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Northeast Ocean Data Portal
2020 Work Plan

Northeast Regional Ocean Council

Ocean Planning Committee

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Northeast Ocean Data Portal Work Plan

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Purpose

The purpose of this work plan is to guide activities that support the maintenance and enhancement of the Northeast Ocean Data Portal (Portal), with particular focus over the next year. These activities pertain to four main categories:

1. Regional ocean data priorities
2. Application development
3. Maintenance of web/IT infrastructure
4. Communication and engagement

Section 1 identifies and organizes regional ocean data priorities and presents a plan for advancing them. Within each of more than ten ocean data themes, this work plan describes each dataset currently available on the Portal (as of December 2019), its current status, its recommended update schedule, and any dependencies. Dependencies refer to the collaboration and coordination required to manage large datasets under each theme. The Portal is reliant on Federal, state, and stakeholder-derived data or data products, and in order to adhere to the data maintenance and update schedules proposed below, the Portal Working Group needs certainty in receiving data from these sources and reliability in the timing of data delivery. For example, if a data provider changes the location of its web services or there is an interruption to the provider's web service delivery, there should be a system in place to notify the appropriate Portal contacts. Lastly, this section describes focal entities, processes, and timelines for stakeholder review and input on each ocean data theme.

Section 2 describes development tasks needed to maintain critical Portal functions such as the Data Explorer and Theme Maps, and other tasks that may be needed to enhance existing tools and provide upgrades to tool-functionality.

Section 3 describes the tasks relevant to Portal web/IT infrastructure maintenance.

Finally, a Communication and Engagement work plan is included in Section 4.

1 Regional Ocean Data Priorities

The following section describes regional ocean data priorities, including data gaps and emerging data priorities for each category of data.

Data gaps

Throughout the Northeast Ocean Plan development process, several data gaps were identified (see [Northeast Ocean Plan Chapter 5 – Science and Research Priorities](#)). While some have been addressed or are beginning to be addressed, others remain. This work plan includes known data gaps, and can be updated as additional data gaps arise.

Priorities recently identified by Ocean Planning Committee members and stakeholders

Stakeholder data priorities articulated through the ocean planning process that led to the 2016 Northeast Ocean Plan are integrated into each data category in this work plan. Since that time the NROC Ocean Planning Committee (NROC OPC) has gathered additional input on particular priorities. That recent input is summarized briefly below and integrated into the appropriate data category in this work plan.

Priority	Progress in 2019
Fishing	As part of the Regional Ocean Data Sharing Initiative, NROC and MARCO are collaborating on updating fishing data products on both regional Portals. The project will address stakeholder feedback, including the need for characterizations of the lobster fishery, and Vessel Monitoring System data product updates, among others. Stakeholders also identified a need for data products addressing climate change and fisheries
Energy	The NROC OPC provided feedback on how the Portal can continue to coordinate with BOEM and other agencies/entities to present timely data and information relevant to offshore wind development processes, including hosting high-resolution project-specific data and/or developer data, and providing additional context on project status and data availability.
Administrative and other contextual data	The Portal incorporated the amended Rhode Island Geographic Location Description, New England Fishery Management Council draft management area alternatives, and the proposed Isles of Shoals North Disposal Site. The Portal will continue to include dynamic management and regulatory boundaries or proposed actions, such as proposed fisheries management areas, vessel discharge and disposal rules.
Nearshore data	The NOAA Coastal Services Center is funding a project to synthesize existing high-resolution LiDAR and bathymetry data from Maine to Cape Cod. Data products will include seamless coastal topography-nearshore bathymetry data and Geoform classifications. The Portal working group contributes to this project by advising on user needs and overall data product development.
Blue economy	Data products reflecting updated characterizations of coastal economic activity and socioeconomic metrics are needed. The Portal currently houses some data products from the 2016 Northeast Ocean Plan’s Baseline Assessment (which reflects ~2013 conditions).

Tools	<ul style="list-style-type: none">• Analysis tools to determine compatibility/conflicts• Outputs of predictive models, such as for marine life wind farm avoidance, sea level rise and climate change, species range shifts due to climate change
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The table below summarizes the data priorities and dependencies within each category. Click on the category or subcategory in the table for more information about current status, update schedule, dependencies, and stakeholder review and input.

Summary of regional data priorities, dependencies, and update schedule in each data category

Category	Subcategory	Data Priorities	Dependencies	Update schedule
Marine Life and Habitat	Cetaceans	<p>Predicted density of whale, dolphin, and porpoise species</p> <p>Total abundance and species richness for cetacean ecological groups, species of concern, and stressor groups</p>	US Navy, NOAA AMAPPS, Duke MGEL	3-5 years
	Birds	<p>Predicted density of seabird species</p> <p>Total abundance and species richness for bird spatial groups, ecological groups, species of concern, and stressor groups</p> <p>Movement and tracking data for 3 species from USFWS</p>	USFWS, NOAA NCCOS, BOEM	3-5 years
	Fish	<p>Observed biomass of fish species</p> <p>Total biomass and species richness for fish ecological groups, managed species groups, and stressor groups</p>	NOAA NEFSC, NEAMAP, states	3-5 years
	Sea turtles	<p>Predicted Loggerhead density from tracking data</p>	NOAA NEFSC	3-5 years
Marine Life and Habitat	ESA Section 7 Consultation Areas	ESA Section 7 Consultation Areas and Critical Habitats	NOAA GARFO Protected Resources	As designations change
	Eelgrass	Eelgrass extent	States	Every 2 years
	Kelp and macroalgae	Under development/scoping - Kelp percent cover	Maine DMR, Bigelow, Brown University	TBD

		Not yet available – macroalgae		
	Physical habitat	Sediment grain size data, seafloor morphology, and oceanography data (e.g., climatologies of surface/bottom current speed, temperature, and stratification).	USGS, BOEM, UMass Dartmouth SMAST, NERACOOS	3-5 years
	Biological habitat	Chlorophyll-a concentrations, zooplankton abundance, wetlands, shellfish habitat, cold water corals, and other benthic fauna.	NOAA NEFSC, USFWS, states, NOAA, UMass Dartmouth SMAST	3-5 years
Aquaculture	Aquaculture data	Permitted and leased aquaculture operations	States, ACOE, NOAA	Annually
	Shellfish Management Areas	Open, conditional, closed shellfishing areas	States	Annually or as designations change
Fishing	Vessel activity	Total activity and speed thresholds applied to Vessel Monitoring System data for Multispecies (groundfish) FMP, Monkfish, Scallop, Surfclam/Ocean Quahog, Herring, and Squid, and Pelagics (herring, mackerel, squid)	NOAA Fisheries	Preferably annually; at least every 2 years
	Management areas	Current fishery management areas and management area alternatives under consideration by NEFMC and NOAA	NOAA GARFO, NEFMC	As designations change
	Communities at sea	Vessel trip report data products organized by port, gear type, or both	NOAA Fisheries, NEFMC	3-5 years
Fishing	Lobster fishery	Under development	TBD	TBD
	Recreational fishing	Under development	TBD	TBD
Cultural resources	Historic sites and landmarks	Historic sites, landmarks, districts, and properties listed on the National Register of Historic Places	NPS	Every 2 years

	Coastal parks and reserves	National Park Service, state, local, and some private conservation lands	NPS, states, The Nature Conservancy	Every 2 years
	Tribal cultural resources	Not yet available - Natural resources with Tribal cultural significance; submerged archaeological resources	TBD, possibly Tribes, BOEM	TBD
Energy and infrastructure	Planning areas	Various stages of the offshore wind planning and lease process, as well as permitted projects, projects in review (e.g., hydrokinetic energy projects, cable and pipeline projects), projects with preliminary permits, research leases and demonstration sites, and active renewable energy leases; state and federal planning areas	Project proponents, states, BOEM, DOE, FERC	As areas change, projects are permitted, or projects are proposed
	Infrastructure	Locations of cables, pipelines, other transmission lines, and energy facilities	Industry, DOE, FERC	Annually
Marine transportation	Navigation	Anchorage, pilot boarding areas, safety and security zones, ocean disposal sites, navigation corridors and traffic lanes	NOAA, USCG, EPA, industry	Every 2 years or as designations are modified
Marine transportation	Vessel traffic	Annual and monthly vessel transit counts derived from Automatic Identification System (AIS) data for all vessels, cargo, passenger, tug-tow, fishing, tanker, pleasure-craft-sailing, and other vessel categories	USCG	Annually

National security	National security data	Danger zones, restricted areas, submarine transit lanes, and warning areas; military installation locations; military range complexes; testing and training areas; and OPAREA boundaries	US Navy, USCG	As provided by relevant entities; at least every 5 years
Recreation	Boating	Recreational boating density and recreational boating routes, distance sailing routes; AIS data products could be developed	Recreational stakeholders, industry, USCG	3-5 years
	Whale watching	Commercial whale watching areas; AIS data products under development	Whale watching stakeholders, industry, USCG	3-5 years
	SCUBA	Recreational SCUBA diving areas data	SCUBA stakeholders and industry groups	3-5 years
	Recreation areas	Boat launches, water trails, and coastal parks and reserves	States	3-5 years
Restoration	Restoration data	Potential and completed restoration projects	States, ACOE, EPA, NOAA Fisheries, USFWS, other restoration partners and stakeholders	Every 2 years or as often as the NROC Restoration Subcommittee requests
Water quality	No discharge zones	Locations of no discharge zones	EPA	Every 2 years
	Impaired waters and wastewater discharges	Impaired waters designations and locations of wastewater discharges	EPA	As provided
Bathymetry	Bathymetry data	Individual bathymetry survey data products, bathymetry composites/mosaics of broader geographic areas	NOAA NOS, NOAA OCM, University of NH, states	Every 2 years
Offshore sand	Offshore sand data	Location of aliquots with sand resources Not yet available – location of onshore sand resource needs (e.g., beach nourishment) and	TBD, possibly BOEM, ACOE, states	TBD

		location of offshore sand borrow sites		
<u>Administrative and other contextual data</u>	<u>Administrative data</u>	Coastal/ocean political boundaries, regulatory and management boundaries	NOAA, BOEM, other agencies	At least every 2 years or as designations change for regulatory and management boundaries
	<u>Other contextual data</u>	Locations of ocean observing buoys, monitoring stations, and coastal demographic and economic data	NERACOOS, NOAA	2 years

1.1 Marine Life and Habitat

Several thousand cetacean, bird, and fish species data products are presently provided and served by the Marine-life Data and Analysis Team (MDAT), led by the Marine Geospatial Ecology Lab (MGEL) at Duke University. MDAT members include MGEL who have produced cetacean data products, the NOAA National Centers for Coastal and Ocean Science (NCCOS) and Loyola University who have produced avian data products, and the NOAA Northeast Fisheries Science Center (NEFSC) who have produced fish data products. Many additional marine life and habitat data products, including eelgrass, physical habitat data, and biological habitat data, are provided by or were developed with other agencies and groups such as NOAA GARFO, NOAA NEFSC, USFWS, NERACOOS, The Nature Conservancy (TNC), and the states.

Cetaceans

Cetacean data products represent the predicted density of species of whales, dolphins, and porpoises. Summary products for cetaceans include predictions of total cetacean abundance and species richness for all cetacean species, ecological groups (e.g., baleen whales), species of concern (e.g., ESA-listed species), and stressor groups (e.g., species sensitive to low frequency sound).

Current status

Individual species products for 11 cetacean species or species guilds, and all associated summary products, were updated by MGEL in August 2018. Individual species products for 12 additional cetacean species or species guilds, and all associated summary products were updated by MGEL in June 2019. Scoping for a companion cetacean survey effort layer is now underway, with a new product potentially available in 2020.

Update schedule

Cetacean data products should be updated every 3-5 years. The update process includes expert review, revision, and documentation development for individual species products conducted by the data provider. Once individual species data products are integrated into summary products, another round of ocean planning expert review is conducted by NROC entities. In the past this process has taken between 8-14 months; therefore, the next update to cetacean data products should be initiated in 2020.

Dependencies

The frequency of new data (observations) collection, processing, database entry, and QA/QC by Federal, state, and non-government entities is the first major dependency. Sufficient new data needs to be accumulated to make a full update worthwhile. However, new data in key areas that were previously data-deficient or are of particular importance/interest to the species could be enough to initiate an update.

The frequency of cetacean data updates is also determined by the needs of the US Navy Fleet Forces Command, and/or the data collection and development schedule of the NOAA Atlantic Marine Assessment Program for Protected Species (AMAPPS). These agencies/programs, who have each generated individual cetacean species data products in the past, could be coordinated to determine an appropriate set of products for ocean planning purposes, and a consistent update frequency.

Overall, updates to cetacean data products should be coordinated and ideally occur simultaneously with other marine life taxa to maximize efficiency.

There is a need to consider the long-term vehicle for cetacean data to the Portal, and whether that vehicle is MGEL or a/multiple Federal source/s.

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Birds

Bird data products represent the predicted density of species of seabirds. Summary products for birds include predictions of total bird abundance and species richness for all bird species, ecological groups (e.g., diving and pursuit plunging birds), spatial groups (e.g., nearshore and offshore species), species of concern (e.g., State-listed species), and stressor groups (e.g., species sensitive to displacement from offshore energy infrastructure).

Current status

Individual species products for approximately 40 avian species, and all associated summary products, were updated by MDAT in August 2018.

The Portal coordinated with USFWS and BOEM to present data products for 3 diving bird species that are particularly vulnerable to impacts for offshore renewable energy, derived from movement/tracking studies. These data products were made available on the Portal in 2019.

Update schedule

Bird data products should be updated every 3-5 years. The update process includes expert review, revision, and documentation development for the individual species model results conducted by the data provider. Once individual species data products are integrated into summary products,

another round of ocean planning expert review is conducted by NROC entities. In the past this process has taken between 8-14 months; therefore, the next update to bird data products should be initiated in 2020.

Dependencies

The frequency of new data (observations) collection, processing, database entry, and QA/QC by Federal, state, and non-government entities is the first major dependency. Sufficient new data needs to be accumulated to make a full update worthwhile. However, new data in key areas that were previously data-deficient or are of particular importance/interest to the species could be enough to initiate an update.

For bird observations, the primary databases are the USFWS Northwest Atlantic Seabird Catalog and the Canadian Wildlife Service (Environment and Climate Change Canada) Eastern Canada Seabirds at Sea database. NOAA NCCOS, with funding from BOEM, uses data from these sources to develop individual avian species models.

Overall, updates to bird data products should be coordinated and ideally occur simultaneously with other marine life taxa to maximize efficiency.

There is a need to consider the long-term vehicle for bird data to the Portal, and whether that vehicle is MDAT or the Federal source.

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Fish

Bird data products represent the observed biomass of species of fish caught by trawl survey programs throughout New England. Trawl datasets are each represented by separate data products and include the NOAA NEFSC trawl, North East Area Monitoring and Assessment Program (NEAMAP) trawl, Maine/New Hampshire trawl, Massachusetts trawl, and Long Island Sound trawl.

Summary products for fish are developed only for NEFSC trawl data and include maps of total fish biomass and species richness for all fish species, ecological groups (e.g., demersal fish), managed species (e.g., species in the Multispecies Fishery Management Plan), and stressor groups (e.g., species sensitive to changes in abundance due to climate change stressors).

Current status

NEFSC trawl data products were updated in 2019, using NEFSC methods and code. The new data products include spring and fall observed and mean biomass for 81 species over approximately the last decade (2010-2017). State trawl data products were last updated in 2018, when MDAT refined calculation methods only. Historical NEFSC trawl data products (i.e., for decades between 1970 and 2010) could be made available to the Portal through a project coordinated by the Virginia Coastal Program and conducted by The Nature Conservancy. These products could be added to the Portal in 2020.

The Portal is currently coordinating with Rhode Island DEM to display Narragansett Bay and RI Sound fish trawl data products in the Portal.

Update schedule

Fish data products should be updated every 3-5 years. The update process includes expert review, revision, and documentation development for the individual species data products conducted by the data provider. Once individual species data products are integrated into summary products, another round of ocean planning expert review is conducted by NROC entities. In the past this process has taken between 8-14 months; therefore, the next update to fish data products should be initiated in 2020.

Dependencies

The frequency of new data (observations) collection, processing, database entry, and QA/QC by Federal, state, and non-government entities is the first major dependency. However, fish trawl surveys have been consistently conducted by all responsible entities at least annually and often 2+ times per year.

NOAA NEFSC has made recent progress streamlining workflows to process, enter, and QA/QC NEFSC trawl data into electronic databases.

Obtaining data and developing spatial data products from each of the state trawl programs and NEAMAP represents a significant amount of effort. State trawl programs that have contributed data include Connecticut DEEP, Rhode Island DEM, Massachusetts DMF, Maine/New Hampshire DMR. The primary challenge is that each trawl program collects data using tools and methods chosen specifically for that program; therefore results cannot simply be pooled and displayed together. Comparable but separate map products should be developed for each program.

There is a need for NOAA NEFSC to coordinate with NEAMAP and the state trawl programs to obtain updated data at a regular frequency and to maintain these additional data products.

There is a need to consider the long-term vehicle for fish data to the Portal, and whether that vehicle is NEFSC or if another entity should coordinate delivery of the Federal, NEAMAP, and state trawl data.

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Sea turtles

Current status

Monthly density products for tagged loggerhead sea turtles provided by NEFSC were released on the Portal in late 2019. The data products are coarse (~40km) resolution and mapped onto the AMAPPS grid. Legacy spatial data for multiple sea turtle species derived from the TNC Northwest Atlantic Marine Eco-Regional Assessment (NAMERA) were retired in August 2018 due to the age of the data (>10 years).

Update schedule

Sea turtle data should be updated every 3-5 years. The update process should include expert review, revision, and documentation development for the results generated by the data provider. Prior to inclusion in the Portal, agency staff, other experts, and stakeholders should review and provide feedback on data accuracy and presentation.

Dependencies

NOAA NEFSC provided the monthly loggerhead sea turtle data products on the Portal.

Sea turtle stranding data, although more widely available than live observations, is not desirable for producing regional-scale data products representative of sea turtle distribution or occurrence.

Regional-scale sea turtle observation data are sparse.

Sea turtle observation data may be collected by various programs using different methods.

The NOAA AMAPPS may be one source of regional-scale sea turtle data.

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ESA Section 7 Consultation Areas

Current status

The Portal Working Group is currently working with NOAA GARFO to determine how ESA Section 7 Consultation Areas data products can be presented on the Portal by the end of 2018. Options include:

- Portal hosts the data
- Portal hosts one or two composite data products that summarize ESA Section 7 Consultation Areas and directs users to the NOAA GARFO web mapping tool to obtain individual layers
- NOAA GARFO hosts all data products related to ESA Section 7 Consultation Areas (including individual areas and any composite products) and the Portal ingests them via web services

Update schedule

ESA Section 7 Consultation Areas data products should be updated by NOAA GARFO as designations change.

Dependencies

If NOAA GARFO hosts these data, the changes will immediately flow down to the Portal. If the Portal hosts the data, updates including re-calculation of any composite/summary products and expert review, may require 1-3 months.

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Eelgrass

Eelgrass data on the Portal is a single composite layer of current eelgrass coverages from each New England state. The Portal also houses an eelgrass “resource page”, which contains a catalog of many historical eelgrass datasets in addition to previous and current eelgrass regional coverages.

Current status

Updates to eelgrass data were requested from states in mid 2017 and the regional layer was published in 2018.

Update schedule

Eelgrass data should be updated every 2 years; the next update should be initiated in 2019.

Dependencies

Eelgrass data is provided by the state agencies who coordinate eelgrass surveys, including Maine DMR, the University of New Hampshire, Massachusetts CZM/DFW, Rhode Island DEM/University of Rhode Island, and Connecticut DEEP. When the current composite eelgrass layer is updated, the historical datasets catalog on the Eelgrass resource page should also be updated (i.e., the last version is moved to historical).

Once QA/QC'd data are received, updates can be published in 6 months (including expert review).

The next request for eelgrass data should be made to states in early 2020.

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Kelp and macroalgae

Kelp forests and macroalgae distribution and abundance data were identified as a data gap in the 2016 Northeast Ocean Plan and since. Outreach and engagement with research scientists in the region in 2019 identified several publicly-available datasets derived from legacy and ongoing kelp monitoring efforts. In 2020, these data could be synthesized, with guidance and input from the scientists, to develop a regional kelp layer:

- Doug Rasher, Bigelow Labs – 2019 is year 1 of multi-year Maine coastal kelp assessment
- Kelp Ecosystem Ecology Network (<http://kelpecosystems.org/>) – sites throughout the Northeast, seasonal/annual since 2014
- Witman Cashes Ledge (and other Gulf of Maine sites) time series – 1987, 2012, 2014-2016

Research scientists and Maine also suggested that the Portal could leverage kelp monitoring data that are collected by the Maine Department of Marine Resources (DMR) during their annual urchin surveys.

Current status

Kelp forests and macroalgae are not currently depicted on the Portal.

Update schedule

To be determined.

Dependencies

Kelp and macroalgae distribution and abundance data are not routinely collected by federal agencies. States and/or academic researchers may be able to provide data on this topic, including Maine DMR and those research scientists listed above.

Physical habitat

Physical habitat data include sediment grain size data, seafloor morphology, and oceanography data (e.g., climatologies of surface/bottom current speed, temperature, and stratification).

Current status

Physical habitat data were updated in 2016, and should be updated and revised in 2020 in collaboration with NERACOOS and other partners.

Update schedule

Physical habitat data should be updated every 3-5 years, or when new composites of coastal bathymetry/LiDAR, substrate, or state mapping program data are made available.

Dependencies

USGS maintains the East Coast Sediment Texture Database

BOEM is funding seafloor data collection by various entities throughout New England for efforts related to offshore sand management, offshore renewable energy planning, and other resource management purposes. There is a need to understand the repository(ies) for these data and if/how they can contribute to regional characterizations of seafloor features.

Oceanographic data products (sea surface and bottom temperature, stratification, surface and bottom current speed) were developed via a collaboration between UMass Dartmouth and NERACOOS from FVCOM hindcast outputs. NERACOOS could continue to serve as provider of climatological physical oceanography products and expert review.

Data acquisition, analysis, processing, and development of updated spatial data products would require 3-6 months of Portal Working Group effort.

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Biological habitat

Biological habitat data include chlorophyll-a concentrations, zooplankton abundance, wetlands, shellfish habitat, cold water corals, and other benthic fauna.

Current status

All biological habitat data were updated in 2016. Climatological data products for chlorophyll-a concentrations and zooplankton abundance should be updated in 2020. Other biological habitat products, such as shellfish habitat, should be evaluated for updates in 2020.

Update schedule

Biological habitat data should be updated every 3-5 years.

Dependencies

Chlorophyll-a concentrations: Data products characterizing regional chlorophyll-a concentrations and patterns in primary productivity are developed by NOAA NEFSC as part of the Northwest Atlantic Continental Shelf Ecosystem Status Report. The present dataset was compiled by TNC.

Zooplankton abundance: Data products characterizing regional zooplankton abundance and patterns in secondary productivity are developed by NOAA NEFSC as part of the Northwest Atlantic Continental Shelf Ecosystem Status Report. The present dataset was compiled by TNC. In

2019, NEFSC publicly released zooplankton and ichthyoplankton abundance and distribution data collected between 1977-2017 via the NCEI repository.

Wetlands data: Obtained from the US Fish and Wildlife Service National Wetlands Inventory and hosted by the Portal.

Shellfish habitat: Provided by the states.

Cold water corals: As of 2019, the Portal leverages Marine Cadastre web services for deep-sea soft and stony coral habitat suitability models.

Other benthic fauna: Provided by the University of Massachusetts Dartmouth School of Marine Science and Technology in partnership with TNC; hosted by the Portal.

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Marine Life and Habitat Data Stakeholder Review and Input

Marine life and habitat stakeholder review and input will be obtained via webinars, workshops, conferences and/or individual outreach on draft datasets and changes to the overall presentation of the data on the Portal.

There is interest from some agency's marine life data providers (e.g., USFWS, NEFSC) to convene an ad-hoc work group in 2020 to discuss and encourage the development of additional data products based on telemetry and tracking data. The Portal will help facilitate these discussions via webinars and individual outreach.

Key stakeholders include the experts within Federal and state agencies, and academia who have previously served on work groups throughout marine life and habitat data development processes.

Additional key stakeholders include industry members (e.g., commercial fishing, whale-watching), environmental conservation organizations, and citizen science groups (e.g., bird-watching).

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1.2 Aquaculture

The Aquaculture theme includes datasets relevant to the spatial location/footprint of aquaculture operations as well as shellfish management areas.

Aquaculture Data

Current status

Aquaculture data were updated in 2019, however, the composite layer displayed on the Portal is composed of each state's individual aquaculture dataset which are updated by the states on different timelines. For example, the composite layer contains information from between 2013 and 2019, depending on the state. ME, NH, and RI aquaculture datasets were updated in 2019.

Updates to permitted and leased aquaculture operations will continue to be completed in 2020, per coordination with the states.

Update schedule

Aquaculture data should be updated annually.

Dependencies

Each state fisheries and/or aquaculture management agency maintains the data that are eventually compiled in the Portal into a single regional aquaculture layer. The states provide those data to the Portal dependent on their own update cycles.

The ACOE may maintain a database of all permitted aquaculture operations in the region, which can be used to confirm/verify state-level data.

As aquaculture operations in federal waters become more common, increased coordination with NOAA NMFS will be required to obtain relevant data and updates.

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Shellfish Management Areas

Current status

Shellfish Management Areas were updated in 2019, however, the composite layer displayed on the Portal is composed of each state's individual shellfish management areas dataset which are updated by the states on different timelines. For example, the current composite layer contains information from between 2013 and 2019, depending on the state. Maine DMR provides its data as a web service, so monthly updates are automatically reflected in the Portal.

Update schedule

Shellfish Management Areas should be updated every 2 years or as often as states make changes to the data.

Dependencies

Shellfish Management Areas data are obtained from the states. Maine DMR provides its data as a web service, so monthly updates are automatically reflected in the Portal.

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Aquaculture Data Stakeholder Review and Input

Aquaculture stakeholder review and input will be obtained via webinars, workshops, conferences and/or individual outreach on draft datasets and changes to the overall presentation of the data on the Portal.

Key stakeholders include states, US Army Corps of Engineers (ACOE), NOAA, and aquaculture practitioners.

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1.3 Fishing

The Portal includes a Commercial Fishing theme with datasets representing commercial fishing vessel activity derived from the Vessel Monitoring System (VMS), fisheries management areas, and fishing activity data derived from Vessel Trip Reports (VTR) and other sources.

Recreational fishing data is also of interest, but not currently available on the Portal. New work in 2020 will seek to address this data gap.

At the end of 2019 and throughout 2020, NROC and the Mid-Atlantic Regional Council on the Ocean (MARCO) are partnering with each other and with the commercial fishing industry to develop updated map and data products for the Portals that show the use of ocean space by industry through a project known as the Regional Ocean Data Sharing Initiative. Through this project, new and/or updated fishing data products in several of the categories below may be available in 2020, including data products representing the lobster fishery, which has been recognized as a data gap in the region. The project team will also consider and discuss creating new products that merge multiple data sources to provide a more in-depth understanding of effort and catch.

Vessel Activity

Current status

Vessel activity data were updated in 2018 with data through 2016. They are provided in two-year increments. Vessel activity data are aggregated by fishery management plan (FMP) and include the Multispecies (groundfish) FMP, Monkfish, Scallop, Surfclam/Ocean Quahog, Herring, and Squid. A “Pelagics” group (herring, mackerel, squid) is also presented to show together vessels that fish these species similarly and/or under separate permits.

Total vessel activity and vessel activity under a specific speed threshold are both shown for each fishery. Speed thresholds were determined with industry input to better distinguish fishing activity from transits and non-fishing activity. However, many non-fishing activities such as processing catch, sorting, drifting, and idling may also occur below the applied speed thresholds.

Additional categories of vessel activity for existing windows of data are being explored and analyzed, for potential release in 2020. These categories include various classifications of “Declared Out of Fishery”, which correspond to non-fishing activity by vessels carrying a vessel monitoring system.

Through the Regional Ocean Data Sharing Initiative, new products for 2017-2018 will be developed with the same methods used previously.

Update schedule

Vessel activity data should be updated annually.

Dependencies

NOAA NMFS is the source of vessel monitoring system (VMS) data. VMS data represents vessel activity for those vessels carrying federal fishing permits only. Adequate data processing, QA/QC, and advice on how to map VMS codes are important for efficiently visualizing and displaying fishery-specific products on the Portal. Once processed and QA/QC'd data are received, updates can be published in 3-6 months (including expert and industry review).

Management Areas

Fishery management areas includes current (i.e., finalized) Management Areas as well as Management Area Alternatives that are under consideration by NOAA and NEFMC. The hosting of Management Area Alternatives supports the Council's review process and makes relevant data layers and information available to Council members and the public.

Current status

The Final NEFMC Preferred Alternatives for both the Coral Amendment and the Clam Dredge Framework were added in 2018 and 2019, respectively. The representation of other Management Areas from NOAA GARFO was streamlined and updated in 2019.

The Portal will continue to support the assessment and review of NEFMC alternatives for proposed management actions by posting relevant data and information.

Update schedule

Updated Management Areas data are obtained from NOAA GARFO as they are published.

Updates to or progress on Management Area Alternatives are obtained from NEFMC when alternatives are discussed by Council committees.

Dependencies

Updates to Management Areas data could be streamlined if the Portal could ingest web services maintained by NOAA GARFO.

Management Area Alternatives are obtained from NEFMC. In order to prepare data for Council committee consideration, the Portal need to receive data, metadata, and contextual information approximately 2 weeks in advance.

Communities at Sea (CAS)/Vessel Trip Reports (VTR)

Current status

The Communities at Sea/VTR data (1996-2015) were added to the Portal in 2019. These data products represent federal VTRs only. The Regional Ocean Data Sharing Initiative will explore updating these products using 2016-2018 data. This project will also explore creating new products that merge VMS, VTR, and dealer reporting data to more completely depict patterns in effort and catch.

Update schedule

Communities at Sea/VTR data should be updated every three to five years or replaced by other analyses of community fisheries activity that are being conducted and will be replicated by NOAA, the NEFMC, or others.

Dependencies

NOAA NMFS provides Vessel Trip Report data and dealer reports that comprise these data products.

Lobster fishery

Current status

Datasets on the Portal pertinent to the lobster fishery are presently limited. The Regional Ocean Data Sharing Initiative will identify any short-term products or solutions for depicting the lobster fishery in the Portals and develop a longer-term plan for characterizing the extent, historical use, and temporal and spatial dynamics of the lobster fishery.

Update schedule

To be determined.

Dependencies

Industry, the states and NOAA NMFS are sources for lobster fishery data.

Recreational fishing

Current status

There is currently no recreational fishing data on the Portal. The Regional Ocean Data Sharing Initiative will identify any short-term products or solutions for depicting recreational fisheries (e.g., the recreational fishing charter industry and the extent of private recreational fishing activity) and to develop a longer-term plan for characterizing the extent and footprint of these fisheries.

Update schedule

To be determined.

Dependencies

Through the Regional Ocean Data Sharing Initiative, spatial data development for recreational fishing vessel activity or recreational fishing areas would occur in collaboration with recreational fishing groups. Existing sources of data, such as AIS and federal VTRs, could be leveraged to create a partial picture of recreational fishing activity which could then be reviewed and revised by recreational fishermen through participatory GIS or other methods.

Commercial Fishing Data Stakeholder Review and Input

Key stakeholders and venues include states, NOAA National Marine Fisheries Service, the New England Fishery Management Council, industry groups, and industry meetings/conferences. Commercial fishing stakeholder review and input will be obtained via webinars, workshops,

conferences and/or individual outreach on draft datasets and changes to the overall presentation of the data on the Portal.

The fishing data development project conducted through the Regional Ocean Data Sharing Initiative represents a major avenue for stakeholder review and input in 2020. The project was designed to include industry representatives throughout and by including the Responsible Offshore Development Alliance (RODA) as a project partner. Industry focus groups will review the data that are currently available, consider the ways in which fisheries data are currently being used or will potentially be used to inform decision-making, provide guidance on the products that need to be developed in the short and long term, and inform the development of options for filling significant fisheries related data gaps.

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1.4 Cultural Resources

Cultural Resources data on the Portal includes publicly-available locations and information for historic sites, landmarks, coastal parks, reserves, and other data products determined by tribes to reflect cultural importance.

Historic Sites and Landmarks

Current status

A review and update of all maps and data depicting historic sites, landmarks, districts, and properties listed on the National Register of Historic Places began in 2019 and will be completed in 2020.

Update schedule

Historic sites and landmarks should be updated every 2 years.

Dependencies

Historic sites, landmarks, districts, and properties data are derived from the National Register of Historic Places. These data and associated information are maintained by each state and the National Park Service.

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Coastal Parks and Reserves

Current status

The coastal parks and reserves data product includes National Park Service, state, local, and some private conservation lands. This product will be reviewed and updated by the end of 2018.

Update schedule

Coastal parks and reserves data should be updated every 2 years, or when the local, state, and federal entities providing the individual datasets generate an update to these data.

Dependencies

The Nature Conservancy has previously aggregated the Coastal Parks and Reserves data from the various sources and provided the resulting layer to the Portal.

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Tribal Cultural Resources

Current status

Data on the Portal to address Tribal Cultural Resources are presently limited. Tribes have discussed including existing natural resource data products under a Tribal Cultural Resources category within this theme to represent species and/or habitats of particular importance to Tribes. Additionally, ongoing studies of submerged archaeological resources may generate new data products that could be included under this umbrella. Other existing data products determined by Tribes to reflect cultural importance from other Portal themes could be included as well.

Update schedule

Tribal Cultural Resource data derived from existing data sources would be updated according to each individual dataset's update cycle.

Submerged archaeological resource data update schedules will be determined when the data are developed.

Dependencies

Natural resource data of Tribal importance will be dependent on those agencies and entities providing the data and updates (see [Marine Life and Habitat](#)).

Submerged archaeological resource data could be provided by BOEM and/or the University of Rhode Island, or other groups/entities collecting similar data or generating data products.

Cultural Resources Data Stakeholder Review and Input

Cultural resources data will be reviewed by the states, National Park Service, and Tribes. The Portal Working Group will also obtain broader stakeholder input via workshops and conferences on changes to the overall presentation of the data on the Portal.

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1.5 Energy and Infrastructure

Energy and Infrastructure data on the Portal include Federal, state, and project-based energy planning areas offshore and existing infrastructure data. As offshore renewable energy development continues to advance in the region, the Portal will continue to support timely and

efficient updates and representations of datasets (e.g., proposed project footprints, cable routes, turbine layouts, etc.) to facilitate agency and stakeholder review.

Planning Areas

Current status

Planning areas data were updated several times in 2019. Many types of planning areas are represented, including almost all stages of the offshore wind planning and lease process, as well as permitted projects, projects in review (e.g., hydrokinetic energy projects, cable and pipeline projects), projects with preliminary permits, research leases and demonstration sites, active renewable energy leases, and proposed oil and gas draft proposed program areas. State and federal planning areas are distinguished in the representations.

Update schedule

Planning area updates for several layers are obtained from BOEM and or via Marine Cadastre's web services. Other Planning area updates are made as data are provided by project proponents and relevant regulatory agencies (depending on the specific activity) including states, ACOE, BOEM, FERC, and DOE.

Dependencies

BOEM, DOE, FERC, and project proponents are the source of data for energy planning areas. As BOEM makes changes to Planning areas web services, those changes should be reflected in the Portal. States are the source of planning areas in state waters.

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Infrastructure

Current status

Infrastructure data products were updated in 2017. The Portal displays data related to the locations of electrical and telecommunications cables, pipelines, other transmission lines, and energy facilities.

Update schedule

Infrastructure products should be updated annually or as data for new infrastructure is made available. Electrical transmission lines and substations data products will be updated, in collaboration with the Mid-Atlantic Portal, in 2020.

Dependencies

Locations of cables, pipelines, and other critical energy infrastructure can be proprietary and/or classified. The Portal relies on the industry and Federal agencies (DOE, FERC) to provide datasets for these features at the scale(s) appropriate for public display.

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Energy and Infrastructure Data Stakeholder Review and Input

Key stakeholders for Energy and Infrastructure data review and input include individual project proponents, ACOE, BOEM, DOE, FERC, and the states. The Portal Working Group will also obtain broader stakeholder input via workshops and conferences on changes to the overall presentation of the data on the Portal.

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1.6 Marine Transportation

Marine transportation data includes navigation data which represents areas or zones designated for certain types of vessel traffic, routes, or activities, as well as maps depicting commercial traffic by vessel type.

Navigation

Current status

Navigation data were updated in 2019 to include new cartography and updated representation of some navigational areas. Navigation data represented on the Portal are derived from different sources and are reviewed and updated separately:

- Anchorages – both officially designated and informally-used areas
- Pilot boarding areas – both officially designated and informally-used areas
- Safety and security zones – permanent and conditional zones
- Ocean disposal sites - need to be improved/updated based on federal data holdings
- Navigation corridors and traffic lanes – static, almost never change

Update schedule

Navigation data should be updated as changes to areas are made and the theme should be reviewed every 2 years. Exceptions may exist for ocean disposal sites, which may need to be updated when new actions are made final.

Dependencies

NOAA OCM provides navigation data derived from NOAA nautical navigational charts and other sources. The USCG, NOAA, ACOE, EPA, and various industry groups also provide different types of navigational data and information, including:

- Anchorages – designated areas from USCG and NOAA, supplemented by industry and USCG knowledge of informally-used areas
- Pilot boarding areas - designated areas from USCG and NOAA, supplemented by industry and USCG knowledge of informally-used areas
- Safety and security zones - USCG
- Ocean disposal sites – ACOE and EPA
- Navigation corridors and traffic lanes – USCG and NOAA
- Navigation channels - ACOE

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Vessel Traffic

Current status

AIS data were updated in 2018 with a new processing methodology to show actual transits instead of vessel density, additional years (2015-2016), additional vessel types (e.g., fishing vessels, pleasure-craft), monthly data for some vessel types, and a slider tool to visualize the monthly data.

Update schedule

Vessel traffic data should be updated annually. Updates should be initiated as soon as possible after the close of a calendar year in order for updates to be published by the middle of the following year.

Dependencies

The USCG is the source of vessel traffic (AIS) data. Adequate processing, QA/QC, and advice on the appropriate mapping of AIS codes are important for efficiently visualizing and displaying vessel-specific products on the Portal. Once processed and QA/QC'd AIS data are received, updates can be published in 3-6 months (including expert and industry review).

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Marine Transportation Data Stakeholder Review and Input

Key stakeholders for review and input on Marine Transportation data include USCG, DOT, DOD, NOAA, ACOE, states, industry groups, port operator groups, and safety and security forums in the region. The Portal Working Group will also obtain broader stakeholder input via workshops and conferences on changes to the overall presentation of the data on the Portal.

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1.7 National Security

National security data on the Portal include areas designated for various defense purposes and uses.

National Security Data

Current status

National Security data were updated via the Marine Cadastre in 2018. The Portal represents danger zones, restricted areas, submarine transit lanes, and warning areas; military installation locations; military range complexes; testing and training areas; and OPAREA boundaries.

Update schedule

National Security data typically do not change and require infrequent reviews and updates. The Portal Working Group obtains updated National Security data products via Marine Cadastre web services. Data will be reviewed and checked by the Portal Working Group every 5 years.

Dependencies

The Department of Defense is the source of National Security data layers.

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National Security Data Stakeholder Review and Input

Key stakeholders for National security data review and input include DOD and USCG. The Portal Working Group will also obtain broader stakeholder input via workshops or conferences on changes to the overall presentation of the data on the Portal.

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1.8 Recreation

Portal data represents several recreational activities including boating, whale watching, and SCUBA diving. Additional layers represent recreational areas and facilities. Data derived from Coastal Use Surveys depict recreational activities between 2012-2015.

Boating

Current status

Recreational boating density and recreational boating routes were updated in 2013. Distance sailing routes were updated in 2015.

Update schedule

Boating data should be updated every 3-5 years.

Dependencies

In the past, boating density and routes data relied on surveys of boaters. There is an opportunity now, with the growth in AIS on recreational vessels, to derive maps of recreational boating density using automatic tracking data instead. For example, the 2015 and 2016 vessel transit count data currently on the Portal include categories for “Pleasure craft - Sailing vessel”.

To determine whether available AIS data would generate adequate representations of recreational boating patterns, there is an opportunity to collaborate with the recreational boating industry to review the existing data on the Portal from the boating survey along with newer AIS-derived data, and to consider ways to obtain additional information directly from boaters.

Whale watching

Current status

Commercial whale watching areas data were updated in 2015. New whale watching data products will be developed in 2020 by matching the names of vessels associated with known whale watching businesses and their vessel identification numbers in Automatic Identification System (AIS) databases. Whale watch operators will be convened to review and provide input on the new draft maps.

Update schedule

Whale watching data should be updated every 3-5 years.

Dependencies

Commercial whale watching data can be obtained via input and revisions to the existing data from whale watch operators, or by identifying whale watch vessels in AIS data to map whale watching areas. Convening whale watch operators to review maps of existing areas along with draft maps of whale watch vessel tracks derived from AIS would be an efficient approach.

SCUBA

Current status

Recreational SCUBA diving areas data were updated in 2015. New SCUBA diving areas data products will be developed in 2020 by matching the names of vessels associated with known dive boat operations and their vessel identification numbers in Automatic Identification System (AIS) databases. Dive boat operators and other diving stakeholders will be convened to review and provide input on the new draft maps.

Update schedule

SCUBA data should be updated every 3-5 years.

Dependencies

SCUBA stakeholders and industry groups should be convened periodically to review existing maps, add new areas, and revise data.

Recreation areas

Current status

Boat launches, water trails, and coastal parks and reserves data were updated in 2017.

Update schedule

Recreation areas data should be updated every 3-5 years.

Dependencies

Recreation areas data comes from the states.

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Recreation Data Stakeholder Review and Input

Key stakeholders for Recreation data review and input include the states, recreational boating industry groups, whale watching operators, SCUBA divers and industry groups, and other recreation stakeholder groups (e.g., Surfrider Foundation).

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1.9 Restoration

Restoration data on the Portal includes the locations of potential restoration projects identified by the NROC Restoration Subcommittee, which includes participating representatives from ACOE, NOAA, USFWS, EPA, states and Tribes.

Restoration Data

Current status

Potential restoration projects data products are updated according to availability and interest of the NROC Restoration Subcommittee. Updates will include the addition of completed restoration projects from participating agencies.

Update schedule

Restoration data should be updated every 2 years, or as often as the NROC Restoration Subcommittee requests.

Dependencies

Restoration data displayed on the Portal is currently collected and coordinated by the NROC Restoration Subcommittee, which is led by state and Federal co-chairs. Members include the states, ACOE, EPA, NOAA Fisheries, USFWS, and other restoration partners and stakeholders. Once the NROC Restoration Subcommittee provides data to the Portal Working Group, it can be integrated in 3-6 months, depending on the length of the stakeholder and expert review process.

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Restoration Data Stakeholder Review and Input

Key Restoration data stakeholders include states, ACOE, EPA, NOAA Fisheries, US Fish & Wildlife Service, and other restoration partners and stakeholders, all of which are presently coordinated via the NROC Restoration Subcommittee. The Portal Working Group will also obtain broader stakeholder input via workshops and conferences on changes to the overall presentation of the data on the Portal.

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1.10 Water Quality

The Portal displays water quality datasets that depict no discharge zones, impaired waters designations, and locations of wastewater discharges.

No Discharge Zones

Current status

No discharge zones were updated in 2016.

Update schedule

Water quality datasets should be reviewed for updates every 2 years.

Dependencies

No discharge zones data are hosted by the Portal, and so EPA and the states should notify the Portal Working Group when updates to those data are available for integration.

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Impaired Waters and Wastewater Discharges

Current status

Impaired waters and Wastewater discharges were updated between 2014-2016.

Update schedule

The Portal Working Group obtains updated Impaired waters and Wastewater discharges data products when EPA pushes updates to its web services.

Dependencies

Impaired waters and Wastewater discharges data layers are hosted and maintained by EPA.

Water Quality Data Stakeholder Review and Input

Review of Water Quality data is coordinated by the US EPA. The Portal Working Group will also obtain broader stakeholder input via workshops and conferences on changes to the overall presentation of the data on the Portal.

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1.11 Bathymetry

Bathymetry data on the Portal is housed on a “resource page”, which is a dedicated page of various resources on a topic, with a catalog-like structure.

Bathymetry Data

Current status

The Bathymetry Resources page will be updated in 2020. New bathymetry datasets for the Gulf of Maine were provided by UNH-CCOM in 2019.

Update schedule

Bathymetry resources should be updated every 2 years.

Dependencies

The majority of bathymetry products are provided by NOAA NOS (e.g., individual bathymetry survey data products) or NOAA OCM (e.g., bathymetry composites of broader geographic areas). Some bathymetry products are provided directly by state or institution-based mapping programs. It is expected that additional bathymetry data from state or institution-based mapping programs will be made available as BOEM offshore sand resources mapping efforts continue in New England waters.

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Bathymetry Data Stakeholder Review and Input

Key Bathymetry data stakeholders include states, BOEM, NOAA OCM, NOAA Office of Exploration, and some academic programs (e.g., UNH-CCOM), as well as some offshore project proponents, all of which are presently coordinated via the NROC Habitat Classification and Ocean Mapping Subcommittee. The Portal Working Group will also obtain broader stakeholder input via workshops and conferences on changes to the overall presentation of the data on the Portal.

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1.12 Offshore Sand

Data products related to offshore sand will include onshore sand resource needs (e.g., beach nourishment) and potential sand borrow sites.

Offshore Sand Data

Current status

A layer depicting BOEM Aliquots with offshore sand resources was added to the Portal in 2019. There is also some information about seafloor substrate type under [Physical habitat](#), but these data were not necessarily generated with the intention that they would be used to characterize offshore sand resources.

Update schedule

To be determined, based on data products developed and dependencies.

Dependencies

States and ACOE generate information about onshore sand resource needs. BOEM and the states are collecting seafloor data that could be used to generate data products for potential sand borrow sites.

1.13 Administrative and Other Contextual Data

Administrative datasets on the Portal include state and federal political boundaries, and regulatory and management boundaries, some of which may be periodically revised or adjusted. Other contextual data such as the locations of ocean observing buoys or other monitoring stations, and coastal demographic and economic data are also included.

Administrative Data

Current status

Political boundaries	Regulatory and management boundaries
<ul style="list-style-type: none">• Submerged Lands Act Boundary (BOEM)• 200 NM EEZ and Maritime Boundaries (NOAA)• 12 NM Territorial Sea (NOAA)• States• Counties	<ul style="list-style-type: none">• BOEM OCS Lease Blocks (BOEM)• Federal Consistency Geographic Location Descriptions (NOAA)• US Coast Guard Districts and Sectors• Stellwagen Bank National Marine Sanctuary (NOAA)• USFWS Coastal Barrier Resource System• Northeast Canyons and Seamounts Marine National Monument• Others, described in various ocean data themes (e.g., fishery management areas, anchorages, disposal sites, energy programs or leases)

Most layers were updated in 2016. The 12nm territorial sea boundary and Geographic Location Descriptions were updated in 2018.

Update schedule

Political boundaries should be reviewed every 5 years, but these are not expected to change.

Regulatory and management boundaries should be reviewed and updated every 2 years.

Dependencies

Several administrative boundary data layers are maintained and served by NOAA through the Marine Cadastre. Others are maintained and served by agencies (e.g., BOEM maintains and hosts OCS lease block boundaries and the Submerged Lands Act boundary). New England counties,

states and their offshore boundaries, and monument and sanctuary boundaries are served by the Portal.

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Other Contextual Data

Current status

Locations of ocean observing buoys, monitoring stations, and coastal demographic and economic data were updated in 2017. The coastal demographic and economic data represent conditions in the early 2010s.

Update schedule

Ocean observing buoys and monitoring stations data should be updated every 2 years.

Coastal demographic and economic data should be updated every decade, and could be updated to more broadly represent regional Blue Economy metrics.

Dependencies

Ocean observing buoys and monitoring stations data are obtained from NERACOOS and hosted by the Portal.

Demographic and economic layers were generated as part of the Northeast Ocean Plan baseline assessment, and no updates are planned. NOAA ENOW may represent a long-term source of data for this category, but if no new data are developed or provided by 2020, the data representing the early 2010s should be removed from the Portal.

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2 Application Development

The Portal is comprised of several individual applications that together perform the key functions of the site. Application development is needed to maintain the existing functions, as well as to enhance functionality or provide new capabilities or new tools, occasionally associated with new or updated datasets.

Data Explorer

The Data Explorer is a standalone application containing the entire catalog of data on the Portal, organized primarily by ocean data theme. The Data Explorer provides a basic GIS interface (e.g., transparency sliders, drag-and-drop ordering of layers, print function, etc.) and a number of customized widgets that allow users to discover, visualize, and interact with Portal data. The Data Explorer must be compatible with popular browsers (Chrome, Firefox, Internet Explorer, Edge, and Safari) and should be tested and updated as required when new browsers or major updates to the

Explorer itself are released. Workflow improvements, identified by the stakeholder community or the Portal Working Group, are made to enhance Portal user experience.

The Data Explorer may also require updates and enhancements, including the development of new tools when new datasets are introduced. For example, addition of the Communities at Sea required the addition of a new widget to help users navigate all of the related datasets. These tools enhance user experience and provide additional capabilities for analyzing/manipulating/interpreting data live on the Portal. Many of these tools and functions are suggested by users of the Portal during trainings, workshops, conferences, or other outreach.

Some examples include:

Time-slider tool: This tool was added in 2019 and allows the user to toggle through (or animate) a time series of data (e.g., months, seasons, or years). New monthly AIS data are visualized with this tool. A time-slider was also applied to new monthly density products for tagged loggerhead sea turtles.

Threshold tool: A threshold tool would function like a time-slider tool, but would toggle through classifications of the data (e.g., areas of “high” “medium” “low” vessel traffic or marine life abundance), or even classifications of the data through time (e.g., areas of “high” vessel traffic for each month of the year).

Linear measurement tool: This tool was added in 2019 and simply allows the user to measure distance on the Data Explorer map, in a number of selectable units (e.g., miles, kilometers, feet).

Enter coordinates or upload layers: Users have previously requested a tool that allows entering coordinates in order to plot user-defined points or shapes on the Data Explorer map, so as to view them with other Portal data layers. Development of this tool began in late 2019, and is expected to be released in 2020.

Extract by polygon: An extract-by-polygon tool would allow users to draw a shape on a custom map and generate a summary or report of all of the data layers presently shown in that area. For example, a user might draw a shape on an annual vessel traffic map to determine the total number of trips in that shape.

Theme maps

The Theme maps are one of the most common ways that Portal users view and access data. Theme maps roughly correspond to the ocean data categories described in Sections 1.1 – 1.13. Each theme map contains one or more subthemes, numerous datasets, custom legends and symbology, layer information for each dataset, and an “About This Map” narrative.

Potential work on Theme maps could include:

1. Converting them to use the Data Explorer application instead of a unique Theme map application. Each map would still contain the same set of pre-selected data layers that would load automatically when a user selected a theme. Users would then have access to the same maps and data, but with the additional functions and tools of the Data Explorer. However, some of the more complex themes, such as Marine Life and Habitat, would require additional considerations for how to preserve/replicate the user experience of the Theme maps in a Data Explorer application.
2. Updating the existing code so that each individual theme is a separate Javascript file.

3. A combination of #1 and #2.

Any of these options would, over the long-term, reduce programming and maintenance costs. Option #3 would accommodate Theme maps for large and complex themes like Marine Life and Habitat, while allowing Data Explorer applications to take the place of smaller and simpler themes, like Restoration, for example.

Other Application Development Tasks

The Portal Working Group will consider other development tasks as they arise. For example, there may be a need in the future to add support within the current web service structure for feature services or geoprocessing services. There may also be a future need to add support for additional data download file types or export options in order to broaden data accessibility.

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3 Maintenance of Web/IT Infrastructure

The Portal relies on a suite of components whose individual function and maintenance is critical to Portal performance and reliability. Collectively these components are referred to as the Portal information technology infrastructure and include the website, the content management system software (Wordpress), the three-tiered system of production, staging, and development versions of the site, the production and development servers that house the data and web services hosted by the Portal, and all of the mapping software that controls the majority of the web-mapping functions of the site. Major updates were made to this system in 2019. Updates included the addition of a duplicate production web server to increase redundancy and resiliency against high-site usage or internet attacks, and an overall optimization of site content to decrease load times and improve efficiency. In 2020, a new server for staging web services will be added to increase resilience and redundancy of the web services hosted by the Portal.

The Portal's information technology infrastructure needs to be maintained, updated, and supported. This includes annual registration of the URL and renewal of the security certificates, renewal of software licenses, and maintenance and operation of the website, all servers and services, and software. Specifically:

NortheastOceanData.org website

The Portal Working Group will maintain the annual website/URL registration, content management system, and associated security certificates.

Production, staging, and development sites

The Portal Working Group will maintain a three-tiered system to provide sandboxes for development and testing of new datasets and functionality before they are moved to production. The staging system also provides backup and redundancy of important content. Maintenance of this system includes oversight of the production, staging, and development environments, as well as software and hardware upgrades.

ArcGIS servers

The Portal Working Group also maintains and updates the servers that host the development and production data services. Data servers are cloud-based storage obtained through Amazon Web Services. Server performance will continue to be frequently monitored to ensure that services are accessible and functional. The Portal Working Group also conducts monitoring of partner services to ensure that any dataset listed on the Portal is available to users and functioning properly.

Software

The Portal Working Group will maintain and update the software stack for each development tier, including ensuring all operating system updates are installed and determining whether custom mapping software updates should be applied.

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4 Communication and Engagement

Communication and engagement are important aspects of the Portal effort to ensure that data priorities are informed by regional needs and that data products are reviewed and communicated in coordination with regional subject matter experts. In addition, it is critical that the Portal Working Group understand how the site and resources are being used, document these uses via case studies, and adapt site content and features to the extent practicable to users' needs. Both communication and engagement are forms of outreach with different degrees of interactivity. Communication and engagement tasks are responsive to particular events, groups, and individuals, and are also pre-planned.

4.1 Communication

"Communication" refers to products developed and maintained by the Portal Working Group for consumption by users and other external entities. Communication products are informed by interactions and feedback received from users, but are fairly one-sided in their release and implementation.

Portal website

The northeastoceanandata.org website is the primary tool for delivering Portal data products and for communicating about the Portal. In addition to interactive maps and downloadable databases, the Portal contains static content (text and images) that must be kept current and accurate, and dynamic content such as news items that must be added or changed on an ongoing basis. We also expand, remove, and add new types of content; refine design and navigational elements; add new features; and make other changes as necessary to support regional ocean planning and improve the user experience on the Portal.

Maintain, update, and enhance existing content and design

All pages on northeastoceanandata.org are reviewed at least three times per year to ensure that content is accurate, up-to-date, consistent, and properly functioning. Additional updates are made between the scheduled reviews as needed to reflect new information.

Maintain and report website usage statistics

Usage of the Portal is monitored and characterized to track changes in how many people are using the Portal, how they are using it, and relationships between external events (e.g., agency hearings, public meetings) and Portal usage. This information is used to help guide plans for the Portal website and for Portal communications and engagement.

News items

News items are posted for data releases and other major Portal changes or updates. The Portal Working Group aims to post at least one news item per month, depending on newsworthiness of Portal happenings.

Map galleries

In late 2019, map galleries replaced “featured maps” on the Portal home page. Map galleries give users quick access to sets of ready-made maps on current ocean management issues. Each gallery includes several map images, an interactive link to each map, and static pdf versions of each map so that users can easily print, share, or add maps to presentations. As of late 2019, there are map galleries for the Isles of Shoals North Proposed Disposal Site, the NEFMC Proposed Deep-Sea Coral Amendment, and for Offshore Wind.

Video tutorials

Brief video tutorials are created to demonstrate how to use key features of the Portal. Tutorials focus on major data themes and will also be developed for new or updated datasets, new tools, and new features.

Email newsletter

A quarterly email newsletter is sent to Portal email list subscribers to update them on major recent and upcoming data releases, new tools and webinars, and events or entities featuring the Portal, and events where work group members attend and present about the Portal. Logs are maintained to track when the emails are sent, the topics included, and the level of engagement by recipients (opens and click-throughs). Growth of the subscriber list is also tracked, and new ways to increase the subscriber list such as tweeting about the latest newsletter and improving the visibility of the subscribe button on the website, are explored.

Fact sheet

A one-two page fact sheet, with introductory material on Portal purpose, content, and usage information is reviewed and revised every 3 months. The fact sheet will be:

- posted on the website

- included in the Media page/Press kit
- printed and used as a handout at events

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4.2 Engagement

“Engagement” refers to opportunities for direct personal interaction with users, including virtual and in-person venues.

Case studies

The Portal features case studies that provide examples of how people use the Portal for a variety of purposes including planning and management, education and research, and regulatory and siting uses. Case studies are co-developed with the user(s) or user groups.

Each case study includes narrative text, screenshots of relevant maps, photos, a featured quote, a downloadable pdf version, and links to related maps and information sources. The users highlighted in each case study are provided the opportunity to review a draft version before it is posted on Portal. The Portal Working Group is actively working on draft case studies on various topics (e.g., offshore energy development, national security) and featuring various user groups (e.g., agencies, industry, educators).

Workshops and trainings

Workshops and trainings are targeted to broad audiences including educators, journalists, and sectors/industries that have not been as represented in the ocean planning community to-date. Workshops and trainings with ocean planning entities (e.g., state and federal agencies, tribes, ocean industries) also continue. Workshops are offered/targeted to particular stakeholder and industry groups.

Twitter

The Portal has an active Twitter presence at @NEOceanData. The account has more than 1,900 followers, including journalists, NGOs, and other stakeholders. Tweets are released at least once a day during standard work hours on most work days and occasionally at other times.

Tweet content includes Portal news, datasets, maps, tutorials, case studies, and events announcements. The types of tweets and timing of tweets are varied to reach different audiences and to find which approaches are most effective.

The Portal twitter account follows/monitors other relevant accounts (e.g., partner entities, state and federal ocean agencies, collaborators, Portal users, individuals and groups with ocean data expertise, environmental journalists and local news outlets) and seek to engage via twitter.

Tweets amplify the role of the Portal and highlight uses of Portal data.

Webinars

Webinars are held to develop a deeper level of engagement for existing Portal users and a greater awareness among people who are not yet familiar with the Portal. Webinars provide either a general overview of the Portal or focus on a component such as the Marine Life theme. Webinars may be targeted at key audiences such as educators, journalists, industry groups, or agency staff. The Portal Working Group collaborates with other organizations (e.g., professional associations or state agencies) to expand the reach and impact of webinars.

Conferences and meetings

The Portal Working Group submits abstracts to present talks and/or participates as an exhibitor or contributing guest at relevant regional and national conferences and meetings. Examples include:

- NROC meetings
- New England Fishery Management Council meetings
- Port operator groups and safety forums
- Coastal GeoTools (biennial)
- American Wind Energy Association Offshore Windpower
- Coastal and Estuarine Research Federation (biennial)
- Northeast Arc Users Group
- Regional Association for Research in the Gulf of Maine
- National Marine Educators Association
- New England Ocean Sciences Education Collaborative
- Northeast Aquaculture Conference (biennial)
- Boston Sea Rovers
- Maine Fishermen's Forum

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Appendix – 2019 In Review

New Data Products & Updates



COMMERCIAL FISHING

- ▶ Communities at Sea data products
- ▶ Updated fisheries management areas
- ▶ NEFMC Clam Dredge Framework Alternatives
- ▶ Atlantic Large Whale Take Reduction Plan Regulated and Exempted Areas
- ▶ NOAA Fisheries Statistical Areas



ENERGY & INFRASTRUCTURE

- ▶ New York Draft Wind Energy Areas
- ▶ Massachusetts Final Sale Notice Areas
- ▶ Proposed Vineyard Wind project footprint and cable route
- ▶ Proposed South Fork Wind Farm project footprint and cable route
- ▶ December 2018 Competitive lease sale results

ON

- ▶ 2017 AIS commercial traffic data products for eight vessel categories
- ▶ Updated navigation layers
- ▶ Proposed Isles of Shoals North Disposal Site

- ▶ Updated MDAT federal bottom trawl Fish biomass products
- ▶ Updated MDAT Marine Mammals data products
- ▶ USFWS/BOEM Diving Bird movement information products
- ▶ NEFSC Loggerhead sea turtle movement information products

- ▶ US Army Corps of Engineers Regulatory Boundary
- ▶ US Coast Guard Districts
- ▶ US Coast Guard Sectors
- ▶ Amended RI Geographic Location Description
- ▶ Updated Aquaculture data for ME, NH, RI
- ▶ Atlantic OCS Aliquots with Sand Resources
- ▶ Submarine canyons
- ▶ Updated deep-sea coral habitat suitability layers
- ▶ High resolution Gulf of Maine bathymetry
- ▶ Updated offshore wind speed layer

Behind the Scenes



NEW TOOLS

- ▶ Map Galleries for current ocean management issues
- ▶ Communities at Sea (+ tutorial)
- ▶ Time slider for viewing monthly commercial traffic (AIS) and other layers (+ tutorial)
- ▶ Distance measuring tool (+ tutorial)
- ▶ Webpages and interactive maps to support Vineyard Wind DEIS, NEFMC deep sea coral amendment, EPA Proposed Isles of Shoals North Disposal Site



- ▶ Inspiring K-12 Students to Investigate the Ocean Ecosystem and Ocean Uses
- ▶ Coast Guard Uses Data Portal for Waterways Management in the Northeast
- ▶ US Navy Uses Data Portal to Select Test Site for Unmanned Underwater Vehicle



WEBINARS

- ▶ *What is the Northeast Ocean Data Portal and how can the public use it to make comments on proposed projects?* (Surfrider Foundation)
- ▶ *Northeast Ocean Data: Maps and Data for New England's Ocean* (Metcalf Institute for Environmental Reporting)
- ▶ Marine Life data products updates public webinar

Events, Trainings, Uses

- ▶ Northeast Aquaculture Conference and Expo (1/11)
- ▶ Coastal GeoTools Conference (2/11-2/14)
- ▶ Release of draft Long Island Sound Blue Plan including data from Northeast Ocean Data Portal (3/11)
- ▶ Environmental Business Council Portal Workshop (3/22)
- ▶ Maine Sustainability and Water Conference (3/28)
- ▶ NROC spring meeting (4/18)
- ▶ Special Session on Offshore Wind in the Northeast - New England Fishery Management Council (4/18)
- ▶ NERACOOs Northeast Biological Observations Workshop (5/6-5/7)
- ▶ Northeastern Massachusetts Aquaculture Center (NEMAC) Workshop on Shellfish Aquaculture in Federal Waters (5/15-5/16)
- ▶ NROC Ocean Planning Committee spring meeting (6/4)
- ▶ National Association of State Energy Officials (NASEO) Annual Meeting (9/17)
- ▶ "Ocean Observations for Everyone" - EOS (9/12)
- ▶ AWEA Offshore Wind Power 2019 Conference (10/22-10/23)
- ▶ Gulf of Maine 2050 Symposium (11/4-11/8)
- ▶ Coastal States Organization Fall Meeting (11/4-11/8)
- ▶ NOAA Office for Coastal Management Regional Ocean Data Sharing Workshop (11/21-11/22)
- ▶ Maine Department of Marine Resources (12/10)
- ▶ Gulf of Maine Task Force (12/12)