Management Plan are similar to those described for the Ocean Resources Strategy. Both are expected to yield the same type of benefits derived from marine spatial planning:

1. Economic benefits: A Seaside SAMP could facilitate sustainable economic growth on the Eastern Shore by providing transparency and predictability for economic investments in coastal, and marine industries and related businesses. A Seaside SAMP could promote objectives such as economic incentives (e.g., cost savings and more predictable and faster use approvals.

2. Ecological Benefits: A Seaside SAMP could improve ecosystem health and services by planning human uses in concert with the conservation of important ecological areas, such as areas of high productivity and biological diversity; areas and key species that are critical to ecosystem function and resiliency; areas of spawning, breeding, and feeding; areas of rare or functionally vulnerable marine resources; and migratory corridors. Enhanced ecosystem services and benefits can be attained through the SAMP because they are centrally incorporated as desired outcomes of the process and not just evaluated in the context of individual Federal or State agency action. A Seaside SAMP would allow for a comprehensive look at multiple sector demands which would provide a more complete evaluation of cumulative effects. This ultimately is intended to result in protection of areas that are essential for the resiliency and maintenance of healthy ecosystem services and biological diversity, and to maximize the ability of marine resources to continue to support a wide variety of human uses.

3. Social Benefits: A Seaside SAMP would improve opportunities for community and citizen participation in an open planning process that would determine the future of the Seaside. For example, the process would recognize the social, economic, public health,

and conservation benefits of sustainable recreational use of the Seaside (e.g., fishing, boating, swimming, wildlife watching), by providing improved coordination with recreational users to ensure consideration of continued access and opportunities to experience and enjoy these activities consistent with safety and conservation goals.

V. Likelihood of Success

Discuss the likelihood of attaining the proposed program change and implementation activities.

*1) Nature and degree of support for pursuing the strategy and the proposed chang*e.
Virginia CZM's Coastal Policy Team (comprised of state agency division and program directors as well as regional planning district representatives) ranked this issue as a high priority. The CPT has been very supportive of efforts to restore and improve the ecological and economic conditions of the Seaside of Virginia's Eastern Shore. Locally, there is strong support from the shellfish cultivation industry and conservationists. The Marine Resources Commission has supported the effort and recognizes the need for a change in how we manage this dynamic system. MRC particularly supports the concept of attempting a change in a smaller geographic area first before attempting to change the underwater lands management system coastal zone-wide. It is anticipated that there will be some "push back" from watermen harvesting wild shellfish unless they can be convinced that they too gain from a change in the management system. General public support for the concept is unknown at this time but care must be taken in ensuring that information is presented to the public accurately and with sufficient time to allow for a thorough public discussion.

2) Specific actions the state will undertake to maintain or build future support for achieving and implementing the program change, including education and outreach activities.
The Seaside SAMP Project Team will attempt to build support for this effort by employing some or all of the following techniques:

- Conducting stakeholder workshops
- Posting public notices
- Publishing articles in our *Virginia Coastal Management* magazine and other publications such as the Citizens for a Better Eastern Shore newsletter
- Creating and staffing exhibits at public events such as the Eastern Shore Birding & Wildlife Festival and the Eastern Shore Watershed Walk
- Giving presentations on the Seaside SAMP through the VIMS and UVA Seminar Series
- Participating in the meetings of related groups such as the Marine Resources Commission's Habitat Advisory Committee

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:	Two Years
Total Budget:	$120,000
Final Outcome(s) and Products:	A Seaside Spatial Management Plan that maximizes spatial allocations for human uses and conservation objectives

Year One: FY 2011

Description of activities: In FY 2011, the Seaside SAMP Project Team will use the results of the habitat assessments generated in FY 09 and 10 to identify a range of alternative future spatial management scenarios. Comparative analyses will be conducted to assess and forecast the tradeoffs and cumulative effects and benefits among multiple human use alternatives. The alternatives and supporting analyses will provide the basis for a draft Seaside Spatial Plan. However, unlike the Ocean Marine Spatial Plan, this plan will likely incorporate mechanisms for adjusting the boundaries of human uses on relatively short time scales, adding another layer of complexity. Key to the Seaside Spatial Plan will be the identification of a process and regulatory bodies that will have day to day authority to make changes to this plan in order to maximize ecological services as well as economic benefits that can be derived from the Seaside. Funds for this task will be used for decision support tool development and or expert facilitators. The Accomack-Northampton Planning District Commission's Environmental Planner will likely provide project management and some facilitation services.

Outcome(s):

1. Comparative Analysis of Human Use Alternatives for the Seaside
2. Draft Seaside Spatial Plan incorporating compliance, monitoring, enforcement and dispute resolution mechanisms.

Budget: $60,000

Year Two: FY 2012

Description of activities: In FY 2012, the Seaside SAMP Project Team will present the draft plan for public review, solicit and review public comments on the draft plan, and develop a final plan for adoption by the Marine Resources Commission and/or other local regulatory bodies.

Outcome(s):

1. Final Seaside Spatial Management Plan

Budget: $60,000

VII. **Fiscal and Technical Needs**

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

No additional funding need is anticipated at this time.

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).*

A major technical need for the Seaside SAMP is the identification of a facilitator who possesses in depth knowledge of Virginia's Eastern Shore, is neutral in their perspective and trusted by the local population, who understands the concepts of marine spatial planning and who can devote considerable time to communicating with local stakeholders about the value of creating a new spatial management approach for the Seaside.

The Seaside SAMP project team is currently searching for a facilitator. A few suggestions have been offered, but one who meets all of the above criteria has not yet been identified.

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.

Ocean Resources

Virginia Marine Spatial Plan

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)*:

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

II. 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.)*

The Virginia CZM Program will develop a **Virginia Marine Spatial Plan (MSP)** for the waters off Virginia's coast in concert with the Mid-Atlantic Regional Council on the Ocean (MARCO) and the "regional planning body" called for in the July 19, 2010 Final Recommendations of the Interagency Ocean Policy Task Force (IOPTF). The IOPTF's recommendations and the accompanying Presidential Executive Order can be viewed at http://www.whitehouse.gov/files/documents/OPTF_FinalRecs.pdf As the path forward becomes clear, Virginia will determine critical specifics such as what geographic area will be covered by the plan and exactly what form the "enforceable policy" will need to take. At a

minimum, Virginia's Marine Spatial Plan will cover the area from mean low water along Virginia's Atlantic coast out to the 200 mile Exclusive Economic Zone. If time and funding allow, or should it become required, the Virginia portion of Chesapeake Bay will also be included.

In addition this Ocean Resources Strategy will include creation of a **Virginia Marine Debris Plan**, with an analysis of key marine debris issues and prioritization of these issues. The Plan will be presented to the Virginia Coastal Policy Team and MARCO for adoption. Decreasing marine debris is one of the goals within MARCO's set of "Water Quality" goals.

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

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.

The Ocean Resources Assessment identifies six needs:

1. Habitat spatial data, particularly for canyons, corals, sand shoals and migration corridors for marine mammals, sea turtles and birds as well as what human uses negatively impact these habitats.
2. Human use spatial data such as favored fishing locations and traffic patterns are and to what degree these uses are compatible with habitat protection and energy development
3. Development of a marine spatial plan
4. Staff assistance for the marine spatial plan
5. Comprehensive assessment of extractable sand resources
6. Improved understanding of climate change impacts on ocean resources

Section 309 funds are insufficient to fill all of our data needs. So while those needs are an extremely high priority, we cannot hope to meet them all through this funding vehicle and will have to rely on other sources to fill most of those data gaps over time. Therefore the need that this strategy will focus on primarily is the development of a marine spatial plan (items 3 and 4 above) for the Atlantic ocean waters offshore of Virginia in concert with the development of a Mid-Atlantic regional plan by MARCO (the Mid-Atlantic Regional Council on the Ocean – see: http://midatlanticocean.org/) and the National Ocean Council's soon to be formed "regional planning body" for the Mid-Atlantic (see: http://www.whitehouse.gov/files/documents/OPTF_FinalRecs.pdf). Some funds (about $142,200 over the 5 year period) will be kept available for small data collection and analysis projects.

The Marine Debris Assessment notes that this issue is one of medium importance in Virginia, but one that has received little attention. Given the significant impact marine debris can have on ocean resources, we propose to include it in this Ocean Strategy. Problems associated with marine debris in Virginia's waters and federal waters offshore of Virginia include resource damage, threats to wildlife and habitat, aesthetic impacts, economic impacts, threats to human health and safety, user conflicts, and boating safety.

Although a number of nongovernmental organizations are involved in marine debris management, efforts often lack coordination and there is a need to prioritize actions. During the 309 Assessment process, the need for a Virginia Marine Debris Plan was identified as a means of providing better coordination and prioritization. The three high priority needs

The Marine Debris Assessment identifies three high priority needs

1. Continued education and outreach for general litter prevention and recycling, as well as specific concerns
2. Increased state involvement in and coordination of marine debris issues
3. Continued funding for removal of derelict fishing gear

According to data from the International Coastal Cleanup program conducted annually by Clean Virginia Waterways, land-based activities (mostly attributable to littering) accounted for approximately 95% of the marine debris items collected on Virginia's beaches, inland rivers and tributaries. Balloon litter and discarded fishing line both present a risk of wildlife entanglement. While mass releases of balloons are illegal in Virginia, balloon debris is found more frequently on beaches than in or around other state waterways. Since balloons can resemble jellyfish, they present a potential ingestion hazard for wildlife. Cigarette litter, often resulting from roadway, sidewalk, and parking lot litter washing into waterways, presents a unique ingestion hazard to wildlife because it is floatable and toxic.

Unmarked "ghost" crab pots are also a major marine debris issue in Virginia. A winter 2008-2009 removal program, the largest of its kind in the nation covering over 1500 square kilometers, resulted in the recovery of more than 8,600 derelict crab pots in the Chesapeake Bay. Blue crabs, turtles and various fish species that are entrapped and die in derelict traps can act as an attractant to crabs resulting in a self-baiting effect.

Finally, given that the Energy and Government Facility Siting issue was also ranked as highly important by the Coastal Policy Team, through development of a Virginia Marine Spatial Plan, this Ocean Resources strategy will address many of the needs identified in that assessment. Chief among them will be the appropriate siting of offshore wind energy facilities. This is Item #1 in the Needs and Gaps chart for that issue.

IV. Benefit(s) to Coastal Management

Discuss the anticipated effect of the program change or implementation activities including a clear articulation of the scope and value in improved coastal management and resource protection.

The anticipated value of having a Virginia Marine Spatial Plan (MSP) is three-fold:

4. Economic benefits: A Virginia MSP could facilitate sustainable economic growth in coastal communities by providing transparency and predictability for economic investments in coastal and marine industries, transportation, public infrastructure, and related businesses. A Virginia MSP could promote objectives such as enhanced energy

security and trade and provide specific economic incentives (e.g., cost savings and more predictable and faster project implementation) for commercial users.

5. Ecological Benefits: A Virginia MSP could improve ecosystem health and services by planning human uses in concert with the conservation of important ecological areas, such as areas of high productivity and biological diversity; areas and key species that are critical to ecosystem function and resiliency; areas of spawning, breeding, and feeding; areas of rare or functionally vulnerable marine resources; and migratory corridors. Enhanced ecosystem services and benefits can be attained through MSP because they are centrally incorporated into a Virginia MSP as desired outcomes of the process and not just evaluated in the context of individual Federal or State agency action. A Virginia MSP would allow for a comprehensive look at multiple sector demands which would provide a more complete evaluation of cumulative effects. This ultimately is intended to result in protection of areas that are essential for the resiliency and maintenance of healthy ecosystem services and biological diversity, and to maximize the ability of marine resources to continue to support a wide variety of human uses.

6. Social Benefits: A Virginia MSP would improve opportunities for community and citizen participation in open planning processes that would determine the future of Virginia's coast. For example, the process would recognize the social, economic, public health, and conservation benefits of sustainable recreational use of ocean and coastal resources (e.g., fishing, boating, swimming, and diving), by providing improved coordination with recreational users to ensure consideration of continued access and opportunities to experience and enjoy these activities consistent with safety and conservation goals. Integrated engagement and coordination should result in stronger and more diverse ocean and coastal stewardship, economies, and communities. Moreover, a Virginia MSP could assist managers in planning activities to sustain cultural and recreational uses, human health and safety, and the continued security of Virginia's coast. For instance, an MSP would help to ensure that planning areas identified as important for public use and recreation are not subject to increased risk of harmful algal blooms, infectious disease agents, chemical pollution, or unsustainable growth of industrial uses.

   The anticipated value of having a Virginia Marine Debris Plan is four-fold:
   1. It will increase the visibility of marine debris issues and management efforts in Virginia and the Mid-Atlantic region
   2. It will increase coordination among the organizations currently involved in preventing and removing marine debris
   3. It will set measureable goals and objectives for future management efforts.
   4. It will develop source reduction strategies for certain items of special concern including balloons, tobacco products, plastic bags, fishing line and derelict crab pots.

V. Likelihood of Success

Discuss the likelihood of attaining the proposed program change and implementation activities.

1) Nature and degree of support for pursuing the strategy and the proposed change.
Virginia CZM's Coastal Policy Team (comprised of state agency division and program directors as well as regional planning district representatives) ranked ocean resources as high and marine debris as medium priorities. Although it is difficult for state agencies and local governments to assume a sense of responsibility for waters far off Virginia's coast, they do recognize the fact that regional, state and local input is critical to ensuring that our Virginia needs are heard and met by federal government authorities and that, in the case of marine debris, that waste generated in Virginia ends up in federal waters. The Marine Spatial Plan is, in fact, an unprecedented opportunity for Virginians to shape how the Virginian coast and even the Mid-Atlantic coast is used in the future. So while there remain many other pressing needs for these funds within local and state waters, the Coastal Policy Team agrees that these efforts are necessary, worthwhile and overdue.

The likelihood of success is further bolstered by the MARCO Governors' Ocean Conservation Agreement which calls for the development of a marine spatial plan for the Mid-Atlantic. This agreement was signed by Governor Kaine in 2009 and participation under Virginia's new Governor, Bob McDonnell is still pending review. The President's July 19 2010 Executive Order requires the development of regional Coastal and Marine Spatial Plans over the next five years. Until and unless Congress appropriates funds for CMSP, the CZM Section 309 funding may be one of the only sources of funding for CMSP efforts. Regardless of whether Virginia continues to participate in MARCO, making headway on this strategy will be a useful endeavor.

The likelihood of success for the Marine Debris Plan may also be bolstered by EPA, through the TMDL process, which may eventually include floatables as a stormwater issue that localities are required to address.

2) Specific actions Virginia will undertake to maintain or build future support for achieving and implementing the program change, including education and outreach activities.

The Virginia CZM Program will attempt to build support for these efforts by employing some or all of the following techniques:

- Conducting stakeholder workshops
- Posting public notices
- Publishing articles in our *Virginia Coastal Management* magazine and other publications
- Creating and staffing exhibits at conferences and public events such as the Urbanna Oyster Festival, the State Fair, the Birding & Wildlife Festival, the Virginia Conservation Network Annual Meeting, etc.
- Conducting press events
- Participating in the meetings of related groups such as the MARCO Management

Board (the Virginia CZM Manager currently sits on that Board), the Department of Interior's Bureau of Ocean Energy Management, Reclamation & Enforcement Task Forces on offshore renewable energy, Clean Virginia Waterways meetings and the Mid-Atlantic Fishery Management Council quarterly meetings

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:	Five Years
Total Budget:	$588,200
Final Outcome(s) and Products:	A Virginia Marine Spatial Plan and a Virginia Marine Debris Plan each adopted by appropriate entities able to enforce them.

Year One: FY 2011

Description of activities: In the first year, A Marine Spatial Plan/Marine Debris Plan Coordinator will be hired as a Virginia Institute of Marine Science contractor for the Virginia CZM Program. The Coordinator will maintain an office in Richmond, Virginia within the CZM Program Office.

During the first year, for the MSP, the Coordinator will expand the list of Virginia offshore marine stakeholders/users developed for the December 2009 MARCO Stakeholder Workshop which was held in NYC and communicate with them through surveys or convene them in order to refine the offshore ocean management objectives for the various uses such as fishing, energy development, conservation, sand mining, transportation and whatever other objectives may be identified. The Coordinator will also create an inventory of existing efforts (building on any work MARCO may have accomplished by October 2011) in the offshore Virginia area that may inform the appropriate management of Virginia's ocean resources. The Coordinator will work with the CZM Manager and Virginia ocean stakeholders to develop a Virginia perspective on management objectives that will feed into the National Ocean Council's "Regional Planning Body."

During the first year, for the Marine Debris Plan (MDP), the Coordinator will work with Virginia Sea Grant to host a Marine Debris Summit as an important first step in developing an action plan. The summit would bring together marine debris experts with target audiences, state and local resource managers, community educators, and potential funding sources—to raise awareness and also to identify and prioritize particular elements of marine debris that Virginians consider most critical to address. A summit would ensure stakeholder buy-in and input in the action plan. Virginia Sea Grant (VASG) will act as a neutral broker in hosting and organizing the summit. They will provide science-based information to decision makers and stakeholders and provide staff support to an organizing committee.

Outcome(s):

1. Creation of a Virginia MSP Stakeholder Work Group that may provide input to MARCO and/or the National Ocean Council's "Regional Planning Body" for the Mid-Atlantic
2. A document outlining key Virginia objectives for management of marine waters offshore of Virginia that reflects a consensus of the Stakeholder Work group
3. Summary report on the Marine Debris Summit

Budget:	Coordinator	$ 80,000
	MSP Data Collection/Analysis	$ 20,000
	Marine Debris Summit	$ 6,000
	TOTAL	$106,000

Year Two: FY 2012

Description of activities: During the second year, for the MSP, the Coordinator will consult scientists and other technical experts and work with the CZM Program's GIS Coordinator and others to assess, forecast and analyze:

1. Important physical and ecological patterns and processes
2. Ecological condition and relative importance of areas
3. Economic and environmental benefits and impacts of marine uses in VA
4. Relationships and linkages within and among VA's marine ecosystems
5. Spatial distribution of, and conflicts and compatibilities among current and future uses (This may require additional stakeholder interviews, surveys, focus groups or all three..)
6. Important ecosystem services in the area and their vulnerability and resilience to the effects of human uses and natural hazards
7. Contribution of existing place-based management measures and authorities
8. Future requirements of existing and emerging ocean and coastal uses

For the MDP, a stakeholder workgroup will be formed to develop a marine debris plan which emphasizes policy analysis and development. The workgroup will be facilitated by the Coordinator and anticipated stakeholders include Clean Virginia Waterways, DEQ Environmental Education Office, Virginia Sea Grant, the Virginia Aquarium, and the Virginia Clean Marina Program. The Plan will focus on source

reductions and items of special concern such as balloons, plastic bags, discarded fishing line, derelict crab pots, tobacco products, and bottle caps. The Plan will also explore relationship of marine debris issues to state stormwater management programs.

Outcome(s):

1. A Virginia Marine Assessment Document
2. Draft Virginia Marine Debris Plan

Budget:	Coordinator	$80,000	
	Data Collection/Analysis	$17,400	
	TOTAL	$97,400	$

Year Three: FY 2013

Description of activities: For the MSP, the Coordinator will work with the MSP Stakeholder Work Group and others to identify a range of alternative future spatial management scenarios based upon the information gathered for the Assessment. Comparative analyses will be conducted to assess and forecast the tradeoffs and cumulative effects and benefits among multiple human use alternatives. The alternatives and supporting analyses will provide the basis for a draft Marine Spatial Plan. Stakeholders/users would be convened or interviewed for their input on the scenario options. For the MDP, the Work Group will complete, finalize and secure adoption of the Plan.

Outcome(s):

1. Comparative Analysis of Human Use Alternatives for Virginia's marine areas
2. A Final Virginia Marine Debris Plan

Budget:	Coordinator	$ 80,000
	MSP Data Collection/Analysis	$ 47,400
	TOTAL	$127,400

Year Four: FY 2014

Description of activities: For the MSP, the Coordinator with input from the Stakeholder Work Group and others will prepare and release for public comment a draft marine spatial plan with supporting environmental impact analysis documentation. The draft MSP will also incorporate compliance, monitoring, enforcement and dispute resolution mechanisms.

For the MDP**, s**pecific outcomes of the implementation phase will depend on the prioritized recommendations of the marine debris plan. Implementation activities may involve development and promotion of new state laws and regulations, public education/social marketing campaigns, training initiatives and monitoring at sentinel sites.

Outcome(s):

1. Draft Virginia/Mid-Atlantic Marine Spatial Plan
2. Report on Marine Debris Plan Implementation Activities

Budget:	Coordinator	$ 80,000
	MSP Data Collection/Analysis	$ 30,000
	Marine Debris Data	$ 20,000
	TOTAL	$130,000

Year Five: FY 2015

Description of activities: For the MSP**,** the Coordinator with input from the Stakeholder Work Group and others will review public comments on the draft plan and develop a final plan. That includes all elements identified by the IOPTF in the Final Framework document.

For the MDP**, s**pecific outcomes of the implementation phase will depend on the prioritized recommendations of the marine debris plan. Implementation activities may involve development and promotion of new state laws and regulations, public education/social marketing campaigns, training initiatives and monitoring at sentinel sites.

Outcome(s):

1. Final Virginia/Mid-Atlantic Marine Spatial Plan
2. Report on Marine Debris Plan Implementation Activities

Budget:	Coordinator	$ 80,000
	MSP Data Collection/Analysis	$ 27,400
	Marine Debris Data/Implementation	$ 20,000
	TOTAL	$127,400

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.*

This level of Section 309 funding is sufficient to carry out the strategy however, the development of a Virginia Ocean Plan would be vastly improved by the provision of new data for biological resource distribution (coral habitats, migration corridors, etc.) and human use data. It is unlikely that either the Virginia General Assembly or federal agencies will be able to sufficiently fund these data gaps given the current economic recession. However,

that is a persistent state of affairs and policy making almost always is forced to proceed with imperfect information. The only antidote to that is adaptive management where policies are implemented and then adjusted when we see that they do not have the desired effect.

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).*

This strategy will provide funds for the hiring of a Virginia MSP and MDP Coordinator which will vastly increase the Virginia CZM Program's technical capabilities. We anticipate hiring a professional well versed in ocean management and marine debris issues and with excellent facilitation and writing skills. We already have excellent in-house GIS capabilities through our GIS Coordinator. We anticipate collaboration in this effort with MARCO (should Governor McDonnell choose to continue to participate) and the soon to be created Mid-Atlantic "regional planning body." These groups will likely have strong technical support from relevant federal agencies.

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.

Projects of Special Merit envisioned for this Ocean Resources Strategy may include:

- Data collection: As regional MSPs are being developed, certain data gaps may pose insurmountable barriers to drafting the plan. Virginia anticipates participation in regional projects and may submit a proposal on behalf of the region or to fill a Virginia-specific data gap that is hampering the region.
- Data analysis: Data may be available but not yet synthesized into a readily accessible format that can be fed into decision support tools. Virginia CZM may submit projects of this type for Virginia specific or regional data. An example for the Marine Debris Plan may be synthesis and analysis of recreational and commercial boating data and commercial crabbing data.
- Decision support tools: A need may arise for the development of software that allows a user to input data to a model and then calculate the costs/benefits of a particular human use or natural hazard scenario. Virginia CZM may submit projects of this type for Virginia specific or regional data.
- Facilitation services: Depending on the skill level of existing staff within Virginia (or the Mid-Atlantic region) a PSM for highly skilled facilitators(s) may be submitted to assist

with stakeholder and public workshops. An ability to negotiate agreements among passionate stakeholders and to synthesize an extremely large volume of information will be essential. The goal of such facilitation will be to reduce conflicts among users; eg. Between wind farms and migration corridors or recreational boaters and crab pots.

- Educational or social marketing materials: To promote awareness of impacts on the ocean and ways to avoid them; e.g Bay/Ocean-Safe packaging using fully degradable components.

V. 5-YEAR BUDGET SUMMARY BY STRATEGY

	Oct 11 - Sep 12 Year 1 FY 11	Oct 12 - Sep 13 Year 2 FY 12	Oct 13 - Sep 14 Year 3 FY 13	Oct 14 - Sep 15 Year 4 FY 14	Oct 15 - Sep 16 Year 5 FY 15	**Total**
Program Implementation: RPC's and 2015 Assessment & Strategy	$0	$0	$30,000	$30,000	$30,000	**$90,000**
Cumulative and Secondary Impacts						
Working Waterfront	$50,000	$50,000	$50,000	$50,000	$50,000	**$250,000**
Shoreline Management						
Living Shoreline: State Policies	$30,000	$0	$0	$0	$0	**$30,000**
Local Shoreline Management Plans	$150,000	$135,000	$135,000	$135,000	$135,000	**$690,000**
Land & Water Quality Protection						
HR PDC: Urban & Transitional	$90,000	$90,000	$90,000	$0	$0	**$270,000**
MP PDC: Rural	$50,000	$50,000	$50,000	$0	$0	**$150,000**
Implementation of Pilot Projects				$137,400	$140,000	**$277,400**
Special Area Management Planning						
Seaside SAMP	$60,000	$60,000	$0	$0	$0	**$120,000**
Ocean Resources						
Marine Spatial Plan						
Coordinator	$80,000	$80,000	$80,000	$80,000	$80,000	**$400,000**
Data Collection & Analysis	$20,000	$17,400	$47,400	$30,000	$27,400	**$142,200**
Marine Debris Plan	$6,000	$0	$0	$20,000	$20,000	**$46,000**
TOTAL	**$536,000**	**$482,400**	**$482,400**	**$482,400**	**$482,400**	**$2,465,600**

VI. ACRONYMS

ARRA – American Recovery and Reinvestment Act of 2009 ("Recovery Act")
ASMFC – Atlantic States Marine Fisheries Commission
BBNWR – Back Bay National Wildlife Refuge
BLM – Bureau of Land Management
BMP – Best Management Practices
CBF – Chesapeake Bay Foundation
CBGN – Chesapeake Bay Gateways Network
CBLB – Chesapeake Bay Local Assistance Board
CBPADMR – Chesapeake Bay Preservation Area Designation and Management Regulations
CCB – Center for Conservation Biology
CCI – Comprehensive Coastal Inventory Program
CELCP – Coastal and Estuarine Land Conservation Program
CESCF – Cooperative Endangered Species Conservation Fund
CINWR – Chincoteague Island National Wildlife Refuge
CNHT – Chesapeake National Historic Trail
CVW – Clean Virginia Waterways
CWP – Center for Watershed Protection
CZM – (Virginia) Coastal Zone Management (Program)
CZMA – Coastal Zone Management Act
DCR – Department of Conservation and Recreation (Virginia)
DEQ – Virginia Department of Environmental Quality
DFGP – Derelict Fishing Gear Program
DGIF – Department of Game and Inland Fisheries
DMA – Disaster Mitigation Act
DMME – Department of Mines, Minerals and Energy
DOI – Department of the Interior
ECM – Ecological Core Model
EIS – Environmental Impact Statement
FEMA – Federal Emergency Management Agency
FIRM – Flood Insurance Rate Maps
GCCC – Governor's Commission on Climate Change
GEMS – Geospatial and Educational Mapping System
GIS – Geographic Information Systems
GWRC – George Washington Regional Commission
HIRA – Hazard Identification and Risk Assessment
HRPDC – Hampton Roads Planning District Commission
ICC – International Coastal Cleanup
INSTAR – INteractive STream Assessment Resource Healthy Waters Initiative
JLARC – Joint Legislative Audit and Review Commission
JST – John Smith Trail
KVB – Keep Virginia Beautiful
LAL – Limulus Amoebocyte Lysate
LIDAR – Light Detection And Ranging
LIDATF – Low Impact Development Assessment Task Force

LNG – Liquefied Natural Gas
LWCF – Land and Water Conservation Fund
MAFMC - Mid-Atlantic Fishery Management Council
MAPP – Mid-Atlantic Power Pathway
MARAD – Federal Maritime Administration
MARCO – Mid-Atlantic Regional Council for the Ocean
MAWW – Mid-Atlantic Wetlands Workgroup
MDNR – Maryland Department of Natural Resources
MIBI – Modified Index of Biotic Integrity
MMS – Minerals Management Service
MPCBPAA – Middle Peninsula Chesapeake Bay Public Access Authority
MPPDC – Middle Peninsula Planning District Commission
MSRA – Magnusson-Stevens Reauthorization Act of 2006
NASS – National Agricultural Statistics Service
NEAMAP – Northeast Monitoring and Assessment Program
NFWF – National Fish and Wildlife Foundation
NIMBY – "Not In My Backyard"
NNCBPAA – Northern Neck Chesapeake Bay Public Access Authority
NOAA – National Oceanic and Atmospheric Administration
NPDS – National Pollutant Discharge System
NRC – Nuclear Regulatory Commission
NVRC – Northern Virginia Regional Commission
NWI – National Wetlands Inventory
OCS – Outer Continental Shelf
OCSLA – Outer Continental Shelf Land Act
ODEC – Old Dominion Electricity Cooperative
OSDS – Onsite Sewage Disposal System
OTEC – Ocean Thermal Energy Conversion
PAA – Public Access Authority
PCA – Priority Conservation Areas
PDC – Planning District Commission
PWDCA – Priority Wildlife Diversity Conservation Areas
QTP – Quality's Waste Tire Program
RPA – Resource Protection Area
SAFETEA-LU - Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SAMP – Special Area Management Plan
SAV – Submerged Aquatic Vegetation
SCC – State Corporate Commission
SELC - Southern Environmental Law Center
SMP – Shoreline Management Plan
SWCD – Soil and Water Conservation District
TMDL – Total Maximum Daily Load
TMI – Tidal Marsh Inventory
TNC – The Nature Conservancy
TOGA – Tidewater Oyster Gardeners Association

USDOI – U.S. Department of the Interior
USEPA – U.S. Environmental Protection Agency
USFDA – U.S. Food and Drug Administration
USACE – U.S. Army Corps of Engineers
USFWS – U.S. Fish and Wildlife Service
VaNLA – Virginia Natural Landscape Assessment
VASS – Virginia Agricultural Statistics Service
VCERC – Virginia Coastal Energy Research Consortium
VDACS – Virginia Department of Agriculture and Consumer Services
VDEM – Virginia Department of Energy Management
VDH – Virginia Department of Health
VDOT – Virginia Department of Transportation
VIMS – Virginia Institute of Marine Science
VLCNA – Virginia Lands Conservation Needs Assessment
VLPP – Virginia's Litter Prevention Program
VMRC – Virginia Marine Resources Commission
VNEMO – Virginia Network for Education of Municipal Officials
VOP – Virginia Outdoor Plan
VRS3 – Virginia Renewables Siting Scoring Systems
VRSFF – Virginia Recreation Saltwater Fishing Fund
VSP – Virginia State Parks
VTC – Virginia Tourism Corporation
VWEC – Virginia Wind Energy Collaborative
WW – Working Waterfront

VII. Appendix

Letters received during public comment period conducted
December 1, 2010 – January 3, 2011

TOWN OF CHINCOTEAGUE, INC.

January 3, 2011

Beth Polak
Virginia CZM Program
623 East Main Street
Richmond, VA 23219

RE: Section 309 Coastal Zone Enhancement Program 2011-2016

Dear Ms. Polak:

Please accept the following public comment in response the Draft Needs Assessment and Strategy that your office submitted to NOAA under the Section 309 Program on September 20, 2010.

As a professional land use planner, working for the Town of Chincoteague in Virginia, I am trying to stay informed on the programs and policies that will affect our community. The CZM Program has accomplished significant long range planning projects on the Eastern Shore in the past and we look forward to working with you in the future.

The following ideas and observations are my own and do not reflect an official response by our local government.

- Continue to support coastal community planning under a Coastal Hazards strategy
  - The ESVA Adaptation Working Group, sponsored by The Nature Conservancy, has established a priority for the processing and application of LiDAR elevation data. We will need your continued assistance at the local community level through the Coastal GEMS program to prepare map products and analysis
  - The priority that NOAA has placed on climate adaptation, weather resilience and sustainable coastal communities/economies should be supported by the Virginia 309 plan as a high priority with strategies developed to support a program similar to Maryland's 'Coast-Smart Communities'

- Prepare the Working Waterfronts Plan as a Project of Special Merit – not under the CSI strategy
  - Considering this topic under the Cumulative and Secondary Impacts strategy rather than a more comprehensive strategy creates a bias against existing coastal communities
  - Shoreline management strategies for 'living shorelines', migration of wetlands, and blue/green infrastructure separation of human use from all water edges will conflict with the Working Waterfront strategy and will require special consideration

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- ❖ Include coastal communities in the 309 document planning scope or consider an exclusion for 'human use' habitats from the enforceable policies that are proposed
  - Coastal communities, like Chincoteague, are not recognized as a habitat type for consideration under the proposed Seaside SAMP or the Working Waterfronts strategies
  - The Virginia 309 Plan excludes existing 'human use' communities from consideration except as an 'impact' on natural resources

The proposed Marine Spatial Plan process along with a continued Seaside SAMP will encourage needed long range planning for the Eastern Shore. I look forward to your efforts and hope to participate as an advocate for balancing 'natural resource protection and reasonable coastal-dependent economic growth' in our coastal communities.

Sincerely,

William W. Neville, AICP
Director of Planning

cc. Elaine K. N. Meil, A-NPDC

VCAN
Virginia Coastal Access Now

Helping provide public access to Virginia's coast!

VCAN Home Office
1356 Pamlico Blvd.
Chesapeake VA 23322
757-410-3180
vcanaccess@verizon.net

January 3, 2011

Ms. Beth Polak/DEQ
VA CZM Program
Beth.polak@deq.virginia.gov

VCAN public comments on the Virginia Coastal Zone Management Program's Draft Section 309 Needs Assessment & Strategy (the strategy) September 20, 2010

Virginia Coastal Access Now (VCAN) supports the strategy with the following comment. VCAN believes that public access as a coastal management or "enhancement" area under the CZMA Section 309 is a top priority area that should have been listed by the Virginia CZM Program. This can be found in the strategy's own assessment of public access wherein the continuing trend of the loss of public access via the "privatization of the shoreline" is identified in the face of a stated increase in demand for public access in the Virginia Outdoor Plan. The Middle Peninsula Survey data conducted by the MPCPPAA also expressed that no survey respondents thought that public access to the coast was adequate or better. This response is shared throughout Virginia's coastal zone based on many examples where public access to the water's of the Chesapeake Bay have been lost over the last 40 plus years that continue to this vary day. Hence, our non-profit agrees with the public access component of the strategy with increased priority.

The strategy, specifically the Cumulative and Secondary Impacts (CSI) of Coastal Growth & Development enhancement are, is a potential vehicle to help stop and even reverse this trend by including planned actions to restore public access while developing Working Waterfronts. Under the CSI, a goal to expanding public access needs to include the creation of new public access opportunities, precluding the closure of existing public access locations, and the restoration of sites where public access has been lost.

The VA CZM Program Strategy should dovetail with the President's Executive Order (EO) and draft Chesapeake Bay Strategy Goals Framework (March 19, 2010) including it's public access component for public access to the waters of the Chesapeake Bay.

Enhancements by both these strategies and the proposed Working Water front Preservation Act of 2009 could ensure and restore waterfront and public access. Under the proposed Act, the EO, and draft strategies, restoration of public access could range from re-acquisition of public property from private control to lifting restrictions on parking to removing barriers at public access sites. The lack of public parking or "access to the access" is the great façade of public access. How and where possible in the strategy, the Virginia CZM Program must address the need, issue, and requirement for public parking to provide real public access.

The Coastal GEMS website is an excellent resource for mapping public access. This GIS based resource could include a data layer under recreational features that clearly identifies the availability of public parking.

The Virginia Recreation Saltwater Fishing Fund that are generate from fishing license fees for increasing public access for fishing in saltwater areas should be utilized to improve public access in the saltwater of Virginia's coastal zone when the funds are made available.

VCAN endorses the Coastal Policy Team's stated recommendation that "The issue of public access will be addressed through the CSI, Working Waterfronts strategy by coupling efforts to retain or enhance public access to regionally identified coastal areas for recreational as well as commercial water-dependent activities."

Virginia Coastal Access Now expresses our gratitude for VA CZM Program's efforts on behalf of public access and thanks the DEQ for the opportunity to comment.

Respectfully submitted,

Mark Feltner, President

HAMPTON ROADS
PLANNING DISTRICT COMMISSION

STAN D. CLARK, CHAIRMAN • THOMAS G. SHEPPERD, JR., VICE CHAIR • JAMES O. McREYNOLDS, TREASURER
DWIGHT L. FARMER, EXECUTIVE DIRECTOR/SECRETARY

January 3, 2011

Ms. Beth Polak
Virginia Coastal Zone Management Program
Department of Environmental Quality
629 East Main Street
Richmond, VA 23219

Re: Section 309 Coastal Zone Enhancement Program – Draft Assessment and Strategy Public Comments

Dear Ms. Polak:

The staff of the Hampton Roads Planning District Commission has received and reviewed the Section 309 Coastal Zone Enhancement Program Draft Assessment and Strategy. Based on this review, we believe that the strategy adequately identifies critical issues facing coastal zone localities in Hampton Roads. This strategy addresses a key need in the region for consideration of issues facing the coastal zone.

Specifically, we believe that the section addressing Cumulative and Secondary Impacts of Coastal Growth and Development provides an important opportunity for the development of effective policies that address imminent regulatory issues, including the Chesapeake Bay TMDL and changes to Virginia's stormwater regulations. HRPDC is capable of performing the tasks laid out in the strategy for October 2011 to September 2014.

We appreciate the opportunity to review this draft strategy. If you have any questions, please do not hesitate to call.

Sincerely,

Dwight Farmer
Executive Director/Secretary

BJM/kg

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The Nature Conservancy
Protecting nature. Preserving life.™

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nature.org

January 3, 2011

Beth Polak
Virginia CZM Program
629 East Main Street
Richmond, VA 23219

Re: TNC Comments on the Virginia Coastal Zone Management Program's Draft Section 309 Needs Assessment and Strategy

Dear Ms. Polak:

I am writing to provide The Nature Conservancy's comments on the Virginia Coastal Zone Management Program's Draft Section 309 Needs Assessment and Strategy ("the document"). In general, the Conservancy wishes to convey its strong support for the three priority areas identified in the document: ocean resources, cumulative and secondary impacts of growth and development, and special area management planning.

Several of the strategies outlined within the three priority areas are closely aligned with The Nature Conservancy's objectives in Virginia and the Mid-Atlantic region. We are particularly pleased with the strategies outlined in the document to:

- Develop a Marine Spatial Plan for the Seaside's barrier island lagoon system as part of the Seaside Special Area Management Plan,
- Develop a Virginia Marine Spatial Plan for the waters off Virginia's coast in concert with the Mid-Atlantic Regional Council on the Ocean and the "regional planning body" called for in the July 19, 2010 Final Recommendations of the Interagency Ocean Policy Task Force, and
- Continue work to promote the use of living shorelines.

The Nature Conservancy will do whatever we can to assist in these efforts.

We place tremendous value on our partnership with the Virginia Coastal Zone Management program. Thank you for the opportunity to provide these comments.

Sincerely,

Nicole M. Rovner
Director of State Government Relations