DRAFT

NORTHEAST **OCEAN PLAN**

NORTHEAST REGIONAL PLANNING BODY

SIX STATES

- Connecticut
- Rhode Island
- Massachusetts
- New Hampshire
- Maine
- Vermont

SIX FEDERALLY RECOGNIZED TRIBES

- Aroostook Band of Micmacs
- Houlton Band of Maliseet Indians
- Mashpee Wampanoag Tribal Council
- Mohegan Indian Tribe of Connecticut
- Narragansett Indian Tribe of Rhode Island
- Wampanoag Tribe of Gay Head (Aquinnah)

NINE FEDERAL AGENCIES

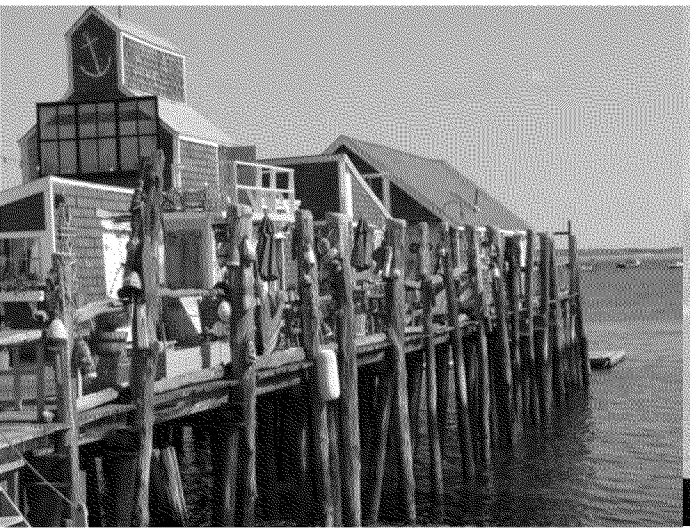
- Joint Chiefs of Staff
- US Department of Agriculture
- US Department of Commerce
- US Department of Defense
- US Department of Energy
- US Department of Homeland Security
- US Department of the Interior
- US Department of Transportation
- US Environmental Protection Agency

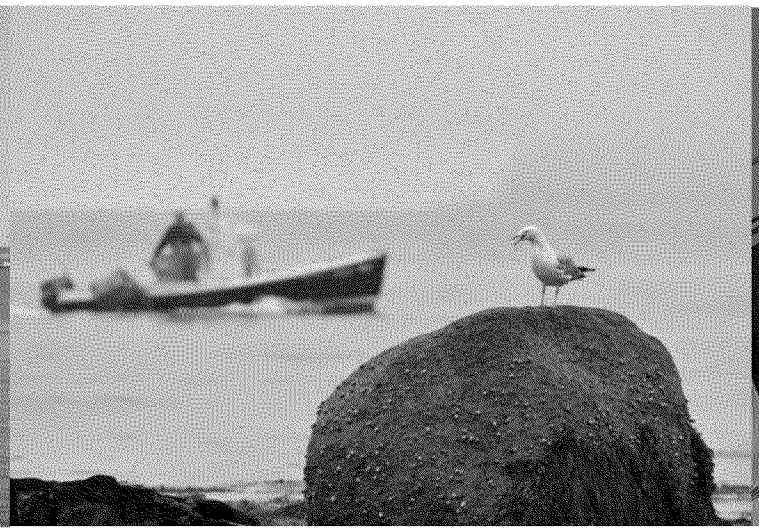
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

EX-OFFICIO MEMBERS

- New York
- Canada

Through a historic, unprecedented effort, federal, state, regional, and tribal entities—the caretakers of New England's marine environment—have joined forces to develop this comprehensive Northeast Ocean Plan. It is a blueprint to protect and manage a public treasure together.





THE OCEAN PLAN

This Plan summarizes the ocean planning process and is a guide to informing agency decisions and practices in order to continue making progress towards achieving regional goals for the management of our public ocean resources.

This Plan recognizes that these goals and a desire to move towards an ecosystem-based approach to management must be achieved through existing legal frameworks by using the best available information and by ensuring public and scientific input in every decision. Therefore, the work is not done and this Plan serves as the foundation for continued progress.

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These chapters describe the path forward for achieving the Plan goals—a path that reflects the RPB's interest in continued public engagement, foundation in sound science, and in advancing an adaptive approach to managing the ocean ecosystem.

04 **CHAPTER 1** describes the unique characteristics of the northeast region and the need for and benefits of ocean planning.

14 **CHAPTER 2** summarizes the ocean planning process to date, including the development of the ocean planning goals, the Northeast Ocean Data Portal and the Plan.

30 **CHAPTER 3** summarizes the regulatory framework for managing ocean and coastal resources. It then provides an in depth look at the primary ocean resources and activities for which this Plan will guide and inform decision-making.

These include:

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138 **CHAPTER 4** describes how the RPB will implement the Plan. This includes best practices for intergovernmental coordination and stakeholder engagement, Plan implementation and oversight responsibilities, and commitments to developing frameworks for monitoring and evaluating plan performance and ocean and ecosystem health.

160 **CHAPTER 5** identifiesknown knowledge and information gaps and organizes those gaps under six primary science and research priorities. These data and information gaps were identified throughout the planning process by the RPB, stakeholders and scientists. Agencies' decisions will be enhanced as each of these individual gaps are filled by the RPB and the broader community over time.

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New England was born of the ocean. The region's identity as well as its vitality is inextricably intertwined with the sea. As with its past, New England's future is equally bound to the fate of the great waters that roll ceaselessly from the northern reaches of the Gulf of Maine to Long Island Sound and the New York Bight far to the south. Sound management of these public resources, and of the regional economy that depends on them, is of paramount importance. That is why federal, tribal, fishery management, and state entities—along with other caretakers of New England's marine environment—have joined forces to develop this Northeast Ocean Plan (the Plan).

The Plan is a direct outgrowth of an Executive Order issued by President Barack Obama on July 19, 2010, titled "Stewardship of the Ocean, Our Coasts, and the Great Lakes."[1] The order built on policy efforts in the previous decade and established an ambitious "national policy to ensure the protection, maintenance, and restoration of the health of ocean, coastal, and Great Lakes ecosystems and resources, enhance the sustainability of ocean and coastal economies, preserve our maritime heritage, support sustainable uses and access, provide for adaptive management to enhance our understanding of and capacity to respond to climate change and ocean acidification, and coordinate with our national security and foreign policy interests." The President tasked federal agencies, through the formation of regional planning bodies, with the responsibility of developing regional ocean plans.

As this was a federal executive order, tribal and state participation was voluntary, but New England states and federally recognized tribes saw the value of this approach and thus have been equal partners in the development of this Plan. The Northeast Regional Planning Body (RPB), composed of representatives from the six New England states, six federally recognized tribes, nine federal agencies, and the New England Fishery Management Council, was formed in 2012. Over the past four years, the RPB combed through reams of data and reports, and solicited input from a wide range of stakeholders and experts each step of the way leading to the draft of this Plan.

The Plan advances three goals: healthy ocean and coastal ecosystems; effective decision-making; and compatibility among past, current, and future ocean uses. The Plan focuses on the ocean environment from the shoreline seaward (thus including waters in state and federal jurisdictions), while recognizing linkages with the ocean to the north, south, and east, as well

07/19/2010
Obama Executive Order
National Ocean Policy

Northeast Regional Planning Body (RPB)

- Six New England states
- Six federally recognized tribes
- Nine federal agencies
- New England Fishery Management Council
- Two ex-officio members: New York and Canada

Northeast Ocean Plan—Goals

1. Healthy ocean and coastal ecosystems
2. Effective decision-making
3. Compatibility among past, current and future ocean uses

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as with coastal communities. Although the Plan imposes no new regulatory requirements, it proposes the use of data, intergovernmental coordination between federal agencies, tribes, and states, and stakeholder engagement to guide and inform RPB agency activities toward meeting these three goals. And it is another step toward advancing a more comprehensive and ecosystem-based approach to managing human activities on the ocean. Reflecting the dynamic environment that it addresses, the Plan, too, will change over time, evolving to better handle emerging issues and incorporating new information.

New England has a long and proud history of innovation and leadership for the United States. The Northeast Ocean Plan itself is a trailblazing effort, being the first-in-the-nation regional ocean plan and serving as a guidepost for those plans that follow. It reflects New England's rich maritime history and resources—and the promise for an even brighter future.

A RICH AND COMPLEX OCEAN ECOSYSTEM

From the rocky outcroppings, sandy beaches, and the verdant salt marshes to ecologically diverse kelp forests and the canyons and deep basins far offshore, New England's waters abound with life. Thousands of animal and plant species share this environment, ranging in size from the tiniest of plankton to the great whales. They all benefit immensely from the cold, nutrient-rich waters, strong tidal mixing, and enormous diversity of habitats, both above and below the waves, that make New England's ocean ecosystem one of the most spectacular and productive in the world.

The region's native plants and animals, and the habitats that sustain them, are spread out along the coast in a string of geographic areas, including Georges Bank, Jeffreys Ledge, Stellwagen Bank, Nantucket Shoals, Narragansett Bay, Long Island Sound, and the largest of them all, the semienclosed sea known as the Gulf of Maine. Although these names demarcate identifiable areas and physical features, they should not obscure the fact that all of New England's coastal waters, and the life they contain, are intricately intertwined and interdependent. Like a beautifully woven fabric, New England's coastal ecosystem is made up of individual threads, each of which contributes to the integrity of the whole.

There is yet another thread, or more accurately, a multitude of threads that are of equal importance—those representing human activity. Humans are neither above nor isolated from New England's coastal ecosystem, but rather they are a critical part of it. In a myriad of ways, human actions affect the ocean environment, and changes in the ocean environment, in turn, greatly affect the quality of human life.

New England's ocean is a very dynamic ecosystem that has always required humans to be adaptable. However, there are an increasing number of warning signals about the future vitality of the ocean as a result of changes in climate and other factors. Rising levels of acidity in ocean waters threaten shellfish and other species, including commercially valuable ones. Historic losses of coastal wetlands will be exacerbated by rising sea levels with some salt marshes having no ability to migrate landward because of development patterns. Changes in fish populations as ocean temperatures rise are increasingly documented. These trends are all indications that large-scale shifts in this naturally dynamic system are already happening, in ways that we likely are only starting to sense.

Thus, the task of managing this complex ecosystem for the public good requires that an astonishing array of factors be considered to ensure that our actions balance the protection and sustainable use of the natural and the human environment.

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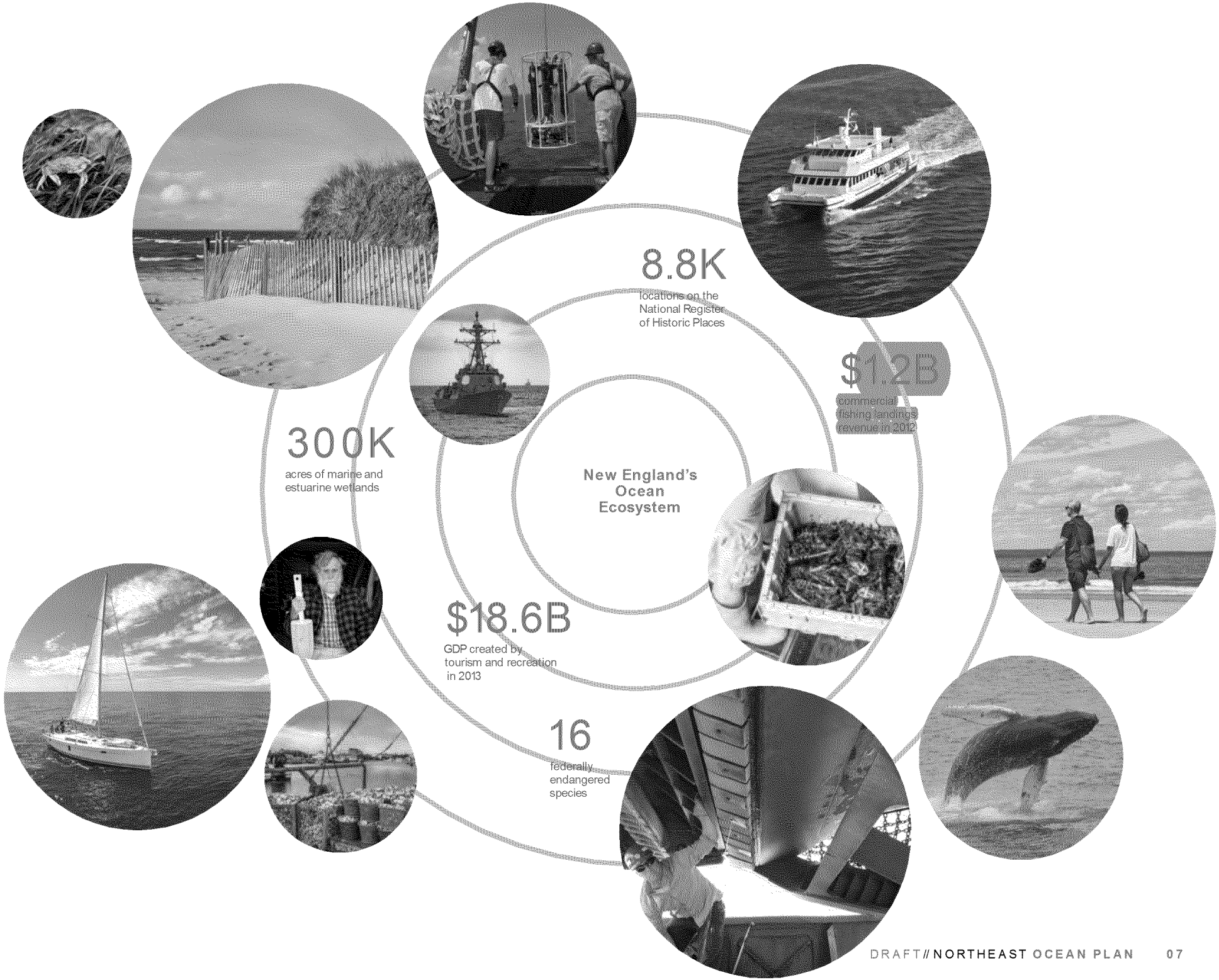

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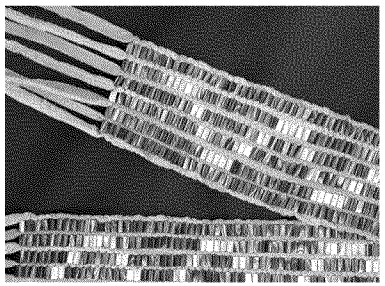
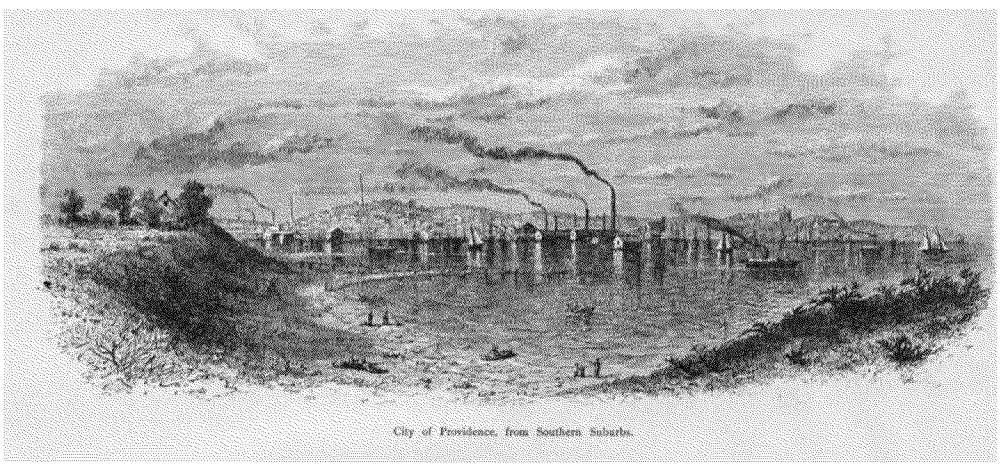


PHOTO: ELIZABETH JAMES-PERRY

The use of wampum for currency was introduced to the English colonists by Native people who also used wampum for record keeping and treaty making. The word wampum is derived from the Southeastern New England tribal word wampumpeake, for "white shell beads." The colonists abbreviated it to "wampum" and used it to refer to both white and purple beads.

HUMAN SETTLEMENT AND OCEAN USE

For thousands of years prior to the arrival of the first Europeans, Native peoples utilized the environment to meet their needs, and in so doing they were also the first humans to benefit from the ocean's bounty. They whaled, harvested fish and shellfish, and used the quahog shell for white and purple wampum adornment and diplomacy. Native people still depend on coastal waters for transportation, trade, recreation, and ceremonial purposes. In traditions built since time immemorial, New England's many tribes developed an enduring and deeply spiritual relationship with the ocean, viewing it, along with the land they inhabited, as Mother Earth, an important source of sustenance that must be kept healthy so that it can continue to provide for the people.



City of Providence, from Southern Suburbs.

When the English first came to New England, they were astonished by the productivity of the coastal waters. On his expedition to northeastern North America in 1602, Englishman Bartholomew Gosnold was so impressed by the vast number of cod that his men caught within sight of a sweeping cape jutting far out into the ocean that he christened this promontory "Cape Cod." A little more than 10 years later, Captain John Smith sailed from London to the New World and gave New England its name. Upon his return to England, Smith urged the adventurous to settle in New England to take advantage of its natural resources and build thriving communities.

From the start, the New England colonies relied heavily on the ocean for their survival. It was their lifeline, providing them with products to consume, barter, or sell, and linking them to the larger world beyond their shores. In the ensuing centuries, up through the present, first the colonies and then the states developed ever-stronger ties to the maritime world. As a result, New England's coast and coastal waters were, and continue to be, critical ingredients in the region's tremendous prosperity and growth, significantly enhancing the quality of life for those who live and work in the region—or only vacation here. Without the extraordinary boost that the ocean has provided, New England would be a very different place.

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Today, New England's ports are hubs for trade and anchors for development. The region's stunning coastline is a magnet for commercial and residential construction, providing one of the most aesthetically pleasing natural canvases upon which to build. A vast array of businesses benefit from the ocean and from ocean-related activities, including shipping, energy, recreational and commercial fishing, aquaculture, and seafood processing, as well as restaurants, marinas, souvenir shops, and whale-watching companies. The ocean economy (defined as marine construction, living resources including fisheries and aquaculture, ship and boat building, marine transportation and related services, ocean tourism and recreation, and a small minerals sector) directly generated $20.8 billion in GDP and directly supported more than 300,000 jobs in the Northeast in 2013.[2] The US military, in particular the Navy and the Coast Guard, rely on the ocean to carry out their missions and maintain national security. An untold number of people view the ocean as a major source of recreation, with activities ranging from relaxing on a beach, exploring coastal wetlands, and visiting cultural landmarks, to sailing, scuba diving, and fishing.

The ocean has been of central importance in shaping the region's character. Indeed, the personality of virtually every seaside city or town in New England is in large part a reflection of its connection to the maritime world. Vibrant communities made up of Native peoples, the commercial and recreational fishing industry, boat builders, and vacationers and "summer people" who flock to the coast contribute to the region's cultural richness, as well as its economic vigor. Tribal members continue as caretakers of the land and waters of the region, which they regard as their spiritual mother: if the land and waters are kept healthy, they will provide for future generations. Ask New Englanders what they love the most about the region, and being close to the coast will certainly rank high on their lists.

THE POWER OF OCEAN SCIENCE

New England boasts some of the world's leading ocean science institutions, research organizations, and academic programs, including Woods Hole Oceanographic Institute, the Marine Biological Laboratory, Massachusetts and Maine Maritime Academies, the New England Aquarium, the Gulf of Maine Research Institute, top marine and oceanographic programs at the University of Massachusetts, the University of Connecticut, the University of Rhode Island, the University of New Hampshire, the University of Maine, Massachusetts Institute of Technology, and Boston University, to name a few. Additionally, federal and state agencies are engaged in many research projects, either by providing funding or undertaking research themselves.

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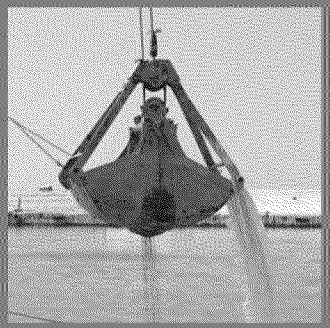

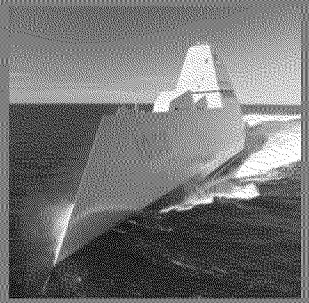

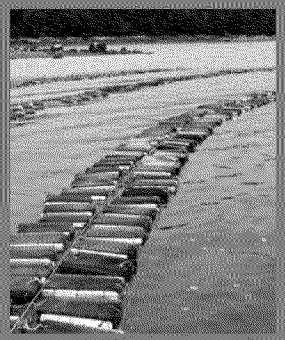

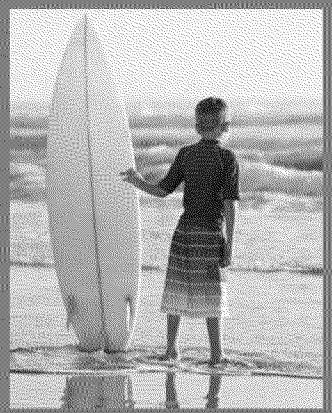

People benefit from ocean resources in many ways, including jobs, food, energy, safety and security, recreational and wildlife-viewing opportunities, transportation, and cultural and spiritual enjoyment.

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BALANCING PROTECTION AND USE

But our relationship with the ocean is not unidirectional, resulting only in benefits and amenities accruing to those who work on the ocean, or live in and visit the region. Human activities can benefit us while simultaneously straining the marine ecosystem. Changes in ocean conditions—driven by climate change or other factors—directly affect many human activities and can exacerbate stresses on species and their habitats.

New England's maritime environmental history offers a valuable lesson: it is much better to be proactive than to try to resolve problems after the fact. Both the environment and humanity benefit from such proactive behavior, not only in the form of a healthier ecosystem, but also as a result of economic savings. The Plan is based on this very simple, yet powerful, philosophy. By encouraging foresight and the improved coordination and planning such an approach necessitates, the Plan is designed to help the region with its management decisions, as the Northeast simultaneously explores new ocean uses, such as wind energy, and protects this rapidly changing environment.

Numerous laws administered by local, regional, state, tribal, and federal agencies have a critical role in balancing the use and protection of ocean resources. Most of these laws and agencies were established to address specific topics or resource needs. At the federal and regional level, dozens of federal, tribal, and state agencies are involved in ocean management, including the Department of Agriculture, Department of Commerce which includes the National Oceanic and Atmospheric Administration, Department of Defense, Department of Energy, Department of Homeland Security, Department of the Interior (which includes the Bureau of Ocean Energy Management, National Park Service, US Fish and Wildlife Service, and US Geological Survey), Department of Transportation, the Environmental Protection Agency, and the New England Fishery Management Council. With responsibilities and authorities for managing the public resources of the ocean under a host of laws, these agencies regulate many human activities on or near the ocean. A number of state agencies also have responsibility for many of the same activities as a result of state laws that address state-level policy and management goals. Within states, municipal and county- or other regional-level agencies involved in planning or permitting add a critical local layer of engagement, oversight, and protection for coastal resources. And beyond regulations, there are numerous nonregulatory government initiatives aimed at conserving, restoring, understanding, and maintaining healthy ocean ecosystems (including habitat restoration, infrastructure enhancements, data collection, water quality improvement programs, and invasive species assessments), providing for economic or recreational opportunities and advancing scientific understanding of the ocean.

All of these entities, laws, and nonregulatory efforts do not operate in isolation from one another. Owing to both practical necessity and legal requirements, many of the relevant actors are required to consult and coordinate with one another to consider how their responsibilities overlap and to be responsive to the public. The goal of such collaboration is to ensure actions and projects are implemented in a manner that not only satisfies legal requirements but, importantly, accounts for the needs and interests of stakeholders. Typically, through the environmental review process (with public input through the National Environmental Policy Act and state counterparts) and the issuance of a range of permits and leases, multiple agencies spell out the conditions under which a proposed project can be undertaken. Thus, these existing processes require agencies to continually coordinate with each other, a key aspect of this Plan.

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The study area for data collection and stakeholder engagement for the Northeast Ocean Plan. It includes important ecological and political boundaries that influence ocean resources and activities in the Northeast. It also overlaps with the study area for the Mid-Atlantic RPB.

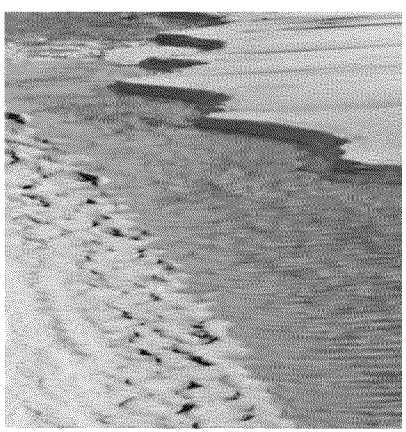
THE NORTHEAST OCEAN PLAN

The Plan is a forward-looking document intended to strengthen intergovernmental coordination, planning, and policy implementation, while at the same time enhancing the public's ability to participate in the process of managing ocean resources. Its initiatives and actions aim to improve the process of data collection and dissemination, enhance stakeholder input and involvement, locate potential areas of conflict, identify additional information and science needs, and promote core goals that will protect and enhance New England's marine ecosystem.

The Plan is a foundation, not a finished structure. It will continue to evolve as new information, needs, and trends emerge. The Plan lays out a strategy for monitoring and analyzing trends in ecosystem health, and for periodically assessing and communicating progress toward achieving its three main goals. If such evaluations indicate a need for goals and objectives to be modified, or for new goals to be set, then the RPB will undertake efforts to do so, employing the same transparent and extensive methods that it originally used to create the Plan.

In the end, the Plan's emphasis on improved data, intergovernmental coordination, stakeholder engagement, and reevaluation will help achieve the goals of healthy oceans and coasts, more-effective decision-making, and compatibility among uses, and will only increase the odds that the ocean environment that results is the one we want.

NOTE: Chapter 1 was written by author Eric Jay Dolin



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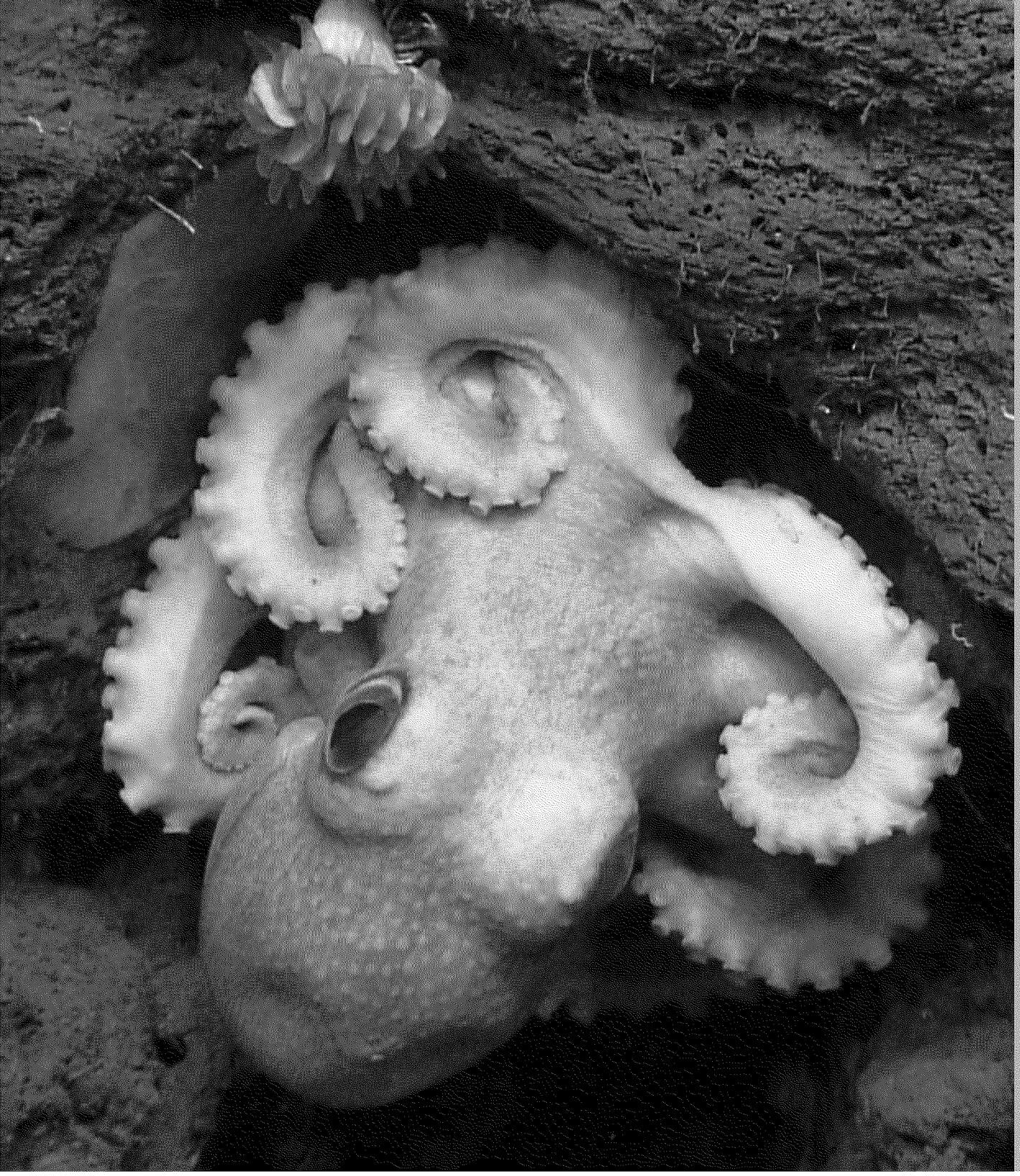

Northeast RPB principles

- **Meaningful public participation**. Reflect the knowledge, perspectives, and needs of ocean stakeholders—fishermen, scientists, boaters, environmental groups, leaders in the shipping, ports, and energy industries, and all New Englanders whose lives are touched by the ocean.
- **Sound science**. Use accurate, up-to-date data and information, ranging from traditional knowledge to innovative mapping technologies.
- **A comprehensive, ecosystem-based approach**. Consider the "big picture" of ecological, economic, cultural, and other needs in our region.
- **Transparent, efficient government decision-making**. Reduce duplication and inefficiency in decision-making, and coordinate among agencies and governments based on a common vision, common information sources, and clear decision-making processes.
- **Adaptive management**. Update decisions as we learn more about patterns of ocean uses, and as environmental, social, and economic conditions change.

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2 Ocean Planning in New England

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Ocean planning in New England has its genesis in numerous efforts and activities that took place in the decade prior to the formation of the Regional Planning Body (RPB). During this time, a growing awareness of significant changes in the ocean environment, combined with incoming proposals for new ocean activities, made it clear that a renewed focus on coordinated ocean management was warranted.

In response, New England's governors formed the Northeast Regional Ocean Council (NROC) in 2005 to coordinate state and federal agencies involved in ocean management issues in the region. At the state level, Rhode Island and Massachusetts completed their initial ocean plans by 2010. In 2011 and 2012, NROC held regional workshops to learn from state-level efforts and to discuss potential approaches to developing a regional ocean plan. Additionally, the Northeast Ocean Data Portal (Portal) was first launched in 2010 to begin integrating data with the goal of providing a regional perspective on ocean management issues. Nationally, the Interagency Ocean Policy Task Force convened in 2009, eventually leading to the development of the National Ocean Policy, which President Obama adopted in Executive Order 13547 in 2010. Collectively, these coordination, information development, and policy efforts helped set the stage for the development of this Northeast Ocean Plan.

In 2011, preparation continued for the formal ocean planning process. Representatives from each of the RPB entities were identified, stakeholder engagement was planned, and work continued on the development of the Portal. The first formal meeting of the RPB occurred in 2012. As the RPB began its work, it engaged multiple audiences and stakeholders in an effort to inform the development of ocean planning goals and to establish reference information on human activities and the ecosystem. The RPB held public meetings and initiated several projects to gather this information, collaborating with scientists, the fishing industry, boaters, the recreation community, and environmental groups, as well as leaders in the shipping, aquaculture, and energy industries.

In 2014, this engagement led to the formation and adoption of the ocean planning goals, objectives, and an associated work plan *(Framework for Ocean Planning in the Northeast United States)*. The work plan detailed the tasks the RPB would undertake to develop the Plan—including the continued development of peer- and expert-reviewed data through stakeholder engagement and expert work groups.

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Ocean Resources & Activities

MARINE LIFE & HABITAT

CULTURAL RESOURCES

MARINE TRANSPORTATION

NATIONAL SECURITY

COMMERCIAL & RECREATIONAL FISHING

RECREATION

ENERGY & INFRASTRUCTURE

AQUACULTURE

OFFSHORE SAND RESOURCES

RESTORATION

The intent of this data development was to provide a foundation for the Plan by characterizing 10 aspects of ocean management and policy, which spanned human activities, cultural resources, and the ecosystem. These 10 ocean resources and activities became the focus of the Plan because of their individual importance to the region and the role they play in existing ocean management and policy. Additionally, many of the stakeholders in the region are associated with, or experts in, one of the 10 aspects. Working with these experts was an important organizing component of the RPB's stakeholder engagement activities.

Maps and data characterizing the ocean resources and activities are included in the Portal, which is an online source of spatial data developed by the RPB in collaboration with the Northeast Ocean Data Portal Working Group (the Portal Working Group). Throughout the ocean planning process, the Portal was an important vehicle for engaging stakeholders and for informing options for the development of the Plan (e.g., by reviewing draft data products). It will also be an important tool for implementing the Plan by providing publicly accessible, expert-reviewed data on human uses and activities for agency and public use.

PLAN DEVELOPMENT PROCESS

The RPB directed the Plan development process and developed the substance of the Plan. From the outset, it did so along multiple simultaneous tracks, each of which informed and built on the others. **Formal RPB meetings** were convened roughly every six months, and each of these meetings included time for public comment. Prior to each meeting, the RPB convened public workshops and gatherings focused on upcoming topics and decisions. RPB decisions always followed a consensus-based approach that welcomed and incorporated public and stakeholder input. Seven multiday public meetings of the RPB occur beginning in November 2012 and culminating in the issuance of the draft Plan in spring 2016.

Between RPB meetings, there was **ongoing outreach** to obtain public feedback, identify and discuss issues, review data, and procure scientific input. As described below, this outreach included meetings of expert work groups, large public forums and workshops designed to inform RPB decision-making, dozens of state-level meetings and workshops, information-gathering meetings with specific stakeholder groups, and conversations with smaller groups of stakeholders. Additionally, RPB members were responsible for internal communication and coordination (e.g., within

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agencies, tribes, states, and the New England Fishery Management Council). Only the combined energy and effort of all these entities, working together, made the development of this Northeast Ocean Plan possible.

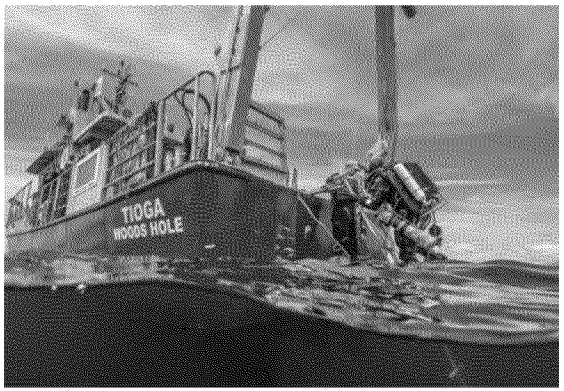
OUTREACH AND ENGAGEMENT

The outreach, engagement, and collaboration-focused activities initiated and conducted between formal RPB meetings included the following:

Stakeholder forums and workshops: The RPB periodically convened public workshops and stakeholder forums throughout the planning process. These events were designed according to the particular topic at hand (i.e., using presentations from expert speakers or facilitated sessions to obtain detailed feedback or brainstorm ideas), and overall, they were more interactive and less formal than RPB meetings. Starting in fall 2014, stakeholder forums were generally held three to six weeks before each RPB meeting and focused on pending topics and decisions. Workshops focusing on specific topics were held periodically throughout the process; for example, in June 2014 the RPB conducted a natural resources workshop, and in April 2015 it initiated a workshop to explore ecosystem-based management.

State-based public meetings and advisory groups: The RPB periodically convened a series of local events throughout the planning process. For example, over an approximately five-week span in May and June 2013, the RPB hosted 10 public meetings throughout New England to obtain public input on a set of draft goals and objectives. Similar to the workshops and forums mentioned, these events were designed to be more interactive and less formal, allowing the public to engage RPB members and staff. These events were often coordinated with state-based advisory group[2] meetings.

Subject-specific projects, targeted outreach, and work groups: Much of the RPB's data and information, public input, and scientific expertise was obtained through topic-specific projects primarily organized around the 10 ocean resources and activities. One additional project explored regulatory efficiencies and best practices across ocean resources and activities. Each project included an extensive outreach component. A work group or subcommittee composed of members from RPB organizations and experts in the subject matter guided the project to enable scientific and peer review of project approaches and results. For example, approximately 80 scientists from academia, RPB agencies, and other entities



participated in the marine life work groups that reviewed and informed the methodology and draft products characterizing marine life distribution and abundance. A separate work group discussed potential approaches to meeting the effective decision-making goal by focusing on federal regulatory programs and their implementation. Projects were designed to engage stakeholders in the development of maps and other data and information products; thus, they were also opportunities to discuss with stakeholders the ocean planning effort more generally. Cumulatively, thousands of stakeholders representing various activities related to the ocean were engaged through these projects, which represented a large proportion of the overall engagement effort.

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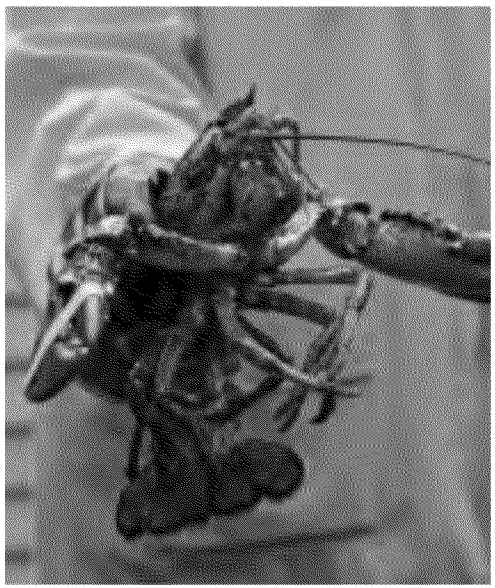

Opportunistic outreach: The PRB engaged stakeholders through existing meetings and conferences, including those of the New England Fishery Management Council, the Atlantic States Marine Fisheries Commission, the Maine Fishermen's Forum, the American Wind Energy Association, the Environmental Business Council of New England, and the port-based Harbor Safety Committees (which convene members of the port and maritime community), as well as at the biennial Northeast Aquaculture Conference and Exposition. These events allowed the RPB to reach individuals within a particular economic sector or community of practice, often in an informal setting conducive to focused discussion.

Throughout the planning process, stakeholders were continually encouraged to review spatial data on the Portal and to help interpret maps, provide additional information, or suggest appropriate uses of the information in the Plan. Their input was invaluable in creating and validating the data in this repository.

Northeast Ocean Data Portal development: Science-based and stakeholder-informed data products form the foundation of the Plan. Throughout the planning process, stakeholders were continually encouraged to review spatial data on the Portal and to help interpret maps, provide additional information, or suggest appropriate uses of the information in the Plan. Their input was invaluable in creating and validating the data in this repository. Since June 2013, the Portal has averaged over 5,000 visits from 2,400 unique visitors per month. Several months counted over 10,000 visits from more than 5,000 unique visitors.

Electronic and social media: The RPB maintained a website and social media presence to provide updates on its activities and to document planning-related activities and outcomes, such as project reports, public comments, and meeting summaries. The website also included (and continues to offer) a tool for stakeholders to submit comments at any time, on any subject, and to sign up for the RPB's email list. The email list was used by the RPB to provide pertinent information about upcoming events and to announce the availability of meeting materials and project reports.

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NORTHEAST OCEAN DATA PORTAL

www.NortheastOceanData.org

MARINE TRANSPORTATION

The Northeast Ocean Data Portal is an online, publicly accessible repository that offers a wealth of current scientific data and maps describing key aspects of the 10 ocean resources and activities covered in the Plan. Additionally, it provides important contextual information on other aspects of the ocean environment and economy. The Portal was developed and is maintained as a foundational element of the Plan by the Portal Working Group with oversight by the RPB and with extensive input from the stakeholders, government agencies, and scientists in the region. It is intended to be a shared source of peer-reviewed regional information that will inform and support decision-making and the activities of the many stakeholders who interact with the ocean.*

Clicking on each ocean resource or activity icon brings up a data-rich map or array of maps representing critical information for that resource. Each map and data layer includes descriptions of how the data were developed and reviewed by experts in the region, important considerations for using the data, and links to additional information, including comprehensive metadata and the ability to search BOEM's Environmental Studies Program Information System (ESPIS) for additional scientific information on a specific topic. In addition to the numerous informative maps, individuals or organizations can download many of the underlying data sets that support those maps or visualize multiple sets of information with an interactive data explorer. The Portal also provides animations showing changes over time, interactive story maps, and a centralized repository for bathymetric and eelgrass surveys in the region.

The maps present information that experts in the 10 ocean resources and activities, and those engaged in ocean policy and management, identified as extremely valuable. For example, the maps provided under Marine Transportation display such critical information as recommended routes, traffic lanes, shipping safety fairways, dangerous or restricted areas, and the current footprint of commercial shipping activity. Marine Life & Habitat maps provide a wealth of information about mammals, sea turtles, birds and fish and their respective habitats. The maps available for Energy & Infrastructure indicate coastal energy facilities for hydro, oil, gas, nuclear, coal and wind energy, as well as the locations of transmission lines, pipelines and cables, and offshore renewable energy planning areas.

The Portal allows users to view each map individually, or to select and view multiple layers of data on one map. Together, the maps on the Portal convey the great diversity of the ocean ecosystem and illustrate the many ways human and environmental resources interact. They also comprise a shared and validated knowledge base to inform the review of future proposals and actions that have the potential to impact ocean and coastal resources.

* The Portal Working Group is composed of representatives from the Northeast Regional Ocean Council, NOAA, SeaPlan, The Nature Conservancy, RPS ASA, Waterview Consulting, and the Northeastern Regional Association of Coastal Ocean Observing Systems. While the Portal includes an extensive library of peer-reviewed regional maps and data, there are likely to be other sources of information that are also applicable to regulatory and management decisions.

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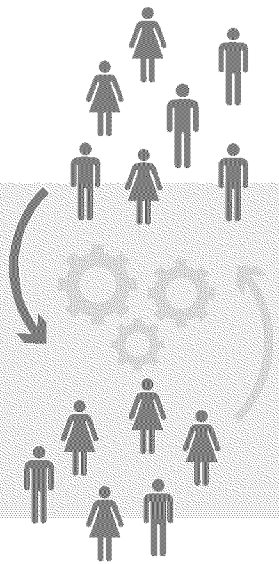


RPB MEETINGS

2012 — 2013 — 2014

1 **11/19–11/20**
PORTLAND, ME
Focus:
Determine operation of RPB

2 **04/11–04/12**
NARRAGANSETT, RI
Focus:
Establish regional planning goals

3 **01/22–01/23**
CAMBRIDGE, MA
Focus:
Approve goals, objectives, and framework for the Plan

OUTREACH + ENGAGEMENT

IDENTIFY ISSUES // REVIEW DATA
INFORM DECISIONS // PROCURE SCIENTIFIC INPUT
UNDERSTAND CULTURAL RESOURCES

Stakeholder forums + workshops

3–6 weeks before each RPB meeting

Focus on upcoming RPB decisions

State public meetings + advisory groups

Interactive and informal

Throughout New England

plan groundwork

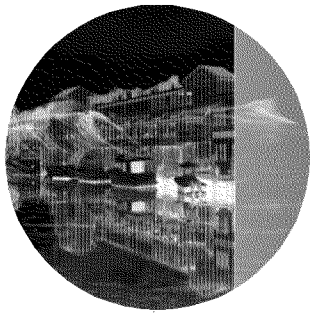
2005–2012

2005 First Northeast Regional Ocean Council convened

2009/2010 Rhode Island and Massachusetts completed initial ocean plans

2010 Northeast Ocean Data Portal: First version launched

2011/2012 Regional workshops: Learn from state-level efforts and discuss potential approaches



4

06/26
CAMBRIDGE, MA

Focus:
Review outcomes of Natural Resources Workshop

5

11/13–11/14
NEW CASTLE, NH

Focus:
Decide on options for Plan development

6

06/03–06/04
MYSTIC, CT

Focus:
Review and modify draft Plan outline

7

11/16–11/17
PORTLAND, ME

Focus:
Decide on draft Plan content and future of RPB

2015

Subject specific projects + targeted outreach + work groups

Cumulatively reached thousands of people across many issue areas

Expert/scientific review of methods, products

Existing meetings + events

Leveraged existing opportunities to reach stakeholders

Various topics, throughout New England

Website + social media + eblasts

Calendar and RPB updates

Project reports, meeting summaries, other products

Northeast Ocean Data Portal

Online, publicly accessible data repository

Expert/scientific review of maps

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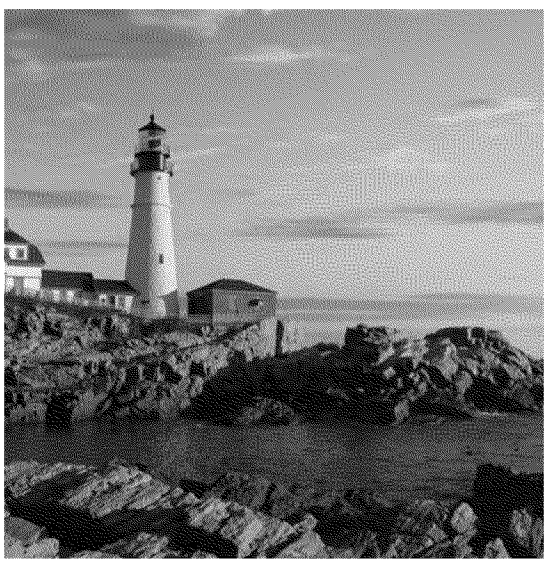
FORMAL RPB MEETINGS

The following timeline summarizes the outcomes of each of the seven RPB meetings, recognizing the importance of these decisions in guiding the planning process and in the development of the draft Northeast Ocean Plan.

November 19–20, 2012

The inaugural RPB meeting, held in **Portland, Maine,** focused on the operation of the RPB. At this meeting the RPB agreed to:

- Make decisions by consensus.
- Continue developing a charter describing RPB members' commitment to working together.
- Implement diverse stakeholder engagement activities.



April 11–12, 2013

The second RPB meeting, held in **Narragansett, Rhode Island,** focused on the resolution of remaining RPB operational considerations and the establishment of regional planning goals. At this meeting, the RPB decided to:

- Approve the Northeast RPB Charter[3], including inviting New York and Canada as ex-officio RPB members.
- Continually review its public engagement efforts to strive to be flexible, transparent, informal, and cost-effective.
- Adopt three overarching planning goals: healthy ocean and coastal ecosystems; effective decision-making; and compatibility among past, current, and future ocean uses.
- Implement various activities to engage the public in the development of objectives, actions, and a work plan to achieve the three Plan goals.

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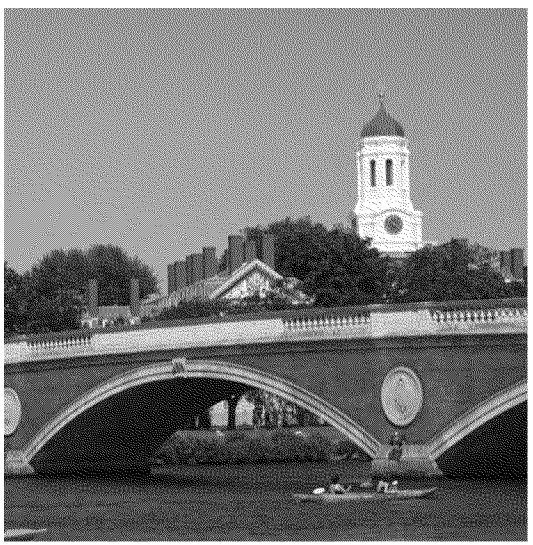
January 22–23, 2014
At the third RPB meeting, held in **Cambridge, Massachusetts,** the RPB reviewed, modified, and adopted the draft *Framework for Ocean Planning in the Northeastern United States*. The framework includes principles, goals, and objectives, and a work plan with specific actions and intended outcomes to advance these goals and objectives, and to generally guide development of the Plan.



June 26, 2014
The RPB held its fourth meeting in **Cambridge, Massachusetts,** focusing on outcomes from the previous day's natural resources workshop, identifying next steps for the effective decision-making goal, and deciding on technical and stakeholder advisory options. The RPB agreed to:

- Convene public stakeholder forums prior to RPB meetings to enhance opportunities for public input on RPB decisions.
- Utilize a flexible roster of technical experts to advise on specific issues, including forming expert work groups to inform the development of marine life distribution and abundance data products.
- Formulate next steps for engaging federal and state agencies and members of the regulated community to further develop options for meeting the effective decision-making goal.

November 13–14, 2014
At its fifth meeting in **New Castle, New Hampshire,** the RPB focused on reviewing an initial plan outline and decisions related to progress under each of the three goals. The RPB agreed to:

- Continue to advance work toward identifying important ecological areas by summarizing marine life and habitat management areas already identified through existing authorities; characterizing marine life species distribution and abundance; and considering additional approaches to define important ecological areas using marine life and habitat products.
- Explore options for the development and use of ocean health indicators.
- Continue developing data products characterizing marine life and habitat, cultural resources, and human activities, and to consider developing agency guidance for the use of those data products in existing regulatory processes.
- Continue exploring options for improving agency coordination and effective decision-making by developing best practices for tribal coordination, preapplication best practices for federal regulatory and environmental review programs, and opportunities to enhance the implementation of the Coastal Zone Management Act.

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June 3–4, 2015

The RPB's sixth meeting, in **Mystic, Connecticut,** included reviewing and modifying an outline for the draft Plan by adding an introductory section to describe RPB and stakeholder aspirations for improving management of ocean activities and resources. The RPB also adopted a work plan for developing components of the draft Plan, including:

- Drafting agency guidance for the use of marine life and human use maps and related information in existing regulatory processes.
- Forming an Ecosystem-Based Management (EBM) Work Group to assist in several aspects of Plan development, beginning with development of a methodology to identify important ecological areas using data from across taxonomic groups.
- Developing best practices for agency coordination, stakeholder engagement, and coordination between federal agencies and tribes.
- Developing specific approaches to monitoring and evaluation, and to identifying science and research priorities.

November 16–17, 2015

The RPB held its seventh meeting (its final meeting before issuing a draft Plan) in **Portland, Maine,** focusing on final decisions and details related to draft Plan content. At this meeting the RPB:

- Reviewed and discussed a detailed outline of the Plan.
- Reviewed progress on marine life characterization, the EBM Work Group, and other components of Chapter 3.
- Discussed draft text of best practices for agency coordination to be included in Chapter 4.
- Received an update on a project to generally characterize climate change impacts on the ocean environment.
- Decided on a Chapter 4 framework to monitor plan performance and ecosystem health, including use of the Ocean Health Index and the Integrated Sentinel Monitoring Network.
- Decided on a framework for science and research priorities in Chapter 5.
- Decided the RPB should continue and generally provide oversight for Plan implementation beyond 2016.

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Ocean Planning Goals

In January 2014, the RPB adopted the following goals and objectives:

Goal: Healthy ocean and coastal ecosystems

- Characterize the region's ecosystem, economy, and cultural resources.
- Identify and support existing nonregulatory opportunities to work toward conserving, restoring, and maintaining healthy ecosystems.
- Produce a regional ocean science plan that prioritizes ocean science and data needs for the region for the next five years.

Goal: Effective decision-making

- Coordinate existing federal and state decision-making processes.
- Implement specific actions to enhance public input in decision-making.
- Incorporate maps and other products into agency decision-making processes.
- Improve respect for the customs and traditions of indigenous peoples in decision-making processes.
- Improve coordination with local communities in decision-making processes.

Goal: Compatibility among past, current, and future ocean uses

- Increase understanding of past, current, and future interactions among ocean uses and the ocean and coastal ecosystem.
- Ensure that regional issues are incorporated in ongoing efforts to assess new and existing human activities.

All goals

- Periodically assess progress toward achieving regional ocean planning goals.

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Developing Peer- and Expert-Reviewed Data to Make Better Decisions

A major outcome of the RPB's outreach and engagement are the maps and data included on the Northeast Ocean Data Portal. The RPB agencies will use these products to support ocean management decisions, as described in Chapter 3.

MARINE LIFE & HABITAT

- **Three expert marine life work groups:** Marine mammals and sea turtles, birds, and fish

  Work groups included more than 80 regional scientists and stakeholders

  Together they reviewed methods and map products, beginning at an individual species level and then focusing on ecological, regulatory, and stressor-based groupings of species
- **Two public workshops:** Natural resources workshop June 2014

  EBM workshop April 2015

  Cumulatively over 200 participants
- **Marine-life Data and Analysis Team (MDAT):** MDAT developed the map products under the direction of the RPB

  Team composed of over a dozen agency and academic scientists

RESULT

150 marine life species characterized

Physical and biological habitats characterized

Peer-reviewed database

Collectively, a powerful information base to inform initial assessments of impacts to species and habitats, identify issues needing further study, and continue to advance ecosystem-based management.

MARINE TRANSPORTATION

- **Two rounds of focused outreach**, with meetings in ports in each state attended by pilots, port operators, shipping companies, US Coast Guard (USCG), and state and local officials
- **Regular updates** at harbor safety committee meetings in each port from Maine to New York
- **Regular presentations** at North Atlantic Port Association meetings and briefings with national-level trade associations
- **Presentations** at pilot association meetings, propeller clubs, and other local events

RESULT

The appropriate use of ship tracking data to map the footprint of commercial vessel traffic and maps of other existing use areas (pilot boarding areas, safety and security zones).

Identification of ways the RPB can use this data in regulatory and management activities.

COMMERCIAL & RECREATIONAL FISHING

- **Two rounds of outreach**—each with meetings in fishing ports and with fishermen, managers, and scientists throughout New England
- **Regular attendance** at New England Fishery Management Council meetings
- **Periodic updates** at state advisory committee meetings, with fisheries organizations, and with agency staff
- **Participation in large industry events:** New Bedford Working Waterfront Festival, Maine Fishermen's Forum, and Massachusetts Lobstermen Association Annual Weekend and Trade Show

RESULT

Identification of the footprint of certain federally managed fisheries, including illustrations of fishing and transit areas. Maps can be used in an initial assessment of potential interactions between these fisheries and proposed activities.

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AQUACULTURE

- **Two rounds of meetings** throughout New England, each focused on understanding the current state of the industry and on permitting and siting challenges for new offshore operations
- **Continued discussions** through regular participation in regional meetings such as the Northeast Aquaculture Conference and Exposition

RESULT

Maps depicting the regional footprint of aquaculture

Increased understanding of the regulatory challenges associated with siting new offshore operations

Ideas about how regional data products could inform planning and siting of aquaculture.

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ECOSYSTEM-BASED MANAGEMENT (EBM)

According to the Scientific Consensus Statement on Marine Ecosystem-Based Management, "Ecosystem-Based Management is an integrated approach to management that considers the entire ecosystem, including humans. The goal of Ecosystem-Based Management is to maintain an ecosystem in a healthy, productive and resilient condition so that it can provide the services humans want and need. Ecosystem-Based Management differs from current approaches that usually focus on a single species, sector, activity or concern; it considers the cumulative impacts of different sectors."

In April 2015, the RPB held an ecosystem-based management workshop to understand the different definitions, frameworks, and stakeholder perspectives for implementing ecosystem-based management, and to explore potential opportunities for incorporating ecosystem-based management principles into regional ocean planning. Based on extensive research and public input, the RPB, in collaboration with regional scientists, identified the following key elements of ecosystem-based management.

- **Protect and restore marine ecosystems**
- **Consider cumulative effects**
- **Facilitate connectivity**
- **Acknowledge uncertainties**
- **Create complementary policies over a range of scales**
- **Maintain native biodiversity to provide resilience to changes**
- **Develop indicators to measure the effectiveness of management efforts**
- **Involve all stakeholders**

In September 2015, the RPB convened the Ecosystem-Based Management Work Group, composed of scientists from federal agencies, states, tribes, and academia. The EBM Work Group reviewed the marine life and habitat data referenced in this Plan and helped develop a regional definition of important ecological areas (IEAs), including a framework for using existing data to identify those areas. The EBM Work Group will continue to inform the RPB during Plan implementation, focusing on informing the development of ocean health indicators, the use of the IEA Framework, and the identification and advancement of science and research priorities.

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PLAN ACTIONS AND IMPLEMENTATION

The remainder of this Plan details the actions that the RPB and its individual entities intend to undertake to meet the Plan's goals and objectives. The Plan is also organized to provide opportunities to advance an ecosystem-based approach to ocean management, as defined by the key elements of EBM. As this Plan occurred under the direction of a federal Executive Order, many of the actions will be the responsibility of the RPB's federal agencies.

Chapter 3 presents actions for using data and information in the Portal and Plan within the existing regulatory and management framework. The chapter includes maps and data characterizing human activities, recognizing the importance of humans in the ecosystem, our reliance on and connection to ocean resources, and the need to consider these factors when new projects are proposed. It also identifies actions for using new data depicting marine life distributions and underlying habitat, and includes accompanying information characterizing the uncertainty associated with these data products. The Plan organizes many of these marine life datasets into species groups that will enable an ecosystem perspective during decision-making.Importantly, the commitments in Chapter 3 go beyond using maps to make decisions; they include commitments to maintaining and updating these information sources, enhancing agency coordination with respect to the specific data collection or regulatory and management processes for each of the ocean resourcesand activities, identifying and communicating with potentially affected stakeholders during agency decisions, and determining additional information and science needs. Chapter 3 also identifies actions to coordinate on ecological restoration activities in the region.

Chapter 4 describes RPB actions and commitments to implement the Plan and to periodically assess and adapt the Plan as necessary. The chapter describes best practices to enhance coordination across federal agencies and between federal agencies, states, and tribes, and to ensure the consideration of Plan information and stakeholder input into pertinent agency decisions. It includes federal agency responsibilities for the continued maintenance and updating of the Portal. It also includes an approach to assessing Plan performance and actions for future ocean ecosystem health monitoring. Finally, it describes the manner in which the RPB would amend or update the Plan in response to stakeholder feedback, emerging issues, monitoring results, and scientific advancements.

Chapter 5 organizes science and knowledge gaps according to six broad priorities to address identified ocean management needs and advance EBM. These priorities include increasing our understanding of marine life and habitats, tribal cultural resources, and human activities, including connections to coastal communities and the interactions between and among uses. They also include priorities to better understand the vulnerability of marine resources to specific stressors and to characterize changing environmental conditions and the resulting impacts to resources and uses.
The chapter also puts forth a priority to use these foundational marine life and human use data, along with other information, to advance ecosystem-management by quantifying ecosystem services and cumulative impacts.

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3 Regulatory and Management Actions

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Protecting ocean and coastal resources, traditional ocean uses, and community character while simultaneously considering changing environmental conditions and proposals for new offshore activities presents a complex set of challenges. In addition, effective ocean management must be achieved through the numerous laws and regulatory and management structures that exist at the federal, state, and local levels. In order to effectively and efficiently fulfill their obligations, agencies increasingly need to work together across this complicated array of challenges and laws. Doing so allows them to effectively consider and ensure their actions are informed by the overarching ecological and socioeconomic context and the various interactions between ocean resources and activities.

This level of contextual understanding and federal agency cooperation requires regional-scale data and information, access to the data and related products, guidance for using the products to inform decisions, and processes for government agencies to improve communication and collaboration regarding the management of each ocean resource and activity.

This chapter addresses all of the above. It describes how federal agencies on the Regional Planning Body (RPB) will incorporate data and information developed as part of the Northeast Ocean Plan into performing and accomplishing the critical tasks involved in managing individual ocean resources and activities within the existing regulatory and management framework. It also describes how the RPB will advance aspects of regional coordination that are specific to each of the 10 ocean resources and activities.

The **Regulatory and Management Context** section of this chapter provides a high-level overview of the existing federal governance framework for protecting and managing ocean resources and human activities. This section includes an overview of the federal environmental and regulatory laws and management-related programs; it is not an exhaustive list of all federal statutes that may apply in every instance, but it focuses on those that are most relevant to this Plan, as determined by the RPB in the *Framework for Ocean Planning in the Northeast United States*.

Throughout this chapter, recognizing that this Plan is under the authority of a Presidential Executive Order, the actions are intended to be implemented by those federal agencies that are signatories to the Plan ("RPB agencies"). Because the Plan was a collaborative effort involving federal agencies, tribes, states, and the New England Fishery Management Council, specific roles for nonfederal agency members in these actions are also described where appropriate. The actions described in this chapter apply in accordance with the extent of jurisdiction of each particular federal authority and therefore apply, as appropriate and pursuant to existing law, in state and federal waters.

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Following this brief overview are 10 individual **ocean resource or activity** sections representing the primary ocean resources and activities described in the Plan, and for which this Plan will guide and inform agency regulatory and management decisions. Each ocean resource or activity section includes the following subsections:

- An **overview** of the importance of each ocean resource or activity to ocean management
- Any **regulatory and management** considerations that are particularly relevant to the specific ocean resource or activity
- Peer-reviewed **maps and data** available on the Portal
- Regulatory and management **actions** identified by the RPB

The actions for each ocean resource or activity section are grouped into the following three categories:

1. Actions that maintain, update, and develop additional data for the Portal
2. Actions that inform regulatory and management decisions under existing authorities
3. Actions that enhance interagency coordination

These categories are similar across the 10 sections of this chapter because they are common areas of interest for the agencies and stakeholders that participate in regulatory and management processes (i.e., enhancing interagency coordination, informing regulatory and management decisions, and keeping the Northeast Ocean Data Portal updated is common across all 10 topics). The combined effect of the actions is intended to result in enhanced federal agency coordination and shared understanding of each of the ten ocean resources or activities, as also described in the Intergovernmental Coordination section of Chapter 4.

The actions provided for each ocean resource or activity highlight important details that are specific to that resource or activity. They also identify connections across the 10 ocean resources and activities and encourage exploration of these important cross-sectoral and sectoral-resource interactions. For example, certain actions describe the potential for specific data products to be used in assessing use compatibility or conflict issues. These actions describe the use of data to help identify specific stakeholders who could be affected by a particular project in a particular geography for further discussion about compatibility considerations that are specific to the unique characteristics of the proposed activity and existing activities in the location.

The Marine Life and Habitat section includes maps of ecologically grouped species and stressor-sensitivity-grouped species, which can be used to help identify ecosystem components or locations with species that may be vulnerable to particular types of stressors. Accompanying these actions are descriptions of the manner in which data products, with full regard for their limitations, can be helpful in beginning to understand potential interactions with particular resources or activities. Maps from the Portal are included to provide examples to accompany and illustrate these descriptions.

Finally, while this chapter describes data on the Portal that were reviewed by stakeholders and subject matter experts to provide important regional context for decisions, there are still likely to be many other sources of information that are applicable to any regulatory or management question. For example, in some portions of the region, there may be more site-specific or locally specific data available for any particular topic. In addition, some agencies may require additional data collection in support of specific regulatory and management decisions. Lastly, new scientific papers, datasets, and other information may have become available since the time of publication of any dataset or of this Plan. The Portal contains links to some additional sources of online information but is not exhaustive of all topics. For these

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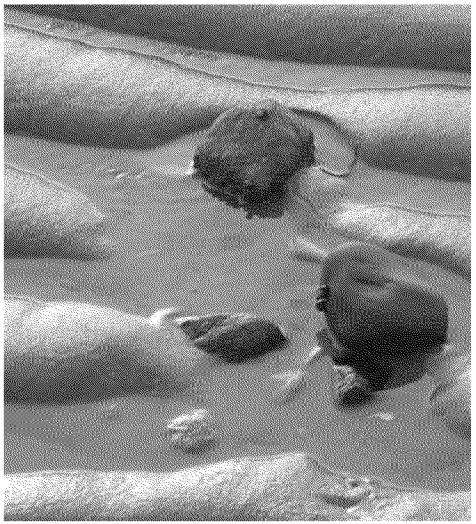
reasons, early consultation with appropriate agencies is always recommended to determine data and information needs. In addition, the best practices for intergovernmental coordination described in Chapter 4 will help to identify additional information requirements for regulatory decisions.

REGULATORY AND MANAGEMENT CONTEXT

This section provides a brief summary of the existing federal laws applicable to agencies that regulate and manage marine resources and human activities. It focuses on those **federal environmental and regulatory laws** and **management activities** that are most pertinent to the implementation of the Plan, but it is not intended to be exhaustive of all federal (or state) laws, agencies, and programs that may be applicable. Because the primary purpose of the Plan is to inform the actions of federal agencies, pursuant to Executive Order 13547, this discussion focuses on federal laws and programs. Tribal, state, and New England Fishery Management Council responsibilities and authorities that significantly intersect with federal agency authorities also are described. A brief description of each law mentioned here can be found in Appendix 1, Primary Federal Laws. For a listing and description of potentially applicable laws, please refer to the National Ocean Council's "Legal Authorities Relating to the Implementation of Coastal and Marine Spatial Planning."[1]

Geography is a key part of determining the full regulatory and management context for a proposed activity. Off New England, coincident with the extent of state ownership of submerged lands, state jurisdiction generally extends three nautical miles offshore. Federal law also applies in state coastal waters. Federal ownership extends seaward of the general three-mile limit of state ownership to the edge of the exclusive economic zone (EEZ) (approximately 200 nautical miles offshore). Consequently, within state coastal waters, both state and federal laws may apply; seaward of state waters, federal laws apply. However, several federal laws provide states an opportunity to influence decision-making in federal waters, including the federal Coastal Zone Management Act (CZMA), which allows states with approved state coastal programs to review federal actions for consistency with state policy. As a part of federal agency implementation of other laws governing specific activities, such as renewable energy leasing through the Outer Continental Shelf Lands Act (OCSLA) in support of which the Bureau of Ocean Energy Management (BOEM) has developed intergovernmental task forces, states can inform federal decision-making. Also, the rights and interests of federally recognized tribes, including their government-to-government relationships with the United States, are recognized and addressed throughout chapters 3 and 4.



Generally, the regulatory and management actions expressed by the RPB in this chapter will enable more consistent regional characterizations of existing conditions and trends, support the identification and avoidance of potential conflicts and resource impacts, aid in the determination of potentially affected stakeholders, and help federal agencies identify additional information or scientific research that may be necessary or warranted to inform decisions. Used in conjunction with the best practices described in Chapter 4, these actions will enhance governmental coordination and foster more-effective decisions that will advance progress toward healthy oceans and compatibility among uses.

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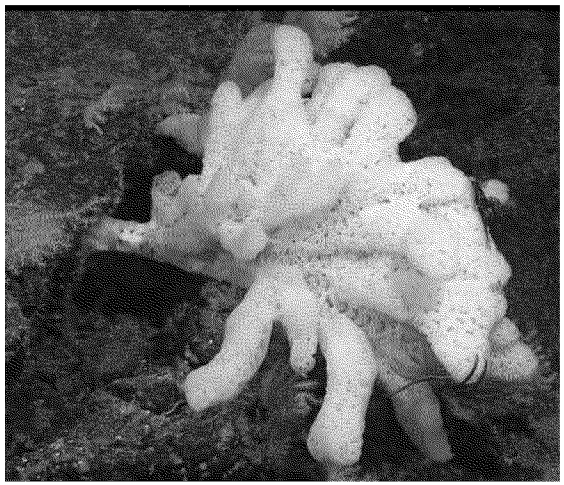

FEDERAL ENVIRONMENTAL AND REGULATORY LAWS

This Plan focuses on federal environmental review, regulatory, and management authorities that are particularly relevant to the 10 ocean resources and activities addressed in this Chapter. For the purposes of the Plan, these authorities can be organized in three categories of laws that apply to proposed management or development activity, as follows. First, and as described in greater detail later, two laws, the National Environmental Policy Act (NEPA) and the CZMA, provide for a broad assessment of the environmental and socioeconomic impacts of federal actions that could affect the natural or human environment. Second, there are laws that have primary responsibility for governing specific activities, such as OCSLA, the Marine Protection, Research and Sancuaries Act (MPRSA), the Deepwater Port Act (DWPA), the Rivers and Harbors Act (RHA), and/or the Clean Water Act (CWA). Review under these laws typically results in the issuance of permits, licenses, leases, rights-of-way, or other kinds of federal approvals. Third, a number of laws provide for the review of issue-specific impacts associated with proposed management or development activities, including the Migratory Bird Treat Act (MBTA), Marine Mammal Protection Act (MMPA), Endangered Species Act (ESA), National Historic Preservation Act (NHPA), Magnuson-Stevens Fishery Conservation and Management Act (MSA), and the Ports and Waterways Safety Act (PWSA). In practice, the three categories of laws typically work in concert with each other; for example, NEPA review is used to identify and present much of the data and information required by all other applicable laws.

The **National Environmental Policy Act** requires federal agencies to review the environmental effects of their proposed actions. This requirement applies to agency-led or agency-funded projects and the issuance of federal permits, licenses, and leases pursuant to the laws (and for the activities) listed in Table 3–1. Thus, NEPA is a central, common component of the general federal regulatory and management structure for managing human activities in the ocean. NEPA action (in the form of a categorical exclusion, an environmental assessment/finding of no significant impact, or, for those projects with significant environmental impacts, an environmental impact statement) is conducted by the lead federal agency undertaking or authorizing an activity. The lead agency also consults and coordinates with other federal agencies, as well as state agencies and tribes as appropriate. NEPA review occurs as part of federal agency responsibilities in implementing offshore leasing programs, licensing and permitting laws applicable to infrastructure development, and other activities, including those listed in Table 3.1.

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Table 3.1 // Federal laws and lead agencies related to particular ocean resources or activities

LAW	AGENCY	OCEAN RESOURCE OR ACTIVITY
Outer Continental Shelf Lands Act (OCSLA)	BOEM	In federal waters: • Offshore sand extraction • Oil and gas planning, leasing, and development • Offshore wind energy leasing and development • Alternative uses of existing facilities (wave and ocean current energy) in conjunction with the Federal Energy Regulatory Commission
Deepwater Port Act (DWPA)	MARAD and USCG	Liquefied natural gas (LNG) facilities in federal waters
Marine Protection, Research and Sanctuaries Act (MPRSA)	EPA and USACE	Disposal of dredged material (and other material) and disposal site designation or selection often associated with navigation projects
Clean Water Act (CWA)	USACE and EPA	Discharge of dredged or fill material, including impacts to various components of the aquatic ecosystem and, through the public interest review,[2] an evaluation of probable impacts, including cumulative effects, across coastal and ocean resources and activities
Section 10 of the Rivers and Harbors Act (RHA)	USACE	Navigational impacts of new activities, such as energy in state waters, aquaculture, cables and pipelines, and others; also includes public interest review (see Appendix 1)

NOTE: BOEM = Bureau of Ocean Energy Management; EPA = Environmental Protection Agency; MARAD = Maritime Administration; USACE = US Army Corps of Engineers; and USCG = US Coast Guard.

Federal agencies typically conduct NEPA review prior to or in concert with the review required under these laws as the basis for determining whether to issue a license, permit, lease, or other authorization. The scope and extent of the NEPA review depends on the proposed activity and its potential impacts on the human and natural environment, which is typically determined as an initial step in the NEPA process. NEPA documents typically include a description of the affected environment, the proposed activity, and alternatives to the proposed activity. They also include an analysis of the potential for environmental impacts (and their significance) that would result from the proposed activity and alternatives, and ways in which these impacts potentially could be mitigated. In marine environments, this means that NEPA reviews consider potential impacts to existing human activities such as marine transportation, fishing, boating, and other activities; historic and cultural resources; and environmental resources, such as species and habitats.

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Many federal laws require the analysis of impacts to specific activities, species, or habitats during review of a proposed activity. Typically, these analyses are conducted as part of the statutory process most directly applicable to the proposed activity (e.g., OCSLA, DWPA, MPRSA, CWA, or RHA). Information to inform decision-making under these (and other applicable) authorities is generally incorporated into the NEPA review associated with the lead federal action. Agencies responsible for administering these authorities act in a consulting and coordinating capacity to the lead federal agency to ensure that obligations under these laws are met. (Table 3.2)

Table 3.2 // Federal laws requiring the analysis of specific resources or activities, and responsible agencies

LAW	AGENCY	OCEAN RESOURCE OR ACTIVITY
Ports and Waterways Safety Act (PWSA)	USCG	Navigational safety and security
National Historic Preservation Act (NHPA)	ACHP, NPS, other federal agencies, and state and tribal historic preservation officers	Historic preservation, cultural significance
Magnuson-Stevens Fishery Conservation and Management Act (MSA)	NOAA and NEFMC	Marine fisheries management, Essential Fish Habitat, Habitats of Particular Concern
Marine Mammal Protection Act (MMPA)	NOAA	Cetaceans and pinnipeds
Endangered Species Act (ESA)	NOAA and USFWS	Threatened or endangered species, critical habitat
Migratory Bird Treaty Act (MBTA)	USFWS	Migratory birds
National Marine Sanctuaries Act	NOAA	Habitat

NOTE: ACHP = Advisory Council for Historic Preservation; NEFMC = New England Fishery Management Council; NOAA = National Oceanic and Atmospheric Administration; NPS = National Park Service; USCG = US Coast Guard; and USFWS = US Fish and Wildlife Service.

Finally, for many federal activities, federal consistency review under the CZMA is required. As defined in the CZMA, federal consistency review means that federal actions within or outside a state coastal zone, which have reasonably foreseeable effects on any coastal use (land or water) or natural resource of the coastal zone, are required to be consistent to the maximum extent practicable with the enforceable policies of a state's federally approved coastal management program[1].

MANAGEMENT ACTIVITIES

In addition to the responsibilities described above, federal agencies fulfill their statutory obligations through an extensive array of management activities and programs. Similar to the overview of the most pertinent federal environmental and regulatory laws described above, the Plan does not describe every management activity undertaken by federal agencies. Instead, this chapter includes the most pertinent and applicable programs, including, for example, marine life and habitat management and research programs or specific programs related to the management of the Marine Transportation System. The individual sections of this chapter provide additional examples and related agency actions.

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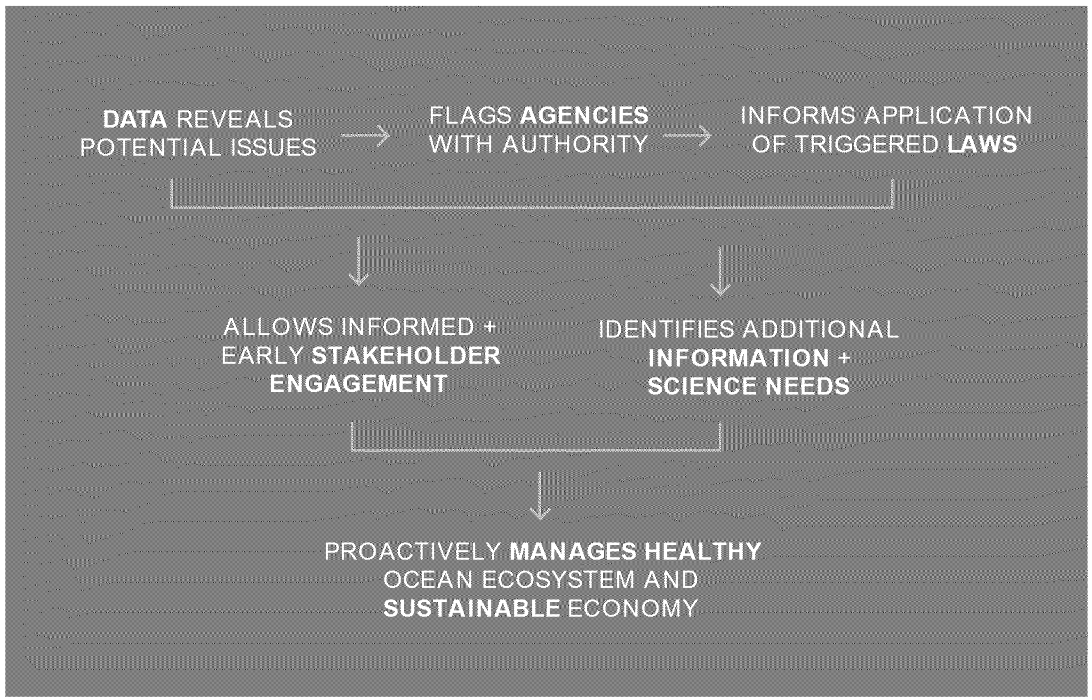
In general and depending on their nature, federal management activities and programs are also subject to NEPA and one or more of the environmental and regulatory laws described above. For example, NEPA review is conducted for many restoration projects and scientific research investigations that have the potential to effect the environment. As described previously, the level of detail of such review is dependent on the activity in question, its location, and the potential for impacts.

Finally, in the Northeast region of the United States, there are numerous federally designated and managed areas, such as the Stellwagen Bank National Marine Sanctuary (managed under the National Marine Sanctuaries Act and administered by NOAA), National Estuarine Research Reserves (managed by NOAA and other partners), National Estuary Programs (administered by the EPA and other partners), several units administered by the National Park Service (Acadia National Park in Maine, Cape Cod National Seashore, Boston Harbor Islands National Recreational Area, and various historic sites throughout New England), and several National Wildlife Refuges administered by the US Fish and Wildlife Service. Specific areas within state waters may also be designated and managed for certain purposes. States often have roles and responsibilities in managing or administering some of the previously identified federally designated areas; these areas are typically managed according to management, conservation, and research plans. Management activities are always subject to applicable federal law. For example, NEPA analysis often accompanies a management or conservation plan for a federally designated area. Lead agencies will also have to consider applicable resource protection laws, such as the ESA, when developing a management plan. Additionally, proposed activities within a managed area are reviewed to determine their compatibility with the pertinent management plan and underlying statutory authority. Finally, activities outside of a particular management area may also be reviewed to determine potential effects upon that area, its natural resources, or other issues.

DATA // AGENCIES // LAWS



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MARINE LIFE & HABITAT

The diversity and richness of the marine life and habitats of the Northeast are a testament to one of the most productive marine ecosystems on the planet. The region's location, bridging the Acadian province in the north and the Virginian province to the south, fosters high productivity. Ocean currents carrying cold, nutrient-rich waters circulating counterclockwise through the Gulf of Maine, the influence of the Gulf Stream and riverine inputs throughout the region, and the presence of highly productive estuaries such as Long Island Sound and offshore habitats such as Georges Bank all contribute to this complex, dynamic, and intricately detailed ecological tapestry. It's because of these habitats and species that New England's history is so interwoven with the ocean.

The Northeast is home to thousands of marine species, some of which are found nowhere else in the world. Hundreds of bird species find their feeding, breeding, or wintering grounds here after continental- or even hemispheric-scale migrations. Dozens of marine mammal species call the Northeast home for some or all of the year, including six species of whales listed under the federal Endangered Species Act. Hundreds of fish species are found from estuarine and salt marsh habitats to the deepest waters of the continental margin; many of these species are pursued by fishermen, and others are prey for other fish, marine mammals, and birds. All of these species are in some way supported by the countless phytoplankton, zooplankton, and benthic invertebrates that form the base of this ecosystem's food web.

We know much about these species, how they interact, and their habitats, but there is much more to learn. Recent years have demonstrated increasingly rapid changes in the distribution of many species and their habitats: warming waters drive some species northward and/or to deeper waters; increasing numbers of warm-water species change the composition of ecological communities in the region; alterations to the timing of the seasons shift migration patterns; increasing acidification affects shellfish; and other changes.

Therefore, a main focus during development of this Plan was to enhance marine life and habitat data. An unprecedented amount of peer-reviewed regional data are now available to characterize the distribution and abundance of marine life and habitats. From these basic building blocks, more complex measures of the ecosystem can be constructed: biodiversity,

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species richness, assessments of ecosystem function, and more. As each building block is refined, the dependent measures get stronger and our understanding of the ecosystem improves.

For many coastal communities, the traditional dependence on the coastal and marine ecosystem and on the continued health of marine life and habitats continues to this day. The role that marine life and habitats play in our livelihoods is also reflected in the amount of management attention that species and habitats get: a large proportion of fish, bird, and mammal species—and their habitats—are monitored, managed, and protected through various federal and state programs and laws. Marine life and habitat data were developed for the Plan while considering the information needs of agencies as they implement these existing authorities.

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REGULATION AND MANAGEMENT

Numerous laws and federal, state, and tribal programs directly relate to the regulation, management, and conservation of marine life and habitat in New England. Federal actions, including regulatory activities (such as licensing, permitting, and leasing) and management activities (such as restoration projects, general management plans, and wildlife conservation plans) are subject to a variety of federal laws and regulations. These laws include NEPA and the individual laws requiring specific investigations into the potential effects of federal action, whether adverse or beneficial, to the ecosystem and individual species and habitats. Therefore, this section applies, but is not limited to, each of the previously identified **federal environmental and regulatory laws** and related processes, including:

- NEPA
- Leasing, licensing and permitting laws (such as OCSLA, CWA, DWPA, RHA, and MPRSA)
- Natural resource consultations applicable to federal leasing, licenses, and permits (such as ESA, MSA, MMPA, MBTA, and the National Marine Sanctuaries Act [NMSA])

This Marine Life and Habitat section also generally applies to the **management activities** previously described in the introduction to Chapter 3 and specifically applies, but is not limited to, other federal programs and activities identified here because they are particularly relevant to this Plan, including:

- Federally designated and managed areas (such as Stellwagen Bank National Marine Sanctuary, National Park Service [NPS] units, National Wildlife Refuges [NWR], National Estuary Program [NEP] units, and National Estuarine Research Reserve System [NERRS] units)
- The US Fish and Wildlife Service (USFWS) Coastal Program, which works with partners to implement fish and wildlife habitat restoration and to build conservation capacity at the landscape scale
- The USFWS National Coastal Wetlands Conservation Grant Program, which provides funding to states to support the long-term conservation of coastal wetland ecosystems.
- Conservation and science partnerships involving USFWS, including the Atlantic Coast Joint Venture (ACJV), the Sea Duck Joint Venture (SDJV), the North Atlantic Landscape Conservation Cooperative (NALCC), the Atlantic Marine Bird Conservation Cooperative (AMBCC), and the Atlantic Flyway Shorebird Initiative (AFSI), which generally support conservation and decision-making by identifying conservation goals, potential threats, and developing related science. An example is the New England/Mid-Atlantic Bird Conservation Region (BCR-30) Implementation Plan which identified high-priority bird species and habitats in the coastal area.
- The NOAA Community-Based Restoration Program, authorized by MSA, to implement and support the restoration of fishery and coastal habitats
- The Northeast Region Marine Mammal and Sea Turtle Stranding and Disentanglement Network
- Oil spill contingency plans, restoration plans, and natural resource damage assessments under the Oil Pollution Act

MAPS AND DATA

The Framework for Ocean Planning in the Northeast United States includes an action to produce regional spatial characterizations of marine life (marine mammals, sea turtles, birds, and fish) and habitat. The framework further states that the RPB will involve the public and science community in the development and

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review of these spatial characterizations and in complementary products demonstrating the scientific certainty of the results. Additionally, the RPB expressed the desire for the Plan to include regional-scale data and information products that could inform decision-making and enhance agency coordination under existing laws, recognizing that there are other sources of data that will be applicable in certain circumstances. For example, site-specific information will be necessary to assess potential for construction and operations impacts for many development activities.

All of the marine life and habitat maps and data included in the Portal were informed by marine mammal, bird, and fish work groups composed of over 80 regional scientists and managers,[2] the Ecosystem-Based Management Work Group,[3] Northeast Regional Ocean Council's (NROC) Habitat Classification and Ocean Mapping Subcommittee,[4] similar proceedings in the Mid-Atlantic region, and by public input. The result of this scientific and public review is an unprecedented number of regional-scale marine life and habitat data for use in ocean planning, management, and conservation, along with accompanying documentation of the methods used, potential limitations of the data products, and links to additional information sources.

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The majority of the **marine life data** (marine mammals, birds, and fish) were developed through a partnership with the Marine-life Data and Analysis Team (MDAT)[5] which collaborated with the RPB and expert work groups to produce **individual species maps** characterizing the distribution and abundance or biomass of 150 marine mammal, bird, and fish species, including measures of uncertainty to supplement each map. For this work, the RPB, with input from the expert work groups, identified a study area that extends from Hudson Canyon in the south into the Bay of Fundy to the north, with the intent of capturing the broader ecological context. The RPB and MDAT attempted to map as much of this study area as possible with consistent and repeatable methods. Therefore, the geographic extent of the maps depends on the availability of data and the specific methods chosen to model or map each taxa. To fill some of the geographic gaps, the Portal includes many additional marine life data products from other sources. For example, gaps in nearshore areas, such as in Long Island Sound, are (or are being) filled using state trawl data (for fish) and data from the Environmental Sensitivity Index (ESI), the USFWS Mid-winter Waterfowl Survey, and other coastal sources (for birds). In addition, Chapter 5 further describes science and research needs to continue to fill gaps in information, both geographically or for species that are not well-understood.

Due to agency, work group, and public feedback, the RPB further aggregated these individual species base products into maps for a range of species groups within each marine life category to provide additional information to support different regulatory, management, and conservation activities. Generally, marine life species have been aggregated into the following groups:

- Maps of species grouped by their **regulatory or conservation priority status** depict the distribution and densities or biomass of marine life species that have been formally protected or designated as a species of concern or are managed through a specific federal program or partnership.
- Mapsof **ecologically and biologically grouped species** portray the distribution and abundance or biomass of species with similar characteristics or life history requirements, enabling an ecosystem perspective during decision-making.
- Maps of species grouped by their sensitivity to specific stressors enable a better understanding of specific interactions between marine life and human activities and the potential effects of ecosystem changes.

The **habitat data** were compiled by the Portal Working Group from authoritative regional sources with input and review by data managers and subject matter experts. While these maps characterize habitat structure and a range of ecological processes, the Habitat theme on the Portal is subdivided into *physical habitat* and *biological habitat* to simplify data access and to group similar products.

- Mapsof **physical habitat**, such as oceanographic properties and sediment types, depict the structure and dynamics of the ocean environment that shape marine life and human activity patterns.
- Mapsof **biological habitat** display the distribution of valuable marine organisms that form habitats, such as eelgrass, shellfish beds, benthic fauna, and maps of important biological processes, such as primary and secondary productivity.

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The marine life and habitat maps on the Portal provide managers, scientists, conservationists, members of ocean industry, and others with a library of information to use as necessary to inform many types of decision-making. They provide a regional and, in some cases, Atlantic coast–wide perspective, supporting management and decision-making at different scales when combined with subregional and site-specific information. The entire library of marine life and habitat data includes many maps and it is unlikely that the full contents of the library will be relevant to every decision. It is intended that portions of the library will be used to address specific questions or to inform specific decisions in conjunction with site-specific data, scientific literature, public input, and many other sources of information.

Regulatory or conservation priority species and habitat groups

Agency and public feedback during the development of this Plan identified the need for spatial products depicting groups of marine life species and habitats that are identified or designated through one of the federal environmental and regulatory laws or by one of the previously described nonregulatory management activities. Therefore, the RPB developed aggregate maps characterizing the abundance, diversity, richness, and core abundance/biomass areas[6] for groups of marine life species with this type of special status (Table ML 3.1).

The Portal also contains aggregate maps characterizing the extent of specific habitat areas identified in one of these laws or management programs (Table ML 3.2). These marine life and habitat products provide the opportunity to determine whether a potential action or conservation measure could affect concentrations of species or habitats that are regulated under existing law or managed through a particular program.

The marine life species group products initially were reviewed by the expert work groups and will continue to be reviewed by experts and stakeholders during the review of the draft Plan. Therefore, the species group products are labeled "draft" in the Portal. The RPB will revise these products and this section accordingly.

Table ML 3.1 // Regulated and managed species groups available on the Portal

PORTAL THEME	REGULATED AND MANAGED SPECIES GROUPS*	AUTHORITY
Marine Mammals & Sea Turtles	All cetaceans	MMPA
	Marine mammals species of concern and ESA-listed species	MMPA, ESA
Birds	All migratory birds	MBTA
	Species of concern: State-listed	ESA, MBTA
	Species of concern: ESA-listed	ESA, MBTA
	Species of concern: BCR 30 priority	ESA, MBTA
	Species of concern: AMBCC species of conservation concern	ESA, MBTA
Fish	All Fish	MSA
	Managed species: Northeast Multispecies Fishery Management Plan	MSA
	Managed species: Small Mesh Multispecies Fishery Management Plan	MSA
	Managed species: Monkfish Fishery Management Plan	MSA
	Managed species: Skates Fishery Management Plan	MSA

* Total abundance, richness, diversity, and core abundance area

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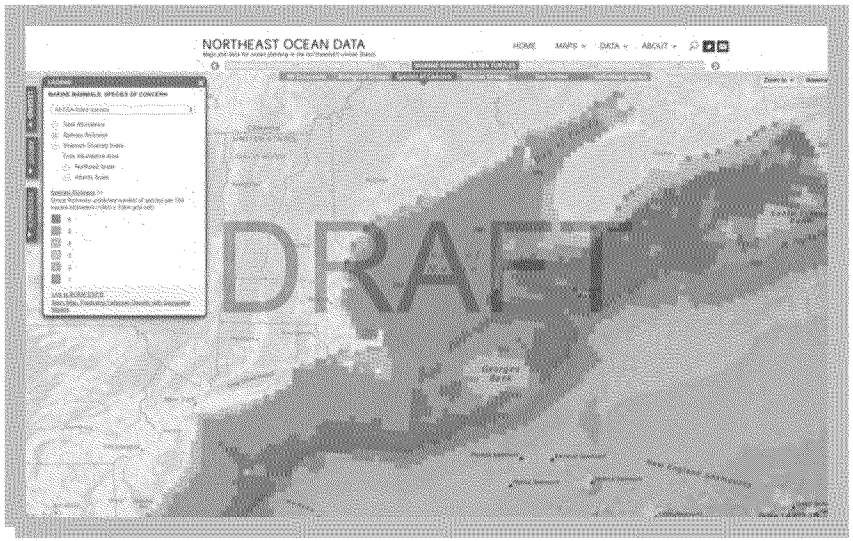
Table ML 3.2 // Regulated habitat areas available on the Portal*

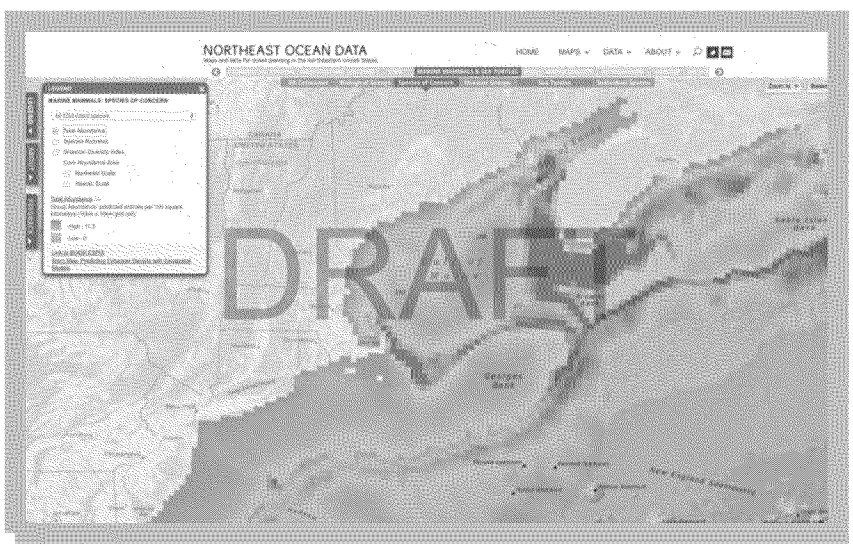
PORTAL THEME	REGULATED HABITAT AREAS (AREAL EXTENT)	AUTHORITY
Marine Mammals & Sea Turtles	Critical habitat for ESA-listed species (where available)	ESA
Fish	Habitat areas of particular concern	MSA
Fish	Essential fish habitat	MSA
Habitat (Biological)	Eelgrass	CWA
Habitat (Biological)	Wetlands	CWA
Habitat (Biological)	Vegetated shallows	CWA
Habitat (Biological)	Mud flats	CWA
Habitat (Biological)	Corals	CWA

* Note that the location of other, more broadly regulated habitat areas, such as the boundary for the Stellwagen Bank National Marine Sanctuary, are also available through the Portal.

Maps of regulatory-based species groups provide the opportunity to determine whether a potential action or conservation measure could affect concentrations of species or habitats that are regulated under existing law or managed through a particular program. For example, these maps show the predicted annual abundance and richness of marine mammal species that are listed as endangered under ESA and therefore suggest the relative likelihood of interactions with these protected species.



Richness



Abundance

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Ecologically and biologically based species groups

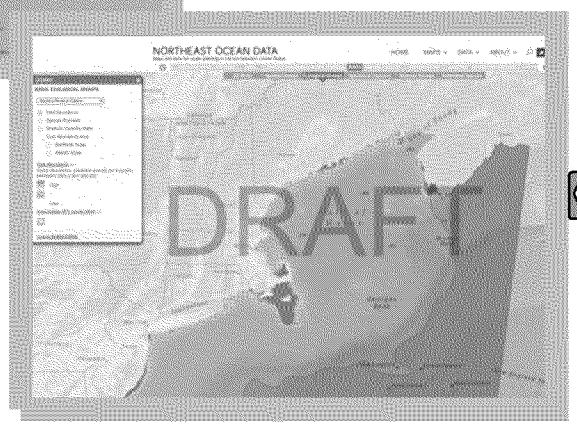
Mapping of species in groups based on ecological and biological characteristics facilitates better understanding of species connectedness, ecosystem function, interactions with human activities, cumulative impacts, and susceptibility to changing conditions. These products provide the underpinning for advancing an ecosystem-based approach to management by grouping species with similar life histories, trophic level, spatial distributions, and habitat requirements (Table ML 3.3). Examining these products, along with other data, could help reveal the ecosystem processes that drive the observed patterns in marine life distribution and abundance. In addition, many environmental laws, particularly NEPA and Section 404 permitting under the Clean Water Act, require consideration of the ecosystem context and the interconnectedness of species and habitats.

The marine life species group products were initially reviewed by the expert work groups and will continue to be reviewed by experts and stakeholders during the review of the draft Plan. Therefore, the species group products are labeled "draft" in the Portal. The RPB will revise these products and this section accordingly.

Biomass of demersal fish

Maps of ecological and biological species groups can support an ecosystem-based approach to ocean management by showing species with similar life histories, trophic level, spatial distributions, and habitat requirements.

For example, these maps show the predicted abundance of benthic feeding bird species and the biomass of demersal fish species, which could be used to identify areas where disturbances or enhancements to benthic habitat will have the greatest effect on these components of the ecosystem.



Predicted abundance of benthic feeding birds

Table ML 3.3 // Ecological and biological species groups available on the Portal

PORTAL THEME	ECOLOGICAL & BIOLOGICAL SPECIES GROUPS*
Marine Mammals and Sea Turtles	Baleen whales Small delphinoids Large delphinoids Sperm and beaked whales
Birds	Coastal waterfowl Divers and pursuit plungers Benthic/bivalve eaters Surface feeders Surface plungers Fish eaters Squid eaters Crustacean eaters Use the Northeast for breeding Use the Northeast for feeding Migrant Northeast resident
Fish	Diadromous Forage fish Demersal fish

* Total abundance, richness, diversity, and core abundance area

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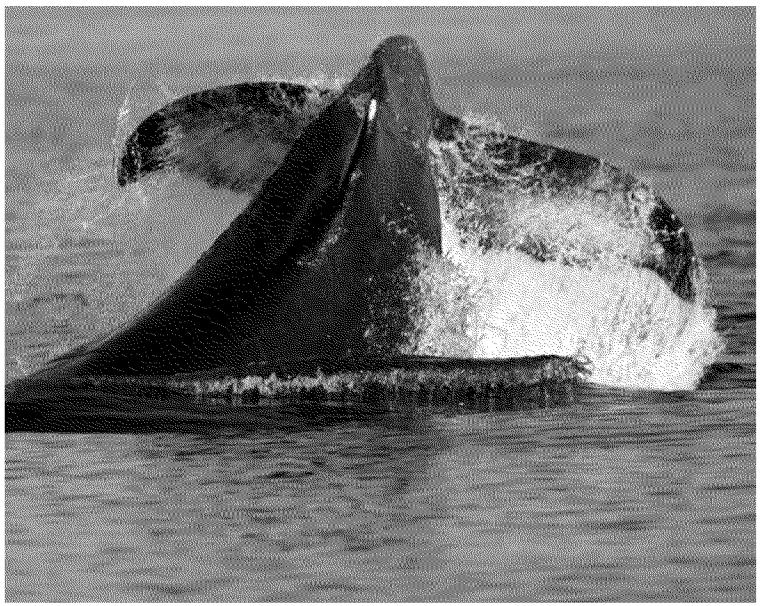

Table ML 3.4 // Stressor sensitivity–based groups available on the Portal

PORTAL THEME	STRESSOR SENSITIVITY–BASED SPECIES GROUPS
Marine Mammals & Sea Turtles	Cetaceans sensitive to low-frequency sound Cetaceans sensitive to mid-frequency sound Cetaceans sensitive to high-frequency sound
Birds	Birds with higher sensitivity to collision with offshore wind Birds with higher sensitivity to displacement due to offshore wind
	* Total abundance, richness, diversity, and core abundance area

Stressor sensitivity–based species groups

Stressor sensitivity–based maps provide the opportunity to understand where species could be directly affected by a particular human use or stressor when a specific interaction is suspected or known. These products can inform impact analyses and assessments of the potential conflicts associated with particular regulatory or management decisions. These groups were developed using existing science that attempted to quantify the relationships between species and stressors. As a result, the development of stressor sensitivity–based species groups is limited to those listed in Table ML 3.4. However, as the science progresses, this category of data provides one of the better opportunities to advance comprehensive ecosystem-based management. As described in Chapter 5, Science and Research Priorities, there are several sensitivity- and vulnerability- based species groups that could be developed in the future to inform decision-making.

The marine life species group products initially were reviewed by the expert work groups and will continue to be reviewed by experts and stakeholders during the review of the draft Plan. Therefore, the species group products are labeled "draft" in the Portal. The RPB will revise these products and this section accordingly.

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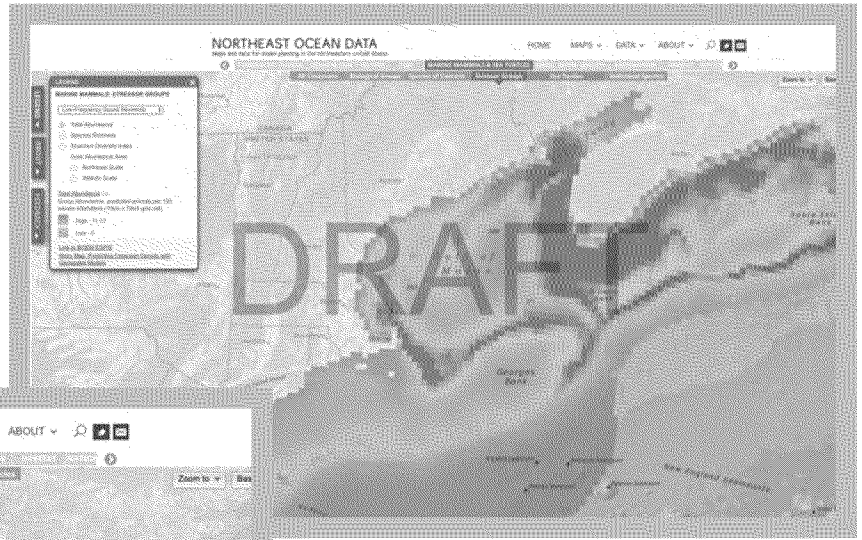
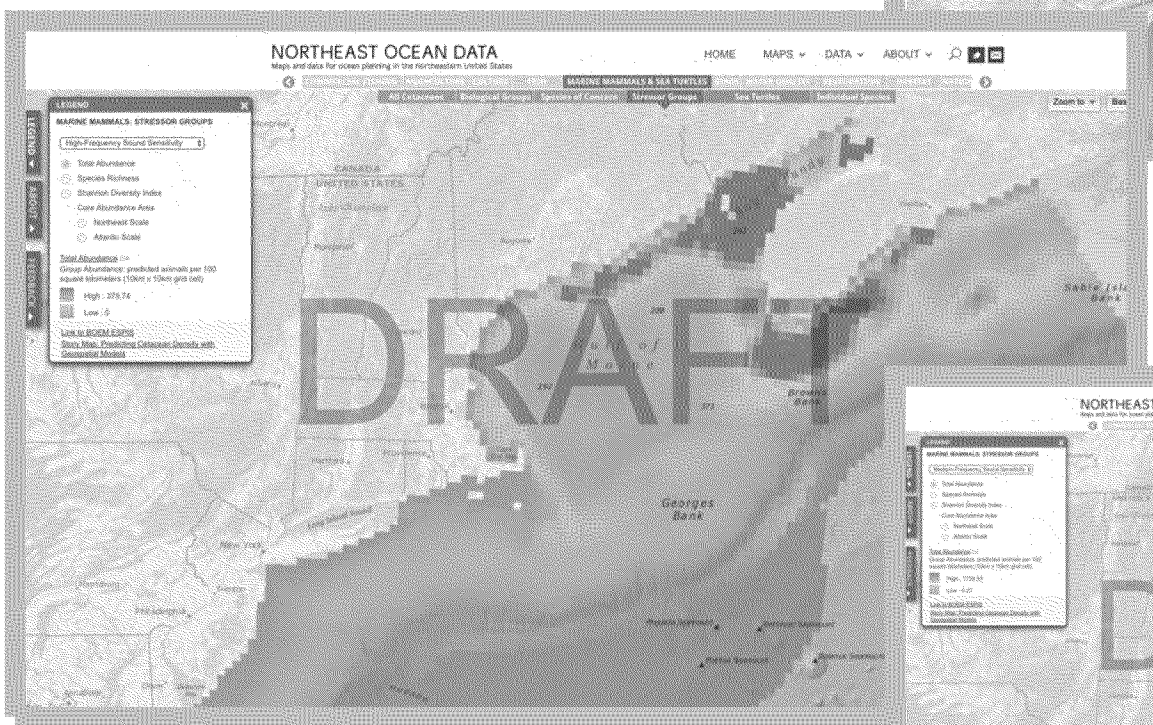
Maps of species grouped by their sensitivity to specific stressors provide the opportunity to understand whether and where groups of species could be directly affected by a particular human use or stressor when a specific interaction is suspected or known.

For example, these maps show the predicted abundance of cetaceans sensitive to low-, medium- and high-frequency sound, and therefore can be useful when determining whether different activities producing different frequencies of sound, such as geological and geophysical surveying, pile driving, or shipping, could affect these species.



Mammals sensitive to low-frequency sound



Mammals sensitive to high-frequency sound

Mammals sensitive to medium-frequency sound

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Individual species maps

The Portal provides maps for 29 marine mammal species or species guilds, 40 bird, and 82 fish species from the MDAT project. Associated with these maps are products depicting measures of scientific certainty (or uncertainty). In contrast to the previously described maps of species groups, individual species maps include a temporal component (i.e., decadal, annual, seasonal, and/or monthly distributions depending on the taxa and species), and, for fish, these maps include maps from different data sources. Table ML 3.5 provides an overview of the different map products for marine mammals, birds, and fish. Individual species map products were primarily developed by MDAT using modeling and mapping methods that are published and extensively peer reviewed, including reviews conducted by marine life work groups in 2014 and 2015.[7] These maps also provide the basis and serve as inputs into the species group aggregations previously discussed.

In addition to products from the MDAT project, the Portal includes other sources of data and information for individual marine life species:

- The Fish theme includes draft maps of sea scallop biomass and average abundance from the NOAA Northeast Fisheries Science Center (NEFSC) scallop dredge survey and the University of Massachusetts School of Marine Science and Technology video survey, respectively. Other sources, including the Virginia Institute of Marine Science dredge survey, are being scoped for potential inclusion in the Portal.
- The Fish theme includes links to animations, developed by the NEFSC, that show annual changes in species distribution using the federal trawl survey. These animations include the spring trawl survey, which is currently not included in the products on the Portal.
- The Marine Mammals and Sea Turtles theme includes maps of leatherback and loggerhead sea turtle sightings per unit effort from The Nature Conservancy's (TNC) Northwest Atlantic Marine Ecoregional Assessment (NAM ERA).
- The Portal includes bird nesting sites and bird habitat areas from the Environmental Sensitivity Index.

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The Portal provides maps for 29 marine mammal, two sea turtle, 40 bird, and 82 fish species

Table ML 3.5 // Individual species map products available on the Portal

PORTAL THEME	INDIVIDUAL SPECIES MAP PRODUCTS	CERTAINTY PRODUCTS	SOURCE(S)
Marine Mammals & Sea Turtles	Predicted monthly and/or annual density of marine mammal species and species guilds	95% confidence interval 5% confidence interval Standard error Coefficient of variation	Duke University Marine Geospatial Ecology Lab model[8]
Birds	Predicted seasonal and/or annual relative abundance and relative occurrence	90% confidence interval range Coefficient of variation	NOAA NCCOS model[9]
Fish	Natural log biomass for the 1970–2014 and 2005–2014 time periods (if available)	Variance of natural log biomass	Mapped by NEFSC from NEFSC, MDMF, NEAMAP, and Maine and New Hampshire trawls[10]

NOTE: MDMF = Massachusetts Division of Marine Fisheries; NCCOS = National Centers for Coastal Ocean Science; NEAMAP = Northeast Area Monitoring and Assessment Program; NEFSC = Northeast Fisheries Science Center; NOAA = National Oceanic and Atmospheric Administration.

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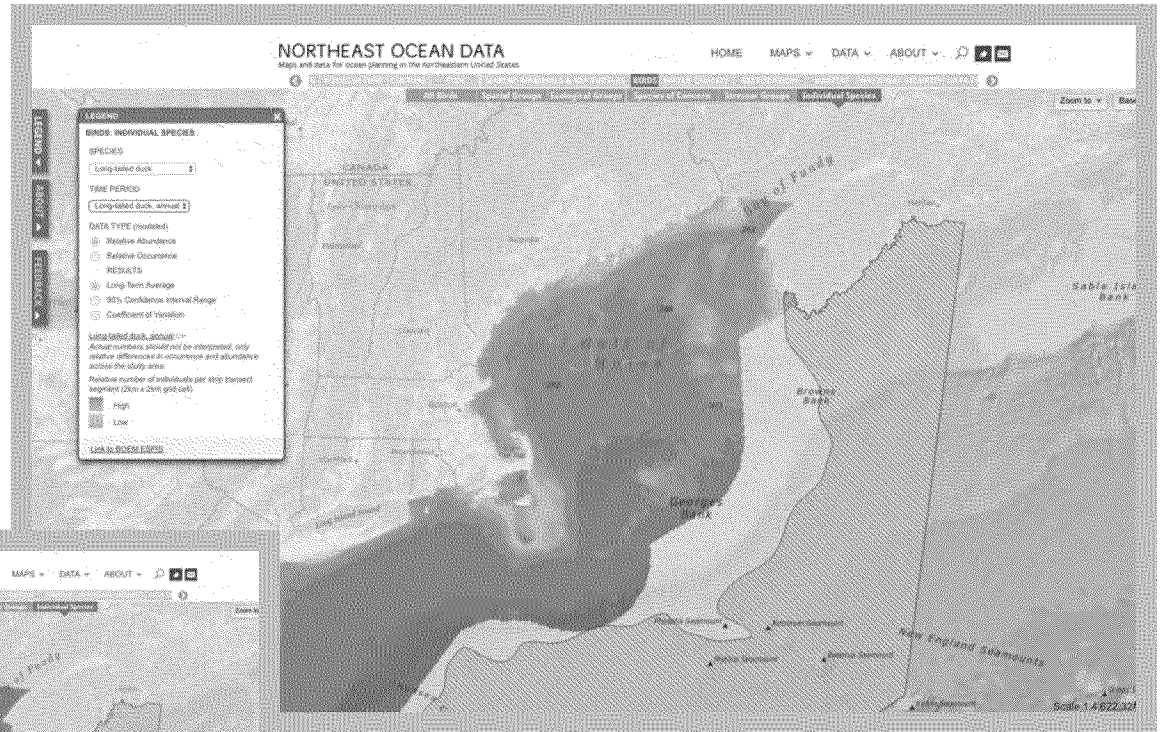
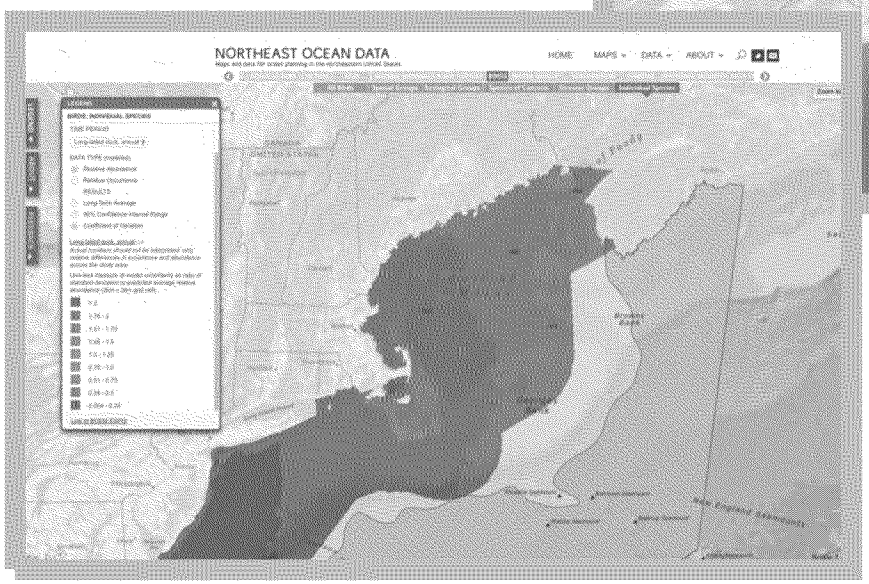
Long-tailed duck: Predicted annual relative abundance

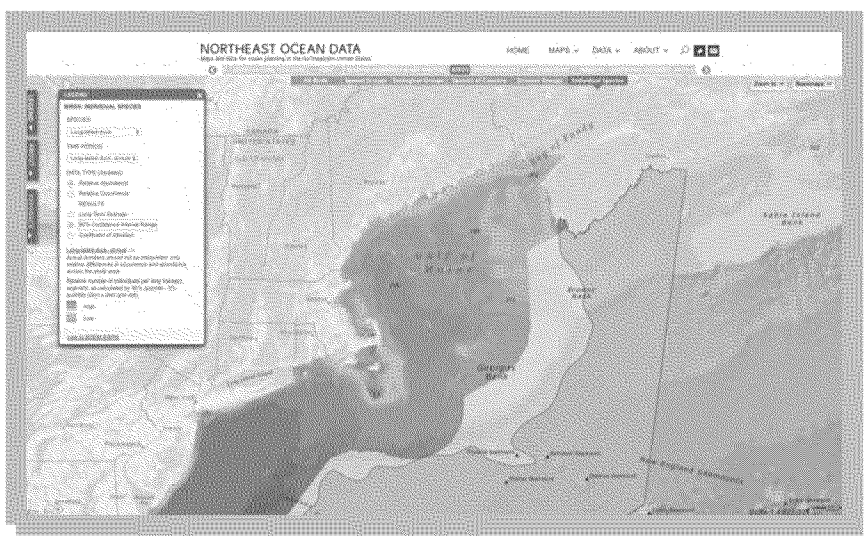


Individual species maps allow for the user to explore the distribution and abundance of particular species and to consider the scientific certainty of the results.

For example, these maps show the predicted annual average relative abundance of long-tailed duck and provide confidence and variation measures as supplementary information.



Long-tailed duck: Coefficient of variation



Long-tailed duck: 90 percent confidence interval range

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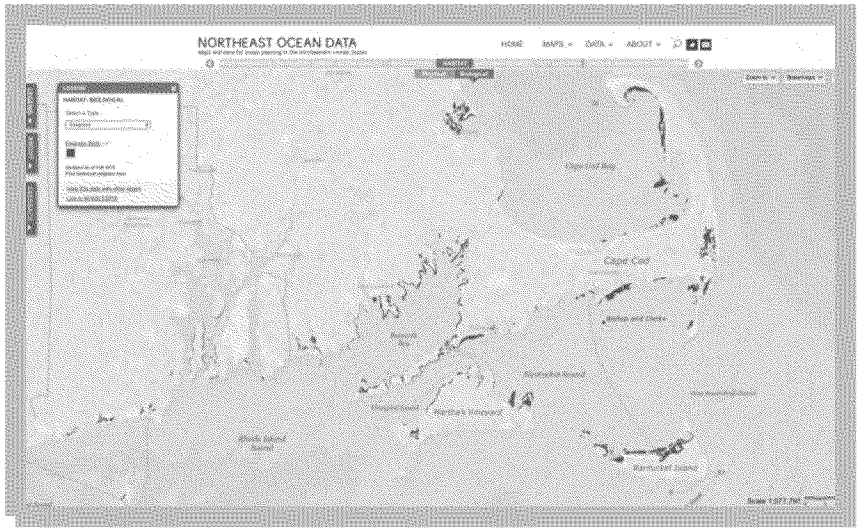
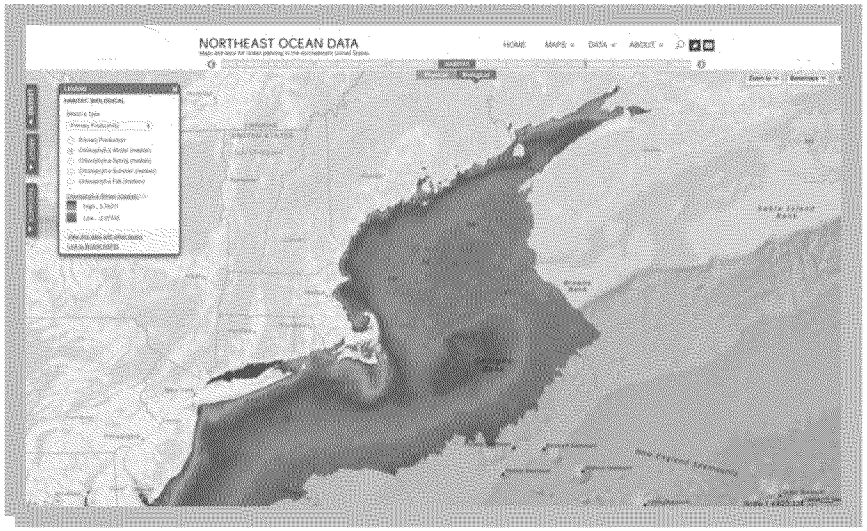
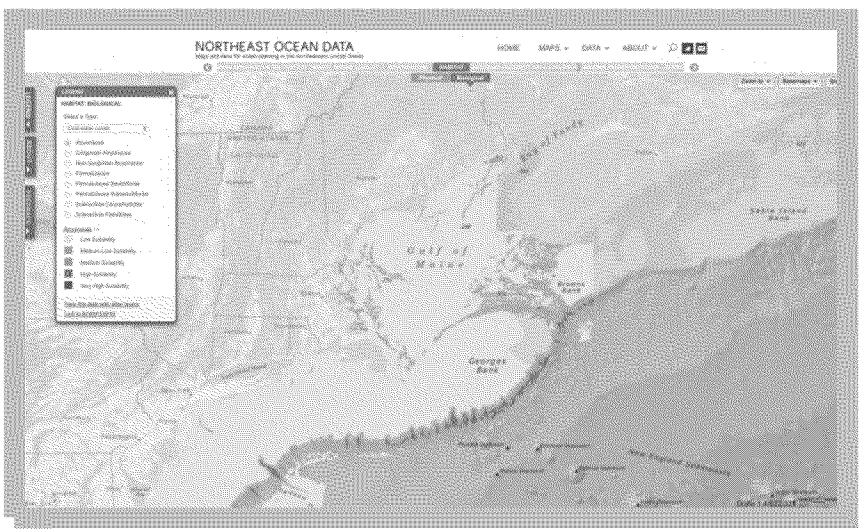
Eelgrass

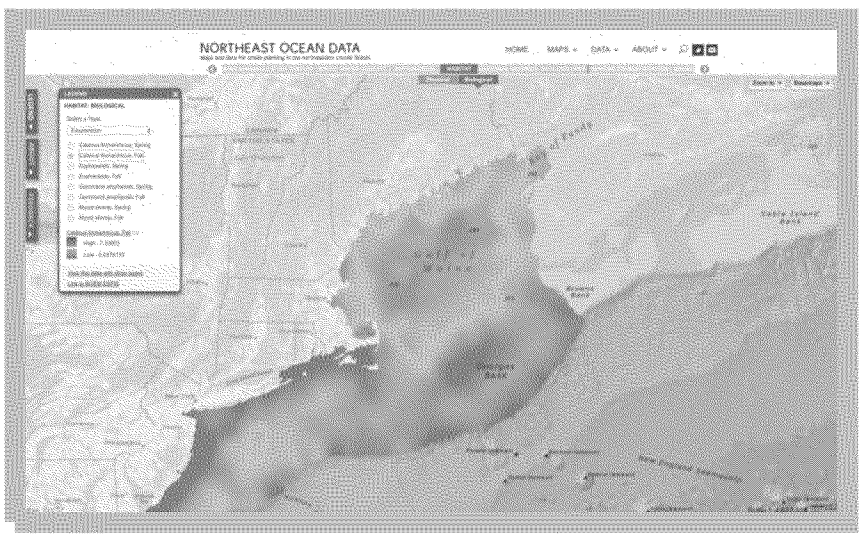


Primary productivity





Corals



Zooplankton

Physical and biological habitat maps depict ecological processes and ecosystem structure that support marine life populations.

For example, these maps of eelgrass, corals, zooplankton, and primary productivity demonstrate ecological connections that can be considered when taking an ecosystem-based approach to management. They can also support the identification of specific habitat areas protected under existing law.

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Physical and biological habitat

The Portal includes maps of data describing certain physical and biological habitats (Table ML 3.6). Several physical and biological habitat layers are represented by annual or seasonal averages using long-term datasets. This approach provides users with a broad picture. Recognizing that the temporal variability in some of these parameters may be important or influential for some data applications, it is intended that these data are used in conjunction with additional sources of information. For example, the benthic fauna layers in the Biological Habitat subtheme includes links to animations, developed by the University of Massachusetts School of Marine Science and Technology (SMAST), that show annual changes in fauna distribution. The need to develop physical and biological habitat map products at fine temporal scales is described in Chapter 5, Science and Research Priorities.

Table ML 3.6 // Physical and biological habitat map products available on the Portal

PORTAL THEME	MAP PRODUCTS
Habitat (Physical)	Sediment grain size
	Sediment grain size data quality
	Seabed forms
	Sediment stability
	Surface currents (annual average 1978–2013)
	Bottom currents (annual average 1978–2013)
	Surface temperature (annual average 1978–2013)
	Bottom temperature (annual average 1978–2013)
	Stratification (annual average 1978–2013)
Habitat (Biological)	Annual mean primary production (1998–2007)
	Median winter, spring, summer, fall Chlorophyll a concentration (2003–2015)
	Average spring and fall zooplankton abundance (Calanus, Euphausiids, Gammarid amphipods, Mysid shrimp) (2005–2014)
	Eelgrass
	Wetlands
	Shellfish habitat (oyster, mussel, scallop, clam)
	Predicted habitat suitability for cold-water corals
	Average abundance of benthic fauna (hermit crab, moon snail, sea star) in SMAST video surveys (2003–2012)
	Average percentage of sample locations with benthic fauna (bryozoans, sand dollars, sponges) in SMAST video surveys (2003–2012)

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Important ecological areas

In addition to the regional spatial characterizations of marine life and habitat distribution and abundance described in this section, the *Framework for Ocean Planning in the Northeast United States* includes an action and a specific task to assess regional efforts to identify areas of ecological importance and to convene the RPB, scientists, and stakeholders to consider options for how to proceed with characterizing and using important ecological areas (IEAs) in ocean planning. The RPB framed its approach to identifying IEAs in several important ways.

First, the RPB sought input from scientists and the public (including forming the Ecosystem-Based Management [EBM] Work Group) to inform key aspects of the methodology, including defining "importance" and determining how to use existing and emerging data products. These discussions were informed by an understanding of the available data that would underpin a characterization of IEAs, including draft products that were recently developed by MDAT. Important topics identified in these discussions included understanding the degree of scientific certainty for data products used in any analyses, as well as considering temporal trends and future shifts in habitats and species distribution.

Second, the RPB was mindful of the executive order's requirement to work within the existing statutory and regulatory framework, particularly when considering how identification of areas of ecological importance could be applied in agency decision-making (agencies must use all Plan-related maps and information within the existing regulatory context). As described later, the RPB recognizes that significant progress was made in establishing a conceptual framework for using existing data to identify IEAs and that there is considerable additional work to be done before an approach can be implemented.

Lastly, the RPB recognized that the concept of IEAs could be interpreted and used in many ways. The IEA concept can have a foundation in species- or habitat-specific data and could therefore be addressed, in part, through the use of previously described individual species and species group products (i.e., to identify an important ecological area associated with benthic feeding birds). The IEA concept can also be considered within the context of individual regulatory or management decisions. The RPB also acknowledged a desire from some stakeholders for a multispecies, multihabitat, or otherwise multifactor approach. Thus, the RPB recognized the need to first define the IEA term and develop a related information base. An overview of the RPB's proceedings related to IEAs follows.

In June 2014, the RPB issued a "Draft Summary of Marine Life Data Sources and Approaches to Define Ecologically Important Areas and Measure Ocean Health"[1] and convened a public workshop to consider next steps related to defining IEAs. Informed by that workshop, the RPB decided to first focus on developing peer-reviewed regional marine life and habitat data products, to conduct additional research, and to seek input on approaches for using marine life and habitat data in a broader, multifactor framework.

In April 2015, the RPB convened an ecosystem-based management workshop to further consider potential approaches for developing IEAs and other subjects related to ecosystem-based management. At its June 2015 meeting, the RPB formed the EBM Work Group. The RPB's charge to the EBM Work Group was to inform the RPB on a range of activities for the 2016 Northeast Ocean Plan, including reviewing approaches to defining and characterizing IEAs. During fall 2015, the EBM Work Group provided feedback on many of the draft marine life and habitat data products described above. It also recommended the RPB define IEAs as various ecosystem components and ecosystem functions, using existing definitions from the National Ocean Policy as a reference point.

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In November 2015, the RPB released an initial framework for identifying IEAs (IEA Framework) for public comment. The IEA Framework defined IEAs in terms of several components representing ecosystem structure and function. The RPB also identified existing marine life and habitat data that could be used to characterize and map each IEA component and identified long-term science and data that would support a more complete characterization of each component over time. EBM Work Group and public review generally expressed agreement with the definition and identification of the IEA components. Other feedback focused on the identification of specific ecological datasets that could be used to characterize each IEA component.

In response to these comments, the RPB revised the IEA Framework, and on **January 6, 2016,** the EBM Work Group met to review the revised IEA Framework, resulting in the following recommendations to the RPB:

- Ensure all marine life and habitat data referenced in this Plan are reviewed by regional scientists before being used in the IEA Framework.
- Illustrate one or two IEA components for which existing marine life and habitat data are sufficient to advance the development and application of the IEA Framework.

The revised IEA Framework is incorporated in this Plan as a draft (see Appendix 3). It defines IEAs for Northeast ocean planning as "habitat areas and species, guilds, or communities critical to ecosystem function, recovery and resilience." These areas are further defined and identified by the following five components:

1. **Areas of high productivity**—These areas have high measurements of primary and secondary productivity, known proxies for high primary and secondary productivity, and metrics such as food availability.
2. **Areas of high biodiversity**—These areas include metrics of high biodiversity and habitat areas that are likely to support high biodiversity.
3. **Areas of high species abundance including areas of spawning, breeding, feeding, and migratory routes**—These areas support ecological functions important for marine life survival; these areas may include persistent or transient core abundance areas for which the underlying life history mechanism is currently unknown or suspected.
4. **Areas of vulnerable marine resources**—These areas support ecological functions important for marine life survival and are particularly vulnerable to natural and human disturbances.
5. **Areas of rare marine resources**—These areas include core abundance areas of state and federal ESA-listed species, species of concern and candidate species, other demonstrably rare species, and spatially rare habitats.

The draft IEA Framework also includes information describing the potential use of existing marine life and habitat data to map each IEA component, and, recognizing the limits of existing data, it makes note of the long-term science and data needs to advance the mapping and identification of IEAs. These and other related science and research needs also are described in Chapter 5. Finally, Action ML-4 describes the immediate next steps the RPB will take to advance the IEA Framework.

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OVERVIEW

ACTIONS

ML-1 Update marine life data through 2017

ML-2 Update habitat data through 2017

ML-3 Identify opportunities to update marine life and habitat data every five years

ML-4 Continue the development of the Important Ecological Area framework

ML-5 Use marine life and habitat data as key inputs to monitor ecosystem health

ML-6 Use marine life and habitat data to inform applicable review processes under federal environmental and regulatory laws

ML-7 Use marine life and habitat data to inform responsibilities within managed areas

ML-8 Use marine life and habitat data to inform other management activities

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ACTIONS: MAINTAIN AND UPDATE DATA

ML-1. Update marine life data: Through 2017, the RPB will make the following updates to the marine life data through continued collaboration with the Portal Working Group and MDAT:

- Incorporate recent survey data from the Atlantic Marine Assessment Program for Protected Species (AMAPPS), the Massachusetts Clean Energy Center survey, and other sources into the marine mammal models and provide updated maps.
- Develop updated sea turtle maps using recent survey data.
- Incorporate fish trawl data for Long Island Sound from the Connecticut Department of Energy and Environmental Protection and for Rhode Island waters from the Rhode Island Department of Environmental Management's Narragansett Bay and Rhode Island Sound fixed-site surveys.
- Develop additional ecological groupings for whales and fish, including foraging guild groupings for whales and dietary guild groupings for fish.
- Further develop maps of scallop abundance and biomass, potentially including the Virginia Institute of Marine Science trawl data.
- Determine the feasibility of incorporating other marine life products that would fill priority data gaps within the 2017 timeframe. One factor in determining feasibility will be the ability to leverage agencies' (or partners') work, since associated costs could be significant. Marine life data sources to be reviewed include:
  - > USFWS Mid-winter Waterfowl Survey
  - > Other information sources in coastal and estuarine areas, such as the Environmental Sensitivity Index (ESI) and the Saltmarsh Habitat and Avian Research Program (SHARP)
  - > Telemetry and acoustic data for fish, birds, and marine mammals
  - > Available data sources of bat distribution and abundance

ML-2. Update habitat data: Through 2017, the Portal Working Group will develop the following habitat datasets with RPB input and review:

- Map products characterizing persistent phytoplankton bloom events
- Updated benthic habitat maps
- Updated submerged aquatic vegetation maps

ML-3. Identify opportunities to update marine life and habitat data every five years: RPB agencies, particularly NOAA, BOEM, and USFWS, will identify opportunities and resources to update the existing marine mammal, sea turtle, bird, fish, and habitat data on the Portal over the long term. This maintenance includes reviewing existing agency efforts for potential additions into the Portal, including the various programs and information sources identified in Appendix 2 and data resulting from any of the science and research priorities described in Chapter 5. All of these data should be updated within a five-year cycle using similar methodologies and outputs, while allowing for incremental updates, improved methods, and practical budget considerations.

ML-4. Continue the development of the Important Ecological Area framework: Through 2017, the RPB will continue to develop the IEA Framework, including the following specific tasks:

- Convene the RPB and the EBM Work Group to review the latest IEA Framework and comments received on the draft.
- Illustrate one or two IEA components using existing data once the peer review of marine life and habitat data is complete.
- Based on this illustration, review the IEA Framework to determine the need for further changes and whether additional IEA components could be illustrated.

ML-5. Use marine life and habitat data as key inputs to monitor ecosystem health: The RPB will use the marine life and habitat data presented in this Plan as key inputs along with other available information when developing indicators of ecosystem health and monitoring changing

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conditions (see Chapter 4). The comprehensive nature of the products in the Plan (i.e., the maps of hundreds of species of fish, marine mammals, birds, and turtles, their groupings, and the repeatable methods used in developing the products) should contribute to efforts to track changes over time for most of the species of management interest. In addition, certain marine life products were developed specifically to facilitate the examination of change over time (e.g., fish biomass 1970–2014 and 2005–2014).

ACTIONS: INFORM REGULATORY AND MANAGEMENT DECISIONS

ML-6. To the extent practicable, RPB agencies will use marine life and habitat data to inform applicable review processes under federal environmental and regulatory laws: The Portal provides new tools and a library of over 3,000 stakeholder- and expert-reviewed marine life and habitat maps to inform and enhance agency regulatory, conservation, and management decisions.

Species groups maps are useful as an early indicator of whether and which marine life populations could be affected by a proposed action; they can also be used to help determine areas where marine life conservation, management, and restoration activities might have the most benefit. Species richness products, in particular, could be used to evaluate the potential number of different species in an area in an average year. Once identified as potentially present, total abundance maps provide additional information about the relative amount of marine life use of a particular area. By identifying species groups potentially affected by a proposed action along with the relevant agencies and particular regulatory processes that pertain to the action, it may be possible to anticipate information needs for similar future actions.

Individual species maps provide additional information on those species that are likely to have an interaction with a particular activity or management measure, including their presence over time and the certainty associated with the findings.

Habitat maps indicate the underlying physical and biological characteristics, including the ecosystem dynamics, which support marine life populations and influence marine life patterns. Habitat maps also provide a snapshot of areas that are specifically protected under existing management authorities.

Regional marine life and habitat data provide initial indications of species and habitats that can be expected in a geographic area. The data will enable more consistent regional characterizations of natural resource conditions and will support the preliminary identification of potential resource impacts. The data will potentially be useful for initial project site characterization, for scoping of alternatives for NEPA and other reviews, and for work with project proponents to avoid or minimize impacts associated with different phases of offshore projects (for example, as described further in the ocean activities sections, such as Energy). As described previously, collection of additional information is likely to be necessary to understand the potential for site-specific construction and operations impacts, as well as to develop pre- and post-construction monitoring requirements. Early coordination with federal and state resource agencies can help determine what additional site-specific information may be useful (as described more in Chapter 4).

In addition to the general use of data described above, RPB agencies have identified the following activities specific to each set of applicable federal laws:

- **NEPA:** RPB agencies will use the Portal to the extent practicable to help identify alternatives, describe the affected environment, and assess cumulative effects under NEPA.
- **Federal leasing, licensing, and permitting (OCSLA, CWA, DWPA, RHA, and MPRSA):** RPB agencies responsible for leasing, licensing, and permitting processes will use the Portal to the extent practicable as an information source to identify potential resource impacts, to help communicate potential issues

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with a proposed project, and to provide information for use in determining appropriate avoidance and mitigation measures.

- **MSA:** NMFS will encourage RPB agencies and project applicants to consider marine habitat information contained in the Plan during the essential fish habitat (EFH) consultation process. To the extent practicable, RPB agencies will use the Portal to identify the presence of already designated Habitat Areas of Particular Concern (HAPC) and EFH in a proposed project area and assist with determining whether an agency action may adversely affect EFH. If necessary, the Portal can be used to assist in the development of an EFH assessment describing the action, the EFH present within the proposed project area, and the effects the project would likely have on EFH. The EFH assessment should consider the physical and biological data layers identified in the Portal.
- **ESA:** To the extent practicable, NMFS and USFWS will use individual species products as one information source when determining if a species should be listed (or de-listed) as threatened or endangered. NMFS and USFWS will also, to the extent practicable, use individual species products as one information source to assist in the monitoring and recovery of ESA-listed species. Lastly, NMFS and USFWS will, to the extent practicable, use the Portal when upgrading or developing new guidance regarding consultations under ESA Section 7.
- **MMPA:** To the extent practicable, NMFS will use Plan data to inform Take Reduction Teams, help in the evaluation of take reduction plans, and conduct cumulative impacts assessments.
- **MBTA:** To the extent practicable, USFWS will use the Portal and the Plan, along with other information, to help facilitate successful enforcement of MBTA and increase coordination among federal agencies in support of Executive Order 13186 by integrating bird conservation principles, measures, and practices into agency activities that avoid or minimize, to the extent practicable, adverse impacts on migratory bird resources.

ML-7. Use marine life and habitat data to inform responsibilities within managed areas: To the extent practicable, RPB agencies will use the Portal, along with many other sources of information, to enhance resource protection, management planning and decision-making in state and federally designated managed areas. This could include:

- Use of data to inform development and revisions to management or conservation plans.
- Characterization of existing conditions and the interaction between marine resources and human activities.
- Interagency consultations regarding potential effects of federal activities on managed area resources.
- Informing development or implementation of research and monitoring programs.

ML-8. Use marine life and habitat data to inform other management activities: This Plan references a diverse subset of other management programs, including restoration, conservation science partnerships, oil spill response, research, conservation, and other activities. A common aspect of these programs is that they rely on up-to-date scientific information to support decisions. RPB agencies responsible for the management programs listed in this Plan will use the Portal to inform their specific activities. Some specific examples include:

- NMFS will encourage the use of the Portal by the NOAA Community-Based Restoration Program, including in the preparation of proposals for federal funding opportunities.
- In the event of a pollutant spill, the Oil Pollution Act (OPA) trustee council and other appropriate agencies will, to the extent practicable, provide information on protected and endangered species and EFH to the US Coast Guard (USCG) to be considered in response activities. The OPA trustee council and others will be able to use the Portal to inform the Natural Resources Damage Assessment and coordinate restoration actions.
- USFWS will use the Portal to the extent practicable to help inform science and conservation partnership priorities.

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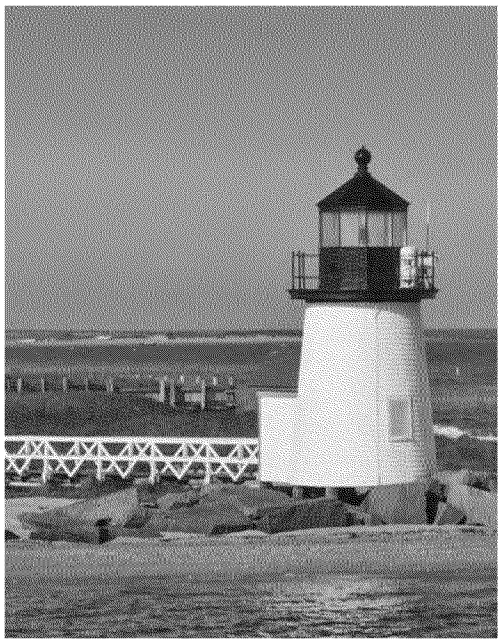
CULTURAL RESOURCES



New England's history and culture are inextricably linked with the ocean. The importance of the sea to the region's economy, character, and vitality is manifest in various ways. New England fishing harbors, the Freedom Trail in Boston, summer vacations at the beach or on a small island, lobster bakes, and countless other images and activities are inseparable from the experience of living in or visiting New England, where recreation and tourism comprise about half of the region's coastal economy.[1]

Tourism is a particularly seasonal phenomenon, with summer employment in the tourism and recreation sector increasing by close to 90 percent (compared with offseason employment) in certain counties in Maine and Massachusetts.[2] Much of this seasonal employment occurs at the region's 10,000 eating and drinking establishments (restaurants and bars), which employ 150,000 people and generate more than $5 billion annually in GDP, and the region's hotels and lodging places, which employ more than 30,000 people and generate more than $2 billion annually in GDP.[3]

In addition to these economic figures, however, there are many intrinsic or otherwise hard-to-quantify aspects of the region's history and culture. Countless sites and properties in New England are foundational to this country's history and pay homage to those who helped shape the region and the United States. Reflecting the region's maritime tradition and continuing connection to the sea, working waterfronts and island communities continue to be vital connections between the land and ocean, supporting commercial fisheries, recreational opportunities such as boating, fishing, and wildlife viewing, and a host of other activities for residents and visitors alike. Coastal parks, wildlife reserves, a National Marine Sanctuary, and National Park Service properties provide other opportunities to experience the New England coast. Cultural opportunities such as museums, theater, art, crafts, and music festivals abound and are not confined to the region's urban centers; many of the cultural events and institutions are known the world over and bring national and international visitors to the region.

Importantly, for far longer than the time of European settlers, Native American cultures in the Northeast have been intrinsically connected to the region's ocean waters. Coastal and offshore areas supported a variety of hunting, harvesting, fishing, and foraging activities for more than 12,000 years before the arrival of European settlers. Ocean resources remain important to the cultural fabric of present-day Native American life through sustenance, medicinal, and spiritual well-being as well as tribal travel, trade, recreation, and ceremonial activities. Tribal members view themselves as

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caretakers of the land and waters of the region; if the land and waters are kept healthy, they will provide for future generations. Ocean planning provides tribal members an opportunity to pursue their priorities of preserving cultural sites, promoting ecosystem health, restoring fisheries and habitat to ensure sustenance, planning for a changing climate, and using traditional knowledge to strengthen partnerships.

REGULATION AND MANAGEMENT

Relevant laws, regulations, and programs

Several federal laws, regulations, and related federal, tribal, state, and local programs are directly related to consideration of cultural resources in general. For the purposes of the Plan, the following are among the most pertinent:[4]

- **Section 106 of the National Historic Preservation Act** (NHPA), which requires federal agencies to take into account the effects of their activities on historic properties that are listed or eligible for the National Register of Historic Places. It also requires federal agencies to consult with states and tribes, and with respect to tribes, determine whether a federal activity may affect a property to which a tribe attaches religious or cultural significance. Section 106 also requires an inventory of sites on the National Register: submerged areas have not been inventoried. Other laws may apply to specific types of underwater historic resources, such as the Sunken Military Craft Act, administered by the US Navy, which protects sunken military craft that are the property of the US government.
- **NEPA**, which requires federal agencies to assess the impact of a major federal action affecting the human and natural environment, including cultural and historic resources.
- Additional laws described in Chapter 4 such as the **Archaeological Resources Protection Act, Native American Graves Protection and Repatriation Act,** and the **American Indian Religious Freedom Act**.
- Each New England state participates in the formal protection of cultural and historic resources through designated **State Historic Preservation Officers** (SHPO) and programs, for example, which implement state-specific laws, rules, and regulations related to the protection and conservation of historic and cultural resources, including shipwrecks. Tribes also have designated **Tribal Historic Preservation Officers** (THPO) who are involved with the protection of tribal cultural resources.

In addition to these formal programs, countless nonregulatory, funding, or technical assistance-oriented programs provide support for protection of historic and cultural resources or are intended to help preserve aspects of community character. While there are too many of these types of federal, state, local, and tribal programs to identify here, working waterfront programs are particularly relevant to this Plan because of their link to offshore activities and resources. Each working waterfront program, alliance, or network is unique, but they generally seek to enhance the capacity of coastal communities and stakeholders to make informed decisions, balance diverse uses, ensure access, and plan for the future of working waterfronts and waterways.[5] In each state, there are state-level resources such as funding and technical assistance available to help ensure that communities consider long- and short-term needs for working waterfronts. Many of these efforts are intended to help communities maintain access for traditional and economically and culturally important uses, including commercial fishing and recreation.

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Environmental and regulatory review

NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and to consult with State Historic Preservation Officers, and, when appropriate, Tribal Historic Preservation Officers. There are 10 federally recognized tribes in New England with almost all having, developing, or sharing a THPO, and each state has a SHPO. If the agency's undertaking could affect historic properties, it consults with the SHPO (and THPO[s] as appropriate), and conducts additional studies as necessary. Historic districts, sites, buildings, structures, and objects listed in the National Register of Historic Places are considered. Unlisted properties are evaluated against the National Park Service's published criteria for a designation of "eligibility" for the National Register, in consultation with the SHPO and THPO(s) associated with tribes that may attach religious or cultural affiliation to the properties. For listed and unlisted properties, the agency consults with the SHPO/THPO and makes an assessment of adverse effects on the identified historic properties. If these state and tribal historic preservation officers agree that there will be no adverse effect, the agency proceeds with the undertaking and any agreed-upon conditions. If the officers find that there is an adverse effect, the agency begins consultation to seek ways to avoid, minimize, or mitigate the adverse effect. Consultation usually results in a Memorandum of Agreement (MOA), which outlines agreed-upon measures for the agency to take in order to avoid, minimize, or mitigate the adverse effect. In some cases, the consulting parties may agree that no such measures are possible, but that the adverse effects must be accepted in the public interest.[6]

Pursuant to NHPA regulations (36 CFR 800), there are several considerations related to historic or cultural properties under NEPA. These generally provide for consideration of NHPA responsibilities as early as possible in the NEPA process and, to the extent possible, preparation of draft environmental impact statements that integrate impact analyses and related surveys and studies required by the NHPA. Consideration of an undertaking's likely effects on historic properties is part of an agency's determination of whether an action is a "major federal action significantly affecting the quality of the human environment," and therefore requires preparation of an environmental impact statement under NEPA.[7] While NHPA focuses on impacts on properties included in or eligible for the National Register of Historic Places, other authorities, such as the American Indian Religious Freedom Act (AIRFA), may require consideration of other cultural resource types from a tribal perspective. NEPA itself provides for considering all aspects of the cultural environment including, for example, the cultural use of natural resources.

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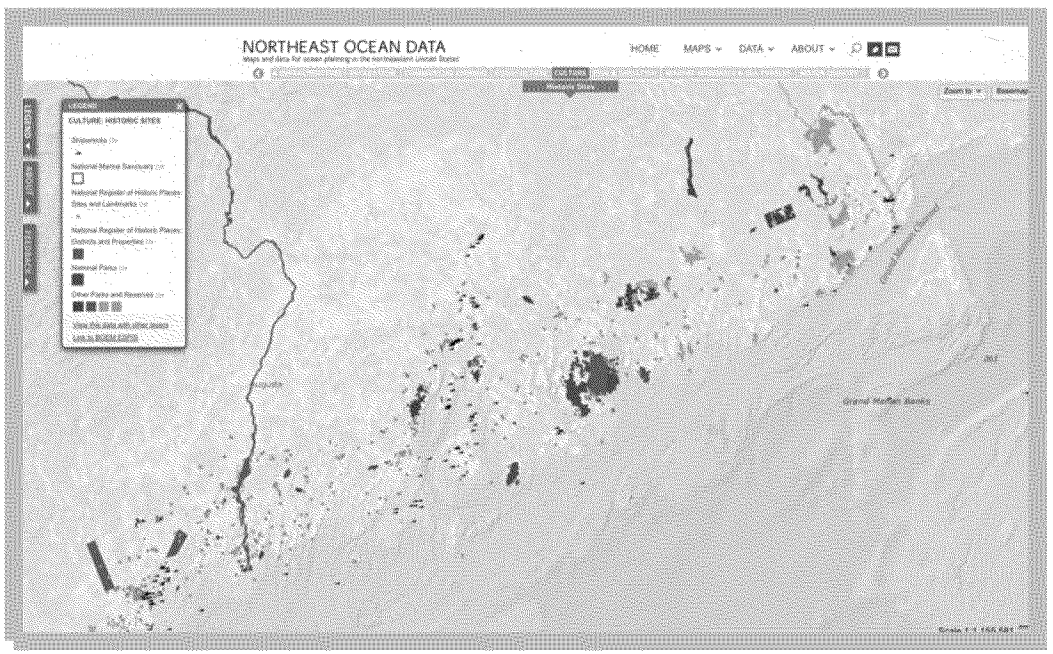
MAPS AND DATA

The National Park Service (NPS) maintains the National Register of Historic Places.[8] The Culture theme on the Portal provides historic district and site location information from the National Register for Maine, Massachusetts, New York, and Rhode Island (as of 2016, other Northeast states are being updated). The states and NPS provided these data. While project proponents are required to consult the National Register to assist in identifying potentially affected sites, they are also required to consult with the appropriate SHPO and/or THPO(s), recognizing that some identified sites or properties may not be listed publicly (e.g., particularly sensitive sites that are considered confidential and thus not included in available data) or that a particular project may affect a site or property that is eligible for, but not yet listed on, the National Register.

Additionally, the Portal also provides information from the Automated Wreck and Obstruction Information System (AWOIS) data layer, which can be used to identify the potential location of some shipwrecks (although there are limitations to its use, given issues with the precision and accuracy of the underlying data). Lastly, the Portal includes layers showing NPS properties, the Stellwagen Bank National Marine Sanctuary, and other federal, state, and local parks and reserves identified based on the cultural importance of these areas.



Historic properties, parks, open space, and islands along the coast of Maine

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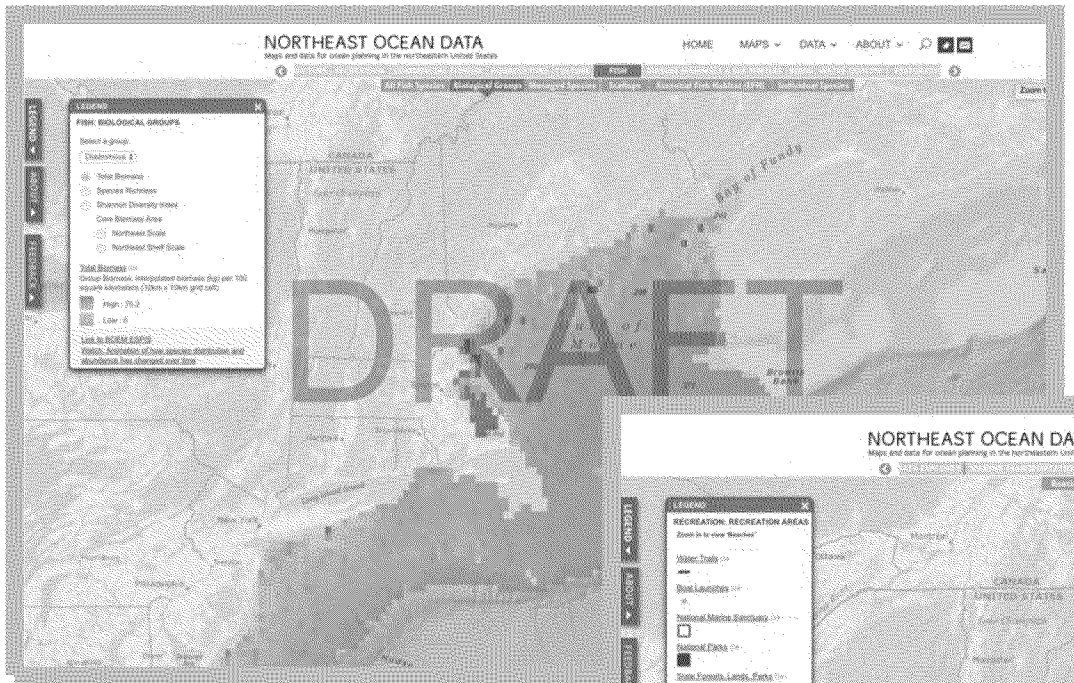
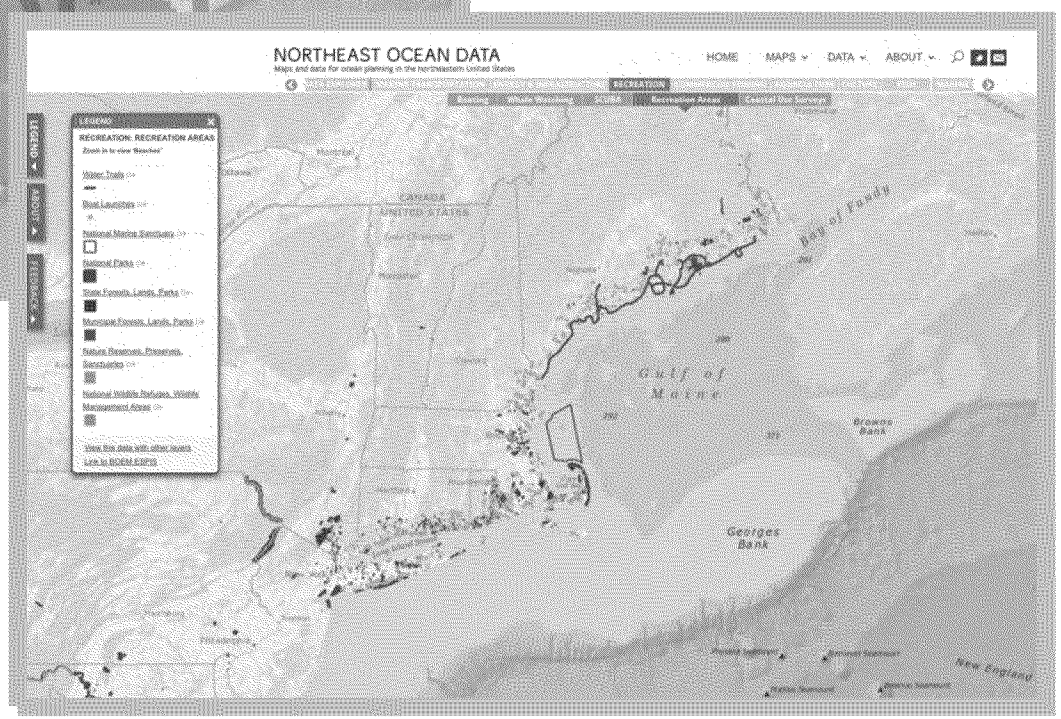


Diadromous fish biomass as caught by the federal trawl survey

Maps of historic properties, recreational areas, and wildlife populations can help identify cultural resources and connections between coastal communities and the ocean.



Coastal recreation areas and access points

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OVERVIEW

ACTIONS

CR-1 Maintain and update maps and data on the Portal

CR-2 Incorporate additional maps and data into the Portal when available

CR-3 Use the Plan and the Portal to identify potential impacts during environmental and regulatory review

CR-4 Identify potentially affected tribes and stakeholders

ACTIONS: MAINTAIN AND UPDATE DATA

CR-1. Maintain and update maps and data on the Portal: The RPB, through the NPS, states, and the Portal Working Group, will review and update the National Register site data on an annual basis. The RPB will also incorporate data about National Register sites in New Hampshire and Connecticut as information becomes available. The RPB will also maintain links to AWOIS data, as served by the Marine Cadastre (an online federal source of spatial data maintained by NOAA and BOEM)[9].

CR-2. Incorporate additional maps and data into the Portal when available: RPB agencies will periodically review existing activities and programs to provide relevant updates to the Portal. As described in Chapter 5, BOEM, the Narragansett Indian Tribe, and the University of Rhode Island (URI) are developing methodologies to identify submerged archaeological and paleocultural resources. If these efforts result in releasable map and data products, the RPB will work with BOEM, tribes, and other interested parties to incorporate the appropriate products into the Portal.

ACTIONS: INFORM REGULATORY AND MANAGEMENT DECISIONS

CR-3. Use the Plan and the Portal to identify potential impacts during environmental and regulatory review: RPB agencies will engage in the following specific activities to ensure the data and information in the Portal and the Plan are used to identify potential impacts to cultural resources during the environmental and regulatory review processes described above.

- RPB agencies will use the Portal to the extent practicable as an initial screening tool to help identify potentially affected historic properties under NHPA. The Portal contains information on thousands of historic properties on the National Register. While it is incomplete, data on the Portal will at least provide an initial indication of whether there are historic properties in the areas of a proposed project, especially once information from New Hampshire and Connecticut is added. Consultation with appropriate federal, state, tribal, and local officials and community groups is always required as the National Register data does not identify resources that are considered confidential or are potentially eligible for designation, including areas of potential cultural resources offshore.

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- As appropriate, RPB agencies will use the Portal, and other information in the Plan (including the baseline assessment) to understand and describe the different factors that contribute to the connections between the ocean and the culture and the economy of island and coastal communities. For example:
  - > Maps of marine transportation, commercial fishing, and recreational activities can be used to demonstrate connections between specific communities and the ocean areas upon which local economies and culture depend.
  - > Maps showing the distribution and extent of marine life populations and important habitats can be used to show the recreational, wildlife viewing, and spiritual connections between communities and different ocean areas.
  - > Information from the baseline assessment showing the volume of fishery landings and cargo by port, ocean sector employment, economic productivity, seasonal housing, and other data can be used to demonstrate the importance of the ocean to the local economy.
- RPB tribes will use the Portal and this Plan to promote ecosystem-based management, recognizing the importance of a holistic approach to understanding the potential impact of new activities to tribal culture. RPB tribes will overlay marine life data with information on existing and emerging human uses to analyze projects from an ecosystem perspective. In addition, RPB tribes will use the following specific datasets, representing resources that are particularly relevant to tribal culture, to inform their engagement in regulatory consultations:
  - > RPB tribes will use marine life data to better understand the distribution and abundance of ecological and functional groupings of marine mammal, sea turtle, fish, and bird species when demonstrating areas of cultural significance. For example, the Portal can be used to identify potential restoration sites and to characterize the importance of diadromous fish species for historic sustenance (American eel, Atlantic salmon, shad, herring, Atlantic sturgeon, and pollock).
  - > RPB tribes will use information on shellfish species (razor clams, soft shell clams, quahogs, and mussels) to demonstrate areas that are important to tribal sustenance and that might be a priority for water quality restoration projects.
  - > RPB tribes will use climate change–related data (e.g., primary productivity trends, trends in marine life distribution) to help characterize the impacts of changing conditions on habitats and resources important to tribes (e.g., eelgrass beds, shellfish sites, restoration areas, and erosion of tribal cultural sites).
- RPB agencies will direct project proponents to the Portal to assist with preliminary identification of potential effects of a particular action on historic, cultural, and archaeological sites, recognizing that certain sites may not be included in public data.
- RPB agencies will use Plan information as one source of regional contextual information for characterizing cultural resources in the affected environment section of NEPA and other similar environmental documents.

CR-4. Identify potentially affected tribes and stakeholders: RPB agencies will use the Portal and this Plan to identify tribes and stakeholders with cultural interests who may be affected by a proposed activity. This action includes using information in the Plan to help identify the range of local stakeholders, representing the different environmental, cultural, or economic interests that compose the culture of coastal and island communities. This action also relates to Chapter 4 best practices regarding coordination with stakeholders.

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MARINE TRANSPORTATION

The Marine Transportation System (MTS) is an interconnected system of waterways and ports that moves people (e.g., on ferries, cruise ships, sightseeing vessels) and goods (e.g., agriculture, oil and gas, cars, clothing, appliances). As such, it has broad-reaching impacts to the Northeast region, nationally, and internationally. The MTS is also crucial to national security by enabling the rapid movement of military resources and logistical support. This system is economically critical to the region as it provides for jobs—such as pilots, port operators, and vessel staff—as well as taxes to local, state and federal entities. Maintaining a safe and efficient MTS is in alignment with the overall goals of the Plan.

The MTS offers an alternative means of transportation in some congested areas and may offer the only method to get to work in certain Northeast island and coastal communities. Northeast ferries carried 26.6 million passengers and 5.4 million vehicles in 2010, and are expected to carry more in the coming decade.[1] The cruise industry is also seeing a 16 percent increase in expenditures over the past four years.[2] Movement of goods is another necessary use of the MTS. Nationally, almost 90 percent of everything we consume arrives via ship, and the Northeast region is no exception.[3] Just-in-time winter deliveries of home heating oil, liquefied natural gas, and propane, essential for heat and electricity, added up to more than 12,000 transits, 8,000 of which were accomplished by tugs and tank barges. Container volume through the Port of Boston was more than 237,000 20-foot equivalent units (TEUs) in 2015. Container volume is likely to increase once the main Boston Harbor shipping channels are dredged to accept larger container vessels transiting the recently widened Panama Canal.[4]

In total, the MTS contributes $5.4 billion to the regional economy as well as providing more than 37,000 jobs.[5] The implications for ocean planning are that the Northeast must continue to sustain important marine transportation activities and systems while making sound decisions about how to manage the introduction of new MTS-related infrastructure and changes to the current marine transportation mix.

REGULATION AND MANAGEMENT

Several federal agencies share authority to maintain the MTS, including the USCG, USACE, and Maritime Administration (MARAD). The USCG has a unique multi-mission role involving both waterway safety and regulatory authority.[6] The USACE is responsible for permitting waterway infrastructure projects and maintaining navigable waterways. The MARAD manages several programs that promote the use of the MTS, including ports, and has authority for the licensing of offshore LNG- and oil-receiving port facilities.

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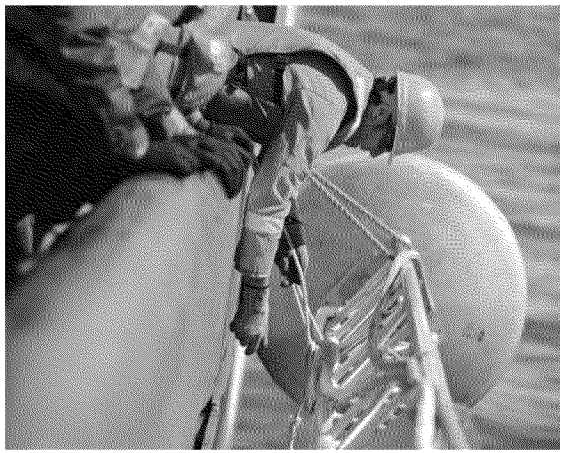
USCG regulatory and management responsibilities

The most relevant USCG missions for regional ocean planning are those that protect ports and sea lanes through waterways management, law enforcement, and environmental protection. The relevant USCG missions and responsibilities provide context for the USCG's role in the everyday operation and management of the MTS as well as in the regulatory review process for offshore projects requiring a permit, lease, or license from other agencies.

The USCG's Ports, Waterways, and Coastal Security (PWCS)[7] mission entails the protection of the MTS and those who live, work, or recreate near it; the prevention and disruption of terrorist attacks, sabotage, espionage, or subversive acts; and response to and recovery from those that do occur. As part of this mission, the USCG is responsible for ensuring the flow of commerce by inspecting foreign and domestic vessels, managing marine licensing, and enforcing treaties to ensure waterway safety. The USCG's Aids to Navigation role[8], to establish, maintain, and operate aids is well known, and relied upon, by mariners. The Ice Operations Program[9] facilitates the movement of vessels through ice-laden Northeast waters. The USCG enforces the International Convention for the Prevention of Pollution from Ships (MARPOL), as well as ESA, CWA, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and other US environmental laws in an effort to protect the marine environment.[10] Search and Rescue[11] entails "minimizing the loss of life, injury, property damage or loss by rendering aid to persons in distress and property."[12]

The USCG protects waterways and reviews new offshore projects through several authorities including the Captain of the Port (COTP) Authority[13] and the Ports and Waterways Safety Act (for assisting with decisions to permit Private Aids to Navigation, Bridges, and Marine Events), and participates as a cooperating agency for NEPA reviews, providing navigation safety evaluations to lead licensing, leasing, and permitting agencies (such as USACE and BOEM) for new waterway uses. Additionally, under the Deepwater Port Act, the USCG has been delegated authority for application processing and environmental review functions for offshore LNG- and oil-receiving port facilities.[14]

The USCG has broad authorities over vessels, facilities, cargo operations, and the people that work on vessels and the waterfront. The USCG, through the District Commander, or COTP, may establish different types of limited or controlled access areas and regulated navigation areas that may be used to mitigate risk to all waterway users. For example, a COTP order is one of



several tools available to provide operational controls over a very specific emergent situation that poses safety, security, or environmental risks to the COTP's area of responsibility.

USACE regulatory and management responsibilities

The US Army Corps of Engineers' role in the MTS is two-fold. The USACE is authorized by Congress under its Civil Works programs to study, design, construct, operate, and maintain federal navigation projects (FNPs). Additionally, through its regulatory authorities (RHA, CWA, and MPRSA), the USACE issues permits for work, structures, the discharge of dredged or fill material, and the transportation for disposal of dredged material in navigable and ocean waters.

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Under its Civil Works program, the USACE studies, designs, and constructs new projects, or makes modifications to existing projects either in response to Congressional authorization or under its delegated Continuing Authorities Programs (CAP). For navigation projects, those with a federal cost of more than $10 million are typically authorized by Congress, while those up to $10 million are typically handled under the Section 107 (RHA) CAP program. Nonfederal cost-sharing is required for feasibility studies (50 percent), while design and construction is shared according to project design depth, in accordance with the requirements in the Water Resources Development Act (WRDA) of 1986.

Inherent in all federal navigation projects is the authority to maintain those projects in perpetuity. The majority of the USACE navigation program in New England in most years involves maintenance of existing FNPs. Currently, the USACE New England District (NAE) has one major deep draft navigation improvement project (Boston Harbor deepening), in partnership with Massport (the state entity responsible for the Port of Boston), that has been authorized by Congress and is currently in the final design phase. Another deep draft improvement project, the widening of the Portsmouth Harbor turning basin, in partnership with the New Hampshire Port Authority, has been forwarded to Congress for consideration for authorization, and is also in the final design phase. NAE also has several projects in the region under study as Section 107 small harbor improvements.

Other USACE authorities cover a range of business lines and project purposes. For example, the USACE also has the authority to address issues with damages to shorelines caused by FNPs (RHA Section 111), to restore habitat including areas formerly used as dredged material placement sites (RHA Section 1135), and to find beneficial use of dredged material for habitat creation or storm damage risk management (Section 204).

MARAD regulatory and management responsibilities

The Maritime Administration promotes the development and maintenance of an adequate, well-balanced United States merchant marine, sufficient to carry the nation's domestic waterborne commerce and a substantial portion of its waterborne foreign commerce, and capable of service as a naval and military auxiliary in time of war or national emergency. MARAD seeks to ensure that the United States maintains adequate shipbuilding and repair services, efficient ports, effective intermodal water and land transportation systems, and reserve shipping capacity for use in time of national emergency. MARAD is also charged with meeting the country's commercial mobility needs while maintaining national security and protecting the environment. MARAD is an active participant at the national and international stage, advocating the need for consistent standards that value environmental protection.

Particularly relevant MARAD programs include:

Deepwater Port Program:[15] MARAD, in consultation with the US Coast Guard, is delegated the authority to license deepwater ports (DWP)[16], including facilities constructed at sea that are used as terminals to transport oil or natural gas to or from a state.[17] MARAD carefully considers all licensing applications to ensure, among other things, that projects achieve the DWPA's stated goals: to protect the marine and coastal environment; to prevent or minimize adverse impacts of port development; to promote the safe transfer of oil or natural gas to DWPs while minimizing the traffic and risk associated with such transport; and to protect the energy security of the United States.[18]

Ship Disposal Program: MARAD serves as the federal government's ship disposal agent of obsolete, noncombatant vessels weighing 1,500 gross tons or more. The program seeks to dispose of obsolete vessels in the most-expedient, best-value, and environmentally safe manner. The program prioritizes the removal of the vessels that present the highest risk to the environment first. While MARAD is authorized to consider alternative ship disposal

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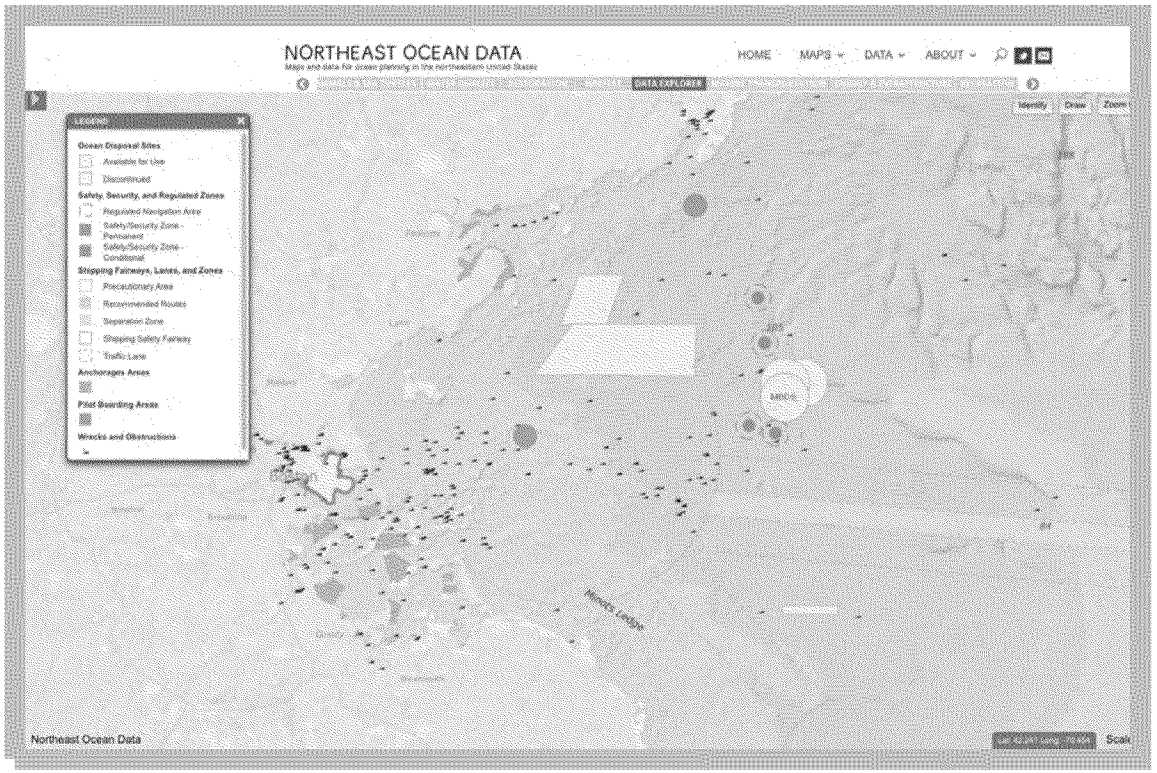
methods, such as, for example, artificial reefing, donation, and SINKEX (sink at-sea live-fire training exercise), MARAD focuses on vessel sales and ship dismantling options as those have been deemed the most expedient, cost-effective, and environmentally friendly methods available.

America's Marine Highway Program: America's Marine Highway Program[19,20] is a Department of Transportation–led initiative to expand the use of waterborne transportation by integrating it into the nation's surface transportation system while relieving landside congestion and reducing air emissions. This collaborative effort among federal agencies, academia, industry, and public stakeholders supports important sustainability-related improvements including reductions in petroleum reliance and greenhouse gas emissions and encourages the use of alternative fuel technologies, such as liquefied natural gas, through the strategic and diversified use of waterborne shipping routes.[21] The program seeks to provide public benefits that relate to the overall transportation system in the US by, for example, reducing wear and tear on surface roads and bridges through the use of waterborne transportation; using less energy to transport goods; reducing air emissions; and providing local public health benefits from the mandatory use of modern technology on designated projects.



This map displays the busy approach to Boston Harbor. Without any other ocean uses displayed, the MTS in this area includes several navigational features: Regulated Navigation Area, Boston Traffic Separation Scheme (TSS) Precautionary Area, Ocean Disposal Site, a private aid to navigation at the Northeast Gateway Deepwater Port, and an inbound traffic lane for the Boston TSS, as well as numerous shipwrecks.

Maritime Environmental and Technical Assistance (META) Program: The maritime industry has increasingly become the focus of new environmental regulations, and it must now comply with a broad array of requirements in the areas of air and water quality, hazardous waste disposal, and aquatic species protection. The Office of Environment (OE) addresses these environmental issues

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through the META Program. The program provides marine transportation stakeholder support and assistance, including research and development, related to emerging marine transportation environmental issues. MARAD collaborates with industry, academia, and other public stakeholders to address critical marine transportation issues including, but not limited to, ballast water treatment, port and vessel air emissions, and alternative fuel technologies, to develop solutions to the most-pressing environmental problems associated with the design, construction, and operation of ships. MARAD also encourages cooperative research programs in regional and international bodies with similar foci. META seeks opportunities to partner on research projects to advance sustainable vessel operations.

MAPS AND DATA

Agencies with authority over the MTS rely on having access to relevant data to make decisions about day-to-day (even minute-by-minute) operational activities as well as issuing permits, a process that can last several years. Accurate maps and data are essential to moving people and goods in a safe, timely, and efficient manner. Having a central repository, such as the Portal, is a significant tool for implementing MTS authorities. The Marine Transportation theme on the Portal reflects two main categories, Navigation and Commercial Traffic.

Navigation

The Navigation map includes several features that are important to waterway users (e.g., pilots, mariners, fishermen, port authorities, industry representatives) and decision makers in order to maintain a safe and secure waterway. Features include Pilot Boarding and Anchorage Areas, Maintained Channels, Disposal Sites, Shipping Traffic Separation Schemes, Regulated Navigation Areas, and Obstructions, as well as the Aids to Navigation System. These features were reviewed and finalized after much input from stakeholders.

Commercial traffic

The Commercial Traffic map is composed of layers derived from the Automatic Identification System (AIS).[22] It displays vessel traffic density, which can be parsed out by general vessel type (cargo, passenger, tug-tow, and tanker) for each year between 2011 and 2013. These maps do not directly show the number of transits, but rather the relative density of vessels in a particular block over the course of a calendar year.

These maps were reviewed and validated by both the USCG and by vessel owners, pilots, and port authorities in the region who suggested the data be broken out by vessel type. This is important because each vessel type may operate in a different manner, may employ different routes, may present different navigational risks, and may interact with other activities in unique ways.

After discussing these data with vessel operators, several operating patterns emerged. Cargo vessels will often wait in an anchorage for pier space to become available or for tide and current conditions to become favorable. Passenger vessels usually adhere to a rigid schedule, and security measures must be coordinated to avoid delays. Tankers generally employ tugs for docking assistance, and, if they are delivering LNG or propane, significant security measures are required by the USCG and local authorities. Tugs with barges towed astern are more restricted in their ability to maneuver than most other vessels, and they often transit routes closer to shore. Some vessels adhere to routes that have been chosen for a variety of reasons, including weather, fuel consumption, and safety concerns.

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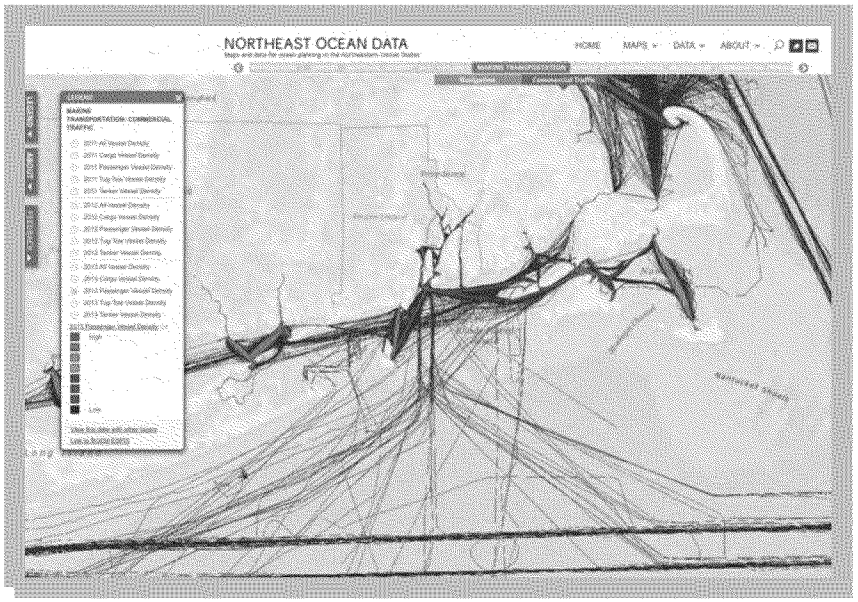
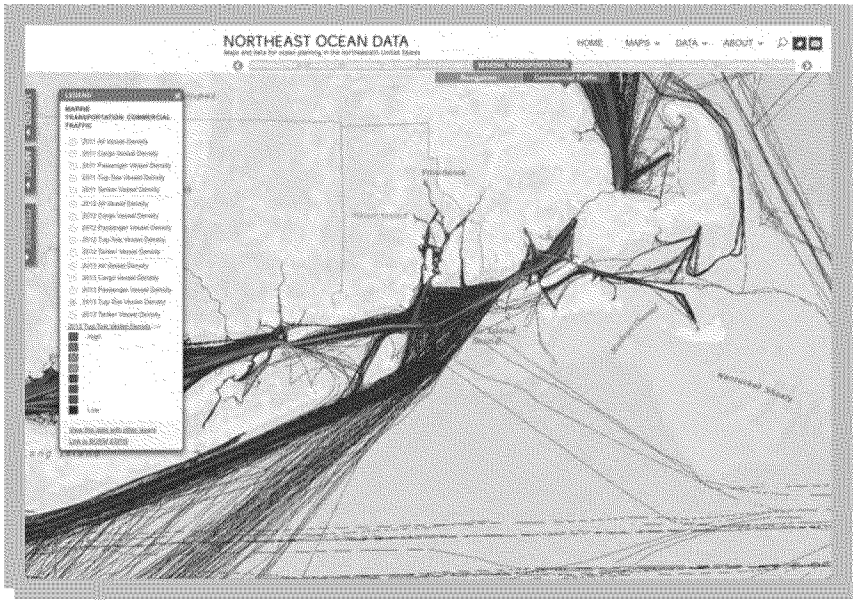
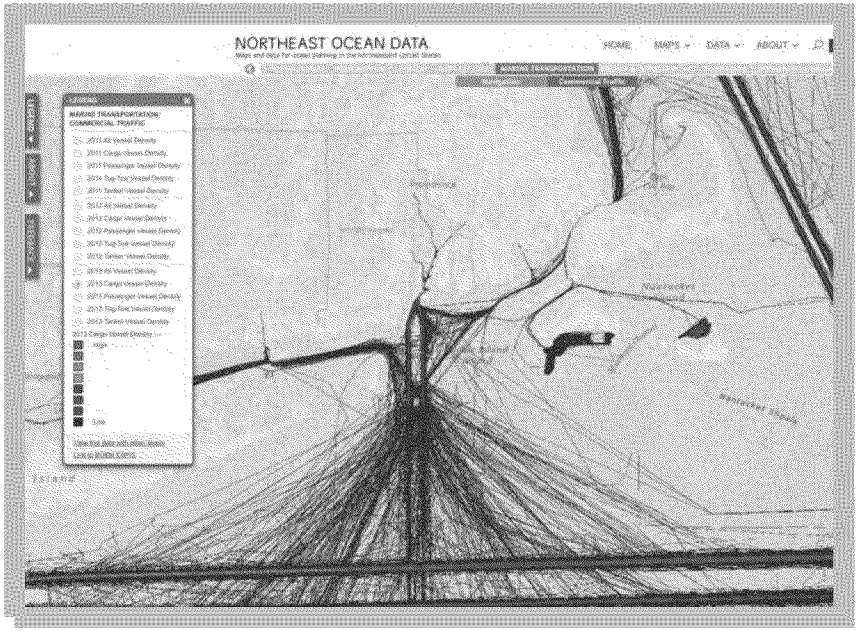
Passenger vessels





Tug-tow vessels

These maps show passenger, cargo, and tug-tow vessel activity in southern New England, where several offshore wind projects have been proposed. The maps demonstrate the unique patterns associated with different vessel types.



Cargo vessels

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OVERVIEW

ACTIONS

MT-1 Maintain existing maps and data on the Portal

MT-2 Provide additional data through new analyses

MT-3 Use the Plan and the Portal to inform regular operations and management of the MTS

MT-4 Use the Plan and the Portal to identify potential conflicts, impacts, and potentially affected maritime stakeholders during permitting and leasing for new proposed activities

MT-5 Use the Plan to inform dredging and federal navigation projects

MT-6 Continue outreach to maritime stakeholders to understand current trends and the potential effects of new activities to the MTS

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ACTIONS: MAINTAIN AND UPDATE DATA

MT-1. Maintain existing maps and data on the Portal: Much of the Marine Transportation data on the Portal is provided by the Marine Cadastre including each of the datasets in the Navigation map except Pilot Boarding Areas and Safety and Security Zones. Those two datasets were developed by the Portal Working Group and reviewed by pilot associations and USCG staff in the region. At the time of this Plan, the Marine Cadastre has begun maintaining these two datasets as well. Therefore, the Navigation maps on the Portal will be maintained through updates provided by the Marine Cadastre, and regional USCG staff intends to ensure those maps are reviewed by MTS agencies and stakeholders.

The USCG is the original source for two vital datasets on the Portal: Aids to Navigation (ATON) and AIS vessel traffic. By law, the USCG has and will maintain the US Aids to Navigation System, which is reviewed and corrected on a regular basis by sector and district waterway managers and displayed on NOAA nautical charts.[23] The USCG also developed and maintains the nationwide AIS.[24] The USCG Navigation Center (NAVCEN) gathers AIS data on a continual basis and provides real-time and historical annual data to government agencies, including ocean planning efforts such as this Plan. As of the publication of this Plan, USCG will provide annual AIS and ATON data to the Marine Cadastre, which will provide it to the Portal Working Group for incorporation into the Portal.

MT-2. Provide additional data through new analyses: While the Portal provides useful and accurate representations of vessel traffic, actual counts of unique vessel transits are a better measure for management purposes than the current maps of relative vessel density. In addition, USCG and representatives of the marine transportation sector recommended using AIS data to review monthly and seasonal traffic variability for different vessel types owing to economic and weather-related factors throughout the year. As of the time of the publication of this Plan, the Portal Working Group is converting AIS data into maps displaying the number of unique transits occurring within a 1 kilometer block of ocean over a year. Preliminary maps of monthly vessel traffic have also been developed and are being reviewed through a time slider tool allowing the user to visualize monthly patterns. The Portal will be updated with these maps once the review process is complete.

ACTIONS: INFORM REGULATORY AND MANAGEMENT DECISIONS

MT-3. Use the Plan and the Portal to inform regular operations and management of the MTS: On the operational side of the agency, the USCG needs access to data to inform decision-making and to focus further analysis. The Portal and this Plan are key to helping find solutions for the increasing conflicts on ocean use. On a regular basis, the USCG in the Northeast will consult the MTS data on the Portal to obtain an initial picture of particular attributes of a waterway and its use. The USCG First District Waterways Management Team communicated internally about the Plan and Portal frequently and extensively. Both at the First District and at Sectors within the Northeast region, Waterway Managers[25] and other decision makers will use the Plan to the extent practicable to understand the navigation risk profile of the relevant waterway, as well as make decisions about how to use limited resources. The following are examples of potential uses of Plan data and information:

- Adding or removing federal or private ATON.
- Potentially adjusting existing fairways or traffic separation schemes, as identified in a Port Access Route Study (PARS).[26]
- Conducting a Waterways Analysis and Management System (WAMS) study. The expansion of the Panama Canal and the potential for increases in US petroleum production collectively have the potential to increase the number of vessels in the MTS, the size and capacity of these vessels, and the amount of commerce arriving/departing US ports and waterways.

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- Maintaining the Vessel Traffic Systems (VTS) and Vessel Movement Reporting Systems.
- Assisting decision makers in their response to marine event permit applications.[27]
- Deciding where to deploy limited ice-breaking assets.
- Supporting cleanup actions in response to unlawful spills or discharge events.
- Providing a backdrop for USCG activities at Harbor Safety Committee[28] meetings with government and industry representatives.

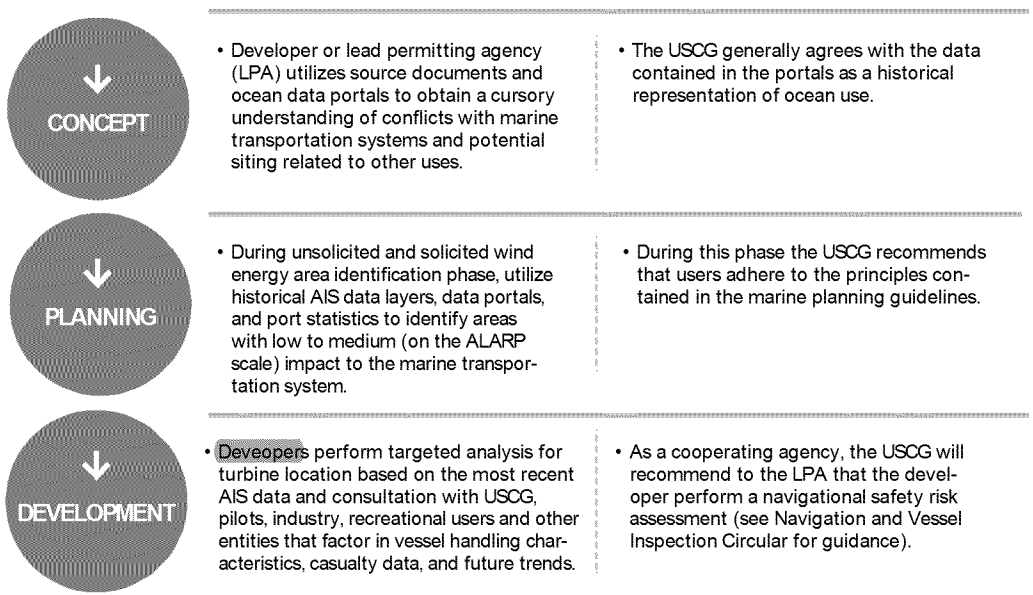
Other USCG offices, such as the Bridge Administration Program[29] and the Marine Transportation System Recovery Units,[30] can review the Portal as they begin to work with agencies and stakeholders.

To the extent practicable, MARAD will use the Portal in monitoring changes in transportation routing, transportation trends, and activities in the region. MARAD also relies on a variety of public and purchased data sources to respond to its stakeholders. To ensure sound maritime policy, MARAD routinely compares data sources and analyzes variation. Identifying changing transportation patterns will assist MARAD and the US Department of Transportation (DOT) in setting sound transportation policy and making wise investments in transportation infrastructure.

MT-4. Use the Plan and the Portal to identify potential conflicts, impacts, and potentially affected maritime stakeholders during permitting and leasing for new proposed activities: For regulatory reviews of offshore projects, such as proposed Wind Energy Areas (WEA) in the Northeast, the USCG First District and Sector Waterways Management teams will use the Portal to the extent practicable to facilitate preapplication discussions with applicants, affected stakeholders, and other government agencies. Additionally, the USCG plans on using internal policies and other maritime safety guidance to evaluate the risk of new activities on an existing waterway and users of that waterway. One example is the guidance that came out of the Atlantic Coast Port Access Route Study. In the role of a cooperating agency for BOEM, MARAD, USACE, or other projects, the USCG will use Plan data, to the extent practicable, in several ways during the three permitting phases of infrastructure projects.

The figure provides an example of how the Portal, as marine planning guidance, can be used at various phases in the BOEM WEA

Figure: Example USCG First District use of Marine Planning Guidance



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permitting process. This includes an initial assessment of impacts or conflicts in a particular waterway. The Portal will help identify potentially affected marine transportation stakeholders and can be used to facilitate individual meetings or to convene stakeholders to understand potential impacts to MTS operations. Such discussions often save time by identifying what is important to particular stakeholders, and they are helpful toward developing alternatives such as rerouting. As a project moves forward into the planning and development stages, navigation risk-mitigation strategies can be developed after reviewing AIS and engaging with vessel operators and owners.

MT-5. Use the Plan to inform dredging and federal navigation projects: The USACE prepares feasibility studies, dredged material management plans, and other decision documents covering its improvement and operations and maintenance (O&M) activities. Environmental assessments and environmental impact statements are also prepared to accompany these decision documents. Due diligence requires that all pertinent sources of information be investigated and considered in making decisions on project benefits and impacts. Federal laws, regulations, policies and executive orders concerning civil works activities must be considered and their compliance documented. To the extent practicable, the USACE will consult this Plan and the Portal in the preparation of its scopes of study for new projects and its dredged material management plans. For example, Portal data will assist in documenting marine traffic levels, patterns, and concerns as they pertain to the shipping upon which USACE new project recommendation decisions are made. Siting and management of open water dredged material placement areas will also benefit from the marine transportation data available through the Portal.

MT-6. Continue outreach to maritime stakeholders to understand current trends and the potential effects of new activities to the MTS: The USCG has several communication tools to update maritime stakeholders of a broad spectrum of information with varying degrees of timeliness. The most immediate communication is the Local Broadcast Notice to Mariners,[31] used to inform mariners over VHF radio of hazards, unusual operations (such as dredging of channels), or unusual conditions. The Homeport[32] website publishes news, alerts, and notices of a less immediate nature, and Marine Safety Information Bulletins[33] provide more-detailed long-range information at the national level and more-urgent safety information at the local level. The USCG also intermittently carries out projects to improve the MTS based on stakeholder feedback. Recently, the USCG partnered with USACE and NOAA to consider the future of navigation.[34]

As cited earlier, the USCG encourages the formation of harbor safety committees (HSC) and supports their activities through active participation in order to improve local coordination and identify potential MTS issues.[35] HSCs provide opportunities to communicate with many stakeholders within the port and can be used to recommend actions to improve the safety and efficiency of a port or waterway. The HSC is composed of representatives of government agencies, maritime labor, industry organizations, environmental groups, and other public interest groups. The USCG plans to continue to participate in HSCs to review MTS data, learn about future trends, and discuss with stakeholders any projects or activities that may affect waterways.

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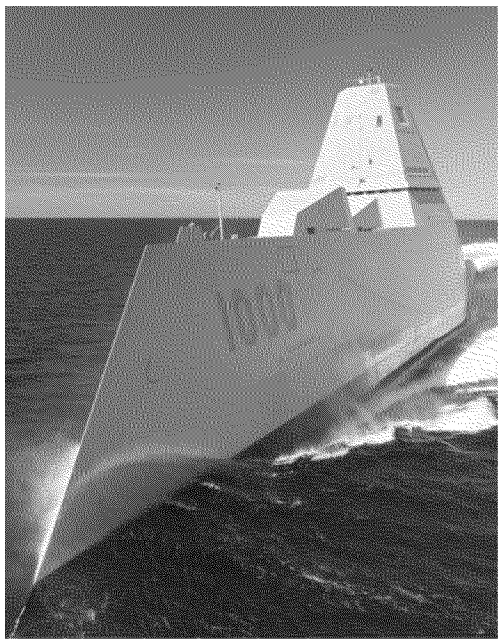
NATIONAL SECURITY



Major conflicts, terrorism, lawlessness, and natural disasters all have the potential to threaten the national security of the United States. Multiple branches of the US Department of Defense (DOD) (i.e., US Navy, Army, Marine Corps, and Air Force) and the Department of Homeland Security (DHS) are responsible for our nation's security. In terms of national security at sea, the US Department of the Navy (Navy) and the US Coast Guard (USCG) are the primary branches that carry out training and testing activities at sea to be able to protect the United States against its enemies, to protect and defend the rights of the United States and its allies to move freely on the oceans, and to provide humanitarian assistance when needed.

While the US Navy is the primary focus for military activities related to ocean and coastal planning programs, the USCG also operates in the ocean, coastal waters, and harbors.

The USCG is tasked with law enforcement, border control, ensuring safety of our domestic waterways and their users, and the efficient flow of commerce as described in the Marine Transportation section. These responsibilities are executed through the region's several command centers. A command center facilitates the execution of all of the USCG national security missions and provides valuable information and coordination capability to other government agencies and port partners. The USCG, through the Captains of the Port, is also the lead agency for coordinating all maritime security planning and operations in US ports and waterways in the designation as federal maritime security coordinator. Additionally, the USCG conducts training exercises in coastal waters to remain ready to execute the many and varied security missions.

The Navy operates on the world's oceans, seas, and coastal areas—the international maritime domain—on which 90 percent of the world's trade and two-thirds of its oil are transported. Naval forces must be ready for a variety of military operations—from large-scale conflict to maritime security and humanitarian assistance/ disaster relief—to deal with the dynamic, social, political, economic, and environmental issues that occur in today's world. The Navy supports these military operations through its continuous presence on the world's oceans, and it can respond to a wide range of issues because, on any given day, over one-third of its ships, submarines, and aircraft are deployed overseas. To learn these capabilities, personnel must train with the equipment and systems that

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will achieve military objectives. The training process provides personnel with an in-depth understanding of their individual limits and capabilities and helps the testing community improve new weapon systems. The Navy's research and acquisition community engages in a broad spectrum of testing activities in support of the fleet. These activities include, but are not limited to, basic and applied scientific research and technology development; testing, evaluation, and maintenance of systems (missiles, radar, and sonar) and platforms (surface ships, submarines, and aircraft); and acquisition of systems and platforms to support Navy missions and give the Navy a technological edge over adversaries.

Operational requirements for deployment of Navy forces worldwide drive and shape training doctrine and procedures. The nature of modern warfare and security operations has become increasingly complex. Naval forces carry out operations on and below the ocean surface, on land, and in the air simultaneously. To stay prepared to effectively counter the array of threats, naval forces bring together thousands of sailors and marines, their equipment, vehicles, ships, and aircraft. Navy units must operate in an environment of continuous readiness and training certification. Therefore, military

readiness training must be as realistic as possible to provide the experiences that are vital to success and survival. While simulators and synthetic training are critical elements of training—to provide early skill repetition and enhance teamwork—there is no substitute for live training with real equipment in a realistic environment.

The Navy has historically used areas along the eastern coast of the United States and in the Gulf of Mexico for training and testing. These areas were designated by the Navy into geographic regions, and named "range complexes." A range complex is a set of adjacent areas of sea space, undersea space, land ranges, and overlying airspace delineated for military training and testing activities. Range complexes provide controlled and safe environments where military ship, submarine, and aircraft crews can train in realistic conditions. The combination of undersea ranges and operating areas (OPAREAs) with land training ranges, safety landing fields, and nearshore amphibious landing sites is critical to realistic training, which allows electronics on the range to capture data on the effectiveness of tactics and equipment—data that provide a feedback mechanism for training evaluation. The range complexes, test ranges, and OPAREAs provide realistic environments with sufficient sea and airspace vital for safety, training complexity, and mission success. Range complexes must provide flexibility to meet these diverse training and testing requirements given the wide range of warfare specialties and array of skills and proficiencies the fleets must demonstrate before certification for deployment.

DEPARTMENT OF DEFENSE PRESENCE AND REGIONAL CONCERNS

The Boston, Narragansett, Atlantic City, and Virginia Capes (VACAPES) range complexes are located along the Mid-Atlantic and Northeastern Seaboard of the United States. Combined, these areas are the principal locations for portions of the Navy's major training and testing events and infrastructure, including activities originating out of nearby Navy installations.

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Three separate range complexes (the Boston Range Complex, the Narragansett Bay Range Complex, and the Atlantic City Range Complex) are collectively referred to as the Northeast Range Complex. The Northeast Range Complex spans 761 miles along the coast of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, and New Jersey. The Northeast Range Complex also includes OPAREAs and associated special use airspace for Navy training and testing activities. The Naval Undersea Warfare Center Division Newport (NUWCDIVNPT) Testing Range consists of waters within Narragansett Bay; nearshore waters of Rhode Island Sound; Block Island Sound; and coastal waters of New York, Connecticut, and Massachusetts.

Proximity of the range complexes to naval homeports is strategically important to the Navy because close access allows for efficient execution of training activities and nontraining maintenance functions and access to alternate airfields when necessary. The proximity of training to homeports also ensures that sailors and marines do not have to routinely travel far from their families. Less time away from home is an important factor in military readiness, morale, and retention. The proximate availability of the range complexes is critical to Navy efforts in these areas. Several military installations including the Portsmouth Naval Shipyard (PNSY), Naval Station (NS) Newport, Naval Submarine Base (NSB) New London, Naval Weapons Station Earl, and Joint Base McGuire-Dix-Lakehurst (JB MDL), are located on land adjacent to the offshore Northeast Range Complexes. These installations use the waters and airspace of the range complexes for training or testing activities (as well as other nearby range complexes such as VACAPES).

The Northeast Range Complexes also support training and testing by other branches of the military, primarily the USCG and the US Air Force (USAF) from nearby bases, as well as visiting operators with home bases located farther away. Overall, minimal surface training occurs within the Northeast OPAREAs due to the time and distance from the operators' homeports and home bases. The primary activities in the Northeast OPAREAs consist of submarine and submersible training and testing. Submarine and submersible testing and training is conducted out of NSB New London, Portsmouth Naval Shipyard, and the Naval Undersea Warfare Center Division Newport, while Bath Iron Works builds and tests surface ships in the area. In addition to these users, non-DOD users are likely to use the offshore range complexes for research, including various government agencies such as various branches of the NOAA, research institutions such as Woods Hole Oceanographic Institution, universities such as the University of Rhode Island, the University of Connecticut, and Rutgers University (among others), and various state agencies. The USCG also conducts weapons training in areas beyond 3 nautical miles from shore for small boats and in areas beyond 12 nautical miles (typically in Navy-designated ranges) for larger vessels such as the national security cutters.

The series of Range Complexes along the East Coast provide a critical controlled environment for all branches of the DOD, especially the Navy, that accommodate training and testing operations in realistic combat conditions. Most of the operating, warning, and restricted areas were initially established before or during World War II and have been in use for decades. Maintaining access to, and usage of, offshoretraining areas is of the utmost importance. Through a variety of internal and public documents, the Navy attempts to quantify potential impacts to offshore ranges in order to minimize incompatibilities and maximize range sustainment. Some concerns are summarized next.

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Airborne noise
The central issue of airborne noise is the perceived impact on people, animals, structures, and land use. The magnitude of noise, resulting complaints, pressure to modify or suspend operations, and threats of litigation are directly related to the degree to which there are people, wildlife, and other noise-sensitive land uses in the vicinity of training space.

Competition for airspace and sea space
The DOD and DHS use shared resources that need to be available for testing, training, and operational missions. These resources must be of sufficient size and quality to provide effective training and testing. Public pressure to share or relinquish air or water resources may inhibit the military from accomplishing its training and test objectives.

Competition for scarce resources
Community pressure to gain access to valuable resources located in littoral areas or seas that the DOD and DHS use may affect the ability to use these waters for operational training or test objectives. Access may include processing and transporting materials. There is also pressure to limit the DOD and DHS's access to the public's resources, as well as pressure on the DOD to develop renewable resources.

Threatened and endangered species
Restrictions for the purpose of protecting threatened or endangered species or their critical habitat can reduce the value of training space for testing and training by limiting the types of permissible activities in terms of composition, magnitude, or timing.

Maritime issues
Regulatory or permit requirements protecting ocean resources cumulatively affect the DOD and DHS's ability to conduct operations, training exercises, or testing in the marine environment.

Safety arcs and footprints
Land or water adjacent to range safety zones may not be suitable for certain types of use or economic development.

Frequency spectrum
The competition for available frequency spectrum may lead to a reduction in available spectrum for training and testing activities. The lack of spectrum may decrease the effectiveness of exercises by restricting the number of war-fighting systems that can participate. As the potential for residential and commercial encroachment increases, so does the risk of increased radio frequency emitters and receivers, which could result in interference with DOD and DHS electromagnetic systems from public or commercial systems.

Habitat
Prohibited or restricted access to sensitive littoral zones such as tidal wetland areas and buffer zones, essential fish habitat, and critical habitat can restrict existing training, preclude or restrict integration of new technology/weapons systems, or preclude future execution of new missions in amphibious, riverine, or estuarine operations.

Interpretation of environmental regulations
Regulatory or permit requirements may affect training and testing operations. Other non-military actions may affect the current regulatory or permit requirements for DOD and DHS.

Interagency coordination
Use of land or sea space controlled by another federal or state agency can limit allowable uses and restrictions. Such allowable uses or restrictions are often the result of negotiations between the parties or are subject to the other federal agency's policies and regulations. Restrictive uses can limit training and operations.

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Legislative initiatives that restrict operations
Congress may enact legislation that directly or indirectly limits the DOD and DHS's flexibility in conducting planned operations, training, or testing. Additionally, local ordinances and/or state legislation may limit the Navy's and USCG's operations, training, or testing.

Potential training and testing impacts may occur due to the concerns listed in this section, which can severely affect the overall readiness of the Navy and USCG. For example, when range access is reduced, the limitations imposed on DOD and DHS units may degrade the realism and value of the training. If areas within training or testing space are permanently or temporarily unavailable for operations, avoidance areas may inadvertently be created. If the number of training days are reduced or if certain types of operations, training, and testing are prohibited or if operations are restricted for a period of time and/or in certain geographic areas, the DOD will be impaired in fulfilling its Title 10 requirements. In these cases, the testing or training must be conducted at other locations or a workaround must be developed, which can reduce realism and the value of the testing or training experiences. Civilian and commercial use of airspace or development on the ground may prevent DOD forces from taking full advantage of training space. During testing or training, aircraft may be forced to fly at artificially low or high altitudes or artificially low airspeeds, which reduces realism. Nighttime operations and training are essential to force readiness. However, while voluntary restrictions on military training at night may foster better community relations, such restrictions pose especially critical limits on militarily essential testing and training. Restrictions can also reduce opportunities for the use of live-fire ordnance, thereby reducing proficiency. While the use of simulation and inert ordnance can replace some live-fire training, testing or training with live ordnance remains essential for adequately preparing DOD forces for combat.

DOD MANAGEMENT PROGRAMS AND REGULATORY COORDINATION

The Navy has policies and processes that currently exist to manage Navy training and testing space, identify potential impacts to Navy training, and integrate the Navy within other federal and state agency directives and programs. DOD offshore operations are subject to regulatory compliance and management measures that can be time-consuming and costly. Establishing (and maintaining) programs that build alliances between DOD, other federal agencies, state regulators, and tribes is essential for sustaining a proactive approach to meeting requirements for compliance. Routine coordination and consultation with other agencies provides information regarding future agency actions and allows the DOD opportunity to advocate for the importance of training activities to sustain the DOD's mission. As future at-sea testing and training activities and required compliance efforts continue and expand, these relationships will prove invaluable. The following examples of existing regulatory, management, and coordination activities are most relevant to the Plan:

- The DOD coordinates with Federal Aviation Administration (FAA) representatives to foster better communication. A military liaison to the FAA is currently based at the FAA regional headquarters in Burlington, Massachusetts and/or Jamaica, New York.
- The DOD coordinates with the appropriate frequency allocation and oversight agencies to identify frequency spectrum impacts on military operations and to develop strategies that will reduce encroachment while ensuring pending use of emerging spectrum technologies.
- The DOD participates in BOEM's intergovernmental renewable energy task forces, which include federal agencies as well as state, tribal, and local governments.
- The Navy has developed a working group, the Ocean Observing System Security Group (OOSSG), for tracking and addressing potential issues with ocean observing systems (OOS). Additionally, the Situational Awareness Office is developing a program to be used as a tool to help the Navy identify the locations

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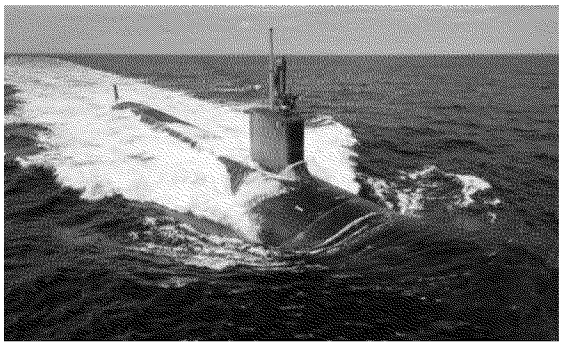

and types of OOS worldwide. The program will tell the Navy where each OOS is, what type of data it collects, and how to avoid it (i.e., avoidance distances).

- To respond to and execute range sustainment and compatibility requirements, the Navy established a monitoring and coordination process based on networked regional coordination teams (RCTs). RCTs are composed of knowledgeable representatives from the fleets, system commands, and installation headquarters. RCTs are equipped to review and analyze potential encroachment problems, determine impacts on DOD operations, and provide alternatives and mitigation requirements. Once an encroachment threat or issue is identified, either at the Navy HQ level or by a subordinate command or unit, the issue is forwarded to the appropriate RCT for initial analysis. The RCT then distributes the encroachment information to all relevant stakeholders.
- Under the Navy At-Sea Environmental Compliance Program, a number of environmental documents have analyzed Navy training and testing in nearshore and open-ocean areas. In conjunction with release of the Navy's Final Environmental Impact Statements/Overseas Environmental Impact Statements and the associated Records of Decision (RODs), NMFS and USFWS issue final rules and letters of authorization (LOAs) under MMPA, and biological opinions (BOs) or letters of concurrence under ESA. The Navy's RODs, final rules, LOAs, BOs, and concurrence letters outline requirements that the Navy must satisfy in order to remain in compliance with environmental laws and regulations.
- Under the Navy At-Sea Environmental Compliance Program, the Atlantic Fleet Training and Testing (AFTT) environmental impact statement/overseas environmental impact statement was prepared to comply with NEPA, Executive Order 12114, CZMA, MMPA, and ESA requirements, and to assess the potential environmental effects associated with military activities. The study area included the western North Atlantic Ocean along the East Coast of North America, the lower Chesapeake Bay, and the Gulf of Mexico. The study area also included several Navy testing ranges and range complexes including the Boston, Narragansett, and Atlantic City OPAREAs. More information can be found at http://aftteis.com.

MAPS AND DATA

The National Security theme on the Portal was developed and reviewed by DOD. It includes the following map layers showing DOD presence in the region, as previously described. Complete descriptions and appropriate DOD points of contact for each layer will be found on the Portal.

- Military installations
- Military range complexes
- NUWCDIVNPT testing range
- OPAREA boundaries
- Submarine transit lanes
- Warning areas
- Cape Cod TORPEX boxes
- Danger zones and restricted areas

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OVERVIEW

ACTIONS

NS-1 Maintain and update National Security maps and data on the Portal

NS-2 Inform management and regulation of military activities

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ACTIONS: MAINTAIN AND UPDATE DATA

NS-1. Maintain and update National Security maps and data on the Portal: The DOD will update the national security data on the Portal periodically as needed, such as when applicable permits are renewed or operations significantly change. All layers were provided by DOD with the exception of danger zones and restricted areas, which was provided by the Marine Cadastre and will be maintained through subsequent updates provided by the Marine Cadastre. In addition, DOD will update appropriate points of contact for the national security data layers, as necessary. Ensuring that agencies have appropriate points of contact improves interagency coordination and will enable decision makers to understand the implications of proposed regulations and development plans on DOD security, training, and testing, and on a variety of other mission-specific needs.

ACTIONS: INFORM REGULATORY AND MANAGEMENT DECISIONS

NS-2. Inform management and regulation of military activities: The DOD intends to use the Plan and the Portal as one mechanism to guide and inform DOD programs, initiatives, and planning documents when involved in the multiple coordination task forces and other planning groups in which the DOD currently participates, including those listed in this Plan.

- DOD will to the extent practicable use the Plan and the Portal as one source of information to identify potential impacts and encroachments to DOD operations resulting from existing or newly proposed activities, such as energy installations, aquaculture, and new navigational measures. The DOD regularly participates in a wide variety of existing local, state, and federal agency coordination groups, forums, and advisory panels across the nation, and will work to identify any additional outlets that it would be beneficial to participate in.
- DOD and DHS will to the extent practicable also use the Plan and the Portal as a research tool to obtain supplemental regional stakeholder and natural resource information related to proposed DOD and DHS actions and activities.
- DOD and DHS will to the extent practicable consult the Plan and the Portal in the preparation of internal agency guidance, existing procedures, and environmental planning. DOD and DHS will also, if practical, identify the Plan and the Portal as an important source of information in decision-making. DOD participation in future RPB efforts will be as directed by the DOD National Ocean Council Executive Steering Group (NOC ESG). Designated DOD and Joint Chiefs of Staff RPB representatives will coordinate Plan implementation actions between the RPB, DOD, and Joint Chiefs of Staff.

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COMMERCIAL & RECREATIONAL FISHING

Commercial fishing in New England has a long and storied history. Its importance culturally and economically has lasted hundreds of years, becoming a part of many tales of the New England coast. Its economic importance is similarly well documented. In a single year (2012), the landings revenue by all species in New England was over a billion dollars;[1] once revenue generated by other related industries (processing, dealers, wholesalers, distributors, importers, and retailers) is included, total sales impact is estimated to be nearly $13 billion in 2012.[2]

There is no single "commercial fishery" in New England. Fishing operations vary from harbor to harbor depending on a myriad of factors, which vary throughout the region and over time: targeted species, vessel sizes, proximity to fishing grounds (current and historic), changes in environmental conditions, economic and market-driven forces, shoreside supporting infrastructure, and many more. Commercial fishing in Maine currently looks quite different than in southern New England. Ports such as New Bedford and Gloucester, Massachusetts (scallops and groundfish), and Stonington, Maine (lobster), have consistently ranked among the top US ports in terms of landings value in recent years.[3] Assessing trends in time needs to be fishery-specific: for example, the number of commercial ground fishing vessels has declined in recent years, while the number of boats in the lobster fleet in northern New England has greatly increased. Many coastal communities in the region remain closely connected to fisheries and thus are directly affected by trends in commercial fishing.

Similar to the case with commercial fishing, angling for recreational purposes is widespread and targets many different species. Striped bass, summer flounder, groundfish, and countless other species are targeted by shoreside anglers, surf casters, boaters, charter and party boats, and fishing tournaments throughout New England all summer long, drawing residents and visitors by the hundreds of thousands. In 2013, an estimated 5 million recreational fishing trips were taken in New England marine waters.[4]

Fisheries are an important issue for many coastal tribes, and are embedded in their culture and history—from a commercial standpoint—as well as for basic sustenance. Tribes are concerned about the restoration of diadramous fish populations and prioritize the restoration of water quality and fish habitat for Atlantic salmon and other species including American shad, river herring, and American eel. Currently, commercial fishing is an important source of income for certain coastal tribes.

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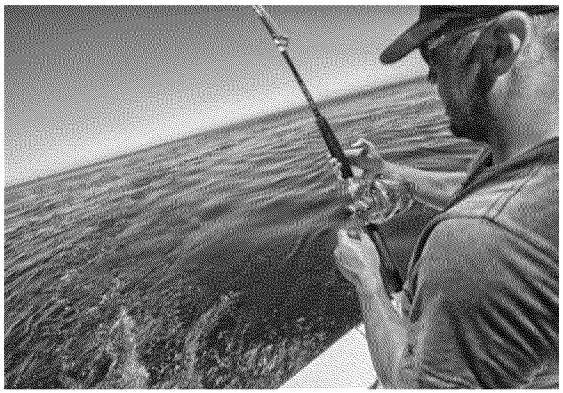
REGULATION AND MANAGEMENT

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) is the primary law governing fisheries management in federal waters. The MSA establishes eight regional fishery management councils, including the New England Fishery Management Council (NEFMC), whose primary responsibility is the development of fishery management plans (FMPs) pursuant to 10 national standards, or conservation and management requirements. Once a Council develops an FMP (or any amendments to an existing FMP) and its management measures, NMFS reviews the Council's recommendations and approves and adopts the recommendations into federal regulations, provided they are consistent with other federal laws such as NEPA, MMPA, MBTA, ESA, Administrative Procedures Act, Paperwork Reduction Act, CZMA, Data Quality Act, and Regulatory Flexibility Act. Other agencies become involved in issues related to fisheries management pursuant to existing authorities. For example, to address potential impacts to birds, turtles, and marine mammals, USFWS and NMFS work with partners to study potential measures that could be effective at reducing impacts to species that are protected under applicable federal law such as the ESA. Additionally, under MSA the US Coast Guard has responsibilities related to commercial fishing vessel safety and to supporting a sustainable fishery by ensuring compliance with the MSA.

Federal agencies are required by existing law (such as NEPA and RHA) to assess potential impacts of federal actions, such as the potential issuance of permits and leases for proposed development activities, on commercial and recreational fisheries, and, depending on the results of the assessment, to consider impact avoidance or mitigation measures. Such assessments occur during the NEPA process associated with these federal actions or, in addition to NEPA, through the individual review processes associated with each applicable federal law. Some examples include the RHA public interest review (conducted by USACE), the DWPA licensing process (MARAD and USCG), and OCSLA leasing (BOEM). Additionally, through the PWSA, the US Coast Guard has responsibilities that include assessing potential navigational risks associated with offshore activities (see the Marine Transportation section for more information).

States are also typically involved in review of the potential impacts of proposed activities on fisheries. State regulatory programs also may require assessment of fisheries impacts as part of the review of proposed activities. For



projects that may impact the waters of multiple states or fishery resources managed regionally or coastwide under an FMP, states may coordinate their review through their representation on the NEFMC (and coordination with the Mid-Atlantic Fishery Management Council) and the Atlantic States Marine Fisheries Commission.

Assessing the impacts of proposed new activities on commercial and recreational fisheries, both quantitatively and qualitatively, has typically proven to be a difficult exercise in New England. This difficulty reflects the dynamic nature of fisheries, the unique characteristics of each fishery, and a basic lack of knowledge about the interactions between various fishing gear and newly proposed activities. Even prior to an impact analysis, however, is the initial step of identifying specific members of the

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fishing industry to engage in a discussion of a particular project, which has also been difficult at times. Additionally, proposed developments may include a range of activities with different types of conflicts with fishing. For example, site assessment and survey-based activities occurring before construction of offshore infrastructure have different spatial and temporal characteristics and impacts than actual construction and installation, which are also different from the long-term operation and support of a facility. Discussions related to newly proposed offshore activities will often become quite detailed to account for all the potential interactions, including understanding fishing activities in a particular location (different gear types, fishing- or transit-related activities, time of year) and results of displacement or interruption of such activities.

Conflicts may also arise between commercial or recreational fishing and activities such as scientific studies, ship-based seafloor mapping projects, and dredging of port channels. These conflicts can arise from various issues, but common root causes include communication difficulties and a general lack of readily available information to assess potential impacts, and the consequent challenges in engaging fishing industry representatives. In New England, the extent of these issues is often magnified by the number of fisheries that operate in a particular area over the course of the year and by the dynamic nature of these fisheries. For recreational fishing, this issue may be even more complex, given the many private anglers who may fish in a particular area.

Changes in environmental conditions, market trends, and other economic factors such as the costs of fuel and gear, advances in scientific understanding of the ocean environment, and fisheries management point to uncertainty when attempting to predict future conditions. For example, warmer water temperature in the Gulf of Maine is likely to contribute to changes in fish stocks, but the resulting future impacts on fishing and, subsequently, fishing communities are unknown. The manner in which commercial and recreational fisheries operate currently or in the past provides important insight, but is not necessarily a predictor of the future.

5M

Number of all types of recreational fishing trips in New England, 2013

$13B

Total sales impact of fishing in New England, 2012

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MAPS AND DATA

The Portal includes the following map products characterizing commercial fishing activity from a regional perspective.

Vessel activity

The Vessel Activity theme contains a series of maps depicting the spatial footprint of vessels operating in certain federally managed fisheries.[5] These maps are derived from Vessel Monitoring System (VMS) data maintained by NMFS and are the result of extensive engagement with the commercial fishing sector, fishery managers, and scientists in the region. This theme includes layers depicting the relative density of vessels operating in each fishery over a defined period of time. For each fishery, there are also maps that use speed thresholds to differentiate fishing activity from vessel transit. Specifically, this includes the following maps:

- Vessels reporting in the Northeast multispecies fishery
  - > 2006–2010: All vessel activity
  - > 2011–2014: All vessel activity
  - > 2011–2014: Vessels traveling at less than four knots[6]
- Vessels reporting in the monkfish fishery
  - > 2006–2010: All vessel activity
  - > 2011–2014: All vessel activity
  - > 2011–2014: Vessels traveling at less than four knots[7]
- Vessels reporting in the herring fishery
  - > 2006–2010: All vessel activity
  - > 2011–2014: All vessel activity
  - > 2011–2014: Vessels traveling at less than four knots[8]
- Vessels reporting in the scallop fishery
  - > 2006–2010: All vessel activity
  - > 2011–2014: All vessel activity
  - > 2011–2014: Vessels traveling at less than five knots[9]
- Vessels reporting in the surf clam/ocean quahog fishery
  - > 2007–2010: All vessel activity
  - > 2012–2014: All vessel activity
  - > 2012–2014: Vessels traveling at less than four knots[10]
- Vessels reporting in the squid fishery
  - > 2014: All vessel activity
  - > 2014: Vessels traveling at less than four knots[11]
- Vessels reporting in the mackerel fishery
  - > 2014: All vessel activity
  - > 2014: Vessels traveling at less than four knots[12]

It is very important to note that these map products are limited to only those fisheries for which there are VMS data and that there are some vessels in the fisheries listed above that do not have VMS reporting requirements, such as some permit categories in the monkfish

fishery. A lack of VMS data in a given location does not mean no fishing is occurring. Fisheries not represented by VMS data include bluefish, black sea bass, dogfish, fluke, lobster, red crab, scup, skate, and tilefish; also, the recreational fishery is also not represented.

In addition, there are fisheries that are important locally that may not be represented by VMS data or may have their local footprint masked by a regional view (i.e., a regional view of a fishery may lose important local detail). Contact with the New England Fishery Management Council, and with state fishery management agencies, and engaging the fishing industry to understand such issues are paramount.

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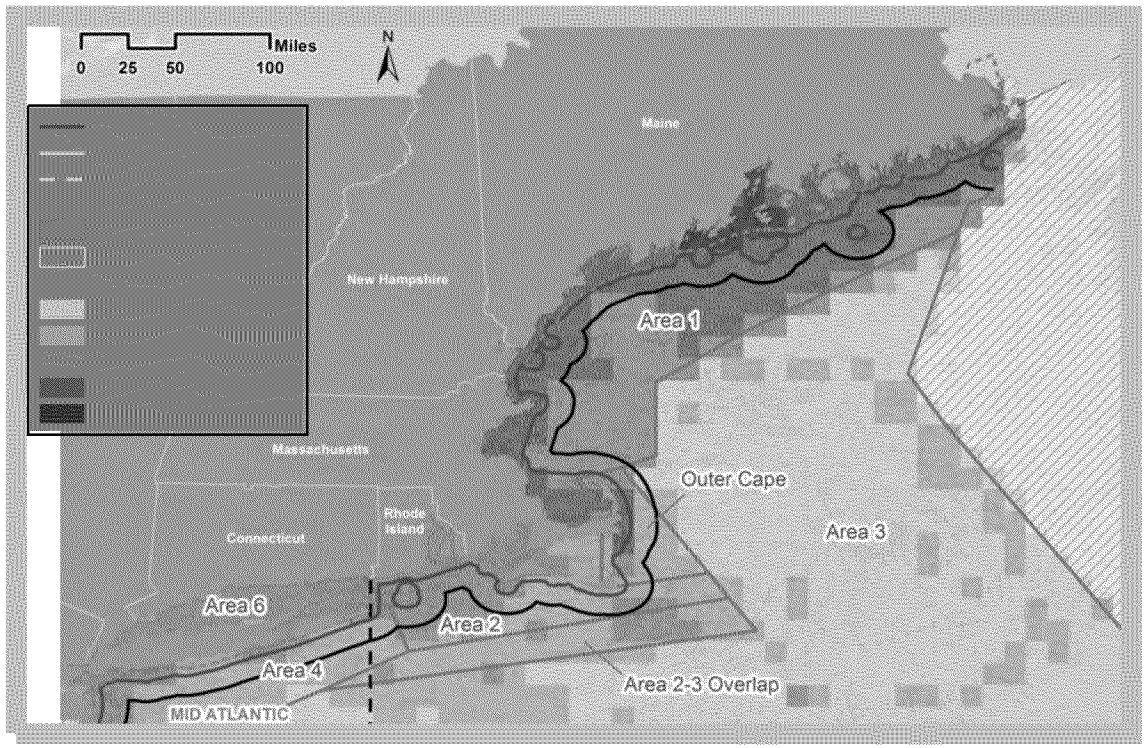
Management areas

The Management Areas theme includes a series of maps showing the geographic extent of certain federal fishery management areas, as published by NMFS. These management areas were specifically selected because they depict management areas related to fisheries represented in the VMS-derived map products. They are an important supplement to the VMS maps: they inform the interpretation of fishing vessel activity patterns, because patterns in fishing activity are partly dictated by fisheries management.

Lobster fishery

In addition to the VMS-derived products and related fishery management areas on the Portal, the RPB considered developing maps and information on the lobster fishery. Spatial data related to the lobster fishery across the region is relatively limited and generally available only at a coarse scale. In discussions with fishery managers, fishermen, and scientists, the best available regionwide spatial depiction of the lobster fishery is a map of lobster trap end-line density.[13] Higher-resolution portrayals of the lobster fishery exist for select smaller geographic areas (i.e., at the state level, particularly in Rhode Island, Massachusetts, and some parts of Maine). The RPB recognizes the need to develop additional information characterizing the spatial extent of the lobster fishery across the region.



Lobster trap end-line density

In this map, darker blues represent relatively higher density of end-lines; lighter greens represent relatively lower density. This work was performed as part of the analysis associated with the North Atlantic Right Whale take reduction team effort to look at the density of vertical lines in the water column.

Charter/party fleet

Similar to the lobster fishery, there is limited information on the spatial extent of recreational fishing activity, including activity through for-hire party and charter boats. In partnership with several vessel captains, the Atlantic States Marine Fisheries Commission, the Atlantic Coastal Cooperative Statistics Program, and several states, the RPB conducted a pilot project to determine the potential for smartphone-based technology to provide spatial data on fishing and transit patterns. The results of this pilot project were promising for improving spatial data on the party/charter fleet.[14]

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OVERVIEW

ACTIONS

CF-1 Maintain existing maps and data on the Portal

CF-2 Develop additional regional maps and data of commercial and recreational fisheries

CF-3 Inform regulatory and environmental reviews of agency actions for their potential impacts to commercial and recreational fisheries

CF-4 Identify potentially affected commercial fishing stakeholders

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ACTIONS: MAINTAIN AND UPDATE DATA

CF-1. Maintain existing maps and data on the Portal: NMFS will maintain the maps and data in the commercial fishing theme on the Portal. NMFS Office of Law Enforcement (OLE) will provide annual updates of VMS-derived map products, using the processing and analysis methods developed for the existing maps. NMFS Greater Atlantic Regional Fisheries Office (GARFO) will ensure the map of fishery management areas related to VMS fisheries is reviewed and updated, if necessary, when VMS products are updated.

CF-2. Develop additional regional maps and data of commercial and recreational fisheries: The RPB will develop and incorporate additional data characterizing commercial and recreational fisheries, including the following:

- NMFS GARFO will develop and make available maps and other data products using Vessel Trip Report information. This activity will initially focus on those federally permitted fisheries that are not currently included in the VMS maps.
- The RPB will work with regional partners to explore opportunities to develop regionally consistent spatial characterizations of the lobster fishery. See Chapter 5, Science and Research Priorities, for more information.
- The RPB will continue to work with regional partners to advance the party/charter fleet pilot project and/or other means of characterizing the recreational fishing industry. See Chapter 5, Science and Research Priorities, or more information.
- The RPB will continue to seek additional ways to fill information gaps and address information needs by leveraging other projects. For example, in the Mid-Atlantic regional ocean planning effort, work has been done with Vessel Trip Report information to provide depictions of fishing activity according to gear type. The RPB will review these efforts to determine their potential utility. Additionally, the RPB will review the ability of AIS data (which, beginning March 1, 2016, is collected for fishing vessels over 65 feet in length) to fill information gaps.

ACTIONS: INFORM REGULATORY AND MANAGEMENT DECISIONS

CF-3. Inform regulatory and environmental reviews of agency actions for their potential impacts to commercial and recreational fisheries: RPB agencies will, to the extent practicable, use the Portal when reviewing actions that may affect fisheries, including, but not limited to, proposals for new offshore development projects, scientific surveys involving research vessel activity or other actions with potential effects on commercial and recreational fishing, and conservation and restoration activities. While the RPB recognizes the limitations of available information, the consistent regional characterizations of certain fisheries can assist with the preliminary identification of potential conflicts by helping to identify fisheries using a particular area and the nature of that use (e.g., in transit or engaged in fishing). To the extent practicable, RPB agencies will also consider regional marine life and habitat data, presented in the Portal, when assessing conflicts or impacts with commercial and recreational fisheries, recognizing the connection between fishing activity and habitat. Specifically:

- USACE and BOEM through their permitting and leasing responsibilities are obligated to consider existing ocean uses, including fisheries, in leasing and permitting programs for offshore energy and the use of offshore sand resources. The information in the Plan and the Portal will provide an important beginning step in identifying fisheries and fishing activity that may be affected by these activities. Furthermore, BOEM will amend guidance documents, such as the *Guidelines for Providing Information on Fisheries for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585*[15] to direct

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potential lessees to the Portal for preliminary fishery-related information. See the Energy and Offshore Sand Resources sections for more information.

- As described in the Marine Transportation section, as part of the USCG's responsibilities as a cooperating agency during leasing, licensing, and permitting processes, to the extent practicable, the USCG will use the Portal to understand potential impacts to the Marine Transportation System and navigational safety. This includes determining potential conflicts, developing navigational risk mitigation strategies related to a particular waterway, and identifying potentially affected stakeholders (fishermen). See the Marine Transportation section for more information.
- The NEFMC will use the Plan data, as appropriate, to supplement traditional internal, state, and NOAA data sources to conduct analyses related to FMP development, and to satisfy the requirements of NEPA, MSA, and other applicable laws. The Portal may also inform NEFMC when considering climate change impacts to fisheries, developing and implementing ecosystem-based fisheries management, and resolving user conflicts. The Council will inform staff of the availability of the Portal.

CF-4. Identify potentially affected commercial fishing stakeholders: To the extent practicable, RPB agencies will use the Portal to help identify and improve communication with commercial fishing stakeholders who are potentially affected by agency actions. Because of the limitations in existing data available on the Portal, this action should be viewed in combination with Chapter 4 best practices regarding coordination with state fishery agencies, the NEFMC, and fishing industry stakeholders.

In addition, several recent efforts have attempted to improve communications with the fishing industry to better assess the potential impacts from newly proposed offshore activities. The following are most relevant to this Plan:

- In 2014, BOEM commissioned a study recommending a series of best management practices and mitigation measures for addressing potential impacts between fishing and offshore wind energy.[16] In 2015, BOEM issued a separate document, titled *Guidelines for Providing Information on Fisheries Social and Economic Conditions for Renewable Energy Development on the Atlantic Outer Continental Shelf*.[17] The practices outlined in the report have resulted in guidance to lessees.
- States have established advisory bodies to provide input into development of offshore wind energy in federal waters (the Rhode Island Fisheries Advisory Board and the Massachusetts Fisheries Working Group are two examples). Successes and opportunities from these efforts will be shared among RPB agencies to identify need for further improvements.

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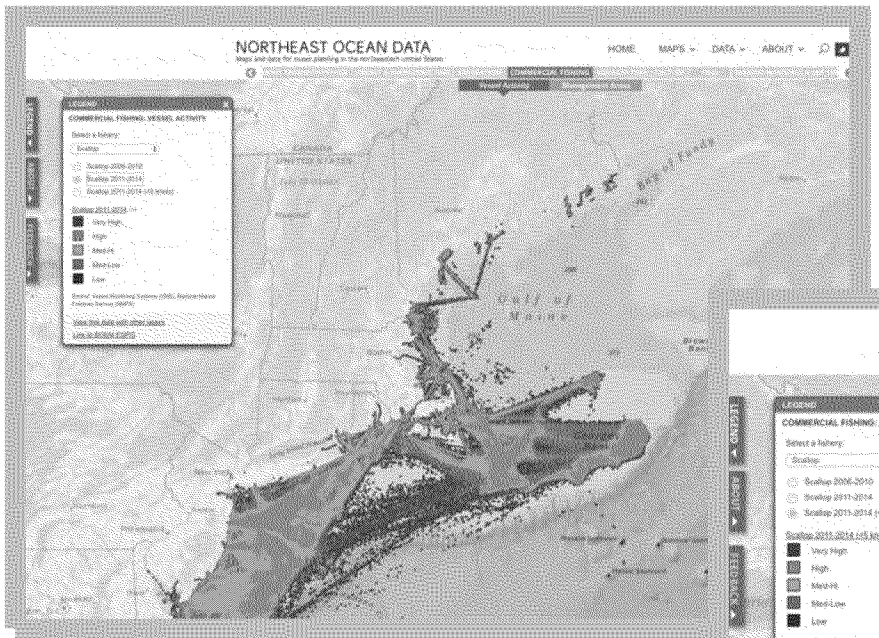
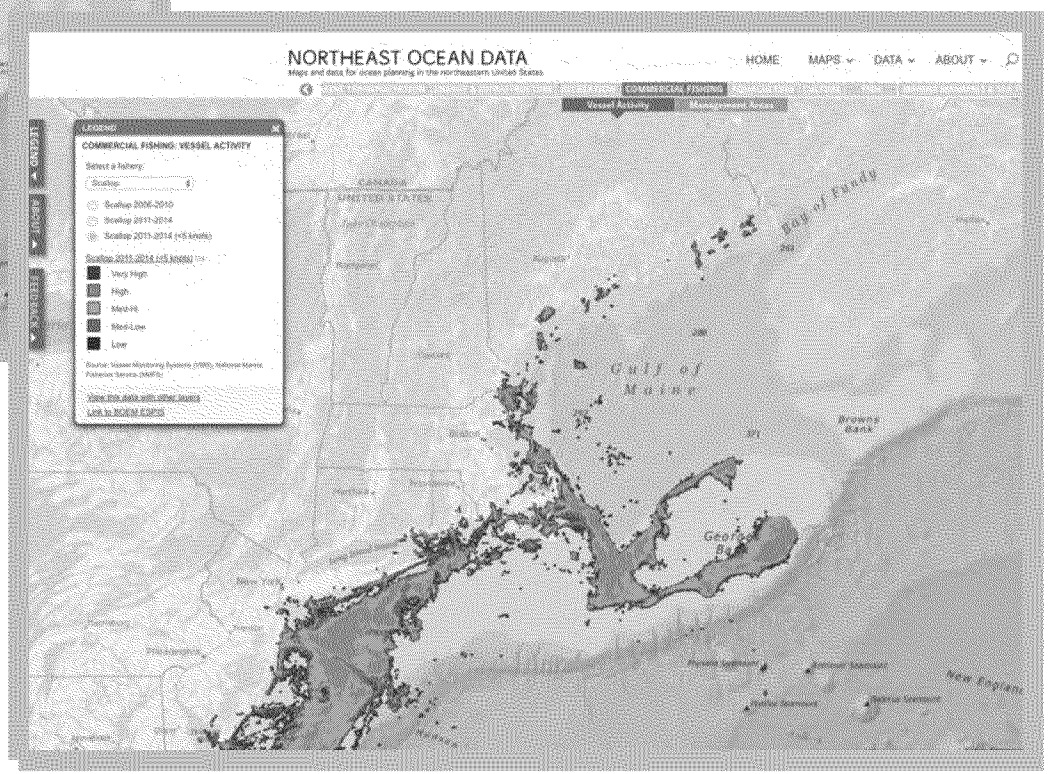
These VMS-derived maps indicate the general footprint of vessels operating in the federally managed scallop fishery. VMS-derived maps like these support a qualitative understanding of where vessels in certain fisheries operate, including potential transit and fishing areas. They can also help identify where certain vessels at a fishing ground originated. Therefore, they can help identify potential conflicts and potential fisheries interests to engage when new activities are proposed.



All VMS scallop vessels 2011–2014



VMS scallop vessels traveling less than 5 knots (speed associated with fishing activity)

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RECREATION

Coastal and marine recreation in New England is ingrained in the region's economic and social fabric. Recreation on the ocean and coast includes many of New Englanders' most time-honored and beloved activities, including boating, swimming, surfing, diving, fishing, and bird and whale-watching. Cumulatively, recreation and tourism directly contributed nearly $10 billion to the coastal economy of New England in 2013 (in GDP).[1]

Residents of and visitors to the Northeast US spend approximately 100 million person-days (Massachusetts alone is about 30 million person-days) at over 1,000 ocean beaches, representing about 10 percent of total beach visits for the United States.[2] Most of this beach activity is concentrated in the summer months, and more than half of beach visits include swimming. In addition to beaches, many NPS properties are located along the coast, including Cape Cod National Seashore and Acadia National Park, which had almost 7 million visitors between them in 2014.[3] There are also countless state, municipal, and private conservation lands and parks along the coast that support a range of recreational activities and provide access to the ocean. The top five recreational activities among individuals participating in a survey conducted for ocean planning were going to the beach, scenic enjoyment, swimming and body surfing, biking and hiking, and wildlife viewing.[4]

While the most highly used recreational areas are onshore or within a mile or two of the coast, recreational activities are widespread and can be found throughout the planning area. Scuba diving, fishing, whale-watching, boating, and sailing can occur well offshore. Stellwagen Bank National Marine Sanctuary is entirely within federal waters, 25 miles east of Boston, and is a destination for each of these recreational activities. In addition, recreational events, such as sailing races, regattas, fishing derbies, and others, result in a high a concentration of activity, often over a short period of time, in specific nearshore and offshore areas.

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There is an abundance of anecdotal and experiential knowledge of recreational use of the ocean. However, there has traditionally been limited information actually documenting the spatial extent and economic impacts of some of these activities. As a result, the RPB engaged in a number of initiatives to better understand their extent and economic importance. These were as follows:

- In 2012, the Northeast Recreational Boater Survey was conducted by a partnership of organizations including SeaPlan, NROC, representatives of the boating industry, the New England states, the state of New York, and the USCG. The survey characterizes when, where, and how New Englanders and New Yorkers motor and sail for fun[5], based on input from boaters themselves. The more than 12,000 boaters participating in the study provided important information about the economic output of recreational boating and boaters' perspectives on coastal issues. The survey identified nearly 374,000 marine boaters with boats registered between Maine and New York, with survey results suggesting that they collectively undertake more than 900,000 boating trips on the ocean each year. Such activity contributes approximately $3.5 billion per year and the equivalent of nearly 27,000 year-round jobs to the Northeast US economy.[6] Most boating occurs within about 20 miles of the coast with an increasingly higher density of activity closer to shore. Certain whale-watching, other types of wildlife-viewing, sailing, and recreational fishing trips can extend farther offshore. Much of this boating is supported by hundreds of boat launches and 600 marinas, which employ more than 5,000 people and generate about $400 million annually in regional GDP.[7]
- In 2015, the RPB conducted a study to characterize other recreational activities in the Northeast.[8] With input from industry representatives, stakeholder groups, and an RPB steering committee, the study collected information, including the spatial footprint, on commercial whale-watching, scuba diving, and marine events through participatory work shops with industry representatives and using online mapping tools. Employing a different methodology, the study collected information on individual recreational uses, including sea kayaking, surfing, and other shore-based, surface water, diving, and wildlife and sight-seeing activities. Many of these activities have a seasonal focus (whale-watching and diving occurring predominantly during the summer, better-weather months), although activities such as scuba diving do occur year-round.

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Whale-watching is one of the larger commercial components of the recreational sector operating offshore, with over 30 businesses throughout New England and New York. Companies operate vessels ranging from small charters with six passengers to large charters out of hubs such as Boston and Bar Harbor, Maine, that may accommodate up to 400 passengers and serve thousands of patrons daily[9].

REGULATION AND MANAGEMENT

As with other marine-dependent uses, federal regulatory agencies are required by existing law to assess the potential impacts of proposed offshore activities to recreation through, for example, the environmental review process under NEPA and the requirements of specific permitting and leasing authorities such as RHA and OCSLA. Additionally, through PWSA and as described in more detail in the Marine Transportation section, the USCG has responsibilities that include assessing potential navigational risks associated with offshore activities, often in a cooperating agency role in the regulatory and environmental review processes identified above. Depending on the results of the assessment, these agencies may decide to develop impact avoidance, minimization, or mitigation measures.

State agencies are usually involved in reviewing the effects of proposed actions on recreational activities because they have extensive knowledge of different recreational uses. State coastal zone management programs help promote and protect public access to the coast. Other state agencies manage beaches, boat launches, coastal parks and trails, boat registrations, and saltwater fishing licenses and permits. State marine patrols or environmental police monitor commercial and recreational activities, support search and rescue operations, mediate disputes, enforce boat registration requirements, and generally have extensive knowledge of recreational uses in different locations.

However, assessing the potential impacts of new proposals to recreational activities can be challenging. Every stretch of the coastline provides recreational opportunities, and almost everyone who visits or lives near the coast participates in some form of coastal recreation. Also, because recreational use is so widespread, representation of the recreational users and sectors in permitting and regulatory processes is often diffuse and dependent on the specific areas and activities that are potentially affected. In addition, proposals for offshore projects often include several phases of activity, each with its own unique spatial and temporal

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characteristics, which may or may not intersect with each particular form of recreation occurring in a given area. Therefore, local knowledge of the recreational activity is often necessary.

Even with all of these considerations, impacts and conflicts with new activities are more likely to occur nearest to shore owing to the prevalence and variability of recreational activities in coastal areas. Recreational activity, both the intensity of use and the range of different recreational pursuits, tends to decrease farther offshore. In some cases, however, offshore activities present different types of conflicts and permitting considerations.

MAPS AND DATA

The Portal includes the following map products characterizing recreational activities.

Boating

The Boating theme features two maps from the 2012 Recreational Boater Survey, including a map of actual boating routes provided during the 2012 boating season, and a map showing the relative density of those routes over that time. It also includes a map of long-distance sailing races from the 2015 Recreational Activity Study.

Whale-watching

The Whale Watching theme includes a series of maps depicting information obtained through participatory geographic information system (PGIS) workshops with approximately 20 whale-watching companies from New York through Maine during the 2015 Recreational Activity Study. The maps show "general use areas," reflecting the extent of whale-watching in the past three to five years, and "dominant use areas," indicating areas routinely used by most whale-watch operators, most of the time. It also includes "transit areas" from home ports to general or dominant use areas.

Scuba

The Scuba theme includes a single map of scuba diving areas derived from information provided by the scuba diving community during the 2015 Recreational Activity Study.

Recreational areas

The Recreation Areas theme contains a series of map layers primarily depicting onshore and nearshore recreation areas and facilities. This includes water trails, boat launches, national parks, state- and municipally-managed properties, national wildlife refuges and wildlife management areas, and other preserves and sanctuaries. These maps were developed by the Portal Working Group, with input from recreational industry representatives and state agencies.

Coastal use surveys

The Coastal Use Surveys theme includes a series of maps with recreational activity points and board and paddle events. These data were provided by individual recreational users through the 2012 Recreational Boater Survey and the 2015 Recreational Activity Study.

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OVERVIEW

ACTIONS

Rec-1 Maintain existing maps and data on the Portal

Rec-2 Develop and incorporate additional data about recreational activities when available

Rec-3 Inform regulatory and environmental reviews of agency actions for their potential impacts to recreational activities

Rec-4 Identify potentially affected recreational stakeholders

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ACTIONS: MAINTAIN AND UPDATE DATA

Rec-1. Maintain existing maps and data on the Portal: The RPB will consider methods and opportunities to update the boating, whale-watching, scuba, and other maps derived from online surveys and participatory work shops. The intent of any new methodology will be to ensure the updated maps are informed by recreational stakeholders. However, different methodologies may be more suitable for budget conditions or new technologies, or for partnering with stakeholder groups and leveraging other efforts. The map of coastal recreation areas will be updated by the Portal Working Group annually using existing authoritative sources.

Rec-2. Develop and incorporate additional data about recreational activities when available: RPB agencies will continue to seek additional ways to fill information gaps on recreational activities by leveraging other projects, incorporating information from state-based planning and management activities, and reviewing the results of government and industry-based surveys. Chapter 5 includes science and research priorities related to better understanding human activities and their connection to coastal communities. Maps and data will be added to the Portal when these priorities are addressed.

ACTIONS: INFORM REGULATORY AND MANAGEMENT DECISIONS

Rec-3. Inform regulatory and environmental reviews of agency actions for their potential impacts to recreational activities: RPB agencies, to the extent practicable, will use the maps and data described above when considering whether new offshore projects or management activities may affect existing recreational activities. Conflicts with recreational activities are more likely to occur in nearshore areas because the majority of these activities have the highest concentration of use within the first several miles of the coast. For example, newly proposed aquaculture facilities, cables and pipelines making onshore connections, dredging and navigation projects, and nearshore energy installations are more likely to intersect with recreational activities in the coastal zone. Farther offshore, conflicts and impacts may still occur to important boating, fishing, whale-watching, and diving areas, but the frequency and intensity of recreational activities generally diminishes away from the coast. However, the nature of all these interactions will be unique, according to the specific spatial and temporal characteristics of both the newly proposed activity and the form of existing recreation. These maps and the Plan will help identify additional information needs for determining whether a proposed agency action conflicts with or impacts recreational uses. Specifically:

- USACE and BOEM, through RHA and OCSLA, are required to consider the potential impacts to existing ocean uses when making a permitting or leasing decision for new activities. The information and the data resources described within the Plan will provide an important beginning step in identifying recreational uses that may be affected by these new activities.
- Additionally, as described in the Marine Transportation section, as part of its responsibilities as a cooperating agency, the USCG will use Plan data to understand potential impacts to the Marine Transportation System and navigational safety, including highly trafficked areas by recreational vessels.

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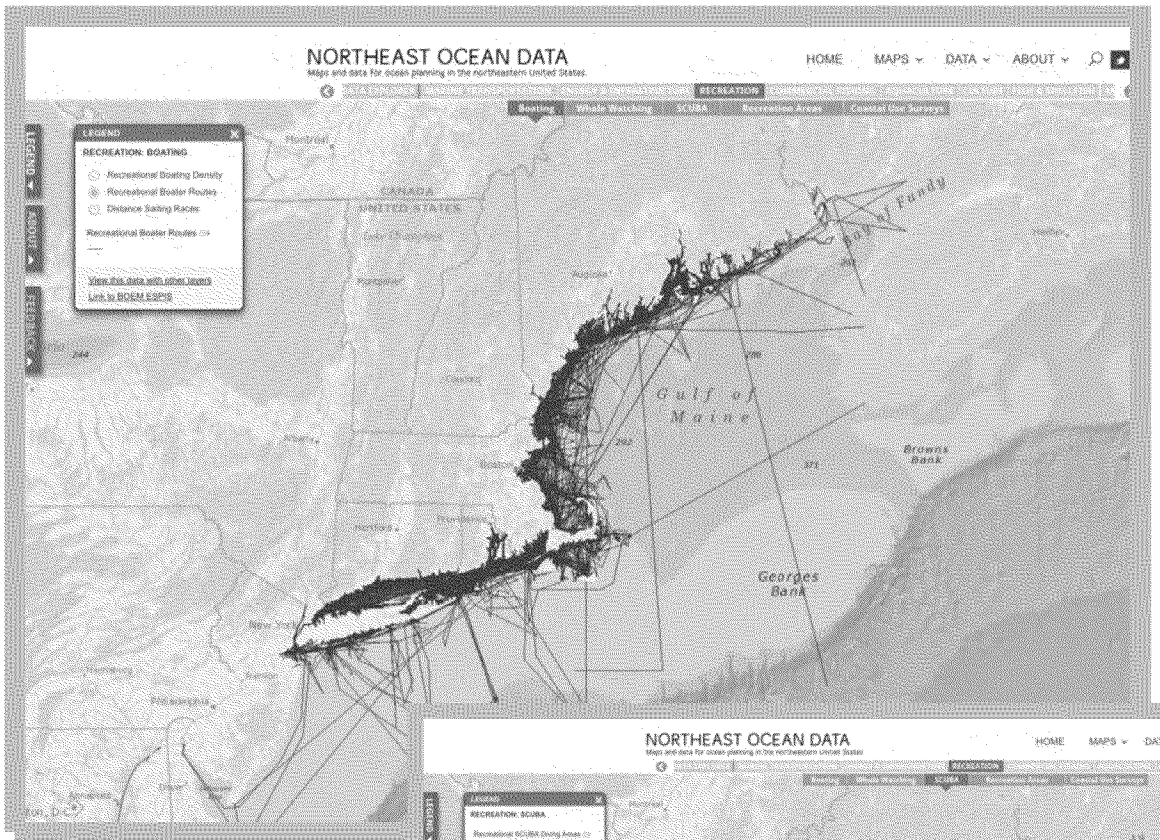
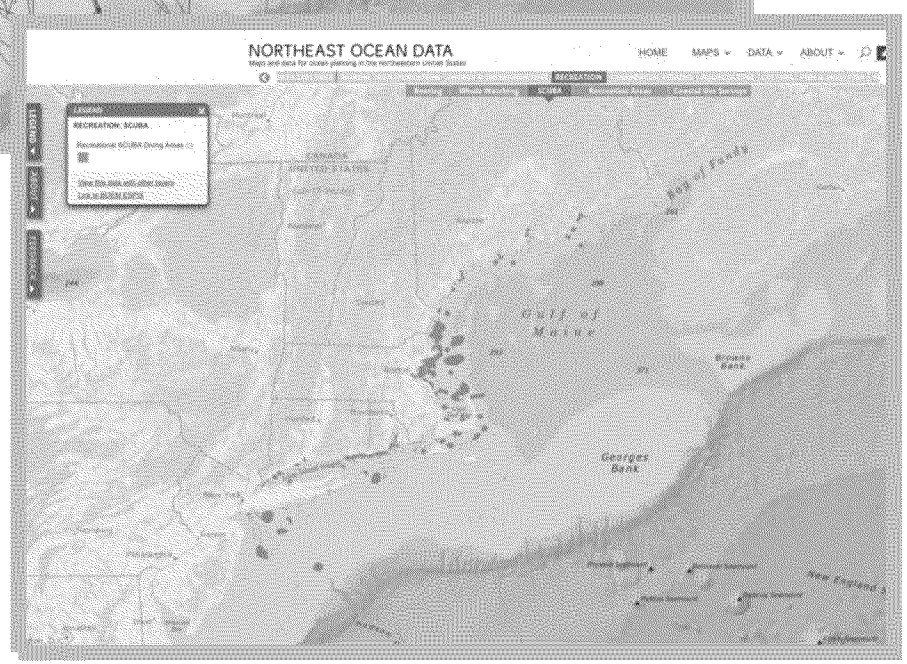
Rec-4. Identify potentially affected recreational stakeholders: RPB agencies will use the Portal to help identify recreational stakeholders potentially affected by a proposed agency action. There are countless opportunities to recreate on the ocean in New England, and recreational activities are widespread and important for tourism, spiritual enjoyment, and sporting and competitive events. Appropriately, the Portal contains information on a wide range of recreational activities, which will enable regulatory agencies to hone in on those activities or events that are most likely to be impacted and to identify the appropriate stakeholders to engage for additional information. In many cases, regulatory agencies can see obvious linkages in the maps between offshore recreational areas and onshore ports and communities, thereby focusing stakeholder engagement efforts on the most likely ports, communities, industries, and even parks and marinas to be affected. This action also relates to Chapter 4 best practices regarding coordination with stakeholders, given that available data may not completely characterize all aspects of recreation in New England marine waters.



Recreational boating



Scuba diving

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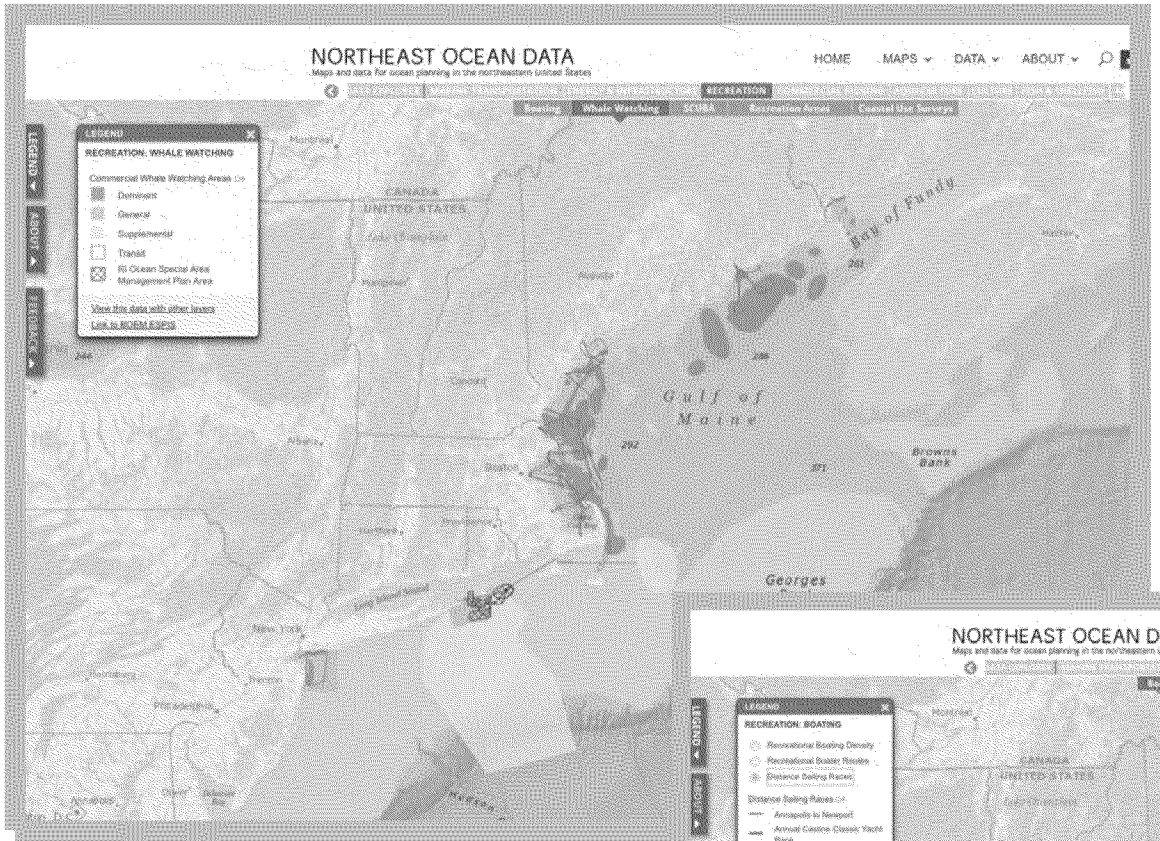
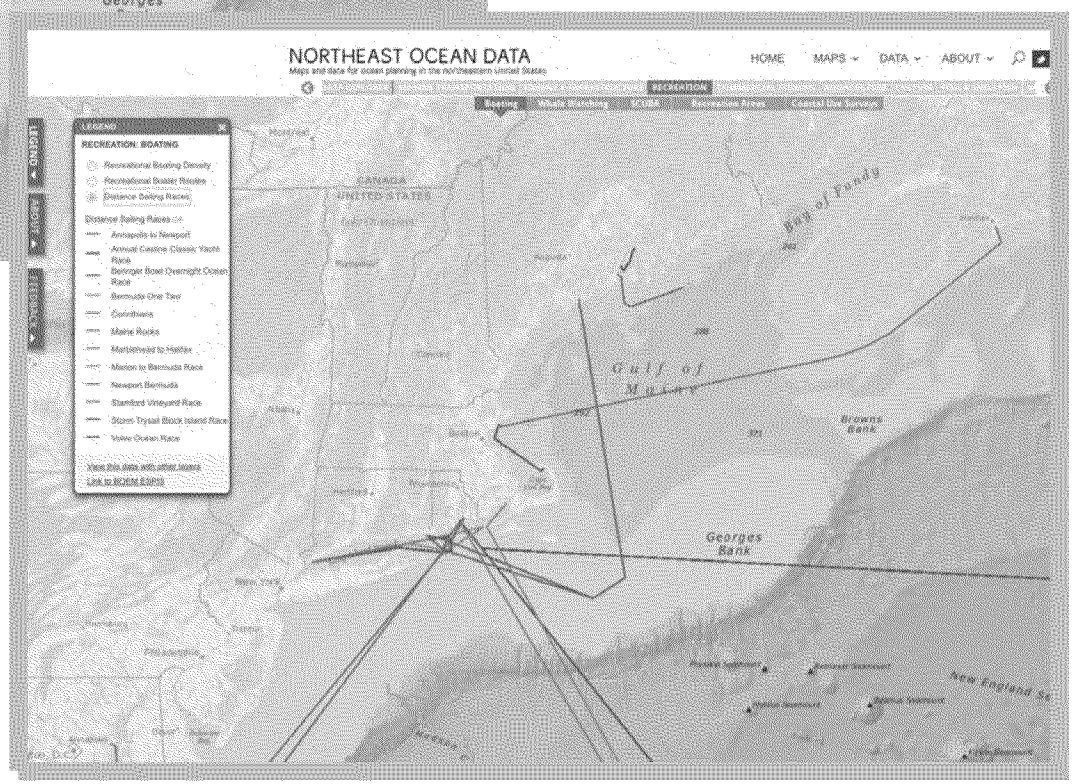


Commercial whale-watching

The highest density of recreational activity occurs within the first few miles of the coast. Therefore, nearshore projects, such as aquaculture facilities, cables and pipelines making onshore connections, dredging and navigation projects, and smaller energy installations are more likely to intersect with recreational activities.

There are also important whale-watching, diving, fishing, and recreational events occurring farther offshore. While the activity is comparatively less dense, these areas are important for certain activities and sometimes to specific ports. These activities may intersect with larger energy and aquaculture installations proposed in those areas.



Recreational events: distance sailing races

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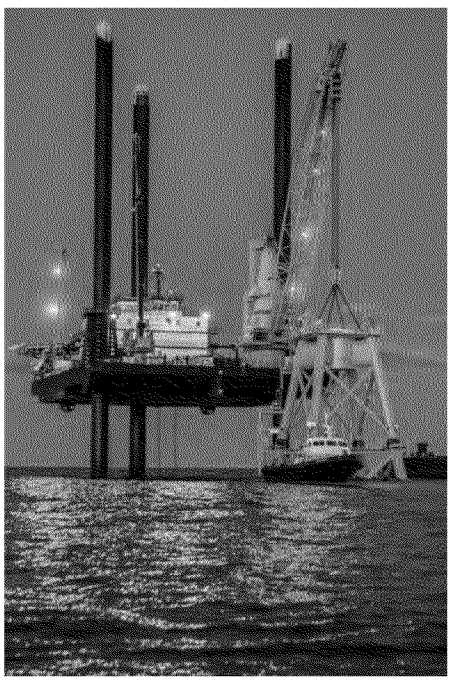
ENERGY & INFRASTRUCTURE



Energy is essential to our society and provides the means to light our homes, operate our businesses, and transport goods to markets. To date, New England does not have offshore oil and gas production, relying instead on the distribution of oil and natural gas by pipeline, truck, and shipping to local ports such as Portland, Boston, and New York. Notably, for ocean planning purposes, the energy infrastructure serving New England includes the HubLine high-pressure gas pipeline and two recently established deepwater LNG ports located in Massachusetts Bay.

Each LNG port includes large buoys that receive gas from shipping tankers and distribute the gas to the HubLine through a system of underwater pipelines. The use of these offshore LNG ports and the frequency of associated ship traffic are subject to the dynamics of the natural gas market. As of the writing of this Plan, one of the LNG ports received several shipments from 2008 to 2010 and again in 2015 and early 2016, while the second has not had any calls.[1]

Regional electricity is primarily generated using gas, nuclear, hydropower, and a range of renewable sources.[2] As part of a regional shift in electricity sources due to market forces and increasing concerns about climate change, the region is beginning to look to offshore renewable energy sources, such as wind, wave, and tidal resources. Similar to how the recent shift to natural gas led to the development of offshore LNG ports, these renewable energy sources are introducing new activities along our coasts and in the offshore environment.

Offshore wind technologies are poised for national deployment to contribute to the nation's wind power portfolio, which is one of the fastest-growing sources of new electricity supply in the United States. The nation's significant offshore wind resources, potential siting near critical load centers with high electricity rates, current higher price relative to other energy sources in some locations, and the availability of long-term power purchase agreements are key technical and economic factors influencing the development of offshore wind. New England's offshore wind resources are abundant and provide the greatest opportunity for offshore renewable energy development in the near term due to available technology.

The region's offshore wind energy potential has generated substantial interest in demonstration- and commercial-scale energy infrastructure projects off the coasts of Rhode Island, Massachusetts, and Maine. This includes the construction of a project with five wind turbines in state waters offshore Block Island

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This map shows the extent of wind resources in the Northeast from a 2010 Department of Energy study[4], the location of the Block Island turbines currently under construction, the areas currently under lease offshore Massachusetts and Rhode Island, and the demonstration-scale floating turbine in Maine.

(Rhode Island), ongoing efforts in Maine to develop a demonstration-scale floating offshore wind facility,[3] and the leasing of areas in federal waters offshore Rhode Island and southern Massachusetts for larger-scale wind development. Further establishment and growth of offshore wind energy development will be influenced by continued efforts to reduce capital costs (which remain higher than those associated with land-based wind), variations in energy market prices, and evolving financing options. In the New England region, developments of both demonstration- and commercial-scale projects have been proposed for the coming decade.

Tidal current and, to a lesser extent, wave resources offshore of New England have also generated interest as potential energy sources. In recent years, several small-scale tidal projects have either been installed or are at different

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stages of permitting. These projects have focused on the few areas where nearshore ocean currents are currently viable for commercial development or experimental use. These projects include the operational Maine Tidal Energy Project in Cobscook Bay[5], proposals to establish small facilities in Muskeget Channel and the Cape Cod Canal in Massachusetts, and some interest in other high-energy locations such as eastern Long Island Sound.

Submarine cables are also an important existing and potential use of the seafloor. Submarine cables transmit either energy or telecommunication signals across stretches of water. Importantly, submarine cables supply up to 95 percent of the intercontinental internet traffic and essential electricity service to island communities. In New England, transatlantic telecommunication cables run through Long Island Sound and out of Charlestown, Rhode Island and Lynn, Massachusetts. A number of transatlantic cables make landfall just to the south of New England, in Long Island, New York City, and New Jersey. Electricity cables can be found along the shoreline, making critical grid connections from the mainland to islands offshore each state, and occasionally transiting longer distances with higher transmission capacity, such as in Long Island Sound.

REGULATION AND MANAGEMENT

Oil and gas

OCSLA provides a process for identifying areas for lease on the outer continental shelf extending from the state boundary, three nautical miles from shore, to the limit of the US jurisdiction, generally the edge of the exclusive economic zone at approximately 200 nautical miles. Every five years, the Department of the Interior (DOI) requests input from the public and consults with coastal state governors regarding offshore oil and gas leasing as part of its BOEM-led process for developing a five-year plan for exploration, development, and production of oil and gas on federal lands on the outer continental shelf (OCS). Under the OCSLA, only areas included and identified as available for leasing may later be offered for oil and gas development–related activities. The BOEM North Atlantic planning area, which includes the OCS offshore New England, New York, and New Jersey, has not been offered for leasing in over two decades and is not being offered in the next cycle from 2017 to 2022.[6] In state waters, oil and gas development is governed by each state separately and is not proposed for the foreseeable future. Prior to oil and gas leasing, private companies conduct seismic surveys to determine the potential locations of oil and gas deep below the seafloor. Seismic surveys are not expected because leasing has not been proposed in the Northeast.

Offshore renewable energy

The Energy Policy Act of 2005 amended OCSLA to address offshore renewable energy including energy derived from wind, waves, tides, and ocean currents. BOEM administers the process for leasing on the OCS for wind, wave, and ocean current energy sources. The USACE, under the CWA and RHA, is usually the lead federal permitting agency for wind energy development in state waters. The Federal Energy Regulatory Commission (FERC), under the Federal Power Act, is the lead federal agency for tidal energy, which is only available in coastal environments (primarily in state waters). While BOEM administers leasing for wave and ocean current energy sources on the OCS, FERC is responsible for project licensing under the Federal Power Act. The Department of Energy (DOE) also conducts NEPA analyses for DOE-funded research and development related to offshore renewable energy. As previously described in this chapter, any of these processes will include an evaluation of potential impacts to specific resources or uses, such as potential impacts to national defense, aviation safety, and marine transportation as determined through consultations with DOD and DHS.

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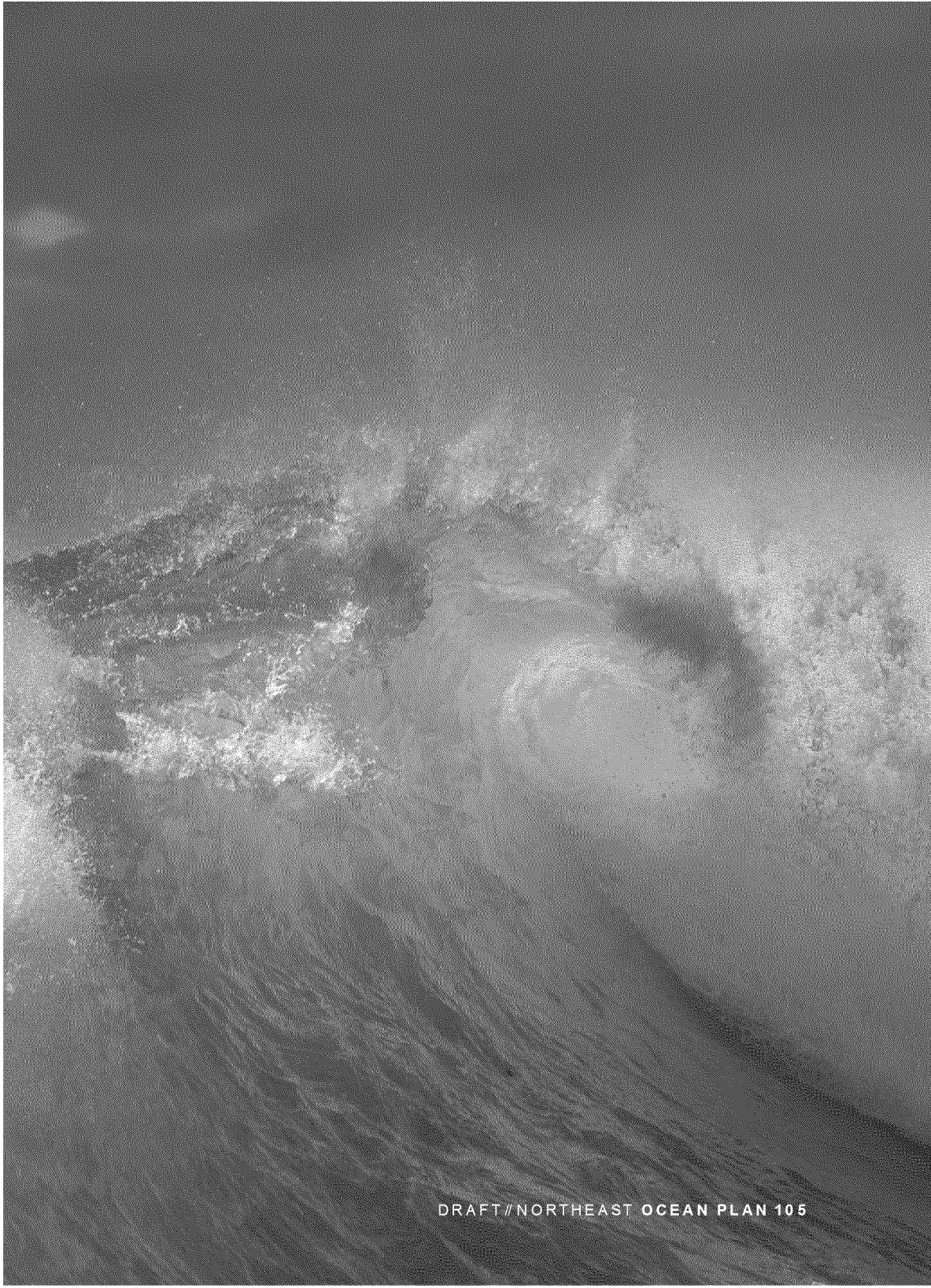
Submarine cables

Differentstate and federal agencies are involved in permitting and licensing submarine cables, depending on whether the proposed cable is part of an offshore electricity generation facility, a stand-alone electricity transmission project, or to be used for telecommunications. The USACE will almost always be involved in project review and permitting under RHA or CWA. BOEM, FERC, and state public service commissions are likely to have roles depending on the type and location of electricity transmission projects. The Federal Communications Commission is likely to have a role with telecommunications cable projects. The Naval Seafloor Cable Protection Office (NSCPO) is the primary initial point of contact within the Navy for seafloor cable inquiries.



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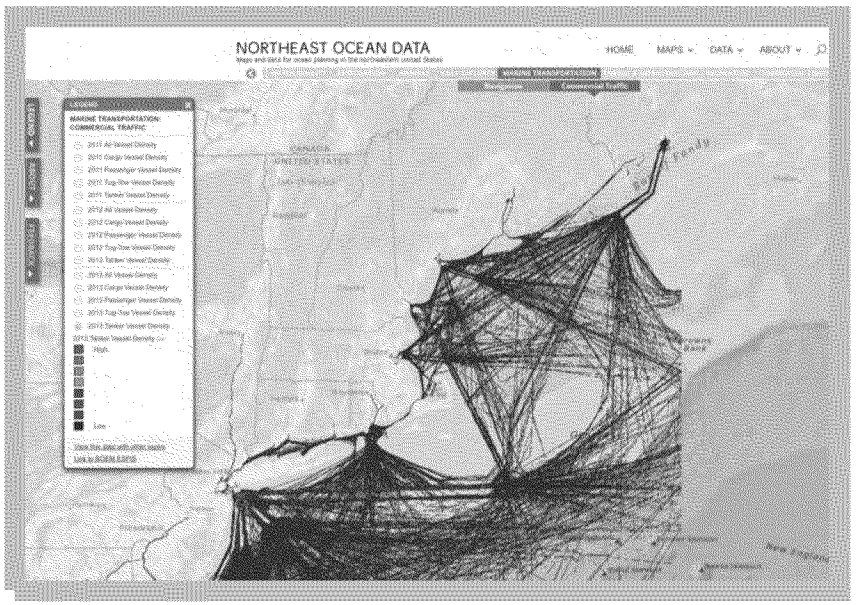
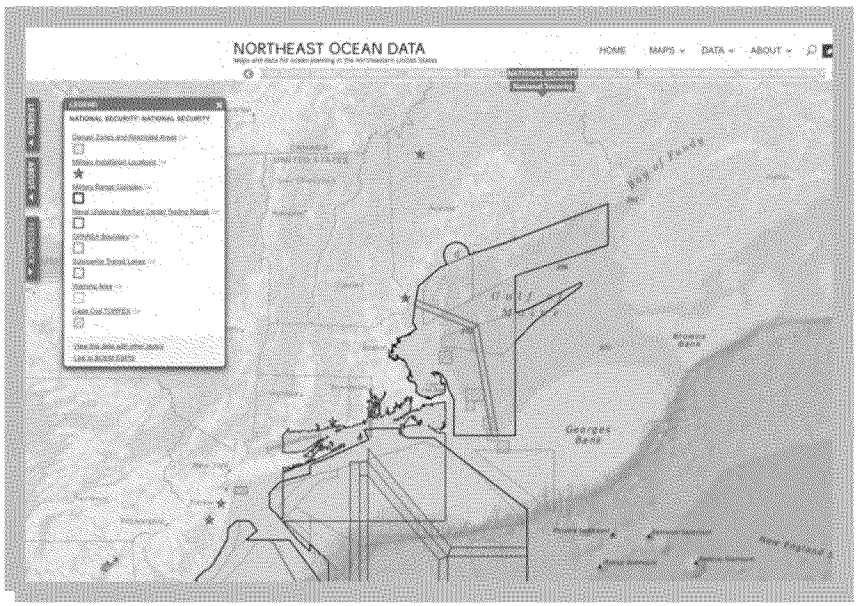
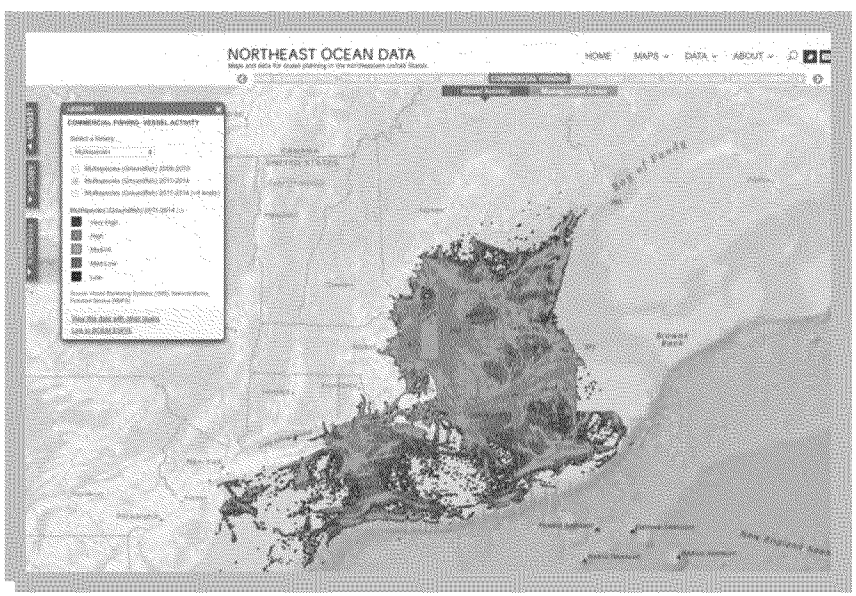


Tanker vessel density

National security use areas



The Portal helps identify important user groups—such as commercial and recreational fishermen, commercial transportation entities, and the military—that are most likely to interact with new offshore energy developments and therefore should be engaged in the commercial leasing process.



Multispecies fishing vessel density (representative of potential interaction with fishing activity)

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Liquefied natural gas terminals
The DWPA provides for the establishment of deepwater ports for LNG in federal waters. The DOT, through MARAD, authorizes activities in close consultation with the USCG (which has delegated authority to process applications, conduct environmental review, and manage other technical aspects of the application) and adjacent coastal states (whose governors have veto power). Any proposal to export natural gas from an LNG terminal requires an export authorization from DOE under the Natural Gas Act of 1938.[7] Depending on the characteristics of their operations, deepwater ports may also require permits from other regulatory agencies. For example, National Pollutant Discharge Elimination System (NPDES) permits will be required from EPA to authorize point source discharges of pollutants from a deepwater port in federal waters.

MAPS AND DATA

The Portal includes the following maps and data products related to energy and infrastructure.

Existing infrastructure
The Infrastructure theme on the Portal shows the footprint of energy and telecommunications infrastructure in the Northeast US as of the time of this Plan in 2016. This infrastructure includes the offshore LNG terminals, energy facilities located near the coast, onshore electricity transmission lines and substations, and submarine cables and pipelines. Each of these maps is derived from products maintained by the Marine Cadastre in collaboration with the authoritative public and private sources.

Renewable energy planning areas
The Planning Areas theme shows the current status of renewable energy projects and related planning areas throughout New England. This map includes a general classification of projects as operational, permitted, and currently in regulatory review. The map also includes renewable energy planning areas in state and federal waters and proposed tidal or wave energy projects that have an active preliminary permit from FERC. This map is updated frequently to ensure project, permitting, and planning area status remains accurate. Wind energy lease areas on the OCS are provided by BOEM. Preliminary permit locations for tidal and wave energy projects are obtained from FERC. Project areas in state waters are obtained via collaboration with each state.

Other resource and human use maps and data
In addition to maps characterizing the offshore footprint for energy and infrastructure activities, this Plan and the Portal include a range of maps of marine life, habitat areas, cultural resources, transportation, fishing, and other human uses to be considered when new energy or other infrastructure developments are proposed. The BOEM Environmental Studies Program, in particular, funds the collection of data on all of these topics in support of energy development on the OCS. The Portal has recently been linked to the BOEM Environmental Studies Program Information System (ESPIS),[8] which allows the user to search for data and final reports from BOEM's environmental studies and contains a geospatial component. DOE also funds targeted, applied research to characterize offshore renewable energy resources as well as to better understand and mitigate any environmental impacts of offshore renewable energy technologies. To this end, the DOE-supported online Tethys database serves to actively aggregate and disseminate information from across the US and around the world (in partnership with more than a dozen other countries) on the environmental effects of marine and wind energy development, which can provide useful data and information for the purposes of planned projects and activities in the Northeast.[9]

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OVERVIEW

ACTIONS

EI-1 Maintain existing maps and data on the Portal

EI-2 Provide additional regional data related to energy and infrastructure permitting when available

EI-3 Inform commercial leasing for offshore renewable energy development

EI-4 Incorporate Plan maps and data into environmental reviews associated with new offshore energy or submarine cable proposals

EI-5 Identify and notify potentially affected stakeholders

EI-6 Improve outreach to industry and stakeholders related to renewable energy development

EI-7 Ensure the Plan and the Portal are used by agencies and recommended to project proponents

EI-8 Inform research and development

EI-9 Enhanceintergovernmental coordination related to offshore energy development

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ACTIONS: MAINTAIN AND UPDATE DATA

EI-1. Maintain existing maps and data on the Portal: The agencies identified in this section will continue to maintain and provide data on existing infrastructure and renewable energy planning areas. BOEM is committed to maintaining up-to-date maps regarding leasing areas on the OCS, including providing authoritative data on administrative and planning boundaries through the Marine Cadastre. Maps of existing infrastructure and federal planning and leasing areas will be updated by the Portal Working Group as updates are made to the Marine Cadastre. Maps of planning areas and infrastructure in state waters will be provided by the appropriate state agency when the status or extents of the areas change and when states have new data to provide. All existing Portal data will be reviewed by the authoritative RPB source on an annual basis.

EI-2. Provide additional regional data related to energy and infrastructure permitting when available: BOEM, DOE, and other agencies will review data collected through relevant research programs, including those identified in this section and in Chapter 5, Science and Research Priorities, to determine whether additional data should be provided for regional planning purposes. Through its Environmental Studies Program, BOEM will continue to collect and make available important data and information about the environment in support of various laws and regulations. BOEM will ensure those data are provided to the appropriate repository specific to the dataset type (e.g., marine mammal data provided to the Ocean Biogeographic Information System Spatial Ecological Analysis of Megavertebrate Populations [OBIS-SEAMAP]). BOEM's science priorities are determined annually based on current and future leasing plans and are available on BOEM's website (http://www.boem.gov/Studies).

ACTIONS: INFORM REGULATORY AND MANAGEMENT DECISIONS

EI-3. Inform commercial leasing for offshore renewable energy development: The BOEM process for offshore renewable energy development occurs in four phases: planning and analysis, lease or grant, site assessment, and construction and operations.[10] Throughout the process, BOEM uses the best available information to make decisions, such as the locations to hold a lease sale or environmental monitoring requirements for industry. To the extent practicable, the Portal will help inform the identification of locations for offshore renewable energy development and the range of activities that occur throughout the four phases of development by taking into account regional perspectives on the marine life, habitat, human uses, and cultural resources that may be present.

Whether the projects being considered result from solicited or unsolicited proposals, or are for commercial development or for research purposes, the Plan will assist BOEM and project developers, to the extent practicable, in identifying the relevant species or locations that require further detailed data collection through the assessment of a site. BOEM guidelines for developers include the recommendation to use the most recent data available to inform any proposed survey work.[11] Developers may also use the information to inform the siting of their structures within a lease area.

EI-4. Incorporate Plan maps and data into environmental reviews associated with new offshore energy or submarine cable proposals: As part of the environmental review process, lead agencies such as BOEM, MARAD, USACE, and DOE consult with federal, state, and tribal partners under the ESA, MMPA, MSA, CZMA, NHPA, and other laws. The Portal will be used to the extent practicable as important reference information about the distribution and densities of marine life species and the presence and extent of important habitats to be considered during environmental review and individual consultations. However, many large-scale activities

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will require the additional collection of site-specific information for impact assessment and monitoring. The Portal will also support cumulative analyses and other information necessary in NEPA documents that must take into consideration all other existing and reasonably foreseeable human uses in an area. The Portal will contribute basic information about the usage of the area under consideration for development.

EI-5. Identify and notify potentially affected stakeholders: The Portal helps identify important user groups such as commercial and recreational fishermen, commercial transportation, and the military that are most likely to interact with new offshore energy developments and therefore should be engaged in the commercial leasing process. Recognizing existing ocean uses and activities greatly expedites the project review process and informs the developer of areas where conflicts may be avoided, minimized, or mitigated.

- RPB agencies will use the Plan and data on human activities in the Portal to identify stakeholders potentially affected by agency actions or proposed projects related to offshore energy.
- Relevant federal agencies (i.e., BOEM, USACE, MARAD, or DOE, depending on the type of offshore energy or infrastructure development) will explore using the Portal as an additional resource for posting agency announcements to help ensure regional stakeholders have updated information about proposed energy and communications infrastructure development activities.

EI-6. Improve outreach to industry and stakeholders related to renewable energy development: RPB agencies have identified the following activities to improve communications and engagement with stakeholders and to inform agency processes.

- *Engage industry and stakeholders in renewable energy strategic planning and administrative processes:* In order to better understand and meet potential challenges to continued development of the offshore renewable energy industry, BOEM and DOE will periodically request responses from industry and other stakeholders via sources such as workshops, public meetings, and Federal Register Notices. Information gained through these sources will inform the agencies' strategic planning efforts, existing regulations, and renewable energy administrative processes.
- *Develop materials clearly describing renewable energy permitting and leasing processes:* In concert with the Mid-Atlantic RPB effort, BOEM will work to enhance coordination and management by developing an online outreach tool to more clearly detail offshore wind energy regulatory processes. The resulting tool will identify how programs intersect and outline where and when relevant authorities play a role in decisions.

EI-7. Ensure the Plan and the Portal are used by agencies and recommended to project proponents: Federal agencies will, where practical, incorporate the use of the Plan and the Portal into existing internal agency guidance to support implementing NEPA and other laws. Relevant federal agencies, including BOEM, USACE, and MARAD, will, where practical, also identify the Plan and the Portal in guidelines to developers as an important source of information to inform proposed survey work associated with energy and communication infrastructure development proposals.

EI-8. Inform research and development: Funding of research and development initiatives is the result of strategic planning and understanding of the state of the science. Regional planning data products will help improve DOE and BOEM strategic investments by highlighting data gaps, such as marine life distribution, trends, habitat conditions, and resource characterization. Although many science and research priorities are published by various entities in the Northeast, the Plan's regional science and research priorities will inform and reaffirm agency investment decisions.

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ACTIONS: ENHANCE AGENCY COORDINATION

EI-9. Enhance intergovernmental coordination related to offshore energy development: RPB agencies have identified the following ongoing and planned activities, which taken together and informed by the Plan, will improve intergovernmental coordination related to offshore energy development.

- *Continue intergovernmental renewable energy task forces:* BOEM established and will continue to operate as-needed intergovernmental renewable energy task forces with many of the New England states to identify areas suitable for offshore wind energy development and to inform the process from planning through development. Each task force is a forum to share data and information to be used by BOEM in the decision-making process. Membership includes federal agencies with interests off the particular state's coast, state agencies, municipalities, and tribes.
- *Continue DOI/DOE collaboration on offshore renewable energy:* The DOI and the DOE will continue close collaboration in support of safe, efficient development of the offshore renewable energy industry in US waters. This collaboration will include reaching out to stakeholders for insight into technical, safety, and market challenges for the industry, contributing to updating the DOE/DOI National OffshoreWind Strategy and other assessments, and coordinating research to better understand and mitigate the environmental impacts of offshore renewable energy technologies.
- *Obtain public, tribal, and state input on energy-related research:* BOEM will continue to partner in ongoing and planned studies and commits to increased awareness of its research planning cycles to facilitate early involvement of the RPB entities. BOEM will continue to solicit and consider state, tribal, and public input to its annual National Studies List through outreach, webinars, announcements on data portals, and websites.
- *Develop an integrated regional ocean research agenda:* The RPB entities will collaborate to develop an integrated regional science and research agenda, including identifying opportunities, as appropriate, for coordination/collaboration with the Subcommittee on Ocean Science and Technology (SOST) on the overall agenda, and working with the National Oceanographic Partnership Program (NOPP) to facilitate discussion and support of specific research projects.
- *Continue collaborative federal and state data collection efforts:* BOEM will continue to engage in cooperative research efforts with states to collect data of mutual interest, as appropriate. For example, BOEM contributed funds to Massachusetts to collect baseline information about marine mammals, turtles, and avian species in the Massachusetts Wind Energy Area.
- *Continue to participate in the Interagency Working Group on Offshore Wind:* BOEM and DOE are participating on the Interagency Working Group on Offshore Wind, which was established by the White House in September 2015 to promote effective coordination among Federal agencies (including NOAA, DOT, EPA, USCG, DOD, USACE, and others). In March 2016, the Offshore Wind Permitting Subgroup, led by BOEM, was established for the purpose of identifying opportunities to improve interagency coordination on all aspects of permitting offshore wind projects.
- *Engage tribes in renewable energy leasing and permitting processes:* BOEM will continue its internal policy of inviting tribal partners to be cooperating agencies in the preparation of NEPA documents, as well as programmatic agreements and post-review discoveries clauses with tribal partners for each stage of BOEM's renewable energy process.

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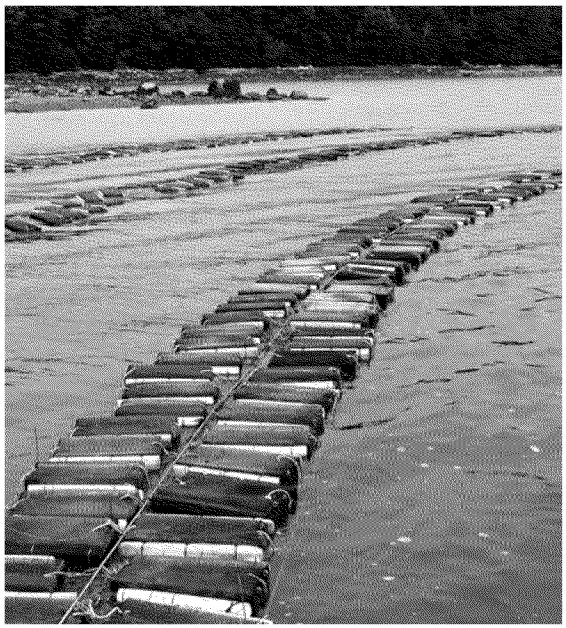
AQUACULTURE



Aquaculture is an important maritime sector in New England with operations dotting the shoreline and providing locally grown seafood and jobs. Over a dozen finfish, shellfish, and algae species are, or have been, commercially grown in the region, including American oyster, Atlantic salmon, steelhead trout, Atlantic sea scallop, bay scallop, blue mussel, European oyster, green sea urchin, quahog, kelp, and soft-shell clam. Shellfish aquaculture is more widespread than finfish aquaculture in New England, with over 1,500 leases from Maine to Connecticut producing $45 million–$50 million per year of dockside value (point of first sale) with oysters representing the largest portion of that total.[1]

Shellfish aquaculture operations in New England include small, family-owned companies often with roots in fishing families or from communities looking for economic diversification from wild harvest fisheries as well as large corporations. Commercial finfish aquaculture in New England almost entirely consists of Atlantic salmon rearing in Maine, which had a market value of over $73 million in 2010.[2] At that time, the majority of this production came from one New Brunswick–based company, with a few other smaller, family-owned operations.

There is future growth potential for aquaculture in New England. National production of farm-raised seafood increased 8 percent per year from 2007 to 2012, with local shellfish production recently reaching all-time highs in several states.[3] There is also increased interest in the production of new species, such as certain seaweed varieties, and in establishing polyculture facilities that combine multiple species at one site. Combining finfish, shellfish, and kelp in a single site can help buffer the effects of changing market and environmental conditions and can mitigate waste and nitrogen inputs from finfish aquaculture. In addition, while shellfish aquaculture has traditionally been located in intertidal or nearshore waters, there has been recent interest in locating operations farther offshore (including in federal waters). There are many potential advantages to siting aquaculture offshore. Offshore areas often have better water quality and fewer existing activities that may conflict with the development of new facilities. Therefore, offshore areas may be better suited for larger operations. That said, the challenges to offshore aquaculture include a complex permitting process, exposure to high-energy ocean conditions, biosecurity concerns, and increased distance to portside support and infrastructure.

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In 2014 and early 2015, two longline blue mussel operations intended for commercial production were permitted in federal waters—one 8.5 miles off Cape Ann and the other in Nantucket Sound—representing the first two locations permitted for aquaculture in federal waters offshore New England. Permitting for these two facilities helped clarify the regulatory process and will inform the industry and regulators about siting aquaculture in federal waters. Through that process, regulators and the permit applicants identified potential conflicts with paralytic shellfish poisoning (PSP) closure areas, navigational safety, existing fisheries, essential fish habitat (EFH), and endangered species. They also identified permitting concerns related to potential impacts to National Marine Sanctuary resources and federal consistency review with the Massachusetts Office of Coastal Zone Management. Each project sought and continues to seek a better understanding of the commercial potential of offshore areas by evaluating shellfish growth rates, environmental conditions, and different gear configurations.

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REGULATION AND MANAGEMENT

Permitting aquaculture facilities is the responsibility of federal, state, and local authorities, depending on location and species. The permitting process is complicated by the necessity of obtaining separate permits for deploying structures on the site, for handling sub-legal (undersized) animals, for discharging pollutants (if applicable), and for commercial harvesting. In state waters, states manage aquaculture according to individual state laws and regulations. Depending on the state, project proponents must acquire a lease, license, or permit for the site and for the propagation of the species being grown. Federal permits, through the USACE and EPA, are also typically required for projects in state waters.

In federal waters, the USACE is currently the lead permitting agency (through RHA for siting facilities) with other federal agencies coordinating to address protected species and habitat (NMFS), water quality (EPA primarily, which, depending on the nature of the proposed facility, also may be the lead agency for a separate permit for discharges), navigational safety (USCG), or other siting-related issues.

There is currently no formal leasing mechanism for aquaculture in federal waters such as exists in many states. The differences between a permit and lease can sometimes be complicated, but generally, permits provide the terms for the conditional use of an area and leases provide the additional right to occupy a given area for a specific time period. This additional occupation right is sometimes necessary to obtain project financing. While a formal aquaculture leasing process does not currently exist in federal waters, the Energy Policy Act of 2005 allows for alternative uses of existing facilities on BOEM leases. This allowance provides for the potential colocation of aquaculture with offshore energy installations (which may raise complicating issues such as the potential attraction of marine birds to concentrated food resources).

The National Shellfish Sanitation Program (NSSP) is the federal-state cooperative program recognized by the US Food and Drug Administration (FDA) and the Interstate Shellfish Sanitation Conference (ISSC) for the sanitary control of shellfish produced and sold for human consumption. The public health provisions of the NSSP have significant effects on aquaculture producers through growing area closures, product handling requirements, and labeling.

At the national level, there have been several recent initiatives aimed at encouraging offshore aquaculture, particularly in federal waters, by clarifying the regulatory process and advancing research. The most relevant of these for ocean planning purposes are the following:

- In 2008, the US Government Accountability Office (GAO) issued an assessment of offshore aquaculture focused on establishing a regulatory framework and highlighting the need for such a framework to address four overall issues: program administration, permitting and site selection, environmental management, and research.[4]
- In 2014, the White House National Science and Technology Council's Interagency Working Group on Aquaculture issued a five-year strategic plan for federal research to encourage aquaculture in the United States. This plan includes nine critical strategic goals and identifies federal agency and interagency research, science, and technology priorities.[5]

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- In 2015, NOAA's Office of Aquaculture[6] issued a draft strategic plan that intends to provide science, services, and policies in support of "significant growth of responsible US marine aquaculture."[7] It includes objectives and strategies to achieve overall goals related to regulatory efficiency, tools for management, technology development and transfer, and an informed public. Included in these objectives and strategies are topics such as developing tools to inform aquaculture and siting decisions, and improving interagency coordination on permit applications.[8]
- A memorandum of understanding (MOU) is being developed for permitting offshore aquaculture activities in federal waters of the Gulf of Mexico. This MOU is intended to improve coordination between the seven federal agencies involved and to streamline the regulatory process. The agencies involved are the USACE, NMFS, USCG, EPA, USFWS, BOEM, and the Bureau of Safety and Environmental Enforcement (BSEE) within DOI. The MOU is expected to be finalized soon. Although this MOU is limited to aquaculture operations located in the Gulf of Mexico, it could serve as a model for other areas of the US coast, including New England.

Numerous regional efforts to support aquaculture have been useful for informing ocean planning:

- The Northeast Regional Aquaculture Center (NRAC) is one of five US regional centers established by Congress to "support aquaculture research, development, demonstration, and extension education to enhance viable and profitable US aquaculture production which will benefit consumers, producers, service industries, and the American economy." [9] NRAC's mission is to "focus… on science and education that will have a direct impact on attaining long-term public benefits through enhanced aquacultural development in the region."[10]
- In 2010, NRAC, in conjunction with NOAA, supported an effort by the East Coast Shellfish Growers Association to publish a Best Management Practices Manual.[11] The manual provides descriptions of various shellfish culture methods, lists state extension and advisory contacts, and includes "best management" guidance.
- The Northeast Aquaculture Conference and Exposition (http://www.northeastaquaculture.org) provides a forum for hundreds of growers, researchers and scientists, agency staff, and others to meet to discuss the latest developments in technology and scientific research, announce new initiatives, and coordinate.

For certain tribes in New England, aquaculture (particularly shellfish) has important food provisioning and environmental value. Through the ocean planning process, RPB tribes also expressed interest in shellfish aquaculture sites and habitats (particularly for razor clams, soft-shell clams, quahogs, and mussels), recognizing that they are important to tribal sustenance and water quality restoration projects. Shellfish bed restoration opportunities have also been identified as being of interest to coastal tribes.

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MAPS AND DATA

The Portal includes a series of maps characterizing the current footprint and relevant management areas for aquaculture in the region.

Current aquaculture footprint

The Aquaculture map shows sites that have been leased or permitted in the region. In addition, the map shows municipally- and state-managed and recreational shellfish beds in Connecticut. The map distinguishes between shellfish, finfish, seaweed, and multitrophic operations in each state's waters. These data are drawn from authoritative state sources and merged into a regional dataset with input and review from each of the data providers. The Portal map also includes the location of the two recently permitted blue mussel operations in federal waters. The location of these permitted sites was provided by USACE.

Management areas

The Shellfish Management Areas map includes shellfish growing and classification areas for New England states and New York. The classification scheme used in this regional dataset is adapted from the National Shellfish Sanitation Program *Guide for the Control of Molluscan Shellfish.* These data are merged from the same authoritative state sources.

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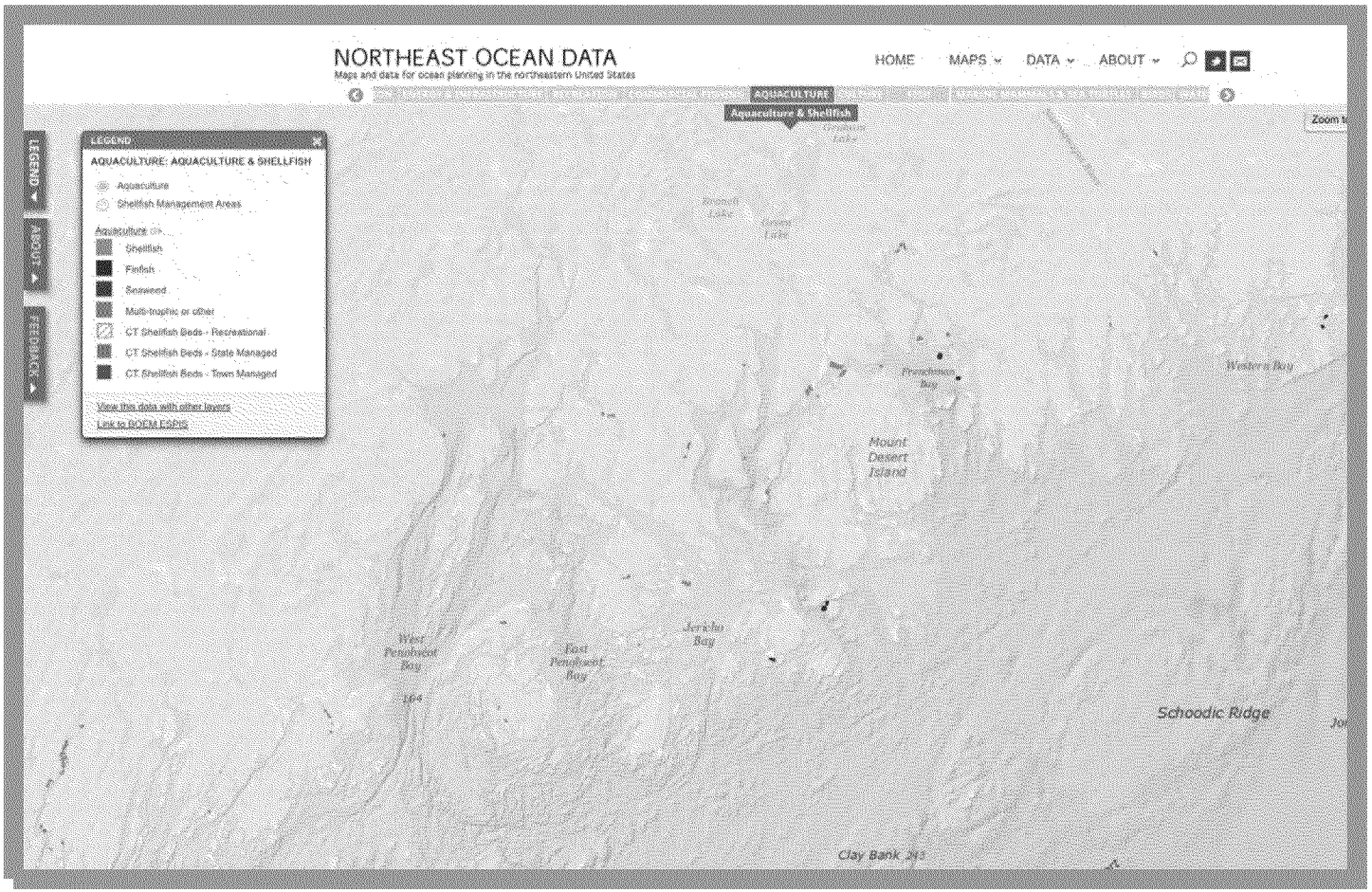

This map displays the areas currently used for shellfish, finfish, and seaweed aquaculture in the area between Penobscot Bay and Frenchman Bay, Maine.

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OVERVIEW

ACTIONS

A-1 Maintain aquaculture maps and data on the Portal

A-2 Identify additional data to support aquaculture siting

A-3 Inform regulatory and environmental review of agency actions for their potential impacts to existing aquaculture

A-4 Inform permitting, leasing, and environmental review of proposed aquaculture operations

A-5 Ensure the Plan and Portal are used by agencies and project proponents

A-6 Continue interagency work group to inform regulatory and siting issues

A-7 Advance national and regional initiatives to support and promote marine aquaculture

ACTIONS: MAINTAIN AND UPDATE DATA

A-1. Maintain aquaculture maps and data on the Portal: USACE and NOAA (for federal waters) and the states (for state waters) will review the maps of current aquaculture operations and shellfish management areas annually and provide updates to the Portal Working Group. Although most of the data comes from state fishery and aquaculture agencies, data on the location of permitted aquaculture operations (particularly in federal waters) can be corroborated with USACE. In addition, NOAA will provide maps of federally designated PSP closure areas (for example, PSP closures have been issued as part of managing the surf clam/ocean quahog commercial fishery).[12]

A-2. Identify additional information to support aquaculture siting: RPB agencies will consider incorporating additional data into the Portal, including recent permitting information from the Public Consultation Tracking System[13] managed by NMFS that provides information on its regulatory consultations, information about the potential effects of aquaculture on listed species and critical habitat from recent biological opinions developed under ESA,[14] and data resulting from new scientific studies.

ACTIONS: INFORM REGULATORY AND MANAGEMENT DECISIONS

A-3. Inform regulatory and environmental review of agency actions for their potential impacts to existing aquaculture: To the extent practicable, RPB agencies will use the data referenced in the Plan and the Portal when considering the potential effects of proposals for new offshore projects. The data will assist with the preliminary identification of potential conflicts with existing aquaculture operations and shellfish habitat areas, aid in the identification of potentially affected stakeholders, and identify when and where additional information (for example, regarding compatibility with existing aquaculture) may be required.

A-4. Inform permitting, leasing, and environmental review of proposed aquaculture operations: To the extent practicable, RPB agencies will use the Plan and the Portal to inform environmental review and permitting processes for newly proposed aquaculture operations. Data and information in the Plan will be used in the preparation of baseline information for environmental assessments. Additionally, maps of human uses—specifically marine transportation, fishing, and recreation, which are the most likely existing activities to interact with new aquaculture operations—will

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be used to help identify potentially affected stakeholders who should be engaged early in the project review process. Early engagement will assist with the identification of additional information needed for permit review, including details about any potential use conflicts.

Data related to marine life will also be used to help consider potential interactions with marine life species and habitat. Depending on the specific type of aquaculture, project proponents, agencies, and stakeholders can first consider those marine life species groups and habitats that are likely to have the greatest interaction. For example, aquaculture may interact with birds that feed on the same fish and shellfish or forage in the same areas as the species that are being grown. Also, proposed offshore aquaculture operations with gear primarily located in the water column are relatively more likely to interact with pelagic species. An analysis like this has actually already occurred using data from the Portal—project proponents for the longline mussel project in federal waters east of Cape Ann, Massachusetts, used marine mammal distribution and abundance and other information from the Portal in their biological assessment.

A-5. Ensure the Plan and the Portal are used by agencies and project proponents: RPB agencies will incorporate, where practical and appropriate, the use of the Plan and the Portal into existing internal agency guidance for implementing NEPA. Relevant federal agencies, including USACE, NOAA, and BOEM, and Northeast states will also identify the Plan and the Portal in guidelines to developers, where practical, or refer aquaculture applicants to the Portal and the Plan as sources of information for siting decisions (particularly for potential operations in federal waters). States will use the Portal as one source of information in the review of offshore aquaculture proposals for federal consistency.

ACTIONS: ENHANCE AGENCY COORDINATION

A-6. Continue interagency work group to inform regulatory and siting issues: In recent years, federal agencies in the Northeast US have coordinated to consider ways to address permitting and other issues related to offshore aquaculture in federal waters. In particular, an interagency work group composed of staff from USACE, NOAA, EPA, and BOEM has met throughout the planning process to identify issues and inform the development of the Plan. These agencies will continue to meet (and include USFWS and states as appropriate) to advance the following activities:

- Using data from the Portal and other sources, map areas of federal waters where potential aquaculture impacts to specific priority species, and conflicts or synergies with existing human activities are more likely to occur and should be considered when siting an aquaculture facility. For example, bird data for species that could be drawn to aquaculture facilities (e.g., species such as gannets, scoters, and eiders that feed on blue mussels) could be examined to determine potential for depredation. Many considerations would have to be taken into account for this type of analysis, such as the specific type of aquaculture and whether the potential application of

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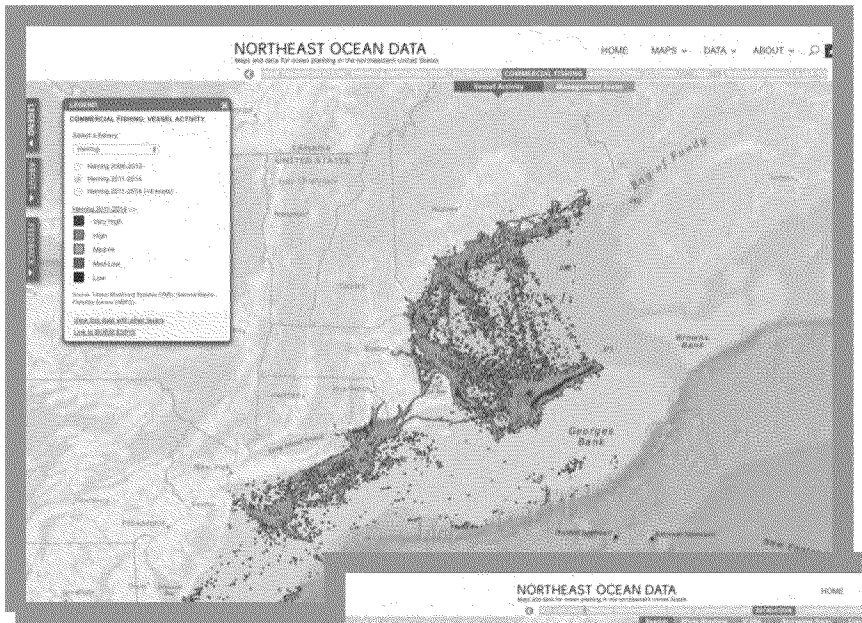
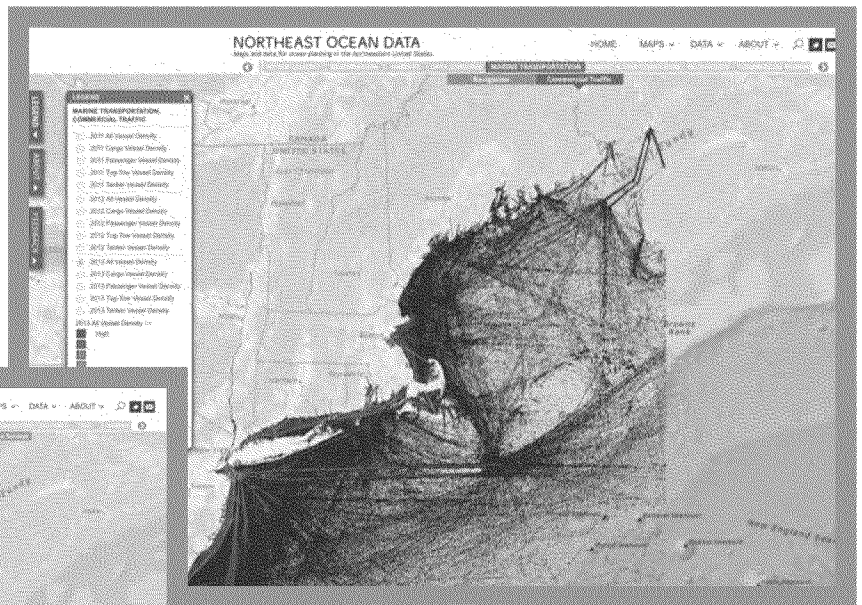
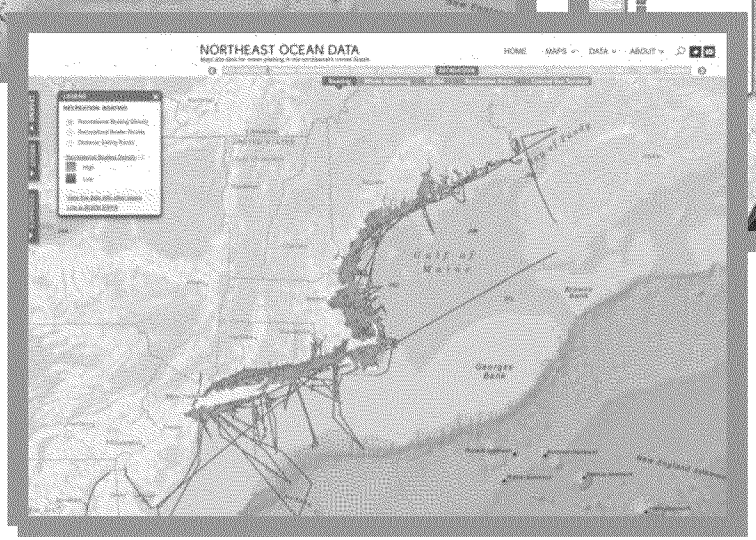
Herring fishing vessel density (representative of potential interaction with fishing activity)



Commercial shipping vessel density





Recreational boating density

Fishing, recreation, and marine transportation are most likely to interact with new aquaculture operations.

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the mapping effort would be useful, given dynamic ecological conditions and technological advancements.

- Develop information using Portal data and other sources to assist with the siting of aquaculture facilities, given the physical, biological, and chemical requirements of certain species and the logistical and operational limitations of different gear types. This information could include water quality, currents, bathymetry, or other physical and biological oceanographic characteristics used to help determine the feasibility and practicality of potential sites.
- Share information and best practices related to gear types and culturing methods for different species, including potential impacts on marine species and water quality. This activity includes sharing information about entanglement hazards for marine mammals and sea turtles, potential interactions with migratory birds, the strength and tension of different types of lines in the water, and water quality considerations including monitoring.
- Review the MOU developed in the Gulf of Mexico and determine whether an MOU for aquaculture in New England federal waters would improve regulatory coordination.
- Ensure that aquaculture proponents and stakeholders who have expressed an interest are able to participate in each of these activities; their knowledge will be critical to the success of these efforts. The interagency work group will engage the aquaculture community and others as these activities progress. Increasing public involvement and awareness through coordinated outreach efforts by the permitting and resource agencies will help to reduce user conflicts and can be beneficial in reaching resolution early in the permit review process.

A-7. Advance national and regional initiatives to support and promote marine aquaculture: RPB agencies, particularly NOAA, will continue to advance initiatives to support and promote marine aquaculture, including the following specific activities:

- RPB agencies will continue to coordinate on the implementation of the White House National Science and Technology Council's Interagency Working Group on Aquaculture, five-year strategic plan referenced previously.
- RPB agencies will have opportunities to coordinate through the RPB once the NOAA Office of Aquaculture finalizes and begins to implement its strategic plan.
- NOAA/GARFO will facilitate and promote communications internally, collaboration with other federal and state agencies, and with the marine aquaculture industry to identify information needs essential for streamlining NOAA's consultation activities as part of the permitting process.
- NOAA will also facilitate collaboration between GARFO, USFWS, NEFSC, and state agencies, and with the regional aquaculture industry, to identify and evaluate research and information needs to promote marine aquaculture development in the greater Atlantic region.
- NOAA will seek to advance public understanding with respect to benefits, potential impacts, and management of marine aquaculture by increasing outreach activities and associated funding opportunities in the greater Atlantic region.

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OFFSHORE SAND RESOURCES

Hurricanes, nor'easters, and other strong storms may only last a day or two, but it may take years for coastal communities to recover and rebuild from the erosion and damage they cause. The effects of climate change—rising sea levels and the increasing frequency of strong storms—exacerbate these risks. Global sea levels are projected to rise by one to four feet by 2100, with most of the coastal Northeast United States expected to exceed this global average. A sea level rise of two feet, without any changes in the severity and frequency of storms, would more than triple the frequency of dangerous coastal flooding throughout most of the Northeast US.[1]

Much of New England's shoreline is extensively developed, and low-lying coastal metropolitan areas in the region have considerable infrastructure at risk. Consequently, many coastal communities in New England are facing the reality of more frequent flooding and coastal erosion that adversely affect residential and commercial areas, recreation and other aspects of the coastal economy, critical infrastructure, and important habitat. The Northeast's coastal ecosystems and the species that inhabit them are highly vulnerable to rising seas. Beach and dune erosion, both a cause and effect of coastal flooding, is a major issue in the region. Impervious urban surfaces and coastal barriers, such as seawalls, limit the ability of marshes to migrate inland as sea levels rise.[2]

There are many possible ways for coastal communities to address coastal erosion and vulnerability issues. These include the use of natural vegetation to help stabilize shorelines and dunes; construction of hard structures (sea walls, breakwaters, riprap, groins, jetties, or bulkheads); relocation of infrastructure or structures; use of dredged material (such as from a nearby dredging project) to help rebuild and widen beaches; use of upland sources of sand and other material; and other site-specific activities.

The potential use of sand resources from federal waters (beyond three miles off the coastline) is another option currently being considered in New England. This Northeast Ocean Plan focuses on this option for several reasons, including that such sand extraction would be a new activity for this region. There is a potential growing need for sand and there are currently no projects in New England that use federal sand resources. Therefore, this Plan provides the opportunity to advance the assessment of federal sand resources in the region and to better understand the potential impacts and benefits associated with the extraction and use of these resources in preparation for potential future needs.

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Secondly, the Plan is being developed in response to regional priorities and a presidential executive order. The extraction of sand in federal waters was specifically mentioned in the RPB's *Framework for Ocean Planning in the Northeast United States*, and much like other topics in the Plan, this section focuses on emerging ocean uses in federal waters under federal authorities. Finally, many of the other coastal resiliency options are outside the purview of this Plan. There are existing processes to assess sand resources in state waters, and decisions about the appropriate method for addressing coastal erosion issues are made based on the unique characteristics of each location.

The potential identification and use of federal sand resources in New England requires more research. Sand deposits have not been well mapped in many areas, except for general trends (for example, larger sand deposits are more likely offshore southern New England than the more geologically and geomorphologically diverse areas offshore Maine, New Hampshire, and much of northern Massachusetts). There is also limited information on the impacts to important habitat and the resulting conflicts with and potential effects on commercial and recreational fisheries.

Offshore shoals and ridges may provide good sources of sand; they may also represent valuable habitat for fish and other species. Shoals are dynamic features that attract a diversity of marine life, producing a variety of habitat types and foraging opportunities for a range of finfish, shellfish, and migratory species. Dredging can alter the bathymetric contours (depths and gradients) of shoals and ridges.

It is known that the structural complexity of rocky habitats, such as gravel and cobble that are often mixed in with sand resources in New England, provide fish with shelter and refuge from predators. These rocky habitats are highly used by commercially important species such as Atlantic cod and American lobster, are vulnerable to disturbance due to slow recovery times, and excavation of these gravel and cobble sources could lead to a complete loss in some areas. Therefore, the composition and habitat value of potential sand borrow areas must be studied carefully and avoided if unsuitable for extraction.

In addition to benthic habitat impacts in areas where sediments are extracted, the placement of sediment on beaches and nearshore areas can also impact neighboring shallow water habitats such as seagrass meadows and areas of high benthic complexity (e.g., gravel and cobble) as the new material moves offsite and buries adjacent bottom habitat. Sand placement can also impact macroinvertebrates and the bird and fish species that feed on them, an impact not unique to the use of offshore sediment sources. These concerns underscore the need to use comparable material to existing sediments for nourishment, and to perform a detailed evaluation of neighboring habitats during the permit review process.

All of the options available for addressing coastal erosion and vulnerability issues, including the use of federal sand resources, involve complex scientific, financial, engineering, and policy issues. General trends such as sea level rise need to be considered in concert with the nearshore sediment processes that affect individual properties or neighborhoods. In addition, there are financial costs, impacts to the natural and built environment, engineering, and other considerations. At the same time, there are many potential public benefits for the use of offshore sand, including improved coastal access and recreational opportunities, protection of coastal infrastructure and residential and commercial areas, and the option for another alternative to using seawalls and other hardened structures. A complete assessment of the appropriate coastal resiliency solution is generally completed on a case-by-case basis by the appropriate local, state, and federal agencies. For example, the enhanced storm protection, economic, and recreational benefits provided by a widened beach have to be weighed against the environmental and other potential effects and costs of removing, transporting, and placing sand onshore.

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REGULATION AND MANAGEMENT

Permitting and leasing

BOEM is charged with environmentally responsible management of certain federal outer continental shelf resources (such as oil and gas, sand and gravel, and seabed for leasing and development of renewable energy infrastructure.) Public Law 103-426 (43 U.S.C. §1337[k][2]), enacted in 1994, grants the Secretary of the Interior (through BOEM) the authority to negotiate, on a noncompetitive basis, the rights to OCS sand, gravel, and shell resources for shore protection, beach or wetlands restoration projects, or for use in construction projects funded in whole or in part, or authorized by, the federal government. As the steward for these resources, BOEM must ensure that the removal of any mineral resources is done in a safe and environmentally sound manner, and that any potential adverse impacts to the marine, coastal, and human environments are avoided or minimized.

BOEM's Marine Minerals Program (MMP) is the nation's steward and scientific expert for nonenergy marine mineral resources (i.e., mud, sand, gravel, and shell) in the OCS. The MMP authorizes use of OCS resources in support of USACE federally authorized and/or locally permitted coastal resiliency projects, since one of the primary missions of the USACE is storm risk management with beach nourishment as one way to achieve this mission. BOEM and USACE partner in varying capacities to support resilient coasts because of their complementary missions and roles.

BOEM uses three standard negotiated noncompetitive agreements (NNA), as determined by the nature of a project, to formalize rights to use OCS resources: a two-party lease, a two-party memorandum of agreement (MOA), or a three-party MOA. The agreement or lease describes the project and procedures that will be followed to access and use the OCS sand and identifies environmental and operational stipulations. BOEM typically issues an MOA for projects using offshore sediment conducted by the USACE Civil Works Program. A lease is issued if the project has a nonfederal sponsor and the USACE is involved in permitting under CWA or RHA.

For some projects, the USACE may be the lead for storm risk management projects with a nonfederal partner using sediments from state waters (such as using dredged material). USACE Civil Works is authorized to implement small projects (for example, under $10 million) executed with state or local municipalities under the USACE Continuing Authorities Program[3]. Other opportunities on a regional scale, such as projects in western Long Island Sound after Hurricane Sandy, usually require congressional authorization and the state as a nonfederal lead.

Prior to proceeding with a project, BOEM and USACE must conduct a review of all environmental impacts through the NEPA process, by developing either an environmental assessment or an environmental impact statement, and ensure that the project complies with applicable laws. This includes the Coastal Zone Management Act (CZMA) with respect to state coastal program policies (federal consistency), the National Marine Sanctuaries Act with respect to potential effects to sanctuary resources, and numerous other consultations about potential impacts to existing uses and resources. For example, any project will likely require consultation with NMFS on impacts of the project to essential fish habitat (EFH) under MSA, to natural resources under the Fish and Wildlife Coordination Act, and to federally listed species under the ESA. NMFS would then work with the lead federal agency to help identify and evaluate options for reducing impacts.

Based on the NEPA analysis and other consultations, BOEM and USACE may include mitigation measures and other stipulations in the MOA or lease to protect physical, biological, and cultural resources. These stipulations often include the following: dredging time-of-year restrictions, dredge location constraints, lighting requirements, equipment requirements, monitoring requirements for threatened and endangered species, and buffers surrounding cultural resources and hard-bottom habitat.

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To date, BOEM has conveyed rights to over 110 million cubic yards of OCS sand for coastal restoration projects in multiple states along the Atlantic and Gulf of Mexico coastlines. These projects have occurred along 260 miles of the nation's coastline. BOEM has seen a steady increase in the number of projects using OCS sand sources. While BOEM has not issued any sand leases in New England, demand in this region is expected to occur in the future as the needs increase with sea level rise and storm impacts.

Regional sand needs and assessing potential federal offshore sources

Hurricane Sandy highlighted the need for all stakeholders to take a more proactive regional approach to building coastal resilience, rather than addressing needs at the individual project scale. Under the Disaster Relief Appropriations Act of 2013, BOEM received $13.6 million for coastal resiliency studies and effortsundertaken in response to Hurricane Sandy. BOEM is also utilizing a portion of the Hurricane Sandy recovery funds to implement a regional approach to strengthening coastal resilience.

In 2014, 13 coastal states, including Maine, New Hampshire, Massachusetts, and Rhode Island, received funding from BOEM to update maps and databases of offshore sand resources to address future requirements. These cooperative agreements support capacity building, assessment of state sand needs, and evaluations of existing information on OCS sediment resources. Additionally, in 2015, BOEM initiated the Atlantic Sand Assessment Project (ASAP) from Florida to Maine to collaboratively identify new potential OCS sand resources. The ASAP was composed of geophysical surveys and geological samples (using sampling techniques such as vibracores and sediment grabs) collected three to eight miles offshore in water depths less than 30 meters (approximately 90 feet), where extraction is the most economically and technologically feasible with current equipment. The ASAP, when coupled with broad-scale environmental monitoring, will facilitate a regional sand resource management perspective.

Also in 2015, NROC established the Sand Management Subcommittee. This subcommittee is co-led by USACE, BOEM, and the Commonwealth of Massachusetts, and includes each of the other New England states, NOAA, EPA, and the US Geological Survey (USGS). The NROC Sand Management Subcommittee, later endorsed by the RPB, is a forum where state, tribal, and federal agencies can discuss future sand needs, collaborate on identifying sources of sand available for beach nourishment, and consider the potential issues associated with this use. Through the subcommittee, USACE and the states developed a preliminary list of onshore areas requiring replenishment, including the volume and type of material that is needed.

MAPS AND DATA

Although there is not currently an "offshore sand resource" map theme on the Portal, it provides a range of information to support the identification of sand resources and to help identify any potential conflicts with proposals to extract sand for coastal replenishment. This includes a centralized source of all federally available high-resolution multibeam sonar surveys conducted over the last 10 years in the region, derived products broadly characterizing sediment type and seabed forms (in the Habitat theme), and extensive data on marine life and existing human activities.

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OVERVIEW

ACTIONS

S-1 Maintain datasets related to the identification and use of resources on the OCS

S-2 Develop an Offshore Sand Resources theme on the Portal

S-3 Characterize areas for future sand resource data collection and assessment

S-4 Incorporate the Plan and the Portal into environmental reviews associated with the identification or use of sand resources

S-5 Ensure agencies use the Plan and the Portal

S-6 Continue regional collaborations to identify sand needs and potential sand resources

S-7 As funding allows, conduct additional geological and biological investigations of offshore sediment resources and form an intergovernmental task force to coordinate the use of sediment resources

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ACTIONS: MAINTAIN AND UPDATE DATA

S-1. Maintain datasets related to the identification and use of resources on the OCS: Currently, BOEM's MMP is developing a Marine Minerals Geospatial Information and Management System, which is compiling marine mineral data from historic BOEM cooperative agreements, lease information, and data, and will be incorporating information from current cooperative agreements and studies. Through this system, BOEM's MMP will have established workflows for updating the marine mineral datasets as well as the metadata using ArcGIS Geodatabase Technology. Federal OCS Sand and Gravel Borrow Areas (lease areas) will continue to be registered at http://www.data.gov/ and http://marinecadastre.gov/. This dataset will be reviewed annually, at a minimum, through the National Geospatial Data Asset (NGDA) Dataset Lifecycle Maturity Assessment Survey process. BOEM will also update the marine mineral lease areas as new leases are signed. Furthermore, BOEM's MMP is working on compiling potential sand resource areas identified through cooperative agreements, resource evaluations, and studies (such as those listed in BOEM's Environmental Studies Program Information System [ESPIS]). This baseline dataset is in progress with state partners. Once complete, BOEM's intent is to provide locations of significant sand resources to the Portal.

S-2. Develop an Offshore Sand Resources theme on the Portal: The RPB, in collaboration with the NROC Sand Management Subcommittee and the Portal Working Group, will develop an Offshore Sand Resources theme on the Portal. The theme will identify and present the data most relevant to identifying and potentially using sand resources within the region for coastal replenishment. The RPB and the subcommittee will consider the following maps and information:

- Areas needing sand resources
- Areas recently investigated or to be studied further for sand resources in state and federal waters
- Marine life, habitat, and existing human activities that are most likely to interact with potential sand borrow areas
- Other information provided by the states, USGS, USACE, and BOEM, including data from the federal Marine Minerals Geospatial Information and Management System

ACTIONS: INFORM REGULATORY AND MANAGEMENT DECISIONS

S-3. Characterize areas for future sand resource data collection and assessment: RPB agencies will have access to data on the Portal and referenced in the Plan, along with many other sources of information, to support the characterization of areas for potential sand resource data collection and assessment. The Plan and the Portal provide information on environmental, human, and cultural resource constraints for development of candidate sand resource areas. For example, areas of particular concern due to heavy commercial or recreational fishing interests would ideally be avoided for assessment unless all other viable options have been exhausted.

Agencies responsible for obtaining sand resources will, to the extent practicable, first consider the data and maps provided in the Commercial Fishing, Marine Life, and Habitat themes on the Portal and refer to those sections in this Plan due to the higher likelihood of interactions with those uses and resources. In addition, specific marine life groupings and species may be more appropriate than others. For example, maps of regulated habitat areas and regulatory marine life groups will be used as one source to screen for potential impacts to protected species. Maps of certain ecological

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groupings, such as benthic feeding bird species and demersal fish, will help identify areas where marine life species are more likely to be affected by disturbances to seafloor habitat. The identification of these areas through the ongoing mapping efforts will be useful in initial reconnaissance determinations for identifying potential offshore sand resources.

S-4. Incorporate the Plan and the Portal into environmental reviews associated with the identification or use of sand resources: Agencies responsible for environmental analyses associated with the use of offshore sand resources will, to the extent practicable, use the data and information in the Plan and the Portal during project scoping. The data will enable consistent regional characterizations of existing conditions and trends, support the identification and avoidance of potential conflicts and resource impacts, and aid in the determination of potentially affected stakeholders. Lastly, the Portal and the Plan will help determine whether additional information or scientific research will be required to inform decisions.

Because BOEM has not issued a lease for an OCS borrow area in New England to date, the compilation of these environmental data provides useful baseline information from which to gauge potential impact, and to examine possible mitigation and minimization measures in federal waters. In addition, BOEM's environmental studies are often driven by data gaps. The ability to examine known data on a regional scale via the mapping effort will be vital in BOEM's internal deliberation about potential data gaps related to OCS sand source usage in the Northeast US. BOEM can then use this knowledge to identify potential questions or concerns that may arise through the NEPA process or during associated consultations that could be answered via an environmental study.

S-5. Ensure agencies use the Plan and the Portal: To the extent practicable, RPB agencies will incorporate the use of the Plan and the Portal into existing internal agency guidance for implementing NEPA and other laws. As part of best practices in the use of best available data, BOEM and USACE will recommend applicants use the Portal as an information resource in their requests for sand and gravel.

ACTIONS: ENHANCE AGENCY COORDINATION

S-6. Continue regional collaborations to identify sand needs and potential sand resources: RPB agencies will continue to collaborate through the NROC Sand Management Subcommittee and existing federal and state cooperative agreements to implement the actions described in this Plan.

- NROC Sand Management Subcommittee: The subcommittee will continue to be a regional forum where federal agencies, states, and tribes can coordinate on sand-related issues, particularly in federal waters. Specifically, this subcommittee will:
  - > Maintain a list of onshore locations potentially requiring sand resources, including the type and volume of material needed. Where possible, the subcommittee will estimate the likely frequency at which each site will need to be replenished. Because shorelines are dynamic and priorities frequently change, the list will be updated regularly. The subcommittee will determine the appropriate method for sharing and publishing the list, recognizing that sand priorities can rapidly change and lists can become outdated.

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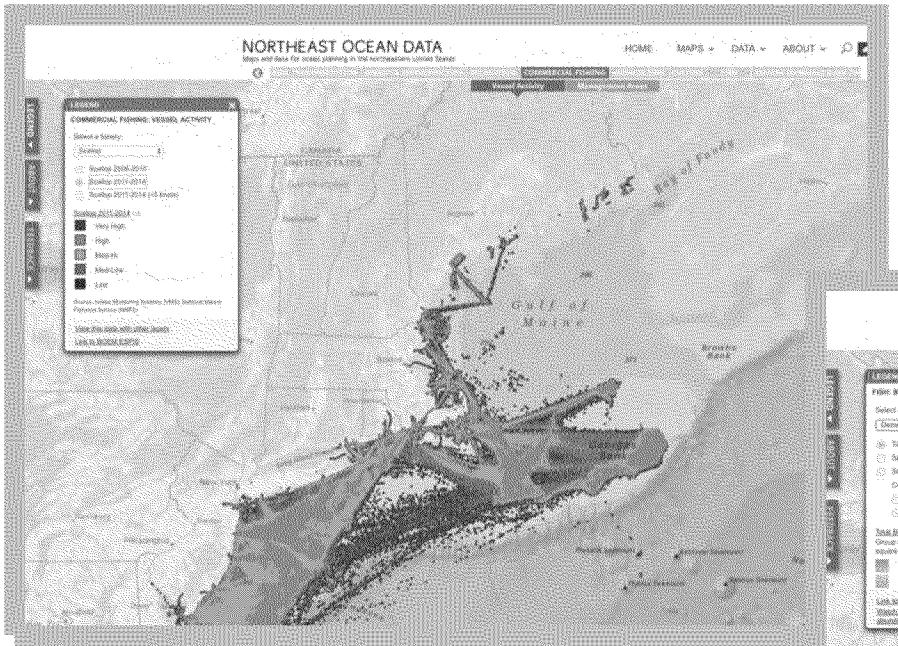
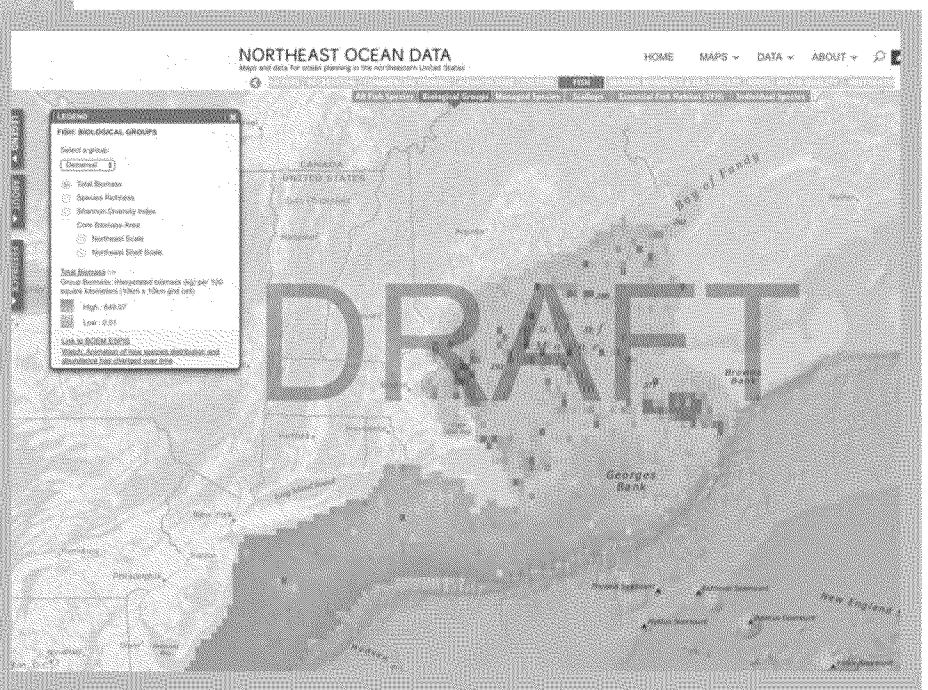
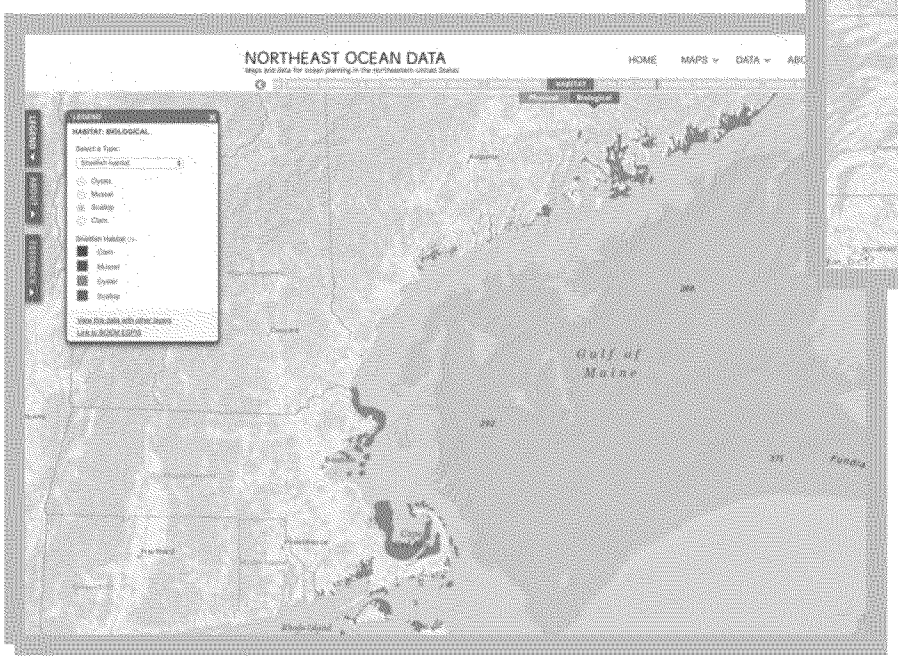
Scallop fishing vessel density (representative of potential interaction with commercial fishing)



The Portal helps identify fishing areas, marine life, and habitat that are more likely to be impacted by efforts to use offshore sand resources.



Total biomass of demersal fish species caught in the federal trawl survey



Nearshore shellfish habitat

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> Inform the prioritization of areas for future sand resource data collection. The subcommittee will be an important forum for consideration of future data collection activities.

> Oversee the development of data and themes on the Portal related to the identification and use of offshore sand resources (as described in Action S-2).

> Consider the environmental effects and advance research to better understand the potential impacts of offshore extraction and onshore placement of sand resources. Although there has been research into the effects of sand extraction on habitats south of New England, the results of that research may not translate well because of the unique or different habitats in New England's offshore environment. The subcommittee will help assess this issue and identify research needs that are specific to New England. As part of this task, BOEM and USACE will bring information to the subcommittee from relevant ongoing studies, such as those studies assessing the biological and habitat impacts of different dredging intensities. BOEM and NOAA will also collaborate on research to understand potential impacts to fish habitat.

- BOEM and state cooperative agreements: BOEM has partnered with the states on cooperative agreements to share data, identify future sand needs, identify OCS sand resource data gap areas, and evaluate existing data sources to identify potential OCS sand resources. These cooperative agreements support development of a regional inventory of potential offshore sand resources.

S-7. As funding allows, conduct additional geological and biological investigations of offshore sediment resources and form an intergovernmental task force to coordinate the use of sediment resources: There is a need for additional studies and more formal oversight of coastal sediment issues in New England, which could evolve out of the NROC Sand Management Subcommittee. However, such an effort would require additional funding, such as through a congressional authorization.

Coastal sediment replenishment in New England is a challenging initiative that needs the direction of an intergovernmental task force of regional leadership, including USACE. Several federal organizations such as the USGS are authorized to conduct regional geological and biological investigations of offshore sediment sources. Coordination of federal efforts to meet coastal resiliency needs should recognize regional priorities. Preference should be given to those investigations that involve replenishment opportunities for multiple state or local intergovernmental jurisdictions, in order to promote a systems approach to meeting coastal resources needs. These coastal resiliency investigation projects should include federal, tribal, and state priorities for coastal storm risk management, ecosystem restoration, recreational beaches, back bays, and related purposes. Any individual projects recommended by these investigations would need to be implemented through appropriate authorities. The geological and biological investigations should complement and not duplicate the offshore investigations of BOEM and other state and federal agencies' investigations.

In addition to coordinating geological and biological investigations, the task force should make recommendations regarding efficient use of coastal sediment resources that fully consider the current extent of, and potential impacts to, marine life, habitat, and human activities. This task force needs to formalize coastal sediment replenishment programs, techniques, and operations and ensure they are coordinated with the investigations and mappings of federal, state, and local agencies, as well as scientific and academic nongovernmental organizations.

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$13.6M

Amount received by BOEM under the Disaster Relief Appropriations Act of 2013 for coastal resiliency studies and efforts undertaken in response to Hurricane Sandy

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RESTORATION

Several sections of this Plan recognize the important linkage between the ocean and coasts, communities, and the ecosystem as a whole. Coastal communities and many marine species depend on healthy nearshore habitats, estuaries, marshes, and watersheds. In recognition of this fact, the RPB included an objective and an action in the *Framework for Ocean Planning in the Northeast United States* to identify, support, and coordinate existing nonregulatory opportunities for activities, such as restoration, that are important management goals of many agency programs, tribes, and states.

Therefore, for the purposes of this section of the Plan, restoration in this context refers to projects that are not associated with permitting, leasing, or licensing (recognizing that restoration activities may occur as part of the mitigation or other aspects of those regulatory programs) nor does this section address environmental reviews or specific permitting associated with restoration activities. Instead, by incorporating this topic into the framework, the RPB recognized the importance of coastal, nearshore, and estuarine habitats to the ocean and the opportunity to coordinate and highlight regional restoration activities.

Most fish and shellfish consumed in the United States complete at least part of their life cycles in estuaries. Estuaries also help to maintain healthy ocean environments by retaining sediments from rivers and streams before they flow into the oceans and, through detrital export, by linking primary production of vegetated shallows and marshes to the coastal food web. Healthy salt marshes provide habitat and water quality improvement, and can provide other benefits such as flood damage reduction. Functioning riverine systems also provide habitat, connection to spawning grounds for diadromous fish, and other benefits to people and animal life.

In many places across the region, these important habitats are threatened or have been degraded by historic development practices, fragmentation of habitats, dams, pollution, inadequate sizing and design of culverts, and other factors. Additional future stressors affecting such habitats include sea level rise and stronger, more intense storms.

Thus, in recognition of the continued and future importance of these components of the ecosystem, many federal agencies, states, and tribes have developed or provide funding for restoration programs intended to restore lost habitat function. New England has a history of successful restoration of coastal, riverine, and nearshore habitats, and there are significant additional opportunities in the future to build on these successes.

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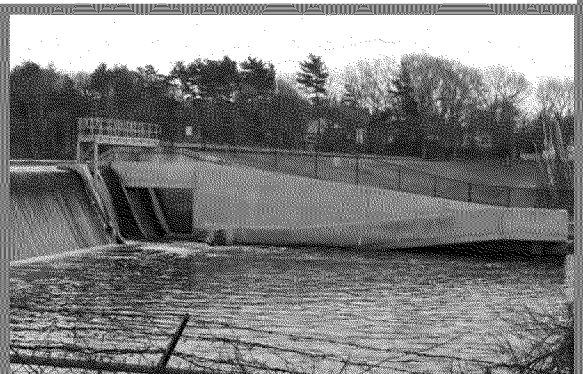

CASE STUDY

COLLABORATIVE RESTORATION

The Ten Mile River Restoration Project is an example of a collaborative restoration project in the region that partially benefited from contributions of American Recovery and Reinvestment Act (ARRA) funds from USACE and NOAA, along with contributions from the Rhode Island Department of Environmental Management and many other federal, state, and nongovernmental organizations. That project, completed in 2015, is expected to restore and sustain a population of approximately 200,000 anadromous river herring (alewife and blueback herring) and up to 25,000 American shad in the Ten Mile River, which flows into upper Narragansett Bay in Rhode Island. The restoration partners in the Narragansett Bay watershed are currently working on a study to demonstrate the landscape-level regional benefits of the many projects already accomplished in the watershed.

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Examples of the ecological value of restoration projects in New England are as widespread as the types of projects that have been undertaken. Improving estuarine habitats and restoring the connection of spawning habitats for diadromous fish through fish passage projects contributes to healthier fish populations in the ocean by providing vital spawning, nesting, and feeding habitats for many species of birds and fish. Appropriately sizing culverts, fixing tide gates so that they properly function, removing old fill material, or restoring tidal flow all can help restore salt marsh function. Projects have also included planting of eelgrass and other native coastal vegetation, controlling invasive species, restoring oyster reefs and clamflats, and removing marine debris. Such habitat improvements sometimes can include control or cleansing of stormwater runoff or other efforts to enhance water quality. All of these types of activities occur throughout the region as part of restoration projects.

Restoration projects provide economic benefits as well. Under the American Recovery and Reinvestment Act of 2009 (ARRA), NOAA awarded $167 million in funding for 50 coastal restoration projects. On average, every $1 of ARRA funds spent on these restoration projects resulted in $1.60 of economic benefit. NOAA's restoration work under ARRA created an average of 17 jobs, and as many as 33 jobs, for every $1 million invested. Those benefiting from ecological improvements also include commercial and recreational fisheries interests, as well as those industries dependent on healthy coastal ocean habitats (e.g., the tourism sector).

RESTORATION SUBCOMMITTEE

The RPB established a subcommittee of restoration experts in 2013. Led by the EPA and USACE, and including NGO, state, and tribal members, the subcommittee met and discussed several approaches to enhance regional coordination, beginning with an agreement that there is a lack of funding to support the advancement of the significant restoration opportunities throughout New England. To strengthen the impact of the limited available funds and to highlight regional restoration opportunities, the subcommittee decided to identify existing restoration projects in need of funding, using an initial set of draft criteria. This initial set of draft criteria was intended to identify projects that, upon completion, would improve ocean or coastal watershed condition either directly or indirectly; complement adjacent habitat; have a strong likelihood of achieving a sustainable, restored condition; be adaptable in the face of climate change; and other goals. Recognizing the complexity of developing and implementing such criteria for the wide array of restoration activities that federal agencies, states, and tribes wish to pursue, the subcommittee had extensive discussions regarding how these criteria could evolve in the future, including their use and relationship to specific management goals or questions. The subcommittee also discussed the importance of focusing on the various habitat types in need of restoration and, as a result, the subcommittee generated an initial set of habitat types to inform its discussions. This set of criteria, habitat types, and related deliberations helped in identifying an initial list of restoration projects that need funding.

As mentioned previously, the subcommittee also recognized that availability of funding is often the limiting factor preventing advancement of restoration projects. There are many funding programs in place to facilitate restoration, and better coordination among entities in the region on project opportunities could demonstrate the regional need for funding. New funding sources could increase the pace and scale of restoration in the region. To begin addressing this opportunity, the subcommittee developed a comprehensive list of federal funding programs for the region to help inform project financing opportunities.

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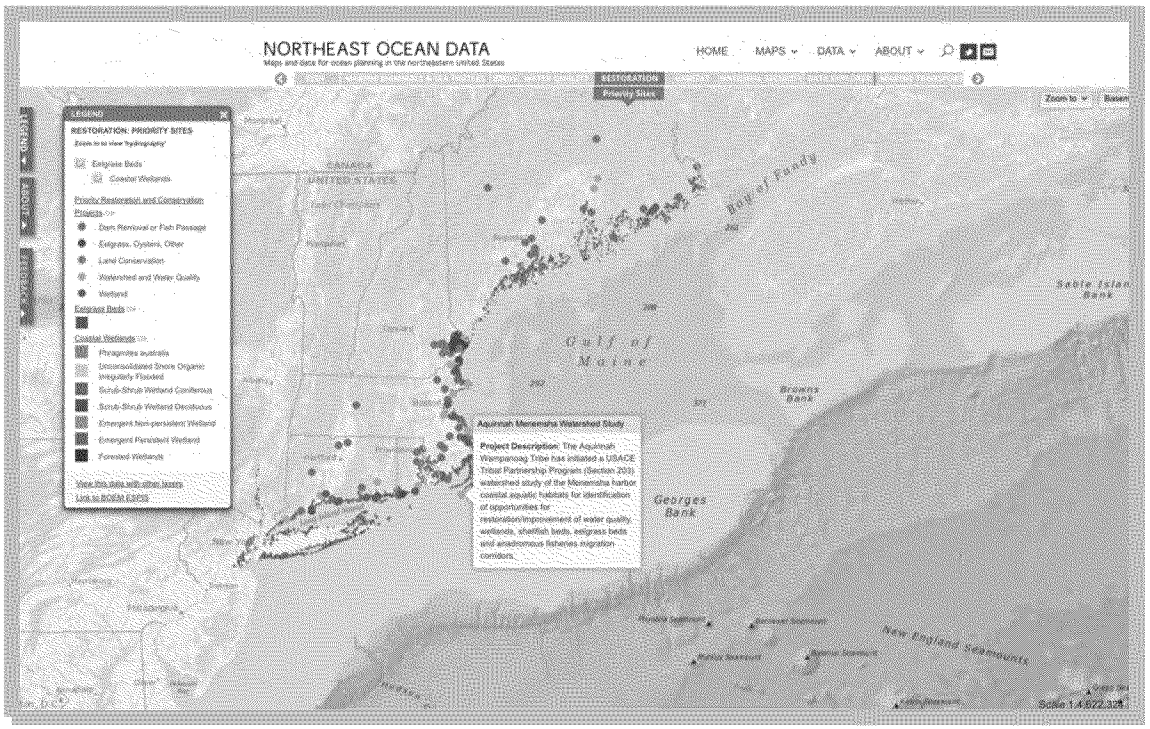
MAPS AND DATA

The Restoration theme on the Portal displays the location of Northeast US restoration projects (of various types) that require funding, as identified by individual RPB subcommittee members. Each site in the Portal dataset includes a project description with information on habitat functions to be enhanced or restored, a link to the project website (if available), and information on project phase, cost, and acres or stream miles to be restored and/or enhanced. As described in Action Rest-1, this data layer will be reviewed and updated periodically to ensure that it remains up to date. A majority of the restoration and conservation projects are eligible for federal funding[3] and require a nonfederal cost-sharing match. The Restoration theme also includes several data layers intended to provide context for the restoration projects, including coastal wetlands, eelgrass beds, and watershed information. Finally, the Portal also includes the list of subcommittee members and the list of federal funding programs.



This map indicates restoration projects identified by the subcommittee.

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OVERVIEW

ACTIONS

Rest-1 Maintain and update the Restoration theme and data on the Portal

Rest-2 Maintain and update the list of funding sources

Rest-3 Use maps and funding sources identified in the Plan to identify regional restoration opportunities

Rest-4 Continue regional coordination through the subcommittee under the direction of the RPB

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ACTIONS: MAINTAIN AND UPDATE DATA

Rest-1. Maintain and update the Restoration theme and data on the Portal: The subcommittee will review the restoration dataset for necessary updates and additions. Over the course of a year, some projects on the data layer will likely be funded or constructed, and therefore will be removed from the dataset. Other projects for potential inclusion will be brought to the subcommittee through its members. The subcommittee will also consider whether additional marine life, habitat, or other data or information should be included in the map to provide context for the restoration projects.

Rest- 2. Maintain and update the list of funding sources: The inventory of active funding programs available through various federal agencies will continue to be provided as a resource through the Portal and maintained by the subcommittee. The subcommittee will provide the updated or revised inventory to the Portal Working Group annually or as otherwise needed.

ACTIONS: INFORM MANAGEMENT DECISIONS

Rest-3. Use maps and funding sources identified in the Plan to identify regional restoration opportunities: RPB agencies will to the extent practicable use the maps and data in the Portal as a source of information to identify restoration opportunities. The restoration data layer and the inventory of potential funding sources will be valuable resources for coordinating practitioners, agency reviewers, and funders. The restoration map may also be particularly useful when funding opportunities, such as emergency recovery funding for natural events, become available.

Additionally, marine life and habitat, cultural, and human use data in the Portal may provide helpful regional context for restoration projects by, for example, helping to identify species and habitats that could be affected by restoration projects; helping to understand competing or conflicting human uses in restoration areas; and helping to identify potentially interested partners and potentially affected stakeholders.

ACTIONS: ENHANCE AGENCY COORDINATION

Rest-4. Continue regional coordination through the subcommittee under the direction of the RPB: The restoration subcommittee will continue, under the direction of the RPB, to provide a forum for federal agencies, tribes, states, and NGO partners to build awareness of potential restoration projects, explore potential topics for regional coordination, and identify funding sources (particularly federal) and new opportunities. The subcommittee will be led by federal, state, and tribal co-chairs, and it is anticipated that the subcommittee will meet at least twice per year. During and between those meetings, subcommittee members will review the Portal for potential updates to the restoration projects (as described in Rest-1) and will review and update the list of funding sources (as described in Rest-2). The subcommittee will also continue to consider additional ways to enhance regional coordination, including:

- Reviewing the initial criteria that were developed to inform the map of restoration projects.
- Reviewing the list of habitat types and the potential to assess restoration projects by their likely impact to each habitat.
- Creating opportunities to enhance the visibility of New England restoration projects to likely funders.

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4 Plan Implementation

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This chapter describes the implementation of the Northeast Ocean Plan, focusing on three components: intergovernmental coordination, plan implementation responsibilities, and monitoring and evaluation. Actions in Chapter 3 are specified for each of the 10 ocean resources and activities and will be conducted by the relevant Regional Planning Body (RPB) agencies. However, there is also a need to coordinate across these topics and agencies.

To continue the level of coordination that emerged during the development of the Plan and in conjunction with the actions in Chapter 3, RPB agencies will implement the *best practices* that are described in the **Intergovernmental Coordination** section of this chapter.

The RPB will have formal responsibilities for overall implementation of the Plan. The RPB will convene annually (or more frequently as needed) to consider whether the goals of the Plan are being met and whether the actions in Chapter 3 are being conducted, discuss the need for future changes to the Plan, and serve in a coordinating and convening role to address the science and research priorities identified in Chapter 5. These RPB *responsibilities*are included in the **Plan Implementation Responsibilities** section of this chapter.

Monitoring and evaluation will help to assess the progress being made toward achieving the Plan's goals, and these activities will also help to identify emerging issues. The RPB identified monitoring and evaluation actions that should be included in the Plan's adaptive management approach. These actions are described in the last section, **Monitoring and Evaluation.**

INTERGOVERNMENTAL COORDINATION

The intent to enhance intergovernmental coordination (and also enhance coordination with nongovernmental stakeholders) underlies several of the Plan's objectives and the National Ocean Policy. This section outlines three particular aspects (or best practices) of intergovernmental coordination:

- **Federal agency coordination**
- **Federal-tribalcoordination**
- **Federal-statecoordination**

These best practices enhance the effectiveness and efficiency of how agencies work together—and with stakeholders—by ensuring that the actions in Chapter 3 are understood and coordinated among these groups.

PLAN IMPLEMENTATION

1. Intergovernmental coordination
2. Plan implementation responsibilities
3. Monitoring and evaluation

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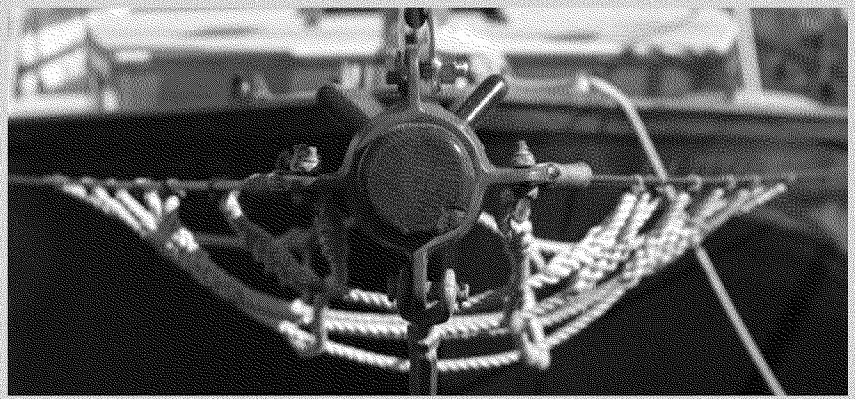
OUTCOMES

INTERGOVERNMENTAL COORDINATION

The intended outcome of intergovernmental coordination is to develop a common understanding of a proposed project or activity, its potential impacts and alternatives, issues for specific agencies, and the information that will be needed to support review and agency decision-making. Coordination of this type can identify opportunities for making the environmental and regulatory review process more efficient by clarifying the applicable authorities and resulting information requirements, by holding joint meetings or hearings, or by producing National Environmental Policy Act (NEPA) documents that support decision-making by multiple agencies. Done successfully, intergovernmental coordination also provides initial identification of potential adverse impacts to resources or potential conflicts with existing human activities, threatened and endangered species (or other habitats or species), and historic and cultural resources. One outcome of agency coordination is a common understanding of what data are available or missing and needed, and which stakeholders need to be consulted, both as a source of information and as parties with interests in the use of ocean space. The actions in Chapter 3 are intended to inform all of these considerations. Their collective impact, along with the best practices in this chapter, will enhance intergovernmental coordination.



EARLY AGENCY COORDINATION

Entities that participate in early agency coordination in the Northeast typically include (or should include) some combination of the following:

- DOI (including BOEM, USFWS, NPS, USGS)
- FERC
- USACE
- NOAA (including NMFS)
- USEPA
- DHS (including USCG and FEMA)
- Navy
- DOT (MARAD)
- NEFMCand Mid-Atlantic Fishery Management Council (depending on location)
- Stateagencies (permitting, wildlife, and fisheries agencies, CZM programs, SHPO).

  Fisheries agencies may also coordinate through NEFMC, MAFMC, or ASMFC.
- Atlantic States Marine Fisheries Commission
- Federallyrecognized tribes

RELEVANT LAWS

Federal environmental and regulatory laws to which best practices may apply include:

- NEPA
- Rivers and Harbors Act, Section 10
- Clean Water Act
- Outer Continental Shelf Lands Act
- Endangered Species Act
- Clean Air Act
- MarineMammal Protection Act
- Federal Power Act
- Integrated Coastal and Ocean Observation System Act
- Deepwater Ports Act
- Migratory Bird Treaty Act
- National Historic Preservation Act, Section 106
- Magnuson-Stevens Act
- Ports and Waterways Safety Act
- Marine Protection, Research and Sanctuaries Act
- CoastalZone Management Act
- Natural Gas Act
- NationalMarine Sanctuaries Act
- Fish and Wildlife Coordination Act

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The term *intergovernmental coordination* in this instance refers broadly to gathering, sharing, and using information, and conducting environmental review–related meetings and procedures associated with planning, leasing, regulatory, research, or other ocean management activities. The overall goal is to address the interests of federal and state agencies, tribes, the New England Fishery Management Council (NEFMC), and stakeholders, and to enhance their participation in ocean management decisions.

Intergovernmental coordination may include informal discussion (among federal agencies and between federal agencies, tribes, states, and the NEFMC, as appropriate) of a proposed project or activity before formal project or permit application review begins. It also includes initial components of formal review under existing authorities (such as the public scoping process under the National Environmental Protection Act [NEPA]), and ongoing components of formal review through regulatory consultations under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), the National Historic Preservation Act (NHPA), and other federal authorities.

Intergovernmental coordination is required or recommended in numerous forms under existing authorities and is an important element of current agency practices. The details will vary depending on the nature of the proposed project or activity, applicable authorities, agency resources, whether an agency has a significant interest in the project, and the scope of information the agencies or proponent needs to address. For NEPA and regulatory actions, agency coordination typically occurs through preapplication consultation initiated by the federal agency with primary authority (the lead federal agency), at the request of a project proponent, or when an agency recognizes that the proposed project or activity may have potentially significant impacts to marine resources or human uses. For example, consistent with its mandate to provide the opportunity for preapplication review[i], the US Army Corps of Engineers (USACE) in the Northeast US encourages preapplication consultation to support a more informed, efficient permitting process for projects that require Clean Water Act (CWA) or Rivers and Harbors Act (RHA) authorization.

RESULTS OF BEST PRACTICES

These best practices provide flexible but consistent guidance to help enhance the value of agency coordination by supporting:

- Broad, shared understanding among agencies of how relevant information from the Portal, the Plan, stakeholders, and other sources may be used early in the review of a proposed project or activity
- Clear and efficient direction for the applicant
- An initial shared understanding of the proposed project (among and between agencies), and an initial broad, shared understanding of potential issues, impacts to marine life and habitats, and compatibility concerns with existing human activities
- Informed stakeholder engagement
- Coordinated federal, state, and tribal review, as appropriate

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Federal agency coordination

This section describes best practices for federal agency coordination under existing federal authorities. Best practices draw on existing agency practices, lessons learned from agency and stakeholder experience with recent projects in the Northeast US, and the opportunity provided by the Plan to use regional information and coordination to enhance the decision-making process. The best practices described apply to federal members of the RPB, and their implementation is subject to and governed by existing legal authorities.

The best practices are organized to describe participation, data and information, and coordination with stakeholders.

PARTICIPATION

- Implementation of best practices should be considered for proposed projects and activities consistent with existing legal authorities and to the extent practical, and it is intended specifically for larger projects that require, for example, a detailed environmental assessment or an environmental impact statement under NEPA, or an individual permit from the USACE. See the *USACE New England District Guide for Permit Applicants*[2] for a description of these types of permits.
- As a general practice, federal agencies that are members of the RPB should engage in early coordination consistent with these best practices, with the understanding that the level of agency coordination will be related to the details of a proposed project or activity. This best practice includes, but is not limited to, a federal agency serving as a lead, participating, or cooperating agency[3] in NEPA review of a private (nongovernmental) project or activity, and a federal agency serving as a proponent for a government project.
- To provide awareness and consistency of information across agencies, lead federal agencies should seek to hold early coordination meetings that include all agencies with jurisdiction or subject-matter interest that are obliged or wish to attend.
- The lead federal agency should ensure that all agencies, federally recognized tribes, the NEFMC (and Mid-Atlantic Fishery Management Council and Atlantic States Marine Fisheries Commission), and states with potential interests in a proposed project or activity receive notice of, and an opportunity to participate in, agency coordination meetings.
- Over the course of early coordination, a lead federal agency (either itself or by request of a project proponent) should to the extent practicable:
  - > Develop project materials that are informed by data and information from the Portal, this Plan, stakeholders, and other sources.
  - > Provide sufficient information to initially identify potential impacts of the proposed project or activity and alternatives (e.g., related to interactions with natural resources or existing human uses) and identify data gaps.
  - > Understand issues and/or requirements for additional information that agencies, tribes, and/or stakeholders are likely to raise.
- Over the course of agency coordination, participating RPB agencies should:
  - > Identify and provide clear direction about the type, level, and potential sources of additional information that they require to formally review the proposed project or activity.
  - > Where possible, identify measures to avoid and minimize adverse impacts to resources and uses, in accordance with existing authorities.
  - > Articulate issues they are likely to address in review under NEPA and other relevant laws, including regulatory consultations under MSA, ESA, MMPA, NHPA, Coastal Zone Management Act (CZMA), and other authorities.

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DATA AND INFORMATION

- As described in Chapter 3, RPB agencies and project proponents will, to the extent practicable, use data and information in the Plan and the Portal as baseline information to support a systematic, interdisciplinary approach to NEPA and regulatory review.
- Data and information in the Portal and the Plan will, to the extent practicable, be used in preapplication review to support or supplement initial characterization of conditions relevant to a proposed project or activity. This best practice includes identifying potential impacts to birds, marine mammals, turtles, fish, habitat, or certain cultural resources, as described in Chapter 3. It also includes initial identification of potential interactions or compatibility concerns with existing human activities (also described in Chapter 3). These uses of Portal and Plan information thus will help inform impact analysis of project alternatives. (For such uses, however, the limitations of Portal and Plan information should be well understood.) This best practice will enable a cross-agency approach to identifying, as early as practicable, what additional project- and site-specific information will be required under NEPA and other relevant authorities.
- Data and information on the Portal and in this Plan should not be used as an exclusive or sole source of information. To the extent practicable, any map or data source should be used with an understanding of the underlying methods and associated caveats and limitations (in some cases, determining caveats and limitations may require discussions with subject-matter experts and the data providers). Specific project details also will inform the utility and relevance of Plan data and information for the detailed analyses required to address specific permitting standards. Regulatory agencies will make their decisions about the need for additional information based on the details of individual proposed projects. In almost all cases, site- and project-specific information will be required to support regulatory review and decision-making.
- Federal agencies should provide project proponents guidance about potential additional data sources that should be incorporated in project or activity planning and/or review materials. Federal agencies should coordinate with state agencies and tribal contacts to help enhance common understanding of this issue.

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COORDINATION WITH STAKEHOLDERS

- In the context of a proposed project, RPB agencies should discuss with the proponent how stakeholder interests are required to be addressed by applicable authorities. Additionally, RPB agencies with subject-matter jurisdiction or expertise should identify management provisions that require characterization of stakeholder interests.
- Consistent with requirements in existing authorities, RPB agencies should discuss with the proponent of the proposed project or activity (and the lead agency for NEPA review should address in the scoping process) a systematic process to identify and engage stakeholders who may be affected by the proposed project. Such a process should include, but may not be limited to, the following components:
  - > Using best professional knowledge, RPB agencies should informally discuss with the project proponent known stakeholders who may be affected. Such information does not relieve the project applicant of its exclusive responsibility to identify potentially affected stakeholders to the extent required or anticipated under core authorities.
  - > Project proponents should identify and seek to engage stakeholders whose activities may be affected, and they should then incorporate stakeholders' data and information in project materials. As discussed in Chapter 3, Plan and Portal data and information can be helpful with this task. Early coordination with state coastal management and marine resource agencies can inform and assist federal agencies' efforts to identify and engage stakeholders.
  - > To address the potential cumulative effects of a proposed project or activity on stakeholders, when those effects may have a community-level impact, project proponents should identify and seek to engage coastal communities that have a particular relationship with a specific location and incorporate relevant data and information in project materials.
  - > Project proponents should seek to identify, engage, and incorporate information from stakeholders before filing a permit application or otherwise formally initiating the review process to ensure that stakeholder information helps inform both the project application and subsequent public, stakeholder, and agency review.
  - > RPB agencies that perform research and data collection in the ocean should develop a protocol to ensure effective advance communication with stakeholders to avoid and minimize conflicts.

Federal-tribal coordination

Federally recognized tribes have a government-to-government relationship with the United States as a result of the US Constitution, treaties, federal statutes, legal decisions, and several executive orders. As a result, tribes are recognized as possessing certain inherent rights of self-government (i.e., tribal sovereignty) and, pursuant to federal Indian trust responsibility, the federal government has legally enforceable obligations to protect treaty rights, lands, assets, and resources.[4]

Federal agencies may be required to formally consult with tribes regarding federal actions with tribal implications, and they may integrate tribal consultation with NEPA and NHPA Section 106 review. (See the Cultural Resources section of Chapter 3 for an overview of NHPA Section 106 and NEPA requirements). Other authorities of particular relevance include:

- **Archaeological Resources Protection Act** (administered at a federal level by the US National Park Service [NPS])—governs the excavation of archaeological sites on federal and Native American lands and the removal and disposition of archaeological collections from those sites.

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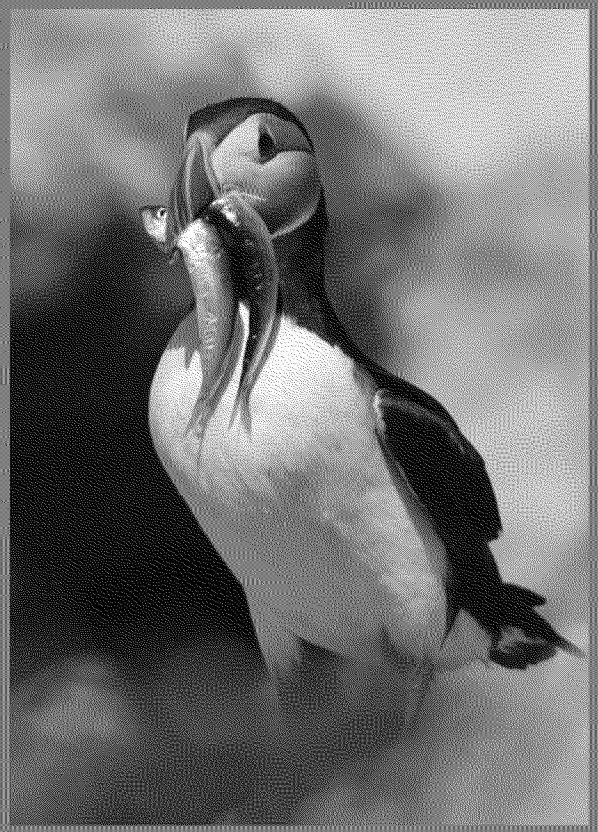
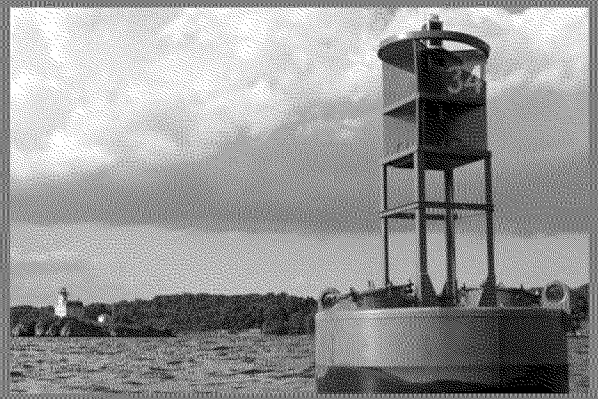
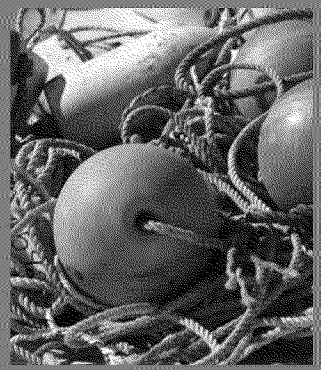
Project proponents should identify stakeholders', and seek to engage stakeholders whose activities may be affected, and they should then incorporate stakeholders' data and information in project materials.







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- **Native American Graves Protection and Repatriation Act** (administered at a federal level by the NPS and the Advisory Council on Historic Preservation [ACHP])—requires federal agencies and institutions that receive federal funding to return Native American cultural items to lineal descendants and culturally affiliated Indian tribes, including human remains, funerary objects, objects of cultural patrimony, and sacred objects.
- **American Indian Religious Freedom Act** (administered by federal agencies through their tribal consultation practices)—protects and preserves the traditional religious rights and cultural practices of Native Americans, including access to sacred sites, and thus may trigger Section 106 review under the NHPA if there are potential effects on such sites as a result of federal actions.
- **Indigenous hunting, fishing, and foraging rights** (a treaty between a tribe and the federal government or as provided for in state statute)—may reserve or provide special rights, for example, related to subsistence-related hunting, fishing, or foraging, to tribal members.
- **Executive Order 13175**—directs federal agencies to coordinate and consult with Indian tribal governments whose interests might be directly and substantially affected by activities on federally administered lands.

Federal agencies have numerous mechanisms to coordinate and consult with tribes throughout the review process. In addition to formal consultation practices, federal agencies and tribes are involved in partnerships such as the US Environmental Protection Agency (EPA) Regional Tribal Operations Committee (RTOC) and the RPB. The RPB is unique in its focus on ocean-related issues and federal, tribal, and state composition, and, as described later, the RPB will continue to be a forum for federal, tribal, and state coordination. Tribes in the Northeast US also coordinate with their counterparts involved in ocean planning in the Mid-Atlantic. The RTOC has established a communication network among tribes to coordinate among and between tribes and the EPA, and it facilitates and coordinates communication with other federal agencies (the EPA maintains an online contact list for the 10 federally recognized tribes in New England.[5]) Through this network, tribes benefit from EPA notices regarding proposed regulations to be published in the *Federal Register*, as well as from webinars and conference calls to discuss issues of common interest.

In addition to the pertinent best practices described earlier in this chapter, the following federal-tribal coordination best practices are incorporated into this Plan:

- RPB agencies engaged in planning, management, or regulatory actions should engage in early coordination with the Northeast tribes as a general practice. These agencies include but are not limited to lead federal agencies for a government action and federal agencies serving as a lead or participating and/or cooperating agency in review of a private (nongovernmental) project. For tribes, early consultation enables concerns to be raised and questions to be answered, and it facilitates the sharing of oral history, as appropriate, to help identify areas or sites with natural or cultural significance, or other relevant information.
- Recent efforts have advanced the development of protocols for reconstructing submerged paleocultural landscapes and identifying ancient Native American archaeological sites in submerged environments. These protocols will be useful in identifying submerged National Register–eligible or National Register–listed ancient Native American archaeological sites in the marine environment. This effort has included federal agency coordination with tribes during design and implementation, and will include continued tribal coordination and training. See Chapter 5 for more detail.

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- Existing partnerships such as the RTOC and the RPB can be strengthened as follows:
  - > Seek opportunities to provide training to improve the use and understanding of the Portal and other spatial data (e.g., USGS light detection and ranging [LIDAR] data), so as to build tribal capacity and technical skills.
  - > Build capacity through early engagement and technical assistance on habitat and water quality restoration projects. Early tribal involvement in project development can include training on data use and analysis and can enable tribes to identify cultural or natural resources and sites of concern.
  - > Northeast and Mid-Atlantic RPB tribal members will compile existing federal tribal consultation policies and make them available to the public. Tribal RPB members from both regions will also work together to develop guidelines for incorporating traditional ecological knowledge as an information source in regional ocean plans. These actions could help tribes continue general coordination on ocean planning activities.

Federal-state coordination

State agencies review proposed projects or activities when they are located in state waters or, in many cases, in federal waters. Through the CZMA, states have the ability to review federal activities (including the issuance of permits or licenses) in federal waters. For federal permit or license activity in federal waters, states can request National Oceanic and Atmospheric Administration (NOAA) approval for review of a specific activity or can request inclusion of a regional geographic location description (GLD)[6] in the state coastal program for CZMA federal consistency review purposes (Rhode Island used this GLD approach in its Ocean Special Area Management Plan).

In cases where there is federal and state review of a proposed project or activity, existing federal law, such as NEPA,[7] offers numerous opportunities for federal and state coordination. For projects that may require a detailed environmental assessment or an environmental impact statement under NEPA, lead federal agencies should work with state(s) to identify opportunities for a coordinated approach to NEPA and state review. It may be appropriate for a lead federal agency to invite a state to participate as a cooperating agency in the NEPA process. Such discussion will be influenced by a range of existing statutory, regulatory, administrative, and/or practical measures. All states in the Northeast US have an interest in, and provide opportunities for, early coordination as a general practice, and they already participate in joint federal- state coordination efforts such as the New England regional dredging team.[8] In the case of projects that may impact fishery resources, fishing activities, or fishing communities, engaging the states through their representation on the fishery management councils and the Atlantic States Marine Fisheries Commission may help facilitate coordinated review, especially related to joint scoping exercises to identify issues that may need further investigation.

In support of federal-state coordination, the following best practices are included in this Plan:

- RPB agencies engaged in any planning, management, or regulatory actions should engage in early coordination with the Northeast states as a general practice. This best practice includes lead federal agencies for a government action, and federal agencies serving as a lead or participating and/or cooperating agency in review of a private (nongovernmental) project. Topics of focus may include identification of necessary state and federal approvals and how their review requirements may align, and discussions of the potential for a coordinated approach to federal and state review (possibility of joint or coordinated

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review meetings and proceedings, public hearings, and the development of NEPA documents that can support multiple decisions), joint scoping exercises (to identify key stakeholders, issues, information needs, alternatives, and other needed consultations), and identification of required research and environmental studies.

- In cases where RPB agencies are not subject to state preapplication requirements per se, they should address states' substantive objectives for preapplication review through early voluntary consultation, consistent with existing authorities. The CZMA's federal consistency provision provides a basis and context for such early coordination.

In addition to these best practices, the RPB has identified three additional CZMA-related opportunities for state-federal coordination:

- Enhancing federal notice to states
- Establishing a regional GLD for CZMA federal consistency review purposes
- Identifying opportunities under existing authorities for more efficient review of certain federal activities

The objective of *enhancing federal notice to states* is for federal agencies to provide notice to states as early as practicable about actions proposed by federal agencies and by non-federal applicants for federal authorizations or federal funding. Options for accomplishing this objective include using an online location (such as the Portal) for federal agencies to post notices of proposed federal actions, with an automatic electronic notice then sent to state CZMA contacts and other interested parties. Alternatively or in conjunction, federal agencies could use a state CZMA program group email list to directly notify the state CZMA contacts of a proposed project. States and federal agencies will continue to discuss the specific actions to be undertaken to meet this objective.

For the two other topics that relate to the CZMA (establishment of a regional GLD for CZMA federal consistency review purposes, and more efficient review of certain federal activities), RPB state members and federal agencies have agreed to set up a work group that will convene during Plan implementation. For the regional GLD topic, the intent is to describe how a state and NOAA could use the Plan and the Portal to improve efficiency and predictability regarding the demonstration of a causal connection between a proposed federal activity and reasonably foreseeable effects on a state's coastal uses or resources. The work group will discuss options for *establishing a GLD for CZMA federal consistency review purposes* for certain specified federal license or permit activities under NOAA's regulations at 15 CFR Part 930, Subparts D or E.

To address the topic of *more efficient review of certain federal activities*, the work group will also determine if the states and federal agencies can develop general consistency determinations under 15 CFR Part 930, Subpart C, or general consistency concurrences under Subparts D, E, and F to exclude some federal actions from CZMA federal consistency reviews; establish thresholds or conditions for federal consistency review; and determine if time frames are needed for any general consistency determination (Subpart C) or general consistency concurrence (Subparts D, E, and F). Initial state and federal discussions for possible CZMA federal consistency agreements indicate the need for further exploration of this topic by focusing on preliminarily identified activities undertaken by the Federal Emergency Management Agency (FEMA), US Coast Guard (USCG), and the Navy.[9] The RPB recognizes that forthcoming agreements may not include all of these preliminarily identified activities and that there may be different thresholds for reinitiation of CZMA federal consistency review for different states. In addition, state decisions on this issue may vary from state to state.

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PLAN IMPLEMENTATION RESPONSIBILITIES

This section describes responsibilities associated with Plan implementation. As required by Executive Order 13547 and described in the RPB Charter:[10]

> The RPB is not a regulatory body and has no independent legal authority to regulate or otherwise direct federal, state, or tribal entities. Agencies involved in this effort administer a range of statutes and authorized programs that provide a basis to implement regional ocean planning. . . . While regional ocean planning cannot supersede existing laws and agency authorities, it is intended to provide a better mechanism for application of these existing laws and authorities . . . the intent [is] to guide agency decision making.

A key aspect of implementing the Plan is that it will inform and guide federal agency actions, but the Plan does not create new regulations, supersede current regulations, or modify established agency missions, jurisdiction or authority. Much of the day-to-day implementation of the Plan will be the responsibility of federal RPB members. The RPB as an entity (including federal, tribal, NEFMC, and state members) will retain overall oversight for the Plan and its implementation.

General Plan oversight and continued federal, tribal, and state coordination

The figure on the next page titled "Plan Implementation Summary" summarizes Plan implementation elements and responsibilities. The RPB discussion about these aspects of Plan implementation focused on the need for resources to achieve Plan goals. The RPB recognizes that resources (through in-kind capacity and funding, as was the case during the development of the Plan) are necessary to implement the Plan. A portion of this need can be met through continued federal, tribal, and state participation in the RPB. Federal agencies will carry out much of the implementation of the Plan; for example, through the actions described in Chapter 3 and the best practices described earlier in this chapter. However, resources will be necessary to maintain and update the Portal and for future amendments or updates to this Plan. Maintaining the Portal is necessary for the actions in Chapter 3 to help achieve the goals of this Plan. Future availability of resources thus relates directly to the ability to maintain the value of the Plan for all RPB entities (federal agencies, tribes, states, and the New England Fishery Management Council).

The discussion of Plan implementation reflects these realities and the current capacity that is available. Through the Northeast Regional Ocean Council (NROC) there are funds available for approximately the initial year of implementation (i.e., into 2017), and the RPB will continue to seek opportunities to leverage agency programs, activities, and agency in-kind capacity to support the Portal and other implementation activities. Seeking stable funding resources for the Portal will be an early priority in 2017 during the initial steps of implementation.

The Plan oversight responsibilities in this chapter reflect the initial approach to Plan implementation, assuming continued support through NROC and federal in-kind resources. If resources or capacity change, the RPB co-leads will work with the RPB and other partners to ensure that Plan implementation activities are adjusted appropriately.

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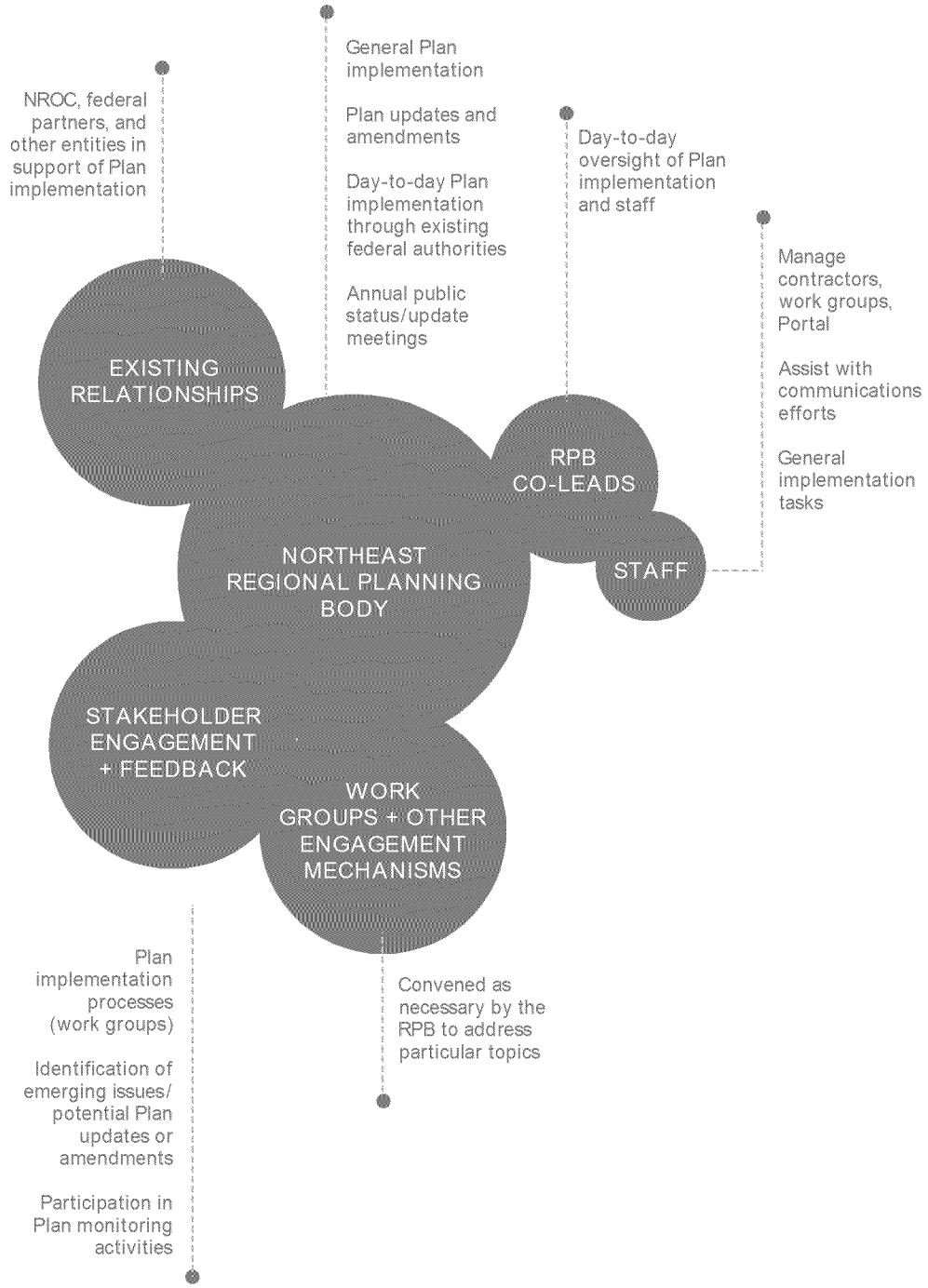
PLAN IMPLEMENTATION SUMMARY

Achieve Plan goals + objectives
Improve agency decision-making + coordination
Ensure implementation actions carried out
Support priority data + research + science
Evaluate Plan performance + ecosystem health



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The RPB's consensus-based approach to decision-making will continue through Plan implementation, with the RPB providing oversight to ensure that progress is being made toward accomplishing the Plan's goals and objectives. The RPB will continue to serve as a forum for federal, tribal, and state coordination. The RPB will also provide oversight for activities such as stakeholder engagement and work groups. For example, the Ecosystem-Based Management (EBM) Work Group will be convened to provide further input for the Important Ecological Area Framework described in Chapter 3, and to help inform the development of ecosystem health monitoring described later.

The RPB recognizes the importance of its relationships with other entities, such as the Northeastern Regional Association of Coastal and Ocean Observing Systems (NERACOOS)[1] and NROC. The RPB anticipates continuing its relationship with NROC to support the RPB through its existing grants that provide for staff and other resources, to manage the Portal (as described later in this section), and to glean input on specific topics (such as through the NROC sand management subcommittee). Additionally, the RPB will continue to coordinate with the Mid-Atlantic RPB as needed. These relationships may also evolve to address new challenges and opportunities.

The RPB will convene, at least annually or as needed, in public meetings to:

- Continue overall coordination among RPB members.
- Review progress toward achieving the overall goals and objectives of the Plan, including review of any monitoring and evaluation results.
- Discuss progress on the science and research priorities identified in Chapter 5.
- Discuss progress toward securing resources for Plan implementation.
- Address, as appropriate, evolving challenges and opportunities, and the need for Plan updates and/or Plan amendments, as described later in this section.

The federal, state, and tribal RPB co-chairs will continue to provide immediate oversight by serving as the immediate contacts for staff, deciding on the need for RPB work groups to address particular issues, promoting collaboration, and seeking to resolve disputes among RPB members. Co-leadership will be rotational and based on a two-year term (with no limits on consecutive terms), at which point co-leads could be reelected or replaced. Ocean planning staff will continue to provide capacity to manage contractors, manage work groups, assist with communications, and perform other tasks related to Plan implementation.

Plan updates and amendments

The RPB intends for Plan implementation to be dynamic and adaptive. Public input during Plan development, increased scientific understanding of the ocean, and the changing nature of the ocean ecosystem contribute to the need for Plan elements to be routinely reviewed and adjusted as necessary. These reviews and adjustments could take the form of Plan updates or amendments.

Plan updates include minor Plan changes to reflect incremental changes in Plan administration, to correct errata, or to otherwise provide for minor content updates that do not substantively alter the Plan's actions. (Updates to information and data elements of the Plan are discussed in the Northeast Ocean Data Portal section later in this chapter). Updates will involve public notice and will occur following consensus by the RPB. Plan updates will generally support improvements to the Plan's effectiveness or efficiency in achieving its goals and objectives, but will not include alterations to the Plan's goals and objectives (which would be addressed through Plan amendments).

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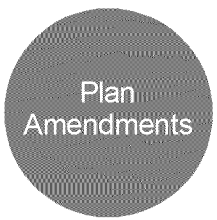
RPB co-leads, in consultation with the full RPB, will determine the need for Plan updates or Plan amendments. Plan updates or amendments would only take effect following completion of appropriate public engagement and notice procedures, and following RPB consensus to update or amend the Plan accordingly. All Plan updates and amendments will comply with existing federal statutes and Executive Order 13547.



Plan amendments are changes to the Plan that would result in substantial changes to Plan administration, to the agency actions described in Chapters 3 or 4, or to Plan objectives or goals. Plan amendments include reviews of the Plan, including the baseline assessment and data incorporated in the Portal, at least once every five years. Plan amendments will include a public engagement process with public notice and public discussion. Plan amendments will also provide an opportunity to review and incorporate the results of Plan performance and ocean ecosystem health monitoring.

Public engagement

As described in Chapter 2, Plan development included many coordinated public engagement elements. During Plan implementation, the RPB will continue this approach to public engagement within the bounds of available resources; many of the actions in Chapter 3 contain a public engagement component or emphasis. The RPB will continue to consult with scientists, technical experts, and those with traditional knowledge of the coast and ocean. As maps and data in the Portal are updated, the RPB will seek opportunities to review them with stakeholders and experts in particular topics. Plan performance monitoring and evaluation, and ocean health monitoring (described in the Monitoring and Evaluation section), will include specific measures to ensure public engagement. As the RPB conducts projects in the future (e.g., to fill gaps in information), engagement will continue to be a main component.

As previously described, the RPB will also implement public engagement activities during future Plan amendments. While these processes will comply with applicable federal administrative procedures, the RPB will also seek to continue to develop and implement strategies that meet its overall principle of the importance of public involvement; an initial part of Plan amendments will be the development of a public engagement strategy.

Northeast Ocean Data Portal

The Portal is an essential tool for implementing the Plan, and thus needs to be maintained. In the short term, through grants administered by NROC, the Portal will be managed on a day-to-day basis by staff and the Portal Working Group. This work will focus on three aspects of Portal management: *priority maps and data* identified in Chapter 3, other *supporting and contextual data*, and *general maintenance and technical support*. In addition, recognizing the importance of the Portal, staff will work with RPB members and other potential partners early in Plan implementation to identify options to ensure the long-term viability of the Portal.

PRIORITY MAPS AND DATA

The maps and data described in Chapter 3 will be used to support decision-making and to enhance intergovernmental coordination. Therefore, these maps and data are priorities for long-term maintenance and updates. This commitment includes the continued collection of underlying data and using them to provide timely updates to regional map products on the Portal. The RPB will continue to engage stakeholders and scientists in the development and review of updated data and information products—just as it did with the maps and data currently on the Portal. This input was instrumental in determining the appropriate update cycle for each map and dataset.

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Table 4.1 // Actions related to existing priority data layers in the Portal and responsibilities

TOPIC	DATA LAYER	RESPONSIBILITY
Marine Life and Habitat	Incorporate recent survey data from the Atlantic Marine Assessment Program for Protected Species, the Massachusetts Clean Energy Center survey, and other sources into the marine mammal models and provide updated map products Update sea turtle products using recent survey data Incorporate fish trawl data for Long Island Sound, Rhode Island Sound, and Narragansett Bay Develop additional ecological groupings for whales and fish, including foraging guild groupings (whales) and dietary guild groupings (fish) Further develop maps of scallop abundance and biomass, potentially including the Virginia Institute of Marine Science trawl data Determine the feasibility of incorporating other marine life products that would fill priority data gaps within the 2017 time frame. One factor in determining feasibility will be the ability to leverage agencies' (or partners') work, since associated costs could be significant. Marine life data sources to be reviewed include: • USFWS Mid-winter Waterfowl Survey • Other information sources in coastal and estuarine areas, such as the Environmental Sensitivity Index (ESI) and the Saltmarsh Habitat and Avian Research Program (SHARP) • Telemetry and acoustic data for fish, birds, and marine mammals • Available data sources of bat distribution and abundance	RPB (particularly NOAA, Bureau of Ocean Management [BOEM], and US Fish and Wildlife Service [USFWS]), through Marine-life Data and Analysis Team [MDAT] and Portal Working Group, through 2017
Marine Life and Habitat	Updated benthic habitat maps Map products characterizing persistent phytoplankton bloom events Updated submerged aquatic vegetation maps	RPB (particularly NOAA, BOEM, and USFWS)
Marine Life and Habitat	Identify opportunities to update marine life and habitat products every five years	RPB (particularly NOAA), through Portal Working Group
Cultural Resources	Maintain and update maps based on National Register of Historic Places data Maintain and update maps based on Automated Wreck and Obstruction Information System (AWOIS) data	RPB (through the NPS, Portal Working Group and states); review for updated information annually RPB through Portal Working Group; maintain links with Marine Cadastre (which is managed by BOEM and NOAA)

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TOPIC	DATA LAYER	RESPONSIBILITY
Marine Transportation	Maintain and update existing navigation maps and data	RPB, with Portal Working Group coordinating with the Marine Cadastre
	Maintain and update Aids to Navigation (ATON) and Automatic Information System (AIS) vessel traffic maps and data	USCG will provide updated data to the Marine Cadastre; the Portal Working Group will coordinate with the Marine Cadastre
	Provide additional AIS-based products (related to monthly and seasonal traffic patterns and counts of unique vessel transits)	RPB with Portal Working Group following review process
National Security	Maintain and update national security maps and data	Department of Defense (DOD) will update periodically as needed, such as when applicable permits are renewed or operations significantly change
Commercial and Recreational Fishing	Maintain and update existing products derived from Vessel Monitoring System (VMS)	NMFS Office of Law Enforcement to provide annual updates to the Portal Working Group employing processing and analysis methods used for current maps
	Maintain and update fishery management areas related to VMS products	NMFS GARFO provides any updates to Portal Working Group as VMS products are completed
Recreation	As resources are available, update boating, whale watching, scuba, and other maps derived from online surveys and participatory workshops	RPB in coordination with future partners
	Maintain and update maps of coastal recreation areas	RPB with Portal Working Group, annually
Energy and Infrastructure	Maintain and update existing infrastructure and renewable energy planning areas	RPB with Portal Working Group, which will coordinate with: • BOEM and the Marine Cadastre for energy and infrastructure data in federal waters • States for data about projects in state waters
Aquaculture	Maintain maps of current aquaculture operations and shellfish management areas	USACE, NOAA, and RPB state members review and provide updates annually to Portal Working Group
Offshore Sand Resources	Maintain datasets related to the identification of sand resources on the outer continental shelf (OCS) and provide to the Portal	BOEM
	Develop an Offshore Sand Resources theme on the Portal	RPB in collaboration with the NROC Sand Management Subcommittee, with support from Portal Working Group
Restoration	Maintain and update Restoration theme and data	Annual updates by RPB restoration subcommittee, through the Portal Working Group

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Table 4.1 summarizes the tasks and responsi bilities related to existing priority data layers in the Portal, as described in Chapter 3. In the short term, staff will manage the Portal Working Group to update the Portal when updated data products are available. For data from projects that were conducted as part of the Plan process (and for data that may result from accomplishing the priority research described in Chapter 5), updates will occur as future resources (funding and/or capacity) allow. In general, except as otherwise discussed in this table, updates to the Portal will occur as data becomes available and resources for updates allow, or as part of the Plan amendment process described previously.

SUPPORTING AND CONTEXTUAL DATA

The Portal also contains a wide assortment of important supporting and contextual data beyond those described in Chapter 3. Many of these datasets are provided by other sources. In those cases, the Portal points to those existing web services, thus partnering with other providers of spatial information. The RPB, through the Portal Working Group, will continue this approach and will continue to maintain these connections.

GENERAL MAINTENANCE AND TECHNICAL SUPPORT

In addition to the priority and supporting data layers, the Portal's online presence and information technology infrastructure will be maintained by the Portal Working Group, with staff providing oversight on behalf of the RPB.

Implementation of monitoring, evaluation, and science priorities

The Monitoring and Evaluation section describes two components of monitoring and evaluation that will occur during Plan implementation: Plan performance and ecosystem health. For Plan performance monitoring, the RPB will establish a working group composed of RPB members and invited experts during early stages of Plan implementation to assist in these actions. For ecosystem health monitoring, the RPB will work with the EBM Work Group and others. The RPB will have broad oversight over all aspects of these two components of monitoring and evaluation, with staff managing the day-to-day work.

The RPB recognizes that there are many opportunities to coordinate with partners regarding the science and research priorities in Chapter 5. Existing agency initiatives, academic and research institutions, regional science consortia, and other nongovernmental organizations already are addressing many of those priorities. Chapter 5 presents an ambitious agenda that can only be achieved by working with existing programs and being opportunistic. Therefore, the RPB will have a convening and coordinating role related to the Chapter 5 science and research priorities. The RPB will periodically convene regional partners to review the items in Chapter 5, discuss progress, refine the priorities as needed, and identify potential partnerships to achieve them. These activities will occur through the RPB's periodic public meetings, the EBM Work Group, or other work groups that the RPB convenes. The RPB also may convene workshops or pursue other means of gathering partners as resources allow. Other opportunities may occur through the work of partners such as NROC.

Ocean planning staff and the RPB co-leads will serve as main points of contact for this coordinating and convening role. Other RPB members will also help identify opportunities. The RPB will also collaborate to develop an integrated regional ocean science and research agenda, including identifying opportunities, as appropriate, for coordination and collaboration with the White House's Subcommittee on Ocean Science and Technology (SOST) on the overall agenda, and working with the National Oceanographic Partnership Program (NOPP) to facilitate discussion and support of specific research projects.

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MONITORING AND EVALUATION

The *Framework for Ocean Planning in the Northeast United States* includes an objective to "periodically assess progress toward achieving regional ocean planning goals." The RPB identified two aspects of monitoring and evaluation to meet this objective: Plan performance and ecosystem health. *Plan performance monitoring* focuses on tracking progress toward achieving the Plan's goals and objectives; *ecosystem health monitoring* focuses on understanding changes in the ocean ecosystem. RPB *actions* for both aspects of monitoring and evaluation are included in this chapter.

Plan performance monitoring

Plan performance monitoring supports an adaptive approach to implementation by providing a systematic means of measuring progress toward achieving the Plan's goals and objectives, and by helping to identify desired changes. Indicators are typically developed to provide a set of qualitative or quantitative metrics to evaluate performance, recognizing that it can be difficult (because of data limitations, complexity of understanding cause-and-effect relationships, and changes in conditions outside the control of a particular management effort) to quantify Plan performance. The RPB identified the importance of Plan performance monitoring and agreed to the following principles for its implementation:

- The need to relate indicators to Plan outcomes, including goals and objectives and implementation activities in Chapters 3 and 4. This principle will include focusing on process-based outcomes of the Plan and the completion and utility of Plan outputs.
- The importance of describing a baseline from which to compare future indicator results while recognizing other factors or context that could affect Plan performance. This principle means that indicator development will include description of pre-Plan baseline conditions (quantitative or qualitative).
- The need to hone indicators to enable measurement of progress, learning, and testing of assumptions. To enhance their usefulness, indicators need to balance specificity with pragmatic considerations about both the availability of data and the practicality of collecting new data. Qualitative or descriptive approaches should be considered for topics that do not lend themselves to a quantitative approach. The RPB noted that developing too many indicators would not be effective or practical and that a few, better indicators would be of greater value.

- The need for ensuring that approaches to compiling existing or developing new data and analyses will appropriately support identified indicators.
- The need for public discussion and input throughout Plan performance monitoring (i.e., identification of indicators, review and discussion of indicator results).
- The importance of ensuring that monitoring and indicators inform the need for changes to the Plan, recognizing that context and evaluation of cause-and-effect are critical factors.

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OVERVIEW

ACTIONS

PPME-1 Develop and implement Plan performance monitoring and evaluation

EHME-1 Finalize and implement the methodology for applying the Ocean Health Index (OHI) to New England

EHME-2 Coordinate with the Integrated Sentinel Monitoring Network (ISMN)

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Action: PPME-1. Develop and implement Plan performance monitoring and evaluation. The RPB will develop and implement Plan performance monitoring by first finalizing indicators through application of the principles identified previously, then measuring and tracking these indicators, analyzing indicator data, and reporting on results. The RPB will form a monitoring and evaluation work group in late 2016 following finalization of the Plan.

Ecosystem health monitoring and evaluation

The RPB's intent is for monitoring of ecosystem health to help identify issues that may need management attention. The RPB has noted that it can be difficult to specifically identify cause-and-effect relationships when dealing with a complex, dynamic marine environment. However, tools have recently been developed to help identify and quantify indicators of ecosystem change. These tools can be used to support ocean management generally and to potentially inform Plan updates. Related efforts are already underway in the Northeast US (such as the integrated ecosystem assessment work at the Northeast Fisheries Science Center [NEFSC]),[12] and the RPB will leverage and coordinate with these activities as appropriate.

The RPB identified the Ocean Health Index (OHI) as a tool that can help meet its intention for monitoring and evaluating ecosystem health.[13] The OHI considers physical, biological, economic, and social elements of the ocean and coastal communities who depend on it; uses available data to analyze and score aspects of each element; and provides various ways of summarizing and communicating its results. It relies upon existing data to provide a baseline for future comparisons.

Following finalization of the Plan, the OHI methodology, goals, and, analyses will be tailored to fit the circumstances (such as data availability and limitations) and needs in the Northeast US. The RPB anticipates working with the EBM Work Group and other stakeholders on applying the OHI to the region.

An additional recent focus in New England has been the development of a Science and Implementation Plan for an Integrated Sentinel Monitoring Network (ISMN). This project included input from over 60 scientists and managers from 45 state and federal agencies, universities, nongovernmental organizations, and Canada. The ISMN plan provides a long-term strategy for monitoring benthic, pelagic, and coastal components of the ecosystem, but does not directly include human uses or socioeconomic considerations. Many of its indicators coincide with marine life and habitat data elements in Chapter 3.

The RPB recognized that the ISMN was developed for various purposes, and that a first step would be to define areas of common interest.

Action: EHME-1. Finalize and implement the methodology for applying OHI to New England. The OHI team will work with the RPB, with input from the EBM Work Group and other stakeholders, to refine the OHI approach (e.g., verify overall goals, define terms, and review and adjust modeling parameters, as necessary, to meet regional needs) beginning in late 2016, following finalization of the Plan. The OHI team will then work with the RPB and stakeholders to implement the OHI throughout 2017, with preliminary results due in early 2018. This projection assumes that the team responsible for creating the OHI will have the budget and capacity to conduct an assessment in the Northeast US.

Action: EHME-2. Coordinate with the ISMN. The RPB will work with the ISMN effort to identify areas where its framework overlaps with relevant components of this Plan, to develop practical steps to implement monitoring protocols and assess results for those areas of mutual interest, and to ensure analyses and conclusions inform the need for management and/or updates to the Plan. The RPB recognizes the need for resources to implement those pieces of the ISMN framework, and the need to continue to work with the ISMN effort to obtain resources and ensure coordination.

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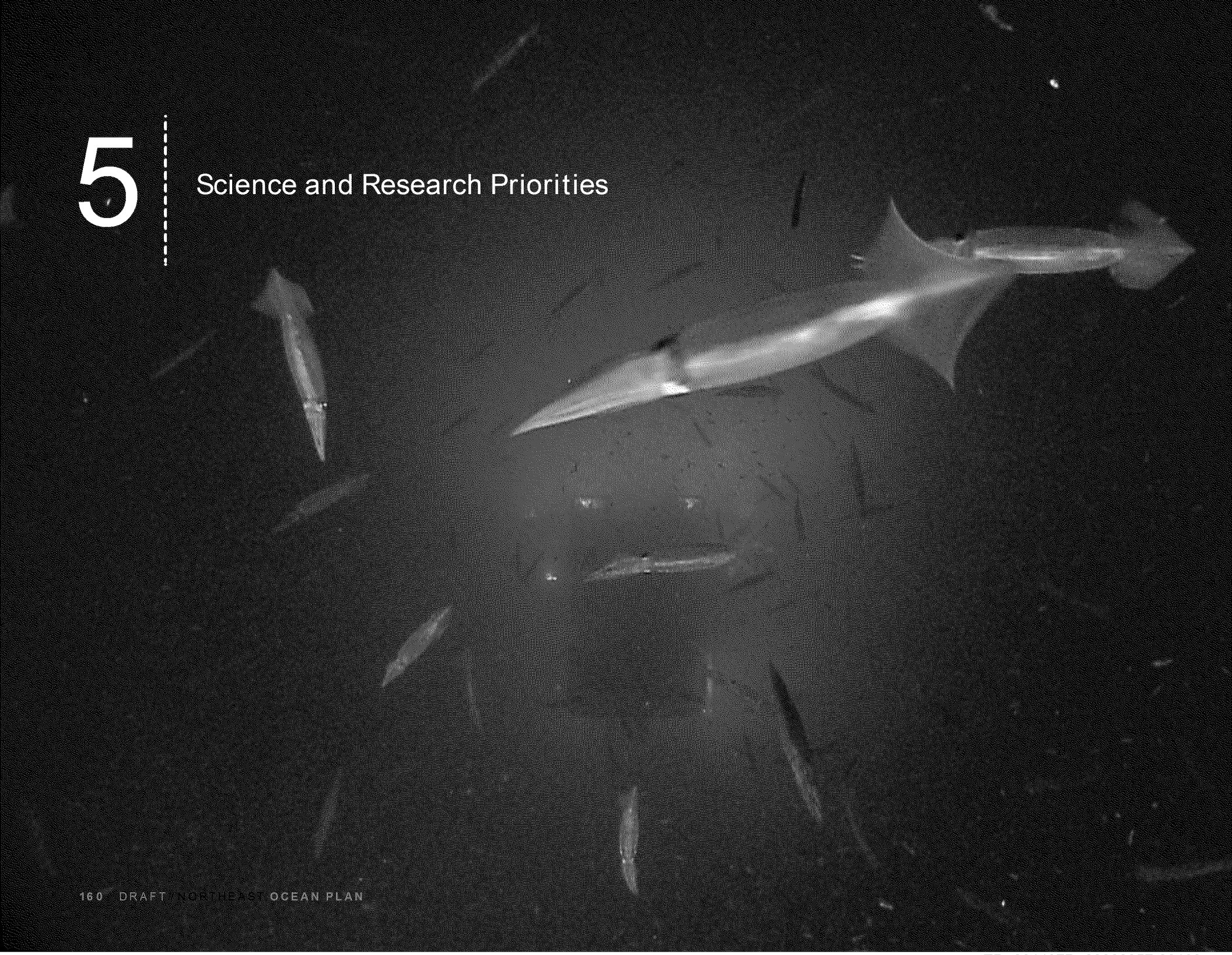
5 Science and Research Priorities



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Throughout the development of this Northeast Ocean Plan, the Regional Planning Body (RPB) dialogue and public input emphasized the need for agency decisions to be based on sound data and science. In addition to the development of peer-reviewed maps and data characterizing the ocean resources and activities in Chapter 3, outreach and engagement throughout the planning process led to an increased understanding of the information gaps that could be priorities for new science and data development. This outreach and engagement also resulted in the identification of several overarching issues that need new research.

These issues include understanding the implications of changing ocean conditions, the interactions between human activities and the effects of human activities on the ocean environment, and the desire to continue advancing a broader ecosystem perspective and approach to ocean management. Basic research underpinning these issues was a common thread of many conversations, as people pointed out the need for marine life surveys, enhanced understanding of potential cultural resources in the marine environment, and a greater understanding of the footprint and impact of existing human uses.

Collectively, these discussions provided great insight for the development of the Plan, and just as importantly, helped lead to the RPB's recognition that the Plan, as well as management of ocean resources and activities in general, should be an adaptive effort continually informed by new data and science. These discussions also resulted in a long list of data and information gaps, science and research priorities, and ideas about how to address and organize these priorities. Some of the data and information gaps identified were actually addressed by the maps and data described in the Plan and incorporated into the Northeast Ocean Data Portal. Other short-term priorities with specific responsible parties are described in the actions to maintain and update data on the Portal, included in Chapter 3 and also summarized in Chapter 4. The remaining science and research priorities are included in this chapter and organized as opportunities for the various governments and nongovernmental organizations in the region to advance the scientific underpinning of a more comprehensive, ecosystem-based approach to ocean management.

This chapter begins with a description of the **RPB's role in advancing science and research priorities**. It then provides a high-level **summary of the science and research priorities** and ends with a section devoted to providing a **detailed description of each of the six science and research priorities**, drawing from the individual data and information gaps and potential topics that were identified throughout the planning process.

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RPB ROLE IN ADVANCING SCIENCE AND RESEARCH PRIORITIES

As described in Chapter 4, the RPB's intent is to have a convening and coordinating role for achieving the science and research priorities identified in this Plan. This approach recognizes that there are many existing federal and state agency initiatives, academic and research institutions, regional science consortia, and other nongovernmental organizations already advancing progress through existing science and research plans; the RPB can help make connections between these existing efforts. There is also recognition that this chapter outlines an ambitious agenda that will be refined and accomplished through existing programs and partnerships, and that the RPB and its regional partners will need to be opportunistic when leveraging or funding opportunities arise. Therefore, the RPB will periodically convene regional partners and scientists to review this list of priorities, discuss progress, refine these priorities, and identify potential partnerships to achieve these priorities. These activities will occur through the RPB's periodic public meetings, the Ecosystem-Based Management (EBM) Work Group, the Northeast Regional Ocean Council (NROC), and potential workshops focusing on particular topics. As mentioned in Chapters 3 and 4, RPB entities will collaborate to develop an integrated regional ocean science and research agenda, including identifying opportunities, as appropriate, for coordination and collaboration with the White House's Subcommittee on Ocean Science and Technology (SOST) on the overall agenda, and working with the the National Oceanographic Partnership Program (NOPP) to facilitate discussion and support of specific research projects.

SUMMARY OF SCIENCE AND RESEARCH PRIORITIES

The RPB developed the following six priorities to organize potential data, information, and research activities into a framework for advancing scientific knowledge and data in support of ocean management decisions. The priorities are organized with the understanding that the first three are foundational in many ways to the last three. This framework is generally aligned with the science required to advance ecosystem-based management, as it has been defined to date. Individual elements within each of the six overarching priorities (especially for the first three) correlate with many of the ocean resources and activities described in Chapter 3.

THE SIX PRIORITIES:

1. **Improve understanding of marine life and habitats**

   Furthering our understanding of the distribution and abundance of living and nonliving elements of the marine ecosystem is critical for ocean management. Analyses and syntheses to support the Plan provide an unprecedented amount of regional marine life and habitat data, but important data gaps remain, including in basic survey coverage and species' movement data. As the type of information collected during surveys informs many other aspects of ocean management, filling geographic and temporal gaps in survey coverage is a priority.

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2. **Improve understanding of tribal cultural resources**
   Work to identify and characterize cultural resources and submerged paleocultural landscapes in the Northeast ocean is ongoing. The results of these efforts will improve our understanding of past human activities in offshore areas and their contribution to the Northeast's cultural heritage.

3. **Improve understanding of human activities, coastal communities, socioeconomics, and interactions between uses**
   Improving the characterization of past, present, and future human activities is critical for understanding the compatibility and interactions between uses. There are gaps in existing information for some human activities (certain fisheries, recreational activities, and archaeological and cultural resources in the marine environment, for example). Additionally, the spatial patterns and the intensity of human activities change through time. All of these changes will have corresponding effects on coastal communities, local and regional economies, and culture. Additionally, it is often difficult to assess the importance of ocean resources and uses beyond traditional economic assessments (i.e., quantifying the number of jobs, earned income, or GDP), which can omit important nonmarket values that are important to coastal residents and communities.

4. **Characterize the vulnerability of marine resources to specific stressors**
   Identifying which marine resources (species and habitats) are particularly vulnerable to specific stressors such as water column infrastructure, benthic disturbance, and ocean noise, as well as quantifying the impacts of stressors and resource vulnerability, is a priority research need.

5. **Characterize changing environmental conditions, particularly resulting from climate change, and characterize resulting impacts to existing resources and uses**
   Understanding how climate change and other mechanisms that lead to shifting environmental conditions affect marine resources and human uses is critical for their management and for future ocean planning. More work is needed to document and monitor changes to ocean resources (e.g., ocean chemistry changes such as ocean acidification and shifts in marine life distribution and abundance) and resulting changes in human activities (e.g., commercial fishing and recreation) to determine potential ecosystem and human impacts. Such information could potentially be used to support forecasting models to help assess if the available science-based information adequately and accurately characterizes conditions over the full duration that management decisions would be in effect.

6. **Advance ecosystem-based management (EBM) by building on the previous priorities and also including cumulative impacts and ecosystem services**
   Continuing to promote an ecosystem-based approach to ocean planning and management requires advances in the five previous priorities, as described above. Additionally, moving toward ecosystem-based management involves continuing the identification and quantification of ecosystem services; the characterization of ecosystem function, resilience, and recovery; and advancing methods for assessing cumulative impacts. Finally, there is a need to review the existing legal framework of federal laws related to ocean management and identify opportunities to incorporate science and research results to help continue to move toward an ecosystem-based management approach.

The following section describes elements of the six priorities that emerged through the development of the Plan. As part of Plan implementation, the RPB will routinely convene partners to discuss these six priorities, noting progress and opportunities to address them.

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1

science and research priority:

Improve understanding of marine life and habitats

Further exploring the relationships between marine life and habitat could highlight important ecological processes, improve the predictive capability of the MDAT and other marine life models, and inform management issues.

Many discussions during the planning process pointed to the need for foundational information to improve our understanding of marine life and habitats so as to increase the effectiveness of ocean management. Basic survey work to understand the presence and abundance of marine life and habitats is one such fundamental scientific research need. The many survey efforts underway or completed in the region over recent decades provide a wealth of information, and the marine life products available on the Portal, and described in Chapter 3, draw from their results. However, survey efforts are not distributed uniformly across the region, resulting in undersampling of some areas. As a result, the distribution and abundance of certain species is not well documented. Additionally, certain species' life histories or behaviors are not well understood. Basic information resulting from survey work can address these issues and is necessary for management needs.

One such use of this essential information that has been a focus of much recent discussion is the continuation of habitat classification efforts. Each of the Northeast states, the New England Fishery Management Council, several academic institutions, and several federal agencies collect and/or interpret habitat data for various purposes. Through national standards, such as the Coastal and Marine Ecological Classification Standard (CMECS)[2], there are tools in place to provide a framework for enhanced understanding of habitat, habitat distribution and variability, and other considerations.

An additional use of information on individual species is to enable examination of the spatio-temporal overlap of species and species groups, which could inform analyses of interspecies interactions. Such thinking extends to considerations of the linkage between species and habitats, since the concept that ocean habitats drive patterns in marine life is implicit in the Marine-life Data and Analysis Team (MDAT) modeling framework for marine mammals and birds. Further exploring the relationships between marine life and habitat could highlight important ecological processes, improve the predictive capability of the MDAT and other marine life models, or inform other management issues.

Many of these considerations (e.g., the need for basic understanding of species, habitats, and their interactions) underlie the concepts, or are included directly, in elements of the draft Important Ecological Area (IEA) Framework. The RPB (as informed by the EBM Work Group and public discussion) identified a number of marine life and habitat datasets that would improve characterization of IEA components by filling information gaps for marine life and habitats not fully characterized in Portal data. Existing datasets could also be reanalyzed or

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reinterpreted to better characterize IEA components. Data and research needs to support components of the IEA Framework include improvements to the characterization of ecosystem structure, function, and connectivity.

Given these considerations, the RPB has identified the following important research topics, recognizing that they are related in many ways:

MARINE LIFE AND HABITAT SURVEYS

New surveys will help fill gaps in current understanding of the distribution and abundance of marine mammals, birds, fish, sea turtles, bats, corals, kelp forests, and other habitats. Existing data can help inform priorities for future surveys by identifying current gaps in survey coverage (e.g., in coastal and estuarine environments). Several projects collecting marine life movement data provide the opportunity to develop methods to analyze, display and communicate this new information spatially. There is also an opportunity to coordinate with the many entities that will be conducting future surveys and analyses to support and complement the types of data products provided on the Portal (i.e., by providing MDAT methodology for researchers' use in designing surveys). The results of this work would provide more robust spatial products depicting marine life and species distributions and movement patterns for use in ocean management decisions.

HABITAT CLASSIFICATION AND OCEAN MAPPING

Continuing and expanding upon the work of the Northeast Regional Ocean Council (NROC) Habitat Classification and Ocean Mapping Subcommittee, specific areas of interest include developing better spatial and temporal representations of pelagic habitats (e.g., upwelling areas or fronts) and compiling seafloormapping products (e.g., bathymetry, backscatter intensity) for analysis/interpretation with regional geological datasets (e.g., sediment) to aid in the development of descriptions of seafloor habitat. There is an opportunity to continue to coordinate these efforts through the US Federal Mapping Coordination website[3] and through the National Oceanic and Atmospheric Administration (NOAA) Integrated Ocean and Coastal Mapping Program. Applying the CMECS and translating existing regional habitat data into CMECS would result in more comparable maps of benthic and pelagic habitats. These maps, plus improved depictions of pelagic habitats, would provide essential context for many other studies and analyses by providing, for example, a physical habitat framework for managing ocean resources, and for informing research related to assessing environmental changes.

SPECIES AND HABITAT RELATIONSHIPS

Understanding the relationships among marine life taxa and between habitat and marine life would address information needs related to topics such as predation, symbiotic relationships between species, and the influences of habitat and habitat parameters on species' distribution and abundance. Examining marine life products on the Portal is a first step toward these types of analyses. A workshop among wildlife and habitat experts would also advance understanding of how to use habitat and species maps and models together. The results of this work would be an enhanced understanding of the relationships among species, which could address many management-related questions; and an enhanced understanding of relationships between species and habitats, which could help improve the predictive power of marine life models, among other benefits.

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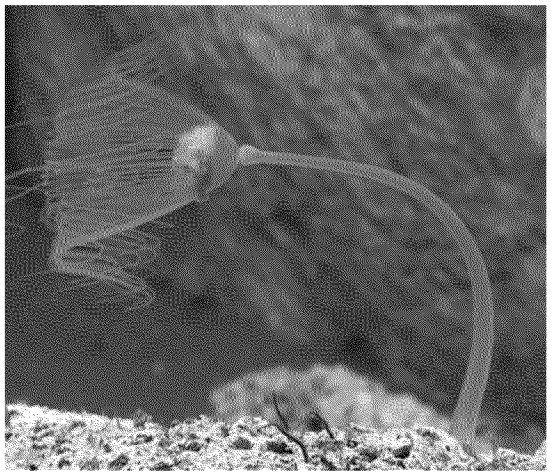
SCIENCE AND DATA TO ADVANCE THE IDENTIFICATION OF IMPORTANT ECOLOGICAL AREAS

Developing new products that build on the marine life and habitat data in the Portal may help improve the characterization of IEA components related to ecosystem structure, function, connectivity, and dynamics. The results of the following individual tasks will improve the understanding of ecological relevance of IEA components, help advance the IEA Framework, and provide useful stand-alone products for decision-making.

Ecosystem Structure:

- Develop metrics of persistence of abundance for marine life, including benthic fauna and other habitat-forming species.
- Understand species and habitats for which cold spots (e.g., areas of low abundance, low richness, or low diversity) are relevant and important.
- Determine and review thresholds for cold spots of productivity, biodiversity, and marine life abundance.
- Develop a multi-taxa index of biodiversity.
- Develop core abundance areas for species with low fecundity, slow growth, and longevity.



- Develop core abundance areas for species groups sensitive to impacts including warming waters and acidification.
- Develop core abundance areas for mammals, birds, and fish (monthly or seasonal averages).
- Identify and map seal haul out areas.
- Identify and map the distribution of ecologically rare species and habitats.
- Map the distribution and abundance of benthic fauna, including crustaceans.
- Map the distribution/abundance of kelp forests and other macroalgae.
- Map the distribution of bivalve-dominated communities.
- Map the distribution of sea grasses and other tidal vegetation.

Ecosystem Function:

- Develop multi-taxa metrics of primary and secondary productivity.
- Develop metrics of food availability.
- Identify and map the distribution of keystone species, foundational species, and ecosystem engineers.
- Map rolling closures and spawning protection areas for fish.

Ecosystem Connectivity:

- Characterize pelagic processes that facilitate multiple ecosystem functions (e.g., food availability, habitat migration).
- Integrate marine life movement and migration information from tracking and telemetry data (including nighttime information where data is available).

Ecosystem Dynamics:

- Specify times of importance for particularly dynamic ecosystem elements that support IEAs.
- Document changes in phenology due to climate changes.
- Address the concept of persistence as it relates to IEAs (in time and space) by using available time series of data to identify areas and times of year with historically persistent high productivity, abundance, and richness, for example.

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2

science and research priority:

Improve understanding of tribal cultural resources

Ocean management decisions require the identification of existing and potential tribal cultural resources. A project funded by the Bureau of Ocean Energy Management (BOEM) and the Rhode Island Coastal Resources Management Council, titled "Developing Protocols for Reconstructing Submerged Paleocultural Landscapes and Identifying Ancient Native American Archaeological Sites in Submerged Environments," is scheduled to be completed in 2016. This project will collect new spatial data that expands existing knowledge of submerged Native American archaeological sites in the Northeast. In addition, the project will generate a Paleocultural Landscape Model that identifies seafloor environments with varying archaeological sensitivity for containing ancient Native American archaeological resources; the model's results will likely be representative of the variability to be encountered in the southern New England offshore environment.

Additionally, tribal resource uses are fundamentally connected to natural resource footprints. Plan data and information provide the opportunity to better understand these relationships. The marine life and habitat data developed for the Plan can provide context for current and historical tribal resource use for sustenance. Ecological data and information can be used to identify the habitat characteristics, distribution, and abundance of marine life in areas of significance to tribes.

The RPB has identified the following topics to advance the understanding of tribal cultural resources:

SUBMERGED ARCHAEOLOGICAL AND PALEOCULTURAL LANDSCAPES

Potential future work identifying submerged archaeological and paleocultural landscapes partially depends on the results of the BOEM study. Nonconfidential data or maps resulting from the project can be incorporated into the Portal. In addition, any lessons learned or methods can be applied in other parts of the region. Lastly, researchers may be interested in further exploring and characterizing areas of potential archaeological sensitivity, as identified by the Paleocultural Landscape Model. This work will result in an improved understanding of submerged landscapes of importance to regional tribes, and the techniques for identifying them, which will support the regulatory process.

IDENTIFICATION OF AREAS OF CULTURAL SIGNIFICANCE USING MARINE LIFE AND HABITAT DATA

As described in the Cultural Resources section of Chapter 3, tribes intend to use marine life and habitat data on the Portal to demonstrate areas of cultural relevance during regulatory consultations. This also presents an area of potential research and development. Maps of culturally important resources, such as shellfish habitat or diadromous fish species, should be assessed for their potential to demonstrate areas of cultural significance. Results could include the identification of areas of importance for current or historical sustenance and areas that may be a priority for habitat restoration. The results could also support tribes in promoting an ecosystem-based approach to identifying and determining impacts to potential cultural resources.

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3

science and research priority:

Improve understanding of human activities, coastal communities, socioeconomics, and interactions between uses

As new data are collected for existing and emerging human uses, there will continue to be opportunities to examine real and potential interactions through simple spatiotemporal overlays and more complex analyses.

The need to better understand human activities and coastal communities' reliance on and linkage to the ocean and its resources was a recurring topic during the development of the Plan. A better understanding of the socioeconomic factors and characteristics of human activities was also emphasized, as was the need to understand potential and real interactions between and among human uses.

Basic work to improve the characterization of human activities is a fundamental research need. Data available on the Portal and described in Chapter 3, related to shipping, fishing, recreation, aquaculture, energy and infrastructure, and sand resources, represent the results of extensive engagement with industry, public, and agency experts on these topics. Discussions with these experts also identified several areas where more work is needed to fill gaps in our understanding of human activities in the marine environment (e.g., as described below in the first element under this priority).

Planning discussions also highlighted the need to acknowledge and characterize "nonmarket" attributes of human activities, marine life, and habitats. In addition to economic "market" values, marine resources and activities generate nonmarket values that affect human well-being, but are not directly measurable in traditional economic assessments (for example, the value beachgoers derive from walking along a clean beach). Presently there are gaps in our knowledge of basic nonmarket values, how to measure or otherwise account for them, the implications for management of ocean uses and resources, and the connections to coastal communities. Further research could help improve understanding on this topic.

Enhanced characterizations of human activities, along with improved understanding of nonmarket values of human activities and the natural environment, would result in a better understanding of potential interactions between and among human uses, including the potential impacts of new uses. As new data are collected for existing and emerging human uses, there will continue to be opportunities to examine real and potential interactions through simple spatiotemporal overlays and more complex analyses. In particular, monitoring data associated with actual project construction and operation will provide ample information to assess real and potential conflicts for projects as they are sited.

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The RPB has identified the following interdependent topics that will contribute to an increased understanding of human uses, coastal communities, socioeconomics, and interactions between uses of the offshore environment:

MAPS AND CHARACTERIZATIONS OF HUMAN ACTIVITIES

The following specific priorities were identified to better understand existing human activities and the connections between coastal communities and the ocean. The result of this work would provide information about human activities, which are not well documented on a regional basis.

- Better assess existing and potential changes in vessel traffic patterns through additional interpretations of Automatic Identification System (AIS) data, including maps showing the relative density of unique vessel transits, monthly or seasonal patterns for different vessel types or cargoes, and potential future traffic changes resulting from market conditions, Panama Canal expansion, or other factors.
- Improve the characterization of commercial and recreational fishing activity in the region, including fisheries that are not in the Vessel Monitoring System (including recreational fisheries, lobster, and fisheries targeting pelagic species, for example) and locally important fisheries, and improve our knowledge of the effects of changing fish species' distribution and abundance on the spatial footprints of commercial fisheries. Explore the ability of AIS data to address some of these gaps.
- Continue to fill gaps in the knowledge of cultural and historic resources in the offshore environment.
- Continue to develop spatial and temporal characterizations of regional recreational activity, including studies of relationships between coastal communities, and the local economic benefits of recreational activities.
- Develop a regional inventory of potential off shore sand resources out to eight miles, and of onshore locations in coastal communities potentially requiring sand resources, leveraging existing and future state efforts.
- Correlate areas of the ocean used by particular human uses and particular coastal communities (e.g., by depicting the home ports related to particular fishing grounds or developing maps of offshore navigational place names and their relevance to coastal communities).

NONMARKET VALUATIONS OF OCEAN RESOURCES AND USES

More study of the social and intrinsic values of ocean resources and activities to local communities would enhance our ability to incorporate nonmarket values into specific ocean management decisions. Such research should include developing and testing methods for assessing nonmarket values and developing tools that incorporate these values in an assessment of the costs and benefits of various decisions. The result of such research would be an enhanced ability to assess and incorporate nonmarket values into specific ocean management decisions.

INTERACTIONS BETWEEN HUMAN ACTIVITIES

New research to increase understanding of the interactions between human uses should assess the potential for conflicts between existing and potential new human activities (e.g., activities that can no longer occur in a particular area, activities that become limited in a particular area, or activities that can only occur in a particular timeframe). This element requires setting a baseline condition of human uses, for which Plan data may be useful, depending on the specific issues being examined. In addition, data and information developed under this topic may be used to assess opportunities for positive or reinforcing interactions between human uses, such as colocating different activities (e.g., offshore wind and aquaculture). This work would result in additional information for use in assessing potential impacts to human uses from potential siting of new uses.

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4

science and research priority:

Characterize the vulnerability of marine resources to specific stressors

Stakeholders, RPB members, and scientists identified the need to better understand the vulnerability of marine resources to specific stressors as an important priority for advancing comprehensive ocean management. As a result, the Marine Life and Habitat section in Chapter 3 references initial maps of marine life species grouped by their sensitivity to a few specific stressors, based on available research. However, available research quantifying relationships between marine resources and specific stressors is limited. Therefore, new research is necessary to characterize the potential vulnerability of marine resources to human activities, especially those activities that are emerging or evolving in the region, such as offshore renewable energy, aquaculture, and the extraction of offshore sand for coastal replenishment.

The RPB has identified the following general science and research topics related to understanding the vulnerability of marine resources to specific stressors:

MARINE LIFE VULNERABILITY TO SPECIFIC STRESSORS

New research to study the effects of various disturbances on marine life will help characterize species' vulnerability to particular stressors. Research could provide vulnerability characterizations within broad categories of disturbances such as benthic disturbance, water column infrastructure, and sound, with the intent to develop more specific disturbance-vulnerability groupings longer term, as additional studies (and project-specific monitoring requirements) are completed (e.g., birds and offshore wind energy, and fish and submarine cables). Baseline monitoring of species would be necessary in many cases; for example, related research likely would have to be completed both prior to and following construction of a particular project to characterize pre- and postconstruction (or operation) conditions. In many cases, the issue of cumulative impacts requires more study, since species vulnerability may result from the interaction of multiple stressors (for example, stressed species' increased vulnerability to disease as a result of changes in climate). Some vulnerability information may be gleaned through a better understanding of particular species' behavior and/or life history. The result of this work would be additional characterizations of species vulnerability for use in impact assessment and other management applications.

BENTHIC AND PELAGIC HABITAT VULNERABILITY TO SPECIFIC STRESSORS

New research to study the effects of various disturbances on benthic and pelagic marine habitats will help form the basis for characterizations of habitat vulnerability. Similar to marine life, research could inform vulnerability assessments within broad categories (e.g., benthic disturbance, water column infrastructure, sound). Furthermore, there could be opportunities to study specific interactions such as pelagic habitats and aquaculture, and seafloor habitats and submarine cables. The result of this work would be additional characterizations of habitat vulnerability for use in impact assessment and other management applications.

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science and research priority:

Characterize changing conditions and resulting impacts to existing resources and uses

Climate change was identified as a critical topic requiring additional research, as it is already influencing the distribution and abundance of marine life and habitats and affecting resource-based economies in the Northeast. Research on this topic is being conducted at a rapid pace for various management applications, and results will continue to greatly benefit the interpretation of data and information to support ocean management. Regional experts are engaged in existing research and new efforts that further our understanding of what climate change-driven effects are occurring, and how these affect the distribution, abundance, and resilience of marine life and habitats. These changes will, in turn, result in changes to human activities.

The RPB has identified the following research topics for characterizing climate change and associated impacts:

RECENT TRENDS DUE TO CHANGING CONDITIONS

Changes in ocean conditions, habitats, and species that result from climate change require further study. Maps of the associated shifts in temperature, pH, dissolved oxygen, water column stratification, sea level rise, and species distribution and abundance would support further analyses and decision-making. Data products that document and convey trends have been identified as a science priority and should be incorporated into the Portal to supplement current ocean resource and activity data. The result would be an enhanced understanding of how climate change and climate forcing factors are changing ocean conditions, habitats, and species. Additionally, these results could be incorporated into forecasting models, several of which are already in existence or being developed for the region, to help identify future trends in ocean conditions and, potentially, species' reactions and habitat changes that could result from these trends. There is already a great deal of interest in assessing the results of such information for management use (e.g., to help assess future conditions for decisions with relatively long-term duration—to cover the anticipated lifespan of ocean development activities).

MARINE LIFE AND HABITAT VULNERABILITY TO CLIMATE CHANGE

There are major gaps in our understanding of the responses of marine life and habitat to climate change. Therefore, assessments of climate change vulnerability are a research priority. Species and habitats can be grouped, ranked, and mapped by climate exposure, vulnerability, or sensitivity to climate change impacts. There is a need to use existing data, and information that is routinely collected to characterize, for example, how ocean warming will affect species living at their southern range limits; and how ocean acidification will impact the development and survival of shell-forming organisms. The result of this work would be an enhanced understanding of the vulnerability of different marine life populations and various habitats to climate change for use in various management applications.

CHANGES IN HUMAN ACTIVITY RESULTING FROM CHANGING OCEAN CONDITIONS

There are uncertainties in how human activity and resource use may shift as a function of climate change. For example, more work is needed to characterize changes in the spatial pattern and intensity of fishing activity due to shifts in fish species distribution and abundance; changes in the timing and intensity of recreational uses due to warming; increased storminess or other climate impacts; and changes in tribal use and in habitats/resources important to tribes.

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6

science and research priority:

Advance ecosystem-based management by building on previous priorities and also including cumulative impacts and ecosystem services

This final priority outlines additional science and research to further advance an ecosystem-based approach in the region by advancing methodologies that will look more comprehensively at human relationships with the ocean environment.

The five preceding science and research priorities will provide interdisciplinary data and information needed to support an ecosystem-based approach to ocean management. This final priority outlines additional science and research to further advance an ecosystem-based approach in the region by advancing methodologies that will look more comprehensively at human relationships with the ocean environment. Planning discussions on this topic focused on the need to assess cumulative impacts, to understand ecosystem service production and valuation, and to continue work on the IEA Framework that the RPB developed as part of this Plan. Such work in the future would likely involve the continued development and testing of various modeling approaches for understanding and assessing changes in the marine ecosystem and its services, for example, as related to cumulative impacts.

Additionally, policy research is necessary to better understand how existing federal laws and programs can utilize the outputs of the science and research described below, i.e., to help identify how ecosystem-based management can continue to be advanced.

CUMULATIVE IMPACTS

Many people have identified the need to advance methods to quantify cumulative impacts, including better mapping of stressors, and investigating the types of cumulative impact considerations in management decisions that could be improved with this information. Cumulative impacts refer to the combination of effects from multiple natural and human stressors on a species, population, or whole ecosystem. Partners in the Northeast and elsewhere have attempted the difficult task of cumulative impact assessment, resulting in the identification of the need to continue developing cumulative impact assessment methods and analyses. Cumulative impact studies at the regional scale could consider the past, present, and future human uses in the Northeast, in addition to changing ocean conditions. Additional considerations for advancing cumulative impact assessments in the region include the spatial and temporal scale(s) of analysis; methods to “translate” human uses into quantifiable stressors; and approaches to qualitatively or quantitatively assess impacts. The result of this work would be a methodology suitable for conducting cumulative impacts assessments in the Northeast that would provide the regional context for specific ocean management decisions.

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ECOSYSTEM SERVICE PRODUCTION AND VALUE

More work is needed to understand and incorporate ecosystem service production and value into decision-making. Ecosystem services are the benefits that humans obtain from the structure and function of ecosystems. Assessing ecosystem services demonstrates the value of ecosystem functions (such as the ability of wetlands to buffer coastal properties from storms) that are not otherwise easily quantified or portrayed. This approach promotes ecosystem-based management because ecosystem services are understood using models of the coupled natural-human components of the marine ecosystem. As such, the following individual activities provide opportunities to build on and coordinate with many of the other science and research priorities, given their utility in understanding the coupled natural-human system. The result of this work would be an enhanced ability to model and understand ecosystem services, their value, and the interrelationships between components of the ecosystem and human activities. Ecosystem services research is needed to:

- Develop methods to use existing data and information to characterize the spatial and temporal dimensions of ecosystem services.
- Help users identify decisions that are optimal across sectors (i.e., ecosystem, human uses).
- Explore how the ecosystem affects human use (i.e., ecosystem services and valuation) and conversely, how human use affects the ecosystem (including cumulative impacts).
- Express outputs in biophysical terms (e.g., biomass lost or gained), economic terms (e.g., dollars lost or gained), social terms (e.g., stakeholder satisfaction or dissatisfaction) or all of the above.

IMPORTANT ECOLOGICAL AREA FRAMEWORK

Continuing work to develop the IEA Framework and explore options for its use within federal law is a priority. The RPB noted that the development of the Northeast IEA Framework is an iterative and adaptive process. This process includes using the latest data and research to support additional and improved characterizations of the individual IEA components, as described in previous science and research priorities. In general, future work refining elements of the framework itself, and the process for identifying IEAs described in the Plan, will result in the continued consideration of aspects of ecosystem-based management such as ecosystem function, recovery, and resilience. Further development of the IEA Framework, that could enhance utility for management, includes:

- Continued review of thresholds and other methodological considerations for certain IEA components as new data are available and/or environmental conditions change.

- Agency engagement on the potential uses of IEA components in planning and decision-making.
- Continuation of the adaptive approach recommended by the EBM Work Group by periodically refining methods and components, and reviewing the application of data to the framework.

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Chapter 1
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   For EBM meeting summaries, see "past events" at http://neoceanplanning.org/events/.

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5. The Marine Life Data and Analysis Team (MDAT) is a collaboration between Duke University, NOAA Northeast Fisheries Science Center, NOAA Centers for Coastal and Ocean Science, and Loyola University.

6. Group core abundance/biomass area maps represent overlays of multiple species core abundance/biomass area maps. Species core abundance/biomass areas are defined as the smallest area containing 50% of the predicted abundance/biomass of a species.

7. Marine life work groups held a total of nine meetings in 2014 and 2015. Agendas and meeting materials can be found at: http://neoceanplanning.org/ projects/marine-life.

8. The Marine Mammals modeling methodology is described here: http://neoceanplanning.org/wp-content/uploads/2015/05/MDAT-Final-Work-Plan_Mammals-Turtles.pdf and in Roberts JJ, Best BD, Mannocci L, Fujioka E, Halpin PN, Palka DL, Garrison LP, Mullin KD, Cole TVN, Khan CB, McLellan WM, Pabst DA, Lockhart GG (2016) Habitat-based cetacean density models for the U.S. Atlantic and Gulf of Mexico. *Scientific Reports* 6: 22615. doi: 10.1038/srep22615.

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12. National Marine Fisheries Service, "Surfclam/Ocean Quahog Summary of Regulations." greateratlantic.fisheries.noaa.gov. http://www.greateratlantic.fisheries.noaa.gov/regs/infodocs/scoqinfosheet.pdf.
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14. National Marine Fisheries Service, "Biological Opinions (ESA Section 7)." nmfs.noaa.gov. http://www.nmfs.noaa.gov/pr/consultation/opinions.htm.

Chapter 3

Regulatory and Management Actions: Offshore Sand Resources

1. Horton, R., G. Yohe, W. Easterling, R. Kates, M. Ruth, E. Sussman, A. Whelchel, D. Wolfe, and F. Lipschultz, Chapter 16: Northeast (US Global Change Research Program, 2014), http://nca2014.globalchange.gov/report/regions/northeast.
2. Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., *Climate Change Impacts in the United States: The Third National Climate Assessment* (U.S. Global Change Research Program, 2014), http://nca2014.globalchange.gov/downloads.
3. US Army Corps of Engineers, "Continuing Authorities Program." nae.usace.army.mil. http://www.nae.usace.army.mil/Missions/PublicServices/ContinuingAuthoritiesProgram.aspx.
4. Bureau of Ocean Energy Management, "Explore More Than 40 Years of Environmental Studies Program Ocean Science." marinecadastre.gov. http://marinecadastre.gov/espis/#/.

Chapter 3

Regulatory and Management Actions: Restoration

1. K.A. Lellis-Dibble, K. E. McGlynn, and T. E. Bigford, *Estuarine Fish and Shellfish Species in U.S. Commercial and Recreational Fisheries: Economic Value as an Incentive to Protect and Restore Estuarine Habitat* (National Marine Fisheries Service 2008). http://www.habitat.noaa.gov/pdf/publications_general_estuarinefishshellfish.pdf.
2. Joint Ocean Commission Initiative, *Charting the Course: Securing the Future of America's Oceans*

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(Joint Ocean Commission Initiative 2013). http://www.jointoceancommission.org/policypriorities/Reports/charting-the-course.aspx.

3. Projects are generally eligible for federal funding through restoration programs if they are not being used as mitigation of impacts of another project.

Chapter 4
Plan Implementation

1. 33 CFR §325.1(b) states that: *"The district engineer will establish local procedures and policies including appropriate publicity programs which will allow potential applicants to contact the district engineer or the regulatory staff element to request pre-application consultation. Upon receipt of such request, the district engineer will assure the conduct of an orderly process which may involve other staff elements and affected agencies (federal, state, or local) and the public. This process should be brief but thorough so that the potential applicant may begin to assess the viability of some of the more obvious potential alternatives in the application."* In New England, the USACE includes pre-application meetings as a topic in its *Guide for Permit Applicants*.
2. US Army Corps of Engineers New England District, *Guide for Permit Applicants* (US Army Corps of Engineers). http://www.nae.usace.army.mil/Portals/74/docs/regulatory/Forms/PermitGuide.pdf.
3. A cooperating agency under NEPA is an agency (which can include a federal, state or local agency) with jurisdiction by law or special expertise on an environmental issue that should be addressed in an environmental impact statement. A lead agency, where appropriate, shall seek the cooperation of a cooperating agency in developing information and environmental analyses. See https://ceq.doe.gov/nepa/regs/40/40p3.htm for more information.
4. Bureau of Indian Affairs, "Frequently Asked Questions." bia.gov. http://www.bia.gov/FAQs/. The exact nature of these obligations varies across tribes.
5. Environmental Protection Agency, "Region 1 Tribal Program: epa.gov. https://www.epa.gov/tribal/region-1-tribal-program#tribes.
6. State coastal management programs have lists of federal license or permit authorities that are subject to state CZMA review (federal consistency review). To review listed activities that are located outside of a state's coastal zone, a state must describe (and NOAA must approve) a geographic location description of such activities, unless on timely request, and based on asserted coastal effects, the state receives project-specific authorization from NOAA to receive the project. For additional information, see "The Coastal Zone Management Act and regional ocean plans-a discussion paper" available at http://neoceanplanning.org/wp-content/uploads/2015/10/CZMA-Discussion-Paper.pdf.
7. Each federal agency has administrative and /or regula tory guidance that describes how it engages in NEPA review. See *A Citizen's Guide to the NEPA*, published by the Council on Environmental Quality, available at https://ceq.doe.gov/nepa/Citizens_Guide_Dec07.pdf. See also: *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations* available at https://ceq.doe.gov/nepa/regs/40/40p3.htm.
8. New England Regional Dredging Team, "Organizations." nerdt.org. http://nerdt.org/organizations-2/.
9. David Kaiser, *The Coastal Zone Management Act and Regional Ocean Plans: A Discussion Paper* (Office for Coastal Management, NOAA 2015). http://neoceanplanning.org/wp-content/uploads/2015/10/CZMA-Discussion-Paper.pdf.
10. The Northeast RPB Charter was signed by each RPB member at the beginning of the regional ocean planning process and is available at http://neoceanplanning.org/wp-content/uploads/2014/07/Charter-with-Signatories.pdf. A change in RPB membership does not require execution of a new charter; new members will be asked to sign. A non-federal member may withdraw by providing written notice to RPB co-leads. Withdrawal from this charter by a federal member requires notice to the federal co-chair, and subsequent concurrence by the National Ocean Council.
11. NERACOOS is part of the US Integrated Ocean Observing System network, and is an interagency and non-federal partnership; it serves data and synthesis products related to ocean climate, wind and wave forecasts, real-time buoy data, water level forecasts, and many other topics. NERACOOS staff participated in the Portal Working Group and collaborate on data products. More information about NERACOOS is available at www.neracoos.org.
12. National Oceanic and Atmospheric Administration, "Northeast Shelf Integrated Ecosystem Assessment." noaa.gov. http://www.noaa.gov/iea/regions/northeast/index.html.
13. The OHI is a quantitative, repeatable, comprehensive approach to assessing the health of the ocean and is intended to inform decision–making by measuring multiple metrics of ecosystem condition using existing data and information. More background on the Ocean Health Index is available at http://www.oceanhealthindex.org/.

Chapter 5
Science and Research Priorities

1. Ecosystem services are the benefits that people obtain from the structure and function of ecosystems and include provisioning services (e.g., food), regulating services (e.g., climate), cultural services (e.g., aesthetic value), and supporting services (e.g., nutrient cycling). For more information see http://www.millenniumassessment.org.
2. The Federal Geographic Data Committee endorsed CMECS in May 2012 (FGDC-STD-018-2012). CMECS provides a comprehensive national framework for organizing information about coasts and oceans and their living systems. For more information on CMECS see https://coast.noaa.gov/digitalcoast/publications/cmecs.
3. For more information on coordination of mapping efforts, see https://catalog.data.gov/dataset/u-s-federal-mapping-coordination.

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APPENDIX 1: PRIMARY FEDERAL LAWS

The following federal laws are summarized as additional background for the Plan. This Appendix is not intended to be exhaustive for all laws that relate to management of ocean resources or activities, but focuses on those federal statutes that are most directly linked to the topics discussed in the Plan. Included in this appendix is information for geographic areas in the Northeast that are already designated and managed under federal law (such as national wildlife refuges, and national park units). Federal agencies provide much greater detail at the links provided, from which these summaries are drawn.

National Environmental Policy Act
(https://ceq.doe.gov/)

The National Environmental Policy Act (NEPA) requires federal agencies to assess environmental effect(s) on the human environment prior to making decisions on whether to move forward with a proposed action. Federal agencies analyze the potential environmental impacts of a proposed federal action through a Categorical Exclusion, Environmental Assessment, or Environmental Impact Statement (EIS). NEPA requires federal agencies to prepare an EIS if the proposed action is likely to have significant environmental effects. NEPA and its implementing regulations (40 CFR Parts 1500-1508) provide that development of an EIS include opportunities for public review and comment and consideration of a range of reasonable alternatives, including evaluation of impacts resulting from the alternatives. In addition, NEPA and its implementing regulations mandate coordination and collaboration among federal agencies and directs federal agencies to coordinate with states and tribes. NEPA is administered by individual federal agencies (each agency has developed its own NEPA implementing regulations) in concert with guidance from the Council on Environmental Quality, which oversees NEPA implementation broadly. Each Federal agency develops their own implementing procedures to integrate NEPA into their existing programs and activities. (42 U.S.C. §§ 4321 et seq. and 40 CFR parts 1500–1508)

Coastal Zone Management Act
(https://coast.noaa.gov/czm/act/)

The Coastal Zone Management Act promotes the sustainable development of the nation's coasts by encouraging states and territories to balance the conservation and development of coastal resources using their own management authorities. The Act provides financial and technical assistance incentives for states to manage their coastal zones consistent with the guidelines of the Act. States with federally approved coastal management programs have the authority under the Act to review—for consistency with the enforceable policies under the approved program—federal actions that have reasonably foreseeable effects on the uses or resources of a state's coastal waters (this process is termed federal consistency review). Federal actions include federal agency activities, federal license or permit activities, BOEM outer continental shelf plan approvals, and federal funding to state and local governments for activities with coastal effects. (16 U.S.C. §§ 1451 et seq.)

Outer Continental Shelf Lands Act
(http://www.boem.gov/Governing-Statutes/)

The Outer Continental Shelf Lands Act (OCSLA) grants the Secretary of the Interior (Secretary) authority for the administration of mineral exploration and the development of the OCS, defined generally as all submerged lands seaward of state submerged lands and waters (in the Northeast, seaward of 3 miles offshore) that are under U.S. jurisdiction and control. The Act provides guidelines for implementing an OCS oil and gas exploration and development program and empowers the Secretary to grant leases for the extraction of marine minerals (including sand and gravel) and oil and gas to the highest qualified responsible bidder on the basis of sealed competitive bids. The Secretary may negotiate non-competitive agreements for sand, gravel and shell resources for shore protection, beach or wetlands restoration projects, or for use in construction projects funded in whole or in part, or authorized by the federal government. Planning and leasing OCS activities are conducted primarily by BOEM. (43 U.S.C. §§ 1331 et seq.) During the course of these activities, BOEM coordinates with other federal agencies (and states and tribes) as required by OCSLA, NEPA, and other statutes. As amended by the Energy Policy Act of 2005, the OCSLA also authorizes BOEM to issue leases, easements and rights of way for renewable energy development on the OCS. BOEM promulgated regulations in 2009 that provide a detailed structure for implementation of the OCS Renewable Energy Program. (42 U.S.C. §13201 et seq.). The OCSLA also establishes an environmental studies program to develop information needed for assessment and management of impacts on the human, marine and coastal environments affected by activities authorized by the Act. Additionally, the USGS provides indirect support to the Department of the Interior's management activities through its basic mission to examine the geological structure, mineral resources, and products of the national domain which, offshore, includes the EEZ (43 U.S.C. 1865 et seq.)

Deepwater Port Act
(http://www.marad.dot.gov/ports/office-of-deepwater-ports-and-offshore-activities/) and http://www.uscg.mil/hq/cg5/cg522/cg5225/)

The Deepwater Port Act authorizes and regulates the location, ownership, construction, and operation of deepwater ports (defined as a non-vessel, fixed or floating manmade structure that is used as a port or terminal for the loading, unloading, or handling of oil or natural gas for transportation to a state) in waters seaward of state jurisdiction, sets requirements for the protection of marine and coastal environments from adverse effects of such port development, and promotes safe transport of oil and natural gas from such locations. The Department of Transportation, through the Maritime Administration, authorizes activities under the Act in close consultation with the USCG, which has delegated authority to process applications, conduct environmental reviews, and manage other technical aspects of application review. (33 U.S.C. §§ 1501 et seq.; 46 U.S.C. §§ 2101 et seq.)

Marine Protection, Research and Sanctuaries Act
(https://www.epa.gov/laws-regulations/summary-marine-protection-research-and-sanctuaries-act)

The Marine Protection, Research and Sanctuaries Act of 1972 generally prohibits (1) transportation of material from the United States for the purpose of ocean dumping; (2) transportation of material from anywhere for the purpose of ocean dumping by U.S. agencies or U.S.-flagged vessels; (3) dumping of material transported from outside the United States into the U.S. territorial sea. A permit is required to deviate from these prohibitions. Under Title I, sometimes referred to as the Ocean Dumping Act, the standard for permit issuance is whether the dumping will "unreasonably degrade or endanger" human health, the marine environment, or economic potential. For some materials, ocean dumping is prohibited. The EPA and the USACE jointly

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administer the MPRSA's program regulating the disposal of dredged material into ocean waters. The USACE is authorized to issue permits for dredged material disposal, applying standards developed by EPA (the Ocean Dumping Criteria) and subject to EPA review and concurrence. The EPA is authorized to designate appropriate disposal sites and to issue permits for dumping of material other than dredged material. (16 USC § 1431 et seq.; 33 USC §1401 et seq.)

Clean Water Act, Discharge of Dredged and Fill Material (Section 404)

(http://www.epa.gov/cwa-404/section-404-permit-program)

Section 404 of the Clean Water Act prohibits the discharge of dredged or fill material into waters of the United States, including wetlands, without a permit. Such discharges may be authorized only when there is no alternative that is less damaging to the aquatic environment and when various other standards are met. The impact of dredged or fill material on the aquatic ecosystem is determined in consultation with federal resource agencies that have subject-matter jurisdiction to evaluate potential impacts to resources or aspects of the aquatic ecosystem such as:

Physical

- Substrate

Biological

- Threatened and endangered species
- Fish, crustaceans, mollusks, and other aquatic organisms in the food web
- Other wildlife (resident and transient mammals, birds, reptiles, and amphibians)

Special aquatic sites

- Sanctuaries and refuges
- Wetlands (saltmarsh)
- Vegetated shallows (sea grasses)
- Mudflats
- Coral reefs

An applicant must demonstrate efforts to avoid and minimize potential adverse impacts, and, where relevant, must provide compensation for any remaining, unavoidable impacts through activities to restore or create wetlands. EPA and the USACE jointly administer the Section 404 program; permits are issued by the USACE, applying standards developed by EPA (the 404(b)(1) Guidelines) and subject to concurrence from EPA! (33 U.S.C. §§ 1251 et seq.). See also the Public Interest Review, below.

Clean Water Act, Permits for Point Source Discharges of Pollutants (Sections 301, 402 and 403)

https://www.epa.gov/npdes

Discharges of pollutants from point sources to waters of the United States and the oceans are generally prohibited unless authorized by a National Pollutant Discharge Elimination System (NPDES) permit. (See 33 U.S.C. §§ 1311(a) and 1342) NPDES permits impose limits on, and monitoring requirements for, such point source discharges. Many, but not all, states have been authorized to administer the NPDES program and issue the permits for point source discharges to waters under their jurisdiction, including the territorial seas extending three miles from shore. Where a state has not been so authorized, EPA issues the NPDES permits for point source discharges to the state's waters. Furthermore, EPA issues the NPDES permits for discharges to waters seaward of the territorial seas for point sources other than from a vessel or other floating craft being used as a means of transportation. Permits for discharges to waters under state jurisdiction ("internal" waters and waters of the territorial seas) must include requirements ensuring satisfaction of state water quality standards. In addition, any permit for discharges to the territorial sea, contiguous zone or the ocean must comply with EPA's Ocean Discharge Criteria (33 U.S.C. §§ 1311(b)(1)(C), 1341, and 1343).

Clean Air Act,

https://www.epa.gov/clean-air-act-overview

Clean Air Act requirements for emission limitation and reduction are generally implemented requirements through permits from [illegible] The applicable regulations of the nearest adjacent coa[illegible]tate given the location of the project, as well as the location of any associated construction activities, are included in project review. For offshore projects, the permit process includes a review of the project design (e.g., the equipment, fuels, or pollutant-containing materials to be used at the project) and consideration of the source and size of any emissions (e.g., whether certain vessel-based emissions are included and whether the project is a major source for certain pollutants). Depending on the project design and applicable law (e.g., state requirements), sources of air emissions from new projects may include construction activities, operation of stationary equipment once the project is built, and vessels associated with operation of the project. (42 U.S.C §85 et seq.)

Rivers and Harbors Act (Section 10)

(http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/FederalRegulation.aspx)

Section 10 of the Rivers and Harbors Act prohibits the unauthorized obstruction of navigable waters of the United States or on the outer Continental Shelf (OCS). Construction of any structure, excavation or the placement of fill in U.S. navigable waters, including the OCS, is prohibited without a permit from USACE. (33 U.S.C. §§ 403 et seq.) See also the Public Interest Review, below.

Public Interest Review

The decision by the USACE whether to issue a permit under the Clean Water Act, Section 404, or the Rivers and Harbors Act Section 10, above, is based in part on "an evaluation of the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest." The review addresses a range of natural, cultural, social, economic, and other considerations, including, generally, "the needs and welfare of the people," and balances the "benefits which reasonably may be expected to accrue from the proposal" against the "reasonably foreseeable detriments" in a way that reflects the "national concern for both protection and utilization of important resources." A permit will be granted if the proposed project is not contrary to the public interest and meets other legal requirements. (33 U.S.C. 401 et seq.; 33 U.S.C. 1344; 33 U.S.C. 1413.)

Ports and Waterways Safety Act

(https://www.uscg.mil/hq/cg5/cg531/LMR/APLMRI/AppG.pdf)

The Ports and Waterways Safety Act provides for the establishment, operation, and maintenance of vessel traffic services, control of vessel movement, establishment of requirements for vessel operation, and other port safety controls. Specific to navigation, the Act requires that the USCG conduct studies to provide safe access routes for vessel traffic in waters under U.S. jurisdiction. In doing so, the USCG considers all waterway uses to assess the impacts on navigation from a specific project, periodically assess navigation safety for specific federally designated waterways, and assess risk in a port, port approaches, or region of significance. (33 U.S.C. §§ 1221 et seq.)

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National Historic Preservation Act (Section 106)
(http://www.achp.gov/work106.html)

Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on historic properties. Effects to districts, sites, buildings, structures, and objects listed in the National Register of Historic Sites are considered; properties not listed on the National Register are evaluated against the National Park Service's published criteria, in consultation with the State Historic Preservation Officer and/or a Tribal Historic Preservation Officer and any federally-recognized Indian tribe that may attach religious or cultural importance to them. If an agency makes an assessment that its actions will cause an adverse effect to a historic property, it initiates a consultation process that typically results in a Memorandum of Agreement (MOA) that outlines measures that the agency will take to avoid, minimize, or mitigate the adverse effects. (54 U.S.C. § 306108 et. seq.)

Magnuson-Stevens Act
(http://www.nmfs.noaa.gov/sfa/laws_policies/msa/)

The Magnuson-Stevens Fishery Conservation and Management Act establishes national standards for fishery conservation and management in U.S. waters. The Act created eight Regional Fishery Management Councils (including the Northeast Fishery Management Council) composed of state and federal officials and fishing industry representatives that prepare and amend fishery management plans for certain fisheries requiring conservation and management. Once a council develops an FMP (or an amendments to an existing FMP) and its management measures, NMFS reviews the Council's recommendations and approves and adopts the recommendations into Federal regulations, provided they are consistent with other Federal laws such as NEPA, MMPA, MBTA, ESA, Administrative Procedures Act, Paper work Reduction act, CZMA, Data Quality Act, and Regulatory Flexibility Act. Other agencies become involved in issues related to fisheries management pursuant to existing authorities. For example, to address potential impacts to birds, turtles, and marine mammals, USFWS and NMFS work with partners to study potential measures that could be effective at reducing impacts to species that are protected under applicable federal law such as the ESA. Additionally, under MSA the U.S. Coast Guard has responsibilities related to commercial fishing vessel safety and supporting a sustainable fishery by ensuring compliance with Magnusson-Stevenson Act.

In addition to provisions that address fisheries science and management, the Act requires that fishery management plans identify protection and conservation measures and essential fish habitat (EFH) for each managed species. EFH is broadly defined to include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. " EFH regulations are intended to minimize, to the extent practicable, adverse effects of fishing and non-fishing activities on EFH. EFH that is judged to be particularly important to the long-term productivity of populations of one or more managed species, or to be particularly vulnerable to degradation, is identified as "habitat areas of particular concern" (HAPC). HAPC is characterized by at least one of the following criteria:

- The importance of the ecological function provided by the habitat.
- The extent to which the habitat is sensitive to human-induced environmental degradation.
- Whether, and to what extent, development activities are, or will be, stressing the habitat type.
- The rarity of the habitat type.

Federal agencies must consult with NMFS in the review of potential impacts of their actions on EFH and HAPC when they authorize, fund, or undertake an action that may adversely affect EFH. In response, NMFS provides conservation recommendations to avoid, minimize, mitigate, or otherwise offset those adverse effects. (16 U.S.C. §§ 1801 et seq.)

Public Law 538, 77th Congress, Chapter 283, 2nd Session, 56 Stat. 267 as amended by Public Law 721, 81st Congress, approved August 19, 1950
http://www.asmfc.org/files/pub/CompactRulesRegs_Feb2016.pdf

This public law, as amended, created the Atlantic States Marine Fisheries Commission, a body comprised of representatives from the coastal states from Maine to Florida and Pennsylvania. The ASFMC serves as a deliberative body that, working in collaboration with NMFS and USFWS, coordinates the conservation and management of nearshore fishery resources including marine, shell and diadromous species. The principal policy arenas of the ASFMC include interstate fisheriesmanagement, habitat conservation and law enforcement. Whereas the Fishery Management Councils created under the Magnuson-Stevens Act focus their management efforts on federal waters, the ASFMC's management focus is on resources in states' waters. Because of this distinction, the ASMFC generally manages different species than the Fishery Management Councils, though some resources are jointly managed by both the ASMFC and one of the east coast councils. The Atlantic Coastal Fisheries Cooperative Management Act (http://www.asmfc.org/uploads/file/ACFCMA.pdf) authorizes the Secretary of Commerce to monitor and enforce states' compliance with mandatory provisions of interstate fishery management plans developed by the ASMFC.

Endangered Species Act
(http://www.fws.gov/endangered/laws-policies/ and http://www.nmfs.noaa.gov/pr/laws/esa/)

The Endangered Species Act provides for the conservation of species that are endangered or threatened, and the ecosystems on which they depend. The USFWS or NMFS determine the species that are endangered or threatened ("listed species"), designate "critical habitat", and develop and implement recovery plans for listed species.

Critical habitat is defined in the ESA as a specific geographic area that contains habitat features essential for the survival and recovery of a listed species, and which may require special management considerations or protections. Critical habitat consists of "the specific areas within the geographical area occupied by the species, at the time it is listed ... on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection." These features include:

- Space for individual and population growth and for normal behavior;
- Cover or shelter;
- Food, water, air, light, minerals, or other nutritional or physiological requirements;
- Sites for breeding and rearing offspring; and
- Habitats that are protected from disturbances or are representative of the historical geographical and ecological distributions of a species.

A critical habitat designation does not establish a preserve or refuge. Section 7 of the Act requires that federal agencies consult with either USFWS or NMFS to ensure that any action authorized, funded or carried out by an agency is not likely to jeopardize the continued existence of a listed species or result in the adverse modification or destruction of critical habitat designated for such species. (16 U.S.C. §§ 1531 et seq.)

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Marine Mammal Protection Act
(http://www.nmfs.noaa.gov/pr/laws/mmpa/)

The Marine Mammal Protection Act provides for the protection of all marine mammals. NMFS and USFWS share authority under the Act; NMFS is responsible for the protection of whales, dolphins, porpoises, and seals. The Act prohibits, with limited exceptions, broadly defined impacts to, or interactions involving, marine mammals. Exceptions can be made through permitting actions for "incidental" impacts from commercial fishing and other non-fishing activities, for scientific research, and for licensed institutions such as aquaria and science centers. NMFS can authorize incidental impacts if it finds that such impacts will have a negligible impact on the species or stock(s) and specifies conditions related to permissible impacts, mitigation, monitoring, and reporting. NMFS is required to consult with the Marine Mammal Commission in its decision-making. (16 U.S.C. §§ 1361 et seq.)

Migratory Bird Treaty Act
(http://www.fws.gov/birds/policies-and-regulations/laws-legislations/migratory-bird-treaty-act.php)

The Migratory Bird Treaty Act implements four treaties (with Canada, Mexico, Japan, and Russia) that provide for international protection of migratory birds. Under the Act, broadly defined impacts to, or interactions involving, migratory birds are prohibited. USFWS can issue permits that authorize falconry, raptor propagation, scientific collecting, and other specified and limited activities but the Act makes no provisions for the authorization of "incidental" impacts associated with other management and development activities. (16 U.S.C. §§ 703 et. seq.)

National Marine Sanctuaries Act (NMSA)
(http://sanctuaries.noaa.gov/about/legislation/; also see http://stellwagen.noaa.gov regarding Stellwagen Bank)

The National Marine Sanctuaries Act authorizes the Secretary of Commerce to designate discrete areas of the marine environment as national marine sanctuaries to protect distinctive natural and cultural resources. The primary objective of the Act is protection of sanctuary resources; a secondary objective is facilitation of all public and private uses that are compatible with resource protection. Regulations for management and protection of sanctuary resources are at 15 CFR Part 922. Section 304 of the Act requires interagency consultation between the Office of National Marine Sanctuaries (ONMS) and federal agencies taking actions that "may affect" the resources of a sanctuary (in the Northeast, Stellwagen Bank). (16 U.S.C. §§ 1431 et seq.)

National Park Service Units
(http://www.nps.gov/index.htm)

The National Park Service Organic Act of 1916 created the National Park Service and gave NPS the responsibility for managing National Park System units. The purpose of national parks broadly is to "to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." In the Northeast, there are several units of the NPS system, including Acadia National Park, Boston Harbor Islands National Recreation Area, Cape Cod and Fire Island National Seashores, and a variety of National Historic Landmarks, Sites, and Parks. These units are managed according to their establishing legislation, the NPS Organic Act, and unit-specific management plans. (54 U.S.C. §§ 100101 et seq.)

National Wildlife Refuges
(http://www.fws.gov/refuges/)

The organic act for the system of national wildlife refuges is the National Wildlife Refuge System Administration Act. Generally, management of individual wildlife refuges is dictated by the statute, Executive Order, or administrative action creating the unit, with purposes thus ranging from narrow definitions to broad statements. The National Wildlife Refuge System Improvement Act of 1997 required that each refuge develop a comprehensive conservation plan (see http://www.fws.gov/northeast/refuges/planning/index.html for a status of the plans for Northeast refuges). (16 U.S.C. §§ 668 et seq.)

National Estuary Program
(http://www.epa.gov/nep)

Under section 320 of the Clean Water Act, EPA oversees implementation of the National Estuary Program, the goal of which is to improve the quality of "estuaries of national importance." There are six National Estuary Programs in New England, covering Casco Bay; the Piscataqua Region (including Great Bay and the NH coastal embayments); Massachusetts Bays (including Massachusetts and Cape Cod bays); Buzzards Bay; Narragansett Bay; and Long Island Sound. Human activities within these estuaries are managed through a comprehensive conservation and management plan (CCMP). The CCMP serves as a blueprint to guide future decisions and actions and addresses a wide range of environmental protection issues, including for example, water quality, habitat, fish and wildlife, pathogens, land use, and introduced species. (33 U.S.C. § 1330)

National Estuarine Research Reserves
(http://nerrs.noaa.gov/)

Created under the Coastal Zone Management Act, the National Estuarine Research Reserve system includes several units in the Northeast. The purpose of designating these areas is for research and the protection of estuarine systems, generally focusing on stewardship, research to aid conservation and management, training on the use of local data for management, and education. Management plans for each reserve guide future decisions and actions. (16 U.S.C. §§1461)

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[1] Note that other provisions of the Clean Water Act are relevant to coastal and ocean management activities informed by this Plan.

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APPENDIX 2: ADDITIONAL INFORMATION FOR CHAPTER 3 OCEAN RESOURCES AND ACTIVITIES

Chapter 3 of this Plan discusses the extensive data on the Northeast Ocean Data Portal that provides a regional perspective of ocean resources and activities. However, there are many other sources of information that may need to be considered in decision–making. This Plan does not attempt to identify every source, but this Appendix provides the following programs and data sources that RPB agencies identified as particularly relevant for use in supplementing the map and data products in the Plan.

For their planning areas, the Massachusetts Ocean Plan and Rhode Island Ocean Special Area Management Plan (SAMP) provide information across all of the topics in Chapter 3. The RI Ocean SAMP is available at http://seagrant.gso.uri.edu/oceansamp/, and the Massachusetts Ocean Plan is at http://www.mass.gov/eea/waste-mgnt-recycling/coasts-and-oceans/mass-ocean-plan/. An additional federal source of spatial information, much of which is also served by the Northeast Ocean Data Portal, is the multipurpose marine cadastre, available at http://marinecadastre.gov/.

MARINE LIFE AND HABITAT

Atlantic Marine Assessment Program for Protected Species (AMAPPS)
http://www.nefsc.noaa.gov/psb/AMAPPS/

AMAPPS is a collaborative project between NOAA, USFWS, BOEM, and the Navy to better characterize the distribution and abundance of marine mammals, sea turtles, and seabirds along the Atlantic coast, and represents an important source of new marine life observations for improving existing marine life products. Furthermore, AMAPPS data is being collected with the intention to inform future environmental assessments, stock assessments, and to provide baseline data for future monitoring efforts in coastal and offshore environments.

Environmental Sensitivity Index (ESI) data products
http://response.restoration.noaa.gov/maps-and-spatial-data/environmental-sensitivity-index-esi-maps.html

NOAA is currently updating ESI data products along areas of the Atlantic coast affected by Hurricane Sandy (from Maine to South Carolina). ESI maps contain information about coastal and marine biological resources such as birds, shellfish beds, marshes, and tidal flats. Because ESI geography includes navigable rivers, bays and estuaries, they are an important source of information for nearshore environments.

Gulf of Maine Coastal Ecosystem Survey
https://gomces.wordpress.com/about/

This collaborative project is led by the Maine Department of Inland Fisheries and Wildlife and seeks to better understand ecosystem dynamics in the Gulf of Maine. Integrated surveys of plankton communities, fish, birds and marine mammals were conducted from July 2014-February 2016. A final output of this project will be mapping biological hotspots in the coastal waters of the Gulf of Maine.

State-level information: Many New England state fish and wildlife and marine fisheries agencies conduct regular surveys of biological resources in state waters and maintain databases of marine life observations.

NOAA Passive Acoustic Monitoring Program
http://www.nefsc.noaa.gov/psb/acoustics/

Passive Acoustic Monitoring provides information on marine life distribution during times and places where human observations are limited (e.g., winter; at night), and can serve to supplement or validate existing marine life products. See also the NOAA cetacean and sound mapping page at http://cetsound.noaa.gov/ .

Biologically Important Areas for cetaceans
http://cetsound.noaa.gov/important

NOAA's effort to map Biologically Important Areas (BIAs) for cetaceans: 1) identifies areas where cetacean species or populations are known to concentrate for specific behaviors, or be range-limited, but for which there is not sufficient data for their importance to be reflected in the quantitative mapping effort; and 2) provided additional context within which to examine potential interactions between cetaceans and human activities. Four types of BIAs are identified: reproductive areas, feeding areas, migratory corridors, and small and resident populations.

Seal Surveys at the NOAA Northeast Fisheries Science Center (NEFSC) Protected Species Branch
http://www.nefsc.noaa.gov/psb/seals/sealsurveys.htm

The NEFSC conducts seal tagging, biological sampling and aerial imagery surveys with numerous partners in the region including the USFWS and the National Park Service.

Monitoring bat activity in the Northeast

- Stantec, in partnership with DOE and NERACOOS, has deployed bat sensors on NERACOOS buoys in the Gulf of Maine. The results of the 2011 deployment can be found in the BOEM ESPIS report: http://www.data.boem.gov/PI/PDFImages/ESPIS/5/5289.pdf. Another set of sensors has been deployed in the Gulf of Maine since April 2013. The goal of these efforts is to gain a better understanding of bat migration activity over ocean waters, to ultimately help determine and overcome potential risks associated with offshore wind turbines.
- BOEM is currently funding a tracking study of Northern long-eared bats in the Northeast to investigate the risks of offshore wind energy development. http://www.boem.gov/Tracking-Northern-Long-Eared-Bat-Offshore-Foraging-and-Migration-Activities/.
- Through the Northeast Regional Migration Monitoring Network, the Maine Coastal Islands National Wildlife Refuge (USFWS), the University of Maine, Acadia University and Acadia National Park collaborated, using radar, acoustic monitoring, banding stations, isotope analysis, nanotags and receivers to try to document and understand more about bat use of Maine's coast. http://rkozlo51-25.umesci.maine.edu/SBE/avian/MigrationMonitoring.html

Saltmarsh Habitat and Avian Research Program (SHARP)
http://www.tidalmarshbirds.org/

The Saltmarsh Habitat and Avian Research Program (SHARP) is a group of academic, governmental, and non-profit collaborators gathering the information necessary to conserve tidal-marsh birds. The program collects data and information to monitor the health of North America's tidal-marsh bird communities and the marshes they inhabit in the face of sea-level rise and upland development. The near-term goal of SHARP is to advise management actions across the Northeast US for the long-term conservation of tidal marsh birds and the ecosystem that supports them.

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Avian movement and migration studies: Telemetry and tracking data provide information on animal movement and migration, neither of which are well-characterized by existing distribution and abundance products for avian species. For some species, breeding, wintering, staging, and molting areas occur in different places across North America, and understanding the links between these life history stages is important. The following efforts have the common goal of better understanding avian movement and migration at the continental scale for certain groups of species. Many have overlapping partners.

- NortheastRegional Migration Monitoring Network
  http://rkozlo51-25.umesci.maine.edu/SBE/avian/MigrationMonitoring.html
- USFWS Mid-winter Waterfowl Survey
  https://migbirdapps.fws.gov/mbdc/databases/mwi/mwidb.asp
- MOTUS Wildlife Tracking System
  http://sandbox.motus-wts.org/data/viewtracks.jsp
- Mid-Atlantic Diving Bird Study
  http://www.briloon.org/mabs/reports
- Atlantic and Great Lakes Sea Duck Migration Study
  http://seaduckjv.org/science-resources/atlantic-and-great-lakes-sea-duck-migration-study/
- Common Eider Wellfleet Bay Virus Tracking Study
  http://www.briloon.org/boston-harbor-common-eider-satellite-tracking-study
- Tracking Offshore Occurrence of Terns and Shorebirds in the Northwest Atlantic
  http://www.boem.gov/AT-13-01/
- University of Rhode Island avian tracking studies
  For example, see http://seagrant.gso.uri.edu/oceansamp/pdf/appendix/11a-PatonAvianRept.pdf
- Avian partnerships:

  Atlantic Coast Joint Venture
  http://acjv.org/

  The Atlantic Coast Joint Venture (ACJV), established under the North American Waterfowl Management Plan, is a conservation partnership focused on the conservation of habitat for native (resident and migratory) birds in the Atlantic Flyway, from Maine south to Puerto Rico. The science provided by the ACJV and its partners includes the Atlantic Marine Assessment Program for Protected Species (described above). Additional research that is being conducted in collaboration with BOEM includes the winter movement patterns of satellite-marked sea ducks (black scoters, surf scoters and white-winged scoters), red-throated loons and gannets.

  Sea Duck Joint Venture
  http://seaduckjv.org/

  The Sea Duck Joint Venture (SDJV) is a conservation partnership established under the North American Waterfowl Management Plan that provides science-based information to support effective management decisions for North American sea ducks. The science provided by the SDJV and its partners includes the identification of coastal and marine areas that are of continental significance to North American sea ducks, survey information which can provide an additional measure of species composition and numerical estimates, and annual movement patterns of satellite-marked sea ducks.

  Atlantic Flyway Shorebird Initiative
  http://www.nfwf.org/amoy/Pages/home.aspx

  The Atlantic Flyway Shorebird Initiative (AFSI) is a partnership of government (led by the USFWS), conservation organizations, academics and shorebird experts to safeguard the phenomena of migration that sustains shorebird populations throughout the hemisphere. The initiative has identified five strategies to address threats to shorebirds including protecting habitat, minimizing predation, reducing human disturbance, reducing hunting, and filling knowledge gaps. The AFSI Business Plan that describes these strategies can be found on the group's website.

  North Atlantic Landscape Conservation Cooperative
  http://northatlanticlcc.org/

  The North Atlantic Landscape Conservation Cooperative (NALCC) is a partnership in which the private, state, tribal and federal conservation community works together to address widespread resource threats in aquatic, coastal, and terrestrial settings amplified by a changing climate, including enhancing coastal resilience to rising sea levels and coastal storms. The NALCC has sponsored two science projects in recent years: application of the Coastal and Marine Ecological Standards (CMECS) to the Northeast, and modeling of the probability of occurrence of 24 species marine birds in the northwestern Atlantic Ocean. Additionally, the NALCC is also currently funding projects related to coastal habitats and species and their thresholds for tolerance to sea level rise and storms as stressors: assessing ecosystem services provided by barrier beaches, tidal marshes, and shellfish beds; and examining opportunities and tools to support tidal marsh restoration. Project reports are available on the NALCC web site.

  Atlantic Marine Bird Conservation Cooperative
  http://www.fws.gov/northeast/migratorybirds/marinebirdconservation.html

  The Atlantic Marine Bird Conservation Cooperative (AMBCC) is a diverse partnership that identifies the most pressing conservation needs for marine birds in the Northwest Atlantic (Canada to the Caribbean), and develops actions to address them. The science provided by AMBCC partners includes the development of the Northwest Atlantic Seabird Catalog, the Business Plan for Addressing and Reducing Bycatch in Atlantic Fisheries, and a number of tracking, surveying and distribution modeling research that will directly inform offshore energy development.

Shallow Water Benthic Habitats in the Gulf of Maine: A summary of Habitat Use by Common Fish and Shellfish Species in the Gulf of Maine.
https://www.greateratlanticfisheries.noaa.gov/policyseries/index.php/GARPS/article/view/11

This report provides habitat use scores for each benthic life stage of 16 common fish and shellfish species. The analysis highlighted the importance of shallow water habitats (< 10 m) to juveniles and adults for spawning, feeding, and growth to maturity. Shallow water habitats were used by all young-of-the-year juveniles for all 16 species.

New England Aquarium Sightings-Per-Unit-Effort (SPUE) marine mammals maps
http://docs.dos.ny.gov/communitieswaterfronts/ocean_docs/NEA_URI_Report_Marine_Mammals_and_Sea_Turtles.pdf

SPUE maps provide a means to display marine mammal observations normalized by survey effort. Researchers at the New England Aquarium have contributed to SPUE mapping efforts for marine mammal species in the Gulf of Maine and offshore New York. These map products are important sources of marine mammal observations and could be used to compare and validate other marine mammal map products. The New England Aquarium also maintains the web site for the North Atlantic Right Whale Consortium: http://www.narwc.org/index.php?mc=1&p=1. The New England Aquarium was part of offshore surveys for marine mammals and sea turtles south of Massachusetts: http://files.masscec.com/research/OffshoreWindWildlifeFirstYear.pdf.

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Northeast Fish and Shellfish Climate Vulnerability Assessment
http://www.st.nmfs.noaa.gov/ecosystems/climate/northeast-fish-and-shellfish-climate-vulnerability/index#

This work provides scores for the climate vulnerability of eighty-two species of fish and shellfish in the Northeast region, in terms of sensitivity and exposure to climate change. In addition to overall positive, negative, or neutral effect, scores are provided for vulnerability to shifts in productivity, and propensity for a shifting distribution. Approximately half of the species assessed are estimated to have a high or very high vulnerability to climate change in the Northeast.

NOAA Deep-Sea Coral Database (sponges and corals):
https://deepseacoraldata.noaa.gov/

The database of deep-sea corals and sponges from NOAA Deep Sea Coral Research and Technology Program is available online. This database includes historical and recent observations of corals and sponges from research surveys, dive transects, specimen collections, and the academic literature.

Geological and geophysical studies for offshore sand resource characterization:
http://www.boem.gov/Marine-Minerals-Program-offshore-sand-resources/

Through the BOEM Atlantic Sand Assessment Project (ASAP) and cooperative agreements with Maine, New Hampshire, Massachusetts and Rhode Island, there are several ongoing geological and geophysical studies to characterize offshore sand resources in the region. BOEM contracted the firm CB&I to conduct geophysical surveys 3-8 nm offshore, and several states are beginning to map sand within state waters.

CULTURAL RESOURCES

National Register for Historic Places
http://www.nps.gov/nr/

The National Park Service maintains the National Register for Historic Places, the official list of historic places worthy of preservation. Includes link to online databases.

- State Historic Preservation Offices provide updates to historic properties that have been nominated and/or deemed eligible for listing on the National Register.

MARINE TRANSPORTATION

Atlantic Coast Port-Access Route Studies (ACPARS)
www.uscg.mil/lantarea/acpars/

In 2011, the Coast Guard, in collaboration with NOAA and BOEM, initiated a Port-Access Route Study (PARS) for the Atlantic coast. Previous PARS studies were limited to a single port; however, the need to understand traffic along the entire coast was considered in order to facilitate unimpeded commercial traffic in the vicinity of Wind Energy Areas (WEAs) in multiple regions. Common PARS outcomes are recommendations that routing measures be established to maintain navigational safety for all waterway users. Routing measures include the following designated areas: Area to Be Avoided, Deep Water Route, Inshore Traffic Zone, Shipping Safety Fairway, Precautionary Area, Regulated Navigation Area. New or amended routing systems are approved through the International Maritime Organization (IMO)[1], of which the USCG is a participant. For example, the IMO Subcommittee on Safety of Navigation approved the narrowing of the north-south Boston traffic separation scheme (TSS) to route vessels away from known right whale populations, thus reducing the risk of ship strikes.

ACPARS met a number of important goals, including enhancing AIS data collection and analysis, facilitating discussions concerning traffic patterns for several WEAs, and gathering significant stakeholder input regarding proposed WEAs. It was unable, however, to develop a modeling and analysis tool that would predict how vessel traffic patterns would be impacted by the presence of wind farms. Even without the ACPARS modeling tool, the USCG provides navigational safety evaluations to the lead permitting agency through well–established USCG policies leveraging United Kingdom Coast Guard guidance.[2]

Interagency Memoranda of Understanding
The USCG has a multitude of references that waterway managers can utilize in order to characterize and maintain a safe MTS. These include: Tactics, Techniques, and Procedures (TTP) Program,[3] Navigation and Vessel Inspection Circulars (NVIC),[4] and Instructions and Manuals.[5]

The USCG uses Memoranda of Understanding (MOU)/Agreement (MOA)[6] to document how to better understand and share mutual responsibilities with government agencies that relate to the MTS and ocean planning. The following are a few of the more recent and relevant:

- MOA—USACE/USCG dated 2 June 2000, and Appendix C: U.S. Army Corps of Engineers Section 10 Permit Review Policy Guidance dated 25 January 2002
- Cooperating Agency Agreement between the U.S. Coast Guard and MMS for Programmatic EIS 7 July 2006
- MOA-BSEE/USCG—Fixed Outer Continental Shelf (OCS) Facilities dated 19 September 2014
- MOA-BOEMRE/USCG—Offshore Renewable Energy Installations on the Outer Continental Shelf dated 27 July 2011
- MOU-BSEE/USCG—Building a Partnership to Improve Safety and Environmental Protection dated 27 November 2012
- DOI/OSHA/USCG MOU—Regulatory Oversight of Offshore Wind Farms in State Waters

The USACE enters into MOUs/MOAs with other federal agencies regarding resource planning, investigations and management (NMFS EFH programmatic assessments), and regulatory permit processing (for example—see USCG 2000 MOA described above). The USACE enters into Project Partnership Agreements (PPAs) with state, county and municipal bodies for non-federal sponsorship, including cost sharing, for its Civil Works improvement activities.

The USACE also enters into MOAs with other federal, state and local bodies under its authorities for international and interagency support, for study, design and construction of marine infrastructure features managed by those agencies where a benefit to the public accrues from such cooperative action (for example under the Economy Act). The USACE-NAE has used these authorities to perform work funded by the states (mainly dredging), USCG (seawalls and ATON bases on Breakwaters and jetties), National Archives (marina design), and the U.S. Navy (pier engineering studies).

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The USACE also enters into MOAs with project sponsors for non-federally funded study, design and construction of local service facilities and betterments associated with USACE Civil Works project activities (for example local berth dredging undertaken concurrent with federal channel dredging), use of non-federally provided confined placement facilities for dredged material, and non-federally funded beneficial use of dredged material for beach nourishment and other coastal resiliency projects.

Relevant References

- New England Regional Dredging Team—http://nerdt.org/
- Port Security Grants—http://www.fema.gov/port-security-grant-program
- TIGER Grants to fund capital investments in surface transportation infrastructure—https://www.transportation.gov/tiger
- NOAA PORTS Program—http://www.nws.noaa.gov/om/marine/ports.htm
- USACE Waterborne Commerce of the United States http://www.navigationdatacenter.us/wcsc/wcsc.htm

COMMERCIAL AND RECREATIONAL FISHING

Data from the multi-purpose Marine Cadastre
www.marinecadastre.gov

Includes a Vessel Trip Report-derived data layer that displays fishing revenue information across the Atlantic Seaboard, including New England state and federal waters, from 2007 to 2012. Other data including historical (1970s) fishing data are also available through the Marine Cadastre.

Mid-Atlantic Ocean Data Portal
http://midatlanticocean.org/data-portal/

The Mid-Atlantic Ocean Data Portal provides several Vessel Trip-Report-derived data products that extend into the Northeast. These include products related to all fisheries reported in the VTR system as well as products organized by gear type.

NEMFC and ASFMC reports and state marine fisheries agencies are primary data sources for many important commercial and recreational fisheries not captured in this characterization, and are key sources for information that will may a significant impact during review of proposed development. Additionally, the Massachusetts Ocean Management Plan and Rhode Island Ocean Special Area Management Plan include maps and other information related to commercial fishing.

Recreational Fishing
http://www.st.nmfs.noaa.gov/recreational-fisheries/index

The NMFS Marine Recreational Information Program (which operates in partnerships with several New England states) is a survey-based assessment of recreational fishing nationwide that produces summary statistics related to catch and effort. Both the Massachusetts Ocean Management Plan (http://www.mass.gov/eea/waste-mgnt-recycling/coasts-and-oceans/mass-ocean-plan/) and the Rhode Island Ocean SAMP (http://seagrant.gso.uri.edu/oceansamp/documents.html) provide information within their respective planning areas depicting the spatial footprint of components of recreational fishing.

The Atlantic Coastal Cooperative Statistics Program's Data Warehouse (http://www.accsp.org/data-warehouse) is a repository of commercial fisheries catch, effort and landings data and recreational catch data for the Atlantic coast. The commercial data is supplied by partner state and federal agencies and the recreational data is from NOAA's Marine Recreational Information Program.

RECREATION

There are numerous other information sources available to help capture the extent of recreational activity by providing a particular perspective or additional information for a portion of the region:

National Recreational Boating Survey
http://www.uscgboating.org/statistics/national-recreational-boating-safety-survey.php

The USCG conducts a National Recreational Boating Survey and maintains a database of past and current marine event permits, among many other sources of information on waterways use and safety.

NPS, SBNMS, USFWS, and NOAA can provide more information on visitation and actual activities within and near national parks, wildlife refuges, and the Stellwagen Bank National Marine Sanctuary.

Each New England state has a marine or coastal unit of its Environmental Police that participates in ocean safety and enforcement exercises. These units and their personnel often have data and extensive personal knowledge of offshore recreational activities.

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[1] International Maritime Organization, "Ships' routeing." imo.org. http://www.imo.org/en/OurWork/Safety/Navigation/Pages/Ships-Routeing.aspx

[2] Maritime and Coastguard Agency, MGN 371 Offshore renewable energy installations (OREIs): guidance on UK navigational practice, safety and emergency response issues (Maritime and Coastguard Agency, 2008), https://www.gov.uk/government/publications/mgn-371-offshore-renewable-energy-installations-oreis

[3] United States Coast Guard, "Internet-Releasable TTP Publications." uscg.mil. http://www.uscg.mil/forcecom/ttp/

[4] United States Coast Guard, "Navigation and Vessel Inspection Circulars." uscg.mil. http://www.uscg.mil/hq/cg5/nvic/

[5] United States Coast Guard, "Directives and Publications Division." uscg.mil. www.uscg.mil/directives/

[6] Unites States Coast Guard, "Commandant Instruction 5216.18: Memoranda of Understanding/Agreement." uscg.mil. http://www.uscg.mil/directives/ci/5000-5999/CI_5216_18.pdf.

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APPENDIX 3: DRAFT IMPORTANT ECOLOGICAL AREA FRAMEWORK

Identifying Important Ecological Areas in Northeast Ocean Planning

The *Framework for Ocean Planning in the Northeast US* (adopted by the NE RPB in January 2014) includes an action and a specific task to assess regional efforts to identify areas of ecological importance and to convene the NE RPB, scientists and stakeholders to consider options for how to proceed with characterizing and using important ecological areas (IEAs) in ocean planning. It also suggests that defining IEAs is the first step to identifying those areas. In June 2014, the NE RPB issued a "Draft Summary of Marine Life Data Sources and Approaches to Define Ecologically Important Areas and Measure Ocean Health"[1] and convened a public workshop to consider next steps related to defining and using IEAs. Informed by that workshop, the NE RPB decided to take a stepwise approach by first developing regional marine life and habitat data.

Since June 2014, the NE RPB, through the efforts of the Northeast Ocean Data Portal Working Group[2] and the Marine Life Data and Analysis Team,[3] has developed numerous data layers that map various habitats and the distribution and abundance of 150 species of marine mammals, bird, and fish. In April 2015, the NE RPB convened an ecosystem-based management workshop, resulting in the formation of an Ecosystem Based Management Work Group (EBM WG). The role of the EBM WG is to support and inform a range of activities designed to incorporate additional EBM considerations into the 2016 Northeast Ocean Plan, including approaches to define and characterize IEAs. At its September 30, 2015 meeting, the EBM WG reviewed regional marine life and habitat data that have been developed to date and recommended that the RPB define IEAs as various ecological components and ecosystem functions, using existing definitions from National Ocean Policy documents as a starting point.

In the Final Recommendations of the National Ocean Policy Task Force, important ecological areas are described as including "areas of high productivity and biological diversity; areas and key species that are critical to ecosystem function and resiliency; areas of spawning, breeding, and feeding; areas of rare or functionally vulnerable marine resources; and migratory corridors." This description provides a basis for defining IEAs for ocean planning in the Northeast.

Several other definitions and criteria for important biological or ecological areas provide additional context, mostly demonstrating consistent definitions and similar approaches nationally and internationally.[4]

Using the National Ocean Policy (NOP) definition as the basis, the RPB developed a series of IEA components, noted their consistency with the NOP and other approaches to defining IEAs, defined each IEA component according to ecological features and the existing natural resources datasets that could be used to characterize and map those features, and included long term data needs for each component. An initial draft IEA document was then released for review and public comment in November 2015. EBM WG review was generally positive, especially regarding the definition and identification of the components of IEAs. Other feedback focused on the details of which ecological datasets could be used to characterize the IEA components. This feedback was incorporated into a revised document that included a summary of the IEA framework development process to-date, suggested definitions for IEA Components, tables outlining categories of existing marine life and habitat data that could apply to IEAs, and tables of potential long-term data, science, and research needs.

This revised framework document was reviewed and discussed by the EBM WG at its second meeting on January 6, 2016. The EBM WG provided additional positive feedback on the framework, and made specific recommendations for further improving the definitions of IEA Components and the use of data to support IEA Components. These recommendations included:

- The NE RPB should conduct scientific review of draft marine life and habitat data that will be referenced in the Plan and that are applicable to IEA components (as described in the Plan, this review is currently ongoing)
- Applicable data for areas of high productivity, areas of high biodiversity, and areas of rare marine resources could be illustrated for review

The EBM WG also recommended that the development of data applicable to IEA Components be an iterative, adaptive process. Allowing for some iteration in data development ensures that thresholds of "importance" are thoroughly reviewed. An adaptive process ensures that data applicable to IEAs continue to stay relevant and representative of changing conditions, a dynamic marine environment, and shifting human uses. The EBM WG reviewed current data gaps and anticipated data needs, which are described in Chapter 5.

The following framework for defining and identifying IEAs incorporates feedback on the November 2015 and January 2016 drafts from the NE RPB, the EBM WG and public comment. The framework includes:

- An overarching definition of Important Ecological Areas for Northeast Ocean Planning
- The identification of five IEA components and a simple definition to describe and bound each IEA component
- A table suggesting categories of existing marine life and habitat data described in Chapter 3 that could be used to characterize and map IEA components, recognizing that an individual ecological resource and corresponding dataset may be applicable to many IEA components
- A table suggesting longer term data, science, and research needs which are also included as Science and Research Priorities in Chapter 5
- Actions associated with the continued development of the IEA framework and data applicable to IEA Components, which are also described in Chapter 5

IEA Definition

Important Ecological Areas (IEAs) for Northeast Ocean Planning are habitat areas and the species, guilds, or communities critical to ecosystem function, resilience, and recovery. IEAs include areas/species/functional guilds/communities that perform important ecological functions (e.g., nutrient cycling, provide structure) that are further defined by five Components.

Five Components of Important Ecological Areas:

The following italicized definitions are intended to describe and bound the types of datasets that could be applicable to each component.

1. Areas of high productivity—includes measured concentrations of high primary and secondary productivity, known proxies for high primary and secondary productivity, and metrics such as food availability
2. Areas of high biodiversity—includes metrics of biodiversity and habitat areas that are likely to support high biodiversity
3. Areas of high species abundance including areas of spawning, breeding, feeding, and migratory routes—support ecological functions important for marine life survival; these areas may include persistent or transient core abundance areas for which the underlying life history mechanism is currently unknown or suspected

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4. Areas of vulnerable marine resources—support ecological functions important for marine life survival and are particularly vulnerable to natural and human disturbances
5. Areas of rare marine resources—distribution and core abundance areas of state and federal ESA-listed species, listed species of concern and candidate species, other demonstrably rare species, and spatially rare habitats

Use of Existing Marine Life and Habitat Data to Describe IEAs

As a consequence of working toward the NE RPB's action to produce regional spatial characterizations of marine life and habitat distribution and abundance, the majority of the datasets currently available for use in the IEA framework are products describing habitat and species distribution and abundance. While habitat and species distribution and abundance are important structural ecological features, the IEA framework identifies additional ecological features that may be independent of abundance (e.g., representations of function, connectivity, dynamics) and suggests datasets to address these.

The following tables provide a listing of existing spatial marine life (Table 1a) and physical and biological habitat data (Table 1b) and suggest where each dataset could fit within the IEA component framework. The tables incorporate feedback from the EBM WG, much of which could be grouped into the following general themes:

- Each ecological resource and corresponding dataset could fit into more than one IEA component
- Some ecological features could be determined to be inherently important over their full extent
- Some datasets characterizing an ecological feature may require determination and scientific review of a certain population threshold, areal extent, or time of year in order to be used to identify IEAs (see Table 1a for examples)

Table 1a // Applicability of existing marine life spatial data to IEA components.

	Areas of high productivity	Areas of high biodiversity	Areas of high species abundance*	Areas of vulnerable marine resources	Areas of rare marine resources	Threshold needed?
	1	2	3	4	5	
Diversity of marine mammals, birds and fish (Shannon diversity index or Simpson diversity index for each group from MDAT)		●				
Multi-taxa species richness (richness for—150 species mammals, birds, fish from MDAT— does not rely on abundance)		●				
Marine mammal abundance core area, bird abundance core area, and fish biomass core area (based on annual averages from MDAT—this could be for species groups, whole taxa, and/or multiple taxonomic groups)[6]			●	●		Core as defined by MDAT?
Core areas for ESA-listed species (from MDAT)				●	●	
Core areas for species groups that are sensitive to particular disturbances or impacts (e.g., marine mammal species groups sensitive to high, medium and low frequency sound, or bird species groups sensitive to collision or displacement from offshore wind energy projects)[7] (from MDAT)				●		

* Including areas of spawning, breeding, feeding and migratory routes

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Table 1b // Applicability of existing physical and biological habitat spatial data to IEA components

	Areas of high productivity	Areas of high biodiversity	Areas of high species abundance*	Areas of vulnerable marine resources	Areas of rare marine resources	Threshold needed?**
	1	2	3	4	5	
Rate of photosynthesis	●					
Chlorophyll a concentration	●					Highest 10% over 50% of time?
Eelgrass meadows	●		●	●		Presence
Cold-water coral habitat		●		●	●	
Wetlands	●		●	●		
Shellfish beds				●		
Frontal boundaries	●	●				>50% of year?
Upwelling zones	●	●				
Canyons	●	●				
Seamounts	●	●				
Areas of complex seafloor	●	●				
Essential fish habitat (EFH)			●			
Designated ESA critical habitat			●	●		
Habitat Areas of Particular Concern (e.g., Atlantic cod, Atlantic salmon, Tilefish)			●	●		

* Including areas of spawning, breeding, feeding and migratory routes
**Some example thresholds provided as context

Long Term Science and Data Needs to Advance the Identification of IEAs

The following tables provide a listing of potential marine life science and data needs (Table 2a) and physical and biological habitat science and data needs (Table 2b) that would advance the identification of IEAs and suggests where each identified need could fit within the IEA component framework. The tables incorporate feedback that was provided throughout the course of the NE Ocean Planning process, including suggestions provided during the October 2015 Stakeholder Forum, EBM WG meetings, and comments on the draft IEA documents. These science and data needs are also described in Chapter 5.

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[1] Northeast Regional Planning Body, Draft Summary of marine life data sources and approaches to define ecologically important areas and measure ocean health (Northeast Regional Planning Body 2014). http://neoceanplanning.org/wp-content/uploads/2014/08/Marine-Life-Assessment-Inventory_Draft.pdf

[2] Northeast Regional Planning Body, "Northeast Ocean Data Portal." http://www.northeastoceadata.org.

[3] Northeast Regional Planning Body, "Marine Life/Habitat and Ocean Planning." neoceanplanning.org. http://neoceanplanning.org/projects/marine-life.

[4] The following efforts to define IEAs were considered:
- National Marine Sanctuary nomination criteria for national significance, 15 CFR §922.10.
- Essential Fish Habitat as defined by the Magnuson-Stevens Act, 16 U.S.C. §§ 1801-1884.
- Canada Department of Fisheries and Oceans, Identification of Ecologically and Biologically Significant Areas (Canada Department of Fisheries and Oceans 2004), http://www.dfo-mpo.gc.ca/csas/Csas/status/2004/ESR2004_006_E.pdf.
- Derous S., et al., A concept for biological valuation in the marine environment, (Oceanologia vol. 49, pp. 99-128, 2007), http://www.iopan.gda.pl/oceanologia/491derou.pdf
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[5] Note that there are no marine life datasets listed that correspond to high productivity. Recognizing that "snapshots" of abundance do not necessarily equal high productivity, can a metric for high productivity be derived from marine life data? See table 2a.

[6] This product could address persistence of abundance for marine mammal and bird species and persistence of biomass for fish species on an annual basis; i.e., provide a very broad characterization of marine life aggregations averaged over a year. There is potential to look at shorter time scales and certain times of year for certain species/groups—this is captured in Table 2a.

[7] Species sensitivity/vulnerability groups will be derived from published studies such as: Bureau of Ocean Energy Management, The relative vulnerability of migratory bird species to offshore wind energy projects on the Atlantic Outer Continental Shelf (Bureau of Ocean Energy Management 2013), www.data.boem.gov/PI/PDFImages/ESPIS/5/5319.pdf

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Table 2a // Long-term marine life science and spatial data needs relevant to IEA components, described in Chapter 5.

	1 Areas of high productivity	2 Areas of high biodiversity	3 Areas of high species abundance*	4 Areas of vulnerable marine resources	5 Areas of rare marine resources	Threshold needed?
Multi-taxa metric of high marine life productivity	●					
Multi-taxa index of high biodiversity		●				
Identification and distribution of keystone species, foundational species and ecosystem engineers				●		
Distribution and abundance of benthic fauna, including crustaceans				●		
MDAT core areas for species with low fecundity, slow growth, longevity				●		
MDAT core areas for species groups sensitive to impacts including warming waters and acidification				●		
MDAT core areas for mammals, birds, fish (monthly or seasonal averages)			●	●		
Seal haul outs			●			
Identification and distribution of ecologically rare species					●	To distinguish rare endemics from non-endemics

* Including areas of spawning, breeding, feeding and migratory routes

Table 2b // Long-term physical and biological habitat science and spatial data needs relevant to IEA components, described in Chapter 5.

	1 Areas of high productivity	2 Areas of high biodiversity	3 Areas of high species abundance*	4 Areas of vulnerable marine resources	5 Areas of rare marine resources	Threshold needed?
Distribution/abundance of kelp forests	●	●		●		
Multi-taxa index of high productivity	●					
Identification and distribution of offshore habitats defined by pelagic hydrodynamic processes			●			
Distribution of bivalve-dominated communities				●		
Rolling closures and spawning area closures for managed species			●			
Identification and distribution of eco-logically rare habitats					●	

* Including areas of spawning, breeding, feeding and migratory routes

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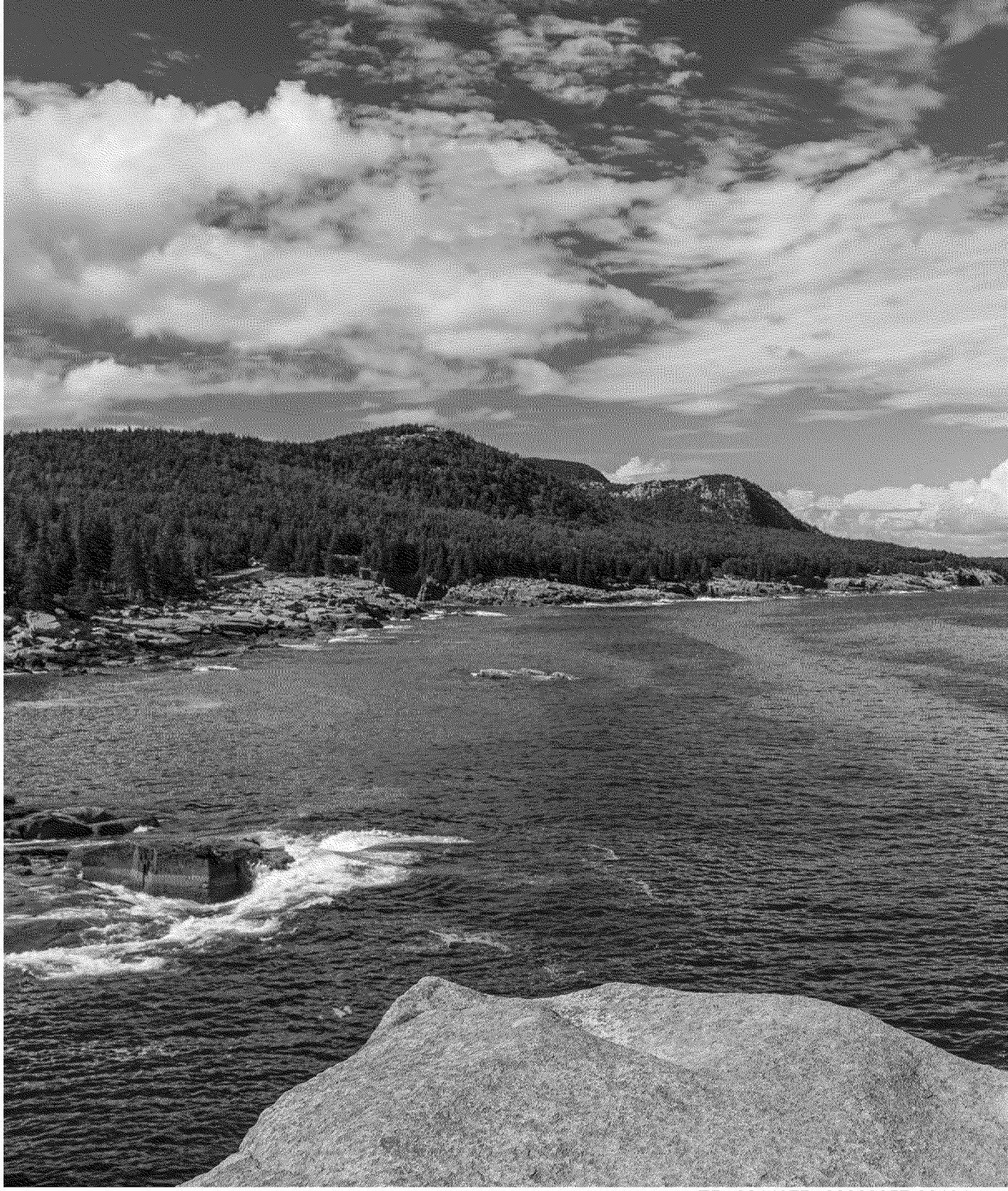
APPENDIX 4: REFERENCE DOCUMENTS INCORPORATED INTO THE PLAN

The process of developing the Plan led to the creation of the following documents, which are incorporated into this Plan:

1. Northeast Regional Planning Body Charter
   http://neoceanplanning.org/wp-content/uploads/2014/07/Charter-with-Signatories.pdf
2. Framework for Ocean Planning in the Northeast United States
   http://neoceanplanning.org/wp-content/uploads/2014/02/NE-Regional-Ocean-Planning-Framework-February-2014.pdf
3. Baseline Assessment
   http://www.neoceanplanning.org

As part of Plan development, the RPB produced many background reports, white papers, summaries of engagement with specific stakeholder groups, and other meeting materials. These are available on the Northeast Ocean Planning web site, www.neoceanplanning.org.



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Acronyms and Abbreviations

Acronyms and Abbreviations—Government Entities

ACHP	Advisory Council on Historic Preservation
ASFMC	Atlantic States Marine Fisheries Commission
BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
DHS	Department of Homeland Security
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
DOT	Department of Transportation
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
GAO	Government Accountability Office
GARFO	Greater Atlantic Regional Fisheries Office (NOAA)
IMO	International Maritime Organization
MARAD	Maritime Administration (DOT)
MDMF	Massachusetts Division of Marine Fisheries
MMP	Marine Minerals Program (BOEM)
NAE	New England District (USACE)
NAVCEN	Navigation Center (USCG)
NCCOS	National Centers for Coastal Ocean Science (NOAA)
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center (NOAA)
NMFS	National Marine Fisheries Service (NOAA)
NOAA	National Oceanic and Atmospheric Administration
NOPP	National Oceanographic Partnership Program
NPS	National Park Service
NRAC	Northeast Regional Aquaculture Center
NRCS	National Resources Conservation Service (USDA)
NREL	National Renewable Energy Laboratory (DOE)
NROC	Northeast Regional Ocean Council
NSCPO	Naval Seafloor Cable Protection Office
NUWCDIVNPT	Naval Undersea Warfare Center Division Newport
OLE	Office of Law Enforcement (NMFS)
RPB	Regional Planning Body
RTOC	Regional Tribal Operations Committee
SOST	Subcommittee on Ocean Science and Technology
USACE	US Army Corps of Engineers
USAF	US Air Force
USCG	US Coast Guard
USFWS	US Fish and Wildlife Service
USGS	US Geological Survey

Acronyms and Abbreviations—Acts, Laws

AIRFA	American Indian Religious Freedom Act
ARRA	American Recovery and Reinvestment Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DWPA	Deepwater Port Act
ESA	Endangered Species Act
FWCA	Fish and Wildlife Coordination Act
FWPCA	Federal Water Pollution Control Act
ICOOS	Integrated Coastal and Ocean Observation System Act
MARPOL	International Convention for the Prevention of Pollution from Ships
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act
MPRSA	Marine Protection, Research, and Sanctuaries Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Protection Act
NHPA	National Historic Preservation Act
NMSA	National Marine Sanctuaries Act
OCSLA	Outer Continental Shelf Lands Act
OPA	Oil Pollution Act
PWSA	Ports and Waterways Safety Act
RHA	Rivers and Harbors Act
WRDA	Water Resources Development Act

Other Acronyms and Abbreviations

ACFHP	Atlantic Coast Fish Habitat Partnership
ACJV	Atlantic Coast Joint Venture
ACPARS	Atlantic Coast Port Access Route Study
AFSI	Atlantic Flyway Shorebird Initiative
AFTT	Atlantic Fleet Training and Testing
AIS	Automatic Identification System
AMAPPS	Atlantic Marine Assessment Program for Protected Species
AMBCC	Atlantic Marine Bird Conservation Cooperative
ASAP	Atlantic Sand Assessment Project
ATON	Aids to Navigation
AWOIS	Automated Wreck and Obstruction Information System
BCR-30	New England/Mid Atlantic Coast Bird Conservation Region
BO	biological opinion
CAP	Continuing Authorities Program
CFR	Code of Federal Regulations

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CMECS	Coastal and Marine Ecological Classification Standard
COTP	Captain of the Port
DWP	deepwater port
EEZ	exclusive economic zone
EFH	essential fish habitat
ESI	Environmental Sensitivity Index
ESPIS	Environmental Studies Program Information System (BOEM)
FMP	fishery management plan
FNP	federal navigation project
GDP	gross domestic product
GIS	geographic information systems
GLD	geographic location description
HAPC	Habitat Area of Particular Concern
HSC	harbor safety committee
IEA	important ecological area
ISMN	Integrated Sentinel Monitoring Network
ISSC	Interstate Shellfish Sanitation Conference
JB MDL	Joint Base McGuire-Dix-Lakehurst
LIDAR	light detection and ranging
LNG	liquefied natural gas
LOA	letter of authorization
MDAT	Marine-life Data and Analysis Team
META	Maritime Environmental and Technical Assistance
MOA	memorandum of agreement
MOU	memorandum of understanding
MTS	Marine Transportation System
NALCC	North Atlantic Land Conservation Cooperative
NAM ERA	Northwest Atlantic Marine Ecoregional Assessment
NEAMAP	Northeast Area Monitoring and Assessment Program
NEP	National Estuary Program
NERACOOS	Northeastern Regional Association of Coastal and Ocean Observing Systems
NERRS	National Estuarine Research Reserve System
NFHAP	National Fish Habitat Action Plan
NGDA	National Geospatial Data Asset
NNA	negotiated noncompetitive agreement
NOC ESG	National Ocean Council Executive Steering Group
NPDES	National Pollutant Discharge Elimination System
NS	Naval Station
NSB	Naval Submarine Base
NSSP	National Shellfish Sanitation Program
NWR	National Wildlife Refuge
O&M	operations and maintenance
OBIS-SEAMAP	Ocean Biogeographic Information System Spatial Ecological Analysis of Megavertebrate Populations
OCS	Outer Continental Shelf
OHI	Ocean Health Index
OOS	ocean observing systems
OOSSG	Ocean Observing System Security Group
OPAREA	operating area
PARS	Port Access Route Study
PNSY	Portsmouth Naval Shipyard
PSP	paralytic shellfish poisoning
RCT	regional coordination team
ROD	Record of Decision
SDJV	Sea Duck Joint Venture
SHARP	Saltmash Habitat and Avian Research Program
SHPO	State Historic Preservation Officer
SINKEX	sink at-sea live-fire training exercise
SMAST	School of Marine Science and Technology, University of Massachusetts
TEU	twenty-foot equivalent unit
THPO	Tribal Historic Preservation Officer
TNC	The Nature Conservancy
TSS	Traffic Separation Scheme
VACAPES	Virginia Capes
VIMS	Virginia Institute of Marine Science
VMS	Vessel Monitoring System
VTS	Vessel Traffic System
WAMS	Waterways Analysis and Management System
WEA	Wind Energy Area

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"We are tied to the ocean.
And when we go back to the sea, whether it is to sail or to watch it,
we are going back from whence we came."

PRESIDENT JOHN F. KENNEDY

NORTHEAST