Maine Coastal Program

STRATEGIC OUTLOOK 2016 – 2020

Assessment and Strategy under Section 309 of the Coastal Zone Management Act

FINAL

Submitted to the

National Oceanic & Atmospheric Administration

Office of Coastal Management

October 2015

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**Funding for this document was provided by the U.S. Department of Commerce,
Office of Coastal Management,
Under the Coastal Zone Management Act (CZMA) of 1972, as amended.**

Award # NA14NOS4190066

Acknowledgements

Special recognition to Melissa Anson, former Maine Coastal Program Senior Planner, for her efforts as project coordinator for this effort and editor of this document.

**Special thanks to our state agency colleagues, non-governmental partners and others who attended meetings, developed text, reviewed drafts and submitted comments.
Your efforts greatly improved this document.**

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Introduction

The Maine Coastal Program and the National Coastal Zone Management Program

Maine is one of 36 states and territories that participate in the National Coastal Zone Management Program. The program 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[1] to address national coastal issues. The program is administered by the National Oceanic and Atmospheric Administration's (NOAA) Office for Coastal Management.

Maine's Coastal Program (MCP) was approved by NOAA in 1978. Maine's coastal zone includes:

- 5,408 miles of coastline;
- All municipalities with tidal waters in their jurisdiction; and
- State-owned submerged lands and islands out to three nautical miles.

MCP (based at Maine's Department of Agriculture, Conservation and Forestry) works in partnership with federal, state and regional agencies, local governments and others to balance the conservation and development of Maine's coastal resources. While the core of Maine's Coastal Program is the effective administration of environmental laws along the coast, (sometimes referred to as "coastal core laws" or "enforceable policies"), the Program conducts a wide range of initiatives that help to create a healthier coast and stronger coastal communities. The program's current areas of focus include: waterfront planning and revitalization, land use planning technical assistance to municipalities, adaptation to shoreline erosion and sea level rise, habitat restoration, seafloor mapping, public access and public education. More detail about the Maine Coastal Program is available at www.mainecoastalprogram.org.

NOAA's Coastal Zone Enhancement Program

To foster innovation and continuous improvement in state coastal programs, NOAA administers the Coastal Zone Enhancement Program also referred to as "Section 309 of the CZMA". The program provides incentives to states to enhance their coastal programs in nine key topic areas of national concern as follows:

- Aquaculture – facilitating farming/cultivation of aquatic organisms such as fish, shellfish and plants.
- Coastal Hazards – eliminating or reducing threats to public health, safety and welfare from storms, climate change, erosion, etc.
- Cumulative and Secondary Impacts of Development – addressing impacts associated with land development and other stressors.
- Energy and Government Facilities Siting – facilitating sound siting of large-scale essential services.
- Marine Debris – eliminating or reducing trash and other refuse in coastal waters or on shorelines.
- Ocean Resources – planning for existing and potential new uses in coastal waters, including consideration of marine resources (species and habitats), cultural/historic resources, water quality, sand and gravel deposits, dredging, etc.
- Public Access – facilitating public access to the shore.
- Special Area Management Plans – planning for resources or geographic areas of concern.
- Wetlands – protecting, restoring or enhancing wetlands.

[1] Text of the CZMA is available at http://coast.noaa.gov/czm/act/

Section 309 Enhancement Area funds are intended for states to achieve "program changes" such as new or revised state statutes and rules, new or revised municipal plans and ordinances, guidance, agreements, creation of new funding sources, procedures, policies and agreements.

Strategic Outlook (Section 309 Assessment and Strategy)

Every five years, the Maine Coastal Program develops a *Strategic Outlook* (also known as the CZMA Section 309 Assessment and Strategy), assessing the status of the topics above, reviewing our past performance, meeting with partner organizations, stakeholders and other state agencies to develop priorities and strategies for program innovation and improvement. Initiatives outlined in this document provide a general blueprint to guide MCP's work over the next five years (2016-2020). The document is also intended for use by others to assess opportunities for potential partnerships and joint efforts.

The *Strategic Outlook* follows guidance and formatting prescribed by NOAA. The document is submitted to NOAA for approval under the Coastal Zone Enhancement Program, and, once approval is gained, Maine will qualify for additional federal funding (around $400,000 in 2015) to address priority enhancement strategies.

Limitations of this Effort

- It was beyond the scope of this assessment to conduct new monitoring or measurement of the health of coastal resources – we have drawn on existing data and trends to inform this assessment.
- Given rapidly changing environmental conditions, (i.e. ocean acidification, invasive species, ocean water temperatures), it is impossible to forecast with certainty what MCP's priorities will be in 2020. Therefore this strategy is flexible and can be amended.
- It is beyond the ability of the Maine Coastal Program (given current and anticipated resources) to complete all of the initiatives described in this document. Rather, the document presents a menu of options for future workplans. Projects will be chosen from this menu annually.
- This document does not describe the entirety of MCP's planned work over the next five years. Rather it includes only strategies that are eligible for funding under Section 309 of the CZMA. See the description of "NOAA's Coastal Zone Enhancement Program" above for limitations on Section 309 funding. MCP's "base program funding" is available for other projects that do not qualify for Section 309 funding, and MCP routinely submits proposals in response to competitive funding opportunities.

How this Document was created

The process to create this Strategic Outlook was as follows:

- MCP conducted "Phase I Assessments"[2] of all nine issue areas, compiling existing data and summarizing trends in demographics, resource use, conservation and economic development and assessing our past work on the assessment topics. Initial priority ratings were developed by staff.

[2] *Phase I Assessments are intended to quickly determine whether the enhancement area is a high priority enhancement objective for the MCP that warrants a more in-depth assessment. The more in-depth assessments of Phase II will help the MCP understand key problems and opportunities that exist for program enhancement and determine the effectiveness of existing management efforts to address those problems.*

- Interagency and stakeholder meetings and one-on-one conversations were held to "reality check" MCP's preliminary identification of priorities.[3] Of the nine federal enhancement areas, four were chosen as priorities for the Coastal Program -- Coastal Hazards, Cumulative and Secondary Impacts of Development, Ocean Resources and Wetlands.
- For these priority enhancement areas, more detailed "Phase II Assessments" were developed that examined stressors/threats to resources, emerging issues, data and information needs and management priorities.
- MCP staff and agency partners developed draft strategies to improve coastal resource management in the four priority topic areas.
- The draft document was posted on the Maine Coastal Program website for a 30-day review period in June, 2015 and notice of its availability was provided to a lengthy list of program partners, collaborators and others. The feedback we received was used to revise and finalize this document.
- The final document was submitted to NOAA for review and approval.
- The final version of this document will be posted on our website following NOAA approval.

MCP reached out to partners and stakeholders at several stages throughout the development of the Strategic Outlook, as summarized below:

- MCP developed/distributed a discussion document to guide discussions at stakeholder and state agency meetings.
- MCP held one stakeholder meeting and followed up individually with those who couldn't attend.
- Staff met with Regional Planning Organizations (RPOs), conducted a follow-up survey of RPOs and compiled the results.
- The draft 309 Assessment and Strategy was posted on MCP's website for a 30 day comment period, and stakeholders that participated in the initial meeting were invited to comment on the document.
- All input received from partners and stakeholders was compiled and considered as part of A&S development. Edits were made to the Assessment and Strategy document based on comments received.
- MCP's response to all feedback received during the 30-day public comment period was documented and provided back to participants.

Appendices A-D included at the end of this document provide summaries of public outreach conducted, comments received and Maine Coastal Program staff responses to comments.

<u>How this Document is Organized</u>

As mentioned above, four priority areas of focus for the Maine Coastal Program over the next five years are:

- Coastal Hazards;
- Cumulative and Secondary Impacts of Development;
- Ocean Resources; and
- Wetlands

Sections on each of the above priorities include Phase I and II assessments, a series of strategies and goals, a description of activities and milestones and a very rough, generalized budget.

[3] See Appendices A-D for additional details about how public participation was used to inform the development of this document.

Sections on the remaining five topic areas – Energy and Government Facilities Siting, Marine Debris, Special Area Management Planning, Public Access and Aquaculture – contain only the Phase I (high-level, cursory) assessment.

Shifts in Priorities Since the Last Assessment in 2011

The Maine Coastal Program's last Strategic Outlook was completed in 2011 and covered the five-year period ending in 2015. The table below contrasts MCP's 2011 priorities vs. those developed for 2016-2020.

Issue Area	**Current Priorities for CZMA Section 309 Funding (2016-2020)**[4]	**Past Priorities for CZMA Section 309 Funding (2010-2015)**	**Notes**
Coastal Hazards	High	High	No change in ranking.
Cumulative and Secondary Impacts of Development	High	Medium	Elevated ranking due to continued lack of capacity in many coastal towns; stakeholder input; availability of potential partnerships.
Ocean Resources	High	High	No change in priority ranking
Wetlands	High	Medium	Elevated ranking due to anticipated effects of sea-level change on coastal wetlands; stakeholder input; availability of potential partnerships.
Aquaculture	Low	Medium	High priority for Maine as a state, but limited role for MCP at present. Limited opportunity for program "enhancements" under Section 309.[5]
Energy and Government Facilities Siting	Medium	High	High priority for Maine as a state, but limited role for MCP at present. Limited opportunity for program "enhancements" under Section 309.
Marine Debris	Low	Low	Limited opportunity for program "enhancements" under Section 309.
Public Access	Medium	Medium	Limited opportunity for program "enhancements" under Section 309.
Special Area Management Planning	High	High	No change. Working at the regional level remains a high priority for MCP.

[4] Cursory, "Phase I" assessments were prepared for low and medium priority issue areas. Cursory, "Phase I" assessments *and* more detailed "Phase II" assessments were completed for high priority areas. Strategies, general workplans and budgets were also developed for high priority topic areas.

[5] Program "enhancements" under CZMA Section 309 are intended to result in new or revised state statutes and rules, new or revised municipal plans/ordinances, agency guidance, interlocal and other formal agreements, and creation of new programs and/or new funding sources.

Summary of Completed Efforts under the Coastal Management Enhancement Program

The following is a brief summary of selected recent efforts completed under the Coastal Zone Enhancement Program within the last five years[6]. See each assessment chapter for a more detailed narrative description.

Coastal Hazards

- Coast-wide mapping of the potential impacts of sea-level rise was completed and 38 communities have been involved in efforts to understand and address their town's vulnerability to climate variability.
- Six communities analyzed anticipated sea level rise impacts on saltmarshes and identified areas with conditions suitable for marsh migration.
- An additional 1500 acres of coastal sand dunes were mapped.
- A vulnerability assessment of shoreline change and sea-level rise was completed for five coastal state parks and state historic sites.
- Maine's Land Use Planning Commission (which regulates development in Maine's unorganized territory) adopted the use of "highest astronomical tide" to delineate the upper boundary of coastal wetlands.

Cumulative and Secondary Impacts of Development

- The rate of growth and extent of impervious surface in the coastal zone was mapped using multiple years of areal imagery.
- The Stream Connectivity Work Group (a restoration practitioners network), was launched to increase the pace and quality of stream restoration. The "Habitat Viewer", a GIS-based tool to view restoration opportunities was created. Inventories of culverts, dams and other structures that block passage of aquatic species (particularly diadromous fish) were completed in many locations.
- Marine and estuarine species were evaluated and conservation actions developed as part of the 2015 update of the State Wildlife Action Plan.

Energy and Government Facilities Siting

- A model ordinance and guidebook for local siting of windpower developments was developed.
- Regulations and rules were modified to facilitate ocean energy development (wind and tidal.)

Ocean Resources

- Rotational management for scallops was instituted and a fishery management plan for rockweed was implemented.
- MCP created the Maine Coastal Atlas, a spatial display and analysis tool.
- The Maine Coastal Mapping Initiative advanced from a pilot project to an active seafloor mapping effort to identify habitats and improve navigation.
- MCP assisted in the development of the recommendations of the Maine Ocean Acidification Commission.
- MCP entered into a cooperative agreement with the federal Bureau of Ocean Energy Management to assess the locations of offshore sand deposits.

[6] The summary includes only efforts that were funded under NOAA's Enhancement Program. Many other successes, accomplished with the use of other funds, are discussed in the report text.

Wetlands

- An analysis of potential for tidal marsh migration onto underdeveloped lands was completed for the entire coast.

Changes to Maine's "Coastal Core Laws" 2010-2015

NOAA's approval of the Maine Coastal Program in 1978 was based, in part, on Maine's ability to balance the development and conservation of coastal resources through sufficiently protective laws (sometimes referred to as "coastal core laws" or "enforceable policies"). In Maine, our coastal core laws include primarily statutes and regulations administered and enforced by the Maine DEP[7].

The CZMA requires that NOAA, on an ongoing basis, approve changes to state enforceable policies enacted by the Maine Legislature. After each session of the legislature (and when applicable, after agency rule-making) the Coastal Program submits pertinent changes for NOAA approval. NOAA-approved changes to the Maine Coastal Program over the last five years are summarized below.

Coastal Hazards

Changes to state laws concerning coastal hazards were submitted to and approved by NOAA for inclusion in the Maine Coastal Program as follows:

Coastal Hazards Program Changes	**Submittal to OCM[8] (Y/N) and if (Y), Date of OCM approval**
Expansions of certain structures exempted from permitting.	Y - 1.24.12 (P.L. 2011 c. 64)
Permit by rule standards changed for riprap, access ways in sand dunes and culvert crossings.	Y - 7.6.11 (DEP rules ch. 305)
Beach areas in Old Orchard Beach and Cape Elizabeth included as essential wildlife habitat for piping plovers.	Y - 7.6.11 (DIFW rules ch. 8)
Clarified NRPA definition of the "footprint" of a building or other structure subject to regulation; clarified existing exemption for construction in sand dune areas to include not just minor expansion of "buildings" but minor expansion of other structures.	Y - 10.25.12 (P.L. 2011 c. 538 /
Allowed certain activities, e.g., driveway for previously developed area, in sand dune system subject to permit by rule requirements; and makes related changes.	Y - 8.17.12 (DEP rules ch. 305)
Amended setback provisions for certain docks.	Y - 11.5.13 (P.L.2013 c.140)
Created NRPA permitting exemption for brownfields clean-up activities on "working waterfront land").	Y - 11.5.13 (P.L. 2013 c. 231)
Coastal Barriers Resource System Act approved for inclusion among MCP's core laws.	Y - 11.5.13 (38 M.R.S. §§1901-05)
Clarified Shoreland Zone Act's definition of "structure".	Y - 7.9.14 (P.L. 2013 c. 489)

[7] A complete list of Maine's coastal core law can be found at http://www.maine.gov/dacf/mcp/downloads/federalconsistencyguidebook.pdf

[8] OCM is NOAA's Office of Coastal Management

Coastal Hazards – Anticipated Future Program Changes

- Pursuant to legislative authorization, DEP amended its ch.335 sand dune rules to allow, under exceptional circumstances outlined in the rule, a residential structure to be relocated from the back dune to the frontal dune. DACF intends to include this rule change in an upcoming RPC submission in 2015.
- A number of bills to address coastal resiliency-related issues are now pending before the 127th Maine Legislature, First Regular Session. If one or more of these bills becomes law, DACF will include pertinent provisions, if any, in an upcoming RPC submission in 2015.
- DEP has amended its model shoreland ordinance (DEP rules ch. 1000), principally to conform the model to prior statutory changes to the Shoreland Zoning Act. DACF will include pertinent provisions, if any, in an upcoming RPC submission in 2015-16.

Cumulative and Secondary Impacts of Development

Changes to state laws concerning cumulative impacts were submitted to and approved by NOAA for inclusion in the Maine Coastal Program as follows:

Cumulative Impacts Program Changes	**Submittal to OCM (Y/N) and if (Y), Date of OCM approval**
Amended overboard discharge removal and related marine water pollution control laws.	Y - 2.28.11 (P.L. 2009 c. 654)
Amended provisions regarding license transfer and replacement of overboard discharge systems with alternative systems).	Y - 1.24.12 (P.L. 2011 c. 121)
Incorporated Maine's Coastal Policies Act into coastal core laws.	Y - 11.5.13 (38 M.R.S. §§1801 to 1802)
Amended permit by rule provisions regarding development in or affecting significant wildlife habitat for waterfowl and wading birds.	Y - 8.17.12 (DEP rules ch. 305)

Energy and Government Facilities Siting

Changes to state laws concerning energy siting were submitted to and approved by NOAA for inclusion in the Maine Coastal Program as follows:

Energy and Government Facilities Siting Program Changes	**Submittal to OCM (Y/N) and if (Y), Date of OCM approval**
Enacted recommendations of the Ocean Energy Task Force on siting and permitting of renewable ocean energy development and related energy policy issues.	Y - 2.28.11 (P.L. 2009 c. 615)
Designated scenic viewpoints of state or national significance on DOC-managed public reserved lands and publicly accessible pedestrian trails that would trigger a scenic impact assessment under the wind power development siting laws)	Y - 7.6.11 (Dept. of Conservation (DOC) rules ch. 3)
Amended the criteria for approval of wind energy development projects in LUPC territory to clarify that DEP has statewide jurisdiction over "grid-scale wind energy development" and related provisions as part of law replacing LURC with LUPC)	Y - 10.25.12 (P.L. 2011, c. 682)
Amended Site Law's noise control rules regarding wind energy development)	Y - 8.17.12 (DEP rules ch. 375)
Amended mitigation and avian habitat protection provisions in laws regarding siting of grid-scale wind energy projects)	Y - 11.5.13 (P.L. 2013 c. 325)
Amended MWDCA provision regarding general permit for tidal energy demonstration project to harmonize state and federal requirements)	Y - 11.5.13 (P.L. 2013 c. 177)

Energy and Government Facilities Siting Anticipated Future Program Changes

A number of bills to revise the statutory framework for siting grid-scale wind energy development and related energy policy issues are now pending before the 127th Maine Legislature, First Regular Session. If one or more of these bills becomes law, DACF will include pertinent provisions, if any, in an upcoming RPC submission in 2015.

Marine Debris

No changes related to marine debris were made to coastal core laws in the last five years.

Marine Debris Anticipated Future Program Changes

The Maine Legislature's Joint Standing Committee on Marine Resources has requested approval to carry over to next session a bill that would amend current law to facilitate cleanup of lost fishing gear. If the

bill is carried over and enacted into law, DACF will include pertinent provisions, if any, in an upcoming RPC submission in 2016.

Ocean Resources

Changes to state laws concerning ocean resources were submitted to and approved by NOAA for inclusion in the Maine Coastal Program as follows:

Ocean Resources Program Changes	**Submittal to OCM (Y/N) and if (Y), Date of OCM approval**
Clarified DMR commissioner's authority to close areas to fishing)	Y - 2.28.11 (P.L. 2009 c. 528)
Clarified eligibility of certain, recently-approved maintenance dredging projects for permit by rule approval	Y - 1.24.12 (P.L. 2011 c. 65)
Clarified DMR commissioner's authority to classify coastal waters as open or closed to harvesting due to pollution and related provisions.	Y - 10.25.12 (P.L. 2011 c. 527)
Amended DMR's authority to adopt state fisheries management plans.	Y - 11.5.13 (P.L. 2013 c. 287)

Wetlands

Changes to state laws concerning ocean resources were submitted to and approved by NOAA for inclusion in the Maine Coastal Program as follows:

Wetlands Program Changes	**Submittal to OCM (Y/N) and if (Y), Date of OCM approval**
Amended Site Law and NRPA provisions regarding regulation of development affecting vernal pools.	Y - 1.24.12 (P.L. 2011 c. 359)
Amended permit by rule standards regarding new activities in existing development areas located in significant vernal pool habitat.	Y - 7.6.11 (DEP rules ch. 305)
Clarified applicability of provisions regulating development that may affect vernal pools.	Y - 2.12.14 (DEP rules ch. 335)

Wetlands - Anticipated Future Program Changes

Amendments to MCP core laws regarding management of wetlands resources are not uncommon. Accordingly, it's reasonable foreseeable that laws making such changes may be enacted and subsequently submitted as RPCs during the next five-year 309 planning period.

Phase I (High Level, Cursory) Assessments

Coastal Hazards

Section 309 Enhancement Objective: Prevent or significantly reduce threats to life and property by eliminating development and redevelopment in high-hazard areas, managing development in other hazard areas, and anticipating and managing the effects of potential sea level rise and Great Lakes level change. CZMA§309(a)(2)

Note: For purposes of the Hazards Assessment, coastal hazards include the following traditional hazards and those identified in the CZMA: flooding; coastal storms (including associated storm surge); geological hazards (e.g., tsunamis, earthquakes); shoreline erosion (including bluff and dune erosion); sea level rise; land subsidence; and saltwater intrusion.

PHASE I (HIGH-LEVEL) ASSESSMENT

Resource Characterization:

1. **Flooding:** Using data from *NOAA's State of the Coast* "Population in the Floodplain" viewer[9] and summarized by coastal county through NOAA's Coastal County Snapshots for Flood Exposure,[10] indicate how many people were located within the state's coastal floodplain as of 2010 and how that has changed since 2000.

Population in the Coastal Floodplain			
	2000	**2010**	**Percent Change from 2000-2010**
No. of people in coastal floodplain	75,314	81,929	8.8% increase
No. of people in coastal counties	1,183,750	1,238,956	4.7% increase
Percentage of people in coastal counties in coastal floodplain	6.4%	6.6%	.2% increase

2. **Shoreline Erosion**: According to data downloaded from *NOAA's State of the Coast* "Coastal Vulnerability Index,"[11] for Maine, 17 miles of Maine's shoreline has a "Low" vulnerability, while 1452 miles has a "Moderate" vulnerability to shoreline erosion; this dataset is clearly incomplete, as it *provides data for just over one-quarter of Maine's overall shoreline*. Thus, the Maine Geological Survey (MGS) used Maine's Coastal Marine Geologic Environments data combined with Coastal Bluff Stability mapping data to create a slightly different classification for vulnerability of the Maine shoreline to erosion. This table does not use calculated shoreline change rates; instead, it uses geologic shoreline types and/or mapped bluff types as proxies for shoreline change vulnerability. According to this data, about 13% of the shoreline is highly or very highly susceptible to shoreline erosion.

[9] http://stateofthecoast.noaa.gov/pop100yr/welcome.html. Note FEMA is in the process of updating the floodplain data. This viewer reflects floodplains as of 2010.
[10] www.csc.noaa.gov/digitalcoast/tools/snapshots
[11] http://stateofthecoast.noaa.gov/vulnerability/welcome.html (see specifically "Erosion Rate" drop-down on map). The State of the Coast visually displays the data from USGS's Coastal Vulnerability Index.

Shoreline Change Vulnerability (CMGE and Bluff Types)	**Miles**	**Percent**
Very Low (Rocky, Armored)	1827	34%
Low (Flats, Stable Bluffs)	2549	47%
Moderate (Coarse Beaches)	355	7%
High (Unstable Bluffs)	406	8%
Very High (Sand Beaches and Dunes, Highly Unstable Bluffs)	271	5%
Total Shoreline	**5408**	**100%**

3. **Sea Level Rise:** According to data downloaded from *NOAA's State of the Coast* "Coastal Vulnerability Index,"[12] for Maine, 658 miles of Maine's shoreline has a "Low" vulnerability, while 831 miles have a "Very Low" vulnerability to sea level rise; again, this dataset is clearly incomplete, as it *provides data for just over one-quarter of Maine's overall shoreline*. Again, MGS created a different table that uses data described in shoreline change, above. This table shows that a high percentage of the coastline – about 31% is very highly vulnerable to sea level rise because it is comprised of either flats or highly unstable bluffs. If sandy beaches, dunes, and unstable bluffs are included, then about 42% of Maine's coastline is vulnerable to sea level rise. See table below.

Sea Level Rise Vulnerability (CMGE and Bluff Types)	**Miles**	**Percent**
Very Low (Rocky, Armored)	1827	34%
Low (Coarse Beaches)	355	7%
Moderate (Stable Bluffs)	942	17%
High (Sand Beaches and Dunes, Unstable Bluffs)	617	11%
Very High (Flats, Highly Unstable Bluffs)	1667	31%
Total Shoreline	**5408**	**100%**

4. **Other Coastal Hazards:** In the table below, indicate the general level of risk in the coastal zone for each of the coastal hazards.

Type of Hazard	General Level of Risk[13] (H, M, L)
Flooding (riverine, stormwater)	H
Extratropical coastal storms (including storm surge)	H
Shoreline erosion	H
Sea level rise	H
Hurricanes or Tropical Events	M
Landslides	M
Coastal Bluff Stability	M
Geological hazards (e.g., tsunamis, earthquakes)	L
Land subsidence	L
Saltwater Intrusion	L

[12] http://stateofthecoast.noaa.gov/vulnerability/welcome.html (see specifically "Erosion Rate" drop-down on map).

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

Explanation of the Table on the Previous Page.

Flooding (riverine, stormwater). MGS has identified riverine and stormwater flooding as a hazard that has not been sufficiently explored to-date. Better, updated precipitation data -- such as available through Cornell University -- could be used to begin looking at freshwater flooding in coastal communities.

Extratropical coastal storms (including storm surge)
The most dangerous and damaging coastal hazards come from extratropical storms. The "100-year storm" has been and will likely be a northeaster. Storms that track into the Gulf of Maine, and sometimes stall, generate 20-30 waves, 4-6-foot storm surges and can linger for multiple high-tide cycles causing property damage, beach erosion, flooding, and threaten lives.

Shoreline Erosion. Many beaches, dunes, and bluffs in Maine are experiencing more acute erosion and flooding problems since the last assessment (Ezer and Atkinson, 2014; Sweet et al., 2014; Slovinsky, 2012, 2014; Slovinsky and Dickson, 2011; 2009; Slovinsky et al., 2013).

Sea level rise. The rate of sea level rise in the Gulf of Maine has accelerated in the last decade (Yin and Goddard, 2013; Goddard et al., 2015) and has also increased along the Maine coastline (Slovinsky, 2015, pers. communication). In the last 100 years of tide gauge data, 83% of the highest recorded average monthly sea levels occurred in the last decade (Slovinsky, 2012). In the next 5 years, updated digital Flood Insurance Rate Maps (DFIRMs) should be completed for all coastal counties and can form the basis for additional sea level rise scenarios.

Hurricanes. MGS completed statewide Potential Hurricane Inundation Maps (PHIMs) for Category 1 and 2 events making landfall at mean high tide and mean tide. This effort, funded through a Cooperating Technical Partners Program grant from FEMA and with support of the Maine Floodplain Management Program, replaced previous mapping from 2005 by the US Army Corps of Engineers by using updated SLOSH model outputs and new, high-resolution coastal LiDAR data. The US Army Corps of Engineers (National Hurricane Partners) is completing Category 3 and 4 mapping in Maine in support of hurricane evacuation planning.

Bluff Stability. Statewide mapping is completed except for Washington County. This has resulted in the mapping of around 1400 miles of bluffs, categorized as stable, unstable, or highly unstable in the Coastal Bluff Map series by MGS. Landslide susceptibility has also been mapped and is available as part of the Coastal Landslide Hazards Map series. However, with the availability of new coastal LiDAR, many new landslides have been revealed through analysis. Geomorphic features in and around Casco Bay suggest that there are more than 10 times the number of landslides than previously known. The risk is medium at this time because the age, and hence frequency, of landslides is yet to be determined.

Tsunamis. Investigation of a 2008 meteotsunami in mid-coast Maine (Vilibić et al., 2014; Whitmore and Knight, 2014) developed a better understanding of the weather systems that produce rapid tidal surges and strong estuarine and riverine currents. The NOAA National Tsunami Warning Center improved the numerical model (Knight et al., 2013) to better predict meteotsunami surges and durations, including reverberations in the Gulf of Maine (Wang et al., 2013). This improvement complements earlier assessments of tsunamis (ten Brink, 2009). Maine Geological Survey analysis determined that tsunami

water levels (without wave runup that has not been modeled) are similar to inundation from a Category 2 hurricane.

Subsidence. Subsidence has been lowered in terms of general risk level from the last assessment because recent analysis of vertical crustal motion has shown lower values than previously thought (Zervais et al., 2013), dispelling the concept of differential crustal warping (Anderson et al., 1984).

Saltwater intrusion. Saltwater intrusion hazard is generally low due to the underlying geology of the Maine coastline which limits the lateral extent and interconnectedness of sand and gravel aquifers. Salt water intrusion is primarily localized to peninsular communities with private drilled bedrock well systems.

5. If available, briefly list and summarize the results of any additional data or reports on the level of risk and vulnerability to coastal hazards within your state since the last assessment.
   - The Maine Emergency Management Agency's State Hazard Mitigation Plan was updated in 2013, with input from MGS. (MEMA, 2013)
   - The State of Maine's Beaches Report (most recently completed in 2013; new version will be completed in 2015) is released biennially.
   - Maine's counties have Hazard Mitigation Plans that are periodically updated.

Management Characterization:

1. 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 the last assessment.

Management Category	**Employed by State** (Y or N)	**CMP Provides Assistance to Locals that Employ** (Y or N)	**Significant Changes Since Last Assessment** (Y or N)
Statutes, regulations, policies, or case law interpreting these that address:			
elimination of development/redevelopment in high-hazard areas	Y	Y	Y
management of development/redevelopment in other hazard areas	Y	Y	N
climate change impacts, including sea level rise or Great Lake level change	Y	Y	N
Hazards planning programs or initiatives that address:			
hazard mitigation	Y	Y	Y
climate change impacts, including sea level rise or Great Lake level change	Y	Y	Y
Hazards mapping or modeling programs or initiatives for:			
Sea level rise and marsh migration	Y	Y	Y
Coastal Sand Dunes	Y	Y	Y
Hurricane Inundation	Y	Y	Y
Maine Beach Mapping Program	Y	Y	N

Briefly state how “high-hazard areas” are defined in your coastal zone.

Maine does not have a specific state-wide definition of “high hazard area”. For beach and dune systems, Maine regulates activities through the Coastal Sand Dune Rules (Chapter 355 of the NRPA), which use a geologic definition of frontal dune and back dunes. Higher hazard areas are typically considered to be areas of the frontal dune, and areas of back dunes that are defined as Erosion Hazard Areas, or EHAs (all frontal dunes are EHAs). EHAs are defined as:

> *Any portion of the coastal sand dune system that can reasonably be expected to become part of a coastal wetland in the next 100 years due to cumulative and collective changes in the shoreline from:*
>
> 1. *Historical long-term erosion;*
> 2. *Short-term erosion resulting from a 100-year storm; or*
> 3. *Flooding in a 100-year storm after a two-foot rise in sea level,*
>
> *or any portion of the coastal sand dune system that is mapped as an AO flood zone by the effective FEMA Flood Insurance Rate Map, which is presumed to be located in an Erosion Hazard Area unless the applicant demonstrates based upon site-specific information, as determined by the department, that a coastal wetland will not result from either (1), (2), or (3) occurring on an applicant's lot given the expectation that an AO-Zone, particularly if located immediately behind a frontal dune, is likely to become a V-Zone after 2 feet of sea level rise in 100 years.*

Additionally, Maine has classified its bluff shorelines as Stable, Unstable, or Highly Unstable. Per Maine’s Mandatory Shoreland Zoning Act (Ch. 1000), areas of the coastline defined as Unstable or Highly Unstable require that development be set back 75 feet from the top of a bluff, instead of 75 feet from the highest annual tide line (which is the standard for stable bluff areas).

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.

Statutes, regulations, policies, or case law.

<u>*Elimination of development/redevelopment in high hazard areas.*</u>

The Maine Legislature passed *An Act Regarding Reconstruction of Residential Structures on Sand Dunes* (P.L. 2013, Ch. 277) authorizing DEP to enact a rule that allows a reconstructed building, whose entire footprint is in the back dune of the coastal sand dune system, to be moved seaward into the frontal dune if certain specific standards are met (Ch. 355 Section 6(B)(6)). Based on MGS’s analysis, this rule revision only affects a small number of properties. This 2013 law also repeals a prior version of a comparable rulemaking directive (P.L. 2011, Ch. 538, Section 15) and directs DEP to repeal the rule enacted under that prior provision. This change was not driven by 309 or CZM but rather by Maine DEP

to provide consistency with Ch. 355, Section 6(B)(5). The likely outcome is that one or two back dune residential structures will be reconstructed in a frontal dune.

On March 24, 2014, Governor LePage approved *An Act to Allow the City of Saco to Stabilize the Coastline and Coastal Sand Dune System Adjacent to the Saco River* (P. & S. L. 2013, Ch. 24). The act allows maintenance of a rip-rap revetment along Camp Ellis Beach by the addition of new rocks to maintain the wall elevation (but not to increase it in elevation or to lengthen it) rather than to excavate rocks from the beach and place them at the top of the wall. The law also allows use of geotextile sand-filled tubes in place of roads to protect public infrastructure in areas where the primary frontal dune has been eroded. Natural dune areas are not to be disturbed and the law's provisions sunset if the U.S. Army Corps of Engineers completes a Section 111 (Rivers and Harbors Act) mitigation project for jetty-induced beach erosion. The law also facilitates permitting for routine beach nourishment with sand dredged from the adjacent Saco River. This change was not driven by 309 or CZM but rather by the City of Saco in order to provide hazard mitigation due to the lack of progress on the Section 111 project. The likely outcome is annual addition of rocks to the revetment along Surf Street within the existing footprint of existing engineering.

Shoreland Zoning: There were several changes made to Shoreland Zoning during this assessment period. P.L. 2013 c. 140 amended setback provisions for certain docks. P.L. 2013 c. 320 amended clearing standards for areas zoned as commercial fisheries, maritime development areas, and for brownfield clean-up activities. It also clarified the setback requirements for structures and amends and enacts several definitions. P.L. 2013 c. 489 clarified the Shoreland Zone Act's definition of "structure."

Hazards planning programs or initiatives.

Hazard Mitigation and Climate Change Impacts: NOAA POSM titled *Integrating Science with Policy: Adaptation Strategies for Marsh Migration.* MGS and Maine Coastal Program (MCP) worked with the Municipal Planning Assistance Program (MPAP) and six coastal communities on identifying potential marsh migration areas from sea level rise and storm surge. Work also identified impacted infrastructure (roads, bridges, buildings) in support of hazard mitigation. This project included development of localized but transferable adaptation strategies.

Hazards mapping or modeling programs or initiatives.

Sea Level Rise and Marsh Migration: MGS completed coast-wide mapping of the Highest Annual Tide, plus scenarios of 1, 2, 3.3, and 6 feet of sea level rise or storm surge. MGS worked with the Maine Natural Areas Program (MNAP) to identify potential upland "marsh migration" areas under future conditions. This was a combination of NOAA 309 and NOAA POSM efforts.

Coastal Sand Dunes. MGS completed coast-wide mapping of coastal sand dunes. This added approximately 1,500 additional acres to the approximate 2,000 acres previously mapped as part of the Coastal Sand Dune Geology Map series. This was completed with 309 funding. It is expected that the entire map series will be released as an ArcGIS online product as soon as review of the newly created maps is completed in conjunction with Maine DEP.

Hurricane Inundation: MGS also completed coast-wide mapping of inundation associated with Category 1 and 2 hurricanes making landfall in Maine. This was completed with FEMA funding. This high

resolution online mapping also includes a 20% error band that is not traditionally displayed in U.S. Army Corps of Engineers inundation mapping.
Coastal Erosion: Maine Beach Mapping Program: MGS continued mapping of shoreline features using RTK-GPS as part of the Maine Beach Mapping Program (MBMAP) at southern and mid-coast Maine's larger beach systems. The U.S. Geological Survey Digital Shoreline Analysis System program was used to calculate short-term shoreline change rates. This was funded through Section 309. Maine continues to hold the biennial State of Maine's Beaches Conference on coastal erosion issues. The conference also coincides with the release, biennially of the State of Maine's Beaches report. Data from MBMAP is integrated into this report, as well as beach changes measured as part of the Maine Beach Profile Monitoring Program (MBPMP).

"Nuisance" tidal flooding has been investigated by MGS using data from the Portland tidal station and the NOAA Inundation Analysis Tool. Additionally, MGS explored the impacts of sea level rise on tidal flooding at various locations along the coastline as part of a second NOAA-funded POSM on coastal state parks. This used hourly data from the Portland tidal station and tidal adjustments per NOAA's VDatum to "adjust" tidal data from Portland to other locations along the coast (Slovinsky, 2015, personal communication).

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.

In recent years, especially post Hurricane Katrina and Superstorm Sandy, NOAA has placed enormous focus on coastal hazards nationally, regionally, and at the state level. The increasing frequency and intensity of coastal storms and flooding, along with other hazards such as erosion, means that coastal areas in Maine are becoming more and more vulnerable. Since much of the state's population and businesses are located in the coastal zone, it is critical for MCP to continue its work on these important issues in order to prepare for and mitigate hazardous effects on public infrastructure, roads and emergency systems, and private property.

Stakeholders in 38 communities have been engaged with MCP in adaptation planning and implementation. A groundswell of interest and positive feedback has arisen in the last 5 years from the use of current science, vulnerability assessments, and local visualizations of at-risk assets. MCP initiatives had spurred follow-on efforts funded locally for infrastructure resiliency. What started as a few communities breaking new ground has resulted in an increasing number of additional local efforts and approaches. As of this writing, the Maine 127th Legislature is exploring several bills that address public safety and state expenditures on infrastructure in hazard areas.

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Cumulative and Secondary Impacts of Development

Section 309 Enhancement Objective: Development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources. CZMA§309(a)(5)

PHASE I (HIGH-LEVEL) ASSESSMENT

Resource Characterization:

1. CHANGE IN POPULATION AND HOUSING UNITS IN THE STATE'S COASTAL COUNTIES BETWEEN 2012 AND 2007.

Trends in Coastal Population and Housing Units[14]				
Year	**Year Round Population**		**Housing Units (Seasonal and Year Round)**	
	Total (# of people)	% Change (compared to 2007)	Total (# of housing units)	% Change (compared to 2007)
2007	982, 846	1.07%	511,097	4.01%
2012	993,404		531,605	

2. Using provided reports from NOAA's Land Cover Atlas[15], please indicate the status and trends for various land uses in the state's coastal counties between 2006 and 2011.

Distribution of Land Cover Types in Coastal Counties in Acres		
Land Cover Type	**Land Area Coverage in 2011**	**Gain/Loss Since 2006**
Developed, High Intensity	69,757.7	3,935.1
Developed, Low Intensity	158,066.3	1,872.8
Developed, Open Space	60,121.8	236.0
Grassland	119,665.1	-1,399.3
Scrub/Shrub	488,375.2	55,133.5
Barren Land	71524.4	3,669.5
Open Water	2,240,171.2	1,071.1
Agriculture	386,919.3	-2,343.4
Forested	5,113,855.7	-60,968.0
Wetlands	1,289,528.5	-1,145.3

Note: Area within the state mapped by C-CAP is 9,997,985 acres.

[14] www.oceaneconomics.org/.
[15] www.csc.noaa.gov/ccapatlas/.

3. Using provided reports from NOAA's Land Cover Atlas[16], please indicate the status and trends for developed areas in the state's coastal counties between 2006 and 2011 in the two tables below.

Development Status and Trends for Coastal Counties [17]			
	2006	**2011**	**Percent Net Change**
Percent land area developed	281,902.0 acres (2.8%)	287,945.8 acres (2.9%)	6,043.8 (2.1%)
Percent impervious surface area	94,131.2 acres (0.9%)	97,251.4 acres (1.0%)	3,120.2 (3.3%)

How Land Use is Changing in Coastal Counties	
Land Cover Type	**Net Change to Land Cover Type from Development**
Barren Land	-125.0
Wetland	-478.8
Open Water	-73.2
Agriculture	-1,144.9
Scrub/Shrub	-646.5
Grassland	-552.2
Forested	-3,779.4

4. Percent of Maine's Shoreline by Shoreline Type (see explanatory notes below table)

Shoreline Types		
Shoreline Type	**Percent**	**Miles**
Armored	5%	252
Sand Beaches and Dunes	4%	211
Coarse Beaches	7%	355
Flats	30%	1607
Rocky	29%	1575
Vegetated	26%	1407
Total Shoreline Length	**100%**	**5407**

Notes:
1) Determined by the Maine Geological Survey from analysis of MGS Coastal Marine Geologic Environments Maps, Coastal Bluffs Maps, and Coastal Sand Dune Geology Maps.
2) Shoreline type lengths based on GIS intersection of the mapped Highest Annual Tide (HAT) and CMGE polygons; a 50 m buffer was used and spatial join conducted where the HAT was close to but did not intersect CMGE polygons.

Shoreline Type	**CMGE Units included**
Armored	Sz (primarily roads, bridges, piers, fill)
Sand Beaches and Dunes	B1, B2, Sd
Coarse Beaches	B3, B4, Br, Bw
Flats	F, F1-F6, Fb, Fc, Fe, Fm, Fp, Fs, Mb, Md, Me, Mf, Mp, Ms, Se, Sf, B5, Bs
Rocky	M
Vegetated	Sw, Sm, Sr, M1-M4

[16] www.csc.noaa.gov/ccapatlas/.
[17] Percent Net Change based on increase in acres of developed land and impervious surface from 2006 to 2011, relative to the respective 2006 figures.

Notes Continued:
3) Additional Data for Southern Maine: Maine Geological Survey developed some additional armored shoreline statistics within mainland dune systems in southern Maine and larger dune/beach complexes in mid-coast Maine. The extent of this data is from Kittery through South Portland, Small Point, Popham Beach State Park, Reid State Park, and Pemaquid Beach. Within this region, there are approximately 50 miles of sandy dune shorelines. Of this, approximately 16 miles is armored, which is about 32 percent (significantly higher than the percentage for the state as a whole). Further data and analysis for the remainder of mapped dune systems is expected in 2016.

4. Summary of Data or Reports on the Cumulative and Secondary Impacts of Coastal Growth and Development

State Wildlife Action Plan:
The Maine Coastal Program (MCP), in collaboration with the Maine Department of Marine Resources (DMR), is working with the Maine Department of Inland Fisheries and Wildlife (MDIFW) to complete the 10-year update of the 2005 State Wildlife Action Plan (SWAP). The completed plan, due in October 2015, will include an extensive list of terrestrial and aquatic fauna in need of conservation, habitats where these species can be found, stressors associated with these species and habitats, and potential conservation actions that could significantly reduce the impacts of the identified stressors. The revised plan contains 69 marine and diadromous species in need of conservation. The plan will also highlight the lack of knowledge for other unlisted marine species whose conservation status is currently unknown. Additionally, the MCP and DMR created a new coastal and marine habitat classification scheme to suit the purposes of this project, which will likely be adopted by other northeast states as they update their SWAPs. We anticipate that greater inclusion of marine and diadromous organisms in the 2015 SWAP will lead to improved prioritization of these species regarding conservation, management, and research funding opportunities.

Ocean Acidification Report:
On December 5, 2014, the Commission to Study the Effects of Coastal and Ocean Acidification and its Existing and Potential Effects on Species that are Commercially Harvested and Grown along the Maine Coast submitted its final report to the Maine Legislature (http://www.maine.gov/legis/opla/OAreportdraft102114.pdf). The report detailed the state of the science of coastal and ocean acidification on Maine's marine resources, generated recommendations for monitoring and mitigating the impacts of ocean and coastal acidification

State of Maine Department of Environmental Protection, 2012 Integrated Water Quality Monitoring and Assessment Report, DEPLW-1246
This document fulfills biennial reporting requirements on both a federal and state level. The federal requirement arises from the Clean Water Act (CWA), particularly Section 305(b) (report on the state of waters), Section 303(d) (list of impaired waters), and Section 314 (Clean Lakes Program). The state requirement arises from 38 M.R.S. § 464.3.A. (report on the quality of the State's waters to the Maine Legislature). The Section 305(b) Report and Section 303(d) List are important ways of regularly communicating information on the health, current status, and trends of the State's waters. Chapters in the report detail that status of lakes, rivers and streams, and coastal/estuarine waters.
http://www.maine.gov/dep/water/monitoring/305b/2012/report-final.pdf

Maine's Aquatic Resource Strategy: A Work in Progress, Maine Department of Environmental Protection (2013). Environmental Protection Documents Paper 37
P.L. 2011. ch. 205 § 4, instructed the Department of Environmental Protection, the Department of Inland Fisheries and Wildlife, the Department of Marine Resources, and the Department of Transportation along with other interested stakeholders to work collaboratively to develop a statewide

aquatic conservation and restoration strategy plan that aims to maintain and restore the ecological health of aquatic ecosystems. In response to this directive, the Aquatic Resource Management Strategy (ARMS) interdisciplinary stakeholder forum was created. DEP's 2013 report to the 126th Maine Legislature is at: http://statedocs.maine.gov/dep_docs/37

Stream Connectivity Work Group– Maine Coastal Program coordinates the Stream Connectivity Work Group (SCWG), which is composed of individuals representing state and federal agencies, tribal governments, non-governmental organizations, forest products companies, and engineering firms, working to increase the rate and quality of habitat restoration in Maine. The SCWG's annual reports include estimates of the extent of dams and road crossings that limit fish passage. http://mapserver.maine.gov/streamviewer/NewsItems/StreamConnectivityGroup2012-2013ReportFinal.pdf Moore, S.2013. Maine Stream Connectivity Work Group 2012-2013 Report. Prepared for the Maine Coastal Program, Department of Agriculture, Conservation and Forestry

Vernal Pool Streamlining Working Group
A multidisciplinary work group is advancing a new mechanism for conservation of vernal pools. Pilot projects to test this approach are underway in two towns (including the coastal town of Topsham). The regulatory mechanism, a US Army Corps of Engineers SAMP (Special Area Management Plan) is designed to develop a local, incentive-based conservation mechanism for vernal pools. It replaces current federal and state vernal pool regulations in designated growth zones with a local, in lieu fee program covering all vernal pools in exchange for greatly enhanced protections in rural areas, funded through mitigation fees for vernal pool impacts in the growth zones. http://www.pnas.org/content/111/30/11002.full.pdf

Management Characterization:

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

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

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

c. Characterize the outcomes or likely future outcomes of the changes.

Statutes, regulations, policies, or case law interpreting these

Amendments to Department of Environmental Protection's Chapter 500 Stormwater Management Rule (Statutory Authority: Title 38 MRS Section 420-D)
The amended rule provides greater flexibility to the regulated community while encouraging the use of innovative stormwater designs that will accommodate measures for addressing climate change, resiliency, and adaptation in our infrastructure. Some of the more notable aspects of the new rule include:

- The treatment levels in the general standards have been revised to provide additional stormwater treatment options for those cases where the standard treatment requirements are impractical or cannot be met.
- A new voluntary Low Impact Development (LID) credit has been established that reduces the volume of stormwater that must be treated if an applicant uses LID techniques.
- New treatment levels have been created for redevelopment projects, through the use of scaled treatment requirements based on stormwater impact changes.
- The appendices, which provide basic performance standards for a variety of stormwater management and associated activities, have been updated to reflect current stormwater best management practices and better align Chapter 500 with Construction General Permit requirements.

Stormwater Management Best Management Practices – Maine DEP has approved new proprietary BMPs for stormwater management. Available at
http://www.maine.gov/dep/land/stormwater/stormwaterbmps/index.html

Maine Clean Water and Wetlands Bond Issue
In November 2014, Maine voters approved a Maine Clean Water and Wetlands Bond Issue "Water Bond" of $10 million, to be administered by the Maine DEP. As part of this bond, $400,000 will go towards restoration of state wetlands. The largest portion of the bond, $5.4 million, will go toward stream crossing and culvert replacement. This funding will go toward public improvements for municipalities and counties, which will reduce flooding and increase fish (and other aquatic organism) passage and stream connectivity. RFPs have been issued and project proposals are due in July and August, 2015. This bond program is not CZM driven.

Case Law: Androscoggin River Alliance et al. v. Maine Board of Environmental Protection
In Androscoggin River Alliance et al. v. Maine Board of Environmental Protection, the Maine Superior Court reviewed an appeal from a July 7, 2011, Order of the Board of Environmental Protection (BEP) that had affirmed issuance of a permit for the construction of the first phase of the Oxford Resort Casino. At issue was the way the Maine Department of Environmental Protection (DEP) had reviewed the permit application under the Site Location of Development Act (SLODA), 38 M.R.S. § 481.The developer's permit application included all necessary information for the first phase of the phased project, with a less-detailed vision for future phases. The developer applied for a permit for Phase I, which DEP reviewed and granted. The Superior Court vacated the previous DEP and BEP rulings, remanded the case to DEP, and directed DEP to evaluate all four phases of construction under SLODA. Highlighting the need for a developer to clarify the action for which it is seeking approval, this ruling effectively confirms the process for review of an application for a SLODA permit for a multi-phase project. DEP must evaluate

permit applications based on all information presented, which allows it to take into account cumulative impacts of the development.

Guidance Documents:

Erosion and Sediment Control BMP Manual, Maine DEP, Update 2015
A pocket guide for contractors was produced along with an engineers' on-line version for engineers containing more design details and instructions.
http://www.maine.gov/dep/land/erosion/escbmps/

Design Guidance for Culvert Sizing, Maine Department of Transportation, 2015
This document provides guidance for sizing culverts under a scenario of increased peak flows and discusses alternatives analyses for sizing culverts in consideration of aquatic species habitats.

Aquatic Resources Pocket Guide
The State's Aquatic Resources Management Strategy Working Group developed a draft pocket guide that contains best management practices and guidance for those installing new and replacement crossings where culverts are 6 feet or less in diameter. The Group is at the beginning stages of a master reference manual that incorporates the best of existing best management practices documents and Stream Smart crossing principles.

Guidebook for Using the State Model Wind Energy Facility Ordinance, 2010.
Recognizing the challenges municipalities face in regulating wind energy facilities, and hoping to foster consistency between state and local approaches to their regulation, Coastal Program resources were used to develop a model ordinance, for voluntary use by Maine municipalities. The Model Ordinance prescribes application requirements and sets review standards to address various concerns such as environmental impacts, visual impacts, noise and safety. The Guidebook assists communities in developing an ordinance.
http://www.maine.gov/dacf/municipalplanning/docs/draft_windenergyfacilityorgguidebook_feb2010.pdf

Storm Event Calculations (ME DEP)
DEP's Chapter 500 Stormwater Rules were changed in light of climate variability and now point project designers to more recent, available data (www.precip.net) to calculate the depth of rain from each of the storm event that needs to be considered under the flooding standards the rule.

Management Plans

Watershed Plans. Municipalities, community water quality groups and Maine DEP completed watershed-based plans were for four coastal watersheds: Alamoosook Lake (Orland/Bucksport/Penobscot), Thatcher Brook (Biddeford/Arundel), Topsham Fair Mall Stream (Topsham) and Cape Neddick Brook (York River). A plan provides assessment and management information and describes actions needed to restore NPS-impaired water bodies, or to protect water bodies threatened by NPS pollution. Non-CZM driven.

Completed Clean Water Act Section 319-funded projects – Project partners and MEDEP completed watershed surveys and plans that identified the following: Eleven stream habitat improvement projects

in Thatcher Brook watershed; 49 stormwater retrofits in Topsham stream watershed (11 are high priority); 56 Nonpoint NPS sites and 19 stream barriers in the Stroudwater River watershed (drains to Fore River Estuary). A watershed and stream corridor study was completed for the Sucker Brook watershed (Bangor). Non-CZM driven.

Frenchman Bay Action Plan, Frenchman Bay Partners 2013

Through a multi-stakeholder process, FBP identified threats to habitats and species of greatest concern and established conservation targets. The Partners' focus is on mudflats, eelgrass, subtidal benthic habitats, and diadromous fish. http://www.frenchmanbaypartners.org/publications/frenchman-bay-plan/ Non-CZM driven.

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 population of Maine's coastal zone continues to grow, albeit at a rate much less than other parts of the country, and with this additional growth and land development comes the challenge of managing cumulative and secondary impacts. Although impacts of development are addressed at the state level by statutes and rules that require avoidance, minimization or mitigation of impacts on coastal resources, as a "home rule state", many land use decisions are made at the municipal level. As a rural state, many Maine towns lack the capacity and technical expertise to focus on impacts to coastal resources. In rural areas, there is a relatively low rate of subdivision activity, and much development occurs on a lot-by-lot basis. The Maine Coastal Program considers Cumulative and Secondary Impacts to be a high priority. This is a cross-cutting issue that is applicable to many aspects of coastal management, and there are numerous opportunities to partner with other organizations. Stakeholders and state partners strongly expressed interest in this topic and agreed that a continued focus on CSI by MCP was needed. MCP's toolbox of management techniques lends well to this enhancement area and could include data coordination, technical assistance, and outreach to municipalities.

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Ocean Resources

Section 309 Enhancement Objective: Planning for the use of ocean resources. CZMA§309(a)(7)

PHASE I (HIGH-LEVEL) ASSESSMENT

Resource Characterization:

1. Understanding the ocean economy can help improve management of the resources it depends on. Using Economics: National Ocean Watch (ENOW), indicate the status of the ocean economy as of 2010, as well as the change since 2005, in the tables below.

Status of Ocean Economy for Maine Coastal Counties (2010)				
	Establishments (# of Establishments)	**Employment** (# of Jobs)	**Wages** (In Dollars)	**GDP** (In Dollars)
Living Resources* (See note below table for this row)	425	8,600*	$62.7 million	$1.5 billion*
Marine Construction	33	187	$10.9 million	$20 million
Marine Transportation	65	3,050	$111.4 million	$186.9 million
Ship and Boat Building	79	10,980	$739.8 million	$664.9 Million
Offshore Mineral Extraction	15	49	$1.9 million	$257,000
Tourism & Recreation	2,358	29,118	$531.1 million	$1.2 Billion
All Ocean Sectors	2,975	45,007	$1.5 Billion	$2.3 Billion

Change in Ocean Economy for Maine Coastal Counties (2005-2010)				
	Establishments (% change)	**Employment** (% change)	**Wages** (% change)	**GDP** (% change)
Living Resources* (See note below table for this row)	7.32%	-6.89%**	24.95%*	42.86%**
Marine Construction	13.79%	-3.11%	32.6%	17.47%
Marine Transportation	-14.47%	50.69%	63.78%	65.32%
Ship and Boat Building	-19.39%	-3.57%	-16.5%	-18.63%
Offshore Mineral Extraction	-25%	-23.44%	-11.04%	-24.15%
Tourism & Recreation	10.29%	7.81%	20.31%	21.03%
All Ocean Sectors	7.91%	6.1%	20.98%	9.37%

*Indicates more accurate data provided by the Maine Department of Marine Resources (DMR).
**DMR does not calculate wages or GDP of living marine resources; however staff has expressed interest in noting these valuable indicators for future use. The "GDP" figures reflect values from ENOW, while values from DMR are reflected under "Wages."

2. 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.

Significant Changes to Ocean Uses	
Resource/Use	**Change in the Threat to the Resource or Use Conflict Since Last Assessment** (↑, ↓, –, unkwn)
Resource	
Benthic habitat	↑episodic, case-by-case
Living marine resources (fish, shellfish, marine mammals, birds, etc.)	**Lobster – Threat Level --:** The lobster resource has been stable/increasing over this time, as evidenced by ~ 25% increase in landings. After a slight downtown in the settlement trend, 2014 settlement showed a return to average. **Shellfish – Threat Level ↑:** The threat to shellfish has increased since the last assessment due to the growing concerns of ocean acidification and invasive species like green crabs. **Groundfish – Threat Level ↑:** Threat has increased due to uncertainty about the status of the population, stock structure, and efficacy of management measures. **Marine Mammals – Threat Level --:** The threat is stable, given work on reducing gear conflict/entanglements. **Birds – Threat Level ↑:** Coastal and ocean birds are increasingly threatened. Much of the threat is due to availability of prey, and climate variability is an overarching issue that is having a negative impact due to warming oceans, sea level rise, and coastal storms. **SAV (eelgrass) – Threat Level ↑ :** Threat level has increased and is expected to continue in this direction. Green crabs and ocean acidification are thought to be factors resulting in eelgrass decline, but others factors contribute to loss. **Marine worms – Threat Level --:** Marine worm populations tend to be somewhat cyclical in nature. The threat to the worm resource is likely stable since the last assessment. Landings of bloodworms have not declined since the last assessment; landings of sandworms have declined gradually. Factors other than commercial fishing are likely to play a part in the population dynamics and are not currently well understood.
Sand/gravel	Thought to be stable; beach nourishment in Maine to date has not involved extraction of sand in coastal waters.
Cultural/historic	Not measured; however, the economic health (proxy for cultural and historic features) of many coastal fishing-dependent communities is closely tied to the value of the lobster resource. Seasonal homeownership in coastal towns may also be a factor affecting community ocean-based cultural identity.
Marine Water Quality	Between 2010 and 2012, there was a 2,062 acre increase in marine waters not meeting the "Marine Life Use Support" water quality standard due to two new areas listings. 3,239 acres were upgraded in attainment status due to the removal of a shellfish consumption impairment.[18] Nutrient loading and ocean acidification is of concern in some Maine embayments, particularly Casco Bay where monitoring by Friends of Casco Bay indicates acidifying waters.

[18] Maine DEP 2012, State of Maine Integrated Water Quality Monitoring and Assessment Report http://www.maine.gov/dep/water/monitoring/305b/2012/report-final.pdf

Significant Changes to Ocean Uses Continued	
Resource/Use	**Change in the Threat to the Resource or Use Conflict Since Last Assessment** (↑, ↓, –, unkwn)
Use Conflict	
Transportation/navigation	-- , case-by-case basis
Offshore development	↓ current state policy diminishes use conflict
Energy production	–– N/A: No Changes Since Last Assessment
Fishing (commercial and recreational)	↓ Opportunity & diversity of fisheries, ↓ opportunity (premiere fish). Trend toward fewer licenses.
Recreation/tourism	-- Stable. Federal mandates requiring recreational fishing closures could impact in future.[19]
Sand/gravel extraction	N/A. Potentially on the horizon
Dredge disposal	--, episodic. The Cape Arundel Disposal Site (CADS), which had served needs for ocean disposal of dredged materials from public and private dredging projects in southern Maine and New Hampshire, closed in 2010 due to lack of final EPA designation. Pursuant to a provision in 2014 federal budget legislation, Congress reopened CADS for a five-year period for small-scale (fewer than 80,000 cubic yards per project) disposal of dredged materials suitable for ocean disposal.
Aquaculture	Use conflicts are on a case-by-case basis. Activity has increased (mostly LPA[20] licenses).
Scientific/Monitoring/Data	↑ MCP's Maine Coastal Mapping Initiative is now conducting annual bathymetric surveys of state waters; mapping of sand/gravel resources has increased and both NOAA and EPA have conducted cruises off of Maine in recent years. Sporadic use conflicts have occurred with the latter due to lack of adequate notification to fishermen.

[19] 50 CFR 648.88 and § 648.89 describes new limitations and restrictions on specific recreationally fished species by charter/party vessel.
[20] Limited-Purpose Aquaculture Lease – An LPA can cover up to 400 square feet of culture equipment and costs $50 for a calendar year for leasing expenses. Only certain species and types of equipment are covered, and it does not include bottom-seeding activities.

For the ocean resources and uses in the two tables on the preceding page 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.

Major Contributors to an Increase in Threat or Use Conflict to Ocean and Great Lakes Resources															
Resource	**Major Reasons Contributing to Increased Resource Threat or Use Conflict** (Note All that Apply with "X")														
	Land-based development	Offshore development	Polluted runoff	Invasive species	Fishing (Comm & Rec)	Aquaculture	Recreation	Marine Transportation	Dredging	Sand/Mineral Extraction	Ocean Acidification	Some unknowns	Climate Change (including storms, warming, sea level rise)	Nearby property - owners	Lack of communication/coordination
Living marine resources:															
Shellfish	X		X	X							X				
Groundfish												X			
Birds	X		X	X								X	X		
SAV (eelgrass)	X		X	X	X [21]			X	X			X			
Benthic habitat	X		X	X	X [22]				X			X			
Cultural/historic	X		X	X							X				
USES															
Water (Quality)	X		X								X	X	X		
Aquaculture	X		X								X			X	
Scientific/Monitoring/Data															X

3. If available, briefly list and summarize the results of any additional state 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.

Lobster Data from Department of Marine Resources
DMR monitors the status of the lobster resource through port sampling (up until 2012, when this was suspended), sea sampling (collection of catch data aboard lobster vessels) and the ventless trap[23] survey. There is also a settlement index, which may provide the earliest indication of any potential change in the status of the resource.

Wind Energy Development: The National Wildlife Federation's 2014 report, *Catching the Wind: State Actions Needed to Seize the Golden Opportunity of Atlantic Offshore Wind Power*, assesses the potential for development of offshore wind energy resources to provide renewable energy to coastal states,

[21] Commercial and recreational fishing is diminishing as a threat to SAV overall because practices have improved. It is still noted here because practices like trawling (which were more widely used in the past) have cumulative effects, even though it is occurring at a much lower rate currently. This is becoming much less of a problem, but historical effects are still being felt.
[22] See footnote 5.
[23] The Ventless Traps Survey used lobster traps without "vents" or a means to leave the trap to assess the stock of the American Lobster. 138 sites were sampled using randomly placed vented (3) and ventless (3) traps.

including Maine, in ways that may address demand at keys times, lower energy costs, and reduce emissions of greenhouse gases and other pollutants. The report summarizes Maine's initial activities to spur development of offshore wind energy, particularly the University of Maine's research and development of a project to pilot a floating wind turbine platform design. The report (p. 19) notes that "Maine, like so many places around the globe, has vast offshore wind power generation potential in waters that would require the use of floating turbine foundations." The report is available here: http://www.nwf.org/News-and-Magazines/Media-Center/News-by-Topic/Global-Warming/2014/07-10-14-New-Report-Golden-Opportunity-of-Atlantic-Offshore-Wind-Power-Finally-Within-Reach.aspx

Maine Wind Energy Development Assessment – In 2012, the Governor's Office of Energy Independence and Security (OEIS, now called the Governor's Energy Office) released a report detailing the status of wind energy in Maine and progress toward wind energy development goals. The report assesses current wind energy projects in Maine, successes and challenges, experience with the permitting process, and technology trends. The OEIS concludes with specific recommendations to achieve wind energy goals, which contribute to the overall goal of energy security in Maine. Recommendations are based around the objective of maintaining Maine's role as a leader in wind development and maximizing wind power benefits to Maine people while protecting natural resources and quality of place. Specific recommendations include ways to improve and expedite the permitting process, allow for public participation, address visual impact and noise through best management practices, and require applicants to establish a community benefits package. The report is available here: http://maine.gov/energy/pdf/Binder1.pdf.

Maine Coastal Atlas – The Maine Coastal Atlas is a spatial display and analysis tool developed by MCP. It is used to depict coastal and marine spatial data, to serve as a data repository, and to allow for the download of otherwise inaccessible spatial data. A link to the Maine Coastal Atlas is here: http://www.maine.gov/dacf/mcp/coastalatlas/index.htm.

Recreational Boating Survey – In 2012, MCP, in partnership with the Northeast Regional Ocean Council states, and the Boston-based science and policy non-profit "SeaPlan", undertook the Northeast Recreational Boater Survey. This survey provided both spatial data depicting boater routes and activities and the economic impact of boating and related activities. Additional information and final reports of the survey can be found here: http://www.seaplan.org/project/2012-northeast-recreational-boater-survey/.

Ocean Acidification Study – In December, 2014, the Commission to Study the Effects of Coastal and Ocean Acidification and its Existing and Potential Effects on Species that are Commercially Harvested and Grown along the Maine Coast submitted its final report to the Maine Legislature (http://www.maine.gov/legis/opla/OAreportdraft102114.pdf). The report detailed the state of the science of coastal and ocean acidification on Maine's marine resources, including recommendations for monitoring and mitigating the impacts of ocean and coastal acidification, and proposed legislation that would create a standing body to continue the work of the Commission. As of spring 2015, there has been no final action on the proposed legislation.

State of the Gulf of Maine – The State of the Gulf of Maine Report is a dynamic document hosted by the Gulf of Maine Council on the Marine Environment (GoMC). The GoMC is a partnership of state, provincial and federal (both Canadian and American) governments that work together to foster a vibrant Gulf of Maine. The Report delves into a range of issues affecting the marine environment. Information on the State of the Gulf Report can be found here: http://www.gulfofmaine.org/2/sogom-homepage/.

Marine Bird Mapping and Assessment (USGS) – The Marine Bird Mapping and Assessment project will develop a series of maps depicting the distribution, abundance and relative risk to marine birds from offshore activities (e.g., wind energy development) in the northwestern Atlantic Ocean. The maps are intended to be used for informing decisions about siting offshore facilities, marine spatial planning, and other uses requiring maps of seabird distributions. Additional information on the project can be found here: http://northatlanticlcc.org/projects/mapping-the-distribution-abundance-and-risk-assessment-of-marine-birds-in-the-northwest-atlantic-ocean.

Maine Seafood Study – Coastal Enterprises, Inc. (CEI), has released the Maine Seafood Study, a report and online tool aimed at integrating Maine seafood into food distribution networks in Maine. The study is a statewide assessment of the who, what, when, and where of Maine's seafood and aquaculture systems with a comprehensive inventory of the businesses and facilities that operate within the industry. An online tool makes it easy to search for specific types of seafood and services being provided and used in Maine. The goal is to connect Maine seafood harvesters, processors, distributors, retailers, and consumers. The study intends to encourage connections within the industry and support this important sector of the Maine economy.

Green Crab Task Force Report – In February, 2014, Governor LePage signed an Executive Order establishing the Green Crab Task Force. The report documented impacts of the invasive Green Crab to commercial fisheries, competition and predation in the food chain, habitat impacts of the species, and summaries of past and ongoing research. Task Force recommendations included holding priority meetings; funding identification, research, industry, and business network development; market development; and streamlining permitting.

Management Characterization:

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

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

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.

Statutes, regulations, policies, or case law interpreting these

For living marine resources, DMR has made extensive changes to statutes and regulations over the past 5 years to improve management and reduce conflicts. Some notable examples of this include a move to rotational management in Maine's scallop fishery (accomplished through changes to regulation), which has yielded significant rebuilding of the scallop resource and additional fishing opportunity for many license holders. In addition, DMR proposed legislation to strengthen the existing authority for the Department to create Fisheries Management Plans for state water fisheries. Both of these changes were supported through 309 projects.

Regional comprehensive ocean/Great Lakes management plans

Northeast Regional Ocean Planning:
The New England Regional Planning Body (RPB) was formed in 2012 and includes representatives from the five coastal New England states, ten federally recognized tribes, ten federal agencies, a representative of the New England Fishery Management Council, and two ex-officio members (one from a Canadian federal agency and one from the Mid-Atlantic Regional Ocean Council). The RPB has no authority to create new regulations. Its mandate is to create a plan and oversee its implementation, with many opportunities for public participation. The RPB is currently working to develop a regional ocean plan (to be completed in 2016) that will include goals that help to foster healthy oceans and ecosystems; effective decision-making; and compatibility among past, current, and future ocean uses. While the regional planning process is still underway, it is anticipated that the final product will provide guidance; data and tools; and a data use agreement for regulatory certainty to agencies, the private sector, and the public.

a) More information on the RPB and the regional planning process can be found here: http://neoceanplanning.org/.
b) State Initiatives: The Maine Coastal Mapping Initiative (MCMI) was created by the Maine Coastal Program (MCP) in 2013 to acquire critical hydrographic data, which will be used by regulatory and planning agencies to maintain vibrant marine ecosystems, expand offshore economic opportunities, and prepare for environmental changes expected due to sea level rise and other environmental changes. Data will be used for:
    a. Habitat Classification;
    b. Ocean Planning;
    c. Effective Management and Siting of Offshore Development;
    d. Identification of Offshore Sand Deposits;
    e. Fisheries Management;
    f. Preservation of Unique Habitats;
    g. Maritime Safety and Resilience;
    h. Emergency Preparedness, and;
    i. Improved Resiliency Modeling.

Single-sector management plans

As referenced above, since 2010, the Maine Legislature has passed legislation that strengthened the Department's authority to develop state water Fisheries Management Plans (FMPs) by specifying what those plans should contain, and what they should seek to achieve. Since that time, DMR has developed a FMP for rockweed. Scallop, urchin, and lobster FMPs are currently under development.

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

Comprehensive Ocean Management Plan	State Plan	Regional Plan
Completed plan (Y/N) (If yes, specify year completed)	N	N
Under development (Y/N)	N	Y
Web address (if available)		http://neoceanplanning.org/
Area covered by plan		Northeast (Long Island Sound to Hague Line)

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.

Maine Coastal Program has identified Ocean Resources as a high priority for its work. With increasing planning being done at the regional level, it is critical for Maine to increase its collection of baseline data. Most of the Gulf of Maine remains unmapped, which makes it difficult to make planning and management decisions on the regional, state, and local levels. Many state partners and stakeholders echoed this sentiment, sharing ideas for data collection that could measurably improve decision-making regarding coastal and ocean resources. Additionally, the Gulf of Maine is seeing rapid environmental change, and baseline data is crucial to provide a benchmark for a means of comparison to future conditions. MCP can have a role in this area by coordinating the collection and serving as a repository for this information. Additionally, climate variability and associated habitat impacts and shifts may necessitate changes to existing or the generation of new FMPs. Ocean acidification has been identified by several partners and by the Maine State Legislature as a significant threat to Maine's ocean resources.

These are dynamic and complicated issues that must be addressed by leveraging MCP's resources with those of partners and other agencies and are of vital importance to the future of Maine's coastal and ocean resources and economy.

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Wetlands

Section 309 Enhancement Objective: Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands. CZMA§309(a)(1)

Note: For the purposes of the Wetlands Assessment, wetlands are "those areas that are inundated or saturated at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." [33 CFR 328.3(b)]. See also pg. 17 of the CZMA Performance Measurement Guidance[24] for a more in-depth discussion of what should be considered a wetland.

PHASE I (HIGH-LEVEL) ASSESSMENT:

Resource Characterization:

Table 1. Current wetland acres in the Coastal Zone. Wetland acres are from National Wetland Inventory (NWI) and the National Wetlands Inventory 2007 update. The 2007 NWI update covers the majority of the Maine coast and is considered supplemental to the original NWI data, however the 2007 mapping ends within the town of Cutler. Therefore the original NWI data remain the best available wetlands mapping data for the rest of the Downeast Coast east of Cutler. Impervious surface data are from the Maine Department of Inland Fisheries and Wildlife (2014) and represent impervious surface area at varying resolutions (1-5m), compiled primarily from leaf-off imagery from 2001-04 (T1) and leaf-on imagery collected in 2007 (T2) through the National Agriculture Imagery Program (NAIP). The percent change in this table includes creation, restoration, and enhancement totals for gain, and altered or filled totals for loss. It does not include acres preserved, since that is a status change that does not indicate a gain.

Coastal Wetlands Status and Trends						
Current state of wetlands in coastal zone in 2014 (acres, according to NWI)	NWI wetlands acres		Impervious surface acres in NWI wetlands		Current wetland acres (2014)	
	Tidal	1,600,911	Tidal	167	Tidal	1,600,744
	Non-tidal	428,926	Non-tidal	1,789	Non-tidal	427,137
	Total	2,029,838	Total	1,956	Total	2,027,882
Percent net change in total wetlands (% gained or lost)*	from 2004-2014		from 2010-2014			
	-.018%		-.007%			
Percent net change in non-tidal) (% gained or lost)*	from 2004-2014		from 2010-2014			
	-.087%		-.036%			
Percent net change in tidal wetlands (% gained or lost)*	from 2004-2014		from 2010-2014			
	-.00046%		-.00019%			

[24] http://coastalmanagement.noaa.gov/backmatter/media/czmapmsguide11.pdf

Table 2. Square miles of wetlands land cover that has been transformed to other landcover types, according to C-CAP data (2006-2010 change detection).

How Wetlands Are Changing*	
Land Cover Type	**Area of Wetlands Transformed to Another Type of Land Cover between 2006-2010 (Sq. Miles)**
Development	.572
Agriculture	.018
Barren Land	.128
Water	.147
Total Area CZM	4,300.738

Table 3: Acres of tidal and non-tidal wetlands altered, filled, enhanced, restored, created, or preserved from 2004-2014.Data are from Maine Department of Environmental Protection and the Maine Chapter of The Nature Conservancy, which administers and maintains data on wetland compensation for the Maine Natural Resources Compensation Program (MNRCP), the granting mechanism for Maine's In-Lieu Fee mitigation program. These data do not include unregulated impacts to wetlands. Non-areal factors include negative and positive influences on wetland function (preservation, enhancement, restoration, or altered). Areal factors include activities that resulted in wetland acreage shifts (creation or filled). Net change was calculated as acres created minus acres filled. Note, preserved acres here only represent those that were preserved through a wetland compensation action (mitigation) and do not include general land conservation that occurred during these time periods. True preservation of wetlands during this time period would be much higher, if taking into consideration other fee and easement conservation actions. In addition, compensation acreage only includes MNRCP projects that have been fully implemented as of December 2014. MNCRP grants were first initiated in 2009.

		Non-areal factors			**Areal factors**			
	Wetland Type	**Altered**	**Enhanced, Restored, or Preserved**	**Total Non-areal factors**	**Filled**	**Created**	**Total Areal factors**	**Net change (acres)**
2004-2014	Tidal	393.91	164.01	557.92	7.51	0	7.51	-7.51
	Non-tidal	202.17	5191.28	5393.45	398.54	22.95	421.49	-375.59
	TOTALS	**596.08**	**5355.29**	**5951.37**	**406.05**	**22.95**	**429.00**	**-383.1**
2010-2014	Tidal	28.43	125.99	154.42	3.09	0	3.09	-3.09
	Non-tidal	103.99	3397.22	3501.21	152.83	0	152.83	-152.83
	TOTALS	**132.42**	**3523.21**	**3655.63**	**155.92**	**0**	**155.92**	**-155.92**

References Cited

Maine Department of Environmental Protection. 2011. State of Maine – In Lieu Fee Program Instrument. Maine Department of Environmental Protection, Augusta, Maine.

Tiner, R.W. 2007. Maine Wetlands and waters: Results of the National Wetlands Inventory. U.S. Fish and Wildlife Service, Northeast Region, Hadley, MA. NWI Technical Report.

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

Marsh Migration and Coastal Adaptation:

- Salt marsh surveys: Coast-wide mapping and ground truthing of tidal marshes, to create a comprehensive tidal marsh map for Maine. As part of this effort Maine Natural Areas Program (MNAP) conducted remote mapping and field surveys of tidal marshes (salt, brackish, and fresh tidal) to characterize and document species, natural community types, and marsh condition. We now have a wall-to-wall map of tidal marshes for Maine.
- Marsh Migration: The Maine Natural Areas Program, working in partnership with the Maine Geological Survey, used LiDAR elevation data to complete an analysis of the potential for tidal marsh migration onto undeveloped lands along the entire coast of Maine based on four projections of sea level rise (1', 2', 3.3', & 6') above current highest annual tide). The results of the analysis show what non-tidal areas within estuaries will be inundated and are likely transition to tidal marsh vegetation as sea level rises.
- Coastal Adaptation Areas: Using the LiDAR-derived marsh migration model, MNAP conducted further analysis to identify percent, acreage, and distribution of future inundated areas that are composed of natural lands, agricultural lands, freshwater wetlands, and/or conservation land. Our initial findings suggest that 66% of the area that will be impacted by a 1' sea level rise along Maine's coast is currently non-tidal wetland. This GIS analysis also identifies "future tidal wetlands" that are well buffered, and potentially highly adaptive, yet are currently unprotected from land conversion. [Note this piece is evolving now and is the subject of currently proposed work.]

Compensation Planning Framework – This document was created by the Maine Natural Areas Program and The Nature Conservancy in 2011as an essential part of Maine's In-Lieu Fee Instrument (Maine DEP 2011). The Compensation Planning Framework (CPF) is used to provide guidance in the selection and implementation of aquatic resource restoration, enhancement, preservation, or creation. The CPF addresses 10 elements, including a delineation of service areas. In Maine the service areas are broken out by biophysical region. Additional elements of the framework address threats to aquatic resources, an analysis of historic aquatic resource loss, an analysis of current aquatic resource condition, and a statement of aquatic resource goals and objectives for each biophysical region. Other elements of the framework address strategy and progress reports. The Coastal Zone intersects with at least three of the biophysical regions delineated in the CPF. Maps and tables in the CPF outline the threats (projected development), aquatic resource loss (permitted impacts), and current condition (extent of wetlands, acres of wetlands in conservation, and water quality).

Eco-Regional Surveys – This report by the Maine Natural Areas Program has compiled the survey results of rare natural communities and ecosystems and rare plant populations on a site-by-site basis, but does not identify trends or summarize conditions across the coast.

Management Characterization:

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

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

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

Statutes, regulations, policies, or case law interpreting these

State Wildlife Action Plan

The Maine Coastal Program (MCP), in collaboration with the Maine Department of Marine Resources (DMR), is working with the Maine Department of Inland Fisheries and Wildlife (MDIFW) to complete the 10 year update of the 2005 State Wildlife Action Plan (SWAP). The completed report, due in October 2015, will include an extensive list of terrestrial and aquatic fauna in need of conservation, habitats where these species can be found, stressors associated with these species and habitats, and potential conservation actions that could significantly reduce the impacts of the identified stressors. The revised report contains 69 marine and diadromous species in need of conservation, a dramatic increase compared to the ten marine and diadromous species listed in the 2005 report; it will also highlight the lack of knowledge for other unlisted marine species whose conservation status is currently unknown. Additionally, the MCP and DMR created a new coastal and marine habitat classification scheme to suit the purposes of this project, which will likely be adopted by other northeast states as they update their SWAPs. We anticipate that greater inclusion of marine and diadromous organisms in the 2015 SWAP will lead to improved prioritization of these species regarding conservation, management, and research funding opportunities. In addition, the 2015 plan will incorporate a greater awareness and recognition of the potential impacts of climate change and sea level rise on Species of Greatest Conservation Need (SGCN) as well as their associated habitats.

Coastal Focus Areas

Beginning with Habitat (BwH) Focus Areas are landscape scale areas that contain exceptionally rich concentrations of at-risk species and natural communities and high quality common natural

communities, significant wildlife habitats, and their intersection with large blocks of undeveloped habitat.

These non-regulatory areas are intended as a planning tool for landowners, conservation entities, and towns. BwH Focus Areas, unlike some other habitat values, are tied to specific environmental settings and are not geographically transferable. Thus they warrant place-specific conservation attention through a variety of methods ranging from conservation acquisition to focused implementation of best management practices. It is hoped that identification of BwH Focus Areas will help to build regional awareness and concentrate conservation initiatives in those areas of the landscape with the greatest biodiversity significance.

Focus Areas that have been designated along the coast are currently under review by multiple agencies including the Maine Department of Inland Fisheries and Wildlife, Maine Department of Marine Resources, and the Maine Natural Areas Program. Staff Biologists are reviewing these designations in light of more recent data on species populations and habitats in order to ensure that Focus Areas along the coast are adequately incorporating coastal and marine features.

Wetlands programs (e.g., regulatory, mitigation, restoration, acquisition)

Maine Clean Water and Wetlands Bond Issue
In November 2014, Maine voters approved a Maine Clean Water and Wetlands Bond Issue "Water Bond" of $10 million, to be administered by the Maine DEP. As part of this bond, $400,000 will go towards restoration of state wetlands. The largest portion of the bond, $5.4 million, will go toward stream crossing and culvert replacement. This funding will go toward public improvements for municipalities and counties, which will reduce flooding and increase fish (and other aquatic organism) passage and stream connectivity. As of Spring 2015, the exact mechanism for dispersing the funding is still in progress, however funds will be distributed through an RFP and competitive granting process. Maine DEP tentatively plans to release a Request for Proposals in the spring of 2015, aiming to support worthwhile wetlands projects that do not receive awards through MNRCP. This bond program is not CZM-driven.

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 provide tremendous ecosystem services, mitigating flooding and providing essential wildlife habitat, among many others. In Maine, we are seeing that wetlands are becoming increasingly threatened due to sea level rise and other coastal hazards, as well as due to increasing coastal development. Maine Coastal Program has noted many overlaps with other enhancement areas such as Coastal Hazards, Cumulative and Secondary Impacts, and Ocean Resources, and has thus ranked Wetlands as a high priority issue. MCP is well-suited to work on this topic, and has many partners that

are willing to collaborate. MCP is especially interested and sees a role for itself in new emerging issues such as marsh migration and living shorelines. Many partners within state government and stakeholders agree that this is a high priority and have ideas for projects that would enhance management in this area.

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Aquaculture

Section 309 Enhancement Objective: Adoption of procedures and policies to evaluate and facilitate the siting of public and private aquaculture facilities in the coastal zone, which will enable states to formulate, administer, and implement strategic plans for marine aquaculture. CZMA §309(a)(9)

PHASE I (HIGH-LEVEL) ASSESSMENT:

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.

Type of Facility/Activity	Status and Trends of Aquaculture Facilities and Activities		
	# of Facilities	Approximate Economic Value	Change Since Last Assessment (In all cases in terms of pounds and value) (↑, ↓, –, unkwn)
Finfish (all salmon)	25	$50-75 million	Slightly increasing
Mussels	16	$2 million	Slightly increasing
Eastern Oysters	221	$2-3 million	Moderately increasing
European Oysters	Limited	Minimal (unknown)	Moderately increasing
Hard Clams	Limited	Minimal (unknown)	Slightly increasing
Scallops	Limited	Minimal (unknown)	Slightly increasing
Seaweed	6	$300,000 - $400,000	Greatly increasing

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.

N/A.

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.

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

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

Aquaculture Regulations

Chapter 2.90 Regulations: Limited Purpose Aquaculture Licenses. In 2012, the Department of Marine Resources revised its Chapter 2.90 Regulations: Limited Purpose Aquaculture (LPA) License to increase the effectiveness of LPA licenses, provide increased opportunities for their use and streamline the license renewal process. It implemented 2009 legislation allowing LPAs to be sited in the intertidal zone and for non-Maine residents to hold LPA licenses. It further facilitated the use of marina slips, lobster pounds, and similar sites for small-scale aquaculture. This rulemaking also simplified the license renewal process; clarified the meaning of the size limit on license sites; clarified the procedure for raising seed shellfish on LPA sites in prohibited areas; and added razor clams, green sea urchins, and bay scallops to the list of species that can be cultivated with an LPA license. Finally, it corrected and clarified wording in the existing rule.

Chapter 2: Aquaculture Lease Regulations. In 2013, the Department revised its Chapter 2: Aquaculture Lease Regulations to provide consistency with existing Maine aquaculture laws, specifically 12 M.R.S. §6072 Section 12-A Transferability and 12 M.R.S. §6072-A Limited-Purpose Lease for Commercial or Scientific Research. In 2009, the Maine Legislature amended these state laws to specify a 14-day comment period as well as remove the hearing requirement for lease transfers and increase the size limitation for limited-purpose leases from 2 to 4 acres for commercial or scientific research.

Summaries of Laws enacted since 2010:

Public Law 2011, Chapter 93 made technical changes to the laws on preference among multiple applications for the same site, standard lease renewals, scientific lease renewals, extension of limited-purpose leases pending an application for a standard lease, and timing of a subsequent lease application after the granting of an emergency lease.

Public Law 2012, Chapter 598 recreated the Aquaculture Advisory Council. It directed the Commissioner of the Maine Department of Marine Resources to appoint four members, with no more than two from similar segments of the aquaculture industry. It specified that the Council shall make recommendations to the Commissioner regarding the Aquaculture Management Fund and concerning other matters of interest to the aquaculture industry.

Public Law 2013, Chapter 301 authorized the Department to approve changes to the list of gear that holders of a standard of limited-purpose lease for commercial or scientific research may use on their lease. It specified the notification requirements and decision criteria for review of a gear change request. The law also allowed sale of scallop spat collected under a special license.

Public Law 2013, Chapter 501 specified a $100 fine for violation of lease conditions. It revised the language for changes to approved gear on a standard and limited-purpose lease for commercial or scientific research for consistency. It clarified that bottom culture is allowed on a limited purpose

aquaculture site. It gave DMR the authority to require annual reports for LPA license holders. It allowed retail sale from a lease site. It eliminated the redundant cultchless permit requirement for lease or license holders.

None of these changes were CZM-driven.

Enhancement Area Prioritization:

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

High	_____	Aquaculture is a high priority for the State of Maine, but it is a low priority for Maine Coastal Program.
Medium	_____	
Low	__X__	

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

   Aquaculture has grown in Maine in recent years, and as a result the State has updated its statutes and rules regularly and developed new policies to effectively manage this marine use and support its expansion. Aquaculture continues to grow, as evidenced in our data reported in this assessment, and of particular interest is the growth in the experimental cultivation of new species such as clams, scallops, and seaweed. There is great potential for economic development in this sector, a newer addition to the traditional marine industry that has been so vital to Maine's economy. With uncertainty in many fisheries, aquaculture could diversify the sector, provide jobs, and stimulate economic growth in Maine's fishing communities. Shellfish aquaculture improves water quality, and would be a welcome benefit as well.

   Challenges that may prevent growth in the aquaculture industry in site-specific locations such as water quality and landowner opposition are further discussed in the Ocean Resources and Cumulative Impacts of Development sections of this document.

   Maine Coastal Program has concluded that aquaculture is a high priority for the State of Maine as a whole, but a low priority for Maine Coastal Program. The University of Maine recently received an EPSCoR grant for $20 million through the National Science Foundation to establish a Sustainable Ecological Aquaculture Network (SEANET) program in Maine. This comprehensive project will look at not only ecological aspects of aquaculture, but also the interaction between aquaculture and ecosystems, policy, and coastal communities.

   Stakeholders and state agency partners agreed that aquaculture is very important, but that Maine Coastal Program is likely not the best program to work in this area. Maine Coastal Program will continue to work on issues in other priority enhancement areas that overlap and are important aquaculture, such as cumulative impacts of development (water quality) and ocean acidification. These efforts may assist in the expansion of the aquaculture industry in Maine.

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Energy and Government Facility Siting

Section 309 Enhancement Objective: Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities and Government facilities and energy-related activities and Government activities which may be of greater than local significance. CZMA§309(a)(8)

PHASE I (HIGH-LEVEL) ASSESSMENT:

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.

Status and Trends in Energy Facilities and Activities in the Coastal Zone				
Type of Energy Facility/Activity	**Exists in CZ**		**Proposed in CZ**	
	(# or Y/N)	Change Since Last Assessment (↑, ↓, –, unkwn)	(# or Y/N)	Change Since Last Assessment (↑, ↓, –, unkwn)
Energy Transport				
Pipelines	Y	↑	Y	↑
Electrical grid (transmission cables)	Y	↑	Y	↑
Ports	Y	↑	Y	↑
Liquid natural gas (LNG)	N	–	Y	↓
Energy Facilities				
Oil and gas	N	–	N	–
Coal	N	–	N	–
Nuclear	N	–	N	–
Wind	Y	–	Y	↑
Wave	N	–	N	–
Tidal	Y	↑	Y	↑
Current (ocean, lake, river)	N	–	N	–
Hydropower	Y	–	Y	–
Ocean thermal energy conversion	N	–	N	–
Solar	Y	↑	Y	↑
Biomass	Y	↓	N	–

Narrative describing previous table:

Energy Transport

Pipelines:
Minor increase in Existing Facilities. Crude oil pipeline: Portland and South Portland host terminal and storage facilities for that serve an oil pipeline to Montreal. Natural gas pipeline: The state has three interstate natural gas pipelines - Portland Natural Gas Transmission System; Maritimes & Northeast Pipeline; and Granite State Gas Transmission Company - with sections in the coastal zone. Since the last assessment, local natural gas distribution lines in limited places in the coastal zone, including areas north of Portland and along the Kennebec River in Augusta, have been placed into service with distribution continuing to expand.

Increase in proposed facilities: Although there has been no proposal, the prospect of changes to oil terminal facilities in South Portland to allow export of oil from Canada has generated controversy and local ordinance changes.

Electrical grid (transmission cables)
Increase in existing land-based electrical grid.
Land-based: Like other states, Maine has a statewide electrical transmission network connected to the regional power grid, parts of which are in the coastal zone. Central Maine Power Company is building large scale upgrade of transmission system, parts of which are in the coastal zone that is expected to be completed in 2015. Ocean-based: There are submerged cables to connect many (not all) inhabited islands to the shore-side electric power grid.

Increase in Proposed Facilities. Following consistency review and concurrence, the Navy constructed an approximately seven-mile sub-sea power line across Machias Bay to improve electrical service to a naval facility in Cutler, Maine. The Maine Aqua Ventus ocean wind energy pilot project proposal (see below) includes submerged power lines to serve Monhegan Island and connect to the regional power grid. There is renewed discussion of a proposed 1 gigawatt, sub-sea merchant power line, dubbed the "Maine Green Line" which was under discussion at the time of the prior 309 assessment. As proposed, Anbaric Transmission and National Grid would partner to build and operate a roughly 300-mile HVDC line that would link northern New England and Quebec generation with Boston area markets and be located in the Gulf of Maine seabed.

Ports
Increase in Existing Facilities. Following a significant agreement with the Icelandic seafood shipping company, Eimskip, Maine DOT has expanded the cargo-handling capacity in Portland Harbor. Portland Harbor and Searsport Harbor remain the primary state energy ports handling imported oil and other fossil fuel products.

Increase in Proposed Facilities. Maine DOT is considering additional, related improvements to cargo handling-related infrastructure in Portland Harbor. The City of Portland, in consultation with agencies and stakeholders, is exploring options for siting a confined aquatic disposal (CAD) cell in Portland Harbor to meet the dredged materials disposal needs of the Harbor's pier operators. ACOE and Maine DOT have proposed dredging to deepen Searsport Harbor to improve its freight-handling capacity. The city-owned Eastport breakwater (a portion of which collapsed in late 2014) is slated for a major repair and renovation.

Liquid natural gas (LNG)
No change in Existing Facilities - there are no LNG import or exports facilities on Maine's coast.

Decrease in Proposed Facilities: Calais LNG withdrew its proposal for an LNG import facility that was pending before FERC at the time of the prior assessment. The Downeast LNG terminal proposal remains under

consideration by FERC. In 2014 the developer announced plans to modify its proposal to include infrastructure to both import and export LNG.

Energy Facilities

Oil and gas
No change in either Existing or Proposed Facilities: there are no existing facilities, and no oil and gas activity in this region is anticipated.

Coal
No change in either Existing or Proposed Facilities: there are none existing or proposed in Maine's coastal zone.

Nuclear
No change in either Existing or Proposed Facilities: there are none existing or proposed in Maine's coastal zone.

Wind
No change in Existing Facilities: Fox Islands Wind LLC 's three-turbine project in Vinalhaven remains the only commercial-scale wind power facility in the coastal zone.

Increase in Proposed Facilities: A floating wind turbine demonstration project (Maine Aqua Ventus, in cooperation with UMaine) proposed for siting in state waters off Monhegan Island remains in the R&D phase. Following the prior assessment, Statoil proposed and subsequently withdrew a two-turbine floating wind turbine demonstration project in federal waters off Boothbay Harbor. Press accounts indicate that wind developers are exploring options for siting land-based wind projects in the coastal zone in Downeast Maine.

Wave
No change in either Existing or Proposed Facilities: there are none existing or proposed in Maine's coastal zone.

Tidal
Increase in Existing Facilities: In 2012, the first grid-connected in-stream tidal power project in the U.S., Ocean Renewable Power Company's (ORPC) facility in Eastport, came on line.

Increase in Proposed Facilities: ORPC continues work on other tidal power projects in the Cobscook Bay region under FERC preliminary permits. A developer, which holds a FERC preliminary permit, continues work on siting a tidal barrage project on Pennamaquan River in Cobscook Bay region.

Current (ocean, lake, river)
No change in either Existing or Proposed Facilities: there are none existing or proposed in Maine's coastal zone.

Hydropower
No change in Existing Facilities.

No change in Proposed Facilities: Two projects in the coastal zone (Union River, FERC no. 2727/Ellsworth and Am. Tissue, FERC no. 2809/Gardiner) are engaged in FERC's relicensing process. There are no current proposals for new hydropower facilities in the coastal zone other than the tidal power facilities discussed above.

Ocean thermal energy conversion
No change in either Existing or Proposed Facilities: there are none existing or proposed in Maine's coastal zone.

Solar
Increase in Existing Facilities: As of the beginning of 2015 an estimated 10.4 Megawatts of solar has been installed in Maine almost all over the last five years. This includes an estimated 2.7 Megawatts added in 2014.

Increase in Proposed Facilities: It is anticipated that solar capacity will continue to grow in the State of Maine. ISO-New England estimates that 2.3 Megawatts will be added each year for the foreseeable future.

Biomass
Decrease in Existing Facilities: Two plants associated with paper-making operations in Old Town and Bucksport closed in 2014.

No Change in Proposed Facilities: There are no proposed in the coastal zone.

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.

State of Maine Comprehensive Energy Plan
The State updated the State Energy Plan in January 2015 http://maine.gov/energy/pdf/2015%20Energy%20Plan%20Update%20Final.pdf The plan focused on residential energy costs, expanded mass transportation and related alternative fueling options, and expanded access of natural gas.

Maine Hydropower Study
The Governor's Energy Office recently released the *Maine Hydropower Study,* a report assessing the potential to increase hydropower production in the state. The report suggests that there is potential for about 56 megawatts of additional generation at existing hydro sites. The report points to the low price of power, limited availability of long-term energy contracts, and lack of transmission access as primary impediments to realization of power increases in a number of locations. The report is available here:
http://www.maine.gov/energy/publications_information/001%20ME%20GEO%20Rpt%2002-04-15.pdf

Maine Wind Energy Development Assessment
In 2012, the Governor's Office of Energy Independence and Security (OEIS, now called the Governor's Energy Office) released a report detailing the status of wind energy in Maine and progress toward wind energy development goals. The report assesses current wind energy projects in Maine, successes and challenges, experience with the permitting process, and technology trends. The OEIS concludes with specific recommendations to achieve wind energy goals, which contribute to the overall goal of energy security in Maine. Recommendations are based around the objective of maintaining Maine's role as a leader in wind development and maximizing wind power benefits to Maine people while protecting natural resources and quality of place. Specific recommendations include ways to improve and expedite the permitting process, allow for public participation, address visual impact and noise through best management practices, and require applicants to establish a community benefits package. The report is available here:
http://maine.gov/energy/pdf/Binder1.pdf.

Northeast Ocean Data Portal
The Northeast Ocean Data Portal (mentioned primarily in the Ocean Resources enhancement area) provides some spatial information regarding location of energy infrastructure and potential resources in the Gulf of Maine region. Data is available here: http://www.northeastoceandata.org/.

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.

   There have been no marked changes in the general nature of activities related to federal facilities since the last assessment. Pursuant to recommendations of the federal Base Closure and Realignment Commission (BRAC), the Brunswick Naval Air Station has since closed. State and local authorities are engaged in redevelopment activities. The Navy continues to maintain and make improvements to the Portsmouth Naval Shipyard's facilities. Review of these actions remains a major part of the DEP's southern Maine office's federal consistency-related work. There have been no significant new federal facilities built or proposed in the coastal zone.

   Energy infrastructure-related development proposals, which are summarized in part above, continue to be the main category of foreseeable "activities of greater than local significance" potentially in or affecting the coastal zone. Fueled in part by increased domestic supply of natural gas and the prospect of lower in-state energy prices that may come from reliable access to that supply, and in part by strong interest in in-state ocean-based and other renewable energy sources to address climate change concerns as well as drive economic development, proposals for energy facility siting in or potentially affecting the coastal zone are expected to continue. Since, as with other development, adverse effects and changes stemming from energy-related development are experienced locally, while the benefits of such development may be realized more broadly, at a state or regional scale, a number of such siting proposals may be expected to be controversial, particularly in the host community(ies).

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.

Management Category	**Employed by State** (Y or N)	**CMP Provides Assistance to Locals that Employ** (Y or N)	**Significant Changes Since Last Assessment** (Y or N)
Statutes, regulations, policies, or case law interpreting these	Y	Y[25]	N
State comprehensive siting plans or procedures	N	N/A	N

[25] The State (DEP) supports local implementation of the Mandatory Shoreland Zoning Act and, in a few instances, Site Law, under which a qualified municipality may exercise delegated authority.

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.

N/A

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.

Current public and private sector interest in energy infrastructure development and related public policy issues is likely to continue in the foreseeable future at the global, national, regional, state, and local levels. Maine state government is exploring opportunities to realize regionally-oriented changes in energy policy and infrastructure development to enhance the state's energy security, lower energy prices, and decrease reliance on oil. These efforts principally involve economic and public utilities-related matters in the bailiwick of the Governor's Energy Office, Public Utilities Commission, and Office of the Public Advocate, regarding which there is not a central role for the Maine Coastal Program. Although not a primary focus of state energy policy and priorities, there is interest in Maine's private sector and non-governmental organizations in building on and realizing the environmental and economic benefits of progress to date in the state in the renewable ocean energy field, including tidal power and deep-water ocean wind. Significant policy work remains to be done to address federal-state coordination and other key issues in order to facilitate efficient and well-sited development of energy facilities, including those for renewable ocean energy. Energy facility siting, particularly in federal waters, is a topic on which the New England Regional Planning Body is focused as part of its work in developing a regional ocean plan. The outcome of this planning effort may include energy facility siting-related policy recommendations or options for consideration by state decision makers.

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Marine Debris

Section 309 Enhancement Objective: Reducing marine debris entering the nation's coastal and ocean environment by managing uses and activities that contribute to the entry of such debris. CZMA§309(a)(4)

PHASE I (HIGH-LEVEL) ASSESSMENT:

Resource Characterization:

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

Source of Marine Debris	Existing Status and Trends of Marine Debris in Coastal Zone		
	Significance of Source (H, M, L, unknwn)	**Type of Impact** (aesthetic, resource damage, user conflicts, other)	**Change Since Last Assessment** (↑, ↓, –, unkwn)
Land-based			
Beach/shore litter	M	Aesthetic, resource	–
Dumping	L	Aesthetic, resource, user conflicts	↓
Storm drains and runoff	M	Resource	Unknown
Fishing (e.g., fishing line, gear)[26]	L	Aesthetic, resource	–
Microplastics[27]	Unknown	Resource	↑
Ocean-based			
Fishing (e.g., derelict fishing gear)[28]	H	Aesthetic, resource, user conflicts	↑
Derelict vessels	Unknown	Unknown	Unknown
Vessel-based (e.g., cruise ship, cargo ship, general vessel)[29]	Unknown	Unknown	Unknown
Hurricane/Storm[30]	Episodic	Aesthetic, resource.	-
Tsunami	N/A	N/A	N/A

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.

[26] Low significance and no change for land-based fishing debris. Debris impact from fishing gear is mostly from offshore fishing activity.
[27] Microplastics – significance and extent are somewhat unknown. We do know that the presence is increasing.
[28] Derelict ocean-based fishing gear is increasing. It is also a cumulative problem because derelict gear is difficult to retrieve, so it accumulates year after year.
[29] There is no system tracking this. Maine has not identified a potential problem with vessel-based marine debris. However, cruise ship visitation has increased since the last assessment period.
[30] Hurricane/Storm-based debris is episodic, and mostly just contributes to derelict gear.

Ocean Conservancy Reports – The Maine Coastal Program participates in the International Coastal Cleanup, coordinated by The Ocean Conservancy. The Ocean Conservancy's most recent report, summarizing results from the 2013 cleanups, found that Maine involved 1,321 volunteers who collected approximately 4,500 pounds of trash**.** Over the past five years, the amount of trash collected remains about the same each year. The most abundant items of trash found are a combination of single use packaging, cigarette filters, and fishing industry-related debris. The abundance of items generally varies with the geographic location moving from West to East and going from more populated areas to less populated.

The Gulf of Maine Lobster Foundation
The Gulf of Maine Lobster Foundation has collected data on derelict fishing gear through its Gear Grab Program. This initiative aims to lessen the economic and environmental impact of derelict fishing gear and marine debris through a combination of at-sea recovery of "ghost gear" on the ocean floor, community shoreline cleanups, proactive collection of gear directly from fishermen, and recycling. Since 2010, the Gear Grab Program has documented the location and tonnage of derelict fishing gear collected, which has amounted to over 5,000 traps recovered at sea and over 3,000 traps collected from fishermen and recycled in a preventative effort.

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) for how marine debris is managed in the coastal zone.

Management Category	**Employed by State** (Y or N)	**CMP Provides Assistance to Locals that Employ** (Y or N)	**Significant Changes Since Last Assessment** (Y or N)
Marine debris statutes, regulations, policies, or case law interpreting these	Y	Y	Y (In progress)
Marine debris removal programs	Y	Y	Y

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

Marine debris statues, regulations, policies.
There is an initiative currently underway to explore the feasibility of amending a state statute (Title 12, M.R.S. §6434) to differentiate between "working" fishing gear and "unsalvageable" gear. Unsalvageable gear that is washed up onto beaches and islands would be defined as "marine debris" in statute. As an interim measure, Marine Patrol (MP) is working to create an internal policy to grant permission for trap cleanups in the intertidal zone by independent groups. The ultimate goal is to create a process that

involves minimal Patrol oversight, but maintains controls that ensure fishermen have the opportunity to retrieve their gear and protects landowner/citizen rights. These changes are not CZM-driven.

Marine debris removal programs. As described above, the Maine Lobster Foundation established the Gear Grab program in 2010. These changes are not CZM-driven.

Enhancement Area Prioritization:

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

High	_____	Low: General Debris
Medium	_____	Medium/High: derelict fishing gear
Low	__X__	

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

While marine debris is an important issue to address, it is not one of the most urgent problems for Maine. We have ranked this enhancement area as low priority for Maine Coastal Program because the amount of general debris has mostly stayed consistent or decreased. Derelict fishing gear remains a medium-high priority issue, but Maine Department of Marine Resources, and more specifically Marine Patrol, is leading the effort to modify laws to make gear collection easier. Partners from state agencies, as well as stakeholders who work on coastal issues, indicated that they did not think this was a high priority for MCP. Compared with other enhancement areas that MCP could approach, they thought there was not as clear of a role for MCP. Though marine debris is an important topic, it was cited by many as an area that would be of a relatively lower priority. Maine Coastal Program will continue assisting Marine Patrol in this process, as well as continue educating the public about marine debris through outreach and the annual Coastal Cleanup.

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Public Access

Section 309 Enhancement Objective: Attain increased opportunities for public access, taking into account current and future public access needs, to coastal areas of recreational, historical, aesthetic, ecological, or cultural value. CZMA§309(a)(3)

PHASE I (HIGH-LEVEL) ASSESSMENT:

Resource Characterization:

1. Status and Trends

Public Access Status and Trends			
Type of Access	**Current number**	**Changes or Trends Since Last Assessment** (↑, ↓, –, unkwn)	**Cite data source**
Beach access sites	178	Unknown. MCP's coastal public access database was not in existence at the time of the last Assessment and Strategy.	MCPAG Database[31]
Shoreline (other than beach) access sites	539	Unknown. (See above)	MCPAG Database
Recreational boat (power or nonmotorized) access sites	241	Unknown. (See above)	MCPAG Database
Number of designated scenic vistas or overlook points	19	Unknown – Using a potentially different source of data than in the last assessment	Maine Department of Transportation
Number of fishing access points (i.e. piers, jetties)	645	Unknown. (See above)	MCPAG Database
Coastal trails/ boardwalks	No. of Trails/ boardwalks 218 Miles of Trails/boardwalks Unknown	Unknown. (See above) Unknown	MCPAG Database
Number of acres parkland/open space	Total sites 123 (10,982 acres) Sites per miles of shoreline .02 Sites Per Mile (based on 5,600 miles of coastline)	Unknown –This figure is not an indicator that MCP has tracked in the past.	State Conserved Lands Shapefile

[31] MCPAG Database refers to the Maine Coastal Public Access Guide Database.

Public Access Status and Trends			
Type of Access	**Current number**	**Changes or Trends Since Last Assessment** (↑, ↓, –, unkwn)	**Cite data source**
Percent Exceedances, Beach Water Quality	10.2% (averaged over 5 years: 2010-2014)	↑ This percentage fluctuates up and down from year to year, depending on many factors such as rainfall, timing of sampling relative to rainfall events, and other variables. Overall, however, exceedances do seem to be increasing over time.	Maine Healthy Beaches Program

Note on trends: Much of the data in this table represent new information, collected as part of the Maine Coastal Public Access Guide/Database. These indicators were virtually unknown previously. While our new data gathered form a great baseline to measure public access to the coast, there is no way to determine trends based on this one set. In addition, the last Assessment and Strategy asked for slightly different categories of public access, and data used came from different sources that were less complete, again making it difficult to draw comparisons.

Metadata for this table:

Note: *All queries for different types of public access site were done within the set of sites included in the Guide (INCLUSION = YES). The total number of sites included is 717.*

Beach Access Sites: Queried MCPAG Database for "Beach." "Beach" no longer used in MCPAG as an amenity, but the classification is still in database. Based on site visits, and includes cobble beaches, not just sandy beaches.

Shoreline (Other than Beach) Access Sites: All public access sites in the database, minus the beach access sites. (717-178= 539).

Recreational Boat Sites: Queried database for hand-carry sites and trailerable boat ramps. This represents the sum.

Number of Designated Scenic Vistas or Overlook Points: This number is incomplete and underrepresents scenic vistas on Maine's coast. This is based upon Maine Department of Transportation (MDOT)'s records of roadside turnouts from July 2008, the most recent available. The number represented here includes only MDOT turnouts that are on the coast (not simply in coastal towns). There may be many other scenic overlooks along Maine's coast that are outside of the purview of MDOT.

Number of fishing access points (i.e. piers, jetties): In Maine, fishing is a fundamental right that occurs within the intertidal zone. For this figure, we included more than just piers and jetties, because fishing can and does take place at all types of coastal public access locations. We estimated that 90% of Maine's coastal public access sites, documented in our database can be used for fishing. This is based on the fact that the only real limitation on fishing seems to be physical aspects of the site, which we estimate to be approximately 10% of sites. Examples would include cliffs that are high above the water and do not provide fishing opportunities and coastal nature preserves where trails do not lead directly into the water.

Coastal trails/ boardwalks: Queried MCPAG Database for both "Hiking Trail" and "Paved Trail" and summed the results. We have no data on the total length of trails.

Parkland/Open Space: We used the State's Conserved Lands Layer to determine the number of open space sites along the coast of Maine. A query of the MCPAG for sites that have been labeled as "Parks," which was more of a loose category during the site visits, yielded a very similar result (129).

Percent Exceedances, Beach Water Quality: We used percentage of exceedances as our measurement, based upon the advice of water quality scientists and managers at the Maine Healthy Beaches Program, administered by Maine DEP and Maine Sea Grant. Exceedances are a better overall indicator than beach closures in Maine; beach advisories don't necessarily lead to a beach closure or even require a posting.

2. Briefly characterize the demand for coastal public access and the process for periodically assessing demand.

The Maine Coastal Program does not have an established process for assessing the demand for public access. Thus far, this has not been a high priority given limited resources and staff time. It can be inferred however, that at some locations, access is inadequate to meet demand, i.e. limits in parking and

parking in designated no-parking areas. In addition, public access at high tide in selected locations is limited where beaches have eroded and where infrastructure such as boat launches is unusable.

However, the following are some indicators that may serve as proxies for demand for public access to the coast.

Coastal Population: The overall population of the State of Maine is projected to decrease slightly (by 0.1%) by 2030. However, while some counties are expected to see higher rates of loss in population (up to 15%), several coastal counties are expected to grow in population, including Cumberland, York, Knox, and Kennebec counties.

Tourism:
The Maine coast is also a major draw for visitors. According to the Maine Office of Tourism, visitors made 17 million overnight trips and 15 million non-resident day visits to Maine in 2014. The Maine Office of Tourism divides the state up into eight tourism regions, with four along the coast and four inland. Their 2014 research shows that 65% of overnight visitors and 71% of day visitors selected the coastal regions as their primary destinations. The percentage of overnight visitors was broken down as follows: The Maine Beaches Region – 24%; Downeast Acadia Region – 15%; Greater Portland Region – 14%; and the Mid-Coast Region – 12%. In terms of day trips to these areas, the percentages are: The Maine Beaches Region – 35%, Downeast Acadia Region – 12%, Greater Portland Region – 14%; and the Mid-Coast Region – 10%. Areas that consistently receive a large number of visitors include the southern coast and Mt. Desert Island (Acadia National Park). While tourism growth fluctuates with national economic conditions, the Maine Office of Tourism expects that the number of visitors to the coast will remain strong.

Kayaking
Maine's long coastline and numerous islands continue to be an attraction for resident and nonresident kayak and canoe paddlers. The Maine Island Trail Association has approximately 4,000 members. The organization is continuously adding new sites to the Trail, and the number of destinations reached 212 in 2015.

Fishing
The recreational use of coastal waters is still strong. According to surveys conducted by the Maine Department of Marine Resources and the National Marine Fisheries Service, the number of saltwater anglers in Maine reached 289,824 (121,633 were Maine residents) in 2010, then declined in 2011 to 198,325 (84,702). These numbers rebounded in 2012 and 2013 with 248,117 and 230,265 total recreational fishing licenses, respectively. Fishing registration numbers fluctuate yearly, depending on the economy, weather and fishing interest, but sports fishermen remain substantial users of water access facilities.

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.

Maine Coastal Public Access Guide and Database: Since the last assessment, Maine Coastal Program has worked to research and document coastal public access in the state. In 2013, MCP has published this information in a 3-volume *Maine Coastal Public Access Guide*. The *Guide* is currently available for sale. Another valuable product of this project was the Maine Coastal Public Access Database, which contains all of this information and allows for many levels of analysis that were not previously possible. MCP is

currently working on a comprehensive Geographic Information Systems layer which will provide spatial coverages for the vast majority of public access sites in the coastal zone. Information about public access will also be more easily accessible by the public, as it will be housed online within the Maine Coastal Atlas.

Recreational Boating Survey: In 2012, MCP partnered with the Northeast Regional Ocean Council and the Boston-based, science and policy non-profit, *Seaplan* to undertake a region-wide recreational boating survey. The results provide insight at a broad scale of counties where boaters tend to recreate and buy supplies, allowing a level of inference in terms of where boaters are accessing the water. A link to the report can be found here: http://www.seaplan.org/project/2012-northeast-recreational-boater-survey/.

Management Characterization:

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

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

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

<u>Statutes, regulations, policies, or case law</u>

Statutes

Working Waterfront Access Protection Program: The Working Waterfront Access Protection Program, mentioned in the last assessment, has been officially codified by the Maine State Legislature. It is no longer a pilot program, and per Sec. B-3. 5 M.R.S. §6203-B, a fund was established exclusively for this specific program of the Land for Maine's Future Program. This is a significant change because it provides more permanence for the program and is expected to increase the acquisition of working waterfront access and interest in these properties. This was not entirely CZM-driven, but MCP helped to found the WWAPP and currently funds one staff position who focuses on this work.

Case Law

Almeder v. Town of Kennebunkport, 2014 ME 12: This case concerns the nature and scope of public rights to use Goose Rocks Beach in Kennebunkport, Maine. In 2009, beachfront property owners initiated this case seeking to quiet title to their beachfront properties and to secure a declaratory judgment confirming their ownership to the mean low water line subject only to uses allowed under the common law "public easement" in Maine's intertidal zone that stems from the Colonial Ordinance of 1647. The defendant Town of Kennebunkport (Town) asserted a number of counterclaims including that the public had acquired legal rights to use the entire beach for general recreation pursuant to a prescriptive easement and the doctrine of custom. About 200 backlot owners intervened asserting a variety of counterclaims claims regarding their rights to access and use the beach. The State intervened to represent the public interest in the nature of scope of public rights under the "public easement."

With the parties' assent, the Maine Superior Court (trial court) bifurcated this complex case into two parts for trial. The first part dealt with public rights to use the dry and wet sand areas of Goose Rocks Beach, and focused on facts and law about establishment of a public recreational easement by prescription on the beach, and to a lesser extent, about the scope of public rights in the intertidal zone (the public trust doctrine). (The second part of the trial, which has not been completed, would concern issues of ownership, title to land at the beach, and potentially the scope of public rights in the intertidal zone.)

Based on its findings that the evidence showed sufficiently long-standing, non-permissive, and continuance public use of Goose Rocks Beach, the trial court ruled that the general public had acquired rights to the entire beach for recreational purposes under a prescriptive easement and, alternatively, the doctrine of custom. In addition, the trial court issued a ruling on the nature and scope of public recreational rights secured under the public easement.

In its above-cited opinion, Maine's highest court (the law court) overturned the trial court's decision and remanded the case to the trial court with directions regarding future proceedings. In reaching its decision, the law court found that the back lot owners lacked standing as parties to the case since their asserted interests did not differ from those of the general public and dismissed their claims. The law court held that the Town had not provided sufficient evidence to show that the public has used Goose Rocks Beach without the landowners' permission and thus had not proven one of the key elements needed to establish a prescriptive easement under Maine law. Pointing to several of its prior decisions as precedents, the law court emphasized that under Maine law there is a presumption that public use of privately-owned lands for recreational purposes is done with the landowner's permission. The law court found that the Town had not met its burden of demonstrating lot-by-lot, as it must, the lack of such permission for the requisite continuance period of years needed to establish a prescriptive easement. Somewhat unusually, and citing the important public rights at issue as a reason for doing so, the law court's decision allows the Town to submit additional evidence to show lack of landowner permission in subsequent trial court proceedings on remand. Citing many cases in Maine and throughout the United States, the law court further ruled there was no legal basis in Maine law for finding that the public had established rights to use the beach as a matter of custom. Lastly, the law court vacated the trial court's determination regarding public recreational rights in the intertidal zone as premature since that part of the case had not yet been litigated.

The trial court has not ruled on the matters remanded to it or the matters reserved for the second part of the bifurcated trial. The outcome of this case, which has potential to include a law court decision on

the nature and scope of public rights under the public easement in the intertidal zone, may have further implications regarding public access and use of Maine's beach areas.

Acquisition/enhancement programs

Land for Maine's Future: In November 2012, Maine voters approved an additional $5 million bond for the Land for Maine's Future Program (LMF). The Land for Maine's Future Board allocated $9.1 million for projects at its meeting on July 15, 2014. This was significant for public access in Maine, allowing the program to fund 30 projects, including 15 in the coastal zone, and 6 with coastal public access. In November 2014, the Land for Maine's Future Board funded an additional four projects for $827,000. All four are in the coastal zone and one provides public coastal access. However, since LMF is funded by periodic state bonds, future levels of funding are uncertain. This is not a CZM-driven change.

Coastal and Estuarine Land Conservation Program: MCP oversees the Coastal and Estuarine Land Conservation Program (CELCP) at the state level. Staff members solicit, review (in conjunction with a review team), endorse CELCP applications, and facilitate the proposal submittal to OCM. In 2011, Maine revised the State's CELCP Plan, which was subsequently approved by NOAA ORCM (now OCM). Maine has been very successful with CELCP funding in the past. During the period of this assessment, Maine had a project that was ranked third overall in the nation (Pleasant Bay), a ranking that would typically result in project funding. However, as a result of fiscal constraints, NOAA has not been able to fund the CELCP at an appropriate level for several years. CELCP program funding is entirely out of MCP's control; decisions are made at the congressional and federal executive level. MCP will continue to monitor the availability of CELCP funding and take appropriate action when necessary.

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

Public Access Guide	Printed	Online	Mobile App
State or territory has? (Y or N)	Y	N (In Progress)	N
Web address (if applicable)	http://www.maine.gov/dacf/mcp/coastal-access-guide.htm	http://www.mainecoastalatlas.org/	N/A
Date of last update	2012	In Progress	N/A
Frequency of update	Periodic – Have not made updates yet.	Periodic – as new data become available.	N/A

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.

The Maine coast is world-renowned. Access to the shore is a tradition and way of life for Maine residents who value the coast for its scenic beauty, recreational opportunities, and cultural heritage. Our marine and coast-dependent industries require access to the water, and tourism is a primary contributor to the state's economy. The state has several programs in place that can acquire easements and fee interest in coastal conservation lands and working lands (farms and working waterfronts), and Maine has the largest network of private, non-profit land trusts in the country.

MCP considers public access to be an issue of medium priority concern at this time. Other enhancement issue areas were more pressing and provided more opportunities for MCP-led enhancement projects. Stakeholders and networked state agencies agreed that a medium priority designation was appropriate. Maine's coastal regional planning commissions, however, noted that improvements in public access were of particular concern to municipalities. MCP will likely continue its current level of effort on public access, including: providing technical assistance to towns; providing grants to towns for legal research on coastal rights-of-way and for public access planning; monitoring the results of litigation; and continuing to improve public educational materials and the Coastal Access Guide.

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Special Area Management Planning

Section 309 Enhancement Objective: Preparing and implementing special area management plans for important coastal areas. CZMA§309(a)(6)

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

PHASE I (HIGH-LEVEL) ASSESSMENT:

Resource Characterization:

1. In the table below, identify geographic areas in the coastal zone subject to use conflicts that may be able to be addressed through a special area management plan (SAMP).

Geographic Area	Opportunities for New or Updated Special Area Management Plans
	Major conflicts/issues
Casco Bay & potentially other embayments	Increased levels of nutrients and ocean acidification
TBD, interested towns with identified growth areas	Vernal pool management & In-lieu fee options (i.e. revising permitting requirements in a designated growth area in exchange for conservation in other locations)
Downeast Counties: Knox, Waldo, Hancock, Washington	Threats to working waterfronts from development pressure.
Casco Bay and Midcoast islands and potentially other year-round islands with ferry service ; other ports and small harbors	Storm and climate change vulnerability; potential impacts to public water transportation
Islands and other areas with unstable bluff shorelines	Persistent erosion and threats of episodic landslides; armoring
Rocky peninsulas – Hancock County and Midcoast peninsulas.	Saltwater Intrusion into groundwater – public water supply near the coast, as well as private wells shallow in the bedrock on rocky peninsulas
Not specific to one geography; pilot projects are possible in one or more areas	Coordinated collection and interpretation of impervious surface data /stormwater management, prevention of impaired streams, and low-impact development/green infrastructure implementation
Maquoit Bay and potentially other locations	Unexplained and massive die-off of eelgrass beds
Not specific to one geography; pilot projects are possible in one or more areas	Barriers to stream connectivity for diadromous fish and other species of concern
TBD	Invasive species

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

The State of Maine has not used the official SAMP designation, and does not have any regional management plans. See Phase I Assessment for Cumulative and Secondary Impacts for regional projects, which include Casco Bay Stream Barrier Assessment, Stream Barrier Survey Report (Wells Reserve), Kennebec Barrier Survey 2010, Belfast Bay Stream Barrier Survey, Lincoln County Stream Barriers, Blue Hill Bay Watershed Needs Assessment, and Frenchman Bay Action Plan.

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.

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

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

There have been no significant management changes to Special Area Management Planning during this Assessment and Strategy reporting period.

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.

Town-by-town approaches to natural resource conservation have produced less than optimal results and MCP recognizes the importance of working on coastal issues regionally in the geographies where

the issue is most pressing and there is local interest in collaboration. Maine has taken many steps to regionalize government functions (schools, emergency management, etc.), resulting in improved effectiveness and efficiencies, but there is still a reluctance to work on environmental issues on a regional basis due to lack of capacity in smaller towns. However, large-scale landscape conservation is emerging as an increasingly important policy objective in Maine. Stakeholders and state partners echoed the importance of working regionally.

Maine places a high priority on fulfilling NOAA's programmatic objectives for special area management planning, but has achieved results without using the formal special area management plan designation. Although Maine has no current plans to designate special management areas, place-based projects and efforts that address specific geographies and specific natural resources are described in numerous places throughout this document (see ocean resources, wetlands, cumulative and secondary impacts, and coastal hazards.) If a formal SAMP designation is determined to be the best approach in a particular geography, MCP will submit a detailed work plan to NOAA/OCM. Since working regionally is an effective approach to natural resource management, the Maine Coastal Program will create several strategies that are relevant to SAMPs, but they will be listed under one of the other relevant enhancement areas.

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Phase II (In-Depth) Assessments

Coastal Hazards

In-Depth Resource Characterization:

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

1a. **Flooding In-depth** (for all states besides territories): Using data from *NOAA's State of the Coast* "Population in the Floodplain" viewer[32] and summarized by coastal county through NOAA's Coastal County Snapshots for Flood Exposure,[33] indicate how many people at potentially elevated risk were located within the state's coastal floodplain as of 2010. These data only reflect two types of vulnerable populations.

2010 Populations in Coastal Counties at Potentially Elevated Risk to Coastal Flooding[34]				
	Under 5 and Over 65 years old		In Poverty	
	# of people	% Under 5/Over 65	# of people	% in Poverty
Inside Floodplain	16,246	21.5%	7,618	10.1%
Outside Floodplain	132,788	20.8%	68,345	10.7%

1b. **Flooding In-depth** (for all states besides territories): Using summary data provided for critical facilities, derived from FEMA's HAZUS[35] and displayed by coastal county through NOAA's Coastal County Snapshots for Flood Exposure,[36] indicate how many different establishments (businesses or employers) and critical facilities are located in the FEMA floodplain.

Critical Facilities in the FEMA Floodplain[4]						
	Schools	Police Stations	Fire Stations	Emergency Centers	Medical Facilities	Communication Towers
Inside Floodplain	80	32	40	0	8	16
Coastal Counties	754	126	305	12	36	117

[32] http://stateofthecoast.noaa.gov/pop100yr/welcome.html
[33] http://www.csc.noaa.gov/digitalcoast/tools/snapshots
[34] To obtain exact population numbers for the coastal floodplain, download the excel data file from the State of the Coast's "Population in Floodplain" viewer.
[35] http://www.fema.gov/hazus; can also download data from NOAA STICS http://www.csc.noaa.gov/digitalcoast/data/stics. Summary data on critical facilities for each coastal state is available on the ftp site.
[36] http://www.csc.noaa.gov/digitalcoast/tools/snapshots

Based on the characterization of coastal hazard risk, what are the three most significant coastal hazards[37] within the coastal zone? Also indicate the geographic scope of the hazard, i.e., is it prevalent throughout the coastal zone or are specific areas most at risk?

	Type of Hazard	**Geographic Scope** (throughout coastal zone or specific areas most threatened)
Hazard 1	Sea level rise	Coastal beaches, dunes, wetlands, and bluffs; low-lying uplands
Hazard 2	Flooding	Coastal beaches, dunes, wetlands, and bluffs; low-lying uplands
Hazard 3	Shoreline erosion	Coastal sand dunes, erodible bluffs

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.

   Sea Level Rise and Flooding

   Maine's Phase I assessment showed that about 42% (2,284 miles) of Maine's coastline is highly or very highly vulnerable to long-term sea level rise, and in turn, short-term coastal inundation. These numbers do not include regions of the coastal zone that may be vulnerable to freshwater flooding during precipitation events, which remain unclassified. Areas vulnerable to both sea level rise and inundation include all of Maine's mapped coastal sand dunes, coastal wetlands, other low-lying areas (such as developed water-dependent areas or freshwater wetlands), and unstable, erodible bluffs.

   Maine's vulnerability to both long-term sea level rise and short-term coastal flooding (Sweet et al., 2014) is further exacerbated by abrupt short-term sea level rise caused by ocean circulation and recurring weather patterns (Goddard et al., 2015; Yin and Goddard, 2013). In 2010, sea levels in the Gulf of Maine deviated more from normal levels (on average, about 5 inches) than anywhere on the U.S. East Coast. Analysis by MGS found that averaged annual sea levels in 2010 were the highest for five months (December through April) out of the year since data has been recorded starting in 1912 (Slovinsky, 2012). As a result of these higher-than-normal sea levels coupled with storm events, extensive beach erosion occurred at many of Maine's beaches in 2010 (Slovinsky and Dickson, 2011; Slovinsky et al., 2013); in fact, erosion was the worst experienced in a half century at some locations (Slovinsky and Dickson, 2011). This particular event has shown how just small changes in sea level – even on short time frames – can greatly exacerbate shoreline erosion.

   The vulnerability of low-lying developed areas to both sea level rise and storm surge inundation has been clearly demonstrated in sea level rise/storm surge mapping undertaken using local to regional approaches under Maine's Coastal Hazard Resiliency Tools project. Maine has also completed state-wide mapping of the Highest Annual Tide (HAT) in support of Shoreland Zoning and as the basis for sea level rise planning. Scenarios of 1, 2, 3.3, and 6 feet of sea level rise (or storm surge) on top of the HAT were mapped as well. An online mapping website is in the process of being developed in order to release these datasets.

[37] See list of coastal hazards at the beginning of this assessment template.

Staff has, (as part of two NOAA-funded Projects of Special Merit), developed sea level rise and storm surge vulnerability assessments for marsh systems[38] (and indirectly, land use development); and for coastal state parks and historic sites[39].

MCP used a simple questionnaire and key-pad polling to evaluate efficacy of the Coastal Hazard Resiliency Tools (CHRT) project process and approach. As part of this effort, we found that *67.5% of respondents felt that sea level rise would impact their community in the next 50 years.* Clearly, sea level rise is an issue that remains important to Maine's coastal communities.

Shoreline Erosion

About 13% (677 miles) of Maine's coastline is classified as highly or very highly vulnerable to shoreline erosion. These areas are generally limited to coastal sand dunes (including beaches) and erodible unstable or highly unstable bluffs. Through the Maine Beach Mapping Program (MBMAP), MGS monitors around 21.4 miles of sandy beaches and dunes in southern and mid-coast Maine. In addition, MGS has also either measured with GPS or digitized approximately 16 additional miles of seawall within and adjacent to these sandy beach areas. Based on these data, about 28% of Maine's sandy beach shoreline is measurably eroding, while 43% is "stable due to armoring."

Maine is also concerned about the potential impacts of long-term sea level rise and short-term storm events on the erodible bluff shoreline, which comprises about 33% (1874 miles) of mapped shorelines. A Project of Special Merit titled *Building Resiliency along Maine's Bluff Coast* is developing better predictive models relating to bluff response (and landslide hazard) to increased sea levels and storms. This project includes a pilot study area within Casco Bay, where approximately 250 landslide sites were identified using newly available LiDAR data. Previously only 118 identified landslide sites had been identified in this populated section of Maine coast.

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

Emerging Issue	Information Needed
Coastal landslides	More complete documentation of historic slides and increased understanding of the process
Bluff recession	Historic information on bluff position
Changes to coastal wetlands from sea level rise	Sedimentation rates for coastal marshes
Saltwater intrusion into drinking water supplies	More complete data on current occurrences; hydraulic connectivity to the ocean; recharge rates; withdrawal rates; desalination rates
Green infrastructure construction	BMPs for "green infrastructure" design and construction in cold climates; analysis of durability and cost/benefit of soft engineering vs. other alternatives

[38] *Integrating Science Into Policy: Adaptation Strategies for Marsh Migration*
[39] *Changing Shorelines: Adaptation Planning for Maine's Coastal State Parks*

In-Depth Management Characterization:

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

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

Management Category	Employed by State (Y/N)	CMP Provides Assistance to Locals that Employ (Y/N)	Significant Change Since the Last Assessment (Y/N)
Statutes, Regulations, and Policies:			
Shorefront setbacks/no build areas	Y	Y	N
Rolling easements	Y	N	N
Repair/rebuilding restrictions	Y	Y	Y
Hard shoreline protection structure restrictions	Y	Y	N
Promotion of alternative shoreline stabilization methodologies (i.e., living shorelines/green infrastructure)	N	Y	N
Repair/replacement of shore protection structure restrictions	Y	Y	Y
Inlet management	N	N	N
Protection of important natural resources for hazard mitigation benefits (e.g., dunes, wetlands, barrier islands, coral reefs) (other than setbacks/no build areas)	Y	Y	Y
Repetitive flood loss policies (e.g., relocation, buyouts)	N	N	N
Freeboard requirements	Y	Y	N
Real estate sales disclosure requirements	Y	N	N
Restrictions on publicly funded infrastructure	Y	Y	N
Infrastructure protection (e.g., considering hazards in siting and design)	N	Y	N
Other (please specify)			
Management Planning Programs or Initiatives:			
Hazard mitigation plans	Y	Y	Y
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	N	Y	N
Beach nourishment plans	N	Y	N
Special Area Management Plans (hazards)	N	N	N
Managed retreat plans	N	N	N
Other (please specify)			
Research, Mapping, and Education Programs 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	N
Hazards education and outreach	Y	Y	Y

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.

Describe significant changes since the last assessment

Statutes, Regulations, and Policies.

Shorefront setbacks/no build areas. There were no significant changes to setbacks or no-build areas since the last assessment. A minor change is described in the next paragraph.

Repair/rebuilding restrictions. An Act Regarding Reconstruction of Residential Structures on Sand Dunes authorized a reconstructed building to be moved seaward from the back dune into the frontal dune. This change was not driven by 309 or CZM. The likely outcome is one or two back dune residential structures will be reconstructed in a frontal dune.

Repair/replacement of shore protection structure restrictions. An Act to Allow the City of Saco to Stabilize the Coastline and Coastal Sand Dune System Adjacent to the Saco River allowed maintenance of rip-rap to maintain seawall elevation, and the use of geotextile sand-filled tubes to protect public infrastructure. This change was not driven by 309 or CZM, but by the City of Saco. The likely outcome is the addition of rocks to maintain an existing revetment footprint, and maintenance of geotextile tubes.

Protection of important natural resources for hazard mitigation benefits (e.g., dunes, wetlands, barrier islands, coral reefs) (other than setbacks/no build areas). Additional coastal sand dunes were mapped and included for protection under the Coastal Sand Dune Rules (Chapter 355) in 2011. Additional sand dune mapping was completed in 2014 but has not been adopted by Maine DEP. In 2014, Maine's Land Use Planning Commission (LUPC) adopted the use of the Highest Astronomical Tide as opposed to the Highest Annual Tide to delineate the upper boundary of the coastal wetland for Shoreland Zoning in Maine's Unorganized Territory[40]. Both of these efforts were driven by Section 309.

Management Planning Programs or Initiatives.

Hazard Mitigation Plans. Maine's State Hazard Mitigation Plan was updated in 2013 by the Maine Emergency Management Agency (MEMA) with significant input from partner agencies, including MGS and MCP. The plan included updated sea level rise, storm surge, coastal bluff and landslide, tsunami and meteotsunami inundation data (Vilibić et al., 2014; Wang et al., 2013; Whitmore and Knight, 2014), and seismic data developed by MGS. Some of the data developed was done so through 309 efforts. The likely future outcome is a better hazard mitigation plan using up-to-date science and information.

Sea level rise/Great Lake level change or climate change adaptation plans. Sea level rise mapping for the entire state was initiated using the 2013 Highest Annual Tide (HAT) as the starting point, and future scenarios of 1, 2, 3.3, and 6 feet of sea level rise. This project resulted in numerous local and regional sea level rise vulnerability and adaptation planning efforts. Examples of regional collaboration include the Saco Bay Sea Level Adaptation Working Group and Lincoln County Coastal

[40] The Unorganized Territory of Maine (UT) is that area of Maine having no local, incorporated municipal government.

Hazard Study. This project, conducted between the Lincoln County Regional Planning Commission, MGS, and MCP, resulted in an MCP-funded project to develop adaptation strategies for an identified vulnerable historic downtown in Damariscotta. A similar project is underway in Stonington in conjunction with the Hancock County Planning Commission. Future outcomes will be more local and regional adaptation plans based on better and updated datasets. These efforts were CZM 309-driven.

Research, Mapping, and Education Programs or Initiatives.

General hazards mapping or modeling. MGS completed mapping of inundation from Category 1 and 2 hurricanes using an updated National Hurricane Center SLOSH model and new LiDAR data. MGS released the results via a Potential Hurricane Inundation Mapping webpage. This effort was facilitated with FEMA funding but made possible through technical mapping tools and techniques funded by CZM 309. The US Army Corps of Engineers is using these results to map Category 3 and 4 water levels. Once completed, this additional hurricane hazard data will update Maine's Hurricane Evacuation Plans used by state, county, and local emergency managers.

MGS completed mapping of approximately 1,500 acres of new coastal sand dunes which are regulated under Chapter 355 of NRPA. This was completed with 309 funding. Preliminary maps are being reviewed with Maine DEP. Additional dune and beach mapping in support of Chapter 355 will be released in the next assessment period.

MGS also mapped approximately 25 miles of sandy beach and dune shoreline in southern and mid-coast Maine using RTK-GPS as part of the continued Maine Beach Mapping Program (MBMAP). This was completed with 309 funding. Mapping will continue to result in better management of Maine's beaches as future outcomes.

During the assessment period, MCP, MGS, and DEP, along with other organizations, held the 2011 and 2013 Maine Beaches Conference, and released the State of Maine's Beaches reports in 2011 and 2013. The 2011 conference brought over 200 beach stakeholders together, with a focus on adapting to climate variability. The 2013 conference had over 220 stakeholders and focused on transferable lessons learned from Superstorm Sandy from states to the south. The conferences bring together stakeholders and beach managers from local, regional, and state levels. Results of the State of Maine's Beaches reports have been used to help inform beach nourishment and beach management decision-making at local and state levels.

Sea level rise mapping or modeling. MGS is updating previously completed state-wide mapping (from 2013) of the Highest Annual Tide using 2015 levels. This mapping delineates the coastal wetland used in state and local regulations. In addition to shoreline mapping, sea-level rise scenarios of 1, 2, 3.3, and 6 feet have been simulated. This effort was driven by Section 309 funding. For Maine's Shoreland Zoning (Chapter 1000), it is likely that the use of Highest Annual Tide will be replaced with Highest Astronomical Tide (a NOAA-defined value) and a single geospatial GIS layer file will replace the need for annual updates and lead to permitting efficiency. NOAA updates of the National Tidal Datum Epoch will, over time, lead to the inclusion of sea level rise and an ambulatory coastal wetland boundary used for setbacks in NRPA, SZ, and Unorganized Territories.

Hazards Education and Outreach. Maine Sea Grant, using data developed by the MGS, released the **Maine Property Owner's Guide to Managing Flooding, Erosion & Other Coastal Hazards**. In addition,

MGS staff, in conjunction with MCP, provided hazards outreach and education via MCP and MGS web pages and in the form of presentations to the general public at over 100 events reaching several thousand stakeholders in four years.

3. 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?

   As mentioned above, MCP used a questionnaire and keypad polling of selected workshop participants to evaluate the efficacy of the Coastal Hazard Resiliency Tools (CHRT) project. The CHRT worked to engage municipalities at the local level, and bring state and regional-level planning and science support to inform local decision -making and adaptation. Some highlights from these results included:

   - *82.1% of respondents had increased knowledge of where to expect flooding as sea level rises in their community*.
   - *87.2% of respondents had increased knowledge of coastal hazards in their community*.
   - *51.3 % of respondents had increased knowledge of adaptation strategies for coastal hazards that are applicable to their community*.
   - *89.8% of respondents felt very well or fairly well informed of the different consequences of sea level rise*.
   - *61.5% of respondents felt very well or fairly well informed about the ways in which they can reduce impacts from sea level rise*,

   Other than this, no other studies have been completed since the last assessment. Analysis of permit process and outcomes is lacking. There is no data on effectiveness of permits issued or follow up on implementation of recommendations made during the permit process.

Identification of Priorities:

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

   Management Priority 1: Advancing Coastal Community Hazard Identification and Mitigation

   Description: In the Gulf of Maine, the rate of sea level rise in the 21st century is double that of the 20th century, and tides have reached record levels in the last decade. Increased tide levels have resulted in a 300% increase in nuisance flooding this century. Communities preparing local coastal floodplain management programs and infrastructure improvement plans need technical guidance to develop adaptive management strategies that identify cost-effective pre-disaster actions. Effort in this priority will focus on coastal community vulnerability assessments to prioritize and systematically build a "roadmap" for hazard reduction efforts as well as to build local capacity and policy direction for mitigation efforts in preparation of storms of today and higher tides of tomorrow.

Management Priority 2: Local post-disaster recovery planning

Description: Disaster preparedness and hazard mitigation planning are institutionalized through the Maine Emergency Management Agency. Maine has not yet focused on post-disaster recovery in ways that reduce future losses and increase overall community resiliency. Lessons learned from both Tropical Storm Irene and Hurricane Sandy's effects in neighboring New England states provide direction for hazard mitigation in Maine. The goal of this priority is to develop state, county, and local plans for improved post-disaster rebuilding (i.e. quickly and effectively) in ways that account for coastal hazards while resulting in lasting benefits to both the built and natural coastal environments.

Management Priority 3: Shoreline erosion rate mapping and modeling

Description: Mapping shoreline change and erosion trends are critical to identifying the severity of coastal hazards. Data are necessary to understand the magnitude of erosion and coastal hazards driven by small amounts of sea level rise or specific storms. Understanding geospatial trends in erosion leads to better regional sediment management, dune or beach restoration analysis, and vulnerability to increased flooding. These data are essential for Priorities 1 and 2 (above) and are necessary for guiding local and state mitigation plans, implementation of cost-effective strategies, and short-term pre- and post-storm actions.

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

Priority Needs	**Need?** (Y or N)	**Brief Explanation of Need/Gap**
Research	Y	Shoreline response to small amounts of sea level rise (beaches and bluffs). Updated mapping of intertidal geology and habitats to replace low-resolution 50-year old data.
Mapping/GIS/modeling	Y	Modeling of mixed fresh/salt water and the influence of increased precipitation on storm water flow; water-penetrating LiDAR along coastal zone for seamless topo-bathy.
Data and information management	Y	Online access to coastal hazards data. Online access to development permits. Long-term measurements of the performance of coastal engineering methods and structures, wetlands restoration, and monitoring of cumulative impacts.
Training/Capacity building	Y	Local stakeholder training on using new data, resiliency tools, that are available from the State of Maine
Decision-support tools		Resiliency Toolkit (MPAP, DEP, MGS, etc.)
Communication and outreach	Y	Tools to help move discussion at the community level forward from vulnerability assessment to adaptation action including more focus on determination and assumption of risk.

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.

Coastal hazards are a growing problem in Maine with a corresponding increase in public awareness of vulnerability. The Maine Coastal Program has been working to address this issue, both through statewide mapping and modeling initiatives and community engagement. As the intensity and frequency of damaging storms, nuisance flooding and shoreline erosion have increased, more towns have sought technical assistance. MCP sees a continuous and growing need for new data to help understand underlying geologic processes and to use new data to inform management decisions. MCP will develop strategies to enhance and deliver products to meet a growing demand to improve public safety, protect public and private investments and conserve natural systems.

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Cumulative and Secondary Impacts

In-Depth Resource Characterization:
Purpose: To determine key problems and opportunities to improve the CMP's ability to address cumulative and secondary impacts of coastal growth and development.

1. What are the three most significant existing or emerging cumulative and secondary stressors or threats within the coastal zone? Indicate the geographic scope of the stressor, i.e., is it prevalent throughout the coastal zone or are there specific areas that are most threatened? Stressors can be coastal development and impervious surfaces; polluted runoff; agriculture activities; forestry activities; shoreline modification; or other (please specify). Coastal resources and uses can be habitat (wetland or shoreline, etc.); water quality; public access; or other (please specify). When selecting significant stressors, also consider how climate change may exacerbate each stressor.

	Stressor/Threat	**Coastal Resource(s)/Use(s) Most Threatened**	**Geographic Scope** (throughout coastal zone or specific areas most threatened)
Stressor 1	Coastal development – stream barriers	Stream and marsh habitats/habitat connectivity. Will be exacerbated by more frequent and severe storms.	Coastal zone
Stressor 2	Stormwater/impervious surface	Aquatic habitats; water quality; stream channel alteration. Will be exacerbated by more frequent and severe storms.	Coastal zone, especially areas ID'd as impaired or threatened. Areas identified by MDEP's impervious cover TMDL
	Polluted Runoff (bacteria)	Shellfish growing areas Aquaculture operations	Several estuaries; Areas identified in MDEP's bacterial TMDL
	Ocean acidification (nitrogen)	Shellfish growing areas and aquaculture. Will be exacerbated by more frequent and severe storms.	Casco Bay
Stressor 3	Shoreline modification (armoring)	Marshes, intertidal habitats, public access (due to loss of uplands). Will be exacerbated by sea-level change.	Coastal zone

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

Stressor 1 -- Stream Barriers.

From Moore, S. 2013. *Maine Stream Connectivity Work Group 2012-2013 Report. Prepared for the Maine Coastal Program, Department of Agriculture, Conservation and Forestry.* When dams or undersized road crossings in rivers and streams restrict or block the flow of water, they act as barriers to the movements of fish and wildlife to and from key habitats. Barriers also impair processes like tidal flow and the transport of sediment and organic material, which are the essential building blocks that create and maintain quality habitat for a range of species. The resulting loss of connectivity increases with the

number of barriers that block species movements and impair habitat sustaining processes. As a result, populations of prized species, like Atlantic salmon, wild eastern brook trout, river herring, and rainbow smelt, are compromised or no longer present, leaving many of our watersheds without the ecological underpinnings necessary to support the economic services and cultural traditions long valued by Maine's citizens.

Surveys of road crossings indicate that most of Maine's culverts over streams hinder or block the movements of fish, other aquatic organisms, or the sediment and organic materials they require for survival. Dams have been the traditional focus of barrier removal efforts, but recent surveys of road crossings in Maine characterize about half (46%) of all surveyed culverts as barriers because they are perched above the stream and/or blocked. Another 43% of culvert crossings show signs of scouring typically associated with undersized culverts that "pinch" or reduce channel width at a crossing. These culverts are called "potential barriers" because stream flows with velocities sufficient to scour may also exceed the swimming abilities of many species. Whether the interest is in highly migratory anadromous fish or resident stream organisms that require mobility within a single catchment, successful recovery and management of stream dependent fish, wildlife and the processes they depend on requires a focus on reversing the impacts of both roads and dams, and other factors.

Stressor 2. Water Quality (stormwater, nonpoint source (bacteria), ocean acidification)

Stormwater/Impervious Surface
Maine DEP, 2012. *Maine Impervious Cover Total Maximum Daily Load Assessment (TMDL) for Impaired Streams*. DEPLW-1239

The Maine Statewide Impervious Cover TMDL report serves as TMDL documents for 30 aquatic life-impaired waters in Maine. Twenty-four of these are located in the coastal zone. The waterbodies included in this document are small urban/suburban streams, generally located in the southern half of the state, in or near the population centers between Bangor in the north to Biddeford in the south. Much of Maine's population is concentrated along the coastline and in the southern portion of Maine. It is these populated areas that generally correspond with the aquatic life-impaired waterbodies listed on Maine's 303(d) list.

Nonpoint Source Pollution
From Maine DEP, 2014, *Maine NPS Management Program Plan 2015-2019*

Impaired Marine Waters. Marine watersheds were added to the nonpoint source pollution priority list if likely NPS sources were known and tied to shellfish harvest area closures. Watersheds were also added to the priority list if partner organizations had documented water quality indicators linked to NPS pollution, or if the waters were threatened by local agriculture, streams, or development that drains to public beaches or protected embayments. Additions to the marine priority list are anticipated as more information becomes available. Eleven impaired marine waters and 16 threatened marine waters were included on the priority list. Threatened marine waters are unimpaired waters that are facing potential impacts from nonpoint sources.

Impaired Marine Waters Priority List

Marine Water	Town	Priority List Reasoning
Cape Neddick River	York	MS4 Priority Water
Goosefare Bay	Kennebunkport	MHB Priority Water, MS4 Priority Water
Kennebunk River	Kennebunk	MHB Priority Water
Maquoit Bay	Brunswick	CBEP Priority Water
Medomak River Estuary	Waldoboro	DMR/NPS Threat
Ogunquit River Estuary	Ogunquit	MHB Priority Water, DMR/NPS Threat
Salt Pond	Blue Hill/Sedgwick	DMR/NPS Threat, MERI
Scarborough River Estuary	Scarborough	DMR/NPS Threat
Spurwink River	Scarborough	MHB Priority Water, DMR/NPS Threat
St. George River Estuary from Rte 1 crossing to head of tide	Warren, Thomaston	DMR/NPS Threat, Negative Water Quality Indicators
Weskeag River	S. Thomaston	DMR/NPS Threat

Threatened Marine Waters Priority List

Marine Water	Town	Priority List Reasoning
Anthoine Creek	South Portland	Negative Water Quality Indicators (FOCB)
Biddeford Pool	Biddeford	Negative Water Quality Indicators
Bunganuc Creek	Brunswick	CBEP Priority Water
Churches Rock	So. Thomaston	DMR/NPS Threat
Harpswell Cove	Brunswick	CBEP Priority Water
Harraseeket River	Freeport	DMR/NPS Threat
Hyler Cove	Cushing	DMR/NPS Threat
Little River and Bay	Freeport	CBEP Priority Water
Mill Pond/Parker Head	Phippsburg	DMR/NPS Threat
Mussell Cove	Falmouth	CBEP Priority Water, DMR/NPS Threat
North Fogg Point	Freeport	CBEP Priority Water
Northeast Creek	Bar Harbor	DMR/NPS Threat
Oakhurst Island	Harpswell	CBEP Priority Water
Spinney Creek	Eliot	MS4 Priority Water, Negative Water Quality Indicators
Spruce Creek	Kittery	MS4 Priority Water, Negative Water Quality Indicators
Willard Beach	South Portland	MHB Priority Water

** Note: A subset of these marine waters are impaired due to shellfish harvest closures but are not listed as impaired in the DEP 2012 Integrated Report. Marine waters with shellfish harvest closures will be listed as impaired in the DEP 2014 Integrated Report and the NPS Marine Waters Priority List will then be adjusted accordingly.*

Bacteria
For the 2012 Integrated Water Quality Monitoring and Assessment reporting cycle, bacterial contamination was the listed cause of impairment for approximately 159 square miles of estuarine waters (excluding those listed based on Combined Sewer Overflows (CSOs). 2009 data from the Maine Healthy Beaches Program show there were 237 advisory days and 13 closure days at 37 beaches. In 2010 there were 196 advisory and 11 closure days at 29 beaches.

Dissolved Oxygen
Eight coastal waterbody segments are listed as impaired due to lack of attainment of state dissolved oxygen standards. The reasons for non-attainment are varied and include loadings from point and non-point sources in waterbody segments with insufficient flow, factors such as benthic respiration (sediment oxygen demand), and restriction of water circulation caused by man-made structures. Generally, data from various studies and volunteer monitoring programs show dissolved oxygen levels along the coast to be adequate to protect marine life[41]. As presented in the Casco Bay Estuary Partnership's 2010 State of the Bay report, the Friends of Casco Bay have determined that approximately 90% of all dissolved oxygen data from Casco Bay (7,600+ measurements from 1993-2008) indicate values above 7.2 mg/L, with periodically lower values generally located in warmer estuarine waters such as Portland Harbor, Maquoit Bay, and the Royal, New Meadows, and Harraseeket Rivers. While some estuaries have dissolved oxygen levels that do not meet their classification criteria, the Department has concluded that some of these instances are a result of natural processes, such as in Harpswell Sound in the vicinity of the long-term water quality buoy owned by Bowdoin College and operated by the University of Maine.

Nutrients/Eutrophication Biological Indicators
In Maine between Kittery and Bar Harbor there is now evidence of nutrient enrichment. From Bar Harbor to Eastport, the principal source of nitrogen is from the Gulf of Maine, while the more developed areas of the Maine coastline along Penobscot Bay, Casco Bay and the southern bays through Kittery exhibit increased nitrogen inputs from freshwater inflows, wastewater, and stormwater runoff, although groundwater nitrogen inputs may be more substantial in coastal areas with sandy soils. While nitrogen is consistently conveyed through water, atmospheric deposition can also provide a dominant nitrogen source in more rural areas of Maine.

Eelgrass within the Piscataqua River segment has declined from 299.1 acres to 6.8 acres (98% loss) from 1996 to 2010, and that sufficient data exist to assign a Category 5 listing for Marine Life Use Support impairment with cause of nutrient/eutrophication biological indicators. The Portsmouth Harbor segment west of Gerrish Island has also demonstrated considerable eelgrass loss, with a 49% decrease in acreage from 1996 to 2010 and a 62% decrease during the same time period when adjusted for decline in both areal coverage and plant density. While the DEP acknowledges the loss of eelgrass within this area and therefore the Category 5 listing, a 'cause unknown' designation has been assigned until further data collection (planned for summer 2014) and analyses can be completed to investigate potential reasons for population decline.

Future evaluations of nutrient data and impacts will be facilitated by development of state nitrogen criteria for Maine's marine waters and more specifically for the Piscataqua River and Portsmouth

[41] Most animals and plants can grow and reproduce unimpaired when DO levels exceed 5 mg/l. When levels drop to 3-5 mg/l, however, living organisms often become stressed. If levels fall below 3 mg/l, a condition known as hypoxia, many species will move elsewhere and immobile species may die.

Harbor, NHDES draft nitrogen criteria, and nutrient load reductions from licensed dischargers and non-point source contributors.

Ocean Acidification

Maine Office of Policy and Legal Analysis, 2015 *Final Report of the Commission to Study the Effects Of Coastal And Ocean Acidification and its Existing and Potential Effects on Species That are Commercially Harvested and Grown Along the Maine Coast*
http://www.maine.gov/legis/opla/Oceanacidificationreport.pdf

Maine's OA Commission identified six goals and 25 recommendations. The goals particularly relevant to the Maine Coastal Program (i.e. where MCP might play are role) are:

- Monitor, investigate and determine the effects of ocean acidification Identify and reduce local land-based nutrients and organic carbon that contribute to ocean acidification by strengthening and augmenting existing pollution reduction efforts;
- Increase Maine's capacity to mitigate, remediate and adapt to the impacts of ocean acidification; Inform stakeholders, the public and decision-makers about ocean acidification in Maine and empower them to take action; and
- Maintain a sustained and coordinated focus on ocean acidification

Stressor # 3-- Shoreline Armoring *Protecting Maine's Beaches for the Future: A Proposal to Create an Integrated Beach Management Program.* Maine Department of Environmental Protection. February 2006 and *Integrating Science into Policy: Local Adaptation for Marsh Migration, Maine Coastal Program/NOAA Project of Special Merit* at http://northatlanticlcc.org/projects/demo-project-marsh-migration/north-atlantic-lcc-demonstration-project-integrating-science-into-policy-local-adaptation-for-marsh-migration

Shoreline modification and armoring is a cumulative problem along Maine's coast – little by little it negatively affects the coastal environment by exacerbating erosion and preventing the migration of marsh habitat.

Erosion problems in Maine are caused by a persistent rise in sea level, storm activity, changes in sand availability, and pre-1983 oceanfront development, including the construction of jetties and seawalls. Armoring shorelines with "hard" engineering structures, such as seawalls, limit the natural ability of shorelines to maintain themselves. Erosion compromises the ability of shorelines to: buffer adjacent development from storms and flooding; provide vital natural habitat; and successfully accommodate recreation and attract tourism.

Coastal marshes serve a variety of important functions including flood control and spawning/rearing areas for marine life. These marsh systems are also critical breeding, wintering, and migratory stop-over sites. Providing and maintaining the potential for these tidal marsh habitats to migrate upslope and landward is a key approach for long-term adaptation to the more frequent and severe coastal flooding and gradual sea level rise anticipated under changing climatic conditions.

See also Coastal Hazards and Wetlands sections, specifically Coastal Hazards Strategy 3 and Wetlands Strategy 1.

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

Emerging Issue	Information Needed
Nitrogen loading in coastal embayments	Additional monitoring and identification of respective contributions; information sufficient to support regulatory criteria; info on performance of controls (BMPs; bioremediation)
Die-off of eelgrass in some embayments	Additional monitoring and identification of contributors to decline

In-Depth Management Characterization:
Purpose: To determine the effectiveness of management efforts to address identified problems related to the cumulative and secondary impacts enhancement objective.

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

Management Category	Employed by State (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Methodologies for determining CSI impacts	Y	Y	Y
CSI research, assessment, monitoring	Y	Y	Y
CSI GIS mapping/database	Y	N	Y
CSI technical assistance, education and outreach	Y	Y	Y

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

CSI Methodologies

Scenic Assessment Methodology and Mapping– MCP hired Terrance J. DeWan and Associates Landscape Architects to digitize existing coastal scenic inventories. Point locations of scenic areas have been added to an existing layer in the Maine Coastal Atlas. A tutorial for how to update and enhance existing inventories using publicly available free web-based tools was completed and posted on MCP's website. A conference presentation and webinars are in progress to assist municipalities and land trusts who wish to do this work. Outcome: additional communities will have credible and enhanced scenic

inventories for use in non-regulatory and regulatory approaches to viewshed conservation. CZM-driven; non-309.

Maine Stream Crossing Survey Manual. Alex Abbott, Gulf of Maine Coastal Program, U.S. Fish and Wildlife Service, Falmouth, Maine. May 2012
This document is a practical guide to the completion of the Stream Crossing Survey form used to assess structures at road-stream intersections. Outcome: consistent documentation of stream barriers. Non-CZM driven.
http://www.fws.gov/northeast/mainefisheries/pdf/MaineStreamCrossingSurveyManual_2012.pdf

Research, Assessment and Monitoring

Impervious Surface Mapping: The Maine Department of Inland Fisheries and Wildlife (IFW) has conducted mapping of impervious surface within the coastal zone based on imagery taken in 2004, 2007, 2009, and 2011 (the most recent completed since the previous assessment)., The Department analyzed the data on a town-by-town basis, comparing impervious surface extent over time. The analysis shows the rate and location of impervious surface expansion in coastal municipalities. It is intended to inform planners and officials at the state and local levels of government. As of April 2015, analysis remains to be completed for 17 coastal communities, mostly in York and Cumberland counties. Outcome: Information will assist the state in evaluating impacts on natural resources and identifying areas of high growth and will assist towns in land use planning. Partially CZM-driven; 309

Maine Nonpoint Source Management Program Plan 2015 – 2019, September 15, 2014
The Maine Department of Environmental Protection (DEP) coordinates the State of Maine Nonpoint Source Pollution Program (38 MRS 410) to restore and protect waters impaired and threatened by nonpoint source pollution. In its NPS Program Plan, DEP establishes the overall strategy that Maine will use over the next five years (2015-2019) to control and prevent NPS pollution to the state's waters. Eleven marine waters are on MDEP's Impaired Waters Priority List, and 16 marine waterbodies are on DEP's Threatened Marine Waters List. Listings for lakes and streams in Maine's coastal zone are also provided in the report. Non-CZM driven, MCP contributed. Outcome: strategic plan for improvement of coastal waters, awareness tool for municipalities and watershed groups to undertake surveys, plan and projects. http://www.maine.gov/dep/land/watershed/nps-management-plan-2015-2019.pdf

Maine Department of Environmental Protection, *Maine Impervious Cover Total Maximum Daily Load Assessment (TMDL) for Impaired Streams*, 2012 DEPLW-1239 The waterbodies included in this document have been assessed by DEP as not meeting Maine's water quality standards for aquatic life use, and have been listed on the Clean Water Act Section (CWA) 303(d) list of impaired waters. The CWA requires that all 303(d)-listed waters undergo a TMDL assessment that describes the impairments and estimates a target to guide the measures needed to restore water quality. The goal is for all waterbodies to comply with state water quality standards. Appendices 4 – 32 of this report contain Waterbody-Specific TMDL Summaries, some of which are for coastal impaired streams. Non-CZM driven. Outcome: directs agency focus areas, directs funding to priority areas, serves as awareness tool for municipalities and watershed groups.
http://www.maine.gov/dep/water/monitoring/tmdl/2012/IC%20TMDL_Sept_2012.pdf

New Bacteria TMDLs. DEP developed TMDLs for two coastal streams impaired for bacteria: Goosefare Brook (Saco/Old Orchard Beach; and Duck Brook (Arundel). These draft TMDLs were submitted to EPA and approved in 2014. Bacteria concentrations were measured in each of the impaired watersheds and

used to determine the percent reduction needed to attain water quality standards. The report identifies potential pollutant sources and sets a goal of meeting bacteria water quality criteria throughout the affected waterbodies. Non-CZM driven.

Statewide Bacteria TMDL Follow-up. For the fifth season, DEP staff and an AmeriCorps volunteer conducted follow-up monitoring on the Statewide Bacteria TMDL approved in 2009. Project objectives are to identify specific sources of bacteria through sampling for E. coli and sanitary surveys; then eliminate these problems; and ultimately remove the impaired stream segment from the 303d list. In 2014, streams were selected based on restoration potential, adverse impact on receiving waters, follow-up on previous sampling efforts, and the need for characterizing natural levels of bacteria at clean sites. In 2014 this project added Rockland Harbor to answer questions about ambient bacteria levels in marine waters that are legally "Prohibited" for shellfish harvesting. Marine waters with highly developed watersheds are closed to harvesting as a precautionary measure and there is little recent monitoring data on these closed waters. A special project was also conducted on the Medomak River to identify potential bacteria sources impacting downstream clam flats that are closed after rain events. Non-CZM driven.

Stream Water Quality Monitoring – MEDEP Conducted preliminary water quality assessment on the following coastal streams to help with current or anticipated planning efforts or help assess progress with restoration goals: Birch Stream, Penjajawock Stream and Arctic Brook (Bangor), Capisic Brook (Portland), Concord Gully Brook (Freeport), Goosefare Brook and Bear (Saco), Thatcher Brook (Biddeford), Topsham Fair Mall Stream (Topsham), Trout Brook (South Portland), Unnamed Tributary to Bond Brook (Augusta). Non-CZM driven.

Urban Watershed Mapping – DEP staff and a summer intern helped complete mapping projects in urban stream watersheds where municipalities are developing watershed-based plans. In 2014, watershed boundaries and stormwater outfall catchments were mapped in the field and entered into GIS for the Goosefare Brook and Bear Brook watersheds in Saco and Old Orchard Beach. Non-CZM driven.

Casco Bay Stream Barrier Assessment

In 2012, working with U.S. Fish & Wildlife Service Gulf of Maine Coastal Program, Casco Bay Estuary Partnership produced the *Casco Bay Watershed Fish Barrier Priorities Atlas*. The atlas was created to help guide and prioritize restoration of streams affected by road/stream crossings and dams acting as barriers to fish passage, and identify places where fish passage and flood issues co-occur. The atlas combines 42 individual town maps that show the degree of restriction each crossing poses for fish passage, as well as flood hazards. Maps were mailed to town managers, road commissioners, and public works directors in each community. Non-CZM driven.

Stream Barrier Survey Report. Jacob Aman, Wells National Estuarine Research Reserve, April 2013

This report describes the results of a stream barrier survey conducted by the Wells National Estuarine Research Reserve (WNERR) in 2012. Staff and volunteers with Trout Unlimited visited 110 potential stream barriers at road, railroad, and trail crossings, as well as dams. The group identified 66 stream barriers including 5 dams and 61 crossings. Over 50% of crossings and dams visited create barriers to movement of fish and aquatic organisms. Sites were given rankings based on the severity of the barrier they create. Priority restoration sites were identified based on many factors including ecological benefit, long term economic benefit, and the unique circumstances of each site.

http://www.wellsreserve.org/writable/files/Stream_Barrier_Resources/2013_wnerr_stream_barrier_survey_report.pdf Non-CZM driven

Kennebec Barrier Survey 2010, Kennebec Estuary Land Trust, 2010
Surveys of about 400 road-stream crossings and dams in the lower Kennebec River watershed were completed. GIS layers were completed for entry into the statewide barrier database, and actions were initiated for restoration projects.
http://kennebecestuary.org/wp-content/uploads/2011/09/Kennebec-Barrier-Survey-2010-Final-Report-v1-1-20110507-MMBT.pdf Non-CZM driven.

Belfast Bay Stream Barrier Survey
The Belfast Bay Watershed Coalition located and documented the condition of every brook and stream crossing in the bay watershed; a total of 197 sites. They assessed, photographed, and reported all dams, natural barriers, and culverts with regard to movement of aquatic species. The study was part of a national effort to expand connectivity for aquatic species and improve water quality and habitat. Results were incorporated into the Stream Habitat Viewer. Non-CZM driven.

Lincoln County Stream Barriers
The purpose of Lincoln County Stream Barriers is to improve access to and the quality of habitat for Atlantic salmon, alewives, sea run rainbow smelt and native brook trout throughout Lincoln County. This map viewer presents information on the location and condition of state and local road culverts that may be adversely affecting access to spawning, rearing habitat and growing habitat for these four important fish species. It is hoped that by making communities aware of these culverts, over time they can be improved, upgraded or replaced as necessary to expand the populations of these species throughout the county. The Stream Barriers map is available at http://lcrpc.org/land-use-planning/lincoln-county-stream-barriers. CZM driven, non-309.

Blue Hill Bay Watershed Needs Assessment. 2013 Thomas E. Martin and James H. Fisher, Hancock County Planning Commission and Barbara S. Arter, BSA Environmental Consulting
The Blue Hill Bay (BHB) Watershed Needs Assessment was a multi-town, multi-stakeholder initiative to assess Blue Hill Bay's resources, identify existing and potential threats to bay ecology, and make informed decisions about coastal activities that impact these resources.
http://www.hcpcme.org/bluehillbay/docs/BHBReport062513.pdf CZM-funded, locally driven; non-309

CSI Mapping and Database

Stream Habitat Viewer
In 2013, the Stream Connectivity Work Group launched the Maine Stream Habitat Viewer to enhance statewide stream restoration and conservation efforts by providing a starting point for towns, private landowners, and others to learn more about stream habitats across the state. The Viewer displays habitats important to Maine's economy, ecology, and way of life, and also the locations of dams and public road crossings that can block the movements of fish, wildlife and the stream processes that create and maintain habitat. In addition, the Maine Stream Connectivity Workgroup maintains a statewide barrier database, a project collaboration spatial viewer and spatial habitat layers.
The Habitat Viewer is available here: http://mapserver.maine.gov/streamviewer/streamdocHome.html.
Partially CZM-driven, partially CZM 309

Technical Assistance, Education and Outreach

MCP Stream Restoration Coordinator
Since 2011, the MCP's Restoration Coordinator has assisted in the development of 30 habitat restoration projects. For 15 of those projects, habitat gains were achieved between 2011 and 2015, including re-establishing 26 miles of barrier-free stream conditions for species like Atlantic salmon, alewife, eastern brook trout and American eel. In addition, access to 1,190 acres of alewife spawning habitat was re-established. Other successes include physical habitat improvements on 66.8 acres of tidal marshland and 0.4 miles of riparian areas. In 2014, following the end of the Gulf of Maine Council's habitat restoration program, MCP has supported the contractor to work with municipalities, community groups, agencies and a wide range of other partners to develop and build support for coastal restoration projects.

Stream Smart Road Crossing Standards, Maine Audubon, 2011.
Maine Audubon and partners (including MCP) launched *Stream Smart*, a program that trains contractors, landowners and other professionals responsible for road-stream crossings, how to construct crossings that maintain fish and wildlife habitat while protecting roads and public safety. *Stream Smart* road crossings let the stream act like a stream and make the road invisible to the stream. View Maine Stream Crossings: New Designs to Restore Stream Continuity at: http://maineaudubon.org/streamsmart/files/2014/11/Maine-Stream-Crossings-New-Designs-to-Restore-Stream-Continuity1.pdf Partially CZM-driven; non-309

EPA Stormwater Calculator Demonstration for Planning Boards
Using funds provided in a grant from the Maine Coastal Program, the Lincoln County Regional Planning Commission has created a demonstration of EPA's online Stormwater Calculator. The step-by-step demonstration is designed to show local Planning Board members the effect Low-Impact Development (LID) stormwater management techniques can have when used in a hypothetical development scenario. http://www.maine.gov/dacf/municipalplanning/docs/LCRPC%20Stormwater%20Calculator%20Tech%20Bulletin.pdf CZM-driven; non-309

Web-based tools. MEDEP developed a web-based map to display the previously collected bacteria data. The information and can be found at: http://maine.maps.arcgis.com/apps/StorytellingTextLegend/index.html?appid=b9dda9cff60542b0888d86e 6ab9bc89c
In addition to data collected for follow up TMDL monitoring, this website includes bacteria data collected by the Volunteer River Monitoring Program and Maine Healthy Beaches. DEP will be updating these maps with current data in 2015. Non-CZM driven

Decentralized Wastewater Systems – A Resource Manual for Municipal Officials and Developers, 2013:
Many rural areas rely on individual septic systems for wastewater management and are unlikely to ever develop a community sewer system. Decentralized wastewater systems provide a mechanism to allow clustered development and increased development in proximity to existing development in rural areas which can be less expensive and which reduces habitat fragmentation and degradation. This guidance document was created for the Maine Coastal Program by the Washington County Council of Governments and aims to inform town officials and developers about the benefits of this alternative approach to septic systems as well as practical steps to employ it.

http://gro-wa.org/wastewater-resource-manual CZM-driven, non-309

Density – A Visualization Tool, 2009: The Municipal Planning Assistance Program has created this PowerPoint presentation using Maine-based examples of different housing densities to help town planners, planning boards, and others understand what different development densities look like on the ground.
http://maine.gov/dacf/municipalplanning/docs/density_visualization.ppt CZM-driven; non-309

Model Low Impact Development Provisions for Shoreland Zoning Ordinances (April 2010)
Nonpoint source pollution from single-family residential development accounts for 20-30% of the pollution impacting Maine's lakes most at risk. This model language is designed to fit into existing shoreland zoning ordinances and addresses impacts of less than 1 acre in size, which are not covered by the State's Shoreland Management Law.
http://www.maine.gov/dacf/municipalplanning/docs/LID_Ord_SZ_model_kvcog_4%209%2010_2.pdf
CZM-driven; non-309

Dark Skies Report – *A Report to the Business, Research, and Economic Development Committee of the 124th Session of the Maine Legislature*, in response to *LD 11 (Resolve 2009, ch. 22, To Encourage the Preservation of Dark Skies)*
The former State Planning Office Land Use Team (currently the Municipal Planning Assistance Program at DACF) prepared this report to assist towns that are interested in working on the issue of lighting and dark skies. The report covers the basics of light pollution, methods to prevent and minimize it, comparison of costs, and the status of municipal lighting ordinances.
http://maine.gov/dacf/municipalplanning/docs/darkskieswappendices_jan2010.pdf CZM driven; non-309

Open Space Subdivisions: A Primary Tool for Protecting Quality of Place (presentation): This 2010 presentation by Kennebec Valley Council of Governments provides a discussion and related visuals of why Maine's typical rural zoning of 2-acre lots does not protect rural character. It provides the basics of open space subdivisions and how they can be used to allow for development while still maintaining rural character and habitat integrity.
http://maine.gov/dacf/municipalplanning/docs/Open_Space_Subdivisions_presentation_2010_10_07_withnotes.pdf CZM-driven; non-309

Farmland Protection Tools (2010)
Farming is increasingly threatened by proximity to new development and fragmentation of farmlands. This presentation by the Kennebec Valley Council of Governments provides general information on basic farmland protection tools including buffers, maximum lot sizes, use of current use tax programs, siting standards and others.
http://maine.gov/dacf/municipalplanning/docs/2010_Farmland_Protection_presentation_QofP_KVCOG.pdf Partially CZM-driven; non-309

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 addressing cumulative and secondary impacts of development since the last assessment. If none, is there any information that you are lacking to assess the effectiveness of the state and territory's management efforts?

Effectiveness Studies

Determining if Maine's Mandatory Shoreland Zoning Act Standards are Effective at Protecting Aquatic Habitat. Vermont Department of Environmental Conservation 2013. This study found that Maine's Mandatory Shoreland Zoning Act standards make it possible to both develop a lakeshore and protect aquatic habitat and biota.

Municipal Stormwater Management in Northern New England: A Comparative Study of Leading Programs Payson,K; Melanson, R; Roncarti, D; Dillon,F. The authors looked at four case study municipalities in Maine (Bangor, Lewiston, Portland and South Portland), four in NH and three in VT and found that current regulatory approaches to municipal stormwater management do not appear to be resulting in substantial improvements to local and regional water quality (i.e., the number of water bodies designated as impaired has not decreased substantially). Other findings included:

- MS4 stormwater managers will need to begin conducting assessments to establish more direct connections between program activities and local water quality improvements.
- Local land use planning and zoning ordinances will become increasingly important in reducing stormwater pollution, and will need to consider development impacts at the site level (stormwater management systems) and watershed scale (impervious coverage %).
- The use of LID techniques and "green infrastructure" will need to become much more common and widespread to meaningfully address polluted stormwater runoff from MS4 communities.
- Accommodating higher density development with proper stormwater management systems improves water quality on a per capita watershed scale basis provided that the planning and placement of development is coordinated.
- Stormwater program management will likely become more expensive so that MS4 communities will increasingly need to consider alternate and sustainable funding sources.
- The actual costs of MS4 stormwater program management will need to be better identified and understood to enable adequate planning and preparation for future stormwater program needs and requirements.

Windpower and Wildlife in Maine: A Statewide Geographical Analysis of High Value Wildlife and Windpower Classes. Maine Audubon 2013. This study found that 85% of the modelled wind base (i.e. areas with windpower potential) does not overlap with significant wildlife resources. In addition, the authors found that the wind resource in Maine's expedited wind permitting areas that does not overlap with mapping wildlife resources is adequate to meet state goals for windpower development.

Identification of Priorities:

1. Considering changes in cumulative and secondary impact threats and management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve the effectiveness of its management effort to better assess, consider, and control the most significant threats from cumulative and secondary impacts of coastal growth and development.

   Management Priority 1: <u>Accelerate the pace and quality of coastal habitat restoration</u>
   Description: MCP, working in partnerships, can enhance and create new assessment methodologies, and decision support tools, increase efforts to build capacity and offer improved technical assistance to advance Maine's coastal restoration goals.

Management Priority 2: Improve coastal water quality, particularly in the watersheds of shellfish growing areas and other priority coastal watersheds.

Description: MCP can help strengthen municipal capacity and commitment towards water quality improvements and can assist municipalities and watershed groups in planning and prioritization.

Management Priority 3: Facilitate the use of low impact development techniques, and nonstructural approaches to shoreline stabilization and stormwater management (e.g. green infrastructure and living shorelines.

Description: MCP can work with networked state agencies, municipalities and developers to research and assess opportunities to implement these techniques and approaches, which are underutilized (LID and Green Infrastructure) or not currently used (Living Shorelines)in Maine.

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

Priority Needs	Need? (Y or N)	Brief Explanation of Need/Gap
Research	Y	• CSI will remain difficult to assess and understand without a substantial investment in monitoring and research. • Regulatory approaches to addressing CSI need to be complemented by non-regulatory techniques and incentives for towns and landowners. Research is needed to identify approaches that are feasible for use in Maine, in particular, techniques to address CSI in light of the predominance of single lot development in some areas of the state (i.e. outside of regulated subdivision activity). • Need additional research into sediment accretion rates in marshes to determine viability given climate variability. • Need additional research on and monitoring of ocean acidification and relative role of nitrogen and runoff, especially as it affects commercially important species. • Need data on the performance of living shorelines in cold climates.
Mapping/GIS	Y	• Need to research, understand and employ a new, cost-effective and less work intensive method for identifying changes in impervious surface using LiDAR. • Need water-penetrating LiDAR to assist with nearshore habitat restoration • Marsh migration analysis is limited by a lack of accretion rate data, a lack of including the influence of freshwater flow on marsh migration, and lack of tidally controlled LiDAR data.
Data/ information Mgmt.	Y	Existing databases are ineffective in tracking CSI and assisting in analysis of CSI.
Training/Capacity building	Y	Given turnover in municipal government, training and capacity building will always be an issue. Capacity needs to be built among new partners, e.g. Soil and Water Conservation Districts (SWCDs) and increased at regional planning commissions. Financial/technical capacity is especially needed to assist with stream restoration project management (design/build), conduct watershed surveys and develop watershed management plans.
Decision-support tools	Y	Integrating new information into existing tools, e.g. integrating flooding potential, public safety vulnerability, and cost-benefit of corrective action into existing tools such as the Habitat Viewer.
Communication and outreach	Y	• Need additional efforts to engage towns and contractors in “stream smart” techniques for habitat restoration. • Need to enlist greater municipal support for water quality remediation; especially in towns that have shellfish resources

Enhancement Area Strategy Development:

1. Will the CMP develop one or more strategies for this enhancement area?
   Yes X *(note: CSI strategies may overlap with other enhancement area strategies and this may be included in other chapters to avoid repetition)*
   No _____

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

The term "cumulative and secondary impacts of development" (CSI) is a huge and generic category that encompasses a broad range of issues of concern in Maine. Despite our small population and slow rate of growth (as compared to other coastal states), and the robust nature of Maine's environmental laws, the impacts of development (both legacy impacts and current impacts) are likely resulting in continued degradation to some of Maine's coastal resources. A variety of new and enhanced approaches may effectively address (or at least advance progress on) addressing Maine's challenges. In many cases, these approaches may save money for Maine's municipalities and developers. MCP is particularly interested in non-regulatory, incentive-based approaches to dealing with CSI. Approaches will have to consider the needs of smaller communities where single-lot development (as compared to regulated subdivision activity) is the predominant development trend.

Ocean Resources

In-Depth Resource Characterization:
Purpose: To determine key problems and opportunities to enhance the state CMP's ability to address challenges to effective ocean resource management.

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

	Stressor/Threat*	**Geographic Scope** (throughout coastal zone or specific areas most threatened)
Stressor 1	Changing Ocean Conditions • Temperature fluctuations and trends • SAV loss • Benthic habitat changes • Invasive species • Habitat "movement" and movement of commercially important fish stocks • Shell disease, new toxins.	Throughout Coastal Zone
Stressor 2	Ocean and Coastal Water Quality • Ocean acidification • Nutrient loading	Observed in Casco Bay; potentially in other embayments
Stressor 3	Changes in the natural environment and socio-economic status of fishing-dependent communities, and changing biological, social, and economic goals for fishing.	Throughout Coastal Zone

*It's important to note that all three of these stressors and their subsequent, specific impacts lack a unified and sufficient monitoring approach. A lack of funding and staff capacity at Maine's natural resource agencies contributes to an overall lack of data and information on the intensity, extent, and impact of these stressors.

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

   Changing Ocean Conditions/Changes in Socio-Economic Status of Communities/Changing Goals for Management of Fisheries

   Maine's ocean and coastal environments are showing signs of potentially impactful changes.

   Scientists at the Gulf of Maine Research Institute and the University of Maine have established through a peer-reviewed process that the Gulf of Maine is warming faster than 99.85% of the

Earth's oceans.[42] The potential impacts on the biological and oceanographic processes of both the Gulf and subsequently Maine's coasts are profound and far reaching. It's estimated that Maine's living marine resources economy generates approximately $1.5 billion per year in GDP, employs an estimated 8,600 people, and provides over $62 million in wages. Changing ocean conditions contributing to habitat "migration", loss of important submerged aquatic vegetation (SAV) beds that serve as harvestable stock nurseries, and the development of oceanographic conditions conducive for the advancement of invasive species that compete directly with Maine's harvestable native stocks are serious issues confronting Maine's significant coastal economy.

Island Institute, 2014. Preparing for an Uncertain Fishing Future: Bringing Communities Together with Climate and Marine Scientists to Understand Predictive Capabilities and Information Needs. Workshop summary report. Predictive Capabilities Summary Report (215.85 KB)

The "Predictive Capabilities Workshop" brought together a diverse group of climate and marine scientists, fishermen, and other marine stakeholders to provide practical links between current climate projection work and the real world issues facing Maine's fishermen and coastal communities. In the next 15–20 years, warming waters are expected with an increase in seasonal temperature ranges and vertical stratification. More frequent and larger storm events will likely cause coastal erosion and damage to waterfront infrastructure. New species will be migrating into the Gulf of Maine (GOM) from the Southeast Atlantic and Mid-Atlantic, creating changes in predator/prey interactions and new fishing opportunities. Lobster stocks in Southern Maine are anticipated to continue dropping, although many predicted lobster would still be the predominant fishery in Maine for the foreseeable future. Invasive species (e.g. green crabs) and water-borne disease (e.g. lobster shell disease) are apt to increase. Changes in marine mammal populations (e.g. right whales and seals) are also likely as the GOM ecosystem changes. Changes in management institutions are also anticipated. Future changes in GOM species will most likely result in the migration of permits and potential changes in access to the resource. The vessels in the fleet may become larger to accommodate more severe storms and offshore fishing, and there will likely be increased consolidation resulting in fewer commercial fishermen. Communities will also need to make choices about investing resources in supporting working waterfronts or other structures along the vulnerable coastline.

Maine's largest fishery, the American lobster, provides over 40% of Maine's commercial landings by live pounds.[43] This is an approximate value of over $456 million in ex-vessel value. The University of Maine, in partnership with the Maine Lobster Promotion Council, the Maine Restaurant Association, and the Natural Resources Council of Maine, has identified the potential migration north of the American lobster (a change that has already occurred in large part in southern New England) as having major impacts on the fishery and the communities that rely so heavily on it.

Until recently, Maine Department of Marine Resources (DMR) annually surveyed SAV. Maps of loss, gain, and no change are available on DMR's website[44] and illustrate a disturbing portrait of bed loss between 2008 and 2010. The Frenchman Bay Partners estimate that the Bay lost 66% of its SAV coverage in this time period. There are many theories as to why this loss is occurring, including growing green crab populations, changing water temperature, increasing pH, dragging activities, and

[42] http://www.seascapemodeling.org/seascape_projects/2014/01/the-gulf-of-maine-is-warming-fast.html.
[43] http://www.maine.gov/dmr/commercialfishing/documents/2014PoundsBySpecies.Pie.Graph.pdf
[44] http://www.maine.gov/dmr/rm/eelgrass/

natural decline. Based on a consensus report[45] from the Maine/New Hampshire Eelgrass Collaborators, the cause of the decline alone is the most important variable to understand. Impacts related to the decline are also important, but prior to any restoration activity or living resource impact assessment, additional monitoring for additional loss and the cause of that loss must take place.

Invasive marine species have been an issue in Maine for decades; however, these issues have been exacerbated as a result of changes and fluctuations in temperature in Maine's coastal waters and a general lack of understanding of the life cycles of several of the invasive species, the invasive European green crab (green crab) in particular. In February, 2014, Governor LePage signed an Executive Order establishing the Green Crab Task Force. The report documented impacts of the green crab on commercial fisheries, competition and predation in the food chain, and marine habitat, and provided summaries of past and ongoing research. The Task Force's recommendations included holding priority meetings; identification of sources of funding to address key concerns; research, industry, and business network development; market development; and permit streamlining.

In 2014, the Maine Coastal Mapping Initiative (MCMI) discovered three separate species (two marine polychaetes and one species of salp) that are native to waters well south of the New York Bight during the summer field season in numbers significant enough as not to be viewed as anomalous.

Underlying all of these issues is uncertainty of the extent or period of climactic changes and the fundamental impacts they will have on the benthic habitat of the Gulf of Maine, which is the home for all of the species listed above and a superb indicator of physical oceanographic changes that the stressors and threats listed in this section precipitate.

Ocean and Coastal Water Quality -- See the Phase II Assessment of Cumulative and Secondary Impacts of Development for discussion of Ocean and Coastal Water Quality.

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

Emerging Issue	Information Needed
Sand and gravel extraction for beach nourishment	Additional field investigations and communication (primarily with federal and state agencies and impacted stakeholders)
Ocean acidification	Monitoring and research, particularly on the impact on the state's two most economically important fisheries (lobster and mollusks)
Impacts of changing ocean conditions on fisheries, e.g., changes in predator/prey relationships, shell disease, new toxins	Research, monitoring, and modeling
The potential selection or designation of a new regional dredged materials disposal site by the USACOA/EPA.[46]	Improved intergovernmental coordination and stakeholder involvement.

[45] Proceedings of the Maine/NH Eelgrass Collaborator's Meeting, January 22nd, 2014

[46] The Cape Arundel Dump Site, which serves some of the dredged materials disposal needs of southern Maine and New Hampshire, has limited remaining capacity and is scheduled to close in 2019.)

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

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

Management Category	Employed by State (Y or N)	CMP Provides Assistance to Locals that Employ (Y or N)	Significant Changes Since Last Assessment (Y or N)
Ocean and Great Lakes research, assessment, monitoring	Yes	No	Yes
Ocean and Great Lakes GIS mapping/database	Yes	No	Yes
Ocean and Great Lakes technical assistance, education, and outreach	Yes	No	Yes
Fisheries Management Plans	Yes	No	Yes

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.

Ocean Research, Assessment, Monitoring

MCP, DMR and other partners have significantly increased the state's capacity to effectively monitor changes in the ocean and coastal environment. The Maine Coastal Mapping Initiative has begun a scientifically rigorous and targeted approach to data collection in the coastal and marine environment and now provides a platform for the collection of bathymetric information in addition to benthic sampling, video, and water column parameter data. Additionally, various working groups and commissions including but not limited to the Ocean Acidification Commission and the Green Crab Task Force (See Phase I Assessment) have developed recommendations to continue to collect water quality, topographic, and marine resource data.
The MCMI is CZM 309 driven.

As a result of Hurricane Sandy, many federal agencies and state governments have begun extensive planning to prepare for what is expected to be an increase in frequency and intensity of major storm events as a result of changing climactic conditions. In 2012, the Maine Coastal Program entered into a cooperative agreement with the Bureau of Ocean Energy Management (BOEM) to assess the locations of sand deposits in federal waters immediately adjacent to Maine's submerged lands. This funding provided a portion of the operational costs of the Maine Coastal Mapping Initiative[47] for the 2014 and 2015 field seasons. The Northeast Regional Ocean Council, and to a lesser extent, the Northeast

[47] http://www.maine.gov/dacf/mcp/planning/mcmi/index.htm

Regional Planning Body have served as forums for regional discussion on sand and gravel management and extraction and potential related impacts on sensitive benthic habitats, fisheries stocks, and surrounding communities.
CZM 309 driven

During the Second Regular Session of the 126th Maine Legislature passed P.L. 2013 c. 517, "An Act to Protect Areas in Which Shellfish Conservation Gear Has Been Placed for Predator Control and Habitat Enhancement Purposes and Establish a Municipal Predator Control Pilot Program." (http://www.mainelegislature.org/legis/bills/getPDF.asp?paper=SP0536&item=3&snum=126)
After passage of the bill on April 5th, 2014, DMR immediately established an application process for towns to request participation in the predator control pilot project program. DMR gave four towns permission to close specified intertidal areas to all harvest activity while they studied predator control methods. DMR staff reviewed the permitted projects several times during the field season and towns presented their findings in December 2014. Additional stakeholder meetings were designed to provide input to DMR on predator control strategies and the needs of the soft-shell clam and marine worm industries. As implemented, the law has not adequately addressed the underlying problem of resource conflict between the clam and worm industries, but it has provided guidance that nets and traps are the most effective methods for controlling green crab predation.
Partially CZM 309-driven

As a result of the Governor's Task Force on Green Crabs (discussed above), a partnership of state agency representatives, community development organizations, non-profit organizations, and fisheries associations was established to work together to maintain open lines of communication on efforts to assess and mitigate the impacts of green crab.
Partially CZM 309-driven.

In 2013 and 2014, MCP provided technical assistance funds to the Towns of Freeport and Brunswick to test new measures (trapping and enclosures) to limit the impact of green crab on certain embayments.[48]
CZM-driven, non-309.

Ocean GIS Mapping/Database

As referenced in previous sections, MCP is actively working with MCMI partners in addition to the Maine Geolibrary Board and Maine Office of GIS to advocate for the collection of not only high resolution bathymetric data products, but also intertidal and nearshore LiDAR data.
CZM Section 309-driven.

Ocean Technical Assistance, Education, and Outreach

With 309 funding, the MCP's partner agencies are able to obtain input on the development of policy initiatives and rulemaking through both formal and informal outreach to stakeholders. Through species-specific advisory councils, as well as the DMR advisory council, partner agencies have a formal mechanism to obtain input throughout the development of the state fishery management plans (FMP). Since 2012, and leading up to the start of development on the lobster FMP, the Commissioner of the DMR conducted a major outreach effort to discuss the current state of lobster science, as well as the

[48] http://www.maine.gov/dacf/mcp/grants/shore-and-harbor-planning-grants.html

policy and socioeconomic issues that will likely be addressed in the FMP process, or through the legislature. The goals of these meetings have been to obtain input, develop ideas, and engage stakeholders in a conversation about the future of their industry and the health of the resource.

In the absence of a Rockweed species-specific Council, DMR established an advisory committee to help develop the Rockweed Fisheries Management Plan (see below). Meetings were open to the public and there was significant participation. CZM 309-driven

MCP and DMR convened a "Maine Ocean Advisors Group" to help Maine's agency representatives to the New England Regional Planning Body (NERPB) accurately represent Maine's needs and views toward regional ocean planning. The group is convened before most RPB meetings. MCP has also played a large role in several rounds of public meetings conducted by the NERPB to elicit input to the ocean planning process.

Fisheries Management Plans

In 2013, the Maine Legislature passed An Act To Provide Guidance for the Development of Marine Fisheries Management Plans P.L. 2013 c. 287.
http://legislature.maine.gov/legis/bills/getDoc.asp?id=19649 The law strengthened DMR's authority to develop Fisheries Management Plans. FMPs define the biological, social, and economic goals of the fishery as well as objectives and metrics to evaluate success. FMPs provide greater certainty to industry members by establishing the triggers and thresholds at which management actions would be sought or taken. FMPs are developed with the advice and input of the species-specific DMR advisory councils where applicable, and approved through the DMR Advisory Council. DMR developed an FMP for rockweed, and scallop, urchin and lobster FMPs are underway.
http://www.maine.gov/dmr/rm/rockweed/DMRRockweedFMPJan2014.pdf
CZM 309 funded.

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

No specific studies have been done to assess the management and planning efforts with regards to oceanographic monitoring and modeling projects undertaken during the previous Section 309 strategy period. The primary reason for this lack of performance data is that the programs listed above are relatively new and have yet to generate data that has been actively used in management decisions.

In September of 2014, the Maine Department of Environmental Protection, in consultation with representatives from all of Maine's natural resource agencies published *Monitoring, Mapping, Modeling, Mitigation, and Messaging: Maine Prepares for Climate Change*[49]. The report provided an inventory of existing climate-related state projects, initiatives, and mitigation measures currently in effect in Maine, and made recommendations for more effective and impactful monitoring work. The report included the following recommendations:

[49] http://www.maine.gov/dep/sustainability/climate/Working%20Group%20maine%20prepares.pdf

- Acquire and assimilate bathymetric data for inclusion in the state's GIS database for areas near the coast as an aid to understanding potential effects of wave run-up and storm surge in sensitive areas.
- Develop a model to predict local consequences of changes in sea level to both the natural and built environments.

With regards to the FMPs developed during the previous period, several studies have been conducted to assess their efficacy and determine whether or not changes need to be made. In 2010, Trott and Larson published a report[50] evaluating short-term changes in rockweed and associated epifaunal communities following cutting and raking. The report concluded that harvesting rockweed increased the biomass over the long haul and that impacts on epifaunal species were negligible.

Identification of Priorities:

1. Considering changes in threats to ocean resources and management since the last assessment and stakeholder input, identify and briefly describe the top one to three management priorities where there is the greatest opportunity for the CMP to improve its ability to effectively plan for the use of ocean resources.

   Management Priority 1: Increased Monitoring of Ocean Acidification and Oceanographic Conditions

   Description: MCP and its partners will continue to work with existing (and identify new) partners to increase the State's capacity to monitor changes in the marine environment and assess how those changes might affect Maine's economy and existing ocean uses.

   Management Priority 2: Fisheries Management Plan Development

   Description: Maine will develop fishery management plans to define evolving management goals and provide guidance for fisheries managers to use when developing statutory or regulatory changes. Through these plans, DMR will seek to engage the fishing industry in a discussion of how the resources on which they depend may change in coming years, and what management responses should occur.

   Management Priority 3: Continued Participation in State and Regional Management Efforts

   Description: MCP will continue to work with the DMR, MGS, and other relevant state partners to address cross-boundary issues that impact the Gulf of Maine, the Northeast region and its user communities.

[50] http://maine.gov/dmr/rm/rockweed/reports/trottlarsenrpt.pdf

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

Priority Needs	**Need?** (Y or N)	**Brief Explanation of Need/Gap**
Research	Yes	Much additional work is needed to unify, standardize, and expand Maine's nearshore monitoring efforts. Increased capacity for storm event run-off monitoring and non-point pollution impacts have repeatedly been identified as issues impeding the effective management of Maine's coastal and marine resources. Additionally, better information is needed about impacts of changing ocean conditions on marine resources, particularly species that are of significant economic importance to coastal communities (e.g., lobster, soft-shell clams, scallops, and shrimp)
Mapping/GIS	Yes	One of the fundamental issues underlying all of Maine's ocean resources-related concerns is the paucity of high-resolution, accurate seafloor and intertidal mapping data. Numerous value-added products can be developed with this type of data. Specifically, this data will provide a better understanding of benthic habitat that will assist in identifying priority scallop beds for management purposes.
Data and information management	Yes	Partner agencies are looking at developing an onboard technology that would allow quicker data entry to enable more real-time decision-making in fisheries management.
Training/Capacity building	No	
Decision-support tools	Yes	MCP is currently in the beginning phases of developing a habitat and topographical data set that will serve as a baseline for certain geographies in Maine's coastal waters. Much additional work and consultation is needed with partners and federal agencies to finalize development and prove the concept. Additionally, state FMPs will guide management action in the statutory and regulatory context.
Communication and outreach	Yes	Partner agencies continue regular outreach to industry as a key tool for industry buy-in and investment in management measures. Other tools include up-to-date websites and newsletters to keep various stakeholders informed about FMP development and other policy initiatives.

Enhancement Area Strategy Development:

1. Will the CMP develop one or more strategies for this enhancement area?
   Yes Y
   No _

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

Based on Maine's Phase I and Phase II Assessments, state and local priorities and efforts, and a regional identification of need, MCP will develop a strategy for the Ocean and Great Lakes Resources Section 309 Enhancement Area. MCP will work closely with the DMR to ensure that all relevant needs are addressed and that communication among partner agencies is consistent and constant.

Wetlands

In-Depth Resource Characterization:
Purpose: To determine key problems and opportunities to improve the CMP's ability to protect, restore, and enhance wetlands.

1. What are the three most significant existing or emerging physical stressors or threats to wetlands within the coastal zone? Indicate the geographic scope of the stressor, i.e., is it prevalent throughout the coastal zone or specific areas that are most threatened? Stressors can be development/fill; hydrological alteration/channelization; erosion; pollution; invasive species; freshwater input; sea level rise; or other (please specify). When selecting significant stressors, also consider how climate change may exacerbate each stressor.

	Stressor/Threat	**Geographic Scope** (throughout coastal zone or specific areas most threatened)
Stressor 1	Development & Land Use Change in Wetlands and Wetland Buffers	Coastwide, though greater impacts occur within Southern and Midcoast Maine, where there is more development.
Stressor 2	Sea Level Rise	Coastwide
Stressor 3	Invasive Species	Coastwide

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.

   Development and Land Use Change in Wetlands and Wetland Buffers
   The cumulative and secondary effects of coastal development, both to wetlands and the landscapes that support wetlands, can have profound impacts. Stressors under this category include wetland alterations that are unregulated, resulting in an unknown level of small but cumulatively significant impacts to wetlands. There is currently no mechanism in place for quantifying these impacts. Wetlands alteration includes fill, ditching, and new or degrading road crossings and culverts. Stressors under this category also include alterations to wetland buffers such as increased impervious surface (and accompanying runoff), changes in land cover or land use type, habitat quality (size, connectivity) alteration, and impacts related to climate change. This is a broad and significant stressor, as it ultimately lends to the incremental decline in wetland health and function. For example, these effects can lead to erosion and sedimentation into waterways, loss of wildlife habitat, increased invasive species infestations, decreased flood control capacity, poor water quality, and loss of corridors and refugia that are needed to support species and habitat adaptation and resiliency to the impacts of climate change. The committee working on Maine's 2015 State Wildlife Action Plan, led by Maine Department of Inland Fisheries and Wildlife, has indicated that housing/urban areas and commercial/industrial areas are ranked as moderate and severe stressors, respectively, for tidal marshes.

   Sea Level Rise
   Sea level rise is a threat to wetlands, particularly tidal marshes, because it has the potential to drastically change the location, area, and composition of high marsh and low marsh. If conditions are ideal, salt marshes have the ability to "migrate" inland in equilibrium with sea-level induced

changes in shoreline position. Under this scenario as sea level rises, the upper boundary of the marsh will shift inland and the lowest of the low marsh will become inundated and shift to subtidal, where marsh cannot grow. Potential impediments to marsh migration include unsuitable land cover types, development, soils, sediment accretion rates, and local topography. A recent study by the Maine Natural Areas Program and Maine Geological Survey (Cameron and Slovinsky, 2014) found that under a 3.3' sea level rise scenario only half of the area needed to accommodate marsh migration is currently wetland (the remainder is upland) and only 46% of the area needed to accommodate marsh migration is currently available. In other words, given current conditions and data Maine stands to lose up to 54% of its marsh area under a 3.3' sea level rise. The loss of tidal marsh acreage is concerning because it provides a range of important functions, services, and goods despite its meager representation in the coastal landscape. The potential impacts of sea level rise include habitat shifting and loss, altered hydrology, increased erosion, infrastructure impacts, flooding, and saltwater intrusion. The committee working on Maine's 2015 State Wildlife Action Plan, led by Maine Department of Inland Fisheries and Wildlife, has indicated that habitat shifting/alteration and storms/flooding are moderate threats to tidal marshes.

Citation: Cameron, D. and P.A. Slovinsky. 2014. Potential for Tidal Marsh Migration in Maine. NOAA Project of Special Merit. Maine Natural Areas Program and Maine Geological Survey, Maine Department of Agriculture, Conservation and Forestry.

Invasive Species
Invasive plant and animal species are considered to be the second largest threat to biodiversity behind habitat loss. They can degrade natural habitats, decrease plant and animal diversity, crowd out rare species, impact water quality, inhibit forest productivity, and even lower property values. Invasive species are a threat to wetlands and uplands in Maine's coastal zone, particularly in areas where development, roads, and a sustained history of human land use exist. We are already seeing significant impacts to saltmarsh vegetation and shellfish communities from marine invaders such as green crabs, and impacts to rare species and nesting habitats due to invasive plants like common reed (*Phragmites australis*). Despite the current impacts of invasive species along the coast, much of Maine remains relatively free of invasives, presenting opportunity for proactive, preventative action and the minimization of harm through the development and implementation of best management practices, if resources are available.

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

Emerging Issue	Information Needed
Sea level rise and marsh migration	Sediment accretion rates; sea level rise rate
Invasives	Forecasting, identifying, tracking, and responding to new invasive species
Anticipated changes in biodiversity in the coastal zone	Natural communities mapping for coastal area
Use of wetlands as "green infrastructure" for stormwater management	Reliability of this technique in cold climates; design guidelines to insure biological integrity of receiving wetlands.
Ocean Acidification	Ecosystem impacts, precision/accuracy of data needed, natural variability, ecosystem structure.

In-Depth Management Characterization:
Purpose: To determine the effectiveness of management efforts to address identified problems related to the wetlands enhancement objective.

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 and if significant state -level changes (positive or negative) have occurred since the last assessment.

Management Category	Employed By State (Y or N)	CMP Provides Assistance to Locals that Employ* (Y or N)	Significant Changes Since Last Assessment (Y or N)
Wetland assessment methodologies	Y	N	Y
Wetland mapping and GIS	Y	N/Y	Y
Watershed or special area management plans addressing wetlands	N	Y	N
Wetland technical assistance, education, and outreach	Y	N	Y
Other (please specify)			

* Note that Maine Natural Areas Program (MNAP) provides assistance to locals in the areas of wetland assessment methodologies; wetland mapping and GIS; and wetland technical assistance, education, and outreach. MNAP is not a networked MCP partner. Maine DEP provides assistance with watershed management plans.

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

Wetland Assessment Methodologies.
The Maine Natural Areas Program (MNAP) has developed two new wetland assessment methodologies for Maine. The first is the Ecological Integrity Assessment (EIA), which is based on a national methodology developed by NatureServe, but adapted specifically to Maine. The second is the Floristic Quality Assessment (FQA), which assigns a score to plant species based on their tolerance for human disturbance and fidelity to specific habitats, to be used as a quantitative metric for monitoring and assessment of vegetative communities. MNAP is currently evaluating the use of these new assessment methodologies in wetlands across a spectrum of condition and type. Potential applications for these two methodologies include monitoring of restoration sites, long term monitoring of reserve areas, and more objective metrics for scoring and comparing wetland natural communities. These management changes were not CZM-driven.

Wetland Mapping and GIS
With the expanded availability of LiDAR imagery for the entire coastline over the past 5 years, the Maine Geological Survey was able to create projection maps for sea level rise that were based on LiDAR's high resolution topographic information. This outcome was MCP-driven; 309.

The Maine Department of Inland Fisheries and Wildlife is currently working on updating the tidal waterfowl and wading habitat (TWWH) layer as well; this is not CZM-driven.

Wetland technical assistance, education, and outreach
In 2014 MNAP hired an Invasive Plant Biologist for the first time. Much of this position is devoted to technical assistance, trainings and presentations on invasive species identification, management strategies, and ecological impacts for towns, land managers, and conservation groups. MNAP also now administers the iMapInvasives program for Maine, which serves as a publicly accessible central repository for invasive species occurrence and management information (http://imapinvasives.org). While MNAP's new staff member is primarily focused on invasive plants, she provides support for the broader invasives effort in Maine, including working with groups such as the Casco Bay Invasive Species Network, Maine Island Trail Association, the Gulf of Maine Research Institute, and multiple towns, land trusts, and public lands in the coastal zone. The iMapInvasives program also includes data on marine taxa such as green crabs, which is an issue that Maine Coastal Program has worked on as well. The addition of a dedicated Invasive Plant Biologist to the State will lead to increased knowledge of the prevalence and extent of invasive species in Maine, ultimately leading to better management and response strategies. This change was not CZM-driven.

3. Identify and describe the conclusions of any studies that have been done that illustrate the effectiveness of the state'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 below descriptions represent studies that relate to coastal wetlands management. However, Maine lacks a comprehensive report of the effectiveness of wetlands management in Maine, as well as a rigorous, coast-wide assessment of tidal wetland impacts and feasibility for restoration.

Whitman, A., A. Cutko, P. deMaynadier, S. Walker, B. Vickery, S. Stockwell, and R. Houston. 2013. *Climate Change and Biodiversity in Maine: Vulnerability of Habitats and Priority Species*. Manomet Center for Conservation Sciences (in collaboration with Maine Beginning with Habitat Climate Change Working Group) Report SEI-2013-03. 96 pp. Brunswick, Maine.

Published by Manomet Center for Conservation Sciences, this report is the result of a collaborative effort put forth by a partnership of state and federal agencies as well as conservation organizations working in Maine. The scientists assessed the vulnerability of species, habitats, and natural communities in Maine with regard to a changing climate. The report then delves into the implications for managers and provides recommendations. The authors concluded that many existing conservation strategies will become increasingly important in the future. These include conserving a diverse network of habitats, identifying and maintaining habitat connections, protecting water quality and riparian areas, and restoring habitat on existing conserved land. In addition, they found that new management techniques should be adopted to facilitate the adaptation of natural systems to climate change. These would include integrating climate change and species vulnerability into state planning efforts and lists of species of greatest conservation need (SGCN), continuing research on climate change effects, adopting

innovative conservation practices to target new and anticipated threats, improving policies to facilitate conservation, and working regionally with other New England states.

Maine Natural Resource Conservation Program, Annual Report – January 1, 2012 – December 31, 2012. 2013. U.S. Army Corps of Engineers, Public Notice.

Annually, The Nature Conservancy releases a report on the outcomes of the most recent round of Maine Natural Resource Conservation Program (MNRCP) projects. The most recent available report is the 2012 summary. It details in-lieu fee payments received by region, impacts to specific habitat types by region (and aggregated), and funds awarded. The report provides an update of past rounds of funded projects, but at this point does not comprehensively examine the success of the program.

Maine Wetland Program Plan 2011-2016
The Maine Wetland Program Plan was prepared by the Maine Wetland Interagency Team, led by Maine DEP. It provides a framework and direction for wetlands management in Maine, organized around four core elements: monitoring and assessment, regulatory activities, voluntary restoration and protection, and water quality standards for wetlands. The plan documents planned activities over the six year period, responsible agencies, and potential partners. While the plan includes a diverse group of people and clearly links to wetlands goals, it does not comprehensively assess the effectiveness of programs. http://water.epa.gov/type/wetlands/upload/me_wpp.pdf

Morgan, P.A., Dionne, M., Mackenzie, R. and J. Miller. 2015. Exploring the effects of shoreline development on fringing salt marshes using nekton, benthic invertebrate and vegetation metrics. Estuaries and Coasts.

Researchers in southern Maine investigated the effects of shoreline development on fringing salt marshes with regard to a number of variables that function as indicators of wetland health. Analysis of data collected revealed several variables that correlated with percentage of shoreline development within the 100 meter buffer of the fringing salt marshes sampled. Variables that correlated with shoreline development included one plant diversity variable (Evenness), two neckton variables (*Fundulus* %biomass and *C. maenas* %biomass), and three benthic invertebrate variables (Insecta – high marsh density; Nematoda – high marsh density; and Diptera – high marsh density). One major goal of the study was to identify biotic metrics that correlate with the extent of development in the shoreline buffer adjacent to fringing salt marshes, which would be useful for the purposes of long-term monitoring and assessing the impact of development on coastal environments. http://link.springer.com/article/10.1007/s12237-015-9947-1

MacKenzie, R.A., Dionne, M., Miller, J., Haas, M. and P.A. Morgan. 2014. Community structure and abundance of benthic invertebrates in Maine fringing marsh ecosystems. Estuaries and Coasts *in review.*

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.

Management Priority 1: Identifying coastal marshes that provide resiliency and flooding buffers

Description: As discussed in the previous section, some work has been done already looking at sea level rise and marsh migration. The next step would be to identify coastal marshes that have the greatest capacity to provide flooding buffers and resiliency for coastal communities and habitats. This would be used to prioritize areas for restoration and conservation that would have the most benefit, taking into account other factors that would affect the practical feasibility of these actions, such as surrounding ownership, land cover types, barriers, significant habitats and rare species, and priority areas for partner organizations.

Management Priority 2: Tracking Unregulated Wetland Impacts

Description: Impacts below 4300 square feet are, for the most part, unregulated by Maine's Natural Resources Protection Act. There is no tracking or notification of these impacts. Anecdotal discussions with wetland scientists, regulators, and developers indicate that the use of the 4300 square feet exemption is widespread. Without understanding how frequently and where this exemption is being used, it is impossible to determine singular or cumulative damages and impacts being caused through its use.

Management Priority 3: Advancing Habitat Connectivity

Description: As development grows in Maine, habitat connectivity is becoming an increasingly important issue. Some work has been done on the issue, notably through the Stream Connectivity Work Group, supported by MCP. This area was heavily emphasized by stakeholders consulted; much work remains to be done, and Maine Coastal Program is well-suited to enhance its work in this area. Regulatory adjustments would facilitate habitat restoration and the removal of barriers to connectivity. In addition, the Maine Coastal Program could provide assistance through prioritization of barriers for removal, identifying potential restoration projects, providing training to build capacity, and general outreach to towns. This management priority can also offer additional benefits, such as flooding control capacity and improved stormwater management.

2. Identify and briefly explain priority needs/information gaps the CMP has to address the management priorities identified.

Priority Needs	**Need?** (Y or N)	**Brief Explanation of Need/Gap**
Research	Y	Sediment accretion rates associated with sea level rise. Plant and habitat shifts related to climate change. Development and field validation of methods for coast-wide assessment of impacts to tidal wetlands and feasibility of restoration.
Mapping/GIS	Y	Expanded LiDAR. Documentation of impacts to wetlands less than 4300 sq. ft.; access to georeferenced data on permitted wetland impacts.
Data and information management	Y	Barrier prioritization for removal, identification of potential wetland restoration projects, DEP database/tracking.
Training/capacity building	Y	"Green infrastructure" use and design; Development of a Coastal Ecologist position dedicated to Maine's coastal issues. Building capacity for local-scale restoration – providing technical assistance to communities/landowners on site-specific restoration projects. Response to invasives.
Decision-support tools	Y	Barrier prioritization for removal. Methods to identify potential wetland restoration projects.
Communication and outreach	Y	Increasing technical assistance to municipal officials and landowners.

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.

Wetlands are an integral part of the coastal environment, providing critical ecological function that benefits both natural and human communities. In Maine, wetlands are increasingly threatened both by coastal development and human alteration of the natural environment, as well as by sea level rise and erosion. Maine Coastal Program's management tools are appropriate for this area. MCP has worked effectively on wetlands issues in the past and will develop strategies for future enhancement of its work on wetlands.

Strategies

Coastal Hazards (CH)

CH Strategy 1: Data Collection and Support for Shoreline Adaptation

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:*** *The State of Maine, its local governments, county emergency management agencies and quasi-governmental authorities will use high quality data and information to adapt to anticipated shoreline changes (erosion, flooding, and sea level rise).*

C. Strategy Approach: High-resolution geospatial visualizations and scenarios linked to historical hazards, recent trends, and a variety of future scenarios for short- and long-term planning will be prepared. These data are critical for risk analysis, near-term hazard mitigation, and emergency planning at the municipal, regional, and state levels. Derivative products, such as vulnerability assessments, will be prepared in conjunction with coastal municipalities, emergency managers and regional planning organizations (RPOs). Data, along with hands-on collaboration with municipalities and regional organizations, will further adaptation at the local, regional, and state levels.

More specifically:

- Evaluating the severity of erosion hazards will provide sound scientific data for estimating benefits and costs of erosion hazard reduction along Maine's beaches and establish a framework for mitigation and adaptation through dune restoration and beach nourishment.
- Evaluation of coastal flooding frequency and the inland extent of flooding from extratropical storm surges, hurricanes, and scenarios of sea level rise will be used to set targets for mitigation and adaptation based on probability and geography.

Guidance for use at the state, municipal, county and quasi-governmental non-profit corporations (e.g. water and wastewater authorities) will be prepared. More specific statutory language for hazard reduction, policies on expenditures of public funds, and use of a scenario-based approach for coastal planning may be developed if feasible and needed.

III. Needs and Gaps Addressed

This strategy will address priority needs identified in the Phase II Assessment – collection of data on shoreline change; calculation of annual erosion rates and identification of trends in relation to sea levels (and storms); and development of cause-and-effect relationships in coastal processes that drive local erosion, loss of beaches and dunes, and result in flooding.

There are over 140 municipalities in coastal Maine, each with unique vulnerabilities to coastal hazards. Disaster planning, recovery, and technical expertise vary widely and prioritization methods often differ among municipalities. This strategy will engage coastal communities and county emergency management officials, deliver customized data, provide hands-on assistance, provide stakeholder training (in person or through webinars), and offer grants to communities and RPOs to increase coastal resiliency.

Information distributed through the internet also may have applications in near-real time response to natural disasters in many ways such as storm preparation, restoration of coastal dunes, reconstruction of roads, and maintenance of seawalls.

IV. Benefits to Coastal Management

This strategy contributes new and enhanced data that will advance Maine's understanding of risk with respect to climate variability.

V. Likelihood of Success

The likelihood of success for the current strategy is high. Determining vulnerability, rating local hazards, and prioritizing actions such as mitigation or restoration requires data on shoreline change, storm surges, 100-year flood levels, and sea-level trends. Data are a critical input to the design of engineered, natural, or hybrid systems that may need to be built for public safety and to help communities withstand natural disasters.

Additionally, the following activities set the stage for continued future success:

- As a result of previous NOAA-funded work, coastal hazards are more widely understood by coastal decision-makers; case studies of action at the municipal level have been widely shared.
- In 2015, a bipartisan "Coastal Caucus" of Maine legislators was rejuvenated and devoted considerable attention to six proposed bills that focused on different aspects of climate variability

(guidelines for state spending on public infrastructure, investment in future data collection, municipal comprehensive planning, funding for beach restoration, etc.) Some of these bills will be carried over for consideration in 2016, and new bills may be introduced.

- Maine's Coastal Sand Dune Rules (Chapter 355) are due for updating.
- Language changes are under consideration for Maine's Mandatory Shoreland Zoning (Chapter 1000) regulations.
- FEMA Flood Insurance Rate Maps for coastal communities are in the process of being updated.
- MEDEP will continue to lead an interagency climate adaptation group.
- The Maine Emergency Management Agency's (MEMA) *State Hazard Mitigation Plan* (and hence many local and county emergency management plans) will be updated.

VI. Strategy Work Plan

Strategy Goal: *The State of Maine, its local governments and quasi-governmental authorities will use high quality data and information to adapt to anticipated shoreline changes (erosion, flooding and sea level rise).*
Total Years: 5
Total Budget: $1,000,000

Year(s): 1-3
Description of activities:
Provide field data (overtopping, inundation levels) to the Maine Floodplain Management Program and FEMA for use in flood map revisions. If opportunities arise, provide input on how shoreline change and sea level rise can be used in updating flood maps. Use the latest effective FIRMs to update Erosion Hazard Areas. Examine use of AO-zones for erosion hazard area (EHA) mapping.
Analyze storm surges and update statistical tables for storm surge risk based on most recent data; recalculate flood level frequencies for different sections of Maine coast. Project flood hazard trends in the near term based on the duration of the historical record. Remap inundation of highest historical storm flooding on new LiDAR (if acquired); compare and highlight areas of increased flood hazard. Make geospatial data available for public use.
Major Milestones:

- Release the most recent effective FIRMs in the MGS online mapping portal to allow multi-hazard analysis.
- Update statistical flood level frequencies based on recent storm events and record tide levels.
- Update EHA boundaries in coastal sand dune systems in support of the Coastal Sand Dune Rules.
- Develop and release a Coastal Hazard Analysis Mapping Portal (CHAMP) for Maine's coastal hazard datasets.

Budget: $200,000

Years: 1-5
Description of activities:
Collect beach sediment samples, analyze them, and add the data to online web mapping. Delineate nearshore beach nourishment sites. Conduct annual beach-dune shoreline surveys for the MBMAP program. Conduct field investigations of storm washover deposition in dunes. Investigate the relationship between monthly sea levels and shoreline change. Evaluate

causes of erosion and significance of storm intensity, track, duration, and surge levels to beach loss, bluff retreat, and landward deposition (conservation) of sediment. Summarize erosion trends in the *State of Maine's Beaches* report. Incorporate monthly beach profile monitoring data in erosion analyses. Develop bluff erosion metrics for monitoring and reporting shoreline change and land loss. Track local relative sea level rise trends and compare them to model projections. Document landslides and, as can be determined, report causes of those occurring in the project period. Develop video visualizations of shoreline change and erosion in 3-D for the MGS website. Review integration of field data with wave models for overtopping and dune scour; compare FEMA model dune loss to Maine data from beach profile monitoring and NWS investigations of storm-induced wave run up.

Major Milestones:

- Add beach sediment characteristics and nearshore sand disposal/dispersal sites to the MGS online mapping portal or Maine Coastal Atlas for use in beach nourishment.
- Annual updates to MBMAP (data collection and processing) and web portal data releases.
- Release reports: *State of Maine's Beaches* and possibly the *State of Maine's Bluffs* (in alternate years).
- Refine the Coastal Hazard Analysis Mapping Portal (CHAMP) as/if needed.

Budget: $300,000

Years: 1-5

Description of activities:

Assist towns and counties to create vulnerability assessments and adaptation techniques for local consideration and adoption. Participate in interagency efforts to create policy or regulatory language that includes incentives for hazard mitigation. Work with MEMA to enhance the state hazard mitigation plan, which in turn will enhance county and municipal level hazard mitigation plans. Participate in interagency teams or work groups (*e.g*. the DEP-led Environmental and Energy Resources Working Group). Evaluate the inclusion of scientific facts in planning for natural disasters, emergency response, and post-storm recovery. Provide a scientific background of up-to-date information for legislative initiatives and rulemaking related to coastal hazards.

Major Milestones:

- Creation of policy documents, guidance.
- Legislative briefings.
- Municipal adoption of measures (plans, regulatory/non-regulatory options, incentives) that relate to adaptation.

Budget: $500,000

VII. Fiscal and Technical Needs

A. Fiscal Needs:

Section 309 funds for staff, project interns, field work and travel will be sufficient to complete this task.

B. Technical Needs:

The Maine Geological Survey needs either new or upgraded RTK-GPS equipment with a current and more accurate geoid model compatible with current Windows operating systems. The

newer equipment will geotag images for upload. This capacity will automate the engineering structure inventory as well as natural features information (berms, ice, and erosional scarps). With current equipment, our ability to survey storm damage or measure erosion is limited.

VIII. Projects of Special Merit (Optional)

- Maine Coastal Hazards Dashboard. Develop a Maine Coastal Hazards Dashboard with near-real-time data feeds from satellites, ocean buoys, tide gauges, wave models, and erosion status. In some ways analogous to the NOAA Global Climate Dashboard, this will require integration and collaboration with NOAA (National Ocean Service and National Weather Service), the Northeastern Regional Association of Coastal and Ocean Observing Systems (NERACOOS) and MGS. It would build on the 2016 Maine Hazard Resilience Index (OCM Coastal Fellow project) by providing current conditions in relation to the index, display the index, and possibly project conditions in the near future in the context of historical trends and events. Much like the El Nino Southern Oscillation (ENSO) index, the Dashboard would provide a quick, visual overview of hazards in the context of recent trends such as approaching periods of "King Tides" along with the current "erosional status" of beaches. The Hazards Dashboard would offer pre-disaster through post-disaster information for planning, response, and recovery.
- Statewide multi-hazard response plan.
- Analysis of saltwater intrusion into groundwater due to sea level rise and other factors.

CH Strategy 2: Inventory and Plan for the Impacts of Coastal Hazards on Waterfront Infrastructure

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.

A. Strategy Goal: *Ensure that Maine's water-dependent industries have viable infrastructure that remains healthy, economically strong, and prepared for future changes.*

B. Strategy Approach:

The strategy provides a foundation for guidelines, procedures, and policy regarding coastal public infrastructure and development. Building on Maine Submerged Lands Program's recent documentation of leased structures on in state waters (docks, wharves, piers, and shore armoring), MCP will: update Maine's Working Waterfront Access Inventory to include a geospatial inventory of public coastal engineering structures in addition to existing erosion, flooding and sea level rise hazards; identify the most vulnerable public assets; create an objective basis for adaptive management of vulnerable facilities by state and local governments; create "resiliency guidance" for use in state programs and, prioritize adaptation alternatives.

III. Needs and Gaps Addressed

There has been no systematic evaluation of the vulnerability of public infrastructure in Maine, and there is no state-wide guidance on measures to consider for construction and facility repair in vulnerable locations.

IV. Benefits to Coastal Management

A comprehensive picture of the hazard and vulnerability status of public waterfront infrastructure and other critical infrastructure will significantly help partner agencies and municipalities make sound investments and informed regulatory decisions. Technical guidelines for new construction or renovation approaches will reduce the amount of investment at risk in the coastal zone, increase the design life of the improvements, increase public safety, and reduce public expenditures.

V. Likelihood of Success

This strategy has a high likelihood of success. There is a significant body of work and current momentum in Maine for conservation of working waterfront facilities, including previous inventory work, the Working Waterfront Access Protection Program[51], two active grant programs for municipal harbor planning and improvements[52], and recent legislative interest in improving investment guidance in waterfront facilities in light of climate variability. Likewise, there is increased attention at the municipal level about the vulnerabilities of other public infrastructure such as water and wastewater facilities.

VI. Strategy Work Plan

Strategy Goal: Maine's water-dependent industries and municipalities have viable infrastructure to remain healthy, economically viable, and prepared for future changes.
Total Years: 4
Total Budget: $400,000

Year: 1
Description of activities: 1) Scope of work and plan developed for inventory and attribute needs for specific types of infrastructure. 2) Work with other agencies, MDOT, DACF, MIFW, and MDMR to document existing state-owned facilities. 3) Work with municipalities to document municipally-owned infrastructure. 4) Develop an approach to facility assessment based on advice from MGS regarding sea level rise and other hazard threats.
Major Milestones: Generation of a municipal/state waterfront infrastructure inventory in database form with specific attributes of each facility.
Budget: $100,000

Year: 2
Description of activities: 1) Conduct facility assessment at sites. 2) Incorporate this facility threat information into the inventory database.
Major Milestones: Development of a hazard threat inventory and database.
Budget: $200,000

Year 3:
Description of activities: 1) Work with MGS, MPAP, MDOT, municipalities and other partners to develop a best practices guide for construction, design, and engineering and funding of public infrastructure.

[51] Land for Maine's Future program purchases covenants on commercial fishing properties to retain their use for fishing.
[52] Shore and Harbor Planning Grants (MCP), Shore and Harbor Improvement Grants (MDOT).

Major Milestones: Completion of best-practices guide for evaluation of, and investment in waterfront improvements and public infrastructure.
Budget: $50,000
Year 4:
Description of activities: Create guidance for state consideration of best practices. Incorporate best practices into state grant review criteria.
Major Milestones: Criteria considered in state construction projects.
Budget: $50,000

VII. Fiscal and Technical Needs

A. 309 funds requested are not solely sufficient to fully implement this strategy. DACF-MCP and its partners are seeking additional funds for necessary field work and data analysis from a variety of sources.

B. Technical Needs: Contractors and technical advisory team members will supplement state agency staff.

VIII. Projects of Special Merit (Optional)

- Conduct the work described above on an in-depth level with year-round island communities, served by public ferry service.
- Expand characterization of coastal public infrastructure in the Coastal Sand Dune System, using the E911 road network and Lidar data to evaluate vulnerability to flooding under storm and sea level rise scenarios, calculate lengths of roads submerged under scenarios. Collect existing GIS layers of road engineering, culverts, wetlands delineations, public parcels and access, utilities, etc. Use information to create guidance for streamlined post-storm permitting and construction in the Coastal Sand Dune System.

CH Strategy 3. Advancing the Use of Living Shoreline Techniques for Shoreline Management

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: *Advance the use of effective, soft shoreline stabilization techniques that address climate variability and protect ecosystem services, including natural flood protection and wildlife habitats.*

C. Strategy Approach:

To reach the strategy goal, MCP will:

- Complete a spatial inventory of shoreline armoring.
- Conduct a suitability analysis of living shoreline management approaches in different coastal geologic environments with tides ranging from 12 to 24 feet.
- Identify potential demonstration sites for living shorelines on public property and privately held conservation lands.
- Convene state, federal, and municipal regulators to discuss existing and potential barriers and disincentives for construction and, if and as needed, develop regulatory reforms.
- Research liability issues, public trust issues, cold water performance, design life issues (including the effects of rising sea level or tides), and pre- and post-monitoring needs.
- Research and potentially create incentives for landowners to use these techniques.
- Develop and provide guidance on shoreline protection strategies for landowners, municipalities, and state agencies.

- Consider revising, expanding, and re-releasing the "Beach Scoring System" tool to help landowners understand the viability of different shoreline management techniques on their properties.
- Conduct outreach through workshops, webinars, conferences, and field trips with a variety of audiences including coastal engineers and realtors.

III. Needs and Gaps Addressed

Maine has very limited experience with the use of "soft" or "living shoreline" management techniques. There is a lack of knowledge about opportunities to employ these techniques, lack of guidance, and lack of incentives to do so.

MCP also lacks information needed to advance living shorelines. Needed are a comprehensive inventory of shoreline stabilization structures; aspects of fetch, tides, and sediment budgets; as well as information about the performance of these treatments in cold climates (sea ice and freeze-thaw periods).

Through a NOAA OCM Project of Special Merit, MCP is exploring the use of these soft stabilization techniques on bluff shorelines in the Casco Bay area. This strategy, however, will allow MCP to fill a gap by looking at a range of other shoreline types along a macro-tidal coast to identify where these techniques might be feasible.

IV. Benefits to Coastal Management

This strategy will improve coastal management in Maine by:

- Fully vetting the feasibility of using soft shoreline stabilization techniques.
- Adding another tool for landowners, towns, land trusts and others to use to manage shorelines in a way that addresses multiple objectives such as shoreline protection, sediment management, and habitat conservation/restoration.
- Improving regulatory efficiencies and removing roadblocks for beneficial activities.
- Assisting in advance preparation for post-storm permit requests (to rebuild hard structures) by documenting the type, size, location and condition of existing shoreline structures and armoring.

This strategy also will add to the body of knowledge about shoreline management in Maine and in the region and complement other state efforts underway in New England. Maine will share lessons learned via the Northeast Regional Ocean Council and through other appropriate venues.

V. Likelihood of Success

Lessons learned from Superstorm Sandy, including the performance of natural shorelines in lessening shoreline damage, have increased interest in soft shoreline stabilization methods. Landowners will use these techniques provided they are understood, low-cost, allowable under state/federal regulations, and proven to be effective. Use of techniques will increase more if incentives for their construction and maintenance are developed. This strategy is likely to be successful due to the increasing concern around this topic.

VI. Strategy Work Plan

Strategy Goal: Advance the use of effective, soft shoreline stabilization techniques that address climate variability and protect ecosystem services, including natural flood protection and habitats.
Total Years: **5**
Total Budget: $375,000

Years: 1-2

Description of activities:
Refine GIS layer files of coastal engineering structures; identify the shoreline extent of seawalls, riprap, artificial dunes, beach nourishment, and jetties at tidal inlets. Identify locations, environments and conditions where engineering (traditional and new) have not performed as expected. Build a relational database with best available description of features (elevation, materials, age, and position in relation to highest astronomical tide); evaluate use of georeferenced photographs for pre-disaster conditions. Analyze trends in shoreline stabilization and coastal erosion control permitted through state programs. Characterize trends in different geologic environments.

Review living shoreline suitability analyses employed by other states. Collect applicable examples and case studies of types of living shorelines created in other states. Assemble and orient a team of state, federal and municipal regulators, land managers and others to learn about living shorelines, discuss existing and potential barriers and disincentives for construction, and identify needs for potential regulatory reform.

Major Milestones:

- Develop a compendium of case studies.
- Publish a white paper on regulatory roadblocks, incentives and the potential need for changes.

Budget: $25,000

Years: 1-3

Description of activities: Summarize success and failures of living shorelines, hybrid engineering, and traditional engineering structures in multiple coastal environments (beaches, salt marshes, mud flats, rocky shores). Conduct a feasibility/suitability analysis of living shoreline management approaches in different coastal geologic environments in Maine. Identify potential demonstration sites for living shorelines on public property and privately held conservation lands.

Major Milestones:

- Publish the shoreline inventory in Maine's Coastal Atlas.
- Report on types of techniques potentially suitable for Maine.
- Report on and complete map of potential demonstration sites.

Budget: $200,000

Year: 3

Description of activities: Research liability issues, public trust issues, cold water performance and design life issues and pre and post monitoring needs. Generate case histories for different responses for erosion control in different geographic and geologic settings. Recommend what strategies are appropriate for consideration in alternative analyses. Summarize policy improvements and

recommend revisions to disaster response plans, to respond to changing conditions, and for lessons learned.

Major Milestones:

- Complete one (or more) white paper(s) on research topics above.

Budget: $50,000

Years: 4-5

Description of activities: Complete regulatory reforms. Develop guidance for landowners and other audiences (Beach Scoring System or other). Conduct outreach through workshops, webinars, conferences and field trips with a variety of audiences including coastal engineers and realtors.

Major Milestones:

- Draft, review, and publish guidance for shoreline management strategies.
- As needed, revise coastal law or regulations to allow additional successful erosion and flood hazard mitigation projects.
- Hold events and use other outreach techniques to disseminate and train target audiences on the guidance.
- Write and receive grants for installation of projects.

Budget: $100,000

VII. Fiscal and Technical Needs

A. Fiscal Needs:

CZMA Section 309 funding may be insufficient to fully fund this strategy work plan. The Maine Outdoor Heritage Fund (MOHF) is a possible source of state funding for this effort. MOHF is a competitive program that issues RFPs on an established cycle.

B. Technical Needs:

MCP will establish an advisory team including agencies and external partner organizations, municipalities, and landowners to provide the technical and regulatory expertise needed to achieve this strategy. We will supplement the advisory team with contracted consultants when needed.

VIII. Projects of Special Merit (Optional)

- Design, construction and monitoring of living shoreline projects to serve as demonstration sites.

5-Year Budget Summary by Strategy: Coastal Hazards

Strategy Title	Year 1 Funding	Year 2 Funding	Year 3 Funding	Year 4 Funding	Year 5 Funding	Total Funding
Data Collection and Support for Shoreline Adaptation	200,000	200,000	200,000	200,000	200,000	1,000,000
Inventory and Plan for the Impacts of Coastal Hazards on Waterfront Infrastructure	100,000	200,000	50,000	50,000	---	400,000
Advancing the Use of Living Shoreline Techniques for Shoreline Management	100,000	100,000	100,000	40,000	35,000	375,000
Total Funding	$400,000	$500,000	$350,000	$290,000	$235,000	$1,775,000

Cumulative and Secondary Impacts of Development

CSI Strategy 1. Improve Coastal Water Quality in Shellfish Growing Areas

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:** *Watershed plans for priority coastal watersheds will be adopted by MEDEP and lay the groundwork for implementation of water quality remediation projects in priority coastal watersheds.*

C. **Strategy Approach:** The proposed strategy involves collaboration among MCP and its networked partners -- the Maine Department of Marine Resources (DMR) and Department of Environmental Protection (DEP) -- to establish priority watersheds for targeted mutual involvement; establish or revive a community or regional watershed committee; conduct surveys for pollution; develop strategies for pollution remediation; and document the results in a Watershed Management Plan. The Management Plan will be submitted to DEP for approval, which sets the stage for eligibility for Clean Water Act Section 319 nonpoint source funding and continued targeted assistance from agency staff. Implementation of watershed management plans can result in marked improvement in water quality and subsequent reclassification of shellfish growing areas.

III. Needs and Gaps Addressed

At present, the Maine DEP has limited staff capacity and limited financial resources for watershed planning, and the Maine DMR has limited staff capacity to conduct special investigations in coastal watersheds.

IV. Benefits to Coastal Management

Harvesting shellfish is an important component of the economic and social/cultural vibrancy of many small to medium-sized communities in Maine. When shellfish beds are closed for extended periods of time due to pollution, fishing-dependent communities are hit hard. Increasing MCP's efforts in coastal water quality issues addresses our core mission of improving both the economic vitality and environmental quality of coastal Maine. This strategy will help MCP evaluate its role (niche) in coastal water quality improvement and will provide a basis for determining the necessary level of effort by MCP staff in the coming years. Case studies will be prepared to disseminate innovative lessons learned to Maine's coastal towns and to the larger coastal management community.

V. Likelihood of Success

This strategy has a high likelihood of success. Municipalities with viable shellfish resources are motivated to do this work, and several priority areas have emerged. There are existing requirements for preparation of watershed management plans and established criteria that DEP uses to evaluate plans to determine approval.

VI. Strategy Work Plan

Strategy Goal: *Improved water quality in priority coastal watersheds results in reclassification of shellfish growing areas.*
Total Years: 5
Total Budget: $125,000

Year: 1
Description of activities: Establish watershed priorities with DEP and DMR, ascertain interest in collaborative municipal or multi-municipal collaborative effort via a letter of interest or similar process. MOU signed among collaborating partners. Convene up to 4 meetings of new or enhanced community watershed group, shellfish committee or similar group and create scope of work.
Major Milestones: Selection of priority areas for focused interagency project; MOU signed; convening of participating partners; draft work plan.
Budget: $25,000

Years: 2-4
Description of activities: Conduct outreach to landowners and municipal officials. Train volunteers. Create study design for data collection. Conduct watershed surveys and sampling and analyze data. Establish potential sources of pollution and conduct landowner outreach.
Major Milestones: Study design, sampling results, source identification, completion of watershed plan, adoption of watershed plan by MEDEP.
Budget: $50,000

Years 4-5
Description of activities: Assist in securing grant assistance for remediation projects. Work with landowners to remediate sources of pollution, repeat sampling as needed. Monitor results of BMPs installed. DMR reclassifies shellfish growing area to open or conditionally open status or reduces the size of the restricted area. MCP conducts assessment of its ongoing role in water quality planning and remediation.
Major Milestones: Pollution sources remediated, shellfish areas reclassified, white paper on MCP options for support of water quality projects.
Budget: $50,000

VII. Fiscal and Technical Needs

A. Fiscal Needs: Completion of this task depends on the availability of, and support from, staff in MCP networked state agencies (DMR and DEP).

B. Technical Needs: MCP will likely need to contract with technical staff (Soil and Water Conservation District or Regional Planning Organization) whose place of work is in close proximity to the watershed of concern.

VIII. Projects of Special Merit (Optional)

A. (Ocean acidification) Evaluating compliance with, and the effectiveness of, agricultural best practices for nutrient management in coastal watersheds, including development and adoption of new or enhanced BMPs.

B. (Ocean acidification) Evaluating the relative contributions of various land-based sources of nitrogen in sensitive coastal embayments.

CSI Strategy 2. Establishing and Implementing Restoration Priorities through Improved Decision Support

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(s):*** *State and municipal investment decisions in habitat restoration and infrastructure repairs and upgrades will reflect critical priorities and multiple needs, including restoration of aquatic systems and fish and wildlife passage, flood risk/reduction, and public safety.*

C. Strategy Approach: This strategy proposes creation and implementation of three new evaluative methods that will help decision-makers prioritize habitat restoration and enhancement projects and state and local infrastructure improvements. We anticipate that the tools will be adopted for use by a wide variety of governmental and non-governmental entities; the results included in MCP's Stream Habitat Viewer and used in state, federal and local priority-setting. This strategy has three elements:

a) Creating one tool that combines habitat information with climate variability and public infrastructure information.
b) Improving standard methods for evaluating potential tidal marsh restoration opportunities.
c) Creating an approach to prioritization of restoration projects and goals for restoration.

III. Needs and Gaps Addressed

a) Opportunities to meet both community infrastructure goals and habitat restoration goals are often overlooked. Natural resource professionals typically prioritize habitat restoration projects based on criticality of species at risk, potential miles or acres of habitat gained/enhanced, feasibility, cost, and level of community support (among other factors). Municipal officials, however, prioritize infrastructure upgrades and replacements based on design life, cost, and threats to public safety.
b) Previous efforts to identify tidally restricted marshes and other efforts were not designed with to include sufficient detail and spatial scale to support a strategic approach to statewide restoration planning and implementation. Maine lacks a consistent detailed assessment of impacts related to tidal restrictions and a consistent method for identifying ecological benefits of restoration actions.
c) Decision-makers lack a method for prioritization of restoration projects. A reactive method of identifying restoration project sites is often employed in response to funding opportunities.

IV. Benefits to Coastal Management

We anticipate that with new assessment tools and a prioritization method in place, Maine will invest in restoration projects that meet the multiple objectives of habitat creation/enhancement and enhanced public safety, and direct limited investments when and where they are likely to address the most urgent priorities. The development of priorities will provide measures of success for ongoing investments and contribute to the coastal management performance measurement system.

V. Likelihood of Success – The likelihood of success for this strategy is high. MCP has experience with multiple projects that considered the effects of climate variability on both the natural and built environment (e.g. marsh migration/critical roadways; state park infrastructure and important natural features; beach systems and erosion control structures). MCP will be building on lessons learned from ongoing and completed projects, ensuring that efforts are complementary and that new/enhanced tools offer compounded benefits to multiple audiences. The tool(s) will be developed by an interdisciplinary steering group, including seasoned practitioners in both habitat restoration and public works planning, ensuring that the needs of end users will be met. Maine Audubon's multi-partner Stream Smart Training Program is a potential venue for publicizing and offering assistance to users. MCP, through the Municipal Planning Assistance Program also has numerous opportunities to work with towns, including through Regional Planning Organizations. The likelihood of success for identification of restoration and conservation needs and goals is high, given that this is an area that is widely recognized as warranting attention.

VI. Strategy Work Plan

Strategy Goal: *State and municipal investments in habitat restoration and infrastructure repairs and upgrades will address multiple needs, including restoration of aquatic habitats, including fish and wildlife passage, flood risk/reduction, and public safety.*
Total Years: 5
Total Budget: $250,000

Year: 1

Description of activities:
Convene a project steering committee. Refine objectives for new tools. Review sea level rise data, marsh migration mapping, stream barrier information and StreamStats; assess feasibility of a tool that identifies vulnerable culverts (i.e. not designed to handle current and projected storm events and represent opportunities for habitat restoration). Develop basic architecture for tool. Convene tidal marsh experts. Review existing methods for tidal marsh barrier assessments, methods for identifying ecological benefits of restoration actions, and prioritization approaches. Begin to develop consistent approaches for use by MCP and partners.
Major Milestones: Preliminary architecture for tools completed.
Budget: $75,000

Year: 2
Description of activities:
Beta-test tidal marsh assessment tools in the field; finalize methods; create priorities for additional field work; train practitioners to use inventory method. Beta-test culvert assessment tool; finalize methods; train practitioners to use inventory method.
Major Milestones: Tools finalized and training completed.
Budget: $50,000

Years: 2-3
Description of activities: Populate new habitat/infrastructure tool with assessment data collected by MCP and partner organizations. Conduct tidal marsh assessments. Begin development of prioritization process through existing forums and technical committees (as needed).
Major Milestones: Enhanced decision-support tool populated with improved data. Draft restoration goals completed.
Budget: $75,000

Year(s): 4-5
Description of activities: Finalize habitat restoration/infrastructure replacement prioritization process. If/as needed, formalize rules, procedures or criteria for state-funded habitat restoration grants. Work with interested towns to prioritize projects via capital improvements plans and other funding mechanisms.
Major Milestones : Guidance and prioritization for state-coordinated and funded coastal habitat restoration and conservation programs; restoration goals and priorities formalized (if appropriate).
Budget: $50,000

VII. Fiscal and Technical Needs

A. Fiscal Needs:

A group of state-funded staff from several state agencies will contribute to this work.

B. Technical Needs:

This project will engage the necessary expertise represented by multiple state agencies and NGOs.

VIII. Projects of Special Merit: (None identified at this time)

CSI Strategy 3: Develop and implement new methods for analysis of impervious surfaces; increase the use of low-impact development and use of green infrastructure for stormwater management.

I. Issue Area(s)

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

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

II. Strategy Description

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

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

B. ***Strategy Goal:*** *Increase the use of low impact development (LID) and green infrastructure (GI) for stormwater management.*

C. **Strategy Approach:** This strategy has the following elements:

- Demonstrate (likely through the use of LiDAR imagery) a cost-effective and simplified method of impervious surface analysis.
- Analyze the data and release a "coastal snapshot" through workshops and webinars.
- Update guidance materials on Low Impact Development as needed to reflect innovations in technology or practices. Address the need for LID guidance for single-lot development. Create appropriate materials on green infrastructure, building on existing materials, but tailored for a Maine audience.
- Develop a letter of intent process to solicit interest in a collaborative project in one or more regions (watersheds).
- Use focus groups and use social marketing techniques to understand barriers that prevent use of LID and GI.
- Evaluate current state incentives and recommend revisions and/or local incentives; assist MEDEP, if and as needed, to consider changes to state stormwater regulations.
- Develop outreach materials, trainings, etc. based on results of social marketing effort.

- Track the use of LID and GI periodically to determine project impact.
- Develop case studies and share results of the project.

III. Needs and Gaps Addressed

Coastal municipalities and regional councils lack methods and capacity to periodically assess changes in land use/land cover and patterns of development, and to track successes of land use management. Information that quantifies the change in impervious surface over time is necessary to measure the success of local land use planning efforts and state and local stormwater management efforts. Modest investments made over the last five years by MCP to analyze impervious cover yielded results that did not meet expectations. Since major land use decisions and policies are implemented at the local level it is essential to be able to provide these data for consideration in municipal decisions
.

Green infrastructure and LID techniques are not yet widely used in Maine. In 2015, the Maine Board of Environmental Protection adopted revisions to DEP's Chapter 500 Stormwater Rules to incentivize the increased use of natural or low impact development techniques. Work performed under the strategy may help inform potential future changes to the Chapter 500 rule.

IV. Benefits to Coastal Management

The MCP is hampered in its abilities to promote LID and other resource protection techniques at the municipal level by the lack of municipal-level data on the pace and location of development and the impact of that development on both the natural and human ecosystems. Through this strategy, coastal municipalities and developers will more easily consider the value of adopting LID techniques and include more effective resource protection strategies in their comprehensive plans and ordinances. Through the use of social marketing techniques, knowledge will be gained about possible barriers to the use of LID practices, and incentives will be designed to address barriers.

V. Likelihood of Success

Unless required by law, the use of LID and GI is dependent on interest among land developers and the buying public. Social marketing, when used in coastal management, has resulted in creation of incentives and subsequent positive changes in practices and improved stewardship.

Many coastal towns are currently updating existing or developing new comprehensive plans–towns clearly see the value of this type of planning. Any additional data that can be provided to help towns understand the trends of development and the impacts of that development within their communities has a role in coastal resource management. This strategy will address those impacts, such as LID, compact growth areas, and cluster subdivision ordinances. MCP will disseminate tools through the regional planning organizations, conservation commissions and comprehensive planning committees and conduct hands-on work with the selected group of towns.

VI. Strategy Work Plan

Strategy Goal: Increase the use of low impact development and green infrastructure for stormwater management.
Total Years: 5
Total Budget: $200,000

Year: 1
Description of activities: Convene technical committee to analyze existing available data and create new method for analysis of impervious cover; research incentives used in other areas for advancement of LID and GI.
Major Milestones: New evaluative method beta-tested and finalized; compendium of research completed.
Budget: $20,000

Year: 2
Description of activities: Complete impervious cover analysis for the coastal zone; analyze the data and release a "coastal snapshot" through workshops and webinars; develop a letter of interest process to solicit interest in a collaborative pilot project in one or more regions (watersheds).
Major Milestones: Analysis completed and released; pilot project communities selected.
Budget: $50,000

Years: 2- 3
Description of activities: Use focus groups to understand barriers that prevent use of LID and GI; develop and test incentives; employ social marketing techniques in selected communities. Address the need for LID guidance for single-lot development.
Major Milestones: Social marketing campaign completed; begin tracking use of LID and GI.
Budget: $100,000

Years: 4- 5
Description of activities: Evaluate current state incentives and recommend revisions and/or local incentives; assist MEDEP, if and as needed, to consider changes to state stormwater regulations. Develop case studies and share lessons learned; continue evaluation of use of LID and GI.
Major Milestones: Incentives finalized; case studies completed.
Budget: $25,000

VII. Fiscal and Technical Needs

Fiscal Needs:
Section 309 funds may not be sufficient to complete this strategy; Maine Outdoor Heritage Funds may be a possibility for supplemental funding for the social marketing proposal.

Technical Needs:
MCP does not have the technical capacity to carry out the analysis of the impervious surface data; contractors will be employed to complete this strategy. Consultants will also be needed to develop the social marketing campaign and outreach materials.

VIII. Projects of Special Merit: None identified at this time.

5-Year Budget Summary by Strategy:

Cumulative and Secondary Impacts of Development

Strategy Title	**Year 1 Funding**	**Year 2 Funding**	**Year 3 Funding**	**Year 4 Funding**	**Year 5 Funding**	**Total Funding**
Improve Coastal Water Quality in Shellfish Growing Areas	25,000	25,000	25,000	25,000	25,000	$125,000
Establishing and Implementing Restoration Priorities through Improved Decision Support	50,000	50,000	50,000	50,000	50,000	$250,000
Develop and implement new methods for analysis of impervious surfaces; increase the use of low-impact development and use of green infrastructure for stormwater management.	20,000	50,000	100,000	15,000	15,000	$200,000
Total Funding	$95,000	$125,000	$175,000	$90,000	$90,000	$575,000

OCEAN RESOURCES

Strategy 1 – Fisheries Management Plan Development and Implementation

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:*** Achieve statutory and regulatory amendments to the management of scallops, urchins, and lobsters in Maine that will improve their long-term viability for the industries that depend upon them.

Strategy Approach: For scallops, the statutory and regulatory amendments will be developed through a process designed to better incorporate local knowledge into modifying the existing rotational management system in some parts of the coast, and developing new management approaches for the parts of the coast which have not implemented rotational management. This may include reopening plans for areas currently closed, and the selection of future closed areas, or entirely new approaches to management. Further, regulatory amendments are needed to implement a limited entry system into this currently closed fishery, as required by the Legislature. Finally the Department will proceed with transitioning the reporting requirements in the scallop fishery toward the use of a “swipe card” system which will improve the timeliness and accuracy of the information used for management.

For urchins, the existing Sea Urchin Zone Council will be used to determine if finer scale management could increase flexibility for fishermen who are constrained by already very limited seasons, while still allowing the best opportunity for continued resource recovery. The experience of the scallop industry with closed areas may lead to interest in either overlapping or distinct closures for urchins. As with scallops, the urchin fishery will transition toward the use of the swipe card system for meeting reporting requirements, which may also open up additional management options for the fishery.

For lobster, the Department will develop the Fisheries Management Plan, which will include identifications of the thresholds and triggers that will guide future management action if necessary to make changes to stabilize the resource. The Department will also develop statutory and regulatory changes to correct deficiencies in the entry system.

The strategy will entail broad and ongoing communication with stakeholders across the lobster, scallop, and urchin fisheries. Primarily, DMR will utilize the species specific advisory councils to inform development of the fisheries management plans (FMPs). For the lobster FMP, DMR anticipates also utilizing the Lobster Zone Councils to further refine areas of the plan that address contentious or regionally diverse issues. Communication and development of the plan will occur over a series of meetings with industry, as well as science and management staff of the DMR. Once the plans have been developed, they will provide an overarching framework to guide long-term management and planning within each of these fisheries, rather than prescribing specific legislative or regulatory changes within each fishery.

III. Needs and Gaps Addressed

The priority needs and gaps addressed by this strategy vary to some degree with the fishery in question. For scallops, the strategy will build upon the initial success achieved toward rebuilding the fishery by diversifying the management approach to tailor specific measures to different parts of the coast. For urchins, the strategy will rely on innovative uses of technology to try to refine the scale of management in order to try to achieve some rebuilding of the resource, which has thus far been unsuccessful. Finally, while the lobster resource is currently abundant and robust, the gap that will be addressed is the development of potential measures to be employed at a time in the future when they are needed to achieve resource stability.

IV. Benefits to Coastal Management

The development of the fishery management plans, and the engagement with industry that will accompany that process, is hoped to increase industry buy-in to management objectives, create additional certainty about the future of a changing fishery, and provide clear guidance for both industry and managers as conditions change and circumstances warrant management response to biological changes.

V. Likelihood of Success

There is a strong likelihood of achieving the majority of the FMP development outlined in this proposal during this five-year cycle. Development of legislation to further clarify the types of information that

would be contained in these FMPs occurred in the previous cycle, so there is a clearer roadmap for development of the documents, and industry has had time to become familiar with the concept and objectives of creating these plans. As environmental conditions are changing more rapidly and socio-economics of each fishery are becoming more variable, it has become increasingly important to guide the legislative and regulatory process with some consistent, long-term vision. Although it took some time to lay the foundation, DMR believes the industry in each of these three fisheries is now ready to develop these documents in earnest.

VI. Strategy Work Plan

Strategy Goal: Co-Management in Maine's Fisheries
Total Years: 5
Total Budget: $130,000

Year(s): 1 - 3
Description of activities: Activities in years 1-3 will include ongoing consultation with industry members at multiple scales (harbor level, Zone level, Advisory Council etc.) to develop and refine management plans, and any associated necessary regulatory or statutory changes.
Major Milestones: Development of Fisheries Management Plans for each of the fisheries identified.
Budget: $78,000

Year(s): 4 and 5
Description of activities: Implementation activities will include addressing the necessary statutory and regulatory changes through the appropriate arenas.
Major Milestones: Adoption of regulatory and statutory changes in the appropriate forum.
Budget: $52,000

VII. Fiscal and Technical Needs

A. Fiscal Needs: DMR will utilize staff resources, largely funded by General Fund, to support additional needs to achieve this strategy.

B. Technical Needs: Not applicable.

OR Strategy 2: Increase State and Local Capacity to Respond to Changing Ocean Conditions

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: *Increase the capacity for monitoring/assessment and the use of coastal and ocean data at the federal, state, regional and local level; create and implement policy guidance to respond to changing ocean and coastal conditions.*

C. Strategy Approach:

MCP and its partners will identify and address data acquisition priorities and goals, develop data products for use in addressing high priority coastal management issues, e.g. ocean acidification, eelgrass decline, shifting habitats, and invasive species, etc. We will create formal and informal mechanisms to leverage limited resources through coordination with federal and state government, academia and not for profit organizations. This work will:

- Provide critical data and information needed to accurately inform decision-making to address high priority coastal management needs (including legislative initiatives, issue-specific task forces and the New England Regional Planning Body);
- Create a mechanism for conveying management-oriented research needs to funders and academic researchers; and,
- Assess the efficacy of how ocean and coastal data and data products are currently made available to stakeholders, including municipalities, regional planning organizations, and others,

and formalize improved methods for data delivery and training and support for use of data products.

III. Needs and Gaps Addressed

Maine has notable gaps in basic information needed for well-informed and forward-looking ocean and coastal resource management. Critical ocean data gaps include bathymetry, habitat, water quality parameters (such as pH and pCO_2), and temperature. This type of information is critical to the understanding of emerging issues and the development of science-based measures to address them. Data gaps related to terrestrial coastal management, also a focus of this strategy, are discussed in other sections of this document[53].

Current networking and information sharing mechanisms are not working effectively to avoid duplication of ocean monitoring activities and to reduce user conflicts. This strategy addresses the need for enhanced coordination among federal, state, and non-governmental partners. This strategy will yield a firm set of identified data needs, document how partners may be collecting those data and will document the timing and geographic focus of efforts to minimize user conflicts.

Maine is considerably behind other New England states in characterizing our coastal waters. Through this strategy, current regional ocean planning efforts, such as those of the Northeast Regional Ocean Council and Regional Planning Body, and their subsequent implementation, will be enhanced by the availability of nearshore data.

During the assessment phase of this planning process, regional planners indicated a general lack of capacity within municipalities to use ocean and coastal data. They specifically identified the need for new data products and tools to assess cumulative and secondary impacts of development. With respect to ocean data, planners were unclear of what was out there, how to access it, and how municipalities might use it. This strategy will attempt to eliminate that need through outreach, development of relevant data products, and improved data delivery methods.

IV. Benefits to Coastal Management

Shared understanding and agreement among partners on data collection methods, protocols, and key topics, such as the primary factors contributing to changing ocean conditions in the Gulf of Maine, will enhance the scientific rigor, predictability, and efficiency of ocean resources management and related regulatory decisions, including those concerning siting of ocean-based development and resiliency preparedness (modeling). This strategy will enhance the State's ability to leverage federal and non-governmental resources to accomplish its goals through increased coordination, prioritization of research, and assurance of compatible research methodologies.

A central feature of this strategy is the assurance that data collected, either as a direct result of this strategy's funding or leveraged by other initiatives, are made readily available to coastal decision-makers and that data products derived from coastal and ocean data are usable by target audiences.

[53] See Coastal Hazards, Cumulative and Secondary Impacts of Development and Wetlands sections of this report.

V. Likelihood of Success

The likelihood of achieving this strategy's principal objectives is high. MCP has cultivated partnerships with various ocean and coastal research institutions and built an ocean survey program from the ground up using various funding sources and in-kind contributions from its partners. Stakeholders consulted during this Assessment and Strategy process confirmed that focus on collection and interpretation of data to address key information gaps and facilitation of the use of such data for decision-making and policy development implementation should be a major focus of the MCP's work during the next five-year period. In addition, there has been recent legislative interest in increasing Maine's efforts in ocean and coastal monitoring.

VI. Strategy Work Plan

Increase the capacity for monitoring/assessment and the use of coastal and ocean data at the federal, state, regional and local level to respond to changing ocean and coastal conditions.

Strategy Goal:

Total Years: 5

Total Budget: $650,000

Year: 1

Description of activities:

- Convene a workshop or series of meetings with DMR, DEP, NOAA, academics and non-profit organizations, municipalities, RPOs and other partners to identify: coastal and ocean management needs; types of data needed and geographic focus; how data will be used in making ocean and coastal resources management decisions; and opportunities for collaboration on data collection and synthesis.
- Work with the Municipal Planning Assistance Program to assess regional and municipal data/information needs, evaluate current methods of data delivery and assess the capacity of towns/regions to use coastal and ocean data. This effort will inform effective distribution of data and tools described in the Coastal Hazards, Cumulative Impacts and Wetlands sections of this document.
- Formalize a "Maine Coastal Data Partnership" among interested parties to establish: long-term goals; annual work plans; data-sharing agreements; and commitments to partner on data collection and product development.

Major Milestones: Identification of coastal management priorities and data needs; identification of specific data applications and data users; formalization of partnership; identification of high priority monitoring/research goals and data products; development of a data distribution plan for municipal and regional governments.

Budget: $50,000

Years 1-3
Description of Activities

- Enhance operation of MCP's nearshore survey platform to gather priority data, populate and run a benthic habitat model, and assist with place-based special studies as needed (e.g. circulation models, green crab invasion, eelgrass die-off).
- Use the results of NROC regional habitat classification work to identify areas of concern for consideration by the Northeast Regional Planning Body.
- Enhance MCP's research database and formalize agreements for researchers to add information annually. Publicize the tool to promote information sharing, networking and collaborative projects.

Major milestones: MCP research database launched, populated and commitments to use and maintain it are secured; regional habitat classification integrated into Northeast Regional Ocean Plan; analysis of data gathered during three field seasons.
Budget: $360,000

Year(s): 4 - 5
Description of activities:

- Operate MCP's nearshore survey platform to gather priority data and assist with place-based studies as needed.
- Integrate benthic data collected from Years 1-3 into the State's scallop and lobster Fisheries Management Plans.
- Monitor the use of the research database and determine its long-term viability.

Major Milestones: Completion of keystone data collection for specific focus areas as agreed upon by partners; and successful application of benthic habitat modeling in the development of Fisheries Management Plans (see Ocean Resources Strategy 2), analysis of data gathered during field seasons 4 and 5.
Budget: $240,000

VII. Fiscal and Technical Needs

A. 309 funds requested are not solely sufficient to fully implement this strategy. DACF-MCP and its partners will seek additional funds from a variety of sources and leverage work of partners for necessary field work and data analysis.

B. Technical Needs: Contractors and technical advisory team members will supplement state agency staff.

VIII. Projects of Special Merit (Optional)

- Special studies and development of new management options in specific geographies.
- Analyze in more detail the vulnerabilities of resource-dependent coastal communities to changing environmental conditions.
- Analyze in more detail vulnerabilities to marine resources from changing environmental conditions.
- Research and disseminate findings on how adaptive management techniques can be developed/used in light of effects on species and communities from changing environmental conditions.

5-Year Budget Summary by Strategy: Ocean Resources

Strategy Title	**Year 1 Funding**	**Year 2 Funding**	**Year 3 Funding**	**Year 4 Funding**	**Year 5 Funding**	**Total Funding**
Fisheries Management Plan Development and Implementation	26,000	26,000	26,000	26,000	26,000	$130,000
Increase State and Local Capacity to Respond to Changing Ocean and Coastal Conditions	170,000	120,000	120,000	120,000	120,000	$650,000
Total Funding	$196,000	$146,000	$146,000	$146,000	$146,000	$780,000

WETLANDS

Strategy 1: Advancing Adaptation of Coastal Marshes to Changing Environmental Conditions

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: *Further the understanding of wetland ecosystem services and coastal marsh migration in Maine and integrate data and best management practices into local community planning and land conservation strategies.*

Strategy Approach: This strategy has two elements:

- MCP will review existing, and investigate new tools to assess wetland impacts for use at the municipal level. The State Planning Office (SPO) Wetlands Characterization, a GIS-based tool that predicts which wetlands provide a specific subset of functions and values, was developed over ten years ago. Significant technological changes have occurred during the last ten years such as the availability of LiDAR, the National Agricultural Imagery Program (NAIP), increased resolution in orthophotography, improved ability to serve mapped data via the web, and improved accessibility to web mapping services. Since the Characterization

was originally developed, there has also been increased recognition and documentation of the impacts of climate change in Maine. With the help of a steering committee, the MCP will review the Characterization, the functions and values it currently assesses, and determine updates necessary to make the tool more robust and useful. This process will take into consideration technical advances, changes to wetland regulations, and changes predicted as a result of climate change. The Characterization will be revised to address these changes as appropriate and outreach and education to municipalities and land trusts will be undertaken to help them incorporate its use into their programs and policies. The updated classification may be used to improve decision-making for Maine's in-lieu fee wetland compensation program (Maine Natural Resources Conservation Program). *Note: in July 2015, MCP became aware of a US Army Corps of Engineers/EPA effort to develop a new functional assessment of wetlands that would be used for regulatory purposes in New England. Desktop evaluation and field evaluation of the protocol is underway. MCP will consult with and build off of these efforts.*

- MCP will build off of mapping and inundation modeling done as part of a Project of Special Merit to identify coastal wetlands along the Maine coast with characteristics that may potentially keep pace with rising sea levels that are good targets for conservation/management. MCP will work with a steering committee to gather more detailed information for target areas including functional assessments of current wetland conditions (see above), surrounding land cover and land use data, along with the soil conditions of areas likely to be inundated but not currently coastal marsh. The Steering Committee will also identify key areas within each coastal geological compartment for sediment accretion research. MCP and the Steering Committee will solicit municipalities interested in assessing the predicted changes and implementing measures to mitigate coastal marsh loss over time. Possible strategies include changes to local zoning regulations, partnership with local or regional land trusts, or implementation of rolling easements. Special emphasis will be placed on identifying incentives for landowners and cost effective ways to mitigate or plan for migration.

C. Needs and Gaps Addressed

- Determining the cumulative and secondary impacts to wetlands remains a high priority for the Maine Coastal Program. State and federal regulatory programs support no net loss of wetland functions and values. Since the original development of the SPO Wetlands Characterization, much research has been done on the ecosystem services provided by wetlands which are especially important for water quality, habitat, and coastal hazard protection. The Wetlands Characterization is an easily disseminated web-based tool that would support assessment of wetlands impacts and ecosystem services throughout the Maine Coastal Zone. In a survey conducted as part of the stakeholder outreach process for this Assessment and Strategy, many Regional Planning Organizations noted a need for tools to be able to assess cumulative and secondary impacts, as well as to develop municipal capacity to be able to use the data for planning and regulatory purposes.
- Maine currently lacks sediment accretion and sediment source data for coastal marshes in Maine. To better understand the ability of marshes to keep up with inundation from sea level rise, it is essential to develop a robust assessment of change over time. This strategy includes installation equipment to measure sediment accretion.

- Maine's Natural Resource Conservation Program (MNRCP) does not currently use a wetland function and values assessment in decision-making about conservation targets for the in-lieu fee compensation program.
- The outreach and education aspect of this strategy will bridge the current gap in municipal and local capacity to use these data.
- Work undertaken by MCP during the previous assessment period through Section 309 and a Project of Special Merit underscored the need to engage with municipalities on multiple levels; to provide support for them to identify their goals relative to the topic; and to help them identify implementation strategies that are the best fit for their community. The municipal outreach undertaken through this strategy will follow those same guidelines.

III. Benefits to Coastal Management

Coastal marshes are a critical component of the coastal ecosystem and provide benefits to both the natural and built systems. This strategy intends to avoid and minimize (net) coastal marsh loss where possible and thus maintain ecosystem services. This strategy will increase understanding of how marsh systems are likely to change as a result of sea level rise, assess what functions, and at-risk species and habitats may be lost, and provide us with an opportunity to implement strategies that support the ability of the marshes to migrate where possible. While some marshes will not be able to migrate due to local topographic conditions and are likely to be drowned by sea level rise, there are places where the topography and soil characteristics are likely to support the landward movement of existing coastal marshes and transition of fresh water marshes to coastal marshes. With a more detailed understanding of existing and future conditions, we will be able to develop more realistic and successful strategies to support coastal marsh migration and potential development.

This strategy will benefit coastal management by:

- Improving assessment tools to measure impacts to wetland functions, values, and ecosystem services.
- Improving wetland conservation techniques in support of no net loss of wetland functions and values.
- Providing outreach and education to municipal officials on how to incorporate this information into decision-making and management of coastal resources at the local level.
- Improve Maine's understanding of the science related to understanding the changes that will occur or what adaptation strategies are needed.

IV. Likelihood of Success

There is a high likelihood of attaining the strategy goal and program change. There is strong support in the land trust and land conservation community for this effort; an ever-increasing awareness on the part of coastal municipalities for the importance of coastal marshes on both the natural and built environments; an increasing municipal interest in addressing the predicted impacts from sea level rise; and a stated need from the research community for more data on the rates of sediment accretion in Maine's coastal marshes. The SPO Wetland Characterization has been a popular tool for assessing wetland functions and values. Updating this tool with the inclusion of the predicted effects to wetlands from climate change with change detection functionality will increase its utility and value for coastal management. Previous and current work undertaken by the Maine Coastal Program has shown the benefit of education and outreach at multiple levels based

on best available science. This project will use that same method to achieve the program change proposed by this strategy. MCP has a long and successful history of working with partners from a wide variety of constituencies; this strategy will employ that approach.

V. Strategy Work Plan

Strategy Goal: Further the understanding of wetland ecosystem services and of coastal marsh migration in Maine and integrate data and best management practices into local community planning and land conservation strategies.
Total Years: 5
Total Budget: $250,000

Year: 1

Description of activities: Assemble a workgroup of federal and state regulators, ecologists/biologists, coastal managers and local officials; review existing SPO Wetlands Characterization; consult with US Army Corps of Engineers and EPA regarding their new, planned functional assessment protocol for wetlands (under development as of Summer 2015), review recent technological advances (e.g., online GIS delivery, LiDAR, NAIP photography, SLR inundation scenarios); review research on ecosystem services provided by wetlands in the coastal zone; if needed, develop roadmap for updates to the SPO Wetlands Characterization. Steering Committee creates study design and begins analysis.
Major Milestones: At least one area chosen within each coastal geologic compartment for accretion rate study. Architecture for new or enhanced characterization developed to include change detection capability, inclusion of ecosystem services, and climate change impacts. Strategy to implement changes to Characterization developed.
Budget: $50,000

Year: 2-3

Description of activities: If additional Maine-specific work is needed, develop enhanced functional assessment tool; beta test and finalize tool; begin analysis of key coastal marshes. Steering Committee conducts municipal outreach and engagement.
Major Milestones: Develop new functionality in Updated Wetlands Characterization; Updated wetland characterization available online. Partnerships developed with at least one interested municipality and land trust in representative regions to look at potential marsh migration impacts and possibilities.
Budget: $100,000

Year(s): 4-5

Description of activities: Functional assessments of representative coastal marsh areas completed; develop and disseminate guidance for coastal towns, coastal managers, land trusts and other groups on use of Updated Wetland Characterization; work with coastal municipalities on integration into policies and programs; work with land trusts on integration into strategic conservation planning.
Major Milestones: Draft, review and publish guidance on use of Updated Wetlands Characterization; work with interested municipalities and land trusts to integrate Updated Wetland Characterization into programs and policies.
Budget: $100,000

VI. Fiscal and Technical Needs

A. Fiscal Needs: CZMA Section 309 funding may be insufficient to fully fund this strategy work plan. Maine Outdoor Heritage Fund is a possible source of state funding.

B. Technical Needs: MCP will develop an advisory team including networked partners and external partner organizations. The advisory team and MCP staff will be supplemented with contractors as needed. MCP will work with the Maine Natural Areas Program, the Wells NERR and academic partners from the University of Maine, University of New England and Bates College to monitor sediment accretion rates. MCP will contract for wetland functional assessments.

VII. Projects of Special Merit (Optional)

- Select a region to create a comprehensive watershed-based wetland conservation plan.

5-Year Budget Summary by Strategy: Wetlands

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

Strategy Title	**Year 1 Funding**	**Year 2 Funding**	**Year 3 Funding**	**Year 4 Funding**	**Year 5 Funding**	**Total Funding**
Advancing Adaptation of Coastal Marshes to Changing Environmental Conditions	50,000	50,000	50,000	50,000	50,000	$250,000
Total Funding	$50,000	$50,000	$50,000	$50,000	$50,000	$250,000

APPENDICES

Appendix A
Description of the Stakeholder Consultation Process

Stakeholder Consultation Activities

MCP conducted the following activities to obtain stakeholder input:

- Developed/distributed a discussion document for use at a stakeholder and state agency meetings.
- Held one stakeholder meeting and followed up individually with those who couldn't attend. (See below for participant list).
- Met with Regional Planning Commissions and Councils of Government, conducted survey of Regional Planning Organizations and compiled results.
- Posted the draft 309 Assessment and Strategy on MCP's website for a 30 day comment period.
- Invited specific stakeholders that participated in the initial meeting to comment on the document.
- All results were compiled and considered as part of A&S development.
- Edits were made to the Assessment and Strategy document.
- MCP's response to all comments received after the 30-day public comment period were documented and provided back to participants.

Process Used

In advance of stakeholder consultations (meetings and individual consultations), MCP staff asked participants to:

- Think about the 309 enhancement topic areas from the point of view of their organization, given their current level of knowledge.
- Identify problems, challenges and needs associated with this topic.
- Rate the importance of the topic for the state of Maine over the next five years. (H,M,L)
- Think about whether there a role for MCP in the topic area?
- Think about what priority ranking should be assigned to this work? (H,M,L)
- Identify ideas for strategies and partnerships.

Participants to rate priority enhancement areas as high, medium, or low using the following considerations and caveats:

- MCP's mission and ways of doing business remain the same (TA, grants, etc.).
- MCP will operate with existing staff capacity and existing resources, but will compete successfully in NOAA competitive awards, and receive additional awards from other sources.
- MCP wishes to avoid spreading resources too thinly across enhancement areas.
- Not all priorities can be addressed given current capacity.
- MCP wishes to remain nimble in foreseeing and considering evolving needs.
- Where are there opportunities for measurable enhancement and improvement?
- Is there a need for continued work on a previously-identified high priority work enhancement area?
- Is there a clear gap that MCP can address within current resources, or competitive award?
- Is the enhancement area of interest to agency partners and/or coastal towns?
- Is there interest, energy, and support to embark on an effort that will deliver measurable results in five years' time?
- Does the work potentially leverage additional resources or build important partnerships?

- Is MCP's current approach sufficient to meet needs; no need for enhanced effort?
- Are other partners addressing the issue adequately with sufficient resources?

Stakeholders Consulted

Private (Coastal Economic Development)

- Nate Johnson – Director of Environmental Affairs, Ocean Renewable Power Company
- Hugh Cowperthwaite— Director, Fisheries Project, and Dick Clime – Project Developer, Working Waterfront; Coastal Enterprises, Inc.

University

- Damian Brady – Assistant Research Professor, University of Maine, Darling Marine Center
- Paul Anderson, Director and Beth Bisson, Assistant Director, University of Maine Sea Grant College Program
- Curtis Bohlen – Director, Casco Bay Estuary Partnership, Muskie School of Public Service, University of Southern Maine

Nonprofit – Research, Science and Stewardship

- Paul Dest – Director, Wells National Estuarine Research Reserve
- Wing Goodale – Deputy Director, Center for Ecology and Conservation Research Director, Biodiversity Research Institute
- Nick Battista – Marine Programs Director, Island Institute
- Sean Mahoney – Executive Vice President, Director of Programs and Director of Maine Advocacy Center, Conservation Law Foundation
- Barbara Charry – Wildlife Biologist and GIS Manager, Maine Audubon
- Barbara Vickery -- Director of Conservation Programs, Maine Chapter of The Nature Conservancy

Appendix B
Initial Stakeholder Input Received, Organized by Enhancement Area
Spring 2015

The following comments were received during initial stakeholder consultations at the Priority-Setting stage of the document development.

General

- Participants found the pre-meeting assignment of determining high, medium and low ratings for enhancement areas to be overly constraining. Instead, a productive conversation took place focused on gaps/needs and potential MCP role.
- Participants commented that the 309 enhancement areas may not be the right way to look at priorities for Maine, e.g. resiliency is a priority topic that transcends categories. Some of Maine's priority issue areas don't fall neatly into any one category.

Aquaculture

- Several communities in Casco Bay are looking at pre-identification of areas for intertidal leasing for shellfish harvesting; want to investigation options for zoning or other methods of restricting access.
- There is a lot of energy around innovation in aquaculture --enhancing investment and markets for new and existing species and fostering land-side hatchery facilities.
- The University of Maine's new multi-partner EPSCOR grant will be taking a comprehensive, interdisciplinary look at aquaculture.
- Sustainable grow-out of industry (considering ecological and social factors is the challenge. Is there an opportunity for a case study in the Bagaduce River? What data do growers need for good siting decisions; what are genuine concerns of stakeholders?
- Work with DMR to create a reasonable permit process for shellfish restoration work (e.g. oysters) – see TNC intern white paper re: regulatory issues and facilitate shellfish restoration (non-harvest beds).

Energy and Government Facilities Siting

- Need pre-identification of sites for ocean energy facilities and landside facilities (e.g. New Bedford supply depot).
- Develop compensation and mitigation programs for to mitigate effects of large scale developments (e.g. Massachusetts LNG).
- Proposed Green Line project (electric cable from Maine to southern New England) has regional ramifications and the potential for use conflicts with fishermen.
- A focus on this enhancement area may not be timely given current energy policy.
- Counterpoint to above is that now is the time to collect baseline information in advance of future development.
- ORPC recent report looks at tidal/wave/river hydrokinetic R&D opportunities to more industry forward.
- Further investigate instream tidal energy potential and impacts.
- The role for MCP is in advance planning.

Wetlands

- Follow-on with marsh migration effort – what are next steps? How do we help with resiliency of species that use these habitats?

Cumulative and Secondary Impacts of Development

- Examine non-regulatory recommendations of Ocean Acidification Commission report and focus attention on them.
- Ocean acidification – needs include shell recycling programs (source of "clean material" for mitigation of acidic waters), experimentation with kelp to reduce nutrients at treatment plants, multi-species aquaculture (algae and shellfish) to reduce nutrients in selected embayments, assist in development of nitrogen loading guidelines.
- Need communities to understand what they can do to reduce nitrogen loading to coastal waters, need tech transfer (towns and coastal engineers/designers).
- Need better information about source of nitrogen.
- Enhancement would result from looking across focus areas, e.g. ocean acidification and climate change
- Work with communities to improve natural system resilience in light of larger storm events.
- Need to focus on tidally-influenced culverts, continue barrier surveys.
- Need to build capacity at regional level (RCs and Soil and Water Conservation Districts) to assist with restoration project management (design/build) and to conduct outreach to towns and contractors.
- Follow-on with marsh migration effort – what are next steps? How do we help with resiliency of species that use these habitats?
- Consider resiliency of least tern and piping plovers given beach erosion.
- Need to work regionally on a broader planning scale.
- Need to look at broader scale of habitat change given climate variability. Convene groups to think about it. Other ecological changes beside marsh migration – what do future systems look like in 50-100 years – where will new species breed --what should be concerned with now?

Coastal Hazards

- NOAA definition of coastal hazards focuses on the built environment/shoreline development) but there are other aspects of resiliency such as sustainable economic development, social and cultural resiliency, impacts on natural systems. Address impacts on habitats and species in future work.
- Aging infrastructure is a huge issue – how can communities protect and improve working waterfront infrastructure and plan for effects of climate variability over next 50 years.
- What are acceptable engineered structures?
- Need to define types of infrastructure that are most vulnerable and define areas of the state that are most vulnerable, is there sufficient support to address vulnerabilities?
- Need to look at broader scale of habitat change given climate variability. Convene groups to think about it. Other ecological changes beside marsh migration – what do future systems look like in 50-100 years – where will new species breed --what should be concerned with now?
- There are opportunities to partner with Maine Sea Grant on stormwater infrastructure issues, coastal erosion, sea level rise and marsh migration.
- Need stronger liaison and a regular communication method for collaboration with University of Maine – they are currently working on wave run up modelling and storm intensity forecasting.

Special Area Management Planning

- Need to work regionally on a broader planning scale
- Take a fresh look at CZMA in Maine. Look at Rhode Island's program; consider enforceable policies re: working waterfronts, coastal communities, SAMPs.
- See Bagaduce River (under aquaculture above).

Public Access

- Continue funding for LMF staff and continue collaboration with land trusts.
- Enhancement would result from looking across focus areas, e.g. public access and sea level rise.
- Rising property values will continue to make shoreline acquisition difficult.

Marine Debris

- Important issue for Maine, but less important than other enhancement topics.
- Are there opportunities for synergy with Maine Healthy Beaches Program, Maine Diving Program (Semester-by-the-Sea at Darling Center)?
- Deepen the connection between people and the coast. Adopt a Beach Program? Add water quality sampling? Springboard for ocean literacy and engagement – "learn, volunteer, advocate, help solve…"

Ocean Resources

- Climate variability is leading to possible markets for new species not traditionally found in the Gulf of Maine (e.g. black sea bass.)
- Species distribution may change quickly as influenced by temperature. Habitat change will be slower and may limit change. Need to understand habitats.
- Can MCP play a role in convening ocean developers and potentially affected communities prior to permitting stage of development and institutionalize that approach?
- Develop compensation and mitigation programs to mitigate effects of large scale developments (e.g. Massachusetts LNG)
- 18th Amendment to Groundfish Fisheries Management Plan will affect spatial locations of fishing.
- Examine shifting economic conditions e.g. aquaculture and fishing.
- Proposed Green Line project (electric cable from Maine to southern New England) has regional ramifications and use conflicts with fishermen.
- 18th Amendment to Groundfish Fisheries Management Plan will affect spatial locations of fishing.
- Need inventory of energy cables – need to understand cable/fisheries interactions.
- Is there an appropriate scale of ocean planning for Maine? Regional is too large.
- Need to bring clarity to the scope and mission for regional ocean planning. Can a small-scale Taunton Bay-like EBM project be done for a larger area?

Cross-Cutting Issue -- Data acquisition and Display

- Serving data to make better coastal management decisions – Does MCP have a central role in developing fine scale data (appropriate for use for decision-making) and making it publicly accessible? Need one stop shopping for data mining.
- In baseline data-gathering efforts, MCP should focus on seminal datasets that can be used in a variety of applications. More planning for data acquisition is needed.

- There are huge baseline data gaps, e.g. vulnerability of species to climate variability; does MCP have a role in linking researchers with opportunities to collect baseline data? Need for integration of intensive studies over small areas into a statewide picture. What species are we most concerned with?

Appendix C
Summary of Comments Received and MCP Responses
DRAFT Maine Coastal Program Assessment and Strategy
July 2015

Coastal Program staff solicited comments on the draft 309 Assessment and Strategy (A&S) via posting the draft document dated June 2015 on the MCP website and inviting comments from partners and other stakeholders who participated in earlier priority setting meetings. Comments were also invited from Maine's coastal Regional Planning Organizations (RPOs). RPOs work directly with coastal communities and are in touch with municipal needs and priorities. The comment period was open for 30 days and ended on July 29, 2015.

Comments received are summarized below by topic area. Following each comment, the MCP staff response is provided. The full text of comments received is available from the Maine Coastal Program.

General Comments

- The format required by NOAA is not user friendly and does not facilitate stakeholder review. (Several comments of this nature were received.)
- The document is comprehensive and well done. Preparation of the document was a clearly a formidable task.
- Issues of importance to The Maine Chapter of the Nature Conservancy such as living shorelines, advance planning for post-storm recovery, salt marsh migration, co-management of scallops and urchins and establishment and implementation of restoration priorities have been captured in the document.
- The details of what is being proposed to further the goals were often not clear. (Maine Chapter of the Nature Conservancy) *MCP response: Strategies and associated budgets are admittedly general in nature. Detailed work programs for Section 309-funded projects are prepared annually. Potential partners will be consulted as needed to more fully flesh out strategy workplans.*
- Incorporation of sea-level rise in several places throughout the document is good.
- With the exception of aquaculture, the document sets MCP up to tackle the challenges that Maine is likely to face in the future. (See also the second bullet under the Aquaculture heading below.)
- Using county level data throughout the assessment section of the document does not make sense. Large areas of what are considered coastal counties are far from the coast. A better measure is data specific to coastal municipalities. This would provide a better approximation of areas affected by coastal issues and coastal municipalities (not counties) are eligible for MCP financial assistance. *MCP staff response: Where data is available at the municipal level, MCP will update coastal community data and trends using Section 306 base program funding.*

Coastal Hazards (CH)

- Coastal hazards assessment – Sea-level rise vulnerabilities are identified based on geologic conditions. The impact of SLR on existing development should be factored in, e.g. highly developed areas at low elevations (e.g. downtowns and resort areas.) Such areas should be identified as more vulnerable than similar areas that are essentially developed. (Lincoln County Regional Planning Commission)
  ***MCP response**: While we have not changed the text of the document, this is an important consideration. In the future, MCP will explore different aspects of vulnerability. This work could assist in prioritizing geographic locations for technical assistance and funding.*
- Two reviewers recommended that CH Strategy 1 should reference County Hazard Mitigation Plans in addition to the State Plan. (MidCoast Economic Development District and Lincoln County Regional Planning Commission)
  MCP response: This change was made.
- CH Strategy 2 - Best Practices Guide should include tools for financing waterfront improvements such as municipal Capital Improvement Plans (CIPs) and information about grants and other funding sources (Midcoast Economic Development District)
  MCP response: Changes have been made to the strategy to address this comment.
- CH Strategy 3. This work should go beyond working waterfront facilities and consider other critical infrastructure like sewer and water lines and treatment facilities.
  MCP response: The strategy language was broadened to reference this comment. It should be noted though, that it may be beyond the means of MCP to complete a broad assessment of this nature. It is MCP's intent to begin with a working waterfront facilities strategy.

Ocean Resources (OR)

- The OR Phase I Assessment (the "Significant Changes to OR and Uses" table) should acknowledge that clams and marine worms are important harvestable species for some communities. (Lincoln County Planning Office)
  MCP response: Clams are addressed in the table under the category of "shellfish". Text of the status of marine worms has been added.
- The OR Phase I Assessment (Table "Major Reasons Contributing to Increased Resource Threat or Use Conflict") should address conflicts between nearby property owners' complaints about their loss of recreational opportunities. (Lincoln County Regional Planning Commission)
  MCP response: These conflicts have been generalized in the table under "nearby property owners" because complaints are not limited to concerns about recreation.
- OR Strategy 2 is focused on identifying data needs, obtaining data and providing it to others. Is more data needed? Are better systems of using data needed? Flexibility, feedback loops and adaptive management needs to be built into management systems. (Maine Chapter of the Nature Conservancy.
  MCP response: A potential "Project of Special Merit" (POSM) has been added in the Ocean Resources section. POSMs are funded by NOAA through an annual competitive process dependent of annual appropriations from Congress.
- Stressor number 3 in the Ocean Resources Phase II assessment includes mention of the impacts of changing environmental issues on communities. OR Strategy 2 should include a closer look at community vulnerabilities and resource vulnerability to environmental changes. (Island Institute)

MCP response: A potential "Project of Special Merit" (POSM) has been added in the Ocean Resources section. POSMs are funded by NOAA through an annual competitive process dependent of annual appropriations from Congress.

Cumulative and Secondary Impacts of Development (CSI)

- The Maine Department of Transportation's design guidance for culvert sizing dated May 21, 2015 should be added under the Management Characterization section. (Lincoln County Planning Commission)
  MCP response: This guidance has been added to the text.
- CSI Phase I Assessment. The table on "Trends in Coastal Population and Housing Units" should state that data reflects year-round population and year-round and seasonal dwelling units. (Hancock County Regional Planning Commission)
  MCP response: This change has been made.
- CSI Phase I Assessment. The subheading ("Areas Lost to Development Between 2006-2011") in the table "How Land Use is Changing in Coastal Counties" could be interpreted as being "anti-development".
  MCP response: The subheading has been changed to "Net Change to Land Cover Types Between 2006 and 2011".
- CSI Phase II Assessment and Strategy 3. Given the relatively low rate of subdivision development (regulated by municipalities) and the predominance of single-lot development (not regulated by municipalities with the exception of zoning and building, plumbing and electrical codes) we need more guidance on single lot LID standards. (Hancock County Planning Commission)
  MCP response: Language added to Phase II Assessment text and CSI Strategy.

Aquaculture

- Although a focus on the growth and development of the aquaculture industry is not reflected in a specific strategy, cumulative impacts of development and polluted runoff are addressed in other strategy areas. (Island Institute)
  MCP response: Cross references have been made in the aquaculture section of the assessment to reflect related actions that support the industry.
- Although the reasoning for the lack of a specific aquaculture strategy was well explained, MCP should place a high priority on facilitating the growth and development of the aquaculture industry.
  MCP response: MCP's networked partner agency, the Department of Marine Resources (DMR) is the lead agency for this work and actively assisted in the development of the Phase I assessment and priority-setting process. Should gaps and needs related to this work (appropriate for the use of MCP Section 309 resources) be identified by DMR, MCP would amend the document to reflect this change.
- Conflicts between some waterfront landowners and aquaculture operations and the presence of overboard discharges and wastewater treatment plants (all of which can limit the growth of the aquaculture in some geographic locations) should be mentioned in this section. (Lincoln County Planning Office)
  MCP response: Text has been edited accordingly.

APPENDIX D

SUMMARY OF RESPONSES TO ONLINE SURVEY FROM COASTAL REGIONAL PLANNING COUNCILS

In March of 2015, the Maine Coastal Program, as part of its 2015 Section 309 Assessment and Strategy development process, distributed an online survey to the coastal Regional Planning Councils (RPC's) throughout Maine. The intent was to gather information and feedback on Section 309 Priorities and to have representatives from the RPC's think about what issues were impacting the communities within their regions. The following pages summarize responses to each question.

Questions 1 and 2 are not included in the summary form below. Question 1 asked for the respondent's name and Question 2 asked for their organizational affiliation. That information is as follows:

1. **Bob Faunce**, Lincoln County Regional Planning Commission

2. **Steph Carver**, Greater Portland Council of Governments

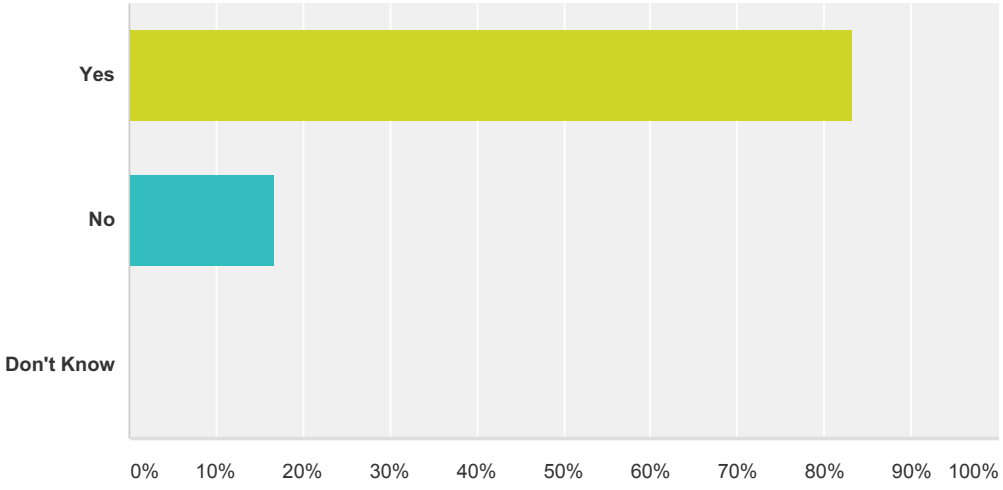
3. **Lee Jay Feldman**, Southern Maine Planning and Development Commission

4. **Scott Hastings**, Midcoast Council of Governments

Two respondents remained anonymous.

Q3 Aquaculture - Historically, MCP has provided policy development and legislative support in the creation of state aquaculture policy.Is this topic a prevalent concern to the coastal communities in your region at present or predicted to be in the future? If yes, please explain what specific challenges the coastal municipalities in your region face regarding aquaculture in the space provided below.

Answered: 6 Skipped: 0



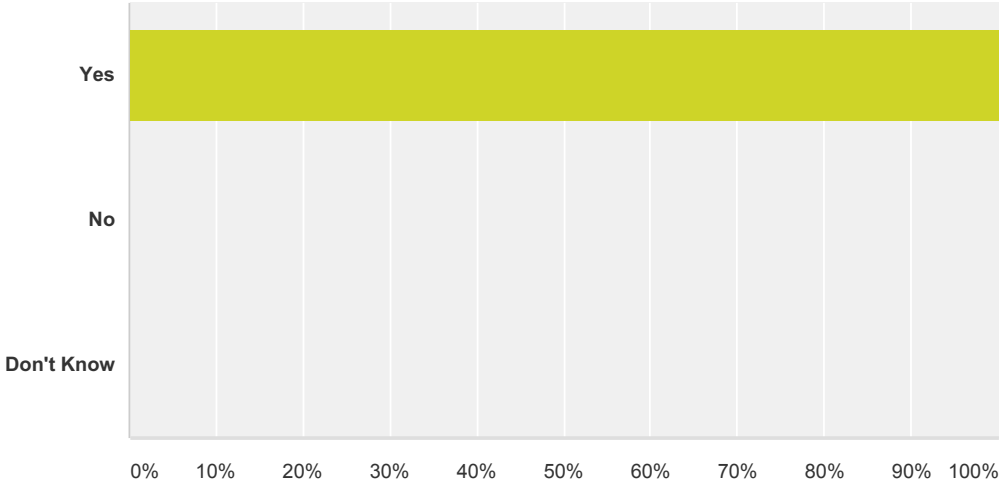
Answer Choices	Responses	
Yes	**83.33%**	5
No	**16.67%**	1
Don't Know	**0.00%**	0
Total		**6**

#	If Yes:	Date
1	There is some interest in Boothbay Harbor to establish/expand aquaculture but water quality is a concern especially with a number of OBDs.	4/1/2015 2:07 PM
2	It is a discussion but not a major focus in most communities as development and associated environmental issues over shadow, and our economy is more diversified.	3/31/2015 4:14 PM
3	I am new to the MCOG region and am not aware of any particularly intensive aquaculture operations currently operating. That said it is an area of great interest to many people and towns in my region. There is a lot of interest in it as a economic driver, employing industry, and a continuation of the maritime industry tradition. That said there is serious concern that it be operated carefully so as to avoid lowering water quality. Communities want to know what they can do to 1) encourage aquaculture, and 2) make sure all aquaculture is operated in an environmentally responsible manner.	3/31/2015 2:31 PM
4	Concern for the health of farmed species and for the potential negative impacts on native species.	3/30/2015 10:43 AM

5	There are complaints from citizens and advocacy group (e.g, Friends of the various bays) that it is a source of pollution.	3/30/2015 10:09 AM

Q4 Coastal Hazards - MCP assists in the prevention or significant reduction in threats to life and destruction of property by addressing development and redevelopment in high-hazard areas, and anticipating the effects of potential sea level rise.Is this topic a prevalent concern to the coastal communities in your region at present or predicted to be in the future? If yes, please explain what specific challenges the coastal municipalities in your region face regarding coastal hazards in the space provided below.

Answered: 6 Skipped: 0



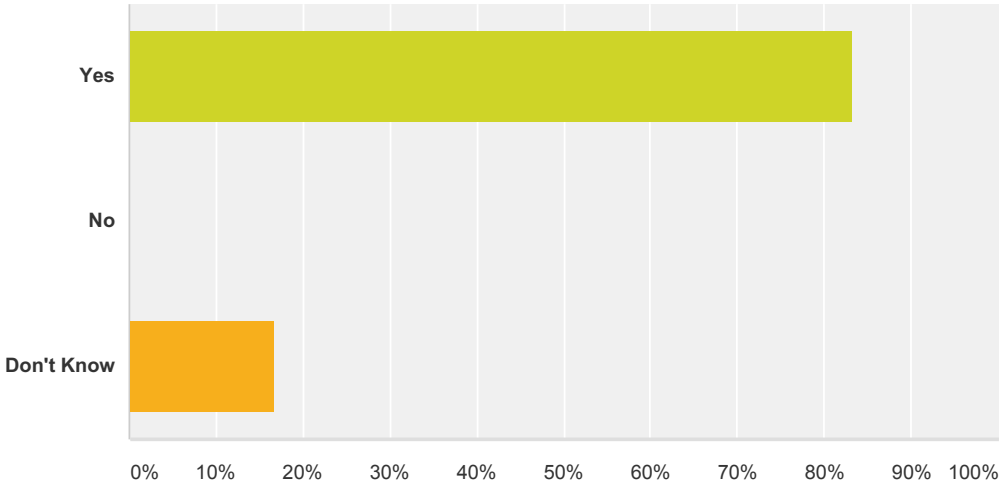
Answer Choices	Responses	
Yes	**100.00%**	6
No	**0.00%**	0
Don't Know	**0.00%**	0
Total		**6**

#	If Yes:	Date
1	Potential impacts from SLR and coastal storms are of concern to several coastal communities, especially Damariscotta with its at-risk downtown and Monhegan Island with its at-risk domestic water supply	4/1/2015 2:07 PM
2	York County sees a great deal of Storm Surge impacts based on low lying areas and surge over runs in the ledge coast locations. It is important to our region to find ways to fortify infrastructure and homes that were built during the turn of the 20 century that are located right at the waters edge and see much more sever storm surge now than 100 years ago	3/31/2015 3:26 PM

3	Communities are very interested in ways to legally and fairly deter development and redevelopment in high risk areas. This is a sensitive issue as it deals with private property rights. This makes many towns unwilling to openly discuss the issue without some idea of a clear path forward that allows property owners to retain value of their land. Similar but slightly less contentious is how to deal with the threat of coastal flooding to public infrastructure such as roads. Towns worry about how to approach these threats, how to afford rebuilding infrastructure, and at what point is it prudent and/or possible to stop maintaining frequently threatened pieces.	3/31/2015 2:31 PM
4	Expanded development will increase pollution runoff which will degrade natural habitats. Structures built in high hazard areas will likely be damaged by storm events.	3/30/2015 10:43 AM
5	There is concern in fishing communities about the vulnerability of harbor-side infrastructure to increased storm surges and coastal flooding. Another issue is potential flooding of key that connect the islands and peninsulas to the main travel routes. Some areas risk isolation if their roads are flooded.	3/30/2015 10:09 AM

Q5 Cumulative and Secondary Impacts of Development - defined as the the collective effect of various individual uses or activities on coastal resources. This is a broad topic and can include issues like stormwater, wastewater and wastewater treatment plants, impervious surface, runoff, pollution, nutrient loading, ocean acidification, and habitat connectivity. MCP works to assess the aggregated effects of various development activities on coastal resources by annually documenting certain indicators that include, but are not limited to, public access, wetland habitat, working waterfront preservation, etc. Examples of MCP work include workshops on Low Impact Development, impervious surface change analysis, wetland migration (sea-level rise) project, and municipal education re: shellfish growing areas.Is this topic a prevalent concern to the coastal communities in your region at present or predicted to be in the future? If yes, please explain what specific challenges the coastal municipalities in your region face regarding cumulative and secondary impacts of development in the space provided below.

Answered: 6 Skipped: 0

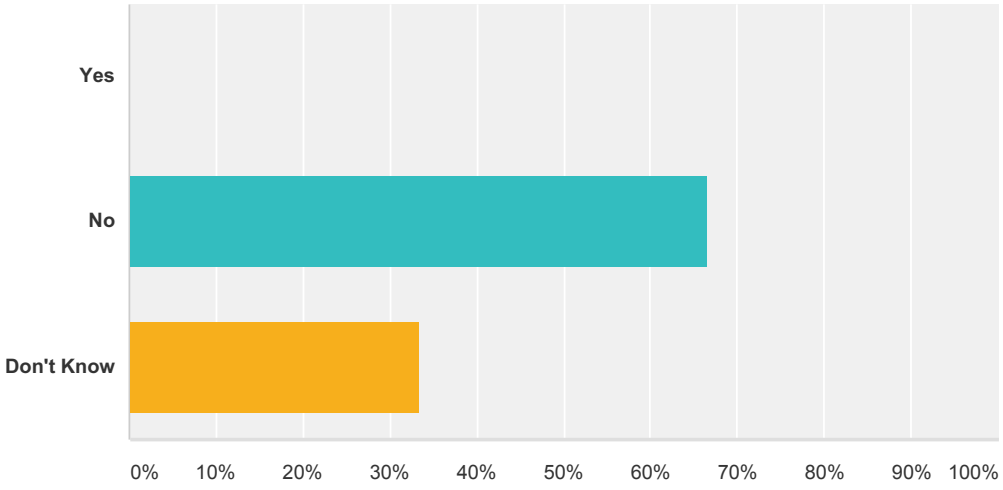


Answer Choices	Responses	
Yes	**83.33%**	5
No	**0.00%**	0
Don't Know	**16.67%**	1
Total		**6**

#	If Yes:	Date
1	With the development boom underway once again, this issue is on the forefront here in Cumberland County.	3/31/2015 4:14 PM
2	Public access is becoming harder and harder to find and maintain. Many water front property owners are challenging public rights and the courts have swung in favor of the property owner. Wetland habitats are being impacted by Sea Level Rise changing the habitat from low marsh areas to High Marsh areas. Not much study has been done in this area to identify future impacts due to the changing vegetation and habitat.	3/31/2015 3:26 PM
3	Public access and working waterfronts are large issues in many communities. Any work that can be done to help towns avoid legal battles over public access to the coast would be very appreciated. Working waterfronts are always a concern wherever they are found but I can not point to any particular issue that needs attention. In general the cumulative and secondary impacts of development are not well understood by communities, particularly the smaller one with less staff capacity. A campaign to raise awareness of these impacts could be very helpful to many communities.	3/31/2015 2:31 PM
4	Funding opportunities to improve and expand public access to coastal waters will support the local working waterfront economy as well as the tourism based workforce.	3/30/2015 10:43 AM
5	Public access for both recreational use and working waterfront is an ongoing challenge both in terms of the number of sites and congestion at the current sites. Only a portion of the access points have all tidal access. Many require development of parking and other amenities. There are several development trends that are affecting our region: 1. the increase in impervious surface and resulting stormwater runoff; 2. increased rate of development on marginal lands;3. inadequate septic system; 4. the high demand for residential properties by retired and summer people has made it very difficult for people dependent on local salaries to find affordable housing in coastal communities. This means higher rates of development in inland towns and increased commuting.	3/30/2015 10:09 AM

Q6 Marine Debris - MCP works with state agencies, non-profit partners, and volunteer coalitions to raise awareness and mitigate the impacts of marine debris. Marine debris can include, but is not limited to plastics, micro-beads, metal, and "ghost" fishing gear, etc. MCP also coordinates Maine's annual coastal cleanup week.Is this topic a prevalent concern to the coastal communities in your region at present or predicted to be in the future? If yes, please explain what specific challenges the coastal municipalities in your region face regarding marine debris in the space provided below.

Answered: 6 Skipped: 0

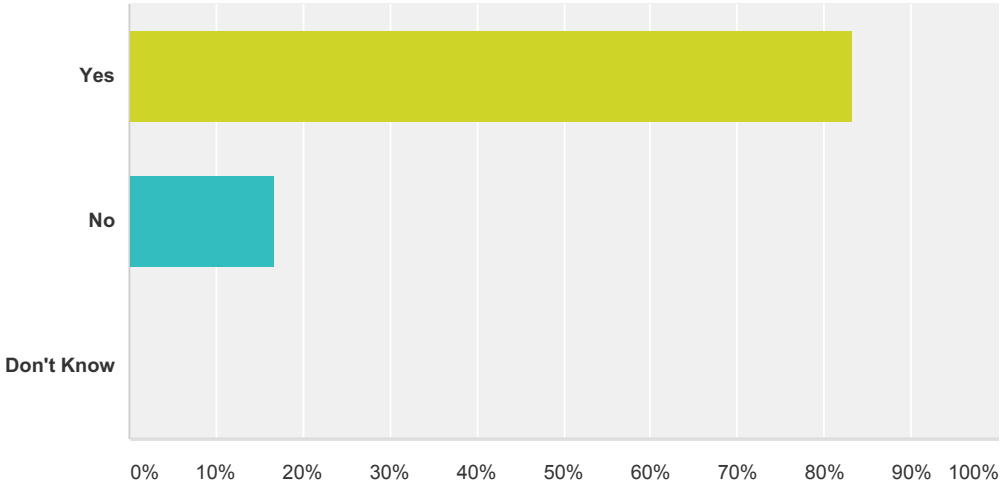


Answer Choices	Responses	
Yes	**0.00%**	0
No	**66.67%**	4
Don't Know	**33.33%**	2
Total		**6**

#	If Yes:	Date
	There are no responses.	

Q7 Ocean Resources - MCP works to provide credible, science-based data and information in the coastal and ocean environment from which appropriate siting/permitting decisions can be made. Additionally, MCP has provided financial capacity to the State for the development of fisheries management plans.Is this topic a prevalent concern to the coastal communities in your region at present or predicted to be in the future? If yes, please explain what specific challenges the coastal municipalities in your region face regarding ocean resources in the space provided below.

Answered: 6 Skipped: 0



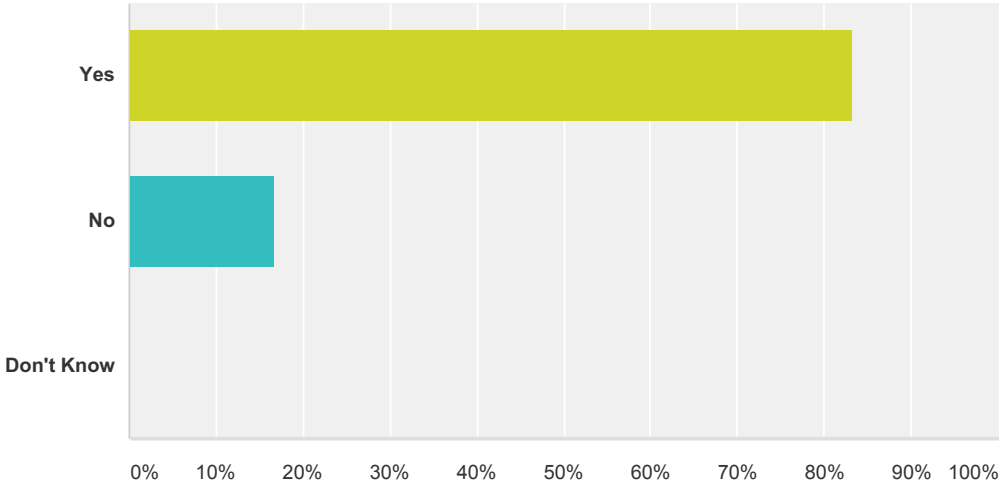
Answer Choices	Responses	
Yes	**83.33%**	5
No	**16.67%**	1
Don't Know	**0.00%**	0
Total		**6**

#	If Yes:	Date
1	Again, in light of the development going on here, especially in the Portland Area, this is a major issue.	3/31/2015 4:14 PM
2	Communities do not have the staff time or the knowledge to collect, compile, or process scientific data and background. They are very aware of the need for this information though. Having a state level resource for this information is very valuable to them to be able to find the information they need to base their local actions on.	3/31/2015 2:31 PM

3	Having accurate longitudinal data is imperative to understand the impact of changes occurring in our coastal waters and to provide a basis for those in authority to adopt effective regulations that will protect natural resources.	3/30/2015 10:43 AM
4	Change in species due to warmer ocean water and acidification, over dependence on lobster, lack of value added products in fisheries sector.	3/30/2015 10:09 AM

Q8 Public Access - MCP provides technical and financial assistance in the form of funding and publications to municipalities for shore and harbor and resiliency planning. MCP works to restore access through the Right of Way Rediscovery Grant Program, publishes the Maine Coastal Public Access Guide (a comprehensive listing of all access sites to the shore), and works with partners to educate constituents on Maine's access laws and policies.Is this topic a prevalent concern to the coastal communities in your region at present or predicted to be in the future? If yes, please explain what specific challenges the coastal municipalities in your region face regarding public access in the space provided below.

Answered: 6 Skipped: 0



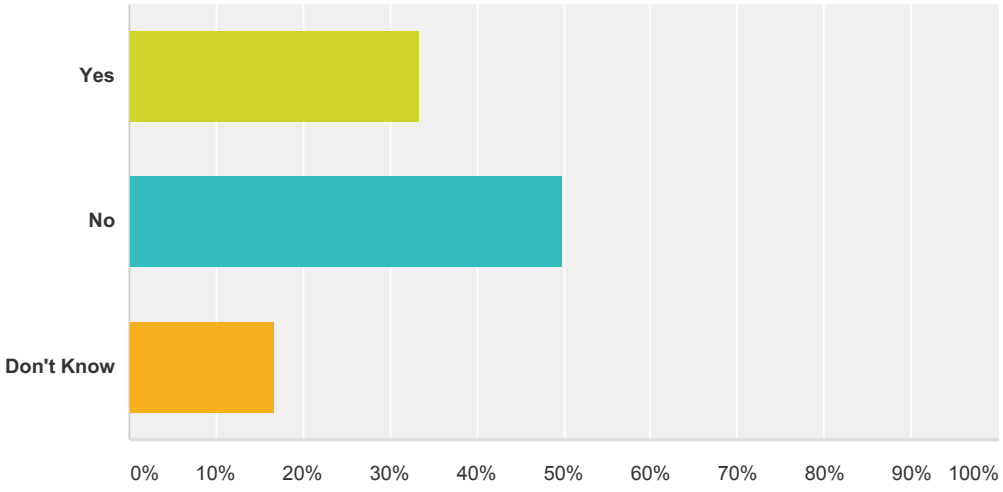
Answer Choices	Responses	
Yes	83.33%	5
No	16.67%	1
Don't Know	0.00%	0
Total		6

#	If Yes:	Date

1	Public access is an issue in most of our communities and come up again and again in master planning as well as develop reviews.	3/31/2015 4:14 PM
2	As noted earlier Public Access is of concern more along the linear areas of the beaches due to private ownership being to the low water mark which is being lost from SLR and that of property rights law suits that are limiting public rights to only certain uses	3/31/2015 3:26 PM
3	Public access to the shore is a huge topic for many communities and any resources that can be made available to them in the area are appreciated. Helping communities to research and understand right of way ownership can help them avoid legal battles in the future to everyone's benefit.	3/31/2015 2:31 PM
4	Several communities in this region would like funding to improve and expand public access to support their local economies, including fishing, lobstering, and recreation and tourism-based activities.	3/30/2015 10:43 AM
5	The high cost of purchasing access properties. The very limited number of all tidal access points, the need for harbor management planning.	3/30/2015 10:09 AM

Q9 Special Area Management Plans (SAMPs) - SAMPs involve the designation of a geographic area with associated policies used to accomplish pre-established goals. As examples, MCP worked with the Maine Department of Marine Resources to implement an ecosystem-based management plan in Taunton Bay and assisted the Maine Department of Conservation in the designation of ocean energy test sites. Are towns in your region interested in working together on a shared coastal challenge? If yes, please tell us the area where there is interest, what the coastal challenge is and what approach might be taken.

Answered: 6 Skipped: 0



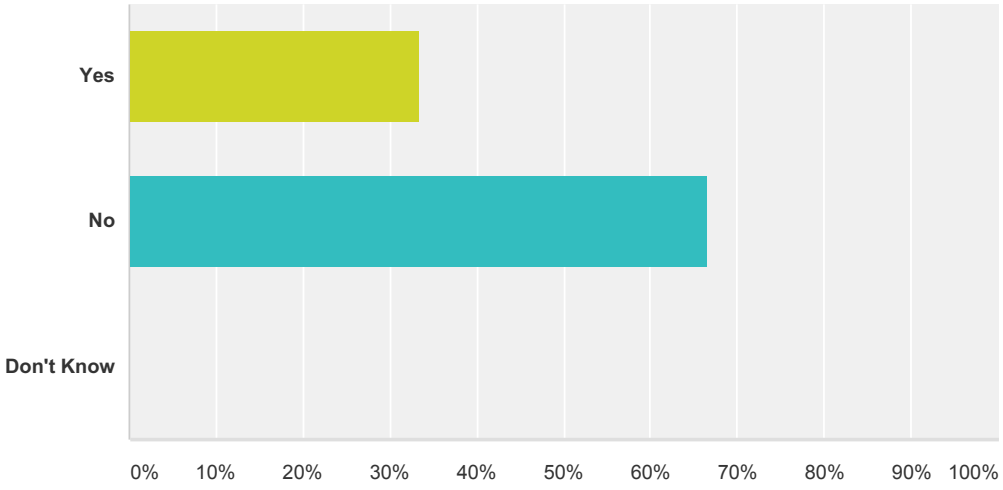
Answer Choices	Responses	
Yes	33.33%	2
No	50.00%	3
Don't Know	16.67%	1
Total		**6**

#	If Yes:	Date
1	One ocean energy test site is off Monhegan Island and Bristol has expressed concerns about undersea power cables.	4/1/2015 2:07 PM
2	not to my knowledge.	3/31/2015 4:14 PM

3	Frenchman Bay Partners, which is identifying source of shell fish contamination. Blue Hill Bay communities need help in implementing the Blue Hill Bay Needs Assessment.	3/30/2015 10:09 AM

Q10 Siting of Energy Projects & Government Facilities – Historically, The Maine Coastal Program (MCP) has provided technical assistance and policy development support for the legislature and the Governor's Office on significant energy development-related issues. Is this topic a prevalent concern to the coastal communities in your region at present or predicted to be in the future? If yes, please explain what specific challenges the coastal municipalities in your region face regarding siting of energy projects and government facilities in the space provided below.

Answered: 6 Skipped: 0

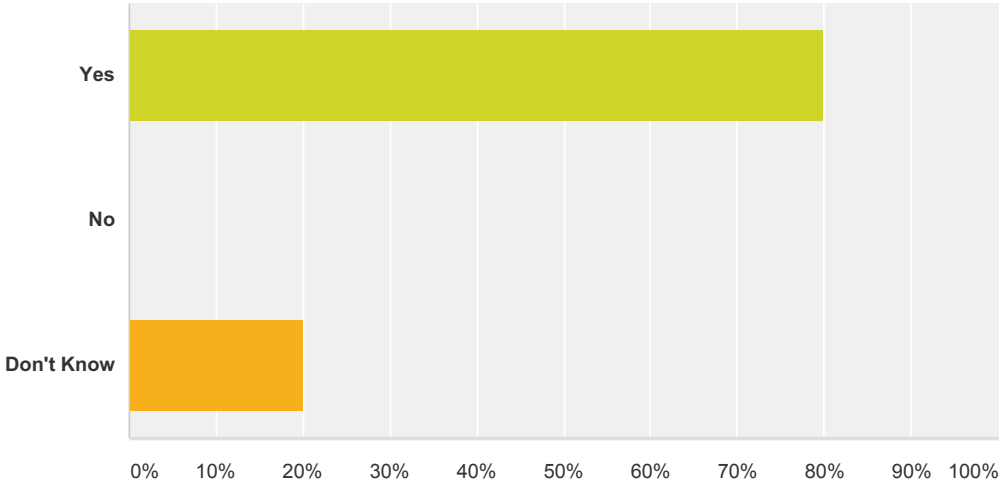


Answer Choices	Responses	
Yes	**33.33%**	2
No	**66.67%**	4
Don't Know	**0.00%**	0
Total		**6**

#	If Yes:	Date
1	There is a lot of controversy in Bristol over the windpower project off Monhegan. UMO has not done a good with the locals (not sure anything would have helped) but there is a lot of misinformation.	4/1/2015 2:07 PM
2	Public resistance to offshore siting of wind energy facilities has been expressed in several communities due to the need for the construction of new transmission lines on the mainland, the potential to degrade fishing grounds, negatively impact other wildlife, the cost of public subsidies, and the visual impact on scenic quality.	3/30/2015 10:43 AM

Q11 Wetlands - MCP works with state, local, federal, and not-for-profit partners to identify, prioritize and restore wetland habitat. Is this topic a prevalent concern to the coastal communities in your region at present or predicted to be in the future? If yes, please explain what specific challenges the coastal municipalities in your region face regarding wetlands in the space provided below.

Answered: 5 Skipped: 1



Answer Choices	Responses	
Yes	**80.00%**	4
No	**0.00%**	0
Don't Know	**20.00%**	1
Total		**5**

#	If Yes:	Date
1	Major issue. How to balance develop needs and an interest in creating more density in certain areas of town, while conserving other less urban areas. Many communities struggle with how to deal with wetlands in these urban growth areas.	3/31/2015 4:14 PM
2	As noted earlier there has not been a lot of analysis to determine the wetland impacts due to SLR. More work in this area is needed in the Southern part of the state.	3/31/2015 3:26 PM
3	Most of the coastal communities I work with have active citizen groups concerned with habitat conservation. Again I am new to the region. I am not aware of specific projects at this time but there is a lot of activity around this topic.	3/31/2015 2:31 PM
4	Monitoring the water quality of wetlands on a regular basis to ensure that they remain healthy and/or are restored, especially in areas seeing new development within the direct watershed or nearby.	3/30/2015 10:43 AM

5	Storm surges and sea level rise, may alter some wetlands. Another concern is contamination of certain wetlands and the loss of biodiversity.	3/30/2015 10:09 AM

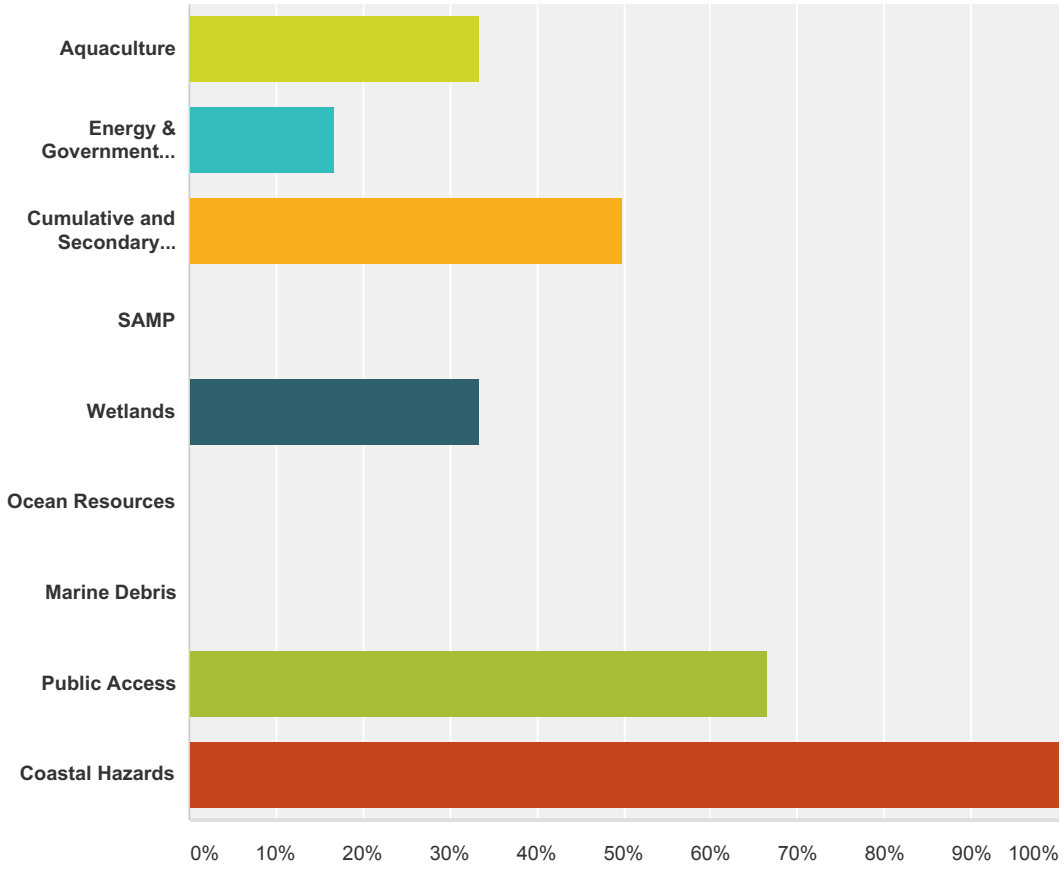
Q12 Do you have additional questions or comments. If so, please provide them in the space below.

Answered: 2 Skipped: 4

#	Responses	Date
1	Again I would like to stress that I only recently started working in this region and so am largely unaware of specific concerns or efforts. Areas in which I indicated a lack of prevalent need are likely of interest to communities in this region but I have not yet heard about them or issues to which they could be applied.	3/31/2015 2:31 PM
2	Municipalities use the comprehensive planning process to learn about coastal resource planning issues and what steps (regulatory and non-regulatory) they should consider supporting. Accordingly, funding the preparation of these plans would be very helpful.	3/30/2015 10:43 AM

Q13 Please indicate the Top 3 Priority Areas in your region:

Answered: 6 Skipped: 0



Answer Choices	Responses	
Aquaculture	**33.33%**	2
Energy & Government Facility Siting	**16.67%**	1
Cumulative and Secondary Impacts	**50.00%**	3
SAMP	**0.00%**	0
Wetlands	**33.33%**	2
Ocean Resources	**0.00%**	0
Marine Debris	**0.00%**	0
Public Access	**66.67%**	4
Coastal Hazards	**100.00%**	6
Total Respondents: 6		

Q14 Please discuss your top priority from Question 11 here. How would you approach this issue? What strategies or projects do you envision that can assist the coastal towns in your region?

Answered: 6 Skipped: 0

#	Responses	Date
1	Coastal hazards are a significant issue in the county. I would like to see one or two projects carried out to a successful conclusion in order to demonstrate that effective and anticipatory planning can accomplish important goals. This will require phase 2 design and implementation funding,	4/1/2015 2:23 PM
2	Wetlands: I would like to see the Coastal program offer training for municipal staff and officials on how to approach this issue regionally using tools to align regulations and develop partners that extend beyond municipal boundaries. The biggest issues for the RPOs is to engage the municipalities together and try to get them to think and act with there neighbors interests as well as their own.	3/31/2015 4:34 PM
3	I think that we need to first map and identify those wetland areas that are directly impacted along the coast. Are great deal of mapping for SLR has been done in general but it needs to be focused on Wetland locations and develop a plan around how to identify the impacts to those areas and how to address those impacts	3/31/2015 3:35 PM
4	Coastal Hazards We are currently working , through DACF, on assisting the MCOG towns in identifying infrastructure at risk to coastal flooding and sea level rise. Communities will then need assistance on what to do address these issues. I see them needing help in three primary areas in regards to public infrastructure: 1: Help in developing plans to deal with at risk infrastructure 2: Financial resources to protect and rebuild at risk infrastructure 3: Guidance about at what point infrastructure can be abandoned (i.e. is it possible for a town to rescind jurisdiction over a road that is under constant and repeated threats to its stability?) Further communities are already starting to worry at the thorny issue of private property that has become at risk. Communities would like to examine ways to discourage development and redevelopment in at risk areas but have to be wary of private property rights. This is a sensitive issue and communities have trouble addressing it locally so any work that can be done to find legally sound and politically palatable approaches would be very valuable.	3/31/2015 2:52 PM
5	The top three priority areas I chose are related and interdependent. Addressing coastal hazards is most pressing. Identifying high hazard areas and recommending regulatory responses would be useful including implementation strategies in the future land use plan, water and marine resource chapters of the comprehensive plan. As well, encouraging voluntary conservation through easements of high hazard areas.	3/30/2015 11:02 AM
6	Cumulative and secondary impacts: We need assessment tools (i.e, examples of how to calculate storm water runoff that is due to the cumulative impacts of various small developments over time). We also need educational tools that allow to present the big picture of how change is occurring along the coast and update the "tool box" of sample ordinances and other town policies. Also some samples of multi-town projects that show how towns have cooperated in assessing development impacts (e.g., multi-town measurement of changes in impervious surface).	3/30/2015 10:48 AM

Q15 Please discuss your next priority from Question 11 here. How would you approach this issue? What strategies or projects do you envision that can assist the coastal towns in your region?

Answered: 6 Skipped: 0

#	Responses	Date
1	Energy and facility siting - UMO did its own thing in Bristol and to date has been unsuccessful. Several years ago Statoil had a similar project, which received good support in BB and BBH. I would like to be able to assist UMO or its successor, assuming they would cooperate. Perhaps too much damage already but maybe not.	4/1/2015 2:23 PM
2	Public Access: Similar issues as above but here I think a statewide study could be a huge benefit. In many cases we can learn a lot from the other RPOs and their communities. Unfortunately in this political climate we are rarely able to work together on things. This would be a great topic for such an effort.	3/31/2015 4:34 PM
3	Coastal hazards are important to our area. We have done a lot of work in this area Additional public education is the most important strategy that needs to get out there. Continues education is required.	3/31/2015 3:35 PM
4	Public access Access to coastal resources is a dearly held amenity in most communities. The recent high profile legal battles in multiple Maine communities has made this a touchy subject and therefore unpopular to address at the local level until absolutely necessary. Any work that can be done in regards to helping towns identify the legal standings of their access points would be appreciated. Similarly draft language and example opportunities to be used in acquiring new access points would be useful for small towns with limited staff capacity.	3/31/2015 2:52 PM
5	Cumulative and secondary impacts are related to coastal hazards. Similar strategies for both topic areas would be warranted for inclusion in comprehensive plan: future land use chapter; going beyond the immediate shoreline to encompass development within the larger watershed that might negatively impact coastal resources. Examining the extent to which the local economy depends upon a healthy marine environment and the potential to improve that sector would be worthwhile by updating the marine resource chapter and economy chapter recommendations of the comprehensive plan.	3/30/2015 11:02 AM
6	Public access: Need case studies we can cite of how towns have overcome the obstacles to creating new public access points. Also, material that describes how to avoid losing current public access. (Possible title: "How to Destroy Public Access Without Even Trying." This material could examine loopholes in CFMA zoning, sample policies on parking, long term vehicle storage, approaches to managing services such as boat wastewater pump out stations, toilets (towns generally don't want the maintenance responsibility) and marine equipment (such as cranes and rescue boats). Another topic is managing the competing needs of recreational and commercial boaters.	3/30/2015 10:48 AM

Q16 Please discuss your final priority from Question 11 here. How would you approach this issue? What strategies or projects do you envision that can assist the coastal towns in your region?

Answered: 6 Skipped: 0

#	Responses	Date
1	Aquaculture - the aquaculture industry would like to expand but two issues are affecting them if the BB and BBH area - water quality associated with OBDs and conflicts with recreational boaters who don't like areas htey use for boating affected by aquaculture facilities. It would be interesting if we could create an off-shore development zone pre-approved for aquaculture or other marine development similar to what DEP is allowed to do under T38 Sec 485A.1.C.	4/1/2015 2:23 PM
2	Coastal Hazards. Although this is definitely an issue, and people are beginning to discuss the issue and how it relates to long range planning, I think many of the communities do not have a sense of urgency. Although they acknowledge it is an issue they will face sometime in the future,they see it a long term and are still not associating storm events etc.. with climate change.	3/31/2015 4:34 PM
3	while there has been a great deal of work in the area of identifying impacts to infrastructure and property, the identification of Cumulative and secondary impacts have not been well documented. It would be nice to have funds available to take all of the current mapping data to the next level on a town by town level to identify those impacts for public consumption	3/31/2015 3:35 PM
4	Aquaculture As I stated before I am new to the region and so am not familiar with the current and ongoing efforts of aquaculture here, that said there is a lot of interest around the issue. It is seen as a way to maintain the working connection between communities and the ocean while injecting new economic activity into the region. This is of particular concern as natural fisheries become more and more depleted. There is also significant concern about the impacts on water quality. Communities are not generally in a position to fully evaluate these concerns themselves and assistance on understanding and regulating aquaculture activities would be useful.	3/31/2015 2:52 PM
5	Improved and expanded public access to coastal waters is sought by several communities in our region on a regular basis. Identifying funding sources to pay for the purchase of property or easements, the maintenance of public facilities, wharfs and piers, is of ongoing importance. Increased funding of these activities would be appreciated by coastal communities and the local businesses that depend upon such access. I recommend that towns allocate local reserve funds on an annual basis to support this. Likewise, MCP should consider expanding the amounts available through existing grant programs.	3/30/2015 11:02 AM
6	Coastal Hazards: Information on how flooding, storm surges, and sea level rise will affect Hancock County. Most of the material has been focused on the southern Maine coast. It would also be helpful to have design standards for increasing the resiliency of waterfront facilities.	3/30/2015 10:48 AM