

***Section 309 Assessment and Strategy
of Pennsylvania's Coastal Resources
Management Program***

Performed Under the
Coastal Zone Enhancement Grants Program
Section 309
Coastal Zone Management Act

Prepared by
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Water Planning Office
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***Pennsylvania Coastal Zone Management Program
309 Assessment***

Table of Contents

<u>309 Assessment</u>	<u>Page</u>
Introduction	3
Overview of Past 309 Efforts	4
Enhancement Area Analysis Summary	4
Wetlands	9
Coastal Hazards	22
Public Access	35
Marine Debris	48
Cumulative and Secondary Impacts	59
Special Area Management Planning	90
Ocean / Great Lakes Resources	96
Energy & Government Facility Siting	108
Aquaculture	115
<u>309 Program Enhancement Strategy</u>	120
Lake Erie Coastal Zone Boundary Expansion	121
Development of AIS Species Specific Rapid Response Plans and a Monitoring and Surveillance System for the Coastal Watersheds	126
Building Marine Spatial Planning for Lake Erie Coastal Resources	131

Overview

Introduction

This assessment of Pennsylvania's Coastal Resources Management Program (CRM) is based on the Final Section 309 Guidance (July 2009) published by the National Oceanic and Atmospheric Administration (NOAA). Section 309 of the Coastal Zone Management Act, as amended in 1990 and 1996 (PL 104-540) [revised by PL 96-464; PL 101-508], encourages states to revise their previous 309 Assessments and develop new Strategies to achieve program changes in one or more of the coastal zone enhancement areas:

- Coastal wetlands
- Coastal hazards
- Public access
- Marine debris
- Cumulative and secondary impacts
- Special area management planning
- Ocean/Great Lakes resources
- Energy and government facility siting and activities
- Aquaculture

Under the 309 grant program, states that improve their programs to meet the goals in one or more of the enhancement areas are eligible for additional federal funding.

As required by the program, CRM conducted a reassessment of the nine enhancement areas in both the Lake Erie and Delaware Estuary Coastal Zones. This provided CRM with an opportunity to reevaluate its management direction and past efforts in the priority enhancement areas.

Following the guidance set forth by NOAA, CRM will submit a combined assessment and strategy. The assessment provides an overview of the 309 efforts since 2006, followed by an evaluation and update of the enhancement areas in accordance with the questions provided in the guidance. A copy of the 2006 Assessment and Strategy is available, for reference, at the Pennsylvania Department of Environmental Protection website, www.depweb.state.pa.us , Keyword "Coastal Zone."

Overview of Past 309 Efforts

In June 2006, CRM submitted its 309 Assessment and Strategy in accordance with the guidance for the Coastal Zone Enhancements Grants Program. Three priority areas were identified for programmatic changes: Ocean and Great Lakes Resources; Coastal Wetlands; and Special Area Management Plans. Changes that resulted included: Finalization of the Pennsylvania Aquatic Invasive Species Management Plan; adoption of the Pennsylvania State Water Plan; and the publishing of the Wissahickon Special Area Management Plan. The approved Pennsylvania Aquatic Invasive Species Management Plan will be formally submitted as a program change involving both enforceable and encouragement policies with CRM's next Routine Program Change request. Draft technical guidance is being developed that will facilitate ambient condition assessment for analyzing permitted wetland impacts and for the proper design and construction of replacement wetlands. The proposed technical guidance has been delayed numerous times but work continues toward that goal. Once finalized, the technical guidance document will be submitted as a routine program change. CRM's overall capacity for ambient condition and functional assessment of wetlands has increased. CRM continues to work with the Partnership for the Delaware Estuary in developing a basin-wide (interstate) wetland monitoring and assessment program and has conducted a rapid assessment of wetlands in Pennsylvania's Lake Erie watershed.

In March 2001, CRM submitted its 309 Assessment and Strategy in accordance with the guidance for the Coastal Zone Enhancements Grants Program. One priority area, Ocean Resources, was identified for programmatic changes, to include the formation of procedures for defining and improving CRM's management regime for ocean resources, especially programmatic and administrative changes related to water quantity (diversions) and resource impacts from invasive species. Changes that resulted included the formation of a historic agreement with the Council of Great Lakes Governors intended to ban new diversions to areas outside of the Great Lakes-St Lawrence River Basin, and the formation of the Pennsylvania Governor's Invasive Species Council.

In February 1997, CRM submitted its 309 Assessment and Strategy in accordance with the guidance for the Coastal Zone Enhancements Grants Program. One priority area, Special Area Management Plans (SAMP), was identified for programmatic changes. These changes outlined a procedure for creating Special Area Management Plans as part of Pennsylvania's approved Coastal Zone Management Program, and created a SAMP for the Lake Erie Bluffs and Shoreline.

Current Enhancement Area Analysis Summary

In accordance with the July 2009 Section 309 Guidance, the Pennsylvania Coastal Resources Program has analyzed the nine priority enhancement areas for changes since the last assessment and has elaborated the changes that have taken place. The enhancement areas have been considered for their priority as coastal issues for Pennsylvania and their potential for CRM program changes. High priority is assigned to

areas in which program changes are anticipated through direct CRM efforts, 309 and otherwise. Medium priority is assigned to areas in which CRM and its networked partners expect to invest significant effort and resources during the next five years, but do not anticipate significant program changes. Low priority is assigned to topical areas that, while important to the program, are sufficiently addressed or are expected to have minimal impact.

- **Coastal Wetlands:**

This area was considered a high priority of the program during the last assessment period. This assessment has indicated a continued need for improved data integration between internal program and external entities' wetlands information. It has identified a need to examine all of the various wetland tracking, monitoring and indicator programs and to determine how to most efficiently manage wetlands data needed for performance measures. The assessment also identified the need for better wetland buffer protection and the need to prevent habitat fragmentation in high quality wetlands in the Lake Erie Coastal Zone.

CRM still considers wetlands a high priority, but will not develop a strategy for this period. CRM will continue to improve the program's capacity to manage wetlands data, especially data from non-DEP sources. CRM will continue efforts to incorporate condition and functional assessment into coastal wetland management. It is anticipated that this data will lead to potential new or revised guidelines, procedures or policy documents. CRM will continue to working through current Commonwealth programs to improve wetlands.

- **Coastal Hazards:**

This enhancement area was considered a medium priority in the last assessment, in consideration of ongoing and anticipated activities related to the Bluff Recession and Setback Act (BRSA).

The Department's Bluff Regulations were updated in 2009. The CRM program is also finalizing a set of criteria and standards for the placement of shoreline stabilization structures along the Lake Erie shoreline.

Staff positions in both Coastal Zones continue to provide coastal permitting, technical and outreach services for the Department. Pennsylvania continues to develop its emergency management and response capabilities for natural and man-made disasters--from storm damage, to shipwrecks, to hazardous material spills--through the Pennsylvania Emergency Management Agency and DEP's Environmental Emergency Response Program.

CRM does not plan to seek overall program changes with regard to coastal hazards under this assessment, and coastal hazards will again be a medium priority issue. CRM will continue to both administer and evaluate the Bluff

Recession and Setback Act, and will work to improve management and local understanding of control points and recession monitoring.

- **Public Access:**

This area was considered a medium priority as an enhancement area in the last assessment.

CRM will continue to encourage public access improvements through its local matching grants program. Pennsylvania has reviewed the public's qualified access rights along the shoreline and continues to support navigational rights in the area between the ordinary high and low watermarks. Case law defining those rights in Pennsylvania is still limited. The Commonwealth, through its Growing Greener and Agricultural Preservation legislation, has markedly increased its commitment to recreation and open space protection. County and municipal open space bond issues are receiving consistent public support. Conservancies and land trusts are increasingly active in both Pennsylvania coastal zones.

Public access will be considered a high priority in this assessment.

- **Marine Debris:**

Marine debris is controlled and reduced through existing state, federal, and local legislation and efforts. While these efforts have likely significantly reduced the introduction of debris to the coastal environments, other efforts are still needed. For example, the CRM program has funded several successful cleanup efforts in both Coastal Zones since 2006, and will continue to consider funding these through 306 funds as needed.

This topic was considered a low priority during the last assessment and will be once again. Marine debris will not be considered for program changes in the current strategy.

- **Cumulative and Secondary Impacts:**

This category was considered a medium priority in CRM's last assessment, but will be ranked high in this one.

Many issues in a watershed cannot be addressed unless the headwaters and upper reaches of the watershed are protected or restored. As was the case in previous assessments, sound land use planning (including methods for managing stormwater) is considered to be a key to minimizing cumulative and secondary impacts. CRM will continue to fund local projects dealing with zoning, planning and stormwater using 306 funding, and will look to leverage other funding

sources being utilized for these efforts in the Coastal Zones. The program will integrate Departmental efforts toward planning on a watershed basis.

To further build capacity for addressing cumulative and secondary impacts in the Lake Erie Coastal Zone, the CRM program is proposing to utilize Section 309 funding to help evaluate various alternatives for expanding the current coastal boundary. Alternatives analysis will include review of data and solicitation of public input. The results of this effort would be used to determine next steps on the potential boundary expansion.

- **Special Area Management Planning:**

This category was considered a high priority in CRM's last assessment. Various watershed issues were placing pressure on water supply and water quality, creating the potential for conflicts among water users in the Coastal Zones. The CRM program determined that capacity needed to be built in order to allow for effective planning to address this issue.

During the last five years, Coastal funds were employed to help build capacity in this enhancement area, building off the tools authorized in Pennsylvania State Act 220. The State Water Plan was adopted, which provides a basis to improve and streamline current water resource planning in the Commonwealth's Coastal Areas. Based on the current assessment, CRM ranks this category as a medium priority.

- **Ocean Resources:**

This category was considered a high priority in CRM's last assessment. Since then, Pennsylvania has adopted the Aquatic Nuisance Species Management Plan. Several key areas still need to be addressed regarding Aquatic Invasive Species, however. Species specific rapid response plans need to be developed, in order to build the capacity to implement response activities when specific species are located in the Pennsylvania Coastal Zones. Building the plans will require data analysis, storage and agreement between agencies on response activities. In consideration of priority coastal resource management issues related to impacts of invasive species, and needs identified, this area will be again considered a high priority.

- **Energy and Government Facility Siting:**

Energy issues are a key area for the Commonwealth, and Department Executive Staff have helped place Pennsylvania as a leader in addressing energy. In the last assessment, this category was assigned a medium priority, as CRM did not anticipate making any 309 related changes.

The current assessment indicates increased activity in the area of Offshore Wind Energy Projects in the Lake Erie Coastal Zone. The assessment also indicates that studies and improved siting procedures would be helpful for these types of facilities. The CRM program has assigned a high priority to this assessment area, and would like to utilize Section 309 funding to help build capacity in addressing this issue. The CRM program would work closely with other Department authorities to manage in the review and advancement of this topic.

- **Aquaculture:**

This category was considered a medium priority in CRM's last assessment. This priority enhancement area is being coordinated through the PA Department of Agriculture, designated as the lead agency in Pennsylvania by 1998 legislation. As a networked program, CRM will work with the Department of Agriculture and the Pennsylvania Fish and Boat Commission if issues arise regarding aquaculture.

The hatchery support of the Lake Erie recreational fishery is an important component of managing the resource. Due to the increased awareness of potential pollution issues associated with hatcheries, as well as the increased desire to upgrade Fish and Boat Commission hatcheries, aquaculture will be considered a medium priority for the program.

Public Review and Responses

The draft 309 Assessment and Strategy was published in the Pennsylvania Bulletin on July 3, 2010. CRM sent notice of availability to the Coastal Zone Advisory Committee and both local advisory committees (Lake Erie and Delaware Estuary), and placed an article in the Department's daily electronic UPDATE newsletter. CRM also placed the document on the DEP web site.

No official public comments were received during the public comment period.

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:

DECZ:

Wetlands type	Estimated historic extent (acres)	Current extent (acres)	Trends in acres lost since 2006 (Net acres gained and lost)	Acres gained through voluntary mechanisms since 2006	Acres gained through mitigation since 2006	Year and source(s) of Data
Tidal vegetated	6,400 – 12,800 total vegetated and non-vegetated acres*	378 acres**	Essentially no change	0	0.02 acre net gain	CRM GIS Tidal Wetland Inventory / Permitting records
Tidal non-vegetated	6,400 – 12,800 total vegetated and non-vegetated acres*	596 acres**	Essentially no change	0	0	CRM GIS Tidal Wetland Inventory / Permitting records
Non-tidal/freshwater	Unknown	1663.8 acres	Essentially no change	0	0.86 acre net gain	Permitting records. October 2002 Status and Trends Analysis.

* Source, Philadelphia Natural Heritage Inventory, December 2008.

** Not including John Heinz National Wildlife Refuge. Based on Tidal Wetland Inventory.

LECZ:

Wetlands type	Estimated historic extent (acres)	Current extent (acres)	Trends in acres lost since 2006 (Net acres gained and lost)	Acres gained through voluntary mechanisms since 2006	Acres gained through mitigation since 2006	Year and source(s) of Data
Great Lakes (Lake-level)	Approximately 1100 acres (no change)	GLCWC = 1100 acres	Steady	0	0	Permitting records.
“Inland” freshwater	Unknown	4597.8 acres	Steady (Undocumented losses unknown.)	0	+ 0.03 acres	Permitting records. October 2002 Status and Trends Analysis.

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.*
3. *Provide a brief explanation for trends.*

The former extent of tidal wetlands in the DECZ was quite substantial, and the bounty they provided to early settlers is well documented in historical literature. Today only 2% – 5% of Pennsylvania’s tidal wetlands remain. Today’s trends are fairly steady and tidal acreage has changed little in the last two decades. Due to the uniqueness of the resource in Pennsylvania, many tidal plant species are considered rare or threatened by the Pennsylvania Natural Heritage Program, this provides added regulatory protection for these resources. However, the forested buffers and transition zones do not have regulatory protection. Given the significant cumulative impact to this resource and the uniqueness within Pennsylvania, the CRM program is particularly vigilant in their protection. Through technical assistance, regulatory development and enforcement, permitting, and outreach, the CRM program often provides the necessary focus for this resource within the Commonwealth. In addition to tidal acreage itself, it is important to the program to maintain the limited amount of connectivity to existing forested buffers and restore forested buffers when opportunities exist. The potential for sea level rise may adversely impact acreage as there is little opportunity for landward migration in the urbanized Delaware Estuary Coastal Zone.

The majority of Great Lakes wetlands (lake-level wetlands) in the Lake Erie Coastal Zone are protected within Presque Isle State Park. Some additional Great Lakes wetlands exist at the mouth of larger streams such as Elk Creek. Changes in lake levels impact the acreage and floristic composition of Great Lakes wetlands, but they are largely protected from development and trends remain fairly constant. The presence of non-native invasive plants continues to impact the function of Pennsylvania's Great Lakes wetlands, and offer a never ending challenge to Presque Isle State Park managers. Inland freshwater wetlands, including isolated wetlands, are protected by Pennsylvania Chapter 105 regulations. However, small, incremental, undocumented wetland losses often escape the realm of the regulatory agencies which operate with limited staff. It is difficult to accurately track these losses. During the course of preparing for and conducting the Lake Erie Rapid Wetland Assessment during the summer of 2009 it was noted that NWI significantly underestimates the extent of wetlands, especially in certain quads. Any future effort to more accurately track wetland losses based on actual landscape change would benefit from updated NWI that could make use of more advanced remote sensing and better aerial photography. The metadata for NWI indicates that much of the NWI for Pennsylvania's Lake Erie watershed is based on 1977 1:80,000 Black and White aerial photography taken during leaf-on conditions.

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

The draft Tidal Wetland Inventory GIS database was completed in 2009. Additional efforts to refine this database are ongoing. The database includes constructed and natural tidal wetland sites. The wetlands of John Heinz National Wildlife Refuge have not yet been incorporated into the database, but CRM plans to do so as time allows. CRM also plans to explore the applicability of this information for input into NWI and/or an estuary-wide wetland assessment effort being led by the Partnership for the Delaware Estuary.

CRM recognizes the considerable loss of historic tidal wetland resources in the DECZ, and generally agrees that the loss is greater than 95%. CRM is currently working on a low priority project that will use historic maps and GIS to sketch the estimated former extent of tidal wetlands in the DECZ.

Pennsylvania CRM currently uses three GIS layers for Great Lakes wetlands; NWI, Great Lakes Wetland Consortium, and a 2002 Status and Trends analysis of Pennsylvania's coastal zones. Each layer has certain inaccuracies and additional work is needed to produce a more accurate layer of Pennsylvania's Great Lakes (lake-level) wetlands. Since the majority of Pennsylvania's Great Lakes wetlands are protected from direct fill, this is considered a low priority at this time.

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.*

Because the status and threats to Pennsylvania's two coastal zones are different, the information is provided in two separate tables.

DECZ:

Type of threat	Severity of impacts (H, M, L)	Geographic scope of impacts (extensive or limited)	Irreversibility (H, M, L)
Development/Fill	H	Extensive	H
Alteration of hydrology	H	Extensive	H
Erosion	M	Limited	H
Pollution	M	Limited	M
Channelization	L	Limited	M
Nuisance or exotic species	H	Extensive	H
Freshwater input	L	Limited	M
Sea level rise	M	Extensive	H
Other – Loss of wetland buffer	H	Extensive	H
Other - ATVs	L	Limited	M

Development/Fill

With the high competition and monetary value for developable land, development/fill will always remain a threat in the DECZ.

Alteration of hydrology

Wetlands that remain within the urbanized landscape of the DECZ are subject to altered hydrology. This could include additional short-term increases due to stormwater from impervious surfaces or a loss of hydrology due to a disconnection from incised stream channels. Alteration of hydrology changes the biotic communities and other functions of the wetlands. While some functions may be lost, services provided by other functions may increase.

Nuisance or exotic species

A rapid assessment of wetlands or a study on distribution of nuisance or exotic species has not been conducted in the DECZ. However, from staff field experience, it should be noted that nuisance or exotic species are ubiquitous to natural and man-made wetlands of the DECZ. Tidal mitigation sites in Bucks County have recently been more impacted by hydrilla. While first noted in 2003, it is unclear when hydrilla first appeared. Monitoring through 2008 indicated the presence of hydrilla, but a diversity of plant species still existed and the constructed wetland continued to successfully provide the primary services it was designed for – feeding areas for wading shore birds. In 2009, monitoring revealed that the hydrilla population had grown exponentially and that the function of the

wetland had been compromised. While eradication is not likely, management measures may be available that would keep these types of constructed wetlands free enough of hydrilla to continue to provide the ecological services for which they were designed.

The Philadelphia Natural Heritage Inventory, completed in December 2008, states that “*non-native species may be the greatest threat to natural areas within Philadelphia and the greatest impediment to natural-land restoration projects*”.

Loss of wetland buffer

A fully functioning wetland needs interaction with terrestrial buffers and transition zones. As competition for available remaining undeveloped land in the DECZ continues to intensify, many previously overlooked parcels with wetlands are being developed leading to a complete loss of wetland buffer.

LECZ:

Type of threat	Severity of impacts (H, M, L)	Geographic scope of impacts (extensive or limited)	Irreversibility (H, M, L)
Development/Fill	M	Extensive	H
Alteration of hydrology	M	Extensive	H
Erosion	M	Limited	H
Pollution	L	Limited	M
Channelization	M	Limited	H
Nuisance or exotic species	H	Extensive	H
Freshwater input	L	N/A	N/A
Great Lakes level change	M	Extensive	M
Other – Loss of wetland buffer	H	Extensive	H
Other - ATVs	M	Extensive	M

Development/Fill

Enforcement of small, incremental, un-permitted wetland fills is difficult and represents one of the most serious long-term threats to loss of wetland acreage in the LECZ. These losses are generally unreported and untrackable. Limited staff to monitor and enforce wetland regulations causes a need for prioritization that often results in little or no resources being available to address these individual small encroachments.

Alteration of hydrology

Removal of groundwater for the purpose of bluff erosion protection can negatively impact bluff seep wetlands, which often serve as habitat to Pennsylvania threatened and endangered plant species. Balancing these conflicting issues remains a challenge. Habitat protection projects that include bluff seeps and limited development on the connected bluff table-top will allow for unaltered hydrology to the seeps without endangering structures.

Erosion

Bluff and ravine erosion causes losses to seep wetlands. Minimizing stormwater impacts to ravine streams can help to protect these resources.

Nuisance or exotic species

The wetlands located in the more rural areas of Lake Erie's watershed remain ecologically intact with little current impact from non-native invasive species. Intact forested wetland buffers have helped to protect these wetlands. The recently completed Natural Heritage Inventory for Crawford County and the on-going Natural Heritage Inventory for Erie County have identified numerous Pennsylvania Threatened and Endangered species in these wetlands. With additional development and loss of forested buffers, these ecologically intact high quality wetlands will become increasingly vulnerable to the impacts from non-native species.

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.*

DECZ:

Habitat type	CMP has mapped inventory (Y or N)	Date completed or substantially updated
Tidal Wetlands	Y	Draft complete 2009. Work plan is to correct and continue building on existing database. Also have 2002 CRM Status and Trends.
Beach and Dune	N	N/A
Nearshore	N	N/A

LECZ:

Habitat type	CMP has mapped inventory (Y or N)	Date completed or substantially updated
Great Lakes Wetlands	Y / Limited Accuracy	Needs updated. Three GIS layers exist: NWI, 2002 CRM Status and Trends, Great Lakes Commission Wetland Consortium
Beach and Dune	N	N/A
Nearshore	N	N/A

* The CMP has three GIS layers of Great Lakes wetlands within Pennsylvania.

7. *(CM) Use the table below to report information related to 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	Data not available.
Number of acres of coastal habitat protected through acquisition or easement using non-CZM or non-CELCP funds	Data not available.

Historically the CRM program has difficulty tracking non-CZM driven activities, and searching for the data relies on the availability and time constraints of staff in other local, state, and federal agencies.

During this reporting period the DEP has developed a Non-Point Source Best Management Practices database repository for tracking all non-point source BMPs, including wetland protection, restoration, and creation. The development of this centralized repository was largely driven by tracking needs in the Chesapeake Bay program, but the application is state-wide. The Chesapeake Bay program staff and Information Technology staff are working to develop procedures and protocols for inputting projects into the repository. The tool is currently available on DEP's web site at <https://www.npstracker.dep.state.pa.us/npstracker/>. It is anticipated that this new resource will be used in the Lake Erie and Delaware Estuary watersheds and will support local and regional efforts as well as become a tool for reporting NPS related data to federal agencies. Efforts include the ability to electronically transfer the data directly from DEP to EPA's Chesapeake Bay office computer node in Annapolis, Maryland. Populating the repository with volunteer and private funded projects is a recognized gap, and Pennsylvania's Chesapeake Bay program is working with two county conservation districts to find ways to capture that data. The technical structure of the database is complete and has been used in the Chesapeake Bay watershed. However, quality assurance/quality control concerns regarding data input and integrity remain. Watershed management staff working on this system now indicate a goal of 2014 to have a fully functioning state-wide system in place. In the interim CRM will explore internal tracking procedures to better capture contextual measure data from non-CZM funded activities.

Another effort that will help the CRM program to better track non-CZM efforts is the development of the Environmental eGrants system. The Environmental eGrants system is an electronic grants system that provides one-stop shopping to the grantee community for all Pennsylvania DEP and DCNR grants. The system was first used in 2010. Standardized in-put information regarding location and purpose should help search and track these projects.

Within the Delaware Estuary a few urban tidal wetland projects are being designed and discussed. The tidal wetland monitoring database developed during this reporting period should help track these specific gains to tidal wetlands. While all of the above mentioned tools will help, ultimately CRM must develop an in-house system that will use these tools to identify and track coastal habitat projects.

Management Characterization

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

Wetland assessment methodologies (health, function, extent)

Wetland research and monitoring

The responsibility for the management and protection of wetlands within Pennsylvania primarily falls within the DEP's Bureau of Watershed Management, within the Wetlands, Waterways, and Stormwater Management Division. During this assessment period the Wetlands Division program staff has worked to develop wetland assessment methodologies appropriate for inland wetlands in the Commonwealth. Much of this work has been funded by EPA Wetland Program Development grants and has been done in cooperation with Penn State University and the Mid-Atlantic Wetland Workgroup (MAWWG). The assessment methodologies developed by DEP are a three-tiered approach similar to those being developed by EPA on the national level. Tier 1 is a GIS-based landscape level look at surrounding land use and landform. Tier 2 is a rapid field assessment methodology based primarily on general vegetative composition and identifiable stressors. Tier 3 is a detailed field assessment including surveying of microtopography, detailed vegetation identification on plots and transects, and investigation of soils. These methodologies are being developed specifically for "inland" wetlands and their applicability for Great Lakes and Tidal wetlands remains unclear. Using the methodologies developed for the lower Susquehanna River watershed by Penn State and DEP, CRM partnered with Pennsylvania Sea Grant in 2009 to employ the Level 2 Rapid Field Assessment in the Lake Erie watershed. This activity was partially funded by CRM through Section 309 enhancement funding. Rapid assessment was conducted on 175 NWI wetland polygons in the Lake Erie watershed. The results of this effort are still being analyzed. In addition to the data generated, the project successfully built a local capacity for understanding functional assessment of wetlands and the stressors that can change the function and services provided. The information gained by local field staff will continue to resonate in the community. The results will also provide a limited snapshot of invasive plant species distribution in wetlands of the Lake Erie watershed that may be applicable to future planning or implementation efforts to rapidly respond to new introductions.

During this reporting period in the DECZ, the Partnership for the Delaware Estuary has taken the lead in developing interstate tidal wetland monitoring and assessment methodologies that could be employed in Pennsylvania, New Jersey, and Delaware.

CRM is working to coordinate these efforts with Pennsylvania DEP's efforts so that the tidal methodologies developed would be consistent with any policy or regulatory changes proposed for Pennsylvania. As a part of developing these methodologies, CRM has helped to support the installation of a permanent tidal monitoring station within Pennsylvania that will include the installation of a Sediment Elevation Table (SET) to monitor sediment accumulations. The rate of sediment accumulation in tidal wetlands of the Delaware Estuary is an important consideration for climate change impacts and mitigation. CRM has participated in the Estuary Program's Delaware Estuary Wetland Workgroup (DEWWG) which was formed to coordinate these tidal wetland monitoring and assessment efforts. EPA has also supported these efforts with Wetland Program Development grants.

DEP continues to move toward incorporating assessment of wetland health and function into regulatory or policy changes. Proposed changes will address impact review and functional replacement for mitigation. Functional replacement policy changes currently being considered will address all aquatic resources; wetlands, lacustrine fringe (Great Lakes wetlands), streams, and open waters of major river systems. It is anticipated that training and outreach to regional Chapter 105 encroachment staff will be held in September 2010. Input received from the technical field staff will be used to finalize formal technical guidance documents that will document procedures for permitting impacts and providing for functional replacement of aquatic resources. Changes to Pennsylvania's in lieu fee program to address functional assessment are also being considered.

Wetland mapping, GIS, and tracking systems

During this assessment period the CRM program developed a tidal wetland inventory for Pennsylvania's tidal wetlands. This GIS based inventory was developed using various rectified aerial photography including 2004 NAIP CIR, 2003 – 2006 PAMAP true color imagery, and 2005 Delaware Valley Regional Planning Commission (DVRPC) true color imagery. These aerial photography layers and their associated metadata are available on the Pennsylvania Spatial Data Access web site (<http://www.pasda.psu.edu/>). The GIS database includes some field notes data on vegetation (including T and E species) as well as hyperlinks to on-the-ground digital photography. It is anticipated that this original inventory work will be a baseline for monitoring changes over time and the CRM program will continue to add to the database. In July 2009, the U.S. Fish and Wildlife Service published *Data Collection Requirements and Procedures for Mapping Wetland, Deepwater and Related Habitats of the United States*. The CRM program intends to explore the suitability and the effort that would be required to incorporate the CRM tidal inventory data into the National Wetland Inventory. While the CRM database may not be directly transferable, it could serve as a tool to more accurately identify wetland types in any future NWI efforts.

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 or Great Lake Wetland	N	N/A
Beach and Dune	N	N/A
Nearshore	N	N/A
Other – inland wetlands	N	N/A

While the CRM program does not have a habitat restoration plan for wetlands of the Lake Erie watershed, the Lake Erie Regional Conservancy (LERC) did complete a Pennsylvania Lake Erie Watershed Conservation Plan in August 2008. This plan is part of Pennsylvania DCNR's Rivers Conservation Program and was funded in part by DCNR. The plan includes sections on Natural Resource Recommendations (including wetlands) and Priorities and Strategies for Action (including wetlands).

In the Delaware Estuary coastal zone, the Partnership for the Delaware Estuary is leading efforts to develop a regional restoration plan. At more local levels numerous watershed restoration plans have been developed, and the City of Philadelphia has committed substantial investment in identifying and prioritizing ecological protection and restoration projects. The Philadelphia Water Department has completed a Watershed Mitigation Registry to help permittees identify priority wetland mitigation areas and the Philadelphia City Planning Commission has developed GreenPlan Philadelphia, an open space guide that includes an inventory of existing and potential ecological resources. The Philadelphia Water Department has recently completed a Philadelphia in Lieu Fee Program Prospectus, to further guide mitigation to previously identified priorities.

Other habitat restoration guidance includes the State Wildlife Management Plans, administered by PFBC and PGC, and Rivers Conservation Plans, administered by the Pennsylvania Department of Conservation and Natural Resources.

In summary, numerous plans for habitat restoration have been prepared in recent years and both coastal zones are in a position where resources should be directed toward implementation.

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)
Need to increase CRM success in supporting habitat acquisition projects in coastal zones.	Policy, outreach	H
Updated and more accurate NWI mapping for the Lake Erie watershed	Data	H
Minimal protection for wetland buffers	Regulatory, policy, outreach	H
Methods to better track volunteer and private funded wetland creation, restoration, and protection projects	Data, outreach, capacity	M
A more accurate and refined GIS layer of Great Lakes wetlands	Data	L

Enhancement Area Prioritization

1. *What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?*

High **X**
Medium
Low

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

The ecologically intact wetlands of the rural portions of the Lake Erie watershed offer the best opportunity to protect habitat of threatened and endangered species and maintain existing habitat connections and corridors. These corridors can be extended from the lake front inland across the watershed to include connections to high quality habitat preserved in the neighboring Ohio River watershed. Priority efforts in the LECZ should focus on protection, including protection from non-native invasive plant species that have severely

impacted the DECZ and urban areas of the LECZ. In the DECZ considerable effort is underway to redevelop the post-industrial waterfronts along the tidal Schuylkill and Delaware Rivers, and local priorities include ecological restoration. This provides an opportunity for CRM to work synergistically with local partners to incorporate wetland restoration into waterfront redevelopment and Coastal Wetlands should remain a high priority.

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

Yes _____
No X

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

Recent efforts in rapid assessment of wetland condition and function have expanded Pennsylvania's capacity for incorporating the concept into regulatory, policy, and outreach. Regulatory and policy revisions regarding wetland assessments are expected to continue through the next reporting period. Although a strategy for this enhancement area is not proposed, CRM can continue the work with DEP's Bureau of Watershed Management to provide the focus for unique coastal wetlands. During this reporting period the Partnership for the Delaware Estuary has strengthened their tidal wetland assessment interest and capacity and has taken the lead in tidal wetland assessments for the estuary. CRM can continue to support their efforts through non-309 funding sources. While not directly tied to the Coastal Wetlands enhancement area, boundary expansion of the Lake Erie Coastal Zone offers the potential for wetland protection in priority areas of the watershed. The historic lack of success in habitat protection/acquisition projects will be further studied as part of the proposed boundary expansion.

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.

Lake Erie Coastal Zone

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	Medium	Sub-region (within LECZ)
Coastal storms, including associated storm surge	High	Coast-wide (LECZ)
Geological hazards (e.g., tsunamis, earthquakes)	NA	NA
Shoreline erosion (including bluff and dune erosion)	High	Coast-wide (LECZ)
Sea level rise and other climate change impacts	NA	NA
Great Lake level change and other climate change impacts	High	Coast-wide (LECZ)
Land subsidence	NA	NA
Other (please specify)	NA	NA

- 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?*

CRM has conducted numerous studies since 1975 identifying the serious bluff recession and shoreline erosion hazards of storm events during periods of higher lake levels in Lake Erie. During periods of higher lake levels, storm events will produce a surge that inundates and erodes shoreline beaches and makes contact with dwellings in the back beach areas causing structural damage and flooding. In undeveloped shoreline areas wave contact with unconsolidated materials making up the stratigraphy of the bluff will cause serious erosion of the lower bluff face, destabilizing the entire bluff face and causing bluff recession and retreat of the bluff crest which will threaten structures overlooking the lake. Lake Erie is currently in a period of rising lake levels.

- 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 fluctuating lake levels went from Medium in the last assessment to High in this assessment because lake levels were at a low period in 2006 and are now rising to high lake levels.

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

In 1980 PA adopted the Bluff Recession and Setback Act and Rules and Regulations (Chapter 85) to regulate development along Lake Erie by establishing a Bluff Recession Hazard Area (BRHA) where new development is prohibited and improvements to existing development is restricted. The regulations were formally updated in 2009. PA CRM has established a network of bluff recession monitoring control points along Lake Erie to develop and update bluff recession rates that are used by local municipalities to enforce construction setbacks within the BRHAs. These recession rates are scientifically updated every four years with the intent of quantitatively measuring the risk of bluff recession undermining the stability of structures in the BRHA. Also, in 1997 CRM completed a SAMP on integrating the management practices of the Bluffs and Shoreline along Lake Erie. The SAMP addressed consolidating planning efforts with a main focus of facilitating a network of these local, county, state, regional and federal interests to achieve a productive balance of resource use and protection with the overall intent of creating a "better organized approach" to increase the effectiveness of management of Pennsylvania's unique shoreline and bluff areas adjacent to and overlooking Lake Erie.

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	10	2009 - FEMA mapping updates.
Storm surge	NA	
Geological hazards (including Earthquakes, tsunamis)	NA	
Shoreline erosion (including bluff and dune erosion)	9	2009 - Bluff data/mapping every 4 yrs & aerial photos every 2 yrs
Sea level rise	NA	
Great lake level fluctuation	NA	
Land subsidence	NA	
Other (please specify)	NA	

FEMA Flood Hazard Mapping updates for Erie County were revised in September 2009. The appeals and protests period ended September 2010. The revised mapping includes all ten municipalities within Pennsylvania’s Lake Erie Coastal Zone and includes lake level flooding:

- | | |
|------------------|--------------------|
| Springfield Twp. | City of Erie |
| Girard Twp. | Lawrence Park Twp. |
| Lake City | Harborcreek Twp. |
| Fairview Twp. | North East Twp. |
| Millcreek Twp. | North East Borough |

The Bluff Recession and Setback Act regulations were changed in 2009 to include portions of the City of Erie as a Bluff Recession Hazard Area. Local ordinances with numeric setback distances will now be required from all nine lake-front municipalities within the Lake Erie Coastal Zone. This includes all municipalities listed above with the exception of North East Borough, which is not on the lakefront.

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	Y (regulations updated)
Methodologies for determining setbacks	Y	N
Repair/rebuilding restrictions	Y	N
Restriction of hard shoreline protection Structures	Y	N
Promotion of alternative shoreline stabilization methodologies	N	N
Renovation of shoreline protection structures	Y	N
Beach/dune protection (other than setbacks)	Y	N
Permit compliance	Y	N
Sediment management plans	Y	Y
Repetitive flood loss policies, (e.g., relocation, buyouts)	N	N
Local hazards mitigation planning	N	N
Local post-disaster redevelopment plans	N	N
Real estate sales disclosure requirements	N	N
Restrictions on publicly funded infrastructure	N	N
Climate change planning and adaptation strategies	N	N
Special Area Management Plans	Y	N
Hazards research and monitoring	Y	Y
Hazards education and outreach	Y	Y
Other (please specify)		

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

- 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.*

The significant changes under Building setbacks/ restrictions have to do with the publication of revised Chapter 85 regulations that address Bluff Recession and Setback requirements for development along the Lake Erie shoreline.

The significant changes under Sediment Management Plans have to do with the development of draft standards for shoreline protection structures. In the past, there was a lack of specific criteria in the form of reference data for length, height and spacing of shore perpendicular structures. CRM is in the final stages of developing criteria to specify and standardize reference data, which would support consistent design and placement of new structures and modifications to existing structures. This draft document, *Criteria and Methodology for the Proper and Consistent Design, Placement and Modification of Shoreline Stabilization Structures along Pennsylvania's Lake Erie Shoreline*, is in a final stage of development. Currently, this document is being used for assistance during internal review of shoreline protection structures and some (but not all) concepts from it have already been used to condition several state permits for shoreline protection structures along PA's Lake Erie shoreline. Before finalization this document is going through several years of field testing to assure quality control before moving it forward to Official Department guidance. 306 project and administrative task funds were used to produce this product.

The significant changes under Hazards Research and Monitoring have to do with the use of Lidar technology in analyzing changes in bluff stability to get a much more detailed and accurate reading on bluff recession rates. CRM staff analyzed existing 1998, 2006 and 2007 Lidar data to create a baseline and are working with the ACOE to obtain Lidar data in 2011, then will finish an analysis to plan how to use Lidar coverages to either replace or supplement an existing monitoring system. This was an internally driven change using 306 administrative task funding.

The significant changes under Hazards Education and Outreach have to do with several years of CRM sponsored workshops for shoreline and bluff property owners and professionals dealing with coastal properties and property owners e.g. real estate salespersons, engineers, landscapers, architects, etc. CRM staff have worked through the PA Sea Grant office to conduct multi-state workshops, working also with Ohio and New York Coastal Programs and Sea Grant offices. This was generated from a CRM driven change with 306 funding. This training has been very successful in educating professionals in the field that may have daily or regular contact with coastal property owners or property owners seeking advice from coastal contractors.

CRM staff continue to provide the well established and very successful Technical Advisory Services to coastal property owners. Highly trained field staff conduct on-site assessments of coastal properties and present an analysis of erosional processes and recommendations on possible courses of action to address shoreline and bluff erosion issues. Since 1980, this program has also been providing annual training of municipal officials overseeing bluff setback ordinances in order to keep them updated on regulatory

changes and updated field measurement techniques. These activities are funded via 306 program staff and administrative task funding.

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 develop away from hazardous areas.	All 9 coastal municipalities of the Lake Erie Coastal Zone (Erie County) which abut Lake Erie: Springfield Twp. City of Erie Girard Twp. Lawrence Park Twp. Lake City Borough Harborcreek Twp. Fairview Twp. North East Twp. Millcreek Twp.
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.	3 municipalities enforce more stringent setbacks than minimum required by state law: Girard Twp. Lake City Borough Fairview Twp.

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)
Vegetation Management	Policy and Regulatory Guidance	M
Catastrophic Loss Prevention Insurance	Regulatory	M

Enhancement Area Prioritization

LECZ:

1. *What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?*

High _____
Medium X
Low _____

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

1. Medium Priority - Vegetation Management. It is imperative that forested areas and even individual stands of trees be managed to prevent the initiation and or exacerbation of bluff recession that is progressive and that affects multiple property sites from the point of disturbance. As open space is developed, once-forested stable bluff areas are vulnerable to mature vegetation removal or modification by prospective land owners or developers. Many times it is a new property owner who removes trees from the bluff crest and/or removes the tree canopies from trees at the mid-bluff area. This practice is usually undertaken to get a “better view of the Lake.” Removal or modification of mature vegetation interferes with normal hydrologic processes of the glaciated soils making up the bluffs overlooking Lake Erie. Individual mature trees (i.e. tulip-poplar, oak, maple, and linden) can remove through evapotranspiration as much as 800 gallons/day from the ground water moving along a suspended water table perched upon an impermeable clay layer that is tilted towards the lake. If this cycle is interrupted the excess ground water may exit the bluff face at the interface of the permeable cap soils and the impermeable clay layer. This excess water on the bluff face will saturate the organic soils holding the root mat of the forested bluff face causing slippage of these soils and eventual denuding of the bluff face. Once the glaciated soils are exposed to other erosion elements and gravity, the bluff will retreat inland to obtain a slope angle of repose and eventual stability. This process is called bluff recession and even though improper vegetation management is a cause of bluff recession it is only one of the ways bluff recession can be initiated on the bluff areas along Lake Erie. For more information on bluff recession processes please see the USGS report titled, National Assessment of Historical Shoreline Change: A Pilot Study of Historical Coastal Bluff Retreat in the Great Lakes, Erie, Pennsylvania: U.S. Geological Survey Open-File Report 2009-1042, 25 p, Hapke, C. J., Malone, S., and Kratzmann, M., 2009. For a more detailed

description of this bluff recession process see section Geology, Physiography, and Recession of the Coastal Bluffs along the Pennsylvania Portion of Lake Erie in the above document.

The CRM Program has been addressing proper vegetation management since 1982 when it created the Technical Advisory Services to advise coastal property owners on ways to address shoreline erosion and bluff recession on the bluffs overlooking Lake Erie. What is needed now are additional guidelines to help assure provisions for proper vegetation management are considered in municipal land development permitting, and county conservation district advisory services on proper land management.

2. Medium Priority - Catastrophic Loss Prevention Insurance. As the bluff recession and setback regulatory program matures, many structures previously outside the minimum bluff setback for structures located in the Bluff Recession Hazard Areas have now migrated into this regulatory minimum setback area due to the movement of the bluff crest landward. These structures are now considered regulated but variance provisions built into the regulations, to allow for reasonable use of the land, allows these structures to be improved. Since there are very few if any proven methods to stop bluff recession, these structures will eventually be undermined by bluff recession, experience structural damage and eventually result in total structural loss. One of the most effective methods used in the past by CRM to remove threatened structures from the minimum bluff setback area was FEMA’s National Flood Insurance Program (NFIP); in particular the Upton-Jones Amendment providing for Catastrophic Loss Insurance. Before being withdrawn, the Catastrophic Loss Insurance provided a mechanism for CRM to remove or demolish insured structures on bluff properties with serious bluff recession that created “zones of imminent collapse.” Since many structures in the Lake Erie Coastal Zone were present before passage of the Bluff Recession Set Back Act (1980), there now remains a need for a similar state insurance program to remove structures before they are damaged by bluff recession.

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

Yes _____
No X

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

No. 1 Medium Priority - Vegetation Management. – Current program initiatives are sufficient.

No 2. Medium Priority - Catastrophic Loss Prevention Insurance. – This is an initiative that can be discussed with the public during on-going program activities undertaken with Section 306 funds.

Delaware Estuary Coastal Zone

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	M	Sub-region(within the DECZ)
Coastal storms, including associated storm surge	L	NA
Geological hazards (e.g., tsunamis, earthquakes)	L	NA
Shoreline erosion (including bluff and dune erosion)	L	NA
Sea level rise and other climate change impacts	M	Sub-region
Great Lake level change and other climate change impacts	NA	NA
Land subsidence	NA	NA
Other (please specify)		

2. (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	<p>All 29 Municipalities of DECZ:</p> <p>Delaware County: Upland Boro Prospect Park Boro Ridley Park Boro Sharon Hill Boro Nether Providence Twp. Norwood Boro Upper Chichester Twp. Lower Chichester Twp. Darby Twp. Folcroft Twp. Ridley Twp. Trainer Boro Marcus Hook Boro Eddystone Boro Chester City Tincum Twp.</p> <p>Philadelphia County/City</p> <p>Bucks County: Langhorne Boro Hulmeville Boro Pennel Boro Langhorne Manor Boro Morrisville Boro Tullytown Boro Bristol Boro Lower Southampton Twp. Middletown Twp. Falls Twp. Bensalem Twp. Bristol Twp.</p>	<p>FEMA mapping updates: Delaware County: Maps Revised November, 2009.</p> <p>Philadelphia County: Maps Revised January, 2007</p> <p>Bucks County: Preliminary Flood Map Release December 2010</p>
Storm surge	NA	NA
Geological hazards (including Earthquakes, tsunamis)	NA	NA
Shoreline erosion (including Bluff and dune erosion)	NA	NA
Sea level rise	NA	NA
Great lake level fluctuation	NA	NA
Land subsidence	NA	NA
Other (please specify)	NA	NA

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	N	N
Methodologies for determining setbacks	N	N
Repair/rebuilding restrictions	N	N
Restriction of hard shoreline protection structures	N	N
Promotion of alternative shoreline stabilization methodologies	N	N
Renovation of shoreline protection structures	N	N
Beach/dune protection (other than setbacks)	N	N
Permit compliance	Y	N
Sediment management plans	Y	N
Repetitive flood loss policies, (e.g., relocation, buyouts)	N	N
Local hazards mitigation planning	N	N
Local post-disaster redevelopment plans	N	N
Real estate sales disclosure requirements	N	N
Restrictions on publicly funded infrastructure	N	N
Climate change planning and adaptation strategies	N	N
Special Area Management Plans	N	N
Hazards research and monitoring	N	N
Hazards education and outreach	N	N
Other (please specify)		

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.	0
Number of communities in the coastal zone that have setback, buffer, or other land use policies to direct develop away from hazardous areas that are more stringent than state mandated standards or that have policies where no state standards exist.	Six municipalities have stream buffer setback ordinances: Bucks County: Lower Southampton Twp. Middletown twp. Langhorne Borough Tullytown Borough Falls Twp. Philadelphia (50 foot setback on Delaware River)

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.	0
Number of communities that have approved state comprehensive management plans that contain land use policies to direct development away from hazardous areas.	0

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)
Planning for increased flooding hazard due to climate change	Regulatory, planning, policy and outreach	M

Enhancement Area Prioritization

DECZ:

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High
Medium **X**
Low

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

Yes
No **X**

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

A strategy will not be developed for this enhancement area because current capacity should allow for the program to effectively address Coastal Hazards. For example, in addition to the information previously discussed, CMP is working with Sea Grant, the Delaware County Department of Planning and other interested groups to conduct a workshop on the flooding hazard associated with climate change for the purpose of developing a plan of action and strategy. NOAA (Coastal Services Center) put on a two day workshop in the lower Delaware River area in April 2010 to pre-plan and gather data for this workshop. The hopeful outcome will be a strategy to address the increased threat of flooding due to sea level rise caused by Climate Change. Also, a strategy to address climate change impacts is being considered under the category of “Ocean/Great Lakes Resources.”

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.*

DECZ

Type of threat or conflict causing loss of access	Degree of threat (H,M,L)	Describe trends or provide other statistics to characterize the threat and impact on access	Type(s) of access affected
Private residential development (including conversion of public facilities to private)	M	Conversion from industrial or port use to high-end residential.	Passive to waterfront.
Non-water dependent commercial/industrial uses of the waterfront (existing or conversion)	M	Conversion that occurs without inclusion of public access.	Passive to waterfront on redevelopment.
Erosion	L	Not a current issue.	N/A
Sea level rise/Great Lake level change	L	Most banks in DECZ armored.	Minimal impacts expected at this time.
Natural disasters	M	Floods generally have temporary impacts on public access amenities.	Minimal.
National security	M	May have impact with Philadelphia Airport expansion.	Passive, fishing.
Encroachment on public land	L	N/A	N/A

LECZ

Type of threat or conflict causing loss of access	Degree of threat (H,M,L)	Describe trends or provide other statistics to characterize the threat and impact on access	Type(s) of access affected
Private residential development (including conversion of public facilities to private)	M	LE watershed is most developed in Great Lakes, all lakefront property valuable.	Passive to beach, fishing
Non-water dependent commercial/industrial uses of the waterfront (existing or conversion)	L	Presque Isle Bay has maintained meaningful access with mixed uses.	N/A
Erosion	H	Beach erosion on Presque Isle State Park public swimming beaches. Significant bluff erosion on State Game Land #301 due to impacts from Conneaut Harbor Breakwaters	Public swimming, public hiking and passive outdoor recreation. Hunting and fishing.
Sea level rise/Great Lake level change	M	Rising lake levels impact ability to access some stretches	Passive to beaches lake ward of shale outcrops.
Natural disasters	M	Individual storms, usually winter storms, can have tremendous negative impacts on Presque Isle State park swimming beaches.	Public swimming, public hiking and passive outdoor recreation.
National security	L	None recognized.	N/A
Encroachment on public land	L	None recognized.	N/A

2. *Are there new issues emerging in your state that are starting to affect public access or seem to have the potential to do so in the future?*

The waterfront of the Delaware Estuary Coastal Zone has been impacted by a history of land use decisions decided on an individual basis with little comprehensive planning. At times, development has been approved on the waterfront without meaningful access to the waterfront. Philadelphia has a need for postindustrial redevelopment and reconnection to the waterfront resources. During this reporting period the momentum

toward a green and accessible Delaware waterfront has continued to gain strength and new emerging issues generally favor additional public access to the estuary. Grassroots public demand and leadership by elected officials have combined to result in positive gains in this area.

In the Lake Erie Coastal Zone public access remains a high priority. Changes to the Pennsylvania Fish and Boat Commission (PFBC) Erie Access Improvement Program now allow use of the funds in the Conneaut and Turkey Creek watersheds.

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 this contextual measure, please describe below actions the CMP is taking to develop a mechanism to collect the requested data.*

Contextual measure	Survey data
Number of people that responded to a survey on recreational access.	Done by workgroups within stakeholder meetings listed below, number of respondents not available.
Number of people surveyed that responded that public access to the coast for recreation is adequate or better.	N/A
What type of survey was conducted (i.e. phone, mail, personal interview, etc.)?	Public meetings and forums.
What was the geographic coverage of the survey?	PFBC did a state-wide survey and evaluated results by HUC-8 watersheds.
In what year was the survey conducted?	PFBC = 2008 Penn Praxis/Central Philadelphia = 2006/2007 PEC Tidal Delaware Water Trail = 2010

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

In December 2005, CRM, through a contractor, conducted sampling of the Lake Erie and Delaware Estuary coastal zones to assess Pennsylvania resident’s perception of access to our coasts. The final report for this survey was submitted to CRM in March 2006 (CZM Project Number: 2005-PS.14). Approximately 2000 phone calls were initiated to garner 301 questionnaire responses. This is a response rate of about 15%, although the author mentions a lower rate in Philadelphia. Of the total questionnaires completed, 62% were from the Delaware Estuary and 38% were from the Lake Erie area.

For the question “Do you feel that you have adequate access to your coastal zone”, 92.69% of the total responded “yes”. That total can be broken down into counties as follows: LECZ – Erie County, 91.3%. DECZ – Bucks County, 96.8%; Philadelphia,

100%; and Delaware County, 88.6%. Delaware County reported the lowest level of adequate access, but it should be noted that subsequent to this survey Ridley Twp. and Tincum Twp. acquired private marinas in order to convert them to public facilities (with assistance from CRM). Ridley Twp. Marina is open with ongoing improvements while Tincum Twp is still looking to provide improvements prior to opening to the public.

During this reporting period other partners have invested considerable resources to improve public access planning and implementation, including forums for public input, and CRM decided a specific survey would be a duplication of effort and was not necessary at this time. However, these other efforts did not randomly ascertain general public inputs and those participating were slanted to those who already had an interest in the subject matter. These efforts are described below, but do not directly address the contextual measure questions. In the future, Pennsylvania CRM will conduct statistically valid random surveys in order to better answer the specific questions ask for the above contextual measure.

The Pennsylvania Fish and Boat Commission, working with the Department of Conservation and Natural Resources and the Pennsylvania Environmental Council, developed *Pennsylvania's Fishing and Boating Access Strategy* for recreational boating and fishing access throughout the state. Ten regional meetings were held to ascertain stakeholder and public input throughout the state. As described in the Executive Summary, some examples of key questions that were asked to identify major components of the Strategy included:

- Are current fishing and boating access points adequate to meet public demand?
- What funding sources are available for acquisition, development and maintenance of access?
- Where are current fishing and boating access points in relation to population centers, fishing license purchasers, and boat registrants?
- What are the criteria for identifying good walk-in fishing and boating access sites?
- Why are private landowners increasingly “posting” their property and eliminating access for the public?
- Where do people live and where do they want access?

The questions were asked in a workgroup setting and individual responses were not recorded or tallied. Results were evaluated by HUC8 watersheds and will be used to prioritize projects within the PFBC Boating Facilities Grant Program.

In the DECZ tremendous strides have been made in creating a civic vision for the Central Delaware Waterfront in Philadelphia. The Central Delaware is defined as the area between Allegheny Avenue on the north and Oregon Avenue on the south. The Central Delaware Riverfront Planning Process has been a citizen-driven open and transparent process. In December 2006, three Value Sessions were held to ascertain the public's needs and goals for the waterfront. Over 4,000 citizens contributed to the Civic Vision for the Central Delaware that was finalized in 2007.

The civic vision called for the following:

1. Public access to the river over paths and extended streets;
2. Parks within a ten-minute walk of every home and neighborhood;
3. A recreational trail along the river for walkers and cyclists;
4. A streetcar line along the median of Delaware Avenue/Columbus Boulevard;
5. Parking that does not interfere with water views or dominate the landscape;
6. A healthy river's edge that includes a 100-foot greenway along its shore.

Also in the DECZ, the Pennsylvania Environmental Council is currently conducting a river recreation survey through the Tidal Delaware Water Trail outreach and web page. The survey can be found at <http://www.zoomerang.com/Survey/WEB22AEQXXT3FQ>.

5. Please use the table(s) 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.

DECZ

Types of public access	Current number(s)	Changes since last assessment (+/-)	Cite data source
(CM) Number of acres in the coastal zone that are available for public (report both the total number of acres in the coastal zone and acres available for public access)	Total = 64,733 acres 5929.0 acres	No Change	CRM GIS Database
(CM) Miles of shoreline available for public access (report both the total miles of shoreline and miles available for public access)	Total = 112.4 miles. Access = 15.3 miles.	No change.	CRM GIS Database
Number of State/County/Local parks and number of acres	65 sites	No Change (+2 corrections only)	CRM GIS Database
Number of public beach/shoreline access sites	25 sites	No change	CRM GIS Database
Number of recreational boat (power or non-power) access sites	Canoe Launches = 7 Power Boat = 43	No change	CRM GIS Database
Number of designated scenic vistas or overlook points	None	No Change	N/A

Number of State or locally designated perpendicular rights-of-way (i.e. street ends, easements)	None	No Change	N/A
Number of fishing access points (i.e. piers, jetties)	15	+1 – Ridley Twp Marina Fishing Pier	CRM GIS database
Number and miles of coastal trails/boardwalks	29.9 miles	+ 0.5 miles Pennypack Park	CRM GIS Database
Number of dune walkovers	N/A	N/A	N/A
Percent of access sites that are ADA compliant access	Data being developed	Data being developed	Data being developed
Percent and total miles of public beaches with water quality monitoring and public closure notice programs	No Public Swimming Beaches	N/A	N/A
Average number of beach mile days closed due to water quality concerns.	No Public Swimming Beaches	N/A	N/A

The CRM program expects major public access gains in the DECZ during the next reporting period. Current projects being planned and nearing construction include:

K&T Trail – A recreational trail covering a total of 11 miles in North Philadelphia, extending from Allegheny Ave to the Bucks County line. Some of this trail would be on public roads, but a major portion will be on an abandoned rail line. This trail would be part of the East Coast Greenway.

Lardner’s Point Park – CRM has long supported this creation of a 4.5 acre riverfront park at the base of the Tacony-Palmyra Bridge. The plans include tidal wetland creation along the river’s edge and it will serve as a gateway to the K&T Trail.

Pier 11 – Pier 11, also known as the Race St. Pier, is located at the foot of the Ben Franklin Bridge. This will be one of the first visible implementations of the Civic Vision for the Central Delaware.

Schuylkill River Trail – Major expansion of the Schuylkill River Trail is expected as American Recovery and Reinvestment Act funds were awarded for continuing the trail on the East Schuylkill, crossing the Schuylkill River, and extending the trail on the western shore. Plans also include connecting to the Cobbs Creek Bikeway

Chester Riverwalk – The riverwalk in Chester, Delaware County, is expected to be completed in conjunction with the construction of a new Major League Soccer stadium that is currently under construction. This 0.04 mile trail will extend south from the existing Barry Park access area and boat ramp.

Money Island and Biles Island, Bucks County – This area, known as the Great Bend, is currently owned and operated by Waste Management, Inc. It is anticipated that

ownership of these substantial waterfront properties will be transferred to the local municipalities during the next reporting period. Recreational public access is being included as a major component of a mixed use waterfront plan. Existing quality habitat includes vegetated tidal wetlands with forested buffers. Balancing public access and other mixed uses in this area without significant adverse impacts to existing habitat will be a key to responsible and successful redevelopment of the area.

LECZ

Types of public access	Current number(s)	Changes since last assessment (+/-)	Cite data source
(CM) Number of acres in the coastal zone that are available for public (report both the total number of acres in the coastal zone and acres available for public access)	Total Land Acres = 40,989 *Publicly available = 5,845.7	+ 19.8 acres total. Avonia Park + 4.1 ac Walnut Cr. Fishing Easement +1.7 ac. Allison Easement +14.0	CRM GIS database.
(CM) Miles of shoreline available for public access (report both the total miles of shoreline and miles available for public access)	Total=76.6 miles Public access = 36.8 miles	Avonia Park = 0.08 mi. Allison easement = 0.23 mi.	CRM GIS database.
Number of State/County/Local parks and number of acres	51 *5829.9	+ Avonia Park, 4.09 acres	CRM GIS database.
Number of public beach/shoreline access sites	32	+ Avonia Park	CRM GIS database.
Number of recreational boat (power or non-power) access sites	Recognized canoe launches = 8 Power boat: Public = 19 Private = 17	No known changes. Major improvements to Shades Beach Launch / new safe harbor.	Previous 309/no change
Number of designated scenic vistas or overlook points	Numerous	0 change, 1 in planning stage	N/A
Number of State or locally designated perpendicular rights-of-way (i.e. street ends, easements)	Perpendicular ROWs for local community groups only	0 change.	N/A
Number of fishing access points (i.e. piers, jetties)	37	+ 2 Bayfront, Walnut Creek Easement	CRM GIS database
Number and miles of coastal trails/boardwalks	Data being developed	Data being developed	
Number of dune walkovers	Numerous, Presque Isle Only	Presque Isle Only	N/A

Percent of access sites that are ADA compliant access	Data being developed	Data being developed	
Percent and total miles of public beaches with water quality monitoring and public closure notice programs	12 Beaches Total beach miles: 44.7 Miles w/WQ monitoring = 3.38 (7.6%)	No change in miles, changes in WQ monitoring and advisory/restriction procedures.	PISP literature, + Freeport Beach, CRM GIS database
Average number of beach mile days closed due to water quality concerns.**	**2007 = 5.89 **2008 = 8.16 **2009 = 8.87	Beach mile days w/advisory or restrictions shows slight increase – mainly weather dependent.	Erie County department of Health

* Large difference from acreage reported in last assessment due to corrections in acreage for Presque Isle State Park and Game Land #314. Updated tax map parcels for Erie County were made available during this reporting period. GIS acreage and calculated acreage is different than courthouse records reported during last assessment.

** Beach sampling and advisory/restriction procedures changed beginning 2007 swimming season. Data reported is a combination of advisory and swimming restrictions (Beach miles days with advisory or swimming restriction).

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 (reaffirmed by court decision)
Acquisition programs or policies	Y	Y – PFBC Lake Erie Access Program
Comprehensive access management planning (including GIS data or database)	N (efforts at local level)	N
Operation and maintenance programs	N	N
Alternative funding sources or techniques	N	N
Beach water quality monitoring and pollution source identification and	Y	Y – Change in protocols, types of “closure”, and additional studies.

remediation		
Public access within waterfront redevelopment programs	Y	Y - DECZ Central Delaware
Public access education and outreach	Y	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.*

Statewide - Little Juniata River Court Case

DEP, DCNR, and PFBC have the primary responsibility for maintaining the public's rights to aquatic public trust resources and joined in filing suit in 2003 with DEP as lead plaintiff. The case involved the Little Juniata River in Huntingdon County but had potential implications for Pennsylvania's coastal zones. A private fishing club, with control of both riparian banks over a 1.3 mile stretch, began erecting fences across the river and otherwise restricting access to the river bottom itself, deemed by the agencies to be submerged lands of the commonwealth. A January 31, 2007 court decision confirmed that historically navigable waters of the commonwealth belong to the people of the commonwealth. The resource agencies have an obligation to protect these rights, including the rights of future generations. A June 15, 2007 decision went on to enjoin the defendants "from interfering with the public's rights in the Little Juniata, including the posting and/or hanging of signs, advertising the Little Juniata River as private waters and threatening, harassing and otherwise attempting to exclude the public from fishing, boating, wading and/or recreating on and in the Little Juniata River and the submerged lands owned by the commonwealth". These rulings basically reaffirmed the commonwealth's long-standing position.

LECZ - Pennsylvania Fish and Boat Commission Erie Access Improvement Grant Program

Act 159 of 2004 created a new Lake Erie stamp that is required for anglers fishing in the Lake Erie watershed. The Act provided that the proceeds from the sale of Lake Erie permits are to be deposited into a restricted account within the Fish Fund to "be used to provide public fishing access on or at Lake Erie and the watersheds of Lake Erie." Through 2009 the program had acquired or acquired easements to 12.65 miles of stream frontage on Lake Erie, Twenty Mile Creek, Crooked Creek, Walnut Creek, Elk Creek, and Fourmile Creek. Many of these sites are within the watershed but outside of the

coastal zone. Act 40 of 2009 amended the original act that created the Erie Access Improvement Plan by extending the restricted account from Lake Erie permits until 2014, adding the tributaries that flow through Ohio before joining the lake (Conneaut and Turkey Creeks), and extending the use of the fund to projects that protect or improve fish habitat. Secondary to acquiring public angler access, the program has served to publicly acquire and protect riparian habitats. However, increased public access and construction of public access amenities may also lead to increased impacts associated with the spread of non-native invasive species to the riparian and aquatic areas. While this has been a non-CZM led activity, CZM is involved and there is tremendous potential and opportunity to partner with PFBC on both access and habitat protection and restoration projects within the watershed.

LECZ - Beach water quality monitoring and pollution source identification and remediation - Presque Isle Beach Monitoring and Source Studies

The public swimming beaches of Presque Isle State Park and Erie County are significant recreational and economic resources to the region. Providing for safe recreation, while not unnecessarily closing beaches due to invalid water quality concerns, is a responsibility shared by DCNR and the Erie County Department of Health. During this reporting period local partners have teamed to conduct additional research and provide additional insight on beach sampling and closure procedures as well as sources of contaminants. The CRM program has helped to support this research. This research is ongoing and will continue into the next reporting period. In 2008 a stream gauge was installed on Walnut Creek and a water quality buoy that transmits real-time general water quality data was installed off of Beach 2 at Presque Isle. The data generated from these devices will be used with actual sample results to help refine a predictive model that is being developed that recognizes the correlation between weather and beach water quality. Non-point source pollution associated with stormwater runoff is the source of the bacteria causing beach advisories and restrictions at Presque Isle. Thus, trends in beach mile closure days may be a result of weather conditions as opposed to an indicator of overall water quality trends. Regardless, protection of the swimming beaches at Presque Isle State Park is a high priority and addressing the existing and potential non-point sources that adversely impact them is critical to future planning.

During this report period DCNR has changed their beach closure/beach advisory protocols to issue beach advisories and restrictions as opposed to actual closures. Current protocols include sampling for *E. coli* and that if a single regulatory sample is greater than or equal to 235 cfu/100 ml, but less than 1,000 cfu/100ml, a swimming advisory is posted for that beach. Under a swimming advisory swimming is permitted but the public is notified of the advisory and what general precautions should be taken. If the *E. coli* level is equal to or greater than 1,000 cfu/100ml, a swimming restriction is posted and swimming is not permitted.

DECZ – Central Philadelphia Delaware River Waterfront

The grassroots public demand for public access along the Delaware River has been the leading driver in the momentum that is leading to action in the Delaware Estuary Coastal Zone. During this reporting period tremendous strides have been made in creating a civic

vision for the Central Delaware Waterfront in Philadelphia. The Central Delaware is defined as the area between Allegheny Avenue on the north and Oregon Avenue on the south. The Central Delaware Riverfront Planning Process has been a citizen-driven open and transparent process. In December 2006, three Value Sessions were held to ascertain the public's needs and goals for the waterfront. Over 4,000 citizens contributed to the Civic Vision for the Central Delaware that was finalized in 2007.

The civic vision, released in November 2007, calls for the following:

1. Public access to the river over paths and extended streets;
2. Parks within a ten-minute walk of every home and neighborhood;
3. A recreational trail along the river for walkers and cyclists;
4. A streetcar line along the median of Delaware Avenue/Columbus Boulevard;
5. Parking that does not interfere with water views or dominate the landscape; and
6. A healthy river's edge that includes a 100-foot greenway along its shore.

The Civic Vision for the Central Delaware can be accessed at:

<http://www.100citiesinitiative.org/files/4/26/files/civic-vision.pdf.pdf>

DECZ – Formation of Delaware River City Corporation

In the North Philadelphia/North Delaware section of the coastal zone a new non-profit, Delaware River City Corporation, was formed in 2006. The mission of the Delaware River City Corporation is to revitalize a sustainable riverfront corridor in Northeast Philadelphia by reconnecting the people, places, businesses, and neighborhoods of the City of Philadelphia and the surrounding region to the Delaware River while simultaneously promoting a diversity of uses through implementation of the North Delaware Riverfront Greenway Plan.

Bucks County Open Space Program

In 2007 Bucks County voters passed an 87-million dollar bond specifically to address protection of open space within the county. Within this program 7 million dollars has been specifically set aside for the Delaware Riverfront Program, which specifically addresses public access needs. There are 17 municipalities along the Delaware River who may participate in this competitive grant program. The acquisition of natural areas, which have been previously identified along the tidal Delaware in Bucks County, is also eligible for an additional 11 million dollars that will be shared county wide. The challenge will be to provide public access and amenities without significantly impacting the small amount of ecologically connected habitats that remain along the Delaware Estuary. The open space program is a key tool toward implementing the Bucks County Waterfront Revitalization Plan that was finalized in 2005.

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.*

Pennsylvania has several public access guides available for recreation in the coastal zones. The PFBC maintains a web site with county guides for each of Pennsylvania’s 67 counties, including the four coastal counties (<http://www.fish.state.pa.us/county.htm>). PFBC has made substantial improvement to this GIS-based web site during this reporting period and the information available is very comprehensive and consistently updated. In addition, PFBC maintains an interactive guide specifically for the Lake Erie tributaries and steelhead fishing (<http://www.fish.state.pa.us/steelhead.htm>). The Lake Erie Coastal Zone also has access guides available through the Seaway Trail / National Scenic Byway program.

The Pennsylvania Environmental Council, with funding and support from CRM as well as numerous other partners, finalized the access guides for the Tidal Delaware Water Trail during this reporting period. The guides are available as 3-part printed copies, as printable pages on the tidal trail web site (<http://www.tidaltrail.org/map.php>), or as an interactive map of public access sites and recreational opportunities (<http://www.tidaltrail.org/explore.php>). These guides contain information for both the Pennsylvania and New Jersey sides of the river.

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	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H,M,L)
Comprehensive way to understand and address non-point source stormwater pollution that impacts <i>E. coli</i> levels and swimming access at public swimming beaches in LECZ.	Research/data	H
A mechanism to rapidly, efficiently, and adequately fund priority parcel acquisition when critical opportunities are presented.	Policy, capacity	M
An assessment of existing access to determine % of ADA compliant access.	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 **X**
Medium
Low

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

Public access is not only critical for quality of life for existing residents it also has tremendous impact on resource appreciation, redevelopment potential, and economic activity. The Delaware Estuary Coastal Zone is in a stage of transformation with land use decisions that will impact the next several decades. Tourism in general and recreational fishing in particular are critical to the Lake Erie Coastal Zone. Beach, bay, and recreational fishing access remain high priorities for CRM and our local partners. CRM has a long history of supporting successful public access planning and strategies and intends to continue that support.

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

Yes
No **X**

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

While public access remains a very high priority for the Coastal Resource Management program, we feel existing program policies and support to our local partners is sufficient to continue the positive momentum and recent successes in the coastal zones. Both coastal zones show signs of strong local support and committed leadership toward public access goals. An expanded LECZ would provide additional opportunities to partner with PFBC and local communities on public access and stream habitat projects within the watershed. An expanded coastal zone would also offer the opportunity to leverage CRM funds to expand the scope of individual access projects to address other priorities such as non-point source pollution and habitat for threatened and endangered species. CRM intends to use existing program policies to begin to address the gaps identified above.

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.

Marine debris is any man-made object discarded, disposed of, or abandoned that enters coastal waters. It may enter directly from a ship, or indirectly when blown or washed out to sea through rivers, streams and storm drains. Marine debris can be generally broken down into two categories, land-based and ocean-based. EPA states that land-based debris accounts for 80% of the nation's marine debris. The percentage in Pennsylvania's coastal waters is probably even higher. Land based sources include storm water runoff, landfills, combined sewer overflows (CSOs), street litter (wind and water driven), damaged structures, illegal dumps, and recreational users who litter. Street litter, entering coastal waters through various pathways, is Pennsylvania's most significant source of marine debris.

In addition to being aesthetically unpleasing, they can cause beach closings, interfere with navigation by fouling propellers and cooling water intake systems, and impact wildlife through entanglement and ingestion.

1. In the table below, characterize the significance of Marine/Great lakes debris and its impact on the coastal zone.

DECZ:

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	Mostly aesthetic, some WQ and wildlife impacts.	N
Land based – Dumping	L	Mostly aesthetic, some WQ impacts.	N
Land Based – Storm Drains and Runoff	H	Mostly aesthetic, some WQ and habitat impacts.	N
Land Based – Fishing Related (e.g. fishing line, gear)	L	Mostly aesthetic.	N

Ocean Based – Fishing (Derelict Fishing Gear)	L	Minimal impacts.	N
Ocean Based – Derelict Vessels	L	No or very minimal impacts.	N
Ocean Based – Vessel Based (cruise ship, cargo ship, general vessel)	L	Minimal impacts.	N
Hurricane/Storm	M	Mostly aesthetic, some WQ and wildlife impacts.	N

LECZ:

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	M	Mostly aesthetic.	N
Land based – Dumping	L	Minimal impact.	N
Land Based – Storm Drains and Runoff	M	Mostly aesthetic, some WQ and wildlife impacts.	N
Land Based – Fishing Related (e.g. fishing line, gear)	L	Aesthetic and wildlife impacts.	N
Ocean Based – Fishing (Derelict Fishing Gear)	L	Minimal impact.	N
Ocean Based – Derelict Vessels	L	No or very minimal impacts.	N
Ocean Based – Vessel Based (cruise ship, cargo ship, general vessel)	L	Minimal impacts.	N
Hurricane/Storm	L	Minimal impacts.	N

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 (most coastal municipalities)	Y (Only Springfield Twp., Erie County, lacks mandatory recycling and curbside pickup)	N
Littering reduction programs	Y (DEP and DCNR education outreach)	Y	Y
Wasteful packaging reduction programs	N	N	N
Fishing gear management programs	Y	Fishing line recycling efforts.	Y
Marine debris concerns in harbor, port, marine, & waste management plans	N	N	N
Post-storm related debris programs or policies	N	N	N
Derelict vessel removal programs or policies	N	N	N
Research and monitoring	Y	Uncertain	
Marine debris education & outreach	Y	Y	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.*

Changes since last assessment:

- 1) The City of Erie and the City of Philadelphia have implemented Single Stream Recycling programs and made the schedules of pickup more convenient for residents. Recycling rates have increased. These were non-CZM driven changes.
- 2) The City of Philadelphia, and the Philadelphia Water Department, have made the reduction of litter, community cleanups, and stream cleanups a high priority. More information on the City of Philadelphia's efforts and results are presented below. Using 306 funds, CRM has partnered on several of these efforts.
- 3) In September 2009, the Philadelphia Water Department submitted its updated Long Term Control Plan for Combined Sewer Overflow which addresses floatable debris from CSOs. This document is currently under review by EPA and DEP. This is driven by non-CZM efforts, but CRM does discuss and coordinate with DEP's regional office on this effort.
- 4) The ICC in the Delaware Estuary Coastal Zone has grown considerably. (The ICC in the Lake Erie Coastal Zone remains strong.). More information on the ICCs is presented below. CRM has been a key supporter of both efforts with 306 funds.
- 5) The Smart Boating Clean Waters workgroup, part of CNPP efforts, implemented a fishing line recycling program in the DECZ. This was done in partnership with Sea Grant, County Conservation Districts, and CRM.

Statewide Management Efforts:

Municipal solid waste is Pennsylvania's most significant source of marine debris. The primary authority for the management of municipal solid waste and recyclable materials in Pennsylvania lies within the requirements of the Municipal Waste Planning, Recycling and Waste Reduction Act of 1988 (Act 101). Under this act each county is required to develop and submit an officially adopted Municipal Waste Management Plan for municipal waste generated within the county. Plans are required to be updated every 10 years, although counties often update them more frequently. The act also mandates that communities with more than 5,000 people implement curbside recycling programs. Springfield Township, Erie County, is the only municipality within Pennsylvania's coastal zones that does not currently have a curbside recycling program.

Pennsylvania renewed its commitment to strengthen recycling efforts when it passed Act 175 of 2002. This act amended the Municipal Waste Planning, Recycling and Waste Reduction Act by seeking to make recycling efforts self-sufficient. Act 175 provides as follows:

The Department shall develop a plan to assist municipalities in making recycling programs under this act financially self-sufficient and shall submit the proposed plan to the General Assembly within one year from the effective date of this section. The plan shall:

1. Include a market development program to be funded by the recycling fund.
2. Specifically address the extent to which municipal recycling programs under Act 101 can be sustained by restructuring the allocation of available recycling grants provided by Chapter 9.
3. Include recommendations to county recycling coordinators designed to encourage market development.
4. Identify the specific means, including legislative changes that the Department intends to use to assist municipalities in making their recycling programs under this Act self-sufficient.

The Department finalized its working draft Act 175 Recycling Program Plan in July 2004. This is the plan the Department currently utilizes. It is clear that recycling has become a significant part of Pennsylvania's economy. According to the 2009 Recycling Economic Impact Study completed by the Northeast Recycling Council, Pennsylvania has approximately 3,800 recycling and reuse establishments and 52,000 Pennsylvanians employed in recycling, reuse, or remanufacturing operations. These businesses have an annual Pennsylvania payroll of approximately \$2.2 billion and sales receipts of approximately \$20.5 billion.

While Act 101 and Act 175 provide a framework for the overall management of municipal solid waste, it is clear that citizen's individual actions play a significant role in how municipal solid waste becomes marine debris. Preventing the transformation of solid waste to marine debris is accomplished in a variety of ways by a variety of partners.

International Coastal Cleanup

The International Coastal Cleanup (ICC) is a global event sponsored by the Ocean Conservancy. From its humble beginnings in 1986 it has grown to include 104 countries/locations and 43 states including the District of Columbia. The event engages people to not only remove trash and debris from beaches and waterways but to identify the sources of debris and change the behaviors that cause marine debris in the first place. Pennsylvania's state-wide coordinator for the International Coastal Cleanup is Ms. Leni Herr of Verizon Telecom Pioneers. During the past ten years Pennsylvania's participation in the event has steadily grown. Participation in International Coastal Cleanup (ICC) has remained strong in the Lake Erie Coastal Zone and improved dramatically in the Delaware Estuary Coastal Zone during this 5-year report period. According to the Ocean Conservancy's 2009 ICC report, Pennsylvania had 2,562 volunteers participate in the 2008 ICC. This ranked Pennsylvania 11th among states in the number of volunteers participating. The 528,026 total pounds of trash collected ranked Pennsylvania 2nd.

The Lake Erie International Coastal Cleanup grew considerably after the CRM program became more active in 2003 and helped form the local ICC Steering Committee. The local ICC Steering Committee remains intact and the cleanup is strongly supported by numerous community partners, sponsors, and volunteers. The outreach and education components remain an important part of the Lake Erie ICC and CRM continues to help support these efforts. The Erie Times-News "Newspaper-in-Education" continues to actively support the educational component, with pull-out sections that document what

was found. Students, including those in the Lake Erie-Allegheny Earthforce program, use the data collected to search for local solutions to the documented problems. The data collected in the Lake Erie Coastal Zone closely matches national trends with the top five items being cigarette butts/cigar tips, food wrappers/containers, beverage containers, beverage caps/lids/straws, and plastic bags. The 2009 Lake Erie ICC was supported by 1257 volunteers.

The Delaware Estuary ICC grew considerably during this reporting period. PA CleanWays, a non-profit organization dedicated to empowering people to eliminate illegal dumping and littering throughout Pennsylvania, became an important part of the Delaware Estuary ICC. Working with state-wide coordinator Leni Herr, PA CleanWays has helped coordinate cleanups in the Delaware Estuary. Within the 5-county region of southeast Pennsylvania, PA CleanWays helped to coordinate 19 ICC events in 2008 and 17 ICC events in 2009. PA CleanWays' efforts include outreach and education at events such as Delaware County's Riverfront Ramble and Southeast Pennsylvania Coast Day. These efforts have been supplemented by a variety of grants from various sources including Pennsylvania's Department of Conservation and Natural Resources, Pennsylvania DEP, and Pennsylvania's CRM program. Local partners have been very supportive in donating disposal costs as well as food and beverages for participants. Philadelphia Water Department's Waterways Restoration Team has been a key partner able to provide equipment and manpower for the large cleanups within urban Philadelphia.

Fishing Line Recycling Programs

In the summer of 2008, the Smart Boating Clean Waters workgroup launched a new monofilament recycling pilot program in the Delaware Estuary CNPP area. This effort not only seeks to prevent fishing line from entering landfills, but also stops the harmful material from littering the local aquatic environment. Maps of recycling bin locations are on the CRM web page. A fishing line recycling program already existed in the LECZ.

Delaware Estuary Coastal Zone – Local Efforts

The Philadelphia Water Department

The Philadelphia Water Department (PWD) is probably the most significant partner in the fight against marine debris in the Delaware Estuary coastal zone. They use a variety of tools to fight against marine debris, often referred to as "floatables". Floatables include plastics, polystyrene, paper and similar items that float at or below the surface of the water. Floatables which enter the combined sewer or stormwater systems often begin as street litter, before eventually reaching the estuary.

Some of Philadelphia's efforts to control floatables are in accordance with National Pollution Discharge Elimination System (NPDES) permits submitted to the Department of Environmental Protection, and work to address issues associated with Combined Sewer Overflows (CSOs). The 1995 document "CSO Documentation: Implementation of Nine Minimum Controls", includes "Minimum Control Number 6: Control of the

discharge of solid and floatable materials”. These minimum controls were incorporated into PWD’s first Long Term Control Plan in 1997. The Nine Minimum Controls are considered low cost actions or measures that can reduce CSO discharges and their effect on receiving waters, do not require significant engineering studies or major construction, and can be implemented in a relatively short time frame. The progress in implementing the Nine Minimum Controls can be tracked through annual CSO status reports the PWD has submitted to DEP and EPA. These are generally available on the internet through PWD’s web pages.

In September 2009, the PWD submitted “The City of Philadelphia’s Program for Combined Sewer Overflow Control – A Long Term Control Plan Update”. This document is currently under review by DEP and EPA. Along with other priorities, this document continues to discuss the control of floatable debris, and recognizes the importance of aesthetically pleasing public access amenities as being critical to gaining public stewardship of water resources. The PWD seeks to integrate water resource stewardship outreach with a redeveloping waterfront that seeks to reconnect Philadelphia’s citizens with the tidal Delaware Estuary. PWD recognizes that citizen stewardship of water resources can significantly decrease their overall operating costs.

Following are some specific efforts the PWD employs to reduce floatable marine debris:

PWD - Pollution Prevention

General housekeeping practices that help to prevent street litter from being deposited on the street in the first place is probably the most cost-effective way to minimize marine debris and keep it from entering the estuary. Litter ordinances, hazardous waste collection programs, illegal dumping regulations and enforcement, bulk refuse disposal practices, and recycling programs help in this regard. Once litter reaches the street, street sweeping and regular maintenance of catch basins can help reduce the amount that will ultimately enter the receiving waters.

In addition to ordinance and regulation the PWD has a robust Public Education Unit. Aggressive public education and outreach programs are implemented through participation at community events, bill stuffers, and through programs at the watershed education center at the Fairmont Water Works Interpretive Center.

PWD - Inlet Inspection and Cleaning

The City of Philadelphia has approximately 79,159 stormwater inlets. The Inlet Cleaning Unit is responsible for the inspection, cleaning, and maintenance of these inlets and the associated catch basins, many of which are designed to trap floatable debris. For the period January 2007 – June 2008, 130,453 inlets were examined and/or examined and cleaned.

PWD - Waterways Restoration Team (WRT)

The Waterways Restoration Team (WRT) is funded and operated by the PWD and is dedicated to removing large trash – cars, shopping carts, and other dumped debris from approximately 100 miles of city streams. These efforts have increased during this report

period. Many of these streams are contained within the Fairmont Park System and the WRT works in partnership with the park staff and the local park’s friends groups. Pennsylvania’s Coastal Resource Management program has partnered with the WRT on several of these cleanups, often working with Pennsylvania Cleanways – a nonprofit group dedicated to litter and dump removal. These projects seek not only to clean the area but to build community stewardship and empowerment. These projects have been very successful in changing community appreciation for their local aquatic resource, and have often lead to greater restoration efforts such as riparian restoration and beautification projects. The Coastal Resource Management program will continue to monitor these project areas to determine if the efforts and progress of the last five years can be sustained within the community.

PWD - Floatables Skimming Vessels

The R.E. Roy

In July 2005 the PWD acquired and began to operate the R.E. Roy, a 39-foot vessel specifically designed for the collection of floatable debris in urban waterways. Pennsylvania’s Coastal Resource Management program partnered in the acquisition of this vessel. The vessel is now operated by an independent contractor for the PWD. The vessel operates approximately 5 days per week, 8 months per year, removing general debris from the tidal Delaware and Schuylkill Rivers. According to PWD’s FY 2008 Combined Sewer and Stormwater Annual Reports, from April 2007 to June 2008 the R.E. Roy removed 47.24 tons of debris. The removal of debris can be targeted to select areas prior to and during specific events, improving aesthetics which leads to a greater public appreciation and ultimately stewardship of the resource. This is consistent with the city and region’s growing visions to reconnect the citizens to the rivers, as the riverfronts redevelop from the heavily industrial past. By operating during public events, the R.E. Roy is a very visible control technology that can increase public awareness and education.

Floatables Pontoon Vessel

In June 2006 the PWD acquired a standard pontoon vessel to assist in the removal of floatable marine debris that had reached the rivers. This vessel is more maneuverable than the skimming vessel and can be operated in tighter spaces such as in marinas and between piers. Pennsylvania’s CRM program also partnered in the acquisition of this vessel. Public outreach is a large part of its value, and the PWD is considering the option of allowing citizen volunteers to help staff the vessel. The PWD tracked the composition of debris collected from January 2007 – June 2008, the results are presented below:

Bottles, Cans, and Jugs	31%
Tires	21%
Plastic bags	17%
Other containers	7%
Tarps	6%
Misc.	18%

(Source: PWD, CSO-Stormwater FY08 Annual Report)

City of Philadelphia – Other efforts

Philly Spring Cleanups

Current Philadelphia Mayor Michael Nutter took office in January 2008. The problem of street litter was a priority Mayor Nutter focused on early in his administration. In April 2008 the City of Philadelphia sponsored the 2008 Philly Spring Cleanup. Keep America Beautiful would later confirm that this was the largest single-day, citywide clean-up on record in the United States. Approximately 15,000 volunteers cleaned up 2.56 million pounds of trash and 48,010 pounds of recyclable materials. The Philly Spring Cleanup returned in 2009. While smaller than the 2008 cleanup, the April 4th event was still a huge success, with approximately 10,000 volunteers cleaning up 692,560 pounds of trash in addition to participating in other city park and recreation center beautification projects. The third annual Philly Spring Cleanup was held on April 10, 2010 and included over 200 project sites. It is hoped that events like this will build the momentum and local stewardship to make long term changes sustainable at the local level.

Philadelphia Recycling Rewards Program

Philadelphia's recycling rates have been historically low. In January 2008 the recycling rate was about 7%. Change to a Single Stream Recycling effort and a more convenient schedule have helped to raise the city's recycling rate to 12.4% in July 2009. Higher rates of recycling directly decrease the city's landfill disposal fees, and can save significant sums of money. In February 2010 the City of Philadelphia began implementing a new program called Philadelphia Recycling Rewards. Under this program residents and communities can earn points that can lead to rewards such as discount coupons or gift cards for local and national businesses or charitable contributions to local schools. Free radio tags are attached to recycling bins and recycling rates as well as trash reduction rates are tracked by community. Similar programs in neighboring municipalities have demonstrated dramatic increases in recycling rates.

Philadelphia Streets Department - UnLitter Us Campaign

The UnLitter Us campaign is a series of print, radio, and television ads based on inspirational messages from local urban poets. The campaign began in Spring 2010. The Streets Department will also help sponsor on-going block cleanups with the Philadelphia More Beautiful Committee.

Consideration of Plastic Bag Ban

The problems associated with plastic bags can be seen in the trees, bushes, streams, and rivers throughout the Philadelphia metro region. It is a problem shared by other metropolitan areas and other nations. Philadelphia City Council has considered both a 25-cent fee on plastic bags and an outright ban on their use in most situations. In June 2009, City Council voted down the latest measure that would have banned carry-home plastic bags from major stores. While no regulatory action has been taken to date, City Council members have stated that they will continue to study the problem and seek alternative solutions to the use of the inexpensive and convenient plastic bags.

Lake Erie Coastal Zone – Local Efforts

City of Erie Sewer Department

The City of Erie Sewer Department controls floatable debris within its sewer system by use of conventional bar screens and baffles within the overflow retention facility. The sewer department also maintains litter booms on Cascade Creek and most recently Mill Creek, which drains the majority of the urban area of Erie. The Mill Creek litter boom was installed in the fall of 2009 with support funding from state Growing Greener and Growing Greener II grants. Part of the Growing Greener grants calls for an educational component whereby the Junior Pennsylvania Lake Erie Watershed Association and Earthforce students will examine and document the amount and types of litter captured by the booms.

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)
DECZ Public Access sites as sources of floatable marine debris. Better refuse container design / management. The carry in/carry out debate.	Data, communication and outreach, potentially equipment.	L

Enhancement Area Prioritization

- What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?*

High _____
Medium _____
Low X

The increasing reliance on plastic products has made marine debris a world-wide issue and urban environments are significant sources of floatable marine debris. The aesthetics

of Philadelphia's waterfront are critical to gaining community involvement as stakeholders and stewards of the estuarine resource, especially as momentum builds for increased public access to the tidal Schuylkill and Delaware Rivers. Local partners have become increasingly active in this enhancement area and CRM plans to continue to address this issue with support to local efforts to help sustain the positive momentum that has evolved.

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

Yes _____
No X

The CRM program will continue to work to address this issue with our networked partners and envision some continued support through CZMA 306 and potentially CNPP funding. Program changes to address this issue do not seem necessary at this time.

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:*

As population and development in the Delaware Estuary and Lake Erie coastal zones expand, so do their impacts on land and water coastal resources. The conversion of natural wetland, forested, and lower density development to high intensity urban areas increases impervious surfaces and resulting quantities of stormwater; the cumulative and secondary impact referred to most in this section. Increased residential, commercial, and industrial development, especially in the southeast, also adds to the quantity and variety of pollutants entering nearby tributaries to the Delaware Bay and Lake Erie.

DECZ:

Land use change (2001-2006)	Geographic area	Type of growth or change in land use	Change in land use (acres converted & % change)	Types of CSI
Developed land change	Entire DECZ	All developed land High intensity Med intensity Low intensity Developed open space	415 acre (0.9%) gain +743 (6%) +20 (0.2%) -65 (0.5%) -283 (3%)	<ul style="list-style-type: none"> • Increased volume and rate of stormwater runoff • Decreased infiltration and baseflow to streams/wetlands • Increased amount & transportation and of pollutants (nutrients, sedimentation, hydrocarbons, toxics, and high water temps) • Emerging pollutants - pharmaceuticals
	Delaware County	All developed land High intensity Med intensity Low intensity Developed open space	47 acre gain +163 -36 -24 -55	
	Philadelphia	All developed land High intensity Med intensity Low intensity Developed open space	71 acre gain +215 -31 -3 -110	
	Bucks County	All developed land High intensity Med intensity Low intensity Developed open space	297 acre gain +365 +86 -37 -117	

2001 land uses converted to developed land	Entire DECZ	Lower intensity developed to higher intensity developed Wetland to developed Forest to developed Agricultural to developed	759 acres 149 acres 117 acres 72 acres	
Wetland change	Entire DECZ	All wetlands Palustrine emergent Estuarine emergent Palustrine forested	266 acre (4%) loss -101 (7%) -40 (6.5%) -118 (3%)	<ul style="list-style-type: none"> • Decreased removal of pollutants • Loss of threatened & endangered species, decreased diversity • Decreased flood protection • Decreased carbon sequestration
	Delaware	All wetlands Palustrine emergent Estuarine emergent Palustrine forested	46 acre loss -16 -21 -4	
	Philadelphia	All wetlands Palustrine emergent Estuarine emergent Palustrine forested	36 acre loss -25 -6 -5	
	Bucks	All wetlands Palustrine emergent Estuarine emergent Palustrine forested	184 acre loss -60 -13 -109	
Forest change	Entire DECZ	All forest Deciduous	148 acre (2.5%) loss -147 (2.6%)	<ul style="list-style-type: none"> • Increased stormwater • Decreased water quality • Loss of habitat • Decreased buffering of streams & wetlands
	Delaware	All forest Deciduous	3 acre loss -2	
	Philadelphia	All forest Deciduous	5 acre loss -5	
	Bucks	All forest Deciduous	140 acre loss -139	
* Coastal Change Analysis Program, 2001 & 2006, NOAA				
Population Change	Entire DECZ	2000-2010	-3,280 (-1%)	
		2000-2020	4,737 (+1%)	
		2000-2030	-13,878 (-3%)	
	Delaware	2000-2010	-3,858 (-8%)	
		2000-2020	-7,959 (-17%)	
		2000-2030	-7,924 (-17%)	
	Philadelphia	2000-2010	-6,713 (-2%)	
		2000-2020	-524 (0%)	
		2000-2030	-14,999 (-5%)	
	Bucks	2000-2010	7,291 (+4%)	
		2000-2020	13,220 (+8%)	
		2000-2030	9,051 (+5%)	
* Population predictions derived from 2000 US Census data, PA DEP				
Building Permits	Entire DECZ	2005-09 total building units	18,965	
	Delaware	2005-09 total building units	3,065	
	Philadelphia	2005-09 total building units	9,290	
	Bucks	2005-09 total building units	6,610	
* New privately-owned residential housing units authorized by building permits, US Census Bureau				

According to NOAA's Coastal Change Analysis Program data, developed land expanded from 2001 to 2006, while wetland and forested land uses experienced a slight decline across the DECZ. This dataset was extracted to only include areas within the coastal zone management boundary of Delaware, Philadelphia, and Bucks Counties and is the most up-to-date, comprehensive dataset available for both the DECZ and LECZ. During this five-year period, all developed land increased with most of this expansion occurring in Bucks County. However, in most counties, high intensity development increased the most at about a 6% gain across the entire DECZ, with most of that again within Bucks County. Delaware County, in general, saw the slowest expansion of

developed land uses. According to the CCAP data, the majority of increased intensity resulted from the conversion of lower intensity developed to higher intensity land use, followed by conversion from wetlands, forested, and agricultural land across the entire DECZ.

According to direct analysis of only the CCAP data, wetland losses were documented in all counties. Overall, about 266 acres were lost, totaling about 4% of all DECZ-classified wetlands. Again, Bucks County had most of this loss, with 184 acres converted between 2001 and 2006.

Forest conversion followed a similar trend, although to a lesser degree with a calculated loss of 148 acres or 2.5% in the DECZ. Delaware and Philadelphia experienced a negligible change, while Bucks had most of the loss at 140 acres.

Total new building unit data from 2005-2009 reflects a growth trend in the DECZ with almost 19,000 new units. Philadelphia, as an existing urban area, experienced the most residential growth. Bucks grew moderately and used the most amount of land to accommodate this growing population. Delaware County experienced positive new residential units, but the least in the region.

Predicted population change data shows a noticeable trend in development from 2000 to 2030. This information is extracted from a GIS layer created by the PA DEP that utilizes census data from 1980, 1990, and 2000 to project decadal population change. The data is aggregated by municipality. Between 2000 and 2020, Bucks County is anticipated to experience the most significant growth at 8%, while Delaware will shrink and lose 17% of its residents. Philadelphia is predicted to maintain its population.

LECZ:

Land use change (2001-2006)	Geographic area	Type of change	Change in land use (acres converted & % change)	Types of CSI
Developed land change	Entire LECZ	All developed land High intensity Med intensity Low intensity Developed open space	29 acre (0.3%) loss +16 (3.6%) -22 (0.4%) -25 (1.4%) +1 (0.1%)	<ul style="list-style-type: none"> • Increased volume and rate of stormwater runoff • Decreased infiltration and baseflow to streams/wetlands • Increased amount & transportation and of pollutants (nutrients, sedimentation, hydrocarbons, toxics, and high water temps) • Emerging pollutants - pharmaceuticals
	Springfield Girard Lake City Boro Fairview Twp Presque Isle State Park Lawrence Park Twp Harborcreek Twp	All developed land High intensity Med intensity Low intensity Developed open space	0 acre change 0 0 0 0	
	Millcreek Twp	All developed land High intensity Med intensity Low intensity Developed open space	0 acre change +2 -1 -1 0	
	Erie City	All developed land High intensity Med intensity Low intensity Developed open space	-29 acre loss +3 -18 -16 +1	
	North East Twp	All developed land High intensity Med intensity Low intensity Developed open space	0 acre change +1 -2 1 0	
	North East Boro	All developed land High intensity Med intensity Low intensity Developed open space	0 acre change +10 -1 -9 0	
2001 land uses converted to developed land	Entire LECZ	Lower intensity developed to higher intensity developed Wetland to developed Forested to developed	47 acres 7.1 acres 2.2 acres	
Wetland change	Entire LECZ *Not including Presque Isle SP	All wetlands Palustrine emergent Palustrine forested Palustrine scrub/shrub	4 acre (0.1%) loss -8 (-1.3%) -54 (-1.7%)* +57 (11%)* *(majority of this gain attributed to classification differences)	<ul style="list-style-type: none"> • Decreased removal of pollutants • Loss of threatened & endangered species, decreased diversity • Decreased flood protection • Decreased carbon sequestration

Forest change	Entire LECZ *Not including Presque Isle SP	Deciduous forest	25 acres (0.4%) loss	<ul style="list-style-type: none"> • Increased stormwater • Decreased water quality • Loss of habitat • Decreased buffering of streams & wetlands
	Springfield	Deciduous forest	-38	
	Girard	Deciduous forest	+4	
	Lake City Boro	Deciduous forest	0	
	Fairview Twp	Deciduous forest	0	
	Millcreek Twp	Deciduous forest	0	
	Erie City	Deciduous forest	0	
	Lawrence Park Twp	Deciduous forest	0	
	Presque Isle State Park	Deciduous forest	+27	
	Harborcreek Twp	Deciduous forest	+8	
	North East Twp	Deciduous forest	0	
	North East Boro	Deciduous forest	0	
**Negligible change in other types of forest land uses				
Agriculture Change	Entire LECZ *Not including Presque Isle SP	All agriculture Cultivated Crops Pasture/Hay	19 acre (0.11%) gain +50 (0.40%) -31 (0.80%)	<ul style="list-style-type: none"> • Increased sediment, nutrient, and pesticide polluted runoff • Increased water use • Loss of habitat
	Springfield	All agriculture Cultivated Crops Pasture/Hay	4 acre loss -4 0	
	Girard	All agriculture Cultivated Crops Pasture/Hay	2 acre loss +3 -5	
	Lake City Boro Millcreek Twp Erie City Presque Isle State Park North East Boro	All agriculture Cultivated Crops Pasture/Hay	0 acre change 0 0	
	Fairview Twp	All agriculture Cultivated Crops Pasture/Hay	0 acre change +2 -2	
	Lawrence Park Twp	All agriculture Cultivated Crops Pasture/Hay	0 acre change -7 +7	
	Harborcreek Twp	All agriculture Cultivated Crops Pasture/Hay	4 acre gain +15 -12	
	North East Twp	All agriculture Cultivated Crops Pasture/Hay	22 acre gain +39 -16	
	2001 land uses converted to agricultural land	Scrub/shrub to agriculture Deciduous forest to agriculture Grassland to agriculture Wetland to agriculture	10 acres 8 acres 4 acres 4 acres	
* Coastal Change Analysis Program, 2001 & 2006, NOAA				

Population Change	Entire LECZ	2000-2010 2000-2020 2000-2030	-69 (0%) 277 (+1%) 217 (0%)
	Springfield	2000-2010 2000-2020 2000-2030	-7 (-1%) 10 (+1%) 6 (+1%)
	Girard	2000-2010 2000-2020 2000-2030	56 (+8%) 112 (+16%) 112 (+16%)
	Lake City Boro	2000-2010 2000-2020 2000-2030	55 (+7%) 125 (+16%) 123 (+16%)
	Fairview Twp	2000-2010 2000-2020 2000-2030	167 (+10%) 270 (+15%) 280 (+16%)
	Millcreek Twp	2000-2010 2000-2020 2000-2030	567 (+7%) 1,273 (+16%) 1,253 (+16%)
	Erie City	2000-2010 2000-2020 2000-2030	-1,335 (-8%) -2,379 (-14%) -2,420 (-14%)
	Lawrence Park Twp	2000-2010 2000-2020 2000-2030	-87 (-7%) -173 (-13%) -173 (-13%)
	Harborcreek Twp	2000-2010 2000-2020 2000-2030	231 (+5%) 530 (+11%) 520 (+11%)
	North East Twp	2000-2010 2000-2020 2000-2030	263 (+7%) 487 (+12%) 492 (+13%)
	North East Boro	2000-2010 2000-2020 2000-2030	21 (0%) 21 (0%) 24 (+1%)
	* Population predictions derived from 2000 US Census data, PA DEP		
Building Permits	Entire LECZ	2005-08 total building units	1,906
	Springfield	2005-08 total building units	18
	Girard	2005-08 total building units	92
	Lake City Boro	2005-08 total building units	9
	Fairview Twp	2005-08 total building units	323
	Millcreek Twp	2005-08 total building units	714
	Erie City	2005-08 total building units	355
	Lawrence Park Twp	2005-08 total building units	2
	Harborcreek Twp	2005-08 total building units	315
	North East Twp	2005-08 total building units	63
	North East Boro	2005-08 total building units	15
* New privately-owned residential housing units authorized by building permits, US Census Bureau			

According to CCAP data, land use changes were less significant in the LECZ, with minor changes in developed land, wetlands, and negligible forest losses and agricultural gains. Overall, developed lands in the entire coastal zone actually decreased by 29 acres (a minor change of 0.3%). Most of this loss was actually conversion from low and medium intensity developed land. However, high intensity development did increase during the 5-year period by 16 acres or about 4%. These changes are very minor and could be attributed to technical classification error or small-scale landscape modifications. Almost all of this developed land use change is attributable to Erie City and North East Borough. As similar to the DECZ, almost all of development change

resulted from conversion of lower intensity development to a higher intensity developed land use, followed by minor conversions from wetland and forested areas.

Wetland and forest change in the LECZ was very minor. About 4 acres of wetland was lost in the entire LECZ, mostly attributable to changes in Palustrine emergent types. 25 acres of forest land overall was lost. This includes small gains in Girard and Harborcreek Townships. Most notable is a 28 acre forest loss in Springfield Township, which is most likely from planned clearing activities in the State Game Lands.

Agricultural land experienced a slight 19 acre gain from 2001 to 2006. While Springfield and Girard Township showed a minor loss, North East experienced the most gain at 22 acres, mostly converted from deciduous forest and grassland.

Total new building unit data from 2005-2009 shows an overall development trend during the time period. Millcreek Township experienced the greatest amount of growth with over 700 new units, followed far behind by nearby Erie City, Fairview, and Harborcreek Townships. Remaining municipalities on the eastern and western edges of the coastal zone still saw increases, but were significantly less.

Between 2010 and 2020, the LECZ is expected to experience a slight growth of 277 residents or 1%, followed by a slight decline the following decade. Most growth will be seen in Millcreek, Harborcreek, and North East Townships. Erie City is anticipated to experience a continued decline of 14% of its population throughout 2030.

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.

DECZ:

Sensitive resources	CSI threats description	Level of threat (H,M,L)
Sensitive streams	<ul style="list-style-type: none"> • Urban stormwater runoff • Combined sewer overflows 	H
Wetlands	<ul style="list-style-type: none"> • Direct conversion (fill, drainage) for development • Other hydrologic alterations (dredging, increased stormwater inputs) • Pollutant inputs from increased runoff (sediment, fertilizers, pesticides, heavy metals) • Sea level rise • Conversion of vegetated buffers to developed land uses 	H
Threatened & endangered species in wetlands	<ul style="list-style-type: none"> • Habitat loss from land use conversion • Habitat degradation (change in DO, toxicity...) • Introduction of nonnative species 	H
Freshwater Mussels	<ul style="list-style-type: none"> • Water quality degradation • Dams or other impoundments 	H

Sensitive streams

Area	Assessed Impaired Streams (miles)	All Streams (miles)	Percent Impaired
DECZ tributaries to tidal Delaware & Schuylkill	86	176	49%
DE CNPP tributaries	1,690	4,075	41%

Source of Impairment – DECZ tributaries	Total Miles	Percent of all Impaired Streams
Urban runoff/storm sewers	58	68%
Habitat modifications	24	28%
Municipal point source	13	15%
Agriculture	11	13%
Other	9	10%
Channelization	2	3%
Land Disposal	2	3%

According to the DEP's section 303(d) list, about 49% of DECZ tributaries to the tidal Delaware and Schuylkill Rivers are listed as nonattaining at least one use. Of these 28 miles of streams, approximately 68% are assessed as being impaired by urban runoff/storm sewers. The remaining sources of impairment include habitat modifications, municipal point sources, agriculture, and other sources. Specific types of impacts listed include water/flow variability, siltation, and metals. Tributaries in the expanded CNPP watersheds follow a similar trend, with about 41% of streams listed as being impaired.

Considering stormwater has impacted almost every stream in the DECZ, management measures need to retroactively address the impacts of intense land development through restoration. Alternatively, areas that have yet to be significantly altered, possibly including some portions of Bucks County, should be identified and protected through management measures.

Wetlands

Cumulative and secondary impacts to wetlands can have significant adverse impacts to both acreage and function. Historical cumulative and secondary impacts to wetlands in the DECZ have been severe, and the loss of function across the coastal zone is substantial. While cumulative and secondary impacts in the LECZ are present, the opportunity for protection of largely ecologically intact wetlands remains. Many wetlands in more rural forested areas of the LECZ remain free from the non-native invasive plant species that have become ubiquitous in the DECZ. Efforts to limit cumulative and secondary impacts to high quality wetlands in the LECZ should focus on protection of natural buffers, rapid response to new introductions of invasive plants, and outreach to help limit the small, incremental, unreported and largely untrackable losses due to small individual fills. Additional information on wetlands can be found in the Coastal Wetlands section.

Freshwater Mussels

Freshwater mussels have and continue to be impacted by water quality degradation in the DECZ. Originally, 12-14 native species were found in the Delaware Estuary, including seven of these in the DECZ. However, now only a single species is sparsely populated in some reaches of Ridley Creek, Delaware County. Mussels are very sensitive organisms and can function as an indicator species for ecological health of an area. Their decline is most likely attributable to long-term water quality degradation, resulting from urban runoff, in addition to isolated incidents, like spills. The mussels are also reliant on fish hosts for a part of their life cycle. Resultantly, declines in fish species from water quality impairments and dams have also contributed to their decline.

Reestablishing healthy mussel populations back in the Delaware Estuary is anticipated to further improve conditions for other sensitive resources. As filter-feeders, the organisms remove particulate nutrients and other suspended matter, improving water quality. Mussels have also been proven to stabilize stream bottoms and improve spawning habitats for other species. Now that water quality has improved and dams are being removed, there appears to be an opportunity for freshwater mussel restoration. The CRM program is supportive of these types of efforts.

LECZ:

Sensitive resources	CSI threats description	Level of threat (H,M,L)
Impaired streams	<ul style="list-style-type: none"> Urban stormwater runoff Agriculture 	M
Large contiguous forested headwater wetlands	<ul style="list-style-type: none"> Direct conversion & fragmentation Loss of forested buffers Indirect degradation (increased stormwater inputs, decreased groundwater recharge, pollutant inputs) Introduction of nonnative species 	H
Presque Isle Bay	<ul style="list-style-type: none"> Urban stormwater runoff Past & continued inputs of heavy metals and polycyclic aromatic hydrocarbons (PAHs) contamination 	H
Lake bluffs	<ul style="list-style-type: none"> Removal of vegetation by existing property owners, bluff face stabilization construction, new development Disturbance to threatened & endangered plant species on bluffs 	H
Threatened & endangered fish species	<ul style="list-style-type: none"> Sediment, nutrients, and other contaminants from agricultural and developed land uses. Nitrogen from atmospheric sources. Habitat degradation from streambed scouring to bedrock Decrease in nutrient cycling in hyporheic zone Dams and impoundments Overharvest Invasive species 	H
Public beaches	<ul style="list-style-type: none"> Pollutant contamination indicated by E. coli contamination predominately from stormwater runoff sources. Other possible CSI sources include septic discharges, sewer outfalls, and agricultural runoff. 	H
Migratory bird species	<ul style="list-style-type: none"> Loss & fragmenting of stopover habitat (forests, riparian buffers, wetlands, scrub-shrub, grasslands) Invasive plants and animals Pesticides and herbicides Wind turbines Avian Botulism 	H

Sensitive Streams

Area	Assessed Impaired Streams (miles)	All Streams (miles)	Percent Impaired
LECZ	22	131	16%
LE CNPP	100	720	14%

Source of Impairment – LECZ tributaries	Total Miles	Percent of all Impaired Streams
Urban Runoff/Storm Sewer & Small Residential Runoff	9	44%
Agriculture & Crop Related Agriculture	8	36%
Municipal Point Source	2	11%
Land Development	1	5%
Golf Courses	0.9	4%
Recreation and Tourism	0.7	3%
Bank Modifications	0.4	2%

According to the Department's section 303(d) list, about 16% of streams in the LECZ are impaired. 44% of these 22 miles of nonattaining streams are impaired by urban runoff/storm sewers and small residential runoff impacts. These reaches include almost all assessed streams within Erie City limits, including Mill and Cascade Creek West Branch, along with two tributaries and Millcreek Township and North East Township and Borough. Specific impairments caused by runoff include siltation and water flow variability. About the same amount of streams are impaired by agricultural land uses. These three impaired agriculturally-impaired tributaries include Trout Run and are located in Fairview and Girard Townships in western Erie County. Specific impairments included siltation and nutrients. Other lesser sources of impairment in the LECZ include municipal point sources, such as sewage treatment plants, land development, golf courses, recreation/tourism, and bank modifications.

Over 80% of LECZ streams are deemed to be healthy and without significant impairments. In this coastal zone, management should be aimed at the protection of existing high quality streams.

Presque Isle Bay

A milestone was achieved for the Presque Isle Bay Area of Concern (AOC) with the Environmental Protection Agency's approval in March 2007 of delisting the restrictions on dredging beneficial use impairment. Originally listed at the request of local citizens, Presque Isle Bay became the 43rd AOC under the Great Lakes Water Quality Agreement in 1991. The Stage 1 Remedial Action Plan identified restrictions on dredging activities and fish tumors or other deformities as two key Beneficial Use Impairments (BUIs) occurring in the AOC.

Subsequent investigations by the Department and its partners found that sediment contaminants are widespread throughout the bay sediment at levels typical of many urbanized regions of the Great Lakes. However, no "hot spots" were identified that would be candidates for active remediation. In September 2005, a comprehensive sediment survey was implemented in the bay examining both surficial and core samples. The survey was developed and implemented under the guidance of experts from federal and state agencies with experience in Great Lakes sediment chemistry and toxicity.

Members of the Presque Isle Bay Public Advisory Committee were extensively involved in every aspect of planning and implementation of the survey.

Evaluation of the data confirmed previous study results that the Bay's sediments contained widespread but low levels of several metals and polycyclic aromatic hydrocarbons. Limited toxicity to benthic organisms was observed which did not correlate to concentrations of contaminants. The evaluation of sediment in the context of dredging within the AOC showed that there need not be restrictions on dredging or disposal activities based upon contaminants in the sediments exceeding standards, criteria, or guidelines. Based upon these findings, the department, with the Public Advisory Committee's support, forwarded a recommendation to remove the restrictions on dredging beneficial use impairment for the AOC. This recommendation was approved. The focus now is on long term monitoring of the Presque Isle Bay watershed, ongoing public education, and research on the fish tumors.

Lake Bluffs

The Lake Erie coastline consists of bluffs that range from 5 to 200 feet above lake level. They are composed of unconsolidated sand, gravel, and clay glacial soils, with about 20% having shale bedrock exposure. The bluffs are unique ecosystems sensitive to natural erosion accelerated by human development and disturbance. Three biological diversity areas (BDAs) are identified along the shoreline in the Erie County Natural Heritage Inventory, including: the Lake Plain Shoreline BDA of exceptional significance in Girard and Springfield Townships. The area contains four special plant species that are classified as threatened, rare, endangered, and of concern in Pennsylvania. The Eight Mile Creek BDA is located in Harborcreek Township and is of high significance. Two endangered plant species are located within this area. Lastly, the North East Lake Bluff BDA is located within North East Township and is listed as Exceptional Significance containing two Pennsylvania threatened plant species.

Recommendations for preservation of all three BDAs focus on protecting the bluff habitat from the influences of development. Bluff recession is hastened by increased stormwater runoff resulting from more impervious surfaces and removal of vegetation. When trees and plants are cleared, often for a better view of the lake or new construction, there is less binding of the soil and interception of surface flow. Vegetation removal will also commonly increase groundwater flow through reduced transpiration uptake. New city water use without installation of sewer service will also introduce additional water which is not drawn from local groundwater and adds to quantity on the site. New structures, pools, and other constructions also increase weight load to the bluff face.

Fish and aquatic species

The Lake Erie fishery is composed of a blend of native and introduced species. Commercial fishing peaked in the early 1900s, but overfishing and other issues reduced commercial fleets to only a few boats in the 1990s. Today, recreational fishing is a major economic asset to the area.

Aquatic communities in the Lake Erie watershed have been impacted by overharvest, invasive species, dams, and environmental degradation, mostly brought on by the impacts of human development. Conversion of land from natural forested areas to

agricultural and urban development increases the inputs of sediment, nutrients, and contaminants. Another under-discussed source of water-based nitrogen loading is deposition from fossil fuel burning. In addition to point sources, such as sewer plants, and agricultural runoff, dry and wet-deposition of Nitrogen Oxides on the hardened, impervious landscape enters streams as increased runoff. Development has also altered the morphology of most streams in the watershed, causing scouring to the bedrock and removal of gravel and cobbles in the streams. The Conneaut is most likely the only gravel-dominated stream remaining in the watershed. These incised, scoured streams will also exhibit flashier, higher discharges of warmer water, all further degrading habitat for aquatic organisms. The change in stream morphology also exacerbates nitrogen inputs as less nutrient transformation occurs within the hyporheic zone of bedrock-dominated streams. Resultantly, the lake continues to suffer from inputs of nutrients from its tributaries.

Public Beaches

Pennsylvania's Lake Erie Coastline includes seven miles of public beach located in Presque Isle State Park and one mile of permitted public beach at Freeport. These areas are a highly valued recreational and economic resource. Bacterial contaminants arising from fecal matter indicated by E. coli concentrations have and continue to persist as a recurring problem. More recent research has examined other chemicals in contaminated beach waters off Presque Isle including Triclosan, Ethinyl estradiol, Fluoxetine, and Diuron. The Pennsylvania Department of Conservation and Natural Resources monitors bacterial concentrations at Presque Isle State Park and will issue a swimming advisory or restriction based on sample concentrations, visual inspection, and weather conditions. Lake Erie beaches experienced the following days with swimming advisories or restrictions: 2005 - 39 days, 2006 - 53 days, 2007 - 6 days, and 2008 - 45 days.

Research indicates that closures are typically triggered by rainfall events that increase water entering the lake, bringing bacterial and other contaminants with it. Other potential, but lesser sources of eColi are sediment and lake waters. Likely sources of eColi during high runoff events include septic discharges, sewer outfalls, and agricultural runoff.

Migratory Bird Species

The Great Lakes are a hub within the North American migration flyway. Millions of migrating birds accumulate in the coastal area waiting to cross the barrier of Lake Erie until they have developed sufficient fat stores and weather is prime. Presque Isle State Park has been named one of Pennsylvania's most diverse Important Bird Areas by the Audubon society. About 325 migratory and other species have been recorded on the Peninsula, including a number of endangered, threatened, and species of special concern. State Game Land #314, along the shore in western Erie County, is also an IBA.

Migratory species populations have measurably declined across the country since monitoring began 40 years ago and are extremely sensitive resources in the LECZ. The most significant threat is this loss of vital stopover habitat, including contiguous forests, grasslands, scrub-shrub areas, and wetlands. Fragmentation of large habitat patches with abrupt transitions between adjacent areas has been found to be especially detrimental to

species survival. Invasive plant and animal species propagated by human development also indirectly alter bird habitat quality. Moreover, zebra and quagga mussels concentrate harmful pollutants up the food chain, which may be linked to outbreaks of avian botulism. Human uses of pesticides and herbicides impact the reproduction and mortality of native and migratory birds. The emerging issue of wind turbines in the Lake or along the shoreline also continues to pose a controversial impact on bird populations.

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 Relevant management effort	Significant changes since last assessment	CRM-driven change
Laws/ Regulations	Statewide Law/Regulations		
	• Water Resources Planning Act (220)	Y – State Water Plan adopted; Water Atlas released, Chapter 110 regulations published, CWPA & CARP guidance published, Conservation center being developed	N
	• Chapter 102 Erosion & Sediment Control Regulations	Y – New proposed rulemaking published	N
	• Sewage Facilities Act (537)	N	N
	• Dam Safety & Encroachments Act	N	N
	• Chapter 105 Dam Safety and Waterway Management	Regulations currently being drafted	N
	• Stormwater Management Act (167)	Y– Updated draft model stormwater ordinance published	N
	• Amendments to Phosphate Detergent Act	Y – New Act passed, Places additional restrictions on phosphate use in detergents	N
Policies	Federal Clean Water Act • NPDES	Y – New effluent limit guidelines from EPA, Proposed Pennsylvania GP for MS4s	N
	Philadelphia City • Stormwater Parcel-based billing • City-wide stormwater regulations & guidance manual	Y – New billing system for stormwater, Updated stormwater regulations and manual	N
	Statewide Policies		
Guidance	• State Water Plan o State Water Atlas o Statewide & Regional Priorities	Y – Water atlas released, Statewide & regional priorities developed, Plan adopted	N
	• Comprehensive Stormwater Policy	Y – Policy developed last assessment period & continues to be implemented	N
	• Pennsylvania Stormwater BMP Manual	Y – Manual finalized in 2006	N
	• Guidelines for identification of Critical Water Planning Areas and Guidelines for development of Critical Area Resource Plans	Y – Both documents published	N
	• Riparian Forest Buffer Guidance and Toolkit	Y – Guidance developed and out for public comment, Toolkit is being finalized	N

	<ul style="list-style-type: none"> Erosion & Sediment Manual 	Y - Draft manual developed in 2009 & currently out for public comment	N
Management Plans	Watershed-based Management Plans		
	<ul style="list-style-type: none"> Act 167 Stormwater Management Plans 	<p>New plans developed (within the Delaware & Lake Erie CNPP)</p> <ul style="list-style-type: none"> Darby-Cobbs Creek, 2005 Maiden Creek, 2007 Swamp Creek, 2007 Schuylkill River (Berks County), 2007 Sacony Creek Update 2007 Tookany/Tacony-Frankford Watershed, 2008 Erie County-wide plan, Phase I Update, 2008 (prior plan published in 1996), Phase II Update currently being developed Being developed - Crum Creek, Pennypack Creek, Sandy Run, Valley Creek 	N
	<ul style="list-style-type: none"> Rivers Conservation Plans 	<p>New plans developed (within the Delaware & Lake Erie CNPP)</p> <ul style="list-style-type: none"> Crum Creek Watershed, 2005 Darby Creek Watershed, 2005 Lower Neshaminy Creek, 2005 Lower Perkiomen Creek, 2005 Pennypack Creek, 2005 Wyomissing Creek, 2006 Little Neshaminy Creek, 2007 Poquessing Creek, 2007 Lake Erie Watershed, 2008 Direct Delaware Drainage, in progress 	N
	<ul style="list-style-type: none"> Integrated Watershed Management Plans developed by the Philadelphia Water Department 	<p>New plans developed</p> <ul style="list-style-type: none"> Tookany/Tacony-Frankford, 2005 Pennypack (being developed) Poquessing (being developed) Wissahickon (being developed) 	N
	<ul style="list-style-type: none"> Integrated Water Resource Plans 	Pilot Lake Erie Watershed Integrated Water Resource Plan, in progress	Y, 306 funded
	<ul style="list-style-type: none"> Walnut Creek Watershed Protection & Restoration Plan 	Walnut Creek Environmental Quality Report, 2007 & Walnut Creek Watershed Protection and Restoration Plan, 2008	N
	<ul style="list-style-type: none"> Special Area Management Plans 	Upper Wissahickon SAMP, 2008	Y, 309 funded
	<ul style="list-style-type: none"> Lakewide Management Plans 	Lake Erie LaMPs, 2006 & 2008	N
	<ul style="list-style-type: none"> Presque Isle Bay Watershed Restoration Plan 	Presque Isle Bay Watershed Restoration Plan, in progress	Y, 306 funded
	<ul style="list-style-type: none"> Pennsylvania Section 319 Nonpoint Source Management Program 	Y - Update document published in 2008	N, CRM involved through CNPP
<ul style="list-style-type: none"> Philadelphia's Green City, Clean Waters Program CSO Long Term Control Plan Update 	Yes – CSO Long Term Control Plan document published in 2009.	N	

	Partnership for the Delaware Estuary – Regional Restoration Initiative: A Blueprint for the Delaware Estuary	Y – Initiative started in 2008, document published in 2009	N
Research, assessment, monitoring	Wetland Monitoring and Assessment	Addressed in Wetlands Section	
	Stream Assessments & Total Maximum Daily Loads (TMDLs)	Y - All wadable streams assessed, TMDL consent decree met	N
	Partnership for the Delaware Estuary's Freshwater Mussel Recovery Program	Y - Launched in 2007	N
	Ongoing Presque Isle Bay Area of Concern Research	Y – Bullhead studies & monitoring, sediment monitoring	Y, 306 funded
	Presque Isle & Erie County Bacterial Testing	Y – Research funded by CRM, multiple years	N, but 306 funded
	Bird Use of Coastal Habitat During Migration Study, Audubon Society	Y – Research funded by CRM, 2009	N, but 306 funded
Mapping	Some plans contain maps	N	N
Education and Outreach	Education/Outreach funded by CRM	Projects of note funded from 2006-2009 <ul style="list-style-type: none"> • Lake Erie and Delaware Valley Earth Force • Southeast Pennsylvania Coast Day • Delaware County Riverfront Resource Environmental Event • Erie Times News weekly coastal zone environmental issue page 	Y, 306 funded
	Coastal Nonpoint Pollution Prevention Program	N – Conservation districts and Philadelphia Water Dept. continue to address nonpoint source management measures.	Y
	Lake Erie Sea Grant		
	<ul style="list-style-type: none"> • Nonpoint Education for Municipal Officials (NEMO) • Open Space Preservation 	Y – Harborcreek & Millcreek Township land use regulation updates, over 1,065 acres of land preserved	Y, CRM partner funded through 306
	<ul style="list-style-type: none"> • Pharmaceutical collection & education 	Y – Collection event held in 2008, presentations, disposal slips	
	<ul style="list-style-type: none"> • Bluff Outreach Workshops 	Y – 8 workshops funded for property owners & professionals from 2005-2009	
	Vegetative Best Management Practices – A Manual for Pennsylvania Lake Erie Bluff Landowners	Y – Manual published in 2007	Y, 306
	CRM program advisory services technical assistance to bluff landowners on BMPs	N – service is provided continually	Y, 306
	Water Resource Technical Assistance Center	Y – new initiative currently being developed under the State Water Plan and Great Lakes Compact	N
	Philadelphia – Model Neighborhoods, Rain barrel distribution, Stormwater BMP Recognition Program	Y - Programs either started or expanded during reporting period	N, but CNPP funded
Watershed Partnerships	<ul style="list-style-type: none"> • Schuylkill Action Network • Pennsylvania Lake Erie Watershed Association • Partnership for the Delaware Estuary • Lake Erie Region Conservancy • Pennsylvania Sea Grant • Earth Force, Erie- Allegheny and S.E. Pennsylvania. 	N – CRM continues to foster partnerships with these organizations	Y, various
Grant Programs	Grants addressing CSIs funded by CRM	Grants funded from 2006-2009 <ul style="list-style-type: none"> • \$898,951 in the DECZ • \$745,780 in the LECZ • \$33,000 Statewide 	Y, 306

	Grants addressing CSIs funded by Growing Greener & 319 NPS program	Grants funded from 2006-2009 <ul style="list-style-type: none"> • \$533,320 in Bucks County • \$3,038,167 in Philadelphia County • \$860,181 in Delaware County • \$1,353,826 in Erie County 	N
Other Programs	Treevitalize	Y - Expanded outside of Southeast PA to include metro areas, including Erie	N, but 306 funded

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.

LAWS/REGULATIONS, POLICIES, AND GUIDANCE:

Pennsylvania State Water Plan

Water Resources Planning Act (Act 220)

Pennsylvania passed the Water Resources Planning Act in 2002, which requires the Department to do the following:

- Update the existing State Water Plan completed in 1983
- Register and report certain water withdrawals
- Identify Critical Water Planning Areas
- Create Critical Area Resource Plans
- Establish a voluntary water conservation program

During this reporting period, DEP has achieved or is currently working to develop all of these requirements. While the State Water Plan is a mandated non-CRM effort, the coastal program has been closely involved in its development and implementation in the coastal zones.

State Water Plan documents

The State Water Plan was adopted in February 2009. The Statewide and six Regional Water Resources Committees have been working to guide the development of the State Water Plan, which was officially published in 2009. The plan provides a qualitative and quantitative description of water resources in Pennsylvania and offers tools and guidance to decisionmakers based on the availability of water of adequate quantity and quality. The final State Water Plan is comprised of a paper and web-based version of the Pennsylvania Water Atlas, along with a State Water Plan Principles

document that includes a vision, priorities, and recommendations for action.

Chapter 110 Water Resources Planning Regulation

Chapter 110 regulations were published in 2008 and establish water withdrawal and use registration, monitoring, record-keeping, and reporting requirements. The regulations apply to all public water suppliers and hydropower facilities that withdraw an average rate of 10,000 gallons per day in any 30-day period. These entities must report usage annually and retain records for at least 5 years.

Guidelines for Identification of CWPAs and Development of CARPs

In 2006, DEP published final guidelines for the identification of Critical Water Planning Areas (CWPAs) where existing or future demands exceed or threaten the safe yield of available water resources. These areas may be identified and nominated through one of the six regional committees or other entities. A screening tool developed under the State Water Plan effort has also been used to identify potential CWPAs. Nominations are then reviewed and analyzed to produce a Critical Area Resource Plan (CARP), which identifies alternatives for assuring an adequate supply of water to satisfy existing and future reasonable and beneficial resources. DEP published draft guidelines for the development of CARPs in 2009. A finalized CARP should prioritize resources to address key problems, identify conflicts, alternatives, and establish a Critical Area Advisory Committee to head the planning process. There are currently three watersheds under CWPA consideration in the Delaware Basin (Brodhead, Little Lehigh, and Upper Neshaminy) and Temple Creek in the Lake Erie Watershed.

Water Resource Technical Assistance Center

DEP is currently working with the Pennsylvania Environmental Council to develop a Water Resource Technical Assistance Center. A leading-edge website has been drafted to educate homeowners, farmers, and other water users on water conservation. A business plan and organizational strategy is also being developed for the new center, addressing issues such as funding, sources, staff, and activities.

Chapter 102 Erosion & Sediment Control Regulations

DEP published proposed rulemaking in the fall of 2009 to state Chapter 102 regulations which require anyone conducting earth moving activities to use BMPs to minimize sediment pollution. The rulemaking requires the establishment and protection of riparian forest buffers when developing within 150 feet of an Exceptional Value stream. There are no EV streams within the coastal zones, but 21 of these waterways are in the southeastern CNPP area. The rulemaking is in the process of being finalized.

DEP completed a draft version of the Erosion and Sediment Control Best Management Practice Manual in 2009 and is currently out for public comment. The document provides guidance and procedures for those that must comply with Chapter 102

requirements.

Chapter 85 Bluff Recession and Setback Regulations

During the assessment timeframe, Pennsylvania regulations were updated pursuant to the Bluff Recession and Setback Act, 32 P.S. Sections 5201 – 5215. The Act is intended to address bluff erosion and recession matters along the Pennsylvania portion of the Lake Erie shoreline. The rulemaking was initiated in response to a petition sent to the Environmental Quality Board (EQB) by Millcreek Township, Erie County, asking for clarification of the designation of Bluff Recession Hazard Areas (BRHAs) along Lake Erie. In response to the petition, the Department initiated a study of Pennsylvania's entire Lake Erie shoreline in order to identify and update the number and location of BRHAs. As a result of this and other related studies and data, the Department clarified the locations of BRHAs and recommended adding the City of Erie as a municipality identified as having a BRHA. The regulations were finalized in 2009.

Revision of NPDES PAG-2

During this reporting period, DEP revised the NPDES General Permit for Stormwater Discharges Associated with Construction Activities (PAG-2). The revision contains new effluent limit guidelines and source performance standards that are to be consistent with new federal regulations. Overall, the updates should decrease pollutants released from construction sites.

Proposed General Permit for MS4s

In 2009, DEP published renewal of their NPDES MS4 General Permit (PAG-13). A good portion of both coastal zones is considered part of the Erie and Philadelphia urbanized areas covered by the MS4 General Permit and can apply for a general permit through the Department. The most significant change is a new component for MS4s to meet their TMDL requirements through a stormwater TMDL implementation plan.

Pennsylvania Stormwater Management Program

Comprehensive Stormwater Policy

DEP's Comprehensive Stormwater Policy was developed last reporting period, but continues to be utilized as a major guidance document integrating the Department's stormwater-related programs.

Stormwater BMP Manual

DEP developed this manual in the previous reporting period and finalized the document at the end of 2006. The manual provides design standards and planning concepts to manage water quality and quantity. It focuses on an integrated approach to address water quality enhancements, rate, and volume controls.

Stormwater Management Act Updated Model Ordinance

In 2006, DEP published a new draft model stormwater ordinance. This model will be used as a template for municipalities to pass local regulations to implement stormwater management plans developed under Act 167 or urbanized areas under NPDES MS4 requirements.

Phosphate Detergent Act Amendments

Amendments to the Phosphate Detergent Act of 1989 were adopted in 2008 prohibiting the use of phosphate in dishwashing detergents, with some exceptions. This was adopted with the main goal of meeting reductions under the 2000 Chesapeake Bay Agreement, but applies state-wide.

Philadelphia's Green City, Clean Waters Program

Philadelphia published their Long Term Control Plan Update in 2009, which formally establishes their Green City, Clean Waters vision for both meeting regulatory obligations of the Clean Water Act and fundamentally changing management of water resources in the city and its watersheds. The 20-year plan initiates the largest green stormwater infrastructure program envisioned in the country, providing for the capture of 80% of sewage and stormwater that would otherwise flow into streams. The plan includes three main elements:

- Green stormwater infrastructure. Eight green programs are already being implemented across the city, including: Green streets, schools, public facilities, open spaces, industry/institutions/commerce and business, driveways/alleys, and roads. Some programs of interest include the Model Neighborhoods initiative started in 2009. Fourteen communities have been selected to serve as a model to showcase green stormwater infrastructure elements. Several events and educational materials have already been developed. The Philadelphia Water Department has also been providing free rainbarrels to citizens since 2002 and expanded efforts in 2006. The Stormwater BMP Recognition Program was initiated in 2006 to recognize innovative BMPs in Southeastern PA. CRM has been involved in some of these outreach efforts through CNPP funding to the Philadelphia Water Department.
- Stream corridor restoration and preservation. Priority stream corridors have been identified to address water quality requirements, aesthetics, and recreational issues.
- Wet weather treatment plant upgrades. Traditional infrastructure upgrades are planned to address combined sewer overflow reductions.

Stormwater Parcel-based Billing

The city also recently announced its upcoming plan to phase-in a new non-residential stormwater utility over the next four years starting in 2010. Traditionally, water customers were charged based on water use. This new fee is derived from the ratio of impervious surface to gross property area, resulting in a higher cost to properties with more impervious surface. Parcels without a water or sewer account, such as parking lots, will now be incorporated into the program and billed accordingly. This new approach is anticipated to more fairly apply stormwater costs and provide a monetary incentive for adoption of green practices.

Stormwater Regulations and Guidance Manual

Philadelphia adopted new stormwater management regulations in 2006. The new rules address smaller, more frequent storms in terms of water quality, volume, and channel protection. Two years later, the city revised their Stormwater Guidance Manual to be consistent with the new regulations.

MANAGEMENT PLANS:

Watershed Management Plans Developed

A number of watershed-based plans were developed during this reporting period that address management of coastal DECZ and LECZ watershed resources.

PA Stormwater Management Program Act 167 Plans

Act 167 requires counties to prepare stormwater management plans for all 370 watersheds in the state, including 31 in the DECZ CNPP area and Lake Erie watershed. The following new plans were developed from 2005-2009:

- Ridley Creek, 1988
- Stony Creek/Sawmill Run, 1992
- Neshaminy Creek, 1992 & 1993
- Little Neshaminy Creek, 1996
- Tulpehocken Creek, 2001 & 2002
- Chester, 2003
- Delaware River South (Bucks County), 2004
- East Branch Perkiomen Creek, 2004
- Darby-Cobbs Creek, 2005
- Maiden Creek, 2007
- Swamp Creek, 2007
- Schuylkill River (Berks County), 2007
- Sacony Creek Update 2007
- Tookany/Tacony-Frankford Watershed, 2008
- Erie County-wide plan, Phase I Update , 2008 (prior plan published in 1996), Phase II Update currently being developed
- Crum Creek, in progress
- Pennypack Creek, in progress
- Sandy Run, in progress
- Valley Creek, in progress

Act 167 plans not yet developed:

- Delaware River, Delaware County
- Delaware River, Philadelphia County
- French Creek
- Little Schuylkill River
- Manatawny Creek
- Perkiomen Creek
- Pickering Creek
- Pigeon Creek

- Poquessing Creek
- Rock, Mill, Gulley, Arrowmink
- Skippack Creek
- Wissahickon Creek

Rivers Conservation Plans

The Rivers Conservation Program is managed by Pennsylvania Department of Conservation and Natural Resources and provides grants for the development of plans that identify natural, recreational, and cultural resources of a watershed. The process requires significant stakeholder input and meetings to identify issues, concerns, and threats to resources, while recommending solutions to conserve, enhance, and restore rivers. Seven new plans were developed during this reporting period with three additional southeast watersheds still in progress:

- Neshaminy Creek, 1997
- French & Pickering Creeks, 1998
- Ridley Creek, 1998
- Lower Delaware River, 1999
- Wissahickon Creek, 2000
- Manatawny Creek, 2001
- Schuylkill River, 2001
- Tulpehocken Creek, 2001
- Chester Creek, 2002
- French Creek, 2002
- Upper Perkiomen Creek, 2002
- Chester Countywide Plan, 2003
- Pigeon Creek & Stony Run, 2003
- Sandy Run, 2003
- Tookany Creek, 2003
- Tookany/Tacony-Frankford, 2003 & 2004
- Upper and Middle Neshaminy Creek, 2003
- Hay Creek, 2004
- Maiden Creek, 2004
- Crum Creek Watershed, 2005
- Darby Creek Watershed, 2005
- Lower Neshaminy Creek, 2005
- Lower Perkiomen Creek, 2005
- Pennypack Creek, 2005
- Wyomissing Creek, 2006
- Little Neshaminy Creek, 2007
- Poquessing Creek, 2007
- Lake Erie Watershed, 2008
- Direct Delaware Drainage, in progress

Integrated Watershed Management Plans by the Philadelphia Water Department

The Philadelphia Water Department has initiated this effort to develop Integrated Watershed Management Plans for each of the five main tributary streams of the Schuylkill and Delaware Rivers. The Cobbs and Tookany/Tacony-Frankford plans are completed, while the remaining are still in development. These plans address the needs of many water regulations and programs with the goals of improving habitat, water quality, and quantity. A watershed partnership is established during the development of each plan.

- Cobbs Creek, 2004
- Tookany/Tacony-Frankford, 2005
- Pennypack (being developed)
- Poquessing (being developed)
- Wissahickon (being developed)

Lake Erie Watershed Pilot Integrated Water Resource Plan

The Lake Erie Integrated Water Resource Plan is currently being developed as a pilot initiative under the State Water Plan. One of the State Water Plan's three priorities is to encourage and sustain an integrated approach to managing water resources. This pilot project is envisioned as a large-scale GIS-based tool and watershed monitoring plan.

It will incorporate the in-progress Erie County Stormwater Management Plan and the completed Walnut Creek Watershed Protection and Restoration Plan. CRM has funded development of this plan.

Walnut Creek Watershed Environmental Quality Report and Protection and Restoration Plan

In 2006, DEP identified Walnut Creek as a priority watershed and completed an assessment report the following year. This report investigated the watershed to determine if environmental conditions were supporting health/safety, economics, and quality of life for Erie County Residents. In 2008, the Department published a draft Protection and Restoration Plan that identifies activities DEP will facilitate and pursue, including: focusing funding opportunities, permitting and planning, environmental monitoring, and compliance and enforcement.

Upper Wissahickon SAMP

This effort is discussed in detail in the Special Area Management Plan section of this document. The CRM program has been very involved in its development.

Lake Erie Lakewide Management Plan

The latest Lake Erie Lakewide Management Plan (LaMP) was developed in 2008 by numerous binational organizations, including CRM partners. The goal of the LaMPs is to assess, restore, protect, and monitor the ecosystem health of a Great Lake. The 2008 Lake Erie plan includes information on the Presque Isle Bay AOC Remedial Action Plan, research and monitoring on oxygen shortages and algal blooms, and along with ongoing issues with a recent focus on nutrient management.

Presque Isle Bay Watershed Restoration Plan

This plan has been developed by CRM partner Pennsylvania Sea Grant. It will serve as the framework for restoring and protecting water resources within the watershed and function as a model that can be adapted to other areas. The project involves extensive use of GIS in the assessment of restoration priorities. This plan was funded by CRM and the Great Lakes Protection Fund.

Pennsylvania's section 319 Nonpoint Source Management Program Update

This report is required under Section 319 of the Clean Water Act for Pennsylvania's program. The document is a result of semi-annual meetings of various stakeholders throughout the state to assess the conditions of nonpoint source pollution management in Pennsylvania and develop a management plan to be applied throughout 2012. CRM staff attended these planning meetings.

Partnership for the Delaware Estuary Regional Restoration Initiative and Plan

PDE's new initiative was launched in 2008 with the goal of providing a science-based decision-support system to guide restoration activities in the Estuary. The program consists of three components, including: tools to identify needs and opportunities that will provide the greatest ecological benefit, coordination of regional priorities and activities, and a project registry clearinghouse. The initiative targets tidal wetlands, urban waterfronts, shellfish, and headwaters regional priorities. In October 2009, PDE published the Regional Restoration Initiative: Blueprint for the Delaware Estuary document detailing specifics of the new program.

RESEARCH, ASSESSMENT, MONITORING

Wetland Monitoring and Assessment

This topic is addressed in the Wetlands Assessment section.

Stream Assessments Under the Clean Water Act

By the end of 2006, DEP completed assessment of all wadable sections of the state's 86,000 streams and rivers as required under the Federal Clean Water Act and the Statewide Surface Water Assessment Program. As of 2007, the Department is utilizing an updated and more rigorous sampling protocol called the Instream Comprehensive Evaluation. This new method will be used to resurvey streams found to be attaining aquatic life use and re-evaluate impairments.

During this reporting period, Pennsylvania also met a 1996 EPA consent decree requiring Total Maximum Daily Loads (TMDLs) to be established for all impaired waters listed on the 1996 303(d) list.

The following streams were assessed and listed as impaired and requiring a TMDL from the Delaware CNPP and Lake Erie watersheds between 2005 and 2009:

- Delaware CNPP Watersheds:
 - Biles Creek
 - Portions of the Delaware River*
 - Portions of Mill Creek*
 - Portions of Neshaminy Creek*
 - Portions of West Branch Neshaminy Creek*
 - Chester Creek*
 - Crum Creek*
 - Frankford Creek
 - Mine Run
 - Mollhead Creek
 - Northkill Creek
 - Unnamed tributaries to Perkiomen Creek
 - Pleasant Spring Creek*
 - Trout Run*
 - Tulpehocken Creek*
 - Wolf Creek*
- Lake Erie Watershed:
 - Walnut Creek

*(additional use designation impairment)

Final

The following TMDLs were developed during this reporting period:

- Delaware CNPP Watersheds:
 - Delaware River Estuary PCB TMDL
 - Schuylkill River PCB TMDL
 - Bernhart Creek Watershed
 - Goose Creek
 - Indian Creek
 - Upper Schuylkill River (metals)
 - Revised Little Schuylkill River
 - Southampton Creek

- Lake Erie Watershed:
 - None

Partnership for the Delaware Estuary Freshwater Mussel Recovery Program

The Partnership for the Delaware Estuary launched its Freshwater Mussel Recovery Program in 2007. Its goal is to restore the population, diversity, and resilience of mussels through conservation, habitat expansion, and reintroduction. A preliminary screening study is being completed in southeastern PA to determine areas where mussels can survive. The program will then seed streams with juvenile mussels and transplant adults.

CRM received a 2010 grant application for PDE to propagate over 1,000 juvenile mussels into Chester Creek and assess water quality impairments and future expansion to Darby and Crum Creeks.

Presque Isle Bay Area of Concern Research

Several research projects are being conducted by CRM staff:

- Bullhead sediment exposure experiment: CRM staff in 2009 initiated experimental exposure of brown bullhead catfish to whole sediment from Presque Isle Bay in order to better understand the cause-effect relationship between such exposure and the development of tumors and other deformities. The experiment is partially funded by PA Sea Grant and is ongoing.

- Bullhead tumor database: CRM is partnering with Pennsylvania State University to develop a comprehensive, on-line database containing best available information on bullhead tumors and sediment contaminant data from throughout the Great Lakes region. This database will allow for calculation of tumor incidence rates at Areas of Concern and reference sites, as well as correlations between incidence rates and sediment contaminants. This project is funded by EPA Great Lakes National Program Office (GLNPO).

Final

- Bullhead virus study: CRM staff is partnering with the US Geological Survey to investigate the potential role of viruses in the causation of bullhead tumors. Actual research will begin in 2010 and is funded by EPA-GLNPO.
- PIB Bullhead monitoring: Annual monitoring of bullhead tumor incidence rates has conducted by CRM staff since 2002. Histopathology (microscopic analysis of liver and skin tissues) conducted on a subset of samples in 2002, 2003, 2004, 2005, 2007, and planned for 2010. Bullhead sampling and analysis at potential reference sites in PA, OH, NY, and Ontario is also periodically conducted.
- Presque Isle Bay Sediment monitoring: CRM is partnering with Sea Grant starting in 2009 to monitor sediment subsequent to delisting of the beneficial use impairment. Samples are collected from 10 historical sites for trend monitoring, 3 bullhead collection sites for correlation with tumor rates, and 4 tributaries of the bay for assessment of contaminant loading from watershed. The project is funded by EPA-GLNPO.

Erie County and Presque Isle Bacterial Testing

Significant research has been recently dedicated to examining eColi bacteria in the Lake Erie watershed. CRM has funded several grant projects that investigate the sources and transport of bacteria in western and Eastern Erie County tributaries and research into developing new technologies to test and identify these pathogens in Presque Isle waters. DEP, along with CRM-partner Sea Grant, also sponsored a conference on the issue in 2007.

Bird Use of Coastal Habitat During Migration

Another CRM-funded project of note was a recent grant to the Audubon Society to research migratory bird use of Lake Erie coastal habitat. Activities to be conducted include: netting and banding of birds during spring and fall migration at Presque Isle State Park and the new western Erie Bluffs State Park, evaluation of habitat characteristics at sampling sites, and education of volunteers. Prior to the study, non-systematic research has been conducted on this topic along Pennsylvania's Lake Erie shoreline.

EDUCATION AND OUTREACH

Education/Outreach Efforts Funded by CRM

CRM has continued to partner with a number of local organizations that host educational events and activities in the DECZ and LECZ. Some of these efforts include:

- Lake Erie and Delaware Valley Earth Force - These organizations provide training for educators and youth on various watershed conservation topics, ranging from urban forests, pollution prevention, and urban runoff.

- Southeast Pennsylvania Coast Day - Coast Day is an annual education event in Philadelphia organized by The Partnership for the Delaware Estuary that increases awareness and promotes involvement in coastal issues.
- Delaware County Riverfront Resource Environmental Event - This is an annual interactive activity targeted toward children that features Delaware County's riverfront parks. It educates the public on the coastal zone's environmental, cultural, recreational, and historic resources.
- Erie Times Weekly Issue Page - The Erie area newspaper produces a weekly spread covering a range of environmental topics targeted at the coastal zone and provides newspapers to 6,000 area students annually.

Coastal Nonpoint Pollution Prevention Program

The CNPP program is administered by CRM through provision of \$25,000 grants to six county conservation districts in the southeast, along with the Philadelphia Water Department and Erie County Conservation District. Technicians from each county implement Pennsylvania's priority management measures addressing urban runoff, agriculture, marinas and recreational boating, and hydromodification. Some activities of interest funded during this reporting period include: development of nutrient management plans, agricultural BMPs, and Act 167 plans, environmental education presentations to local schools, participation in annual envirothons, Chapter 105 NPDES permitting, and rain barrel workshops.

Lake Erie Sea Grant Outreach Activities

Smart Growth and Nonpoint Education for Municipal Officials (NEMO)

PA Sea Grant continued to assist and inform local elected officials, property owners and developers about the benefits of non-point water quality/conservation design techniques. In 2010, Harborcreek Township incorporated conservation design language into its municipal land use regulations as an alternative to “traditional” development styles that are far less sustainable. Technical assistance is currently being provided to Millcreek Township in updating their zoning ordinance. Staff also served on several groups, including the Erie County Subcommittee of the Northwest Pennsylvania Greenway & Open Space Plan Committee and Board of the Pennsylvania Lake Erie Watershed Association.

PA Sea Grant also continued to address open space preservation and recreational access improvements. \$7.8 million in funds have been obtained to preserve (via fee simple purchase and conservation easements) over 1,065 acres of land, which includes 2.16 miles of Lake Erie shoreline and 4.10 miles of stream shoreline.

Pharmaceutical Collection & Education

PA Sea Grant hosted the first pharmaceutical collection event in 2008 where Erie residents turned-in about 600 pounds of medicine and personal care products. The event was held as part of the US EPA Great Lakes Earth Day challenge. Additionally, Sea Grant staff have presented to over 350 middle school through college students and the general public on the issue of pharmaceuticals in our water systems. Sea Grant has also worked with local pharmacies in Erie to provide slips to customers that include information on the proper disposal of expired or unwanted medications. The organization plans to continue these efforts in the future.

Bluff outreach workshops

CRM sponsored several of the eight bluff outreach workshops conducted by Sea Grant from 2005 to 2009. Separate events were held to update property owners and professional contractors on bluff erosion issues. A total of about 500 individuals participated in the workshops from Pennsylvania, New York, and Ohio.

Vegetative BMP Manual

CRM funded development of the “Vegetative Best Management Practices - A Manual for Pennsylvania Lake Erie Bluff Landowners” in 2007. The printed booklet is designed to provide lakefront property owners with information on how to best use and manage vegetation on their bluff properties to minimize erosion.

Bluff Landowner Technical Assistance

CRM field staff provide ongoing technical assistance to property owners on proper bluff and vegetation management. Consultations are provided on-site with interested residents.

WATERSHED PARTNERSHIPS

CRM continues to work with a number of organizations in the coastal zones, including: Pennsylvania Sea Grant, The Schuylkill Action Network, Partnership for the Delaware Estuary, PA Lake Erie Watershed Association, Lake Erie Region Conservancy, and Earth Force. These partnerships have been extremely effective in establishing a wide, diverse network to address coastal issues.

Grant Programs

Relevant CRM Grants

Numerous studies, plans, construction activities, and outreach efforts addressing the impacts of development have been funded by CRM during this reporting period. Relevant 2006-2009 grants include:

- DECZ
 - Tookany Creek Stabilization-Phase 2 - \$40,000
 - Southeast PA Coast Day-2007, 2008, 2009, 2010 - \$27,900, \$31,000, \$32,000, \$30,000
 - Tree Vitalize in Philadelphia - \$50,000
 - Implementing Storm water Best Management Practices at Philadelphia Ports 2007, 2008 - \$33,000, \$45,000
 - Delaware Estuary Native Communities Mapping Initiative - \$40,000
 - Bristol Marsh Conservation Plan - \$16,000
 - Delaware Valley Earth Force Watershed Awareness-to-Action Environmental Education Program - \$40,000, \$40,000, \$40,000
 - The Banks of Philadelphia: Yesterday, Today and Tomorrow Environmental Education - \$15,000
 - Tookany Creek Riparian Buffer, Streambank and Habitat Enhancement Project - \$45,000
 - Wetlands and Watershed Educational Initiative at Silver Lake Park - \$22,000
 - Riparian Best Management Practices in Southeast PA - \$40,000
 - North Delaware River Ecological Restoration Project - \$25,000
 - Upper Wissahickon CARP/SAMP - \$20,000
 - Little Crum Creek Assessment & Action Plan Phase II - \$25,000
 - Delaware County Riverfront Resource Environmental Event 2009, 2010 - \$10,000, \$10,000
 - Bristol Marsh Restoration & Protection Implementation - \$32,000
 - Springfield Township Stormwater BMP Park - \$50,000
 - Villanova Urban Stormwater Partnership Constructed Stormwater Wetland Study - \$30,000
 - Schuylkill Action Network Coordinator - \$25,000
 - Environmental Habitat Change in Tidal Freshwater Marshes - \$49,847
 - Development of Monitoring & Assessment Methods for PA's Tidal Freshwater Wetlands - \$35,204
- LECZ
 - SCUBA DOOs Too Training - \$10,300
 - Erie Bluffs Workshops-Part 2 - \$3,500
 - Presque Isle Beach Bacteria Testing - \$39,400
 - Erie Times-News in Education 2007, 2008, 2009 - \$33,700, \$31,000, \$34,680
 - Allegheny Earth Force-2007, 2008, 2009 - \$40,000, \$40,000, \$42,800
 - Western County Tributary Bacteria Testing - \$20,900
 - Presque Isle Bay Management Study - \$50,000
 - City of Erie Urban Reforestation Project - \$25,000
 - Walnut Creek Education Initiative - \$20,000, \$36,500
 - Bacteria Analysis of Beach Waters at Presque Isle State Park - \$35,000
 - Eastern Erie County Watershed Bacteriological Study - \$25,000
 - Protecting Open Space Property Owner Education - \$15,000
 - City of Erie Resident Stormwater Education - \$12,500
 - Installation of Fish Ladders - \$45,000
 - Conservation Easement Appraisal Funding - \$6,000
 - Allison Property Conservation Easement - \$50,000
 - Walnut Creek Water Quality Network Program - \$40,000
 - Lake Erie Integrated Water Resource Management Plan & GIS tool - \$20,000
 - Erie County Environmental Education Development - \$4,500
 - Erie Downtown Litter Prevention & Containment Program - \$5,000
 - Mercyhurst College Tree Plantings - \$5,000
 - Chemicals of Concerns in Beach Waters of Presque Isle State Park - \$20,000
 - Bird Use of Coastal Habitat During Migration - \$35,000
- Statewide
 - Invasive Species Council Support - \$33,000

Final

Growing Greener and Other DEP Grants

Both Growing Greener I and II grant programs were initiated last reporting period and continue to provide funds for a variety of grant projects that address cumulative and secondary impacts of human development. Several nonpoint source activities funded through Pennsylvania's 319 program are also included. The list below includes projects funded throughout the entire county, not just the coastal zone exclusively:

- Bucks County
 - Cooks Creek Stream Restoration – \$75,000
 - Upper Tinicum Stream Restoration – \$51,000
 - Lake Galena & North Branch Neshaminy Creek Watershed Implementation Plan – \$45,000
 - West Rockhill Township Stormwater Facilities Retrofit Design – \$18,150
 - Little Neshaminy Watershed Rain Garden, SWM Basin Construction – \$100,000
 - Little Neshaminy Creek Tributary Streambank Stabilization & Outreach – \$52,170
 - Swamp Creek Stabilization & Restoration – \$145,000
 - Aquetong Creek Watershed Assessment – \$47,000

- Philadelphia County
 - Pleasant Hill Park Restoration - \$200,000
 - Chestnut Hill Stream Corridor Restoration Project – \$80,987
 - Cathedral Run Infiltration Gallery Construction – \$873,180
 - Verree Road Wetland & Porous Parking Lot Construction – \$293,385
 - Saul High School Bioinfiltration Swale construction – \$107,000
 - Saint George's Road Stormwater Management & Tributary Restoration – \$100,000
 - Kelly Drive Drainage Improvements – \$350,000
 - Philadelphia Recreational Center Stormwater Retrofits – \$200,000
 - Philadelphia Green Streets Program Stormwater Demonstration Projects – \$225,000
 - Carroll Park Gully Repair & Wetland Creation – \$241,102
 - Columbia Ave Green Vegetated Stormwater Collectors Design & Installation – \$112,000
 - Forest Habitat Reclamation in the Wissahickon Valley Park – \$100,000
 - Wissahickon Valley Slope Restoration - \$755,513

- Delaware County
 - PA Resources Council Pond/Wetland Restoration – \$14,514
 - Villanova Raingarden BMP Study – \$69,483
 - Villanova Constructed Wetland BMP Reconfiguration – \$185,000
 - Thatcher Park Stormwater BMP Design & Construction – \$21,759
 - Villanova Evapotranspiration From BMPs Study – \$251,672
 - Springfield Township BMP Park Phase I Construction – \$63,096
 - Hoffman Park Streambank Stabilization & Floodplain Restoration – \$87,060
 - Chester Creek Trail Streambank Stabilization – \$167,597

- Erie County
 - Edinboro Lake Watershed Management Plan – \$15,000
 - Trout Run Assessment & Implementation Plan – \$15,680
 - Agricultural BMPs Cost Share Program – \$300,000
 - Bacterial Monitoring in Lake Erie Watershed – \$106,500
 - Washington Township Regional Sewage Service – \$100,000
 - Baker Creek Watershed Improvements Project – \$175,000
 - PennState Behrend Erosion & Sedimentation Control Project – \$49,900
 - Trout Run BMP Implementation – \$20,000
 - Erie Stormwater Collection and Reuse Project – \$64,846
 - Walnut Creek Septic System Education & Outreach – \$65,000
 - Cascade Creek Streambank Restoration & BMPs – \$200,000
 - Trout Run Nutrient Management Plan Development, BMP construction, streambank stabilization – \$150,000
 - Bear Run Riparian Buffer Restoration – \$91,900

OTHER PROGRAMS

Treevitalize

Treevitalize is a Pennsylvania Department of Conservation and Natural Resources led effort established in 2004 to restore tree cover, educate citizens, and built capacity within local governments. Since its inception, the program has expanded outside its initial focus area of southeast PA to include all metropolitan areas in the Delaware CNPP watershed and Erie County. Over the last four years, DCNR and DEP have contributed about \$13 million to Treevitalize in the southeast region. CRM has also dedicated funding to projects in Philadelphia and Erie. As of summer 2008, Treevitalize has planted over 20,000 large shade trees and restored nearly 300 acres of forested riparian buffer. Its continued goal is to plant 1 million trees by 2012.

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)
Limited coastal zone boundary in DECZ and LECZ prevents protection & restoration in headwater areas.	Regulatory – change in coastal zone boundary	H
Improved mapping and planning tools needed to address CSI.	Capacity – Marine Spatial Planning is needed to help address CSI.	H
Minimal coordination of resources to acquire sensitive land parcels	Regulatory & Policy – creation of a statewide land acquisition program	H
Lack of anticipated funding for CNPP activities	Capacity – utilize other funding pathways to ensure nonpoint source pollution is addressed	H
Lack of research into the impacts of air pollution on aquatic habitat	Data/Research – funding to research on nitrogen inputs to the Lake Erie watershed	M
Lack of coordinated development and implementation of watershed management plans	Capacity – Encourage development of integrated water resource management plans using Lake Erie plan under development as an example	M

Enhancement Area Prioritization

1. *What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?*

High X
 Medium
 Low

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

The assessment shows a number of threats from CSI, and that various information gaps and information needs should be addressed. Based on the assessment, the CRM program considers CSI to be a high priority.

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

Yes X
No

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

A strategy for CSI will be developed. The assessment indicates a need to develop a strategy to help balance the demand for land and water resources in Pennsylvania's coastal areas. Cumulative and secondary impacts are a major source of impairment to aquatic resources and to be successful need to be managed on a landscape level or using an ecosystem approach.

For example, the wind power classification for Lake Erie is "excellent", and the interest in large scale wind turbine and other alternative energy development projects continues to gather momentum. Petroleum and natural gas reserves are also located under the lake bed and interest in solar and kinetic energy sources are also under study. Comprehensive mapping and collection of existing sources of mapping of Lake Erie resources - ecological, economic, and cultural – is a key gap that would lead to better tools for individual project evaluation, comprehensive ecosystem management and a plan to address potential cumulative/secondary impacts. This data collection and mapping would be beneficial to all stakeholders and agencies in review of future projects, and specifically domestic and renewable energy generation and transmission projects. Additional research gaps that could be addressed by comprehensive marine spatial planning include the delineation of key habitat (i.e. spawning habitat) of priority recreational species such as lake trout and threatened and endangered species such as lake sturgeon. Pennsylvania's portion of Lake Erie also lies at the crossroads of the Atlantic and Great Lakes Flyways. While Presque Isle is famous for its resting and staging location for migratory shorebirds, the rest of the watershed's woods and scrubby wetlands offer significant stop-over habitat for migrating songbirds. Additional information on the use, patterns, and timing of migratory flight is a research gap that ideally would be included in marine spatial planning efforts. Additional gaps will be identified as the mapping and marine spatial planning effort moves forward.

In addition, much study is underway in the Delaware Estuary Coastal Zone for analysis of the steps necessary to prepare for Climate adaptation, specifically sea level rise. CRM will work with DVRPC and Partnership for the Delaware Estuary, as well as other partners in the coastal zone, to evaluate the need for a possible MSP in the DECZ to plan and prepare for sea level rise to protect estuarine resources and upstream freshwater resources.

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.”

Integration of natural resources protection and sustainable land use practices for important coastal areas.

Resource Characterization

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

Geographic Area	Major Conflicts	Is this an emerging or a long-standing conflict?
Upper Wissahickon Creek Watershed, DECZ	Water users	Long-standing conflict
Tributaries to Neshaminy Creek, DECZ	Water users	Long-standing conflict
Temple Creek Watershed, LECZ	Water users	Emerging conflict

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	Date approved or revised
Upper Wissahickon Creek Special Area Management Plan	New	June 2008

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)

Since the 2006 309 enhancement program, a SAMP was developed for the Upper Wissahickon Creek Watershed.

b) Specify if it was a 309 or other CZM-driven change (specify funding source) or if it was driven by non-CZM efforts

The SAMP was developed through the 309 process, with some technical support funds provided through 306 funding. The Upper Wissahickon Creek Special Area Management Plan (SAMP) was prepared by the Delaware River Basin Commission (DRBC) and the Montgomery County Planning Commission (MCPC), along with various stakeholders in the study area. The planning process took into account the various plans and studies relevant to the Wissahickon Creek in assessing key issues and developing recommendation strategies. The draft plan and relevant background materials were made available on the internet for public review. A public meeting was held on May 28, 2008 to gather further input into the plan and its recommendations. The overall purpose of the plan is to verify the extent of current and projected water resource limitations and the existing water quality problems in the Upper Wissahickon and to develop recommendations that would effectively address them. In performing the evaluation of water resources in the study area, the Upper Wissahickon Creek SAMP compares surface and groundwater availability with current and future demands, identifies existing and potential adverse impacts on water resource uses, and prioritizes recommendations for providing reliable and safe water supply for all water users. In doing this, the plan recognized the importance of suitable water supply to meet all human and ecosystem needs, the importance of

restoring and protecting hydrologic function in the creek, and the relevance of an integrated multi-municipal water resource planning perspective. The SAMP is available at the following link:

<http://planning.montcopa.org/planning/cwp/view,a,1607,q,63757.asp>

The Neshaminy Creek (DECZ) and Temple Creek (LECZ) watersheds were elevated for additional evaluation but using the guidelines for identification of critical water planning areas it was determined additional management plans were not needed at this time. The following paragraphs summarize general conditions within those watersheds:

Neshaminy Creek Watershed:

The 233 square mile watershed extends from its mouth on the Delaware in Bensalem Township up to its headwaters above Route 202 in Bucks and Montgomery Counties. The watershed is characterized predominately of gently rolling hills. The upper watershed is still rural or semi rural in nature with a diminishing agriculture presence. The headwaters of the West Branch, the Little Neshaminy and the southern portion of the watershed are highly developed. The entire Neshaminy Creek watershed is located in the DRBC's southeastern Pennsylvania Ground Water Protected Area (GWPA). Within this area subbasins have been assigned net ground water withdrawal limits based on the 1 in 25 year baseflow recurrence interval.

It is estimated that 78 percent of registered water use in the combined watershed comes from public water supply sector with 37 percent of all registered water use coming from groundwater, 58 percent from surface water and 5 percent estimated as either groundwater or surface water. The Point Pleasant diversion is a dominant influence on the watershed, particularly the mainstem Neshaminy Creek. Importation of water from the Delaware River is necessary to support current pattern of water use.

DEP staff collaborated with Delaware River Basin Commission staff and USGS to produce a document provides a summarization of information supporting the Department of Environmental Protection (DEP) findings as to whether a nomination for the Neshaminy Creek (or certain tributaries) would satisfy the Critical Water Planning (CWPA) designation criteria. Attached as part of this document is a report entitled "Verification of Water Analysis Screening Tool Results for the Neshaminy Creek Watershed, Bucks and Montgomery Counties, Pennsylvania" prepared by the Delaware River Basin Commission (DRBC) as part of the process for identification of critical water planning areas by DEP.

http://www.pawaterplan.dep.state.pa.us/Docs/TechnicalDocuments/SupportingDocumentation/Neshaminy_Creek_Report.pdf

Although the report concludes that there are tributaries to the Neshaminy Creek Watershed that may meet the criteria for designation as a Critical Water Planning Area (CWPA), there are several studies that exist in the Neshaminy watershed, and stakeholder interest in pursuing another study is fairly low. There are some other areas in the larger Delaware River basin that are in need of a management plan that

are higher priority for development, but these areas are not located in the Coastal Zone Boundary or Coastal Nonpoint Boundary.

Temple Creek Watershed:

Temple Creek is a tributary to Conneaut Creek located east to south east of Albion Borough in both Crawford and Erie Counties. Ninety four percent (94%) of water use in the watershed is estimated as coming from public water supply sector with 94% of all registered water use coming from groundwater, 0% from surface water and 6% estimated as either groundwater or surface water (likely groundwater).

DEP staff collaborated with USGS to produce a document provides a summarization of information supporting the Department of Environmental Protection (DEP) findings as to whether a nomination for the Temple Creek (or certain tributaries) would satisfy the Critical Water Planning (CWPA) designation criteria. Attached as part of this document is a report entitled “Verification of Water Analysis Screening Tool Results for the Temple Creek Watershed, Erie County, Pennsylvania” prepared by the United States Geologic Survey (USGS) as part of the process for identification of critical water planning areas by DEP.

http://www.pawaterplan.dep.state.pa.us/Docs/TechnicalDocuments/SupportingDocumentation/Temple_Creek_Report.pdf

The State Water Planning process involved a detailed analysis of water availability problems in this watershed, and the water availability problems were linked to one particular water supplier in the basin. DEP staff are attempting to resolve the problems by working directly with this water supplier to develop alternatives and implement new strategies to redirect water into Temple Creek.

c) Characterize the outcomes and effectiveness of the changes.

The SAMP brought stakeholders and local government officials in the Wissahickon watershed together to discuss concerns over water availability and water quality. This steering committee identified recommendations for improving the overall quality of the watershed. The steering committee felt that the SAMP process was so valuable, that they would like to continue to meet and discuss issues relevant to the watershed.

Priority Needs and Information Gaps

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

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H. M. L)
Implementation of SAMP recommendations	Policy Training Communication and outreach	Medium

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High _____
 Medium X
 Low _____

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

Drinking water supply is always a priority. CRM does not see additional program changes that are necessary at this time.

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

Yes _____
 No X

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

The watersheds of the coastal zones have been evaluated for water use conflicts using the guidelines for identification of critical water planning areas. Using these guidelines a SAMP was developed for the Wissahickon watershed and evaluated for the Neshaminy Creek and Temple Creek watersheds. The Neshaminy Creek and Temple Creek watersheds do not warrant a SAMP at this time for the following reasons:

Final

Tributaries to the Neshaminy Creek: There are several studies that exist in the Neshaminy watershed, and stakeholder interest in pursuing another study is fairly low. There are some other areas in the larger Delaware River basin that are in need of a management plan that are higher priority for development, but these areas are not located in the Coastal Zone Boundary or Coastal Nonpoint Boundary.

Temple Creek: The State Water Planning process involved a detailed analysis of water availability problems in this watershed, and the water availability problems were linked to one particular water supplier in the basin. DEP staff are attempting to resolve the problems by working directly with this water supplier to develop alternatives and implement new strategies to redirect water into Temple Creek.

Ocean/Great Lakes 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 and/or Great Lakes resources and uses of state concern, and specify existing and future threats or use conflicts.

DECZ:

Resource or use	Threat or use conflict	Degree of threat (H,M,L)	Anticipated threat or use conflict
Recreational fisheries	Loss of habitat, bioaccumulating contaminants, emerging contaminants (pharmaceuticals and personal care products), Sea level rise	M	Sea level rise
Native FW mussel populations	Remnant dams and associated migratory fish losses	M	Water quality
Drinking water	Watershed land use, flood prevention.	M	Sea level rise

LECZ:

Resource or use	Threat or use conflict	Degree of threat (H,M,L)	Anticipated threat or use conflict
Potable water quantities	Diversions, consumptive use	L	
Recreational fisheries	Invasive species, VHS, PAHs in Presque Isle Bay, bioaccumulating contaminants, emerging contaminants (pharmaceuticals and personal care products), eutrophication.	H	Domestic energy development
Recreational Swimming Beaches	Stormwater and non-point sources of eColi within the watershed.	M	Domestic energy development
Port facilities	Ballast discharges/invasive species	H	Domestic energy development

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

Aquatic Invasive Species

Environmental and economic threats associated with invasive species continue to be a high concern. The omnipresent threat from new introductions such as the asian carp continue. The complexities of the Lake Erie ecosystem make the full impact of existing introduced non-native species difficult to fully understand and research in this area continues. The relationship between quagga mussels, cladophora algae, and botulism is one relationship of current interest and concern. The full impact of round goby predation on Lake Trout nests is also being investigated. Zebra and quagga mussels continue their slow spread through Pennsylvania. While present in the Delaware River watershed, an active monitoring program has yet to detect them within the Delaware Estuary. Zebra mussels have established themselves in tidal portions of other rivers such as the Hudson. In October 2008 zebra mussels were discovered in the lower Susquehanna River. Water chestnut, *Trapa natans*, is now established in at least three lakes in southeast Pennsylvania (Delaware watershed). Responses to the water chestnut infestations have depended heavily on volunteers and additional equipment and manpower is needed for an adequate response. Didymo (*Didymosphenia geminate*, or “rock snot”) has been found in the cooler waters of the Upper Delaware watershed. A non-native golden algae has been reported to be responsible for impacts to 30 miles of stream in the Ohio watershed in southwestern Pennsylvania. Non-native invasive wetland plants have had a severe impact on the ecological integrity of wetlands in the DECZ and threaten the highly valued relatively ecologically intact wetlands in the LECZ. Climate change may help exacerbate this threat, but the most immediate threat is continued land conversion and loss of forested buffers.

Emerging contaminants

A significant emerging issue is the impact of pharmaceuticals and personal care products (PPCPs) on the environment and in drinking water. While the threats are largely unknown, there is increasing recognition that PPCPs persist in the environment as a result of improper disposal and lead to potential ecological and human health impacts including endocrine disruption (e.g., feminization of male fish) and the promotion of tumors in bullhead catfish. A 2008 Associated Press investigation and story indicated that Philadelphia drinking water contained traces of 56 different pharmaceuticals or byproducts and pharmaceuticals were found in drinking water sources in metropolitan areas throughout the nation. These chemicals are found in very low concentrations and at present there are no known human health effects but additional research is warranted.

Nutrient Trends in Lake Erie

Total phosphorus concentrations in the nearshore zone of Lake Erie have been increasing. Significantly increasing loads of dissolved reactive phosphorus (DRP) have now been measured in the Maumee and Sandusky rivers. Increasing trends in DRP have also been identified in the Cuyahoga and Grand (OH) rivers. As a result, the algal blooms that threatened the Lake Erie ecosystem in the 1960s and 1970s have returned, and the extent and duration of anoxia/hypoxia in the central basin continue to increase. The reasons for

these changes are active areas of investigation. However, it appears that existing programs to control phosphorus are no longer sufficient to protect the lake. The Lake Erie watershed is densely populated compared to the other Great Lakes' watersheds, and agriculture represents a high percentage of land use. Non-point sources of nutrients within the watershed must remain a high priority.

Viral Hemorrhagic Septicemia (VHS)

Viral Hemorrhagic Septicemia (VHS) is a disease, caused by a rhabdovirus (rod or bulletshaped), which infects freshwater and marine fish species. It was first reported in Lake Erie in 2006 and has spread to inland waters in other Great Lakes states. To date it has not been reported in Pennsylvania's portion of Lake Erie or any inland waters within Pennsylvania.

Management Characterization

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

3. *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)
Comprehensive ocean/Great Lakes management plan or system of Marine Protected Areas	N	N
Regional comprehensive ocean/Great Lakes management program	Y (LaMP)	N
Regional sediment or dredge material management plan	N	Y
Single-purpose statutes related to ocean/Great Lakes resources	Y	Y
Comprehensive ocean/Great Lakes management statute	N	N
Ocean/Great Lakes resource mapping or information system	N	N
Ocean habitat research, assessment, or monitoring programs	Y	Y
Public education and outreach efforts	Y	N

4. *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.*

Aquatic Invasive Species Management Plan

Aquatic invasive species was one of three CRM Section 309 priorities during this past reporting period. Significant progress has been made in building program capacity, designing a comprehensive management framework and elevating the overall attention to the issue. During this reporting period Pennsylvania's Aquatic Invasive Species Management Plan (AISMP) was finalized by the Pennsylvania Invasive Species Council and signed by Governor Rendell. The plan was also approved by the federal Aquatic Nuisance Species Task Force, making the Commonwealth eligible to receive additional federal assistance for the implementation of the AISMP. CRM Policy XI (Ocean Resources) will be amended to include the AISMP when the next Routine Program Change (RPC) request is submitted. The AISMP identifies eight key management objectives for Pennsylvania:

1. Provide leadership and coordination for AIS issues in Pennsylvania among local, state and federal agencies and organizations, and ensure that state policy effectively promotes the prevention, early detection and control of aquatic invasive species in Pennsylvania. Establish coordination and provide leadership within the Mid-Atlantic and Great Lakes regions in order to address AIS issues more effectively, including prevention, advanced warning and concerted efforts in drainage basins shared across state lines.
2. Identify vectors and mechanisms and minimize the introduction and spread of aquatic invasive species into and throughout Pennsylvania.
3. Detect new introductions of aquatic invasive species in Pennsylvania before they have a chance to become established in the ecosystem.
4. Develop a system for early response to eradicate or contain target species before the species can become permanently established.
5. Monitor and inventory existing infestations of aquatic invasive species in Pennsylvania.
6. When feasible, control and eradicate established aquatic invasive species that have significant impacts in Pennsylvania. Reduce the harmful effects resulting from AIS infestations by managing those that cannot be eradicated.
7. Increase research efforts on AIS species, issues and impacts to support AIS management, control and eradication in Pennsylvania.

8. Educate the general public and people involved in the business, trade, research and government sectors about AIS issues so that they do not facilitate the introduction or spread of AIS species.

The AISMP also specifically identifies the Priority Strategies and Priority Actions necessary to meet the above objectives. CRM would like to utilize Section funding to initiate program changes to directly address selected Priority Strategies and Priority Actions that will build capacity for rapid response for specific species within the coastal zone watersheds.

The AIS management plan is a stand alone document that is also a subset of the Pennsylvania Invasive Species Management Plan. The purpose of the Pennsylvania Invasive Species Management Plan is to provide a framework to guide efforts to minimize the harmful ecological, economic and human health impacts of nonnative invasive species through the prevention and management of their introduction, expansion and dispersal into, within and from Pennsylvania. The Pennsylvania Invasive Species Management Plan was signed by Governor Rendell in December 2006. Another move forward in the management of invasive species within the Commonwealth was the hiring of a full- time coordinator for the Pennsylvania Invasive Species Council within the Department of Agriculture (July 2008).

Dedicating staff from state resource agencies to specifically address AIS under the current economic conditions has been difficult. Additionally, Pennsylvania's Citizen's Volunteer Monitoring Program, which had traditionally focused on water quality issues but was seen as a potential for invasive species monitoring, has been subject to budget cuts in recent years.

Zebra Mussel Monitoring Network

During this reporting period the Zebra Mussel Monitoring Network was transitioned from DEP's Bureau of Watershed Management to Pennsylvania Sea Grant. CRM funding has helped facilitate the expanded monitoring network. Improvements included the development of a monitoring booklet for volunteer monitors and the joint CRM-Sea Grant production of a zebra mussel monitoring training video entitled "Stemming the Tide: Pennsylvania Zebra and Quagga Mussel Monitoring Network." Pennsylvania's capacity for zebra/quagga mussel monitoring and outreach has improved as a result of this management change. During this reporting period, new populations of zebra/quagga mussels were detected in 6 river sections or quarries in Pennsylvania. The Zebra Mussel Monitoring Network can be found at www.seagrants.psu.edu/zm/.

Emerging Contaminants – PPCPs

Comprehensive management efforts to address these emerging threats are still in the process of being researched and developed. In April 2008, Pennsylvania Sea Grant and the Lake Erie College of Medicine School of Pharmacy hosted the first ever Erie County unused medicine collection day. The event drew 87 local residents who dropped off unused medicines and personal care products. The effort was supplemented by education and outreach in the Erie Times-News in Education program. Long term, cost effective, and sustainable solutions to this problem are needed on a national scale. It is anticipated

that this emerging threat will receive additional attention during the next 5-year period and new management systems will begin to emerge.

Sediment or dredge material management plan(s)

In the DECZ management of dredge material and sediment budgets for wetlands remain an important economic and environmental issue. With projected sea level rise and limited ability for landward migration of tidal wetlands, accumulating sediment rates have been identified as a key research need for ecological planning within the estuary. The Pennsylvania CRM program has helped support this research with 309 and non-309 funding. The Philadelphia District of the US Army Corps of Engineers has been working toward development of a Regional Sediment Management Plan and during this reporting period has formed a Regional Sediment Team of concerned stakeholders, including DEP regional office staff. On March 30, 2010, a Delaware Estuary Regional Sediment Management Workshop was held at the John Heinz National Wildlife Refuge to share information and build toward development of the plan. This developing change is driven by non-CRM sources. During the next reporting period the management and ultimate beneficial use of dredge material will remain a high priority in the Delaware Estuary. CRM will continue to monitor development of the Regional Sediment Management Plan and provide assistance to DEP's regional office when requested. The formation of the Regional Sediment Team has been well received within the estuary community.

During this reporting period in the LECZ the DEP has amended the Water Obstruction and Encroachment Permits issued to the Erie Western Pennsylvania Port Authority for maintenance dredging within defined areas of Presque Isle Bay and the dredge disposal within the Erie confined disposal facility. These revised permits incorporated updated sediment sampling and analysis requirements based on the USACOE Upland Testing Manual. Section 401 Water Quality Certifications issued pursuant to the permits are now valid for a period of five years from the date of analysis, increasing efficiency for both the permittee and DEP permit review staff.

LECZ Research - Habitat

Lake Sturgeon Research Workgroup, Lake Trout Habitat Research - LECZ

In 2009 the Pennsylvania Fish and Boat Commission and Pennsylvania Sea Grant partnered with other members of the Research Consortium at the Tom Ridge Environmental Center to form a Lake Sturgeon Workgroup and Sturgeon Watch for Lake Erie. Key goals of the effort at this time include identification of key habitat within Pennsylvania's portion of Lake Erie and public outreach to enlist public participation by informing the workgroup of sturgeon catches and sightings. The effort received favorable attention after the recreational catch of two Lake Sturgeon on the same day during the summer of 2009. The identification and eventual mapping of key sturgeon habitat can be coordinated with existing efforts involving Lake Trout restoration and its associated research regarding locations and impacts to key spawning habitat (*Cladophora* algae and round goby predation). Once key habitats are identified and mapped, marine spatial planning could become critical to their protection. CRM staff have participated in these efforts.

LECZ Research – Presque Isle Bay Area of Recovery

In 2002, the Presque Isle Bay Area of Concern moved into a “Recovery Stage”. A strategy of natural attenuation was decided, and a long-term monitoring strategy was developed. Monitoring and research associated with sediment contamination and bullhead catfish tumors continues. CRM staff participate in these efforts along with Pennsylvania Office of Great Lakes and Pennsylvania Sea Grant. These efforts are largely funded by the EPA Great Lakes National Program Office. Current efforts include continued routine monitoring of PIB sediment concentrations, sediment sampling within the watershed, research on the cause-effect relationship between sediment contamination and bullhead tumor rates, and in partnership with USGS a study will begin in 2010 to determine the potential role of viruses in the observed tumor rates in bullheads.

LECZ Research – Public Beach Closures and E. coli

During this reporting period considerable attention has been placed on research regarding the sources of E. coli contamination that causes public beach alerts and closures at Presque Isle State Park. CRM has helped to fund these efforts. These are discussed in more detail in the Public Access section of this document.

Viral Hemorrhagic Septicemia (VHS) - LECZ

The Pennsylvania Fish and Boat Commission and Pennsylvania Department of Agriculture have new statutes to address the potential spread of VHS within Pennsylvania. These statutes and regulations are discussed in more detail in the aquaculture section. In addition to the regulatory changes, Pennsylvania Sea Grant and the Pennsylvania Fish and Boat Commission have increased outreach efforts to try to prevent the spread of the disease. On June 23, 2010, the Sea Grant programs of Pennsylvania, New York, and Lake Champlain along with the College of Veterinary Medicine at Cornell University will present a workshop on research updates on VHS. The workshop will be held at the USFWS Northeast Fishery center in Lamar, PA with a target audience of aquaculture businesses, bait dealers, and resource agencies. The workshop is being funded by the USDA Northeast Regional Aquaculture Center.

Water Quantity – State Water Plan/Act 220

The Water Resources Planning Act, signed into law on December 16, 2002, established a Statewide Water Resources Committee and six Regional Water Resources Subcommittees that are charged with guiding DEP through the development of a new State Water Plan (SWP) and updating it at five year intervals. The SWP consists of inventories of water availability, an assessment of current and future water use trends, assessments of resource management alternatives, and proposed methods of implementing recommended actions. The State Water Plan established a process to designate “Critical Water Planning Areas,” locations in the Commonwealth where existing or future demands exceed or threaten to exceed the safe yield of available water resources. CRM was a leader in developing this process through this past enhancement period. There are currently three watersheds under CWPA consideration in the Delaware Basin (Brodhead, Little Lehigh, and Upper Neshaminy); and Temple Creek in the Lake Erie Watershed.

Water Quantity - LECZ – Great Lakes Compact

To adopt a more consistent approach to managing and protecting the water and water-dependent natural resources of the Great Lakes basin, each of the eight Great Lakes states enacted legislation adopting the Great Lakes-St. Lawrence River Basin Water Resources Compact (Compact). Governor Rendell signed Act No. 43 into law on July 4, 2008 authorizing Pennsylvania to join the Compact and providing for implementation of a water management program in the Pennsylvania portion of the basin. President Bush signed a joint resolution of Congress providing consent for the Compact on October 3, 2008. The Compact became effective on December 8, 2008. Any new or increased diversion, consumptive use of 5 MGD or more, or withdrawal of 100,000 GPD or more that occurs within the basin is prohibited under the Compact, with limited exception.

Water Quantity - DECZ

The balance of protecting water supplies (New York City, Philadelphia, and Bucks Co.), preventing flooding, and protecting aquatic life in the upper Delaware River was the subject of much study and debate among stakeholders during this report period. Reservoir levels in the upper watershed became a focus of attention after three severe floods between 2004 and 2006 impacted the main stem of the Delaware River, including upper portions of the DECZ. In September 2007, Pennsylvania, Delaware, New Jersey, and New York City signed an agreement to incorporate a Flexible Flow Management Program in order to better protect and manage the competing uses. New weather forecasting and flow models are also being developed and tested. This issue is being addressed by the Delaware River Basin Commission, which includes the four governors of the basin states and a representative from the U.S. Army Corps of Engineers as the federal representative.

Migratory Fishes - DECZ

Pennsylvania continues to address the impacts associated to migratory fishes due to remnant historic dams. Dam removals and fish passage remain a high priority for the Pennsylvania Fish and Boat Commission and numerous other volunteer, local, state, and federal partners including CRM. Pennsylvania continues to lead the nation in the number of dams removed. Notable progress continued to be made during this reporting period. On May 18, 2009, the City of Philadelphia celebrated the retrofitting of an existing fish ladder at Fairmont Dam (river mile 9 - current head of tide) with a ribbon cutting ceremony attended by Mayor Nutter and other dignitaries. Other major accomplishments on the mainstem of the Schuylkill River include construction of a fishway at Flat Rock Dam (mile 15, 2006), removal of the Plymouth Dam (mile 18, 2009), construction of a fishway at Norristown Dam (mile 21, 2008), and construction of a fishway at Black Rock Dam (mile 37, 2009). At River Mile 42, Vincent Dam, fish passage is probably occurring now but removal of the remnants of the breached dam are planned for the near future and at Felix Dam (mile 79) remnants of the dam and a smaller upstream dam were removed in 2007. The dam removal efforts have been supplemented by PFBC stocking efforts and high returns of American shad have shown promise for a naturally sustainable fishery. At this point the large majority of returning adult shad remain hatchery reared.

On the Pennypack Creek in Philadelphia a total of 7 dams were removed or retrofitted with fish passage allowing for 22 miles of additional migratory fish access. On the Darby Creek in Philadelphia, Natural Resource Damages from the November 26, 2005 Athos Oil Spill will be used to remove three dams that will allow for 2.6 additional miles of migratory fish passage. Several partners are working together to potentially remove additional dams that would bring the total additional miles of Darby Creek available to migratory fishes to 10.5 miles.

Regulatory changes addressing migratory fishes in the DECZ were also made during this reporting period. Due to the overall successful restoration of striped bass populations along the Atlantic Coast Pennsylvania licensed anglers may now harvest striped bass and hybrid striped bass from April 1 through May 31 (beginning 2010). This season had been closed by PFBC since 1992 in order to better protect spawning. Under the new regulations anglers can harvest two striped bass per day between 20-26 inches during April and May. For the rest of the year, there is a 28-inch minimum length and two fish per day creel limit. Reduced creel limits have gone into effect for American shad and river herring in the Delaware River and Estuary. Creel limits for American shad will be reduced from six to three fish and for river herring from 35 to 10 fish.

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	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H, M, L)
A simple, coordinated reporting system and associated training program for AIS detection and monitoring in Pennsylvania’s coastal watersheds. A GIS-based database to support the effort.	Policy, data, training, capacity, communication and outreach	H
Species specific, geographic specific rapid response plans and control/eradication plans for AIS including the intergovernmental agreements and formal agency commitments to direct action.	Policy, training, capacity	H
A documented system to	Capacity.	H

Final

evaluate AIS pathways and potential prevention strategies addressing these pathways, including climate change implications.		
Comprehensive plan and mapping of Lake Erie including key habitat, utilities, submerged lands license agreements, wrecks, prime recreational fishing areas, currents, etc. that could be used as a starting point for comprehensive marine spatial planning.	Policy, data, capacity, communication.	H
A higher level of focus that leads to direct action on control of invasive plants in the border area between terrestrial and aquatic habitats (riparian areas and wetlands).	Policy, capacity, communication, and outreach.	H
A long-term management system to address consistent, cost effective, and environmentally responsible ways to dispose of unused pharmaceutical and personal care products.	Regulatory, capacity, communication and outreach.	H
Sea level rise, wetland migration, and protection of communities from coastal hazards need to be integrated into local planning and decision making to minimize adverse impacts to human and natural communities	Regulatory, policy, capacity, communication, outreach	H

Enhancement Area Prioritization

1. *What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?*

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

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

Threats and competing uses associated with coastal resources can have tremendous economic and environmental impacts. Ocean/Great Lakes Resources are of concern to the public as they touch on several societal needs for commerce, energy, and recreation - as well as offer unique and treasured environments.

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

Yes	<u> X </u>
No	<u> </u>

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

CRM, in partnership with Pennsylvania Sea Grant, has been a statewide leader in addressing aquatic invasive species issues for the Commonwealth. While multiple state agencies and commissions have individual responsibilities for addressing portions of invasive species issues, no one agency or commission has the resources to dedicate to a comprehensive approach to monitoring and response for all species in all situations. On the ground action, particularly rapid on the ground action, will require coordination across multiple agencies. To help build the capacity for rapid response, key elements identified in the “Priority Needs and Information Gaps” must also be developed, to include: training plans for key personnel; coordinated reporting system; and comprehensive mapping. CRM, working with the networked partners and PA Sea Grant, is uniquely positioned to facilitate the coordination necessary to address invasive species issues - whose impacts often cross the primary resource responsibilities of the various agencies. The proposed strategy will build on past successes and lead to program changes that will facilitate on the ground action.

Pennsylvania’s Lake Erie sea bottom is very heterogeneous and includes portions of the central basin, the eastern basin, the Long Point–Erie Ridge, the Clear Creek Ridge, the Pennsylvania Ridge, the Pennsylvania Channel, Conneaut Bank, and the Dunkirk Escarpment. Some key sensitive habitat and historic information exists, and more is currently being researched. With increased focus on domestic and renewable energy sources the open waters of Lake Erie will undoubtedly receive additional attention for both generation and transmission. While Pennsylvania’s Chapter 105 regulations (Dam

Safety and Waterway Management) offer some protections to environmental, recreational, and historic resources of the lake floor and open waters, additional information and specific protections are warranted. Mapping, including substrate, sand and gravel leasing, existing utilities, key habitat, flyways, prime recreational fishing grounds, shipping channels, wrecks, currents, winds, etc. is a necessary first step toward more comprehensive Marine Spatial Planning. Marine Spatial Planning will allow the most efficient and balanced use and protection for competing Great Lakes resource uses. The goal is to institute a comprehensive approach to resource management that supports ecosystem health and economic vitality, balances current lake uses, and considers future needs. This will be accomplished by determining where specific lake uses will be permitted and which lake uses are compatible. Resource mapping and Marine Spatial Planning in Lake Erie are also major gaps identified in the Energy and Government Facility Siting section and the Cumulative and Secondary Impacts section.

While a significant gap with regard to the unknown impacts and proper disposal of PPCPs was identified, the CRM program will not propose a strategy to address this gap at this time. CRM considers it a national problem and anticipates additional efforts and information will be developed at the national level during the next reporting period. CRM may use other funding sources to help support efforts to address these emerging threats.

Much study is underway in the Delaware Estuary Coastal Zone for analysis of the steps necessary to prepare for Climate adaptation, specifically sea level rise. CRM will work with DVRPC and Partnership for the Delaware Estuary, as well as other partners in the coastal zone, to evaluate the need for a possible MSP in the DECZ to plan and prepare for sea level rise to protect estuarine resources and upstream freshwater resources.

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.

DECZ

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	Yes	No	No	No
Pipelines	Yes	No	No	No
Electric transmission cables	Yes	No	No	No
LNG	No	Yes	Yes	No
Wind	No	No	No	No
Wave	No	No	No	No
Tidal	No	No	No	No
Current (ocean, lake, river)	No	No	No	No
OTEC	No	No	No	No
Solar	Yes	Yes	Yes	Yes
Biofuels	Yes	No	No	Yes
Electric Gen facilities	Yes	No	No	Yes

LECZ

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	Yes	No	No	No
Pipelines	Yes	No	Yes	No
Electric transmission cables	Yes	No	No	No
LNG	No	No	No	No
Wind	No	Yes	Yes	No
Wave	No	No	No	No
Tidal	No	No	No	No
Current (ocean, lake, river)	No	No	No	No
OTEC	No	No	No	No
Solar	No	No	No	No
Biofuels	Yes	No	No	Yes
Electric Gen facilities	Yes	No	No	Yes

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.*

DECZ

Biofuel Facilities

- Keystone Industrial Port Complex and Biofuels Advanced Research and Development LLC opened a biodiesel facility in 2009 in Bucks County.

Electric Generation Facilities

- Keystone Industrial Port Complex also houses Dominion Generation’s Fairless Energy LLC plant, which produces power from natural gas-fired generators.

Solar Energy

- Tullytown Landfill, Falls Township, Bucks County, PA.
- Philadelphia Navy Yard (Proposed).

LNG

- PADEP approved a LNG pipeline for Texas Eastern Crown's Landing LNG project in 2006. The proposed facility to be located in New Jersey was never built.

LECZ

Biofuel Facilities

- Lake Erie Biofuels.
- Lake Erie Biofuels interest in a pipeline to carry biofuel products to Erie's port facilities.

Gas Facility

- Potential Clinton –Medina Sandstone Formation natural gas exploration under Lake Erie.

Wind

- PADEP is currently reviewing a proposal for an Offshore Wind Turbine Project occupying 105 square miles. The legislature is also considering House Bill 2342, which would lease submerged lands in excess of 25 acres within Erie County, for the assessment, development, construction and operation of utility scale offshore wind, solar or kinetic energy generation facilities

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?*

Yes. A projected 46.1 million barrels of oil and 3.01 trillion cubic feet of natural gas lie underneath Lake Erie contained within the Clinton –Medina Sandstone Formation.

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.*

- The PADEP Division of Energy Policy and Technology Deployment addresses issues associated with innovative environmental technologies: verification,

- information exchange and incorporation of technologies into all aspects of environmental management systems.
- The Division of Pollution Prevention and Energy Promotion deals with development of sustainable energy sources and conservation practices, including pollution prevention and the utilization of PA's environmental indicator system.
 - Pennsylvania is investing \$665.9 million to spur the development of alternative and renewable energy sources and help families and small business conserve energy and use it more efficiently.
 - The \$650 million Alternative Energy Investment Fund and the nearly \$16 million Alternative Fuels Investment Fund include \$237.5 million specifically targeted toward helping consumers conserve electricity and manage higher energy prices.

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.

There has not been a significant change in the number of government facilities since the last assessment.

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.*

Yes, the Commonwealth has enforceable policies related to energy facilities.

Enforceable Policy 8.1: Energy Facility Siting (EFS)/PERMITTING

“The Commonwealth has an energy facility permitting process which has the ability, through the issuance of permits covering air discharges, water discharges and withdrawals, solid waste disposal, shoreline erosion control, wetlands protection and control of water obstructions and encroachments in the bed of Lake Erie and the Delaware River, to ensure that all facilities are sited in an environmentally responsible manner.”

POLICY 8.1: Enforcement/Regulations

“IT IS THE POLICY OF THE COASTAL RESOURCES MANAGEMENT PROGRAM TO ENSURE THROUGH REGULATIONS, BY PERMIT, THAT ENERGY FACILITIES SUCH AS OIL AND GAS REFINERIES, ELECTRIC GENERATING STATIONS

(COAL, HYDRO, OIL, AND GAS), ELECTRIC GENERATING SUBSTATIONS, GAS DRILLING, AND LIQUIFICATION OF NATURAL GAS OPERATIONS LOCATING IN THE COASTAL AREAS ARE SITED IN SUCH A MANNER THAT THE COASTAL AREAS ECOSYSTEMS ARE NOT UNREASONABLY ADVERSELY AFFECTED.

The CRMP will monitor permit applications for the development of energy facilities in the Commonwealth's coastal areas to ensure these facilities are sited in an environmentally responsible manner. Additionally, coastal zone management funds and expertise will be utilized in developing studies and siting procedures designed to improve the current site selection process."

The future development of offshore wind power in the LECZ has resulted in the PA CRM updating its Enforceable Policy 8.1 Energy Facility Sighting (EFS) to include Wind as a new type of energy facility that may impact the resources of the Coastal Zone.

Enforceable Policy 8.2: Energy Facilities/Natural Gas

"The increasing dependence on foreign energy supplies is a problem of national concern. The coastal areas of Pennsylvania contain supplies of natural gas that could address this problem at the local level. To date however, the development of these supplies has been delayed."

POLICY 8.2: Enforcement/Regulations

"IT IS THE POLICY OF THE COASTAL RESOURCES MANAGEMENT PROGRAM TO FACILITATE THE PRODUCTION OF NATURAL GAS SUPPLIES IN LAKE ERIE USING PROPER ENVIRONMENTAL SAFEGUARDS THAT ARE DESIGNED TO MINIMIZE ADVERSE AIR AND WATER QUALITY IMPACTS ASSOCIATED WITH RESOURCE EXPLORATION AND DEVELOPMENT."

"This policy focuses coastal zone management funds and resources on addressing the problems currently existing in the development of energy resources in the Commonwealth's coastal areas. In addition to improving the monitoring of the current permitting system, efforts will be made to educate the public as to the ramifications of developing these energy resources in the coastal zones."

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	Yes	No
Policies	Yes	No
Program guidance	Yes	No
Comprehensive siting plan (including SAMPs)	Yes (*)	No
Mapping or GIS	No	No
Research, assessment or monitoring	Yes (*)	No
Education and outreach	Yes (*)	No
Other (please specify)		

(*) CRM has the administrative ability to apply these management processes but have never employed these towards Energy Facility Siting.

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)
Lake Erie Offshore Wind Energy data, studies and GIS layers and mapping.	Data needed to improve procedures designed to improve the current site selection process.	High

Enhancement Area Prioritization

1. What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?

High X
 Medium
 Low

Final

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

With pending interest in Offshore Wind Energy Projects in our Lake Erie Coastal Zone and the demand and federal assistance given to projects that produce green energy on the increase, it is imperative that this program be prepared to properly review such projects to assure minimal impacts on coastal resources.

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

Yes _____
No X

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

This assessment will be addressed as part of a strategy regarding Marine Spatial Planning. Under Enforceable Policy 8.1, the CRM program is charged with using coastal zone management funds and program regulatory/resource management expertise to develop studies and siting procedures designed to improve the energy facility siting selection process. Advancements in technology and the need and support for cleaner domestic sources of energy continue to make the concept of offshore wind projects as energy facilities more economically viable. However, the states of Ohio and Michigan are looking at a whole myriad of environmental concerns that they feel need to be considered before moving ahead with such projects. To better understand and evaluate the potential impacts on the coastal resources in Pennsylvania, the CRM Program is looking into ways to evaluate the following criteria as it relates to the siting of offshore wind turbines.

- Bird Habitat
- Commercial Fishery
- Distance from Shore
- Fish Habitat
- Industries
- Lake bed substrates
- Natural Heritage Observances
- Navigable Waterways
- Shipwrecks
- Sport Fisheries
- Utilities

The CRM Program does not currently have sufficient data and mapping relative to the above listed criteria to evaluate the effects offshore wind energy development may have on Pennsylvania's Great Lakes coastal resources.

Aquaculture

Section 309 Enhancement Objective:

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

Resource Characterization

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

Type of existing aquaculture facility in CZ	Describe recent trends	Describe associated impacts or use conflicts
LECZ: Pennsylvania Fish and Boat Commission Fairview Hatchery (steelhead)	Steelhead trends remain steady. In future may help support recent “put-grow-take” Lake Erie Brown Trout initiative.	No significant impacts or use conflicts. VHS being monitored.
LECZ: Save Our Native Species (S.O.N.S. of Lake Erie) Hatchery (Presque Isle Bay; walleye, perch, and steelhead)	Trends remain steady.	No significant impacts or use conflicts. VHS being monitored.
DECZ: Cheyney University Aquaculture Program and Facilities (not in CZ, within watershed). Provides support for the Delaware Estuary Watershed Freshwater Mussel Recovery Program.	Recent and growing effort.	Consideration of appropriate species and collection of more rare species for brood stock from wild sources.

Pennsylvania’s private and public aquaculture industry remains dominated by trout production. According to the *Pennsylvania Trout and Aquaculture Census, 2008* (compiled by USDA, National Agriculture Statistics Service – PA Office), Pennsylvania trout growers produced trout valued at \$20.13 million in 2008. In 2008 Pennsylvania food fish trout producers sold 1.67 million pounds of trout, valued at \$5.43 million. Food fish trout production ranked 5th nationally, behind Idaho, California, North Carolina, and Washington. The value of trout produced for conservation and recreational purposes was more than double that of trout produced directly for food. In 2008 Pennsylvania trout producers (including the Pennsylvania Fish and Boat Commission) produced trout valued

at \$14.7 million for conservation and recreation purposes, second only to California in the value of trout produced for conservation and recreation.

Other commercial aquaculture categories reported in the *Pennsylvania Agricultural Statistics 2008 – 2009* (also compiled by the USDA, National Agriculture Statistics Service – PA Office) include non-trout foodfish, baitfish, ornamental and aquarium fish, sport/game fish, mollusks, crustaceans, and “other” aquaculture. According to this resource the total value of aquaculture sales in Pennsylvania in 2008 was \$10,475,081. While there has been some fluctuation, this total sales number is comparable to the \$10.9 million total sales figure reported for 2004 and cited in our 2006 Strategy and Assessment. During the past five years the lowest total aquaculture sales reported for Pennsylvania was in 2006, when the sales dropped to \$7,916,264. The following year, 2007, showed the total value of sales quickly rebounded to \$9,943,317. Within each category the total sales numbers have also remained somewhat consistent, with no dramatic changes in any one category.

Within Pennsylvania’s Coastal Zones, commercial aquaculture opportunities remain limited and the aquaculture focus is on recreation and conservation. In Pennsylvania’s Lake Erie Coastal Zone the production of steelhead, *Oncorhynchus mykiss*, remains critically important to the region for both recreational opportunities and economic stimulus. As reported in the 2006 Strategy and Assessment, a 2004 report authored by the Pennsylvania Fish and Boat Commission and Penn State University entitled *Creel Analysis and Economic Impact of Pennsylvania’s Lake Erie Tributary Fisheries in Erie County, Pennsylvania, with Special Emphasis on Landlocked Steelhead Trout (Oncorhynchus mykiss)* highlights the significant economic impact associated with recreational steelhead fishing in Lake Erie and its major tributaries. The report indicated that in 2003 steelhead anglers spent \$9.5 million on trip related expenditures, including \$5.71 million in new value-added activity in Erie County and that this activity creates 219 jobs in the economy through direct and indirect impacts. The report also recognized that “guaranteed public access is paramount to the success of Pennsylvania’s steelhead fishery”. Significant gains in public access to Lake Erie tributaries have occurred during this report period, largely due to the successful steelhead fishery supported by aquaculture. The Public Access section of this document contains additional discussion on these gains.

There are three Pennsylvania Fish and Boat Commission hatcheries that support the Lake Erie steelhead fishery by stocking approximately 1,000,000 fish per year into Lake Erie tributaries and Presque Isle Bay. The 2008 total was actually 1,220,934 steelhead yearlings. The Fairview State Fish hatchery, located within the coastal zone, is the headquarters for the spawning operations. In addition to the spawning operation, the Fairview hatchery rears approximately 350,000 steelhead per year for stocking. The steelhead stocking operation is also supported by two Pennsylvania Fish and Boat Commission hatcheries located outside of the Lake Erie watershed. After fertilization at Fairview, eggs are transported to the Tionesta State Fish Hatchery which raises approximately 650,000 steelhead per year, and the Linesville State Fish Hatchery which rears approximately 100,000 steelhead per year.

Pennsylvania Fish and Boat Commission efforts are strongly supported by local sportsmen’s clubs and cooperative nurseries, especially S.O.N.S. (Save Our Native Species) of Lake Erie and 3CU, a trout fishing volunteer support organization. S.O.N.S. operates a hatchery on the shores of Presque Isle Bay in downtown Erie. The cooperative nurseries add approximately 100,000 additional steelhead smolts per year. In 2008, the Pennsylvania Fish and Boat Commission began a Lake Erie put-grow-take brown trout program. Working with local cooperative nurseries and fertilized eggs from the New York Department of Environmental Control, the Pennsylvania Fish and Boat Commission completed the first stocking of this program in May 2009. The Commission hopes to stock 50,000 – 100,000 yearling brown trout annually.

In the Delaware Estuary coastal zone there is an effort to use aquaculture to aid in freshwater mussel restoration projects. The Delaware Estuary Freshwater Mussel Recovery Program is being supported by a variety of partners including the Partnership for the Delaware Estuary with assistance from the aquaculture program and aquaculture facilities at Cheyney University.

Management Characterization

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 or territory (Y or N)	Significant changes since last assessment (Y or N)
Aquaculture regulations	Y	N
Aquaculture policies	Y	N
Aquaculture program guidance	Y	N
Research, assessment, monitoring	Y	N
Mapping	N	N
Aquaculture education & outreach	Y	N

The Pennsylvania Department of Agriculture continues to have the primary responsibility for the regulation and support of the aquaculture industry in Pennsylvania. This was established in 1998 by the Aquaculture Development Act, Act 1998-94. The Aquaculture Development Act includes the statement that “It is the policy of the Commonwealth that aquaculture is an agricultural activity which adds to the diversity of our food and fiber production system and should be conserved, protected and encouraged to develop and grow within this Commonwealth.” As required by that Act, the Department of Agriculture developed the Aquaculture Production Development Program (APDP). The

objective of that program is specified in Chapter 106.1. The Department of Agriculture employs one Pennsylvania Aquaculture Coordinator for the state.

Prior to 1998, the Pennsylvania Fish and Boat Commission was the primary regulatory agency for the aquaculture industry. Since some responsibilities overlap, the Department of Agriculture and Fish and Boat Commission cooperate to ensure regulations are complimentary and not conflicting. The major changes to regulations during this report period involve responding to the threats associated with Viral Hemorrhagic Septicemia (VHS), first found within the Great Lakes (including portions of Lake Erie) beginning in 2006. These changes were driven by non-CZM efforts. The Pennsylvania Fish and Boat Commission has adopted new or revised regulations to address the sale, introduction, importation, and transportation of VHS-susceptible fish. These new and revised regulations can be found at 58 Pa. Code §§63.51, 69.3, 71.8 and 73.3. As of this writing there are 30 species of fish identified as being “VHS-susceptible”. The Department of Agriculture has issued a General Quarantine Order and an Interstate Quarantine Order with respect to VHS. These orders are consistent with but more specific than federal quarantine orders. The orders have been issued for Erie County and Crawford County in the Lake Erie watershed, as well as for Potter County, which contains a small portion of the Lake Ontario watershed. The orders were issued under the authority of the Domestic Animal Law at Pa. C.S. §2329 and provide that propagators and dealers of VHS susceptible fish may not transport from affected or susceptible states into Pennsylvania or outside of the quarantined counties within Pennsylvania without proper testing and certification to ensure VHS is not present.

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.

The following gap or need descriptions are taken from the Northeast Regional Aquaculture Center publication *Aquaculture Situation and Outlook Report 2009: Pennsylvania*. The document was authored by Pennsylvania Sea Grant and the Pennsylvania Department of Agriculture Pennsylvania Aquaculture Coordinator and represents industry input on the subject.

Gap or need description	Type of gap or need (regulatory, policy, data, training, capacity, communication & outreach)	Level of priority (H, M, L)
Development of more effective and uniform regional policies and management	Regulatory, policy, training, capacity, and communication and	M

techniques dealing with interstate regulations of fish health and biosecurity.	outreach.	
Ensure assistance and minimum financial impact to farmers if changes to NPDES regulations or policy impact aquaculture operations.	Training, communication and outreach.	L
Provide clear messages and balanced public awareness of the risks and benefits of consuming farmed fish.	Communication and outreach.	L
Development of practical bird predation deterrent methods to reduce economic losses.	Training / capacity	L
Establishment of a comprehensive Pennsylvania fish pathogen laboratory that can test for viral, bacterial, and parasitic disease.	Capacity	M

Enhancement Area Prioritization

1. *What level of priority is the enhancement area for the coastal zone (including, but not limited to, CZMA funding)?*

High
Medium X
Low

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

Yes
No X

The Pennsylvania Department of Agriculture and Pennsylvania Fish Commission are the state agencies primarily responsible for the regulation of and support for the aquaculture industry. These efforts are currently adequately supplemented by Pennsylvania Sea Grant, universities, federal aquaculture facilities, feed manufacturers, and agricultural extension specialists. The CRM program anticipates supporting the Delaware Estuary Freshwater Mussel Recovery Program through non-309 funds.

Final

Pennsylvania CRM Section Strategy
FFY 2011 to FFY 2015

Lake Erie Coastal Zone Boundary Expansion 2011 Strategy

I. Issue Areas

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

II. Program Change Description

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

- A change in 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. Description of proposed program changes:

The CRM program proposes to evaluate various alternatives for expanding the Lake Erie Coastal Zone boundary. Expansion based on watershed boundaries will be a critical part of the analysis. CRM will provide outreach on the proposed expansion and seek comment from local government, other key stakeholders, and the general public. CRM

will also analyze impacts to internal workloads on existing staff. An expanded Lake Erie Coastal Zone that better addresses cumulative and secondary impacts will also benefit the enhancement objectives of several priority areas by offering additional tools to local municipalities, partner agencies, and local non-profit organizations within the watershed. As part of this effort, discussions about possibly developing a land acquisition program through a pilot program in LECZ will be included.

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

The proposed expansion of the Lake Erie Coastal Zone can address multiple gaps across several of the priority enhancement areas. The proposed boundary expansion most directly addresses Cumulative and Secondary Impacts, which can have direct and significant impacts on Great Lakes Resources, Wetlands, Public Access, and habitat for threatened and endangered species.

The adverse changes to the physical, chemical, and biological structure of streams and wetlands associated with Secondary and Cumulative Impacts are well documented and can be readily seen in the impaired waterways of the LECZ. The water quality and associated beach advisories and restrictions of the Presque Isle swimming beaches are from stormwater impacts which begin outside of our current coastal zone. Habitat fragmentation, and the loss of ecological integrity associated with the loss of stream and wetland buffers, can be addressed by extending protected habitat corridors outside of our current coastal zone – focusing on critical linkages. Threatened and endangered species as well as more common species whose numbers are becoming increasingly rare (amphibians) will benefit. The increasing problems associated nutrients, emerging contaminants, and aquatic invasive species can all be better addressed through a watershed approach.

IV. Benefit(s) to Coastal Management

The need to manage water resources on a watershed scale is a well accepted principle. Pennsylvania DEP has continued to move toward an integrated water resource management approach and this proposed change is consistent with that approach. Many of the problems identified within the current coastal zone can not be adequately addressed at the bottom of the watershed (bank erosion, nutrients, siltation, emerging contaminants, beach closures, and habitat fragmentation). An analysis of impaired streams in the Delaware Estuary Coastal Zone highlights the significant adverse impacts from secondary and cumulative impacts associated with urban run-off and land use management decisions. Restoration is more difficult and expensive than protection, and in the Lake Erie Coastal Zone opportunities for protection and informed land use decisions still exist. This program change will allow CRM to take advantage of these opportunities by offering additional tools and support to local municipalities within the watershed. Partner state agencies with similar goals and local non-profits and land trusts

will also be strengthened by expansion of the coastal zone. An expanded Lake Erie Coastal Zone will better integrate with Erie County's county-wide stormwater management plan, the Priorities and Strategies for Action identified in the Pennsylvania Lake Erie Watershed Conservation Plan, the Strategies to implement the Erie and Crawford Counties' components of the Northwest Pennsylvania Greenways Plan, and the Pennsylvania Fish and Boat Commission's Erie Access Improvement Plan (which now has provisions for fish habitat improvement).

The proposed expansion would be consistent with the goals and objectives of the Lake Erie Lakewide Management Plan (LaMP) and specifically the objectives and rationale expressed in Section 3.3.3, Ecosystem Management Objectives and Rationale. This section of the LaMP states that "*Ecosystem alternative analysis identified land use practice as the dominant management category affecting the Lake Erie ecosystem*". The section goes on to say that "*It is expected that there will be increasing demands and pressures for land conversion in the Lake Erie basin. Proactive planning for these pressures needs to include the protection of critical habitat corridors that connect and link habitats between the lake, the wetlands and the upland habitat. Specific targets need to be established, which include securing, protecting and restoring natural lands. A watershed approach is critical to developing local solutions and to maximize gains with partners.*"

The U.S. Fish and Wildlife Service has also indicated the importance of managing habitat on a larger, landscape level approach. The Foreword to the 2008 Strategic Habitat Conservation Handbook includes the statement that "*The future of conservation hinges on a landscape approach, and our success in this area will rise and fall with how well we integrate our efforts with our Federal, State and NGO partners.*"

The boundary expansion is a critical first step in better managing non-point source pollution and maintaining native biodiversity and ecological community integrity, including protection of Pennsylvania rare, threatened, and endangered species. It will allow CRM to more strategically address the many challenges to the coastal areas, with direct implications for land use, stormwater and nutrient management, and habitat fragmentation. The availability of natural, undisturbed land and nutrient levels were identified by the LaMP as the two most influential actions that can be taken to restore the Lake Erie ecosystem.

V. Likelihood of Success

There is a high likelihood of success for this Strategy. The local Lake Erie Coastal Advisory Committee voted to request Pennsylvania's CRM program consider boundary expansion. Consideration of a boundary expansion was also a recommendation made during the program's last 312 evaluation. There is existing local support for an expansion, and an expansion of the boundary in some form is highly likely.

VI. Strategy Work Plan

Total Years: 5

Total Budget: \$376,000

Final Outcome(s) and Products: Expansion of the Lake Erie Coastal Zone Boundary and pilot land acquisition program for the LECZ

Year(s): 1

Description of activities:

- Develop workplan for contractor support
- Gather data
- Conduct research, as needed

Outcomes(s):

- Workplan for contractor (Penn State University / Sea Grant)
- Outline of boundary change documents
- Identification of additional needs

Budget:

Total Budget: \$80,000
\$20,000 (contractor)
\$60,000 DEP/CRM

Year(s): 2

Description of activities:

- Draft boundary expansion documents
- Conduct early public outreach

Outcomes(s):

- First drafts of boundary expansion documents
- Summary of initial public outreach efforts

Budget:

Total Budget: \$76,000
\$16,000 (contractor)
\$60,000 DEP/CRM

Year(s): 3

Description of activities:

- Conduct formal public outreach
- Publish draft documents for comment
- Review comments

Outcomes(s):

- Summary of public comments
- Second set of draft documents

Budget:

Total Budget: \$76,000
\$16,000 (contractor)

\$60,000 DEP/CRM

Year(s): 4

Description of activities:

- Draft responses to public comments
- Finalize program change documents
- Submit program change request to OCRM

Outcomes(s):

- Program change request

Budget:

Total Budget: \$68,000
\$ 8,000 (contractor)
\$60,000 DEP/CRM

Year(s): 5

Description of activities:

- Update CRM program documents
- Publicize changes
- Conduct outreach

Outcomes(s):

- Program change
- Dissemination of information

Budget:

Total Budget: \$76,000
\$16,000 (contractor)
\$60,000 DEP/CRM

VII. Fiscal and Technical Needs

Fiscal needs: Funding in Years 1 through 5 for external technical support to assist with local capacity building and public outreach in the LECZ and proposed expansion area. These gaps will be further delineated during Year 1, when the workplans for the contractor are developed.

Development of AIS - Species Specific Rapid Response Plans and a Monitoring and Surveillance System for the Coastal Watersheds 2011 Strategy

I. Issue Areas

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

II. Program Change Description

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

- A change in 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. Description of proposed program changes:

Aquatic invasive species, and those more terrestrial invasive species that impact the borders between terrestrial and aquatic habitats (wetland and riparian areas), can have negative impacts on the physical, chemical, and biological integrity of aquatic resources.

Partnering with Pennsylvania Sea Grant, CRM proposes to revise the Pennsylvania AIS Management Plan (AISMP) and develop species specific rapid response plans for the watersheds of the coastal zone. The AISMP was created in 2006, and since that time state agencies and others have worked to address the priorities it identified. The AISMP calls for a revision every five years to describe progress made and identify new priorities for coming years. Species specific rapid response plans are a unique type of restoration plan. Key to the development of species specific rapid response plans is a monitoring and surveillance system that will identify new introductions and serve as a baseline for existing distributions. While preventing introduction is the most efficient and economical way to prevent AIS impacts, rapid response is key when prevention fails.

Five government agencies within Pennsylvania share the majority of responsibility for invasive species management: Department of Agriculture, Fish and Boat Commission, Department of Conservation and Natural Resources, Game Commission, and Department of Environmental Protection. Due to budgetary concerns within all agencies, it is likely that both monitoring and response for invasive species will need to be addressed with existing staff, and will rely heavily on existing field staff in various agencies. This proposed workplan would result in changes that would better coordinate agency resources and improve capacity to address AIS impacts by improving efficiencies.

The proposed program change includes coordinating the necessary intergovernmental agreements such as cooperative agreements and memoranda of understanding/agreement between the various agencies as well as identifying potential aquatic invasive species of concern in the watersheds of the coastal zone, paying attention to how climate change will impact the movement and potential range of species. Specific program changes will involve the incorporation of the MOUs and MOAs as well as encouragement policies to support species specific rapid response plans into CRM's program plan. While field staff from the various agencies possess the necessary fundamental skills, specific training programs will need to be developed to keep their skills current. The potential for monitoring assistance from other stakeholders and volunteer groups will also be evaluated. This proposed program change is consistent with Pennsylvania's approved Aquatic Invasive Species Management Plan and continues to build on prior accomplishments of the CRM program.

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

The Aquatic Invasive Species (AIS) Management Plan was approved by the Governor's Invasive Species Council of Pennsylvania at their October 2006 meeting. The approved plan was signed by Governor Ed Rendell in November 2006. Specific priority strategies and priority actions identified in the 2006 approved AIS Management Plan remain unfulfilled. This proposed change seeks to address some of these gaps with the limited funds available. Pennsylvania still lacks a comprehensive database for the tracking of AIS and a system of monitoring and surveillance using existing field staff to populate the database. This is key to understanding existing distributions and quickly and confidently identifying new introductions where rapid response is warranted. The coordination

among the various agencies will require formal agreements, in place, in order to respond quickly to new introductions of specific species. This proposed change will also formalize intergovernmental agreements to implement rapid response actions.

IV. Benefit(s) to Coastal Management

The economic and natural resource impacts to coastal areas associated with aquatic invasive species are well documented. CRM has been a leader within Pennsylvania in developing a system to address these impacts. Pennsylvania's Aquatic Invasive Species Management Plan has been approved by Governor Rendell and the federal Aquatic Nuisance Species Task Force. The plan identifies priority strategies and actions that CRM can help accomplish through program changes that address our ability to detect new introductions and respond rapidly to introduction of critical species in critical areas before new introductions become established. Without additional funding for individual agencies to unilaterally address AIS infestations, it is imperative that the agencies work together to comprehensively address the monitoring and response to AIS. With networked policies and agencies, CRM is uniquely situated to bridge the gaps and bring the various agencies together through intergovernmental agreements.

V. Likelihood of Success

This proposed change continues to build on past successes and there is a high likelihood of success. The CRM program has been a state leader in bringing focus to the economic and environmental impacts from AIS and in coordinating AIS efforts to develop comprehensive planning. The proposed change will strengthen the coordination and networks that have been established.

VI. Strategy Work Plan

Total Years: Five

Total Budget: \$352,000

Final Outcome(s) and Products: Monitoring database; MOUs between state agencies and possibly non-governmental partners; revisions and updates to the Pennsylvania AIS Management Plan (AISMP)

Year(s): 1

Description of activities:

- Develop workplan for contractor support (Pennsylvania State University/Sea Grant)
- Research specific species and determine policy gaps
- Review currently available tracking data, identify detailed needs for database system

Final

- Coordinate with Pennsylvania Invasive Species Council, including initial discussions on revising AISMP
- Conduct additional research, as needed

Outcomes(s):

- Workplan for contractor
- Summary document outlining target species and data gaps

Budget:

- Total Budget: \$80,000
- \$80,000 Consultant (PSU/Sea Grant)

Year(s): 2

Description of activities:

- Meetings with other agencies to review identified policy gaps concerning specific species
- Research possible responses that may be appropriate for specific species
- Continue to refine monitoring database needs and develop framework for database
- Coordinate with Pennsylvania Invasive Species Council
- Continue to develop revisions to AISMP

Outcomes(s):

- Summary document of targeted specific species as agreed upon by various agencies
- Schedule of activities for formalizing agreements between agencies
- Framework for monitoring database

Budget:

- Total Budget: \$66,000
- \$66,000 Consultant (PSU/Sea Grant)

Year(s): 3

Description of activities:

- Draft rapid response plans for specific species
- Draft inter-agency MOUs
- Begin to populate monitoring database
- Coordinate with Pennsylvania Invasive Species Council
- Complete proposed draft revisions to AISMP

Outcomes(s):

- Draft rapid response plans
- Drafts of inter-agency MOUs

Budget:

- Total Budget: \$66,000
- \$66,000 Consultant (PSU/Sea Grant)

Year(s): 4

Description of activities:

- Finalize rapid response plans for specific species
- Finalize inter-agency MOUs
- Finalize monitoring database
- Coordinate with Pennsylvania Invasive Species Council
- Finalize revisions to AISMP

Outcomes(s):

- Rapid Response Plans
- MOUs/MOAs
- Monitoring database

Budget:

- Total Budget: \$74,000
- \$74,000 Consultant (PSU/Sea Grant)

Year(s): 5

Description of activities:

- Conduct training and implement rapid response plans for specific species
- Submit program change request (MOUs, MOAs, encouragement policies).
- Publicize monitoring database
- Coordinate with Pennsylvania Invasive Species Council
- Workshops on AIS identification, rapid response and revisions to AISMP

Outcomes(s):

- Formal changes to CRM's Ocean Resources Policy, primarily Policy 11.2
- Staff training
- Implementation of plans as warranted
- Dissemination of information

Budget:

- Total Budget: \$66,000
- \$66,000 Consultant (PSU/Sea Grant)

Building Marine Spatial Planning for Lake Erie Coastal Resources 2011 Strategy

I. Issue Areas

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

II. Program Change Description

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

- A change in 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. Description of proposed program changes:

CRM proposes to begin mapping the diverse resources of Lake Erie, including the seabed, water column, and airspace. Comprehensive mapping will lead to the ability to conduct marine spatial planning and better balance competing uses and protect those areas most critical to the resources of highest priority, including Pennsylvania threatened

and endangered species. Marine spatial planning can include or lead to the development of marine protected areas or areas that should be subject to special area management plans in the future. It is anticipated that the proposed program changes will focus on developing MOUs or MOAs with other key agencies that will have a role in reviewing and permitting structures in Lake Erie. Any potential enforceable policies would be networked through these agencies. Given the high priority of renewable and domestic energy projects, Marine Spatial Planning could attract considerable political attention and the ultimate specific program changes are difficult to predict at this time.

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

The wind power classification for Lake Erie is “excellent”, and the interest in large scale wind turbine and other alternative energy development projects continues to gather momentum. Petroleum and natural gas reserves are also located under the lake bed and interest in solar and kinetic energy sources are also under study. Comprehensive mapping and collection of existing sources of mapping of Lake Erie resources - ecological, economic, and cultural – is a key gap that would lead to better tools for individual project evaluation and comprehensive ecosystem management. This data collection and mapping would be beneficial to all stakeholders and agencies in review of future projects, and specifically domestic and renewable energy generation and transmission projects. Additional research gaps that could be addressed by comprehensive marine spatial planning include the delineation of key habitat (i.e. spawning habitat) of priority recreational species such as lake trout and threatened and endangered species such as lake sturgeon. Pennsylvania’s portion of Lake Erie also lies at the crossroads of the Atlantic and Great Lakes Flyways. While Presque Isle is famous for its resting and staging location for migratory shorebirds, the rest of the watershed’s woods and scrubby wetlands offer significant stop-over habitat for migrating songbirds. Additional information on the use, patterns, and timing of migratory flight is a research gap that ideally would be included in marine spatial planning efforts. Additional gaps will be identified as the mapping and marine spatial planning effort moves forward.

IV. Benefit(s) to Coastal Management

Increased attention to offshore energy facility siting and transmission has highlighted our need for a more comprehensive approach to spatial planning in Lake Erie. Critical recreational, natural resource, historical, and economic resources will be better protected and managed through comprehensive marine spatial planning. Additional tools will be available to all stakeholders and review agencies to better balance potential use conflicts. Better science will be available to evaluate efforts needed to protect the high intrinsic value of coastal resources. Ultimate use decisions should be rendered more efficiently.

V. Likelihood of Success

This project has a very high likelihood for success. The CRM program currently has a high level of in-house expertise on GIS. The DEP Office of Great Lakes supports the

marine spatial planning effort and will be part of the project throughout its duration. The Tom Ridge Environmental Center Research Consortium offers a local pool of expertise to draw upon to support individual components of this effort. At this time CRM anticipates pursuing MSP only in the Lake Erie coastal zone.

VI. Strategy Work Plan

Total Years: 5

Total Budget: \$100,000 (plus 306 funds and potentially PSM funds)

Final Outcome(s) and Products:

Year: 1

Description of activities:

- Research marine spatial planning efforts in other coastal states and national trends.
- Accumulate existing biogeographical data layers for building GIS database that will serve as building block for marine spatial planning.
- Identify and prioritize data gaps.

Outcomes(s): A baseline of existing GIS layers and identification of specific needs.

Budget: \$20,000 (CRM Staff)

Years: 2, 3 and 4

Description of activities:

- Form local workgroups for support and technical expertise.
- Continue to identify and prioritize data gaps.
- Seek ways and alternative funding sources for the research needed to fill priority data gaps, which likely would include a submission of a Project of Special Merit for additional assistance in technical work needed to support planning efforts.
- Begin to draft components of Marine Spatial Plans for public review and comment.

Outcomes(s): Draft components of plans.

Budget: \$20,000 (CRM Staff) Annually

Year: 5

Description of activities:

- Finalize research.
- Finalize plan(s), to include a public comment period.
- Prepare Program Change request materials for submittal to OCRM.
- Begin outreach to support formal marine spatial planning and to implement marine spatial plan.

Outcomes(s): Final plans and program changes.

Budget: \$20,000 (CRM Staff)

VII. Fiscal and Technical Needs

Fiscal needs: Funding in Years 2 through 5 for external technical support to assist with technical work that likely will exceed CRM staff resources. These gaps will be further delineated during Year 1, with the intent of pursuing additional funding at that time.

Projects of Special Merit (Optional)

Prior to and during Year 1 activities associated with this program change CRM will identify and prioritize data gaps needed for developing marine spatial planning. It is anticipated that gaps will involve specific benthic mapping needs associated with species of highest concern and additional information on avian migration patterns. We will evaluate our resource needs and submit application(s) for developing projects in support of marine spatial planning.

5-Year Budget Summary by Strategy

Strategy Title	Year 1 Funding	Year 2 Funding	Year 3 Funding	Year 4 Funding	Year 5 Funding	Total Funding
Lake Erie Coastal Zone Boundary Expansion	\$80,000	\$76,000	\$76,000	\$68,000	\$76,000	\$376,000
Development of Species Specific Rapid Response Plans and a Monitoring and Surveillance System for the Coastal Watersheds	\$80,000	\$66,000	\$66,000	\$74,000	\$66,000	\$352,000
Building Marine Spatial Planning for Lake Erie	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$100,000
Total Funding	\$180,000	\$162,000	\$162,000	\$162,000	\$162,000	\$828,000