Delaware Coastal Management Program
Section 309 Enhancement Program

2021-2025 Assessment and Strategy

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Delaware Coastal Management Program
Division of Energy, Coastal and Climate
Department of Natural Resources and Environmental Control

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Section 309 Enhancement Program 2021 – 2025 Assessment and Strategy

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Acronyms

BOEM	Bureau of Ocean and Energy Management
CZMA	Coastal Zone Management Act
CZA	Coastal Zone Act (Delaware)
CZCPL	Coastal Zone Conversation Permit Law (Delaware)
CFMS	Coastal Flood Monitoring System
DCCE	Division of Climate, Coastal, and Energy (DNREC)
DCMP	Delaware Coastal Management Program
DCP	Delaware Coastal Programs
DECAP	Delaware Comprehensive Assessment Procedure
DELDOT	Delaware Department of Transportation
DEM	Digital Elevation Models
DEMA	Delaware Emergency Management Agency
DEMAC	Delaware Environmental Monitoring and Analysis Center
DFW	Division of Fish and Wildlife (DNREC)
DGS	Delaware Geological Survey
DNERR	Delaware National Estuarine Research Reserve
DNREC	Department of Natural Resources and Environmental Control (Delaware)
DPR	Division of Parks and Recreation (DNREC)
EPA	Environmental Protection Agency
GIS	Geographic Information System
IPA	Institute for Public Administration
LULC	Land Use and Land Cover
LiDAR	Light Detection and Ranging
MACAN	Mid-Atlantic Coastal Acidification Network
MARCO	Mid-Atlantic Regional Council on the Ocean
MidTRAM	Mid-Atlantic Tidal Wetland Rapid Assessment Method
MHHW	Mean Higher High Water
NOAA	National Oceanic and Atmospheric Administration
OAP	Ocean Action Plan
OSPC	Office of State Planning Coordination
OCS	Outer Continental Shelf
RASCL	Resilient and Sustainable Communities League
RCP	Resilient Community Partnership
RPB	Regional Planning Body
SAMP	Special Area Management Plan
SCORP	State Comprehensive Outdoor Recreation Plan
SLR	Sea Level Rise
SAA	Statewide Activity Approval
SWMS	Shoreline and Waterway Management Section (DNREC)
UD	University of Delaware
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service
WATAR	Watershed Approach to Toxic Assessment and Restoration
WMAP	Wetland Monitoring and Assessment Program

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Introduction

The National Coastal Zone Management Program, administered by the National Oceanic and Atmospheric Administration (NOAA), is a voluntary partnership between the federal government and U.S. coastal and Great Lakes states and territories authorized by the Coastal Zone Management Act (CZMA) of 1972 to address national coastal issues. The program works with coastal states and territories to address coastal issues, including climate change, ocean planning, and energy facilities and development.

The CZMA provides the basis for protecting, restoring, and responsibly developing our nation's diverse coastal communities and resources. To meet the goals of the CZMA, the national program takes a comprehensive approach to coastal resource management—balancing the often competing and occasionally conflicting demands of coastal resource use, economic development, and conservation. The program's key elements include protecting natural resources, managing development in high hazard areas, giving development priority to coastal-dependent uses, providing public access for recreation, prioritizing water-dependent uses, and coordinating state and federal actions.

The Coastal Zone Enhancement Program, established in 1990 under Section 309 of the CZMA, provides incentives to states to enhance their state programs within nine key areas: wetlands, coastal hazards, public access, marine debris, cumulative and secondary impacts, special area management planning, ocean and Great Lakes resources, energy and government facility siting, and aquaculture.

Under the Section 309, the Secretary of Commerce is authorized to make awards to states with approved coastal management programs to implement multi-year strategies that focus on one or more of the priority enhancement goals. To be eligible for the awards, every five years states assess their programs to identify priority needs and opportunities for improvement. This document is the Delaware Coastal Management Program's (DCMP) 309 Coastal Zone Enhancement Program Assessment and Strategy for 2021-2025.

This assessment was prepared based on information collected during a multi-phase programmatic strategic planning effort including interviews with network partners, internet-based surveys of network partners, focused workshops gathering stakeholder response and needs, and comments received from the public.

The Delaware Coastal Programs (DCP), comprised of the DCMP and the Delaware National Estuarine Research Reserve (DNERR), has assessed and ranked the nine enhancement areas. Through this document, DCP is indicated when activities are conducted in conjunction with the DNERR. DCMP is indicated when an activity is initiated, conducted, or supported (technically or financially) solely by DCMP. The following priorities have been assigned based on the results of the assessments, and the information received from DCP staff, partners and collaborators.

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Enhancement Area	Past and Current Priority Rankings				
	2001	2005	2010	2015	2020
Wetlands	High	Medium	High	High	High
Coastal Hazards	High	Medium	High	High	High
Public Access	Low	Medium	Low	Low	Low
Marine Debris	Low	Low	Low	Medium	Medium
Cumulative & Secondary Impact	High	High	Medium	Medium	Medium
Special Area Management Plan	High	High	High	Medium	Medium
Ocean Resource	Medium	High	High	Medium	Medium
Energy & Government Facility Siting	Medium	Medium	Medium	Medium	Medium
Aquaculture	Medium	Low	Low	Low	Low

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Summary of Recent Section 309 Achievements

In the 2016-2020 cycle, Delaware worked to further advance enhancement efforts in coastal hazards and wetland resources. Achievements were seen though the implementation of the current strategy "Determining the Economic Impacts of Coastal Resilience Actions to Support Policy Change", and with continued efforts on the previous strategy, "Delaware Sea Level Rise Adaptation Plan Refinement and Early Implementation".

Coastal Hazards

With increased awareness to coastal hazards, community resilience and sustainability planning and support were being undertaken by multiple state-level offices. To improve coordination and information sharing, the DCP worked with the University of Delaware's (UD) Institute for Public Administration (IPA) and Department of Natural Resources and Environmental Control's (DNREC) (then) Division of Energy and Climate to organize an interagency workshop and began laying the groundwork the Resilient and Sustainable Communities League (RASCL). The group quickly grew with over twenty representatives from offices in the DNREC, Delaware Department of Transportation (DelDOT), the State Office of Planning Coordination (OSPC), Delaware Emergency Management Agency (DEMA), IPA, and others. After formally agreeing to establish a collective, the group met quarterly to promote coordination and information sharing on community resiliency and sustainability planning. Working together enables the group to strategically plan and leverage resources to address needs of many stakeholder groups. In addition to creating a listserv for organized communities with all interested parties, resources have been developed for use by communities (e.g. funding database for resiliency projects and how to apply for them), and RASCL now holds quarterly coffee hours and a highly popular annual summit bringing together resilience practitioners, elected officials, government agencies, and community members to discuss the issues that matter to Delawareans.

The DCP implemented the new Resilient Community Partnership (RCP), a redesigned approach to assisting communities address coastal hazards. Through the program, individual communities or community groups can partner with the DCP to address larger scale planning and adaption projects to reduce future damage and economic impacts from hazardous events. Additional information on the RCP may be found in the Coastal Hazard Phase I assessment.

With the successful completion of a multi-year planning effort in the early 2010's, a set of 55 recommendations were developed to minimize the impacts from climate change though increased sea level rise (SLR), increased coastal erosion, and other impacts. Governor Jack Markell led the way with the issuance of Executive Order 41 "Preparing for Emerging Climate Impacts", which was followed with the implementation of over 24 recommendations within five years of development. The Division of Climate, Coastal, and Energy (DCCE) continues to lead planning efforts with multi-stakeholder efforts and for climate, energy, and resilience adaptation plans.

Although significant monitoring of the environment is occurring across the State, there is no statewide ability to ingest, organize, archive, and disseminate the data from these initiatives in a meaningful way

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for research, education, and decision-making. The DCMP provided technical and financial support to expand the development of tools offered by the Delaware Environmental Monitoring and Analysis Center (DEMAC). DEMAC establishes and maintains a coordinated approach to disseminating environmental data, including developing key tools used to prepare for and reduce impacts from climate change. The DCMP provides further support by sponsoring the Delaware Environmental Monitoring Symposium bringing together scientists and decision-makers to expand the knowledge of long-term environmental monitoring and remote sensing efforts the in the state and to consider mechanisms to improve coordination and collaboration efforts in the state and region.

The DCMP has funded data collection and analysis to gather information necessary to guide informed decision-making processes. Examples include a cost analysis for flood proofing eligible structures in the City of New Castle. Along with an average cost per structure, the study examined the costs for several options to raise the flood-control levees protecting the City as well as novel flood protection measures for areas currently not protected by those levees. This information and other baseline data collected on coastal communities can be used to support proactive investment planning by municipalities through Hazus modeling to evaluate the cost-effectiveness of adaptive measures to minimize the impacts of coastal hazards. Knowing the importance of using current condition data when planning, the DCMP provided funding to update the state land use and land cover (LULC) data using the 2017 aerial ortho-photos, the most recent available, and a detailed analysis measuring impervious surface change in beach communities of southern Delaware.

<u>Wetlands</u>

Wetlands provide multiple important ecosystem services, from serving as key habitat for important and sensitive species to mitigating impacts from climate change. The DCP developed a comprehensive wetland monitoring plan to better understand the role tidal wetlands play in providing these services to vulnerable coastal communities. Though the comprehensive collection and analysis of data from surface elevation tables, meteorological stations, elevation, emergent vegetation biomonitoring, and hydrology studies, wetland coefficients can be determined to support and refine Hazus and storm modeling to improve coastal resiliency planning efforts.

One of the many ecosystem services tidal marshes provide is to buffer uplands from coastal storms; reducing tidal energy and serving as reservoir to contain flood water. However, due to the intrinsic nature of vegetation and its effect on LiDAR, obtaining accurate marsh elevations to more fully understand hydrology has been difficult. The DCP partnered with the Delaware Geological Survey (DGS) to investigate methods to improve digital elevation models (DEM) for marsh vegetation to support its use in tidal wetland applications, including HAZUS modeling for flood risk and coastal inundation, as small differences in elevation can have a large impact on hydrology, vegetation, and habitat. After evaluating several approaches, including a Structure from Motion project using drone-based aerials to create digital elevation models, the DGS developed the algorithms to produce a bias-corrected LiDAR DEM for the tidal wetlands in Delaware along the Delaware Bay coast. As a result of this partnership, additional funding has been made available to expand the analysis to other parts of the state.

Data collection from an array of water sensors is also improving our understanding of water movement through marshes during storm events. While the traditional beach and dune system protect the ocean and bay shorelines, back marsh flooding is harder to predict and more frequent in coastal communities near Delaware's rivers and inlands bays. The DCP's efforts to understand all factors affecting wetlands hydrology, storage potential will allow support more predictive flood models for coastal communities.

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Assessment Phase I

Wetlands

Resource Characterization

1. Using reports provided from NOAA's Land Cover Atlas, please indicate the extent, status, and trends of wetlands in the state's coastal counties.

Table 1: Coastal Wetlands Status and Trends

Coastal Wetlands Status and Trends*				
	1992[1]		2007[2]	2017[3]
Total Wetland Acres (acres)	353,878		320,076	296,938
Palustrine Wetlands	189,471		242,630	166,958
Estuarine Wetlands	127,348		75,966	113,318
Net Change Over Time	**2007-2017***		**1992 – 2017***	
	Acres	**%**		%
Total Wetlands	-23,138	-7	-56,940	-16
Palustrine Wetlands	-75,672	-31	-22,513	-12
Estuarine Wetlands	37,352	49	-14,030	-11

* Due to the different analytical techniques and assumptions used during each of the above referenced efforts to identify and characterize wetland status and trends in Delaware, it is inaccurate to directly compare the data presented in each of these sources as is done above.

[1]Tiner, R.W. 2001. Delaware's Wetlands: Status and Recent Trends. U.S. Fish and Wildlife Service, Northeast Region, Hadley, MA. Prepared for the Delaware Department of Natural Resources and Environmental Control, Watershed Assessment Section, Division of Water Resources, Dover, DE. Cooperative National Wetlands Inventory Publication. 19 pp

[2]Tiner, R.W., M.A. Biddle, A.D. Jacobs, A.B. Rogerson and K.G. McGuckin. 2011. Delaware Wetlands: Status and Changes from 1992 to 2007. Cooperative National Wetlands Inventory Publication. U.S. Fish and Wildlife Service, Northeast Region, Hadley, MA and the Delaware Department of Natural Resources and Environmental Control, Dover, DE. 35 pp.

[3]Robinson, Alison. "A Decade in Review: Delaware Statewide Wetland Changes 2007-2017." Delaware Wetlands Conference, 29 January 2020, Wilmington, DE. Keynote Address.

Table 2: How Wetlands Are Changing - Area of Wetlands Transformed to another Type of Land Cover*

Land Cover Types	1996-2011 (acres)	2006-2011 (acres)
Development	-1252.3	-191.0
Agriculture	-2848.9	4.4
Barren Land	-362.9	53.2
Water	-97.8	105.6

*The State currently has LULC data for 2007 and 2012, however, a glitch in its current GIS mapping application and associated servers are not allowing for spatial analysis to be conducted. The release of an update to this system is eminent. The 2017 LULC is anticipated to be published in the summer of 2020. This table will be updated prior to the report being finalized if the data is made available by that time.

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

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State Wetland Trends

In 2020, the DNREC Wetland Monitoring and Assessment Program (WMAP) will release the report, "A Decade in Review: Delaware Statewide Wetland Changes 2007-2017". This review is a continuation of previous statewide mapping and status and trends reporting efforts. Using 2017 aerial imagery, WMAP completed the assessment to National Wetlands Inventory 2.0 standards at a 9-inch resolution, or 0.1-acre wetland minimum mapping unit. Included in this latest iteration is the statewide wetland layer (Cowardin classifications; landscape, landform, water flow path, and water body type; and national hydrography dataset lines); high tide line; high marsh/low marsh tidal layer; and trends layer (gains, losses and wetland type changes). With the use of recent LIDAR-refined riverine mapping, an extensive quality-assured verification effort, and multiple rounds of desktop map reviews, WMAP feels the effort has resulted in more conservative mapping with increased accuracy and confidence. Changes seen as a result of this analysis include a natural conversion of wetlands due to increased inundation and flooding, as seen with previously mapped freshwater forested wetlands converting to freshwater emergent with standing dead trees. Changes have also been seen from SLR and saltwater impacts, and direct anthropogenic impacts from timber harvest and development.

Wetlands Rating and Assessment

The DNREC WMAP continued to assess tidal and non-tidal wetland conditions. During this assessment period, updates were made to, a) the Delaware Comprehensive Assessment Procedure (DECAP), a method to assess the condition of wetlands relative to minimally disturbed sites; and b) the Mid-Atlantic Tidal Wetland Rapid Assessment Method (MidTRAM), a method to assess the condition of tidal wetlands. Revisions to DECAP included changing the protocol for establishing the assessment area and locating vegetation plots, replacing the condition rating with the Qualitative Disturbance Rating, and removing the reference to the Tiered Aquatic Life Use Model. Revisions to the MidTRAM included changing metrics to better reflect wetlands conditions and updates to minimize user subjectivity and interpretation. Data collected for condition assessments are made available through the Delaware Open Data portal for both tidal and non-tidal wetlands.

Management Characterization

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

Table 3: Significant Changes in Wetland Management

Management Category	**Significant Change** (Y/N))
Statutes, regulations, policies, or case law interpretation	No
Wetlands programs (e.g., regulatory, mitigation, restoration, acquisition)	Yes

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2. For any management categories with significant changes, briefly provide the information below or reference the section in which it is provided:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Various projects have occurred during this period that may impact the management of wetlands in Delaware. However, as has been seen in the past, education of landowners and decision-makers on the importance of these habitats continues to be an important factor in future protection efforts.

A Decade in Review: Delaware Statewide Wetland Changes 2007-2017

The 10-year wetland change analysis, as previously described, may be used to further the understanding of regulatory effects, restoration and management planning, and outreach. The more detailed analysis of 2017 conditions can aid in predicting impacts from regulatory changes. In using this information, the State can more effectivity quantify and characterize how recent changes to the Clean Water Act Waters of the United States rule will impact Delaware's wetlands, with thousands of acres facing reduced wetlands protections, including headwater, streams, and floodplain wetlands that have been cut off from flow, there may be motivation to establish protections at the state level. The wetland change layer can assist in targeting shoreline erosion or tracking wetland migration and habitat conversion to more efficiently target restoration efforts. The results of this effort will be used to update the 2015 State Wetland Management Plan, which currently identifies seven goals and action items to address gaps and needs necessary to improve the capacity of Delaware to monitor, restore and regulate and conserve its wetland resources.

Wetland Migration

Protection of wetlands is important in Delaware due to its high potential of loss from SLR. Therefore, it is important to understand which areas of the state may be suitable for future marsh migration in order to adapt management practices to prevent a net loss in tidal wetlands. A study by DCMP aimed to benefit state land management practices by conducting a suitability analysis on lands in Delaware that may have the potential for future marsh migration. This was achieved through a model in ArcGIS combining the Delaware 0.5m, 1m and 1.5m future SLR scenarios, soil type, slope, LULC, and distance to current tidal wetlands. The model excluded areas of impervious surface, open water, and the current extent of tidal wetlands. The result is a layer for each sea level rise scenario showing the possible suitability of land for future marsh migration. The final layer includes five categories: areas receiving a score of zero are unsuitable for marsh migration, scores between one and three are unlikely suitable for migration, four to six are moderately suitable, 7-9 are suitable and 10-12 are highly suitable. The 1m SLR marsh migration results were analyzed for intersection with protected (publicly owned) and unprotected (privately owned) lands as well as LULC. The results of the 1m sea level rise migration model indicate that 26,391 acres are highly suitable for migration, a majority of which are on privately owned, unprotected lands (60%). More than 43% of the highly suitable areas are currently non-tidal wetlands and almost 34% are currently agricultural lands. This research may help in the development of polices for land protection and direct funding for future acquisitions.

The Delaware Freshwater Wetlands Toolbox

In 2017, DNREC's WMAP launched an on-line GIS-based mapping tool to aid landowners understand the benefits of wetlands, learn the different types, and know if they have wetlands present on their property. Additionally, landowners are encouraged to make the "Wetland Protection Promise", which includes selecting native plants for landscaping, properly disposes trash and waste, avoiding building on wetland areas, and volunteering for an annual clean-up or planting event. Available free for users, wetland landowners using the toolkit can also request a complimentary on-site wetland health evaluation. This tool can help increase landowners' understanding of these valuable habitats and introduce them to stewardship practices that may assist in their long-term preservation.

Delaware Living Shoreline Committee

The Delaware Living Shorelines Committee is a workgroup dedicated to facilitating the understanding and implementation of living shoreline tactics within the State of Delaware. The Committee is comprised professionals from DNREC, National Estuary Programs, the U.S. Fish and Wildlife Service (USFWS), UD, Delaware State University, and private engineering and consulting companies and provides practitioners and researchers the opportunity to discuss current and upcoming living shoreline projects in Delaware, enabling them to stay informed on new policies or techniques. Various outreach and training opportunities have been made available for professionals and property owners, including tailored webinars and in-person workshops to introduce living shoreline science and functional design creation and site evaluation. Additionally, the Committee developed the Delaware Living Shoreline Monitoring Framework, a tool to help landowners, professionals, and scientists develop plans for gauging the success of living shoreline projects installed throughout the state. The step-by-step framework outlines how to identify and prioritize living shoreline project goals (e.g. shoreline stabilization, habitat creation, and water quality improvement), assess whether a living shoreline is developing correctly for each goal, and improve site management if performance is lagging.

USFWS Prime Hook National Wildlife Refuge Wetland Restoration

The USFWS completed a significant tidal marsh restoration project. For decades, the marshes at Prime Hook National Wildlife Refuge had been managed as freshwater impoundments. However, after the beach dune system incurred multiple breaches from a series of coastal storms and the resulting saltwater inundation substantially damaged the freshwater systems, the decision was made to alter the long-term management practices and restore the system to brackish marshes. With monitoring support from the DCP, the approximately 4000-acre salt marsh was restored to allow proper hydrologic flow by reestablishing the natural channel system and restoring the brackish nekton and vegetation communities. Additional information on this project is provided in the Cumulative and Secondary Impacts assessment.

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Enhancement Area Prioritization

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

High	X
Medium	
Low	

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

Wetlands in Delaware are facing ever increasing threats, from development and deregulation to sea level rise, making the need to protect, conserve, and enhance these valuable natural resources even more urgent. Recognizing these increasing pressures, networked partners have taken additional strides to educate stakeholders and coordinate information exchange. A key group proven to have influence over activities affecting wetlands in the state are realtors. Focused efforts to increase the understanding of the importance of wetlands and the ecosystem services they provide, flood risks, and development of regulation relating to beaches have resulted in the creation of 3-hr training targeting realtors, which has seen a good level of participation. Another priority area discussed was the continued need to share information on research and monitoring efforts. The Delaware Environmental Monitoring Coordination Council, which has received financial and technical support from the DCMP, was founded in 2018 and aims to coordinate environmental monitoring efforts, enhance communication among programs, and identify and leverage resources to minimize redundancy and optimize resources. It is comprised of members from government, academic and non-profit sectors, and hosts an annual symposium to learn about the current state of environmental monitoring activities in Delaware, discuss upcoming challenges, and explore opportunities to collaborate on future monitoring campaigns. The DCMP understands these needs and will continue in its role to supporting its networked partners and stakeholders in their efforts more effectively understand, protect and restore these important resources.

The DCP received input from state, county, and local government officials along with private citizens, academic and non-government entities through surveys, in-person meetings, and strategic planning workshops. Input received indicates that wetlands are a priority enhancement area and ranked high as an area in need of continued support.

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Coastal Hazards

Resource Characterization

1. In the table below, indicate the general level of risk in the coastal zone for each of the coastal hazards.

Table 4: General Level of Hazard Risk in the Coastal Zone

Type of Hazard	**General Level of Risk** (H, M, L)	**Risk Change due to SLR** (↑, ↓, unknown)
Coastal Flooding	High	Increase
Coastal storms (including storm surge)	High	Increase
Winter Precipitation	Moderate	Increase
Shoreline erosion	Moderate	Increase
Inland Flooding (riverine /stormwater)	Moderate	Increase
Geological hazards (e.g. earthquakes, tsunamis)	Low	Unknown
Sea level rise	Not Ranked*	-
Land subsidence	Not Ranked*	Increase
Saltwater intrusion	Not Ranked*	Increase

* The 2018 State of Delaware All Hazard Mitigation Plan does not include sea level rise, land subsidence and saltwater intrusion as direct natural hazards. However, SLR along with climate change, were considered factors that can increase the adverse effects of certain hazards.

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

SLR Planning Scenarios Update

The DCMP and the Delaware Geological Survey (DGS) released a report updating SLR planning scenarios for the State of Delaware, as directed by Executive Order 41 issued by Governor Markell. Previous planning scenarios were based on detailed analysis of available research, included three SLR projections. This new effort using statistical methods refined the original scenarios of 0.5m, 1.0m, and 1.5m of rise to 0.52m, 0.99m, and 1.53m of rise by the year 2100. Additionally, GIS-based inundation maps illustrating coastal inundations in one-foot increments above mean higher high water (MHHW) were also developed for use in planning efforts.

Resilient Community Partnership

A change implemented during this assessment period was a revision of the DCMP's financial and technical assistance program to assist local municipalities plan for and reduce impacts from coastal hazards. Prior to 2016 the DCMP awarded community grants typically in the range from $5,000 to $25,000 for small projects or to assist in comprehensive plan development. Many of these projects were piecemeal efforts that, while worthwhile, could not effectively address many important issues communities faced due to lack of financial and/or political support. With the initiation of the RCP, which provides up to $75,000 and target technical support, a community works to address a

resiliency issue from early planning up to implementation. These efforts have resulted in the collection of data and information and preparation reports necessary for these municipalities to significantly advance their planning efforts. The initiative has successfully completed three partnerships. The first partnership produced data and visualization tools to assess and characterize vulnerabilities to coastal storms, SLR, extreme tide, wildfires, and temperature changes due to climate change. With minimal resources to improve their planning and mitigation, the town developed and began implementing a comprehensive plan with adaptation and mitigation measures to enhance its resiliency to hazardous events. One significant measure, completed with support of the DCMP and DELDOT, was the proof of concept installation of a real time flood warning system to monitor the two evacuation routes, which frequently flood during storm and extreme tide events isolating the town. This successful trial has encouraged other communities to work with Del DOT for similar installations. The second partnership was with a historic city located along the Delaware River susceptible to flooding, storm surge, and extreme tides. Upon completing a comprehensive vulnerability assessment of risks from coastal hazards, the city has been able to competitively compete for funding to initiate some of the identified measures, including initial evaluations to raise flood control levees protecting parts of the community. The latest partnership saw multiple coastal communities joining together to address a common issue, the increasing rate of impervious surface and its influence on flooding. This effort resulted in the development of a toolkit with community-specific measures to increase stormwater infiltration, and local model ordinances to limit the increase in impervious surface on building lots tailored to each community. Shifting focus to the state government, the DCMP is supporting the OSPC to improve its GIS-planning portal to help streamline comprehensive and development plan reviews development of state spending strategies.

Management Characterization

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

Table 5: Significant Changes in Hazard Statutes, Regulations, Policies, or Case Law

Topic Addressed	**Employed by State** (Y/N)	**CMP Provides Assistance to Locals that Employ** (Y/N)	**Significant Changes Since Last Assessment** (Y/N)
Elimination of high-hazard development / redevelopment	No	Yes	No
Management of high-hazard development / redevelopment	No	Yes	No
Climate change impacts, including SLR	No	Yes	No

Table 6: Significant Changes in Hazard Planning Programs or Initiatives

Topic Addressed	**Employed by State** (Y/N)	**CMP Provides Assistance to Locals that Employ** (Y/N)	**Significant Changes Since Last Assessment** (Y/N)
Hazard Mitigation	Yes	Yes	No
Climate change impacts, including SLR	Yes	Yes	No

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Table 7: Significant Changes in Hazard Mapping or Modeling Programs or Initiatives

Topic Addressed	**Employed by State** (Y/N)	**CMP Provides Assistance to Locals that Employ** (Y/N)	**Significant Changes Since Last Assessment** (Y/N)
Sea level rise	Yes	Yes	Yes
Other hazards	Yes	Yes	Yes

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

Coastal "High Hazard Areas" are defined as areas of special flood hazard extending from offshore to the inland limit of a primary frontal dune along an open coast and any other area subject to high velocity wave action from storms. Coastal high hazard areas also are referred to as "Zone V" or "V Zones" and are designated on FIRMs as flood insurance risk Zone VE.

3. For any management categories with significant changes, briefly provide the information below or reference the section in which it is provided:
    a. Describe the significance of the changes;
    b. Specify if they were 309 or other CZM-driven changes; and
    c. Characterize the outcomes or likely future outcomes of the changes.

Hazus Modeling

In Delaware one of the greatest impacts from coastal storms is flooding, either via storm surge or from the tributaries and surrounding tidal wetlands, combined with freshwater runoff both exacerbated by SLR. The economic benefits of the existing beach replenishment program are well understood by community officials and resource managers. However, SLR and storm models show flood damage will increasingly occur in areas that do not receive protection from beach nourishment projects and might benefit from nature-based strategies for flood mitigation. As part of the current 309 strategy, the DCMP has worked to quantify the economic and social benefits of both nature-based and traditional infrastructure and other adaptation measures, to support proactive investment in infrastructure improvements and enhancement of natural protections provided by wetlands. The DCP is collecting localized data on infrastructure and quantifying the protection value of wetlands for use as inputs into the Federal Emergency Management Agency Hazus model to determine the economic impact of coastal flooding events. Hazus is a risk assessment methodology for analyzing potential losses from floods and hurricane, coupling current scientific and engineering knowledge with the latest GIS-technology to produce estimates of hazard-related damage before or after a disaster occurs. With quantitative cost-benefit information, local governments can make more informed financial decisions, justify capital improvements, and modify ordinances and comprehensive plans to include protection and zoning measures.

Research and Tools

The DCMP has developed or funded development of several tools to help emergency managers, communities, and citizens manage the impacts of SLR and become more aware of and prepared for coastal storms. As reviewed earlier, the DCMP funded and participated in the update of the SLR scenarios for Delaware in 2017 and creation of new SLR inundation maps. Unlike the original maps

that only depicted potential SLR scenarios for the year 2100, the new maps indicate flooding at one-foot increments from MHHW to 7 ft. above MHHW. This allows users to plan for different SLR levels based on various time frames and rates. Another tool developed in conjunction with UD is the Coastal Flood Monitoring System (CFMS). This application uses NOAA predictive surge levels along the Delaware Bay and River coupled with DEMs for each watershed to show the extent of predicted flooding including evacuation routes road elevations and depth of water on these roads. The need for the CFMS arose in 2009 when a storm in the mid-Atlantic had little predicted impact for the Atlantic coast or the metropolitan areas of northern Delaware; however, the central Delaware Bay coast experienced severe flooding without warning or time for preparation. Since then, DCMP has provided technical and financial support for the development and continued expansion of this important planning tool. Another tool supported by the DCMP is the Delaware Weather Hazard Index. Need for this tool is again to provide a better explanation of the predicted impacts to a localized area. This application, which is in beta testing, examines each component of a weather induced event and gives a separate hazard level for each component based on the NOAA predicted values. For example, the surge from a nor'easter would have the greatest impact along the coast but inland, rain induced flooding or wind gusts might have the greatest impacts. A user would select their location from the map and see the individual predicted values for their location up to 48 hours in advance.

Enhancement Area Prioritization

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

High	X
Medium	
Low	

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

The effects of coastal hazards continue to be seen in Delaware. This is evident with the increase in flooding frequency, both as a result of coastal storms but also high tide flooding exacerbated by SLR. In the last decade, municipalities have begun to take the threats of and the need to plan for these hazards more seriously, but with inadequate resources or technical capacity to address these issues they are limited in what they are able to do. The DCMP understands these needs, as well as the needs to support research and the development of tools, in order to comprehensively evaluate and respond to the risks of coastal hazards. The DCMP will continue in its role to supporting its networked partners and stakeholders in their efforts.

The DCP received input from state, county, and local government officials along with private citizens, academic and non-government entities through surveys, in-person meetings, and strategic planning workshops. The input received strongly supports coastal hazards as a high priority enhancement area due to the need for continued technical and financial support for stakeholders across the state in planning, training, research, and outreach.

Public Access

Resource Characterization

1. In the table below, provide data on public access availability within the coastal zone.

Table 8: Public Access Status and Trends

Type of Access	Current Number	Trend Since Last Assessment (↑, ↓, unknown)	Data Source
Beach Sites	165	Increase	DNREC SWMS
Recreational Boat Sites	74	No change	DNREC DFW
Designated Scenic Vistas or Overlook Points	1 Wild & Scenic River; 6 Scenic By-ways	Increase	Rivers.gov DELDOT
Fishing Points / Shoreline Sites +	60 (tidal/nontidal); 14 artificial reefs	Increase	Delaware 2018 SCORP DNREC FW
Coastal Trails	550 miles	Unknown	Delaware 2018 SCORP
Parkland / Open Space ++	158,203	(no change)	Delaware Outdoor Recreation Inventory (2018)
ADA Compliant	113 +	unknown	DNREC DPR and DFW

+ Non-beach; ++Acres

2. Briefly characterize the demand for coastal public access and the process for periodically assessing demand. Include a statement on the projected population increase for coastal counties.

Delaware's five-year Statewide Comprehensive Outdoor Recreation Plan (SCORP) is a planning and policy effort that identifies outdoor recreation needs throughout the state. Identification of these needs guides the investment and distribution of funding for outdoor recreation, from the Federal Land and Water Conservation Trust Fund, Delaware Outdoor Recreation, Parks, and Trails Program funds, as well as other public and private sources. During the development of the SCORP, input from diverse stakeholders, including citizens; local interest groups; and municipal, county, and state government agencies was used to identify and provide recommendations to meet Delaware's outdoor recreation needs. A technical advisory committee comprised of more than twenty local, regional, state, federal, and non-governmental organizations, informed and guided plan development.

Findings reported in the 2018 SCORP, included changes identified in recreation and growth trends, community needs, and landscape preferences. According to the plan, 96% of Delaware residents indicate outdoor recreation in important to their quality of life, 55% participate in outdoor recreation for physical fitness and healthier living, representing increase and decrease of 3%, respectively. Challenges identified included meeting the needs of a changing population and addressing a backlog of maintenance and rehabilitation of existing facilities. The largest demographic increase is predicted to be the 60+ age group.

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According to the Delaware Population Consortium[1], population and household change predictions for coastal counties from the previous Section 309 assessment are as follows:

	Population			Households		
County	2015	2020	% Change	2015	2020	% Change
New Castle	552,592	564,780	2.21%	202,268	204,441	1.07%
Kent	174,092	178,650	2.62%	65,481	68,565	4.71%
Sussex	213,704	234,350	9.66%	81,183	91,317	12.48%

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

The 2018 SCORP surveyed household participation on various outdoor activities. The following are trends indicating an increase in select public access related activities from 2013 to 2018:

Participation in Outdoor Recreation (Household)			
Activity	2013	2018	% Change
Walking / Jogging	74	82	10.8%
Swimming (Beach)	60	73	21.7%
Visiting Historic Sites	53	66	24.5%
Fishing	40	56	40.0%
Hiking	34	55	61.8%
Canoe / Kayaking	23	41	78.3%
Nature Programs	26	38	46.2%
Hunting	12	28	133.3%

Management Characterization

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

Table 9: Public Access Management Approach

Management Category	**Employed by State** (Y/N)	**CMP Assistance to Locals that Employ** (Y/N)	**Significant Changes Since Last Assessment** (Y/N)
Statutes, regulations, policies, or case law interpretations	No	No	No
Operation/maintenance of existing facilities	Yes	No	No
Acquisition/enhancement programs	Yes	No	No

[1] https://stateplanning.delaware.gov/demography/dpc.shtml (February 18, 2020)

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

There were no categories with significant changes.

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

Table 10: Public Access Guides

Guide	Web Address	Last Update/ Frequency	Print
Fishing	http://www.eregulations.com/delaware/fishing/	2020; annually	Yes
Hunting & Trapping	http://www.eregulations.com/delaware/hunting/	2019/20; annually	Yes
State Parks	https://www.destateparks.com/	2020; Print seasonally; online as needed	Yes

Enhancement Area Prioritization

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

High _____
Medium _____
Low ___X___

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

DCP stakeholder engagement of state, county, and local government, and non-governmental entities highlighted both new tactics and concerns regarding public access in Delaware. One concern is an apparent lack of understanding by some users that, due to various intended uses, differing management practices are applied to different public access areas. This results in allowable uses and amenities varying among locations based on the management goals for given areas. For example, state parks are more likely to have restrooms and other improvements than are conservation areas. Another concern is capacity for education program participants. Due to school district policies, field trips at the elementary level have required single field trips to include all classes within a grade level from a given school. Due to staffing and facility requirements needed to facilitate classes from larger schools, some programs are simply unable to accommodate certain groups.

Stakeholders also shared new methods of engagement, including the development of new programs and events to connect users with resources in a meaningful manner. The regional Delmarva Paddling Weekend, launched in 2016, led to development of the Paddle Coastal Delaware map to

connect paddling enthusiast with amenities and help them better plan for an excursion. Another popular program is “Savoring Our Coastal Heritage”. Combining tales of the heroic actions performed by the beach patrols at the historic Indian River Life-Saving Station with a locally sourced dining experience inspired by local fare from 100 years earlier, participants are immersed in a farm-to-table experience like no other.

With outdoor recreation being a driving force in Delaware economy, the state puts a significant level of effort in supporting public access related activities, from acquisition to creative public programming. State parks and conservation areas are continuing to see high levels of attendance. Stakeholders within this area reasonably ranked this a moderate priority level. However, due the effort and resources being provided to support this enhancement area by others in the state, the DCMP has ranked it as a low priority.

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Marine Debris

Resource Characterization

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

Table 11: Marine Debris Status and Trends

Source of Debris	**Significance of Source** (L, M, H, Unknown)	**Type of Impact** (aesthetic, resource damage, user conflict, other)	**Change since last assessment** (↑, ↓, unknown)
Land-based			
Beach/shoreline	M	Aesthetic, resource impact	-
Dumping	M	Aesthetic, resource impact, user conflict	-
Storm drains and run-off	L	Aesthetic, other	Unknown
Fishing (e.g. line, gear)	L	Aesthetic, user conflict, resource impact	-
Ocean-based			
Fishing (e.g. line, gear)	M	Aesthetic, user conflict, resource impact	-
Derelict vessels	L	Aesthetic, user conflict, resource impact	-
Vessel-based (e.g. cargo, etc)	L	Resource impact/water pollution*	Unknown
Hurricane / Storm	M	Aesthetic, resource impact	Unknown
Tsunami	L	No impact to Date	-

*No/insufficient data to quantify this source of marine debris

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

Adopt-A-Beach

The DNREC in partnership with dedicated volunteers works in tandem to protect and enhance Delaware's beaches. Small sections of beach along Delaware's Atlantic coast, each approximately ½-mile, have been designated for adoption through the program. Adopt-A-Beach volunteers commit to conducting at least four cleanups over two years. Cleanups take place each year during spring and summer—between April 15-May 15 and from mid-August to mid-September, preferably occurring simultaneously with the annual Coastal Cleanup. While data is collected for this initiative, due to variable timing of collection and volunteer numbers, shoreline marine debris trends can't be determined from this effort. It does, however, elevate awareness to marine debris clean-up needs among public stakeholders.

Coastal Clean-up

DNREC has continued to lead the Delaware Coastal Cleanup in conjunction with The Ocean Conservancy's International Coastal Cleanup, completing its 32nd, year in 2019. The most recent

efforts resulted in the collection of 3.8 tons of trash and recyclables compared to 2.8 tons in 2018, 4.3 tons in 2017, and 5.3 tons in 2016. An effort to simplify the reporting through an online data application was piloted in 2019. The DCMP has been involved with this initiative by providing staff and funding to coordinate and conduct the cleanup activities. There was little change in the proportions of types of debris collected during this these time periods. The Delaware Coastal Cleanup includes a recycling component which has been in place since 2011. The debris collected each year is separated to reduce the amount being directed to state landfill. This effort has resulted in from 30-50% of the waste collected each year being redirected to material recovery facilities for recycling. This is a highly popular program and is key in providing the public with the awareness of the detrimental impact litter has on the environment.

Grappling the Invisible: A derelict crab pot removal pilot study

In 2016, DCMP initiated a pilot study to identify and test removal methods on derelict crab pots within Delaware Bay. In collaboration with Stockton University, DCMP has identified over 700 derelict crab pots in the Delaware Bay. The ability to retrieve these pots was significantly impacted by the energy within the system. Pots, after being located with side-scan sonar, would then be pushed along the bottom to new locations before retrieval could occur. Focus then shifted to pot removal in Delaware's Inlands Bay, a system with significantly less energy and more clarity. Partnering with UD and Delaware Sea Grant, side-scan sonar surveys located 294 submerged derelict crab pots in 175-acre area in Rehoboth Bay. This project aims to not only remove the derelict crab pots from Rehoboth Bay but also to collect information to support the development of education and outreach materials on locally relevant impacts. DCMP also partnered with DNREC's Division of Parks and Recreation (DPR) to create a blue crab sculpture at Cape Henlopen Seaside Nature Center to bring awareness to marine debris issues and the environmental impacts of derelict crab pots, and in consultation with DNREC's DFW, DCMP developed an outreach video on how to properly rig recreational crab pots in Delaware.

Microplastics

Understanding the extent and character of microplastics in Delaware's water and bay beaches has been a research interest for the DCP. Initial efforts have focused on developing a sampling methodology to identify and obtain baseline data for microplastics present in sand, surface water, and sediments. Initial findings indicate that microplastics of all forms (fragments, fibers, beads) are present in Delaware's coastal habitats; however, microplastics are ubiquitous and there is a potential for the addition of microplastics into a sample due to background contamination. While DCMP has made strides over the years, in collaboration with partners throughout the Mid-Atlantic to optimize the microplastic sampling methodology. A trial recovery experiment found that reported microplastic values from sand samples are likely a conservative value as 94% of the samples recovered a lower microbead value than what had been initially added. Additionally, smaller beads had a lower recovery compared to larger beads, suggesting a recovery bias. Additionally, the DCMP is collaborating with UD to evaluate the movement of microplastics and its impacts to the marine food web.

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Regional Collaborative Efforts

Regional partners in the Mid-Atlantic Regional Council on the Ocean (MARCO), including DCMP, have been working to conduct a community-based social marketing campaign to halt mass balloon releases. The project's goal is to expand Virginia's mass balloon release campaign, A Joyful Send-Off, to the five Mid-Atlantic states. Delaware-focused data collection efforts include balloon debris monitoring at Delaware Seashore State Park with volunteers from a local fishermen organization and stakeholder surveys at wedding venues to determine the effectiveness the campaign.

Management Characterization

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

Table 12: Marine Debris Management

Management Category	**Employed by State** (Y/N)	**CMP Assistance to Locals that Employ** (Y/N)	**Significant Changes Since Last Assessment** (Y/N)
Statutes, regulations, policies, or case law interpretations	Yes	No	Yes
Marine debris removal programs	Yes	No	No

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

The full impact Marine debris on Delaware has not previously been fully characterized. However, a 2018 study from Keep Delaware Beautiful and the State of Delaware identified more than 6,000 pieces of litter for every mile of Delaware roadway surveyed. Cigarette butts, plastic bags, aluminum cans, and glass bottles accounted for a significant percentage of the roadway trash. While land-based, in 2019 Delaware's Governor John Carney has supported laws and implemented a program to reduce litter that will make its way in the marine environment. The "Keep DE Litter Free" initiative, a campaign to reduce litter across Delaware, was launched. The campaign aims to increase awareness about litter, partner with local officials to pursue anti-litter policies, and reduce the amount of litter in Delaware over time. Also, Governor Carney joined members of the General Assembly to sign two pieces of legislation aimed at confronting litter in Delaware. Both new laws will help protect Delaware communities from litter and protect Delaware's environment and wildlife from the harmful effects of discarded waste. One bans the use of single-use plastic bags and encourages a shift to reusable bags. The second addresses individuals dumping large quantities of trash on public and private property by increasing penalties for unlawful dumping and creating a Litter Investigation and Enforcement Fund.

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Enhancement Area Prioritization

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

High	_____
Medium	__X__
Low	_____

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

New state legislation to address litter and sources that contribute to marine debris have been enacted. DCMP has been engaged in efforts with local and regional partners to better understand the significance of difference sources as well as new approaches for changing behavior. DCP conducted stakeholder engagement of state, county, and local government, and non-governmental entities indicated marine debris was a concern but not the highest priority enhancement issue and ranked it medium. The DCP will continue to coordinate with partners conducting marine activities and, when a need arises that can be addressed with DCP staff or resources; it will work with its partners to address that need.

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Cumulative and Secondary Impacts

Resource Characterization

1. Using National Ocean Economics Program Data on population and housing, please indicate the change in population and housing units in the state's coastal counties between 2010 and 2018.

Table 13: Trends in Coastal Population and Housing Units

Demographic	2010	2018	Percent Change
Population	899,595	967,171	7.51%
Housing Units	406,496	438,693	7.92

2. Using provided reports from NOAA's Land Cover Atlas, please indicate the status and trends for various land uses in the state's coastal counties between 1996 and 2016.

Table 14: Distribution of Land Cover Types in Coastal Counties

Land Cover Type	**Land Coverage in 2011** (acres)	**Gain/Loss Since 2006** (acres)
Developed, High Intensity	45150.04	1746.2
Developed, Low Intensity	87168.1	1723.8
Developed, Open Space	60762.3	780.8
Grassland	9197.1	884.0
Scrub/Shrub	37773.3	4399.4
Barren Land	6332.9	275.8
Open Water	346836.6	242
Agriculture	549808.0	-5135.8
Forested	149099.8	-4784.2
Wetland	302404.3	-165.2

*The State currently has LULC data for 2007 and 2012, however, a glitch its current GIS mapping application and associated servers are not allowing for spatial analysis to be conducted. The release of an update to this system is eminent. The 2017 LULC will be published in the summer of 2020. This table will be updated prior to the report being finalized if the data is made available by that time.

3. Using provided reports from NOAA's Land Cover Atlas, please indicate the status and trends for developed areas in the state's coastal counties between 2006 and 2011 in the two tables below.

Table 15: Development Status and Trends for Coastal Counties

	2006	2011	Percent Net Change
Percent land area developed	188829.9 (11.8%)	193080.8 (12.1%)	4251.6 (2.2%)
Percent impervious surface area	59356.5 (3.7%)	61015.8 (3.8%)	1659.3 (2.8%)

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Table 16: Land Use Change in Coastal Counties

Land Cover Type	Acres Lost to Development Between 2006-2011
Barren Land	90.7
Wetland	262.6
Open Water	13.1
Agriculture	4240.8
Scrub/Shrub	182.8
Grassland	88.5
Forested	548.6

*The State currently has LULC data for 2007 and 2012, however, a glitch its current GIS mapping application and associated servers are not allowing for spatial analysis to be conducted. The release of an update to this system is eminent. The 2017 LULC will be published in the summer of 2020. This table will be updated prior to the report being finalized if the data is made available by that time.

4. Briefly characterize how the coastal shoreline has changed in the past five years due to development, including potential changes to shoreline structures such as groins, bulkheads and other shoreline stabilization structures.

Delaware has experienced relatively little coastal shoreline change in the past five years as a result of development. This is primarily due to the State's Beach Preservation Act (7 Del. C. Ch 68) and its associated regulations, that minimize the impact of development to preserve the protective and recreational functions of beaches and dunes, and the State Coastal Zone Act (7 Del. C. Ch 70) and its associated regulations, that restrict industrial development within the coastal strip. Shoreline protection occurs principally in the form of beaches and dunes. Nourishment of the ocean beach is undertaken by the U.S. Army Corps of Engineers in coordination with DNREC. Maintenance activities of the Bay beaches, including the region from Pickering Beach south to Broadkill Beach, have been occurring as part of a 10-year management plan for the area and are primarily funded with state resources.

Two notable shoreline management projects were completed during this assessment period. Firstly, building on a DCMP-funded study was the stabilization of the Mispillion Harbor inlet region to preserve rapidly eroding habitat in a prime horseshoe crab spawning area. Due to funding limitations, only small stop-gap measures were implemented to limit the degradation. It was not until post-Sandy National Wildlife Foundation and USFWS funds of $5.8 Million, along with $2 million in state funds, allowed for the three-year restoration project to be completed in 2018. The work included the raising of the existing rock structure that served as a breakwater and jetty. Originally constructed in the 1980s to protect the harbor, it was raised, widened, and extended to tie into the existing dune. The sandy beach areas protected by the structure were nourished and planted with beach grass. Secondly, south of Mispillion Harbor is the Prime Hook National Wildlife Refuge. The DCP had been working with the Refuge staff since 2010 to examine its concerns of water quality and loss of habitat. After several storms caused minor breaches in the freshwater impoundments along the Delaware Bay, Superstorm Sandy destroyed large sections of the dunes essentially converting the impoundments into a tidal bay. Instead of restoring the freshwater impoundments, the DCP worked closely with USFWS engineers to conduct a large-scale tidal marsh restoration project. It was one of the largest marsh restoration projects ever done in the eastern

United States. The restored hydrological and salinity regimes now are supporting the natural recolonization of salt marsh grasses and provide flood protection to the neighboring communities.

5. Briefly summarize the results of any additional state-specific data or reports on the cumulative and secondary impacts of coastal growth and development, such as water quality, shoreline hardening, and habitat fragmentation, since the last assessment.

WATAR and Fish Consumption Advisories

The Watershed Approach to Toxic Assessment and Restoration (WATAR) creates the linkage between the rehabilitation of contaminated sites and improvement in watershed health. WATAR is a cooperative initiative within DNREC between the Division of Waste and Hazardous Substances Site Investigation and Restoration Section and Division of Watershed Stewardship Watershed Assessment Program, two programs that found frequently working on the same projects from different perspectives trying to achieve the same goal. Because of Delaware's industrial past, persistent, bioaccumulative, and toxic substances have accumulated in the water, soils, and organisms that inhabited these environments over time. Long-term exposure to these chemicals increases health risks to humans, aquatic life, fish-eating birds, and other wildlife. However, it is not only a priority to address toxics at contaminated sites and in Delaware's watersheds, but to also foster restoration of the natural flora and fauna that were once there. By joining together, the programs were able to leverage resources to accelerate the cleaning and restoration of contaminated sites and impacted watersheds while monitoring to assess long-term improvement. The latest fish consumption advisory shows the concentration of chemical contaminants in fish caught from Delaware waterways continues to decline. This indicates the water quality is improving throughout the state and also means that fish caught in many Delaware waters can now be consumed with lower concerns about risks to public health.

Wetlands Rating and Assessment

As referenced in the Wetlands Phase I assessment, the DNREC WMAP includes habitat fragmentation in its assessments of watersheds in the state. The characterization of the available green corridors, or conversely the extent of habitat fragmentation, help support the development of management strategies that enable resources to be directed towards their support.

Delaware Forests

According to a recent analysis of forest cover in Delaware by the U.S. Department of Agriculture, there were approximately 356,000 acres of forest land in 2017, 78% of which are privately owned. While the increase from 2012-2017 (2.4%) is relatively small, it continues to build on inventory which reached a 30-yr low in 2011. In 2011, a 16% decrease was seen when compared to 1986 levels. In 2017, the overall loss was reduced to 12%.

The Delaware Forest Service in the Delaware Department of Agriculture implements the Urban and Community Forestry Program to increase urban tree cover throughout the state. Its aims to promote quality tree planting and management; diversify, enhance, and promote proper stewardship of urban

forest resources; promote green infrastructure to improve storm water management; and improve air quality through urban forest management practices. To date, the program has provided over $1.7 million and planted over 13,700 trees. It also launched an online GIS-based tool to help cities, towns, and neighborhoods measure and assess their current level of tree cover as a starting point to explore opportunities to plant new trees or maintain their existing ones.

Management Characterization

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

Table 17: Significant Changes in Management of Cumulative and Secondary Impacts of Development

Management Category	**Employed by State** (Y/N)	**CMP Assistance to Locals that Employ** (Y/N)	**Significant Changes Since Last Assessment** (Y/N)
Statutes, regulations, policies, or case law interpretations	Yes	No	Yes
Guidance documents	No	No	No
Management plans / SAMPs	No	No	No

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

Executive Initiatives

During the 2020 State of the State Address, Governor John Carney announced two initiatives that would address cumulative and secondary impacts throughout the state. The first was a proposal to establish the Clean Water Trust to address water quality issues in the state. With a planned $50M to augment the state revolving loan fund, Governor Carney hopes to target low-income and rural communities with insufficient infrastructure to improve stormwater management and reduce well and septic contamination. Secondly, Governor Carney wants to plant one million trees across Delaware over the next decade. Tress provide several ecosystem services and are commonly known to provide habitat, fruit, nuts and wood material. Additionally, trees can mitigate climate change by reducing energy needs, have been seen to improve physical and mental health by improving air quality and decreasing stress, and increase property values. Additionally, there are studies drawing a connection between increased tree concentration and decreased crime rates. All of these factors support the Governor's commitment to improve Delaware's environment and minimize Delaware's role in climate change.

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Regulatory Updates

Several statutes and regulations affecting secondary and cumulative impacts have been update since the last assessment including land protection, sediment and stormwater, beach protection, surface water quality, and update of the state's 305(b) and 303(d) listing of impaired waters.

Notably, in 2017, the Delaware General Assembly passed the Coastal Zone Act Conversion Permit law (CZACP; 81 Del. Laws, c. 120), the first significant amendment to the State's Coastal Zone Act (CZA) since it was enacted in 1971. Considered landmark legislation, the CZA regulates manufacturing and heavy industrial activity along the State's shoreline, protecting miles of sensitive habitat from development. Fourteen industrial sites, existing when the CZA was passed, were grandfathered. Over time, operations at some of those sites ceased and regulations prevented the sites from being converted for other uses. The CZACP, which allows new or alternative heavy industry uses to be permitted at these already heavily impacted sites, was considered and economic and environmental win by State officials as allows for the redevelopment of valuable water-front industrial properties under new regulations requiring financial assurance for site cleanup and managing environmental impacts and planning for SLR.

Enhancement Area Prioritization

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

High	_____
Medium	___X___
Low	_____

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

DCP stakeholder engagement of state, county, and local government and non-governmental entities indicated cumulative and secondary impacts are a moderate to high enhancement issue and ranked it highly as an area in need of most assistance. However, due to the efforts underway by other programs and the input received to address other enhancement areas, cumulative and secondary impacts was identified as an area of moderate priority by DCP staff through its strategic planning efforts. As addressing cumulative and secondary impacts overlaps with numerous efforts undertaken by the DCMP, it will continue to support it networked partners as resources permit.

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Special Area Management Planning

Resource Characterization

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

Table 18: SAMP Opportunities

Geographic Area	**Opportunities for New or Updated SAMPs** (Major conflicts/issues)
Near-Shore Ocean	Emerging/potential use conflicts between proposed alternative energy development (wind and wave), dredging projects, fishing, swimming and benthic resources. A SAMP could provide the foundation for developing policies and plans for these intersecting /emerging issues.
Coastal Atlantic Region	The Coastal Atlantic Region, highly vulnerable to storms and SLR, contains five jurisdictions (Sussex County, Lewes, Rehoboth, Dewey, Bethany, South Bethany and Fenwick Island) that are individually planning coastal resiliency and climate adaptation projects. Because of the similarities in issues, a SAMP could provide a venue for continued collaboration on science-based decision making.
Pea Patch Island Heronry Region	It has been over 20 years since the publication of the Pea Patch Island Heronry Region SAMP, and while the plan is still in use today, conditions in the region have changed significantly, with sea level rise and climate change, and an increase in marine transportation emerging as threats to the Heronry and its supporting habitat. An updated SAMP in this area would assess changing conditions, outline adaptation actions, and chart the course for the next 15-20 years of management of this nationally important bird nesting area.

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

Management Characterization

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

While SAMPs have been used in the past, the use of less formal, local planning and stakeholder engagement processes are emerging as productive alternatives. Due to Delaware's small size, state-level planning efforts can become targets of special interest groups who, whether true or not, voice negative opinions about the process and the intent of a program's effort. To circumvent this, the DCMP has built upon previous community grant program efforts, empowering municipal officials with tools, information and funding necessary to identify locally important issues, such has resiliency adaptation. The DCP further supports these efforts by providing municipalities with planning and stakeholder engagement resources through meeting organization and facilitation, contracting expertise, and public outreach. Most recently, the DCMP's RCP led the Delaware's ocean beach communities' collaborative effort to characterize the change in impervious surface conditions as growth pressures increase and develop adaptation policies to mitigate the associated

impacts. With many SAMPs characteristics, including policy and ordinance related outcomes, such "local-driven" efforts have been successful as residents and local stakeholders are more likely to engage and buy-in to the process.

Table 19: Significant Changes in SAMPs

Management Category	**Employed by State** (Y/N)	**CMP Assistance to Locals that Employ** (Y/N)	**Significant Changes Since Last Assessment** (Y/N)
SAMP policies, or case law interpretations	No	No	No
SAMP Plans	No	No	No

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

Enhancement Area Prioritization

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

    High _____
    Medium __X__
    Low _____

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

    Unlike the other 309 enhancement areas in Delaware which are tangible issues, SAMPs are a tool or process that can be used to develop policies and management tools for the enhancement areas within specific geographic regions. While DCP stakeholder engagement of state, county, and local government and non-governmental entities indicated SAMPS were low priority enhancement issues, the DCP staff ranked this area as a medium priority level and will evaluate the utility of implementing a SAMP as a planning and policy development tool for any high priority enhancement area.

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Ocean Resources

Resource Characterization

1. Indicate the status of the ocean and Great Lakes economy as of 2016 in the tables below.

Table 20: Status of Ocean Economy for Delaware Coastal Communities (2016)

	Jobs	Establishments	Wages ($Mil)	GDP ($Mil)
All Ocean Sectors+	28,875	1,403	$678.4	$1,300
Living Resources+	394	38	$9	$19.6
Marine Construction+	123	24	$5.6	$11.9
Ship & Boat Building+	7	--	--	--
Marine Transportation+	6,404	96	$260.1	$373.3
Offshore Mineral Extraction+	12	--	--	--
Tourism & Recreation	21,863	1,237	$400.1	$847.3

Source: https://coast.noaa.gov/enowexplorer/
+ All or part of data suppressed.

Table 21: Change in Ocean Economy for Delaware Coastal Communities (2006-2016)

	Jobs	Establishments	Wages ($Mil)	GDP ($Mil)
All Ocean Sectors+	7,444	129	284	508.4
Living Resources +	-111	10	-0.1	2.4
Marine Construction+	-141	-9	-6.5	-9.8
Ship & Boat Building+	0	--	--	--
Marine Transportation+	3,354	23	151.9	201.9
Offshore Mineral Extraction+	-44	--	--	-2.8
Tourism & Recreation	4,318	112	137.3	269.6

Source: https://coast.noaa.gov/enowexplorer/
+ All or part of data suppressed.

2. Indicate the number of uses.

Table 22: Uses within the Delaware State Waters*

Types of Use	Number of Sites
Federal sand and gravel leases (completed)	Data not available for this area
Federal sand and gravel leases (active)	Data not available for this area
Federal sand and gravel leases (expired)	Data not available for this area
Federal sand and gravel leases (proposed)	Data not available for this area
Ocean disposal sites	11 (within 10 nm)
Principle Ports (number and total tonnage)	2; 18,076,776 tons
Coastal maintained channels	18 (within 1 nm)
Designated anchorage areas	9 (within 1 nm)
Danger zones and restricted areas	2 (within 1 nm)

* Source: Delaware State Waters quick report; https://www.coast.noaa.gov/digitalcoast/tools/ort.html

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3. In the table below, characterize how the threats to and use conflicts over ocean resources in the state's coastal zone have changed since the last assessment.

Table 23: Significant Changes to Ocean Resources and Uses

Resource/Use	**Change in Threat to Resource or Use Conflict Since Last Assessment** (↑, ↓, unknown)
Benthic Habitat (include coral)	Increase
Living marine resources	Increase
Sand/gravel	Increase
Cultural /historic	Unknown
Transportation/navigation	Increase
Offshore development	Unknown
Energy production	Increase
Fishing (commercial / recreation)	Increase
Recreation and tourism	Increase
Sand and gravel extraction	Increase
Dredge disposal	Unknown
Aquaculture	Increase

4. For the ocean resources and uses in Table 23 that had an increase in threat to the resource or increased use conflict in the state's coastal zone since the last assessment, characterize the major contributors to that increase.

Table 24: Major Contributions to an Increase in Threat or Use Conflict to Ocean Resources

Resource/Use	**Change in Threat to Resource or Use Conflict Since Last Assessment**										
	Land-based Development	Energy Production	Polluted runoff	Invasive Species	Fishing (Comm /Rec)	Aquaculture	Recreation	Marine Transportation	Dredging	Sand / Mineral Extraction	Ocean Acidification
Benthic Habitat (include coral)		X								X	X
Living marine resources	X	X	X					X		X	X
Sand/gravel	X	X								X	
Transportation/navigation		X			X						
Energy production		X			X		X				
Fishing (commercial / recreation)		X									
Recreation and tourism		X				X		X			
Sand and gravel extraction	X	X									
Aquaculture		X			X						X

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

Regional Ocean Planning

Previous collaborations of the Mid-Atlantic states have laid a strong foundation for regional ocean planning. From 2013-2018, MARCO supported the Mid-Atlantic Regional Planning Body (RPB), which included state and federal representatives, tribal entities and the Mid-Atlantic Fishery Management Council, and created a Mid-Atlantic Regional Ocean Action Plan (OAP). DCMP led the Regional Ocean Assessment (ROA) workgroup that developed a comprehensive report summarizing the best available information on the ocean ecosystem and ocean uses from New York to Virginia, essential to the final development of the OAP that was certified by the White House in December of 2016. Executive Order 13840, 'The Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States", was signed in 2018 and replaced regional planning bodies with state-led planning efforts that address ocean-related matters that may require interagency or intergovernmental solutions. Although the RPB is no longer active, the MARCO states and former RPB member organizations continue to collaborate on shared priorities, including those highlighted in the latest executive order.

According to the OAP, the mid-Atlantic region is expected to experience increasing use of the ocean and its resources, likely to result in increased conflict from user groups. Additional ecological challenges resulting from climate change are of concern, including SLR, ocean acidification, and warming temperatures. To home in on some of these challenges, key workgroups and initiatives of the OAP were implemented by MARCO states including marine debris, ocean indicators, ocean data mapping, non-consumptive recreational uses, maritime commerce, and navigation safety.

In 2016, DCMP authored a report on the assessment of marine debris in the Mid-Atlantic to advance MARCO's understanding of water quality in the region, which identified marine debris as topic of across the region. The Mid-Atlantic Coastal Acidification Network (MACAN), led by MARCO and the Mid-Atlantic Regional Association Coastal Ocean Observing System, was developed to lead the region's science and outreach on ocean acidification. MACAN had two papers published in peer reviewed journals, "Scientific Considerations for Acidification Monitoring in the U.S. Mid-Atlantic Region" and "Recommended Priorities for Research on Ecological Impacts of Ocean and Coastal Acidification in the U.S. Mid-Atlantic". Additionally, MACAN prepared a variety of factsheets to raise awareness of increasing ecological impacts of ocean acidification.

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Management Characterization

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

Table 25: Significant Changes in Ocean Use and Resource Management

Management Category	**Employed by State** (Y/N)	**CMP Assistance to Locals that Employ** (Y/N)	**Significant Changes Since Last Assessment** (Y/N)
Statutes, regulations, policies, or case law interpretations	Yes	No	Yes
Regional comprehensive ocean management plans	Yes	No	Yes
State comprehensive ocean management plans	Yes	No	No
Single-sector management plans	No	N/A	No

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

See Regional Ocean Planning in the previous section for the development of the Mid-Atlantic Ocean Action Plan.

See Management Characterization for Energy and Government Facility Siting for legislation opposing offshore oil and gas development and regulations for OCS air quality.

3. Indicate if your state has a comprehensive ocean management plan.

Table 26: Ocean Management Plans

Comprehensive Ocean Management Plan	**State Plan**	**Regional Plan**
Completed plan (Y/N, Year)	Yes (2015)	Yes (2016)
Under development (Y/N)	No	No
Web address	http://maps.dnrec.delaware.gov/oceanplanning	http://midatlanticocean.org
Area covered by plan	State waters	NY, NJ, DE, MD, VA

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Enhancement Area Prioritization

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

High	_____
Medium	__X__
Low	_____

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

DCMP has been engaged in efforts with local and regional partners to better understand the significance of ocean use conflicts as well as the development of a Regional Ocean Action Plan. Increasing uses of our coasts and ocean, along with resource management changes are challenging the DCMP to dedicate more focus to this enhancement area. Since the last assessment, ocean uses, stakeholder engagement and partnerships have increased especially related to offshore energy development. Creating a balance based on sustainable economic development and the protection and conservation of the states coastal ecosystem is vital.

DCMP conducted stakeholder engagement of state, county, and local government and non-governmental entities indicated ocean resources was a concern but not the highest priority enhancement issue and is thus ranked as medium priority

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Energy and Government Facility Siting

Resource Characterization

1. In the table below, characterize the status and trends of different types of energy facilities and activities in the state's coastal zone based on best available data. If available, identify the approximate number of facilities by type.

Table 27: Status and Trends in Energy Facility and Activities in the Coastal Zone

Type of Energy Facility / Activity	Exists in Coastal Zone		Proposed in Coastal Zone	
	(# or Y/N)	Change since last assessment (↑, ↓, unknown)	(# or Y/N)	Change since last assessment (↑, ↓, unknown)
Energy Transport				
Pipelines	Yes	Increase	Yes	Increase
Electrical Grid (transmission cables)	Yes	Increase	Yes	Increase
Ports	Yes	--	Yes	Increase
LNG	No	--	No	--
Energy Facilities				
Oil and Gas	Yes	Increase	Yes	Increase
Coal	Yes	--	No	--
Nuclear	No	--	No	--
Wind	Yes	--	Yes	Offshore (↑)
Wave	No	--	No	--
Tidal	No	--	No	--
Current	No	--	No	--
Hydropower	No	--	No	--
Ocean Thermal Energy Conversion	No	--	No	--
Solar	Yes	Increase	Yes	Increase
Biomass	Yes	Unknown	No	--

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

Wind Energy

Interest in renewable energy installations continue to grow. In 2017, Delaware's governor signed Executive Order 13 (Appendix A) creating the Offshore Wind Working Group after Maryland's Public Service Commission approved two offshore wind projects, including US Wind's 248 MW array off Ocean City, MD and Orsted's 120 MW array, known as Skipjack, off Delaware's Atlantic beaches. The workgroup was tasked with making Delaware specific recommendations for engaging in the development of offshore wind for Delaware and determine how it could leverage related economic opportunities. While permits with the State have not been submitted, Orsted is coordinating with permitting offices and anticipates construction beginning in 2021.

In anticipation of additional offshore wind farms, the state has worked to increase its capacity and understanding of the impacts of these activities. DCMP staff have sat as observers on the New York

Environmental Technical Working Group, which is assessing environmental and wildlife impacts to offshore wind procurement; attended an advance comprehensive overview course for offshore wind farm project development including site selection, permitting, engineering, operations and maintenance, and decommissioning hosted by the Danish Energy and Climate Academy; and attended the "State of the Science on Wildlife and Offshore Wind Energy Development" presented by the New York State Energy Research and Development Authority. With an increase in regional understanding of offshore wind development, the review of development projects can be conducted more efficiently.

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

BOEM 2019-2024 OCS Oil and Gas Leasing, Exploration, and Development Program

In 2017, the Bureau of Ocean and Energy Management (BOEM) initiated the development for the 2019-2024 OCS Oil and Gas Leasing, Exploration, and Development Program (OCS Program). In the first year of the 2017-2022 OCS Program, Executive Order 13795 (April 28, 2017) and Secretary's Order 3350 (May 1, 2017), directed BOEM to implement certain measures necessary to establish United States' energy dominance. Among other things, this included revising the existing OCS program to fully reconsider many areas previously omitted from the OCS Program due limited mineral reserves resource of particular conservation interest. The draft proposed program was met with opposition from states and affected stakeholders, and the proposed program has yet to be released.

Management Characterization

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

Table 28: Significant Changes in Energy and Governmental Siting Management

Management Category	**Employed by State** (Y/N)	**CMP Assistance to Locals that Employ** (Y/N)	**Significant Changes Since Last Assessment** (Y/N)
Statutes, regulations, policies, or case law interpretations	Yes	No	Yes
State comprehensive siting plans or procedures	No	No	No

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

Legislation Opposing Oil and Gas Development

In response to the release of Draft Proposed Program under the 2019-2024 National Outer Continental Shelf Oil and Gas Leasing Program, Governor John Carney signed two pieces of legislation in 2018 aimed at protecting Delaware's coasts from offshore drilling. These bills aim to protect Delaware high-quality coastline waters and the thousands of jobs supported by Delaware's coastal tourism industry. The first, 81 Del. Law c 442, modified the State CZA to prohibit drilling for oil and natural gas in Delaware's coastal zone and territorial waters, and prohibits the issuance of permits in connection with the development of offshore drilling infrastructure. The second, 81 Del. Law c 443, opposed drilling off Delaware's coast, directed certain state officials and agencies to enforce Delaware's rights relating to offshore drilling under federal and state environmental laws, and directed the DCMP to review its "policies and enforceable mechanisms as they relate to offshore drilling to ensure they reflect Delaware's current environmental laws and regulations for purposes of their use in the consistency review process under the Federal Coastal Zone Management Act." The process of drafting and passing these laws created challenges for the DCMP as it became evident that current members of the General Assembly were unaware of the authority or purpose of the DCMP in reviewing federal activities. The DCMP was ultimately tasked with conducting an in-depth review of its enforceable policies applicable to oil and gas development and conduct a department-wide review of existing authorities that could be used to regulate such activities. This has highlighted the need to promote the education of higher-level state officials when turnover occurs to make certain they understand that the DCMP reviews activities aiming to balance use and protection of coastal resources, especially those activities having greater than local significance.

State Outer Continental Shelf Air Regulations

Delaware's OCS Air Quality Regulations have been updated to regulate air emissions pursuant to Environmental Protection Agency (EPA) regulations 40 CFR Part 55, under Section 328(a)(1) of the federal Clean Air Act. The EPA's regulations apply to all sources of air emissions from within the OCS. For Delaware, the OCS is the area that is within 25 miles of Delaware's coastal boundaries along the Atlantic Ocean. This means that air emissions from within the OCS are regulated in the same manner as if the source was located on Delaware's land. In practice, this regulation allows DNREC to issue permits for any source to be regulated under 40 CFR Part 55, thereby effectively regulating air pollutants emitted in the OCS consistent with state and federal laws and regulations. The EPA reviewed the rule to ensure they are not designed expressly to prevent exploration and development of the OCS, and that they are potentially applicable to OCS sources.

Legislation Supporting Renewable Energy

The Delaware State Senate's Energy Committee is considering a bill to modify the State Renewable Energy Portfolio Standards Act, originally enacted in 2005 to establish a market and lower consumer costs for electricity from renewable sources. The legislation would extend the schedule, increase the percentage requirement for renewable energy sources, and expands definitions of solar energy. If passed, the bill would require the State to operate with 40% of its energy coming from renewable sources by 2035, 7% of which must be from solar energy.

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Enhancement Area Prioritization

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

High	_____
Medium	X
Low	_____

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

There is a need to balance our natural resource protection efforts with the national interest of energy production. DCP stakeholder engagement of state, county, and local government, and non-governmental entities, input received on Energy and Government Facility Siting focused on the need to prioritize the development of sustainable energy resources and combat climate change through reduced carbon pollution. With increasing energy facility-related activity in the region and the potential cumulative and secondary impacts, (e.g., water quality, impacts to threatened and endangered species) pressure on the State's coastal resources and uses is increasing. With these considerations, the DCMP ranked Energy and Government Facility Siting as an area of moderate priority. The DCMP will continue to monitor siting activity and support research to further characterize potential impacts. It has also developed recommendations for enforceable policy development to address resource protections and support economic development relating to energy facility siting that are being considered for inclusion in upcoming program changes.

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Aquaculture

Resource Characterization

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

Table 29: Status and Trends of Aquaculture Facilities and Activities

Type of Facility / Activity	No. of Facilities	Approx. Economic Value	Change Since Last Assessment
Catfish	1	Withheld to avoid disclosing data for individual farms	Unknown
Trout	1	Withheld to avoid disclosing data for individual farms	Unknown
Sport /Game fish	1	Withheld to avoid disclosing data for individual farms	Unknown
Baitfish	1	Withheld to avoid disclosing data for individual farms	Unknown
Other Food Fish[+]	3	$484,000	Withheld to avoid disclosing data for individual farms

Source: USDA Census of Aquaculture (2017 and 2012 comparison)
[+] Fish, other than catfish and trout, raised on farms primarily for food. Examples include hybrid striped bass, perch, salmon, sturgeon, and tilapia.

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

Aquaculture in Delaware continues to expand. With the shellfish aquaculture gaining traction in Sussex County and a new unique-to-Delaware hydroponics/aquaculture facility in Kent County, which grows lettuce using water fertilized by organically grown tilapia, this burgeoning industry is growing with the support of partnerships from academic and non-governmental organizations.

Shellfish Aquaculture in Delaware's Inland Bays

During the previous assessment period, the State of Delaware promulgated regulations allowing for commercial shellfish aquaculture activities to be conducted in Delaware's Inland Bays. The impetus for Delaware's aquaculture initiative originated with the Center for the Inland Bays, which assembled a team of interested parties that developed a program framework and recommendations that led to enabling legislation. As oysters also filter high volumes of water, they are catalysts for improving water quality. Since that time various activities, including the development of an interactive map and a statewide activity approval (described below) to help establish operations in Delaware have occurred. The most recent data available indicates that approximately 15% of the 323 available blocks for shellfish aquaculture activities are at some stage of development - 35 have been leased and 13 additional leases are pending.

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Delaware Sea Grant

Recognizing the potential for aquaculture to have an impact on economic development in the state, Delaware Sea Grant has been working with fisherman, regulators, and researchers to support sustainable marine fisheries. Through its effort to progress the oyster growing industry, including partnering with Delaware State University's Aquaculture Research and Demonstration Facility to develop mid-Atlantic appropriate techniques and developing an effective marketing campaign for the local industry, Delaware Sea Grant expects local shellfish and aquaculture efforts to grow, support the local economy, and improve water quality in the Inland Bays. As a result of the combined efforts of numerous stakeholders, the first oyster planting in the Inland Bays occurred in 2019.

Management Characterization

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

Table 30: Significant Changes in Aquaculture Management

Management Category	**Employed by State** (Y/N)	**CMP Assistance to Locals that Employ** (Y/N)	**Significant Changes Since Last Assessment** (Y/N)
Statutes, regulations, policies, or case law interpretations	Yes	No	Yes
Aquaculture comprehensive siting plans or procedures	Yes	No	Yes

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

Statewide Activity Approval Permit for Shellfish Aquaculture

Delaware implemented a Statewide Activity Approval (SAA) permit, providing aquaculturists a more efficient and expedient authorization process in specifically designated areas. The number of areas now eligible for SAAs were reduced from the areas originally adopted as part of the regulations that provide for program oversight; this was primarily due to public objection to aquaculture operations in certain areas. The growing areas identified within the SAA corresponds with the U.S. Army Corps of Engineers' recently developed nationwide permit for shellfish aquaculture development areas. Jointly, these authorizations streamlined the permitting process to undertake shellfish growing operations while minimizing the conflict with other resource users in the area, a factor that might have dissuaded growers from investing in the process in the early stages.

Interactive shellfish aquaculture map for the Inland Bays

The DNREC DFW shellfish aquaculture program launched a GIS-based interactive map online that provides site-specific information helpful for selecting shellfish aquaculture lease locations in the Inland Bays. The map shows those areas covered by the recent SAA issued by DNREC's Wetlands and Subaqueous Lands Section, which facilitates the expedited processing of shellfish aquaculture lease applications. The interactive map depicts prohibited and seasonally closed shellfish areas and allows users to gather information on shellfish aquaculture areas covered by the SAA, including location coordinates and which acres have been sampled and are eligible for leasing based on natural hard clam density. The map also will serve as a tool for identifying shellfish aquaculture acreage as it is leased in the future.

Delaware Shellfish Aquaculture Import Policy

As with many industries, there is often a need to address emerging risks. With shellfish aquaculture in Delaware, the risks include the potential to import shellfish or shellfish products, such as larvae, seed, or broodstock, with disease and non-native organisms. In an effort to minimize the risks associated with importation, the State implemented a policy requiring approval and testing of these products by a State-approved facility before importation.

Enhancement Area Prioritization

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

   High _____
   Medium _____
   Low ___X___

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

   DCP stakeholder engagement of state, county, and local government, and non-governmental entities indicated aquaculture had varying degrees desired focus. Due to the advancements made with the support of the DCP's network and program partners, the shellfish aquaculture industry has made significant progress establishing a foothold as a burgeoning economy in Delaware. With a network of resource managers and outreach professionals focused on this enhancement area, the DCMP ranked it as a low priority for its strategic planning efforts. The DCMP will continue to monitor aquaculture activities and if a need arises that can be addressed with DCP staff or resources; it will work with its partners to address that need.

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Assessment Phase 2

Wetlands

In-Depth Resource Characterization

1. What are the three most significant existing or emerging physical stressors or threats to wetlands within your coastal zone? Indicate the geographic scope of the stressor, i.e., is it prevalent throughout your coastal zone, or are there specific areas that are most threatened?

Table 31: Top Three Significant Threats or Stressors to Wetlands in Coastal Zone

Stressor or Threat	Geographic Scope
Climate Change	Tidal and freshwater wetlands statewide
SLR/ Erosion/Subsidence	Tidal wetlands, to the greater extent those adjacent to Delaware River and its tributaries
Water Quality/Development	Lands adjacent to tidal marshes; freshwater wetlands statewide

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

Through stakeholder engagement, the major issues facing Delaware wetlands today are climate change and its associated impacts; physical and chemical impacts of SLR, subsidence, and erosion; and the destruction and/or significant degradation resulting from development and toxic contamination.

Coastal and nontidal wetlands are particularly vulnerable to climate change and its associated impacts, especially sea level rise, increased storm frequency and intensity, and changes in rainfall resulting in increased flooding and prolonged droughts. Impacts to these sensitive habitats are seen both physically and ecologically, negatively affecting their abilities to function and provide healthy habitats and nursery grounds, sequester carbon, improve water quality, and buffer storms. Delaware's coastal wetlands are particularly vulnerable due to the state's low lying elevations and high subsidence rates, resulting in increasing inundation by rising tides and erosion from more frequent coastal storms. Increased temperatures and variation in precipitation patterns, resulting in longer dry period or increase floods are likely affecting nontidal wetlands.

Compounding these issues are development pressure, lack of resource protection, and contaminates. Continued population growth with limited buffer regulations allow for lands adjacent to tidal wetlands to be developed, occupying land essential for wetland migration and stormwater runoff filtration. Direct development impacts to non-tidal wetlands continue to occur due to a lack of regulations to ensure their protection. Recent efforts in Delaware to implement protections for freshwater wetlands have been unsuccessful. During the previous assessment period a process was undertaken in an attempt to develop freshwater regulations; however, the process followed lacked the necessary education components. This would have better informed decision-makers about the benefits to be gained from protecting these valuable resources. Through the stakeholder engagement

process, wetland resources managers in DNREC's Wetlands and Subaqueous Section stressed developing freshwater wetlands regulations should be priority for the State, and even more so with recent changes to the Clean Water Act that will further reduce the limited protections provided at the federal level.

Water quality is yet another factor threatening the function of these important habitats. State-wide, nonpoint source nutrient pollution is a significant factor in the State's poor surface water quality; however, legacy pollution from Delaware's long industrial history also plays significant role in the health of these ecosystems. Industrial development has resulted in toxic substances in Delaware's waterways, affecting soils, water quality, and fish. The heaviest contamination is in areas of greatest industrial and urban land use, most frequently seen in the northern region of the state. This is reflected in wetland condition assessments conducted by the DNREC WMAP. The most recent assessment of tidal and nontidal wetlands in the Christina Watershed presented a considerably higher percentage of severely stressed wetlands and greater overall combination of moderately and severely stressed wetlands, than seen in watershed in other regions of the state.[2] Heavily impacted by development, hydrological changes, and invasive species, the ability for these systems to reduce storm impacts through buffering or storage capacity, or improve water quality is diminished.

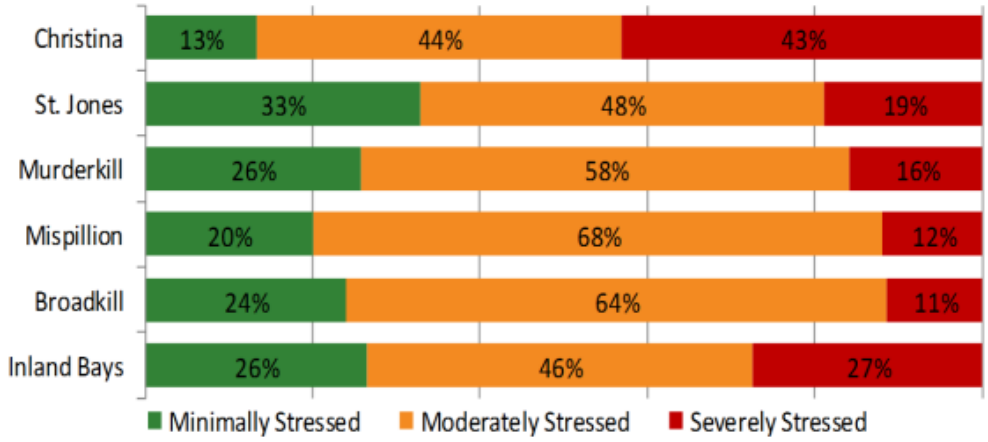

Figure: Combined condition of tidal, tidal freshwater, flat and riverine wetlands in the Christina River watershed, compared to wetland condition in the St. Jones, Murderkill, Mispillion, Broadkill, and Inland Bays watersheds. (Source: Jennette, M.A., et al. 2014)

The decadal update of the 2007 wetlands trend and status report will be released this years, and will better illustrate the overall changes being seen in Delaware's wetlands. The 2015 Delaware Wetlands Management Plan included action items that have resulted in improvement of these systems, including implementation of watershed level restoration plans. DNREC's WATAR team undertakes a watershed-scale approach to evaluating contaminant sources and implementing remediation and restoration. A major wetlands remediation and restoration project in the Christina River basin includes the South Wilmington Wetland /A Street Ditch project, a site confirmed to be

[2] Jennette, M.A., L. Haaf, A.B. Rogerson, A.M. Howard, D. Kreeger, A. Padeletti, K. Cheng, and J. Buckner. 2014. Condition of Wetlands in the Christiana River Watershed. Delaware Department of Natural Resources and Environmental Control, Watershed Assessment and Management Section, Dover, DE and the Partnership for the Delaware Estuary, Wilmington, DE.

continuing source of PCBs to the Christina River. As part of the reconstruction in 2019, the site received an application of inoculated Sedimite™ an activated carbon product successfully used in reducing PCB's in Dover's Mirror Lake pore water and fish tissue, 80% and 70%, respectively, in a 2013 project. Post-application monitoring of the site is showing a 64% reduction in total PCBs. Along with other remedial projects conducted in the area, will improve water quality in this area of the Christina River and will lead to restoring the health and function of these wetlands. However a larger coordinated effort of remediation and restoration for this environmentally and economically critical area is necessary.

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

Table 32: Emerging Issues Affecting Wetlands Requiring Additional Information

Emerging Issue	Information Needs
Climate Change (ongoing)	Additional research to understand how it affects ecological conditions and processes, and monitoring to measure change
Management	Additional research to identify factors that can affect wetland management including migration analysis mapping, coordination, and planning to minimize conflicting management priorities

In-Depth Management Characterization

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

Table 33: Wetland Management Category Assessment

Management Category	Employed by State (Y/N)	CMP Assistance to Locals that Employ (Y/N)	Significant Change Since Last Assessment (Y/N)
Wetland assessment methodologies	Yes	No	No
Wetlands mapping and GIS	Yes	Yes	Yes
Watershed or SAMPs addressing wetlands	No	No	No
Wetlands technical assistance, education, and outreach	Yes	Yes	No

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

Wetlands Mapping and GIS

The latest update of the State's LULC is nearing release. This is an interpretation of the 2017 aerial imagery and is a continuation of a 5-year update cycle, with previous updates occurring in 2007 and 2012. This information is publicly available through FirstMap, a comprehensive self-service Enterprise GIS tied into the State's ArcGIS Online portal for full self-service data discovery and mapping. It is designed to support the GIS needs of all state agencies, counties, municipalities, higher education, and the public. The 10-yr update of the state's wetlands status and trends report, referenced in the Phase I assessment, is based on this data and is anticipated to be made available in 2020.

3. Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the state's or territory's management efforts in protecting, restoring, and enhancing coastal wetlands since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the state's or territory's management efforts?

The State has undertaken many research, planning, restoration, and education activities in its effort to properly manage wetlands. Technological advancements in research and assessment methods have allowed the state to gather more information to support these efforts. However, ongoing questions and limited resources to conduct research are limiting the ability to fully understand the effectiveness of current management practices. Much of the efforts of the state to protect and restore wetlands, completed or underway, have been presented in the assessment:

- Update and refinement of status and trends report (release pending)
- Update of wetlands management strategy
- LiDAR DEM vegetation correction
- Tidal and non-tidal wetland condition assessments
- Wetland Migration Suitability Analysis
- Development of Delaware Freshwater Wetlands Toolbox
- Organization of Delaware Living Shoreline Committee and related outreach
- Completion of Prime Hook National Wildlife Refuge wetland restoration
- Continued WATAR coordination

Additional efforts include:

- Comparative analysis of wetlands mapping procedures
- Organization of the Environmental Monitoring Coordinating Council
- Delaware Native Species Commission
- Development of the Mid-Atlantic Coastal Wetland Assessment
- Development of buffer ordinance in Sussex County
- Continuation of the bi-annual wetlands conference
- Living shoreline demonstration projects
- Management / strategic plan updates for Delaware Estuary, Bombay Hook, Inland Bays
- Research to support science-based management solutions

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Identification of Priorities

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

Management Priority 1: Wetlands Research, Monitoring,

Description: The extent and rate of impacts resulting from climate change can affect all levels of function and process within the wetland ecosystem. Assessing the condition and applied research of wetlands in Delaware will help increase the understanding how the ecological and hydrological systems are affected, how they may serve to mitigate the anthropogenic impacts, and will have significant implications on how wetlands are managed and restored in coming years.

Management Priority 2: Wetland Restoration

Description: Wetlands provide significant beneficial services to the environment and society and their health and functionality are essential for the continuation of these services along with their support of the larger ecosystem. Prioritizing and conducting wetland restoration as part of a system-wide approach will enhance the results and accelerate the benefits to supported resources.

Management Priority 3: Wetland Regulations

Description: Delaware does not currently have a freshwater wetland regulatory program and depends on federal agencies to protect this resource. In recent years, the State undertook another attempt to develop regulation, but was unsuccessful. Additionally, federal protections have been weakened with changes to the Clean Water Act, putting these valuable habitats are even greater risk of loss and or degradation.

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

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Table 34: Wetland Priority Needs

Priority Need	Need?	Brief Explanation of Need/Gap
Research	Y	Continued research and monitoring to understand the changes in baseline function as a result of climate change and sea level rise.
Mapping/GIS	Y	Update tidal wetland regulatory and condition assessment maps
Data /Information/Planning Management	Y	Support collaboration among wetland scientist/regulators and planners to enable data sharing for analysis, and comprehensive management and restoration strategies.
Training/Capacity Building	Y	A network to foster collaboration, share limited resources and data supporting comprehensive research and management approach
Decision-support tools	Y	Development of reports and outreach materials to disseminate data and information to decision makers
Communication and outreach	Y	Education for stakeholders prior to regulatory development and ongoing education of wetland importance
Other (specify)	Y	Creation of a freshwater regulatory program

Enhancement Area Strategy Development:

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

Yes ___X___
No _____

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

The DCP will develop a strategy for this enhancement area. The services provided by wetlands make them the most ecologically significant habitats in Delaware. From their ability to improve water quality, increase flood storage, provide storm surge buffering, harbor biological diversity, and sequester carbon, tidal and freshwater wetlands in Delaware are invaluable resources that due to both human and natural impacts are suffering losses annually. Stakeholders have strongly expressed the need to direct more effort and resources to this area.

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Coastal Hazards

In-Depth Resource Characterization

1. Based on the characterization of coastal hazard risk, what are the three most significant coastal hazards within your coastal zone? Indicate the geographic scope of the stressor, i.e., is it prevalent throughout your coastal zone, or are there specific areas that are most at risk?

Table 35: Top Three Coastal Hazard Threats in the Coastal Zone

Type of Hazard	Geographic Scope
SLR	Throughout the coastal zone
Coastal Storms	Throughout the coastal zone
Flooding	Throughout the coastal zone

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

With Delaware's low mean elevation and the reach of tidal waters, the effects of climate change, particularly from SLR and flooding, are being felt throughout the coastal zone. A 2019 survey[3] "Delaware Residents' Opinions on Climate Change and Sea Level Rise" was conducted to gauge awareness, understanding, and willingness to act to address the impacts of these hazards. Results of the survey indicate a vast majority of Delaware residents believe climate change and SLR are occurring, 77% and 71 % respectively. Over half have indicated they have directly experienced or observed climate change and 70% say immediate steps need to be taken to mitigate its impacts. Also in 2019, there was almost a 60% increase in the number of people who indicated they had directly experienced SLR over 2014 respondents.

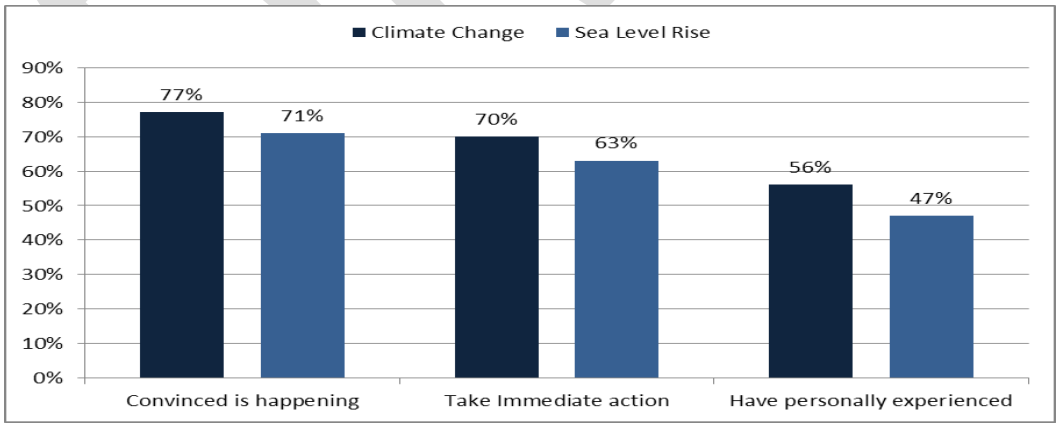

Figure: Public Perception Survey (Source: DNREC 2019)

[3] DNREC (2019) "Delaware Residents' Opinions on Climate Change and Sea Level Rise". http://www.dnrec.delaware.gov/energy/Documents/Climate/DNREC-Climate-Survey-Full-Report-20200323.pdf

With this increased awareness and willingness to act, there has been an upsurge in the planning activities at the local level. Through stakeholder engagement with the community planning and adaptations practitioners, including OSPC, Delaware Sea Grant, UD IPA, it was determined the need to devote more technical assistance and resources to the Delaware's municipalities was great. Specific identified needs that would benefit communities included having the State provide full-time staff dedicated to assisting communities with specific planning and adaptation needs, educating local decision makers on the cost-benefit of short-term maladaptive measures vs. long-term resilient solutions, and conducting green-infrastructure/ habitat restoration projects whose costs would far exceed the financial capacity of many municipal coffers.

During the last five years, the DCMP has focused significant effort understanding the economic impacts of sea level rise to the state and educating citizens and decision-makers about the risks and the need to be proactive in their adaptation planning efforts. As a result of this work, the DCMP has become a key source of information and technical assistance to municipal officials, state agencies, and citizens wanting to learn about adapting to climate change.

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

Table 36: Emerging Coastal Hazard Issues and Needs in the Coastal Zone

Emerging Issue	Information Needed
Effects of SLR, Heavy Precipitation, and Storm Surge	Data to inform storm/flood models utilizing future climate scenarios of combined forces; particularly in areas models are less confident
	Data to determine impact of forces, individually and combined, on contaminated sites identified for restoration or redevelopment
Cost-Benefit of Adaptation Options	State-wide building and infrastructure data; economic data on wetlands, intrinsic values, avoided costs to accurately perform CBA of adaptation.
Green/Grey Infrastructure Restoration	Data collection and research necessary to assess siting potential to inform development plans and restoration strategies
Adaptation Plan Implementation	Data and information necessary to determine adaption measure implementation sequence, independently and in relation to other agency activities

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In-depth Management Characterization

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

Table 37: Significance Changes in Coastal Hazards

Management Category	**Employed by State** (Y/N)	**CMP Assistance to Locals that Employ** (Y/N)	**Significant Changes Since Last Assessment** (Y/N)
Statutes, Regulations, and Policies			
Shorefront setbacks / no build areas	Y	Y	N
Rolling Easements	N	N	N
Repair / rebuilding restrictions	Y	Y	N
Hard shoreline protection structure restrictions	Y	Y	N
Promotion of alternative shoreline stabilization methodologies (i.e., living shoreline /green infrastructure)	Y	Y	Y
Repair/replacement of shore protection structure restrictions	Y	Y	N
Inlet Management	Y	N	N
Protection of important natural resources for hazard mitigation benefits (e.g., dunes, wetlands, barrier islands, coral reefs) (other than setbacks/no build areas)	Y	Y	N
Repetitive flood loss policies (e.g., relocation, buyouts)	Y	N	N
Freeboard requirements*	Y	Y	Y
Real estate sales disclosure requirements	Y	N	N
Restrictions on publicly funded infrastructure	Y	Y	Y
Infrastructure protection (e.g., considering hazards in siting and design)	Y	Y	Y
Planning Programs and Initiatives			
Hazard Mitigation Plans	Y	Y	N
Sea level rise/Great Lake level change or climate change adaptation plans	Y	Y	Y
Statewide requirement for local post-disaster recovery planning	N	N	N
Sediment management plans	Y	N	Y
Beach nourishment plans	Y	Y	Y
Special Area Management Plans (that address hazards issues)	N	N	N
Managed retreat plans	N	N	N
Research, Mapping, and Education Program or Initiatives			
General hazards mapping or modeling	Y	Y	Y
Sea level rise mapping or modeling	Y	Y	Y
Hazards monitoring (e.g., erosion rate, shoreline change, high-water marks)	Y	Y	Y
Hazards education and outreach	Y	Y	Y

*Employed by select municipalities

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

In its efforts to manage coastal hazards in the State of Delaware, the DCMP has undertaken a range of activities including research to understand effects of climate change and SLR; tool development for emergency and community planning; and providing training, technical, and financial assistance to communities. Its effectiveness at managing hazards has been measured through surveys measuring awareness, like that described above, and feedback from communities, partners and participants in outreach events such as RASCL Coffee Hours and the Annual Summit. These efforts have all been touted for the benefits derived; but the general consensus is that with increase awareness and evidence of impacts comes increase need for resources and assistance. The DCMP will continue working with all levels of government and its partners to identity needs and projects where resources can be effectively leveraged to increase the state's overall capacity for resiliency against coastal hazards.

Identification of Priorities

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

Management Priority 1: Improving the ability of decision-makers to incorporate social, economic, and environmental data into decision-making about coastal hazard adaptation and mitigation projects.

Description: A continuing impediment to on-the-ground action for coastal hazards at the state and local level is the ability for decision-makers to understand and apply the long-term economic, social, and environmental costs and benefits of coastal projects to their decision-making. Information is being collected to support this effort by modeling flooding and SLR impacts necessary to determine long-term costs and economic benefits, however the information that exists is often general or not geographically relevant, limiting its usefulness for practical applications. Improving the understanding of the long-term costs and benefits of hazard mitigation projects can lead to increased support for projects that may appear too costly, without the additional consideration of the benefits resulting from avoided storm damage, improved function of natural systems and economic stability.

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Management Priority 2: Improving state policies and local ordinances to support coastal hazard adaptation and mitigation projects and measures that reduce vulnerability to flooding, coastal storms and sea level rise.

Description: Many state, county and local policies and authorities have failed to keep pace with the emerging science on sea level rise, coastal storms, climate change and shoreline erosion and with newly established best management practices. These outdated policies, procedures and regulations can hinder or prevent the implementation of effective plans that reflect the emerging science and novel measures and could lead to maladaptation.

Management Priority 3: Restoring degraded wetlands to re-establish their ability to provide flood storage capacity, improve water quality, and provide quality habitat.

Description: Utilizing the natural benefits of wetlands and other green infrastructure to mitigate the impacts of flooding from coastal storms and heavy precipitation events. Many wetlands in the state have been degraded as a consequence of development, industrial contamination and climate change. Restoring the function of these systems not only increase community resilience but also the overall health of the ecosystems.

2. Identify and briefly explain priority needs and information gaps the CMP has for addressing the management priorities identified above.

Table 38: Coastal Hazard Priority Needs

Priority Need	Need?	Brief Explanation of Need/Gap
Research	Y	Geographically specific cost-benefit and impact studies are needed to influence decision-making. Many required data sets are lacking, including long-term remediation with climate change, green and hybrid adaptation measures, site condition (contamination/habitat degradation) and economic impacts.
Mapping/GIS	Y	There is currently limited information available for decision-makers regarding the combined impacts of flooding, SLR, and coastal surge.
Data/Information Management	Y	Expanded site specific data and information management system to support holistic resilience effort; included site condition assessment, contamination profile, restoration potential.
Training/Capacity Building	Y	Staff and end-users need to become more familiar with site investigation and restoration plans and inspections, green infrastructure restoration and maintenance, ordinance development, and/or social science literature.
		A library of coastal hazard training resources for using tools and applying adaptation planning strategies should be made available municipal officials for access as needed.
Decision-support tools	Y	Web-site or document outlining best practices for decision-making for mitigation measure implementation, including ancillary steps necessary to Implement, economic and social considerations, are necessary.
Communication and outreach	Y	A revised strategic communication strategy that incorporating emerging knowledge of economic and social factors, and adaptation measure implementation, is needed.

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Enhancement Area Strategy Development

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

   Yes ___X___
   No _____

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

The DCMP will develop a strategy for this enhancement area. Stakeholders from state and local government, academic and nonprofit, businesses and private citizens continue to seek assistance to educate, inform, support, plan, and implement measures to address resiliency throughout the state. Coastal hazards continue to be a federal priority focus area and the DCMP has positioned itself as a statewide leader in dealing with coastal hazards. Strategy development and implementation will utilize the existing network of partners and staff expertise to engage stakeholder to improve the state's resilience to coastal storms, flooding, and sea level rise and emerging issues related to these impacts.

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Strategy

Christina & Brandywine River Remediation, Restoration and Resilience: Development of an Implementation Plan

I. Issue Area(s)

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

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

II. Strategy Description

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

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

B. Strategy Goal: Based on scientific analysis and stakeholder engagement, develop an implementation plan to improve the resilience, health, and function of the Lower Christina & Brandywine River system through a holistic approach to remediation and restoration.

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

A long history of industrial development and activity has left a legacy of toxic contamination and degraded habitats in some of Delaware's northern waterways. The DCMP's networked partners

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who lead DNREC's Watershed Approach to Toxic Assessment and Restoration (WATAR) team have been working to address toxic contaminants in the Christina River basin for many years. The culmination of this work has led to a basin-wide remediation, restoration, and resilience concept that, with appropriate partnerships, has great potential to reverse the loss of wetland functionality and significantly improve the health of the watershed.

The aim of the Christina & Brandywine River Remediation, Restoration and Resilience (CBR4) initiative is to perform a feasibility assessment and create a plan to guide the transformation of the lower Christina and Brandywine Rivers in Wilmington into healthy riparian habitat from sediment to shore. This will include using a logical ecosystem-based approach to assess, prioritize and plan for a suite of projects to remediate and restore the health and function of the watershed, and increase the resiliency of adjacent communities. The process undertaken to create the implementation plan for the CBR4 will be used as guidelines to enhance state watershed restoration programs to restore degraded waterways and wetlands through a holistic process, leveraging resources and stakeholders to maximize restoration benefits.

The WATAR team has worked for over ten years on targeted toxic contaminant reduction projects in the Christina River and Brandywine Creek watersheds, among others. These collaborative projects have focused on identifying sources of persistent, bioaccumulative and toxic compounds, reducing or eliminating their loading to surface waters and determining the extent of impact to human health and the environment. The CBR4 will expand those efforts to address legacy toxic contaminants in the sediments of the lower Christina River and tidal Brandywine Creek, to improve water quality; restore habitat in and along the banks of the Christina River and the Brandywine Creek; increase capacity to lessen the impact of flooding in nearby businesses and communities; provide access to the water for a multitude of recreational activities; and improve the area for companies and individuals wishing to establish themselves along the Wilmington waterfront.

To guarantee a successful outcome for CBR4, the DCMP will support project partners in the collection of data necessary to assess the extent of contamination, collect additional essential data to develop a plan to cleanup river sediment, restore wetlands and provide lasting resilience to the region. This effort will include stakeholder coordination throughout the entire process. Specific tasks will include training and education for CBR4 team members and critical stakeholders, data collection and analysis, feasibility determinations, implementation plan creation, development of transferable protocols, and ongoing public outreach.

This project requires the coordination, cooperation, and leveraging of a multitude of local groups who access, utilize, or otherwise could benefit from an improved Christina River, Brandywine Creek and surrounding areas for commerce, recreation, education, or transportation. While not currently modelled, the economic benefit to the City of Wilmington, New Castle County and the State of Delaware may follow the 2010 Brownfields Economic Benefit Study conducted by the University of Delaware ($17.50 return for every $1.00 invested). The intrinsic value of clean sediment, surface water and flora and fauna will expand the redevelopment draw on the Wilmington

waterfront and, more importantly, provide attractive and safe resources to current residents in the project area, including several environmental justice communities.

It is important to note that the CBR4 project represents a capstone to the many improvements that have occurred or are in the planning and construction stages on both sides of the Christina River at the Wilmington Riverfront that have reinvigorated the former industrial area. Further, river sediment cleanup will enhance the results of brownfield redevelopment planning along the Brandywine Creek in northeast Wilmington, which has a goal of inviting residents to utilize the Brandywine Creek for recreational purposes and connecting these assets to the rest of Wilmington. Additional ongoing projects such as combined sewer separation near Southbridge, the 19-acre South Wilmington Wetland remediation and rehabilitation project for water quality and flood abatement, the development of a sports complex, and a new bridge across the Christina River will most certainly draw additional investment to these areas, and enhance the quality of life for many who live and visit the area.

III. Needs and Gaps Addressed:

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

Research: To develop a feasible remediation and restoration plan, additional research is needed to identify and review existing environmental data sets and historic data for the Christina River and the Brandywine Creek. The DCMP will support the collection of data to identify physical, chemical, and biological characteristics of the study area. The data review will focus on the aquatic environment (e.g. sediment, surface water, porewater, fish and benthic communities, organism tissue concentrations), along with the terrestrial sources (e.g. soils, groundwater), additionally, tributary inputs will be reviewed. After initial analysis, the DMCP will support field studies to be conducted to fill gaps in site assessments and contamination records.

Mapping/GIS: To inform the development of a feasible plan, comprehensive data review along with stakeholder coordination will be used to refine the project study area, identify potential hot spots of impacted sediments, and to divide the project area into focused subareas for the further evaluation. Accurate elevation maps to support hydrological assessment, including expected SLR inundation and flood capacity potential will be necessary. Wetland condition assessment maps will be used in combination with hydrologic and inundation maps to characterize the quality of habitat more fully and to determine baselines to assess improvement.

Data and Information Management: DCMP will support the creation of preliminary conceptual site model evaluations of the physical and chemical characteristics of the sediments. The site models will then be used to identify the exposure pathways between the sources (e.g. surface sediment) and the receptors (e.g., fish and recreational users), and support the development of the feasibility study.

Training and Capacity Building: This strategy will support improved collaboration between resource managers in Delaware while providing for a more robust dataset on habitat remediation and restoration. This information would update and inform current redevelopment activities and enable project partners to educate municipal officials and commercial stakeholders on where to target redevelopment of the waterfront while maintaining the intrinsic value of open spaces for recreation and habitat.

Decision Support Tools: A number of plans need to be developed, including remediation, restoration, and development feasibility plans, as well as a guidance document outlining the procedures used for the stakeholder engagement and plan development. While these reports may initially be of use only to a limited technical audience of project stakeholders, through the efforts of the DCMP and the DNERR Coastal Training Program the information will be translated for use by a wider audience including local government and decisions-makers. The methodology will also be useful as guidance to others desiring to approach remediation and restoration in a holistic manner.

Communication and Outreach: The strategy has a strong communication and outreach component. Identifying stakeholders with necessary data and information to properly assess current condition, governmental agencies and other organizations with potential roles in redevelopment planning, as well as maintaining communication among all project partners is critical for the success of this effort. The DCMP will work closely with project partners to facilitate stakeholder involvement and education on hazard areas, inundation and flood risks, wetland importance; planning tools; project partner coordination; and other communication and outreach needs as necessary. In addition, DCMP will take the lead on public outreach to the local residents including several surrounding environmental justice communities.

IV. Benefits to Coastal Management:

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

Successful completion of this strategy will provide several benefits to coastal management, initially by improving coastal resilience, restoring the natural function of wetlands, and facilitating proper redevelopment. Shoreline and wetland restoration will increase flood storage capacity, improve coastal resilience, restore valuable habitat, and target development to meet needs of many local stakeholder groups. The ability to leverage resources and funding accelerates the remediation and restoration of contaminated sites and impacted watersheds, thereby eliminating these pathways of toxic chemicals and providing cleaner water and protecting public health.

Through the holistic restoration of this area, additional benefits in coastal management will be gained. Cumulative and secondary impacts will be mitigated with both the removal and/or sequestration of toxic contaminants from the sediment, which will in turn reduce contaminant levels in fish and water. A targeted waterfront improvement plan will reclaim underutilized and neglected places to foster sustainable economic natural landscapes. Public access will be enhanced along

with coastal hazard reductions through appropriately designed multi-functional green infrastructure that can serve as areas for recreation and education as well as flood storage during periods of heavy precipitation or coastal storms. This would be especially beneficial for the adjacent environmental justice communities that have limited access to open space amenities. Marine debris can also be better managed. Existing debris will be removed from the system as the sediment and wetland restoration efforts are undertaken.

Lastly the holistic methodology used to undertake this process will be key to modifying current remediation and restoration practices to best utilize and leverage resources, apply innovative technologies and provide hazard resilience in these projects.

V. Likelihood of Success:

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

This 309 Strategy has a high likelihood of success. The unique approach of the DNREC WATAR team has a proven record of success. This success is derived from the ability to leverage information and regulatory authorities of the state level CERCLA/RCRA programs and CWA programs to prioritize contaminant mitigation actions towards achieving the Department's clean water goals. Delaware's WATAR program is a national frontrunner in utilizing new and innovative technologies and approaches to achieve their goals. They have received local, regional, and national awards for innovation and success through projects they have undertaken. While the WATAR team's achievements are driven by leveraging technical and regulatory authorities, due to the scope of this project the DCMP's involvement is necessary to address the significant need for stakeholder engagement, education, and partner coordination. The DCMP has demonstrated success in large-scale multi-stakeholder engagement and planning projects including the South Wilmington SAMP, Delaware Sea Level Rise Assessment and Adaptation Recommendations and the New Castle Vulnerability Assessment and Levee Restoration projects, which demonstrate that the DCMP possesses the requisite abilities to work at all levels of government in the State that will be necessary for this strategy.

Additionally, the Christina River and Brandywine Creek area has benefitted from the support of the City, and from the State with investments in the Wilmington Riverfront through economic development and environmental remediation activities, and the Riverfront Development Corporation, which is actively bringing businesses and people back to the river. All of which indicate the continuing desire to improve the area.

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VI. Strategy Work Plan

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

Strategy Goal: Develop a feasibility and implementation plan to improve the resilience, health, and function of the Lower Christina & Brandywine River system through a holistic approach to river remediation and restoration and collaboration with stakeholders, with the intent to incorporate the implementation plan development process into state watershed restoration programs.

Total Years: 5 years
Total Budget: $420,000

Year(s): 1-5
Description of activities: Stakeholder Coordination. DCMP will identify and manage pertinent stakeholders and keep them informed about CBR4 throughout the plan development. Initial stakeholder engagement will include city, county, and state government officials; select state agency/program representatives; commercial entities; non-governmental organizations; and community leaders. At different stages of plan development additional stakeholders may be brought into the project as needed. It is anticipated at least one annual meeting of all stakeholders and the facilitation of numerous specific task-oriented subgroups will occur.
Major Milestone(s): Annual meeting(s), productive subgroup(s) and successful coordination with all stakeholders
Budget: $50,000 ($10,000/yr.)

Year(s): 1-5
Description of activities: Public Outreach. The DCMP will provide ongoing outreach through print, electronic, social media and in-person events to educate the public on the project including benefits of the natural areas, hazards reduction and the remediation/restoration process.
Major Milestone(s): Annual public event(s) ongoing web presence, regular social media posts, presentations at regional events
Budget: $40,000 (4,000 yrs. 1-3, $10,000 yrs. 4-5)

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Year(s): 1-2
Description of activities: The DCMP will support the WATAR team with analysis of existing data to quantify extent of contamination and identify gaps in the data. Subsequently, the DCMP will support the collection of new data and analysis to fill identified data gaps in the project area. The DCMP will also provide GIS expertise for the development of mapping products to visually illustrate contaminated regions.

Major Milestone(s): Analysis of existing data, and the collection and analysis of new data to develop a complete understanding of the area. Interim report of environmental status and risk in the CBR4 target area
Budget: $ 130,000 ($70,000 yr.1, $60,000 yr. 2)

Year(s): 2-3
Description of activities: CBR4 Stakeholder Training and Education. For a holistic approach to be successful the CBR4 affiliated stakeholder need to be properly educated and trained in all activities that will occur and how to conduct public engagement and communicate science. DCMP may host trainings on remediation, restoration, ecosystem services, facilitation, and effective public outreach as examples.
Major Milestone(s): Stakeholders understanding of all aspects of CBR4 and ability to effectively communicate the projects goal, objectives, and activities.
Budget: $30,000 ($10,000 yr.1, $20,000 yr.2)

Year(s): 3
Description of activities: Feasibility Plan. DCMP will support the WATAR team, the CBR4 stakeholders, and consultants with the development of feasibility determinations for CBR4 outlining what practical actions can be completed within varying timelines and costs restraints.
Major Milestone(s): Feasibility Plan.
Budget: $50,000

Year(s): 4-5
Description of activities: Implementation Plan Development. The DCMP will support the development of an implementation plan of actions and timelines that would be undertaken by the various stakeholders to ensure successful remediation and restoration to the lower Christina River and Brandywine Creek so as to provide environmental, social, and economic resillence to the region. Existing and novel approaches to remediation and restoration will be explored to determine best path(s) forward. Sources of potential funding, critical partners and other key factors will be examined and included in the report.
Major Milestone(s): Implementation Plan
Budget: $120,000 ($60,000 each yr.)

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Year(s): 4-5
Description of activities: Watershed Restoration Framework Development. The DCMP will coordinate with the DNREC Divisions of Watershed Stewardship, Waste and Hazardous Substances, and Community Affairs to develop a framework to enhance watershed restoration programs that includes a multi-stakeholder planning process and addresses holistic remediation and restoration needs.
Major Milestone(s): Watershed Restoration Framework
Budget: $ 8,000 ($4,000 per yr.)

VII. Fiscal and Technical Needs

A. Fiscal Needs:

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

The involvement of numerous partners and substantial resources will be necessary to fully implement the CBR4. DCMP should be able to complete the outlined portion of the project with the available 309 funds. DCMP will also assist other partners in efforts to secure additional funding and resources to accomplish the objectives to the project.

B. Technical Needs:

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

DCMP possess the knowledge and skill to support the facilitation and outreach portions of the outlined project and our networked partners in DNREC possess many of the technical skills to assess and formulate the plans. However, DCMP and the WATAR team also understand the need for other expert support and have already engaged local habitat experts, site remediation consultants, local NGO's, and governmental officials to be a part of the initial CBR4 team.

VIII. Projects of Special Merit (Optional)

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

While this project could be completed under the proposed timeline and budget, Project(s) of Special Merit could enhance the results by improving and refining the datasets and field sampling and additional site investigations if primary evaluations uncover unexpected or extraordinary issues. Additional benefits of Project(s) of Special Merit could include research into the application of novel approaches to remediation and restoration.

The need for PSM(s) will be evaluated throughout the implementation of the project.

5-Year Budget Summary by Strategy

Activity Title	Anticipated Funding Source	Year 1 Funding	Year 2 Funding	Year 3 Funding	Year 4 Funding	Year 5 Funding	Total Funding
Stakeholder Coordination	309	10,000	10,000	10,000	10,000	10,000	$50,000
Public Outreach	309	4,000	4,000	4,000	10,000	10,000	$32,000
Data collection and Analysis	309	70,000	60,000				$130,000
Stakeholder Training and Education	309		10,000	20,000			$30,000
Feasibility Determinations	309			50,000			$50,000
Implementation Plan Development	309				60,000	60,000	$120,000
Watershed Framework Development	309				$4,000	$4,000	$8,000
Total		**$84,000**	**$84,000**	**$84,000**	**$84,000**	**$84,000**	**$420,000**

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Summary of Stakeholder and Public Comments

Stakeholder Engagement

In preparation for the development of this document the DCMP identified a variety of partner and stakeholders to discuss coastal management effectiveness, including the identification of gaps and needs to more effectively manage CZMA Section 309 Enhancement Areas. Input was collected through various means including strategic planning workshops, discussions with standing committees and a survey of stakeholder in public and private capacity. Information collected through these efforts was considered in the prioritization of enhancement areas.

Stakeholder groups engaged included federal, state, county, and local government officials and agencies; commercial entities; academic institutions; non-governmental organizations and private citizens. Many comments were received and incorporated into the enhancement area assessments. Engagement also led to the identification and development of the strategy for this cycle. Comments received repeatedly include the need for comprehensive research and monitoring for wetlands management and restoration; implementation of initiatives on a watershed or whole-basin level; comprehensive planning for adaptation implementation, habitat restoration, and outreach; data and information sharing; improved science to policy communication; and support for expanded implementation of innovative practices to address coastal management issues.

Public Comments

Delaware's draft CZMA Section 309 Enhancement Program 2021-2025 Assessment and Strategy was made available for public review. Notice of the opportunity to review and provide comments on this document was made through a newspaper with statewide circulation and the DNREC electronic public notification system. The document was published electronically on the DCP website and printed copies were made available upon request. The DCMP also discussed the draft with various networked partners.

{Comments received during public comment period will be summarized for inclusion prior to final submission}

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