MARCO

MID-ATLANTIC OCEAN DATA PORTAL

RESOURCES FOR
REGIONAL OCEAN PLANNING

DRAFT 2021 Work Plan

DECEMBER 16, 2020

Table of Contents

Contents

Part I: Data Priorities **3**

2021 DATA PRIORITIES AT A GLANCE **4**

Part II: IT Support and Application Development **12**

Tech Support and Maintenance **12**

Upgraded Tools and Capabilities **12**

Part III: Data Production and Systems Administration **15**

Data Production and Management **16**

Systems Administration/Server **18**

Part IV: Communications and Outreach **19**

Top Layers of 2020 **23**

APPENDIX: Marine Life Data Work Plan Table **24**

Introduction

This document provides an overview of anticipated work to be conducted by members of the Mid-Atlantic Ocean Data Portal development team (Portal Team) in 2021. It assumes funding and staffing at current levels and reflects data priorities and expected updates and maintenance schedules that will likely need to be continued beyond the calendar year. The plan covers a broad range of priorities ranging from map data additions to functional improvements to stakeholder engagement activities.

The Portal Team looks forward to building upon a banner year in terms of site traffic and high-profile uses. The site saw a 43% increase in users in 2020 and a 32% increase in overall sessions. It served as a focal point for public outreach around a series of Coast Guard Port Access Route Studies (PARS), proposed anchorage grounds and potential fairways prompted in part by the advance of offshore wind development in the region. Communications efforts including instructional webinars, newsletter/blog content and trainings for stakeholders educated users on the PARS and other new map products and introduced the Portal to new audiences.

While this document provides a roadmap for 2021 based on the best information available today, a project of this kind requires ample flexibility to account for unforeseen developments including regulatory decisions (e.g., the creation of new wind areas), changes in funding availability, and regional data requests with high urgency that can alter schedules or the team's workflow. The team has limited capacity, but will work to meet these challenges to the best of its ability.

The Portal Team currently consists of:

- John Bognar, Rutgers University Center for Remote Sensing and Spatial Analysis
- Jeff Herter, New York Department of State
- Ryan Hodges, Ecotrust (developer)
- Richard Lathrop, Rutgers University Center for Remote Sensing and Spatial Analysis
- Tony MacDonald, Monmouth University Urban Coast Institute
- Nick Napoli, MARCO (Portal Team lead)
- Jim Trimble, Rutgers University Center for Remote Sensing and Spatial Analysis
- Karl Vilacoba, Monmouth University Urban Coast Institute (project manager/communications lead)

Part I: Data Priorities

Outlook for 2021: A major emphasis of 2021 work activities will be the improvement of the Portal's fishing data. The most recent Vessel Monitoring System (VMS) data covers 2016 and Vessel Trip Report (VTR)/Communities at Sea data covers 2015. The most current fishing data on the Portal is the 2019 Automatic Identification System (AIS) fishing vessel transit counts. Per the federal budget enacted by Congress for fiscal year 2019, the National Oceanic and Atmospheric Administration (NOAA) provided approximately $135,000 to the Mid-Atlantic Regional Council on the Ocean (MARCO) and similar funding to eight other regions throughout the U.S. to improve regional data-sharing efforts. The Mid-Atlantic and Northeast Ocean Data Portal teams pooled matching $135,000 federal grants in 2020 in an effort to produce new commercial fishing data that can help inform analysis on compatibilities/conflicts with offshore development.

The funding allowed MARCO and the Northeast Regional Ocean Council (NROC) to conduct outreach to government agencies and the fishing industry with the assistance of the Responsible Offshore Development Alliance (RODA). Through this outreach, the Mid-Atlantic team solicited feedback on a number of existing and proposed fisheries data products and will understand what new products need to be developed in order to better represent fishing activity. Among the outcomes of these discussions, the Portal Team expects to update its VMS fishing maps current to the year 2019 this year and consider adding a series of VTR-derived products produced by NOAA. It will also debut Communities at Sea maps showing party and charter boat activity – an important replacement for a recreational fishing layer that is currently based on 2000-09 data, yet is one of the most frequently activated layers on the Portal.

The following is an overview of planned data additions and enhancements in the year ahead. "External Dependencies/Sources" refer to data providers and other outside organizations whose collaboration is essential for developing products. "Update Frequency" is a suggested maintenance schedule for data, provided here as an indication of potential data needs/work focus beyond this annual plan period. Further explanation of individual data items follows the table.

2021 DATA PRIORITIES AT A GLANCE

Theme	Layers	External Dependencies/Sources	Update Frequency
Administrative	1. CZM Boundary 2. Tribal territories 3. Congressional districts 4. Review of federal data providers for additional options	1. MC service 2. Native Land Digital or other TBD 3. MC service or other TBD 4. MC/BOEM/others TBD	1. Automatic update via MC service 2. TBD 3. Every 2 years 4. TBD
Fishing	1. VMS '15-19 updates 2. VTR fishing effects model maps 3. VTR fishing footprint priority layers 4. Communities at Sea/VTR party/charter boat 5. Management areas update 6. Lobster/shrimp VTRs (TBD) 7. NY proposed artificial reefs	1. NOAA/NMFS 2. Northeast Portal services 3. NOAA/NEFSC 4. NOAA/NMFS 5. NOAA/NMFS 6. NOAA/NMFS 7. NYDEC	1. At least very two years 2. TBD 3. At least every two years 4. 3-5 years 5. As needed 6. 3-5 years 7. As needed
Marine Life	1. Marine mammal/turtle strandings 2. Aquaculture 3. Northeast Regional Fish Habitat Assessment 4. MDAT marine mammal, fish, bird updates 5. Deep sea coral data feature service 6. Federally funded marine life data (updates to fish, marine mammal stressors, NHRA outputs, etc.)	1. NOAA/state stranding centers 2. States 3. MAFMC/NEFMC 4. Duke/MDAT 5. NOAA 6. Many sources	1. TBD 2. 1-2 years 3. TBD 4. 3-5 years 5. Automatic update via NOAA service 6. TBD
Maritime	1. Beach nourishment projects, modeled shoals and new sand resources folder 2. New submarine cable infrastructure and proposed actions 3. Revised shipwreck density map 4. AIS data (2020) 5. USCG proposed areas and studies 6. Combined cables map	1. MC and MMIS services 2. Data from developers (Subcom, et. al) 3. NOAA 4. USCG, MC 5. USCG 6. Data from MC, MARCO and developers	1. Auto update via MC and MMIS services 2. ongoing 3. 3-5 years 4. 1-2 years 5. Ongoing 6. TBD
Oceanography	1. MARACOOS oceanography layers TBD 2. Fronts/NPP updates 3. Updated regional bathymetry map 4. Seabed Forms 5. Soft sediments by grain size	1. MARACOOS 2. NOAA CoastWatch 3. TNC 4. TNC 5. TNC	1. TBD 2. 1-2 years 3. 5 years+ 4. 5 years+ 5. 5 years+

Recreation	1. New products derived from AIS data (e.g. whale watching, SCUBA, fishing)	1. USCG, MC, Industry	1. 2-5 years
Renewable Energy	1. Updated federal and state offshore wind lease and wind energy area boundaries 2. New layers and reorg of maps to reflect advancement of projects (permitting, construction, design of power cable routes, etc.) 3. Exploration of data available from wind developers	1. BOEM/MC and state partners 2. BOEM/MC/states 3. None	1. Ongoing 2. Ongoing 3. TBD
Security	1. Naval offshore wind compatibility assessment update 2. Maintenance of existing layers and additions in consultation with Navy	1. DOD 2. Navy	1. As areas change 2. Ongoing
Socioecon	1. Updated ocean economics/ENOW data	1. NOAA/Census	1. 3-5 years
Water Quality	1. Offshore discharge flow/outfall positions update 2. Ocean acidification monitoring updates 3. EPA impaired waters/assessment areas 4. Marine debris/balloon litter 5. Evaluation of options for harmful algal blooms/marine stressors data	1. MC/EPA 2. MACAN 3. EPA 4. MARCO 5. NOAA/TBD	1. TBD 2. Ongoing 3. Auto update via MC service 4. TBD 5. NOAA/TBD

Administrative

- **CZM Boundaries**: A Marine Cadastre (MC) service for the CZM layer has been added to the Staging site and was reviewed with both the MARCO and NROC states. The Mid-Atlantic and Northeast Portals are finalizing a data catalog description for the layer containing suggested edits from the states and links to the region's CZM programs.
- **Tribal Territories**: The nonprofit Native Land Digital has produced a GIS site containing maps illustrating tribal geography and history around the globe. The Portal Team will inquire as to whether the organization would be willing to share its tribal territories data (or at least portions covering the Mid-Atlantic and Northeast regions) for inclusion on the Portal and will review the data with tribes

before publishing. The portal team will also engage tribes to advise on other representative datasets.

- **Congressional Districts**: A federal service was added in 2020, but will need to be updated/replaced based on the recent election. The district boundaries may also change in the near future based on Census data.
- **Federal data options**: A sweep of prominent federal map data providers (e.g. Marine Cadastre, MMIS, NOAA Digital Coast) will be conducted to seek any layers that the Portal team may be unaware of. This is a step taken early each year and has led to the addition of popular layers like the U.S. Historic Lighthouses, Wrecks & Obstructions, and NCEI bathymetry maps.

Fishing

- **Vessel Monitoring System**: The most current VMS fishing layers summarize activity for a two-year period running from 2015-16. As summarized above, through the Portal's federally funded collaboration with NROC and RODA, new products reflecting revised fishing activity in 2015-16 and new activity from 2017-19 will be added this year.
- **VTR Fishing Effects**: These maps, recently published by the Northeast Portal and vetted by the MAFMC and fishing stakeholders, indicate areas that have been most impacted by fishing gear such as dredges and bottom trawls.
- **VTR Fishing Footprint Priority Areas**: Feedback from fishing stakeholders has also led to the recommendation that the Portal incorporate VTR-based fishing footprint data posted online by NEFSC. Discussions with users and OMDT will determine what portions of this extensive data collection will be used and what types of maps will be created.
- **Management areas update**: The team will consult the NMFS regional office, fishery management councils and others to ensure the current layers are up to date and replace/retire them as needed. The project with RODA has provided recommendations for publishing and maintaining fishing management areas on the Portal.
- **Charter/Party Boat Data**: In 2019, the team created a series of draft VTR-based maps (modeled after the Communities at Sea products) that show popular areas for charter/party boat fishing trips. Users can click individual ports for summaries of how many trips emanated from the site, the number of customers/fishers, and more. The team received positive feedback from the industry in 2020 as part of the joint project with NROC and RODA. These maps will now be published, and an attempt will be made to secure the most current data possible. Recreational fishing data are a major need, as the current Recreational Fishing map, consistently among the Portal's top 10 most activated, summarizes data from 2000-2009.

- **Lobster/Shrimp VTRs**: Draft VTR/Communities at Sea maps showing lobster and shrimp fishing reported via VTRs in the Mid-Atlantic and Northeast were reviewed with the fishing industry in 2020. Based on industry input, some of these maps may be published this year per the final report from RODA.
- **NY Proposed Artificial Reefs:** Fishing industry stakeholders requested that the Portal add a layer showing the areas of new and expanded artificial reefs currently being considered off the Long Island coast. A draft of the data is currently being finalized in cooperation with the New York Department of Environmental Conservation.

Marine Life

- **Marine Mammal Strandings**: NOAA is in the process of developing a tool with IOOS to visualize reporting data filed by state marine mammal stranding centers. The Portal Team filed a request to NOAA for this data, which is expected to include information for several species dating back 15+ years. Once obtained, the Portal Team will confer with the OMDT on options for maps, such as density maps for all species, maps for groups that align with MDAT classifications, or individual species of concern (e.g. right whales, humpacks).
- **Aquaculture**: A single regional map or a set of state-by-state maps depicting areas with aquaculture activities will be created in collaboration with each state.
- **Northeast Regional Fish Habitat Assessment**: A team with researchers from NOAA Fisheries, NEFMC, the MAFMC, Monmouth University and others are working on a project that will develop habitat use models for commercially and ecologically important fish species across the Northeast and Mid-Atlantic continental shelf. The project will continue through 2022; the Portal Team will work with the researchers to incorporate map products from this project when ready.
- **Observed Corals**: The team made significant improvements to its corals and canyons data in 2020. Among them, the existing observed corals map was replaced with new data now being updated quarterly by NOAA. This year, tech upgrades to the Portal's back end will make it possible to directly ingest this feature service (and others being offered more frequently by data providers).
- **MDAT Fish/Avian/Marine Mammal Distribution Products**: These datasets produced by the Marine Life Data and Analysis Team (MDAT) cover long time periods, but must be updated on an approximately 3-5 year basis to ensure their accuracy.
- **Federally Funded Marine Life**: With NOAA funding, MARCO and NROC will collaborate to improve both portals' marine life collections. Expected products include updated right whale maps, including range shifts; new sea turtle data; integration of US Fish and Wildlife Service avian tracking products; fish

distribution and range shift products, including coordination with Northeast Regional Habitat Assessment team; and species sensitivity and risk data. See Appendix for table summarizing project work plan.

Maritime

- **Sand Data**: Maps showing the history of beach nourishment projects along the East Coast and modeled shoals in federal waters will be added. These maps are currently available on the Marine Cadastre and BOEM Marine Minerals Information System (MMIS) sites, respectively. Given the growing number of available maps depicting sand resources, a new dropdown folder will be created to house these and the existing federal sand and gravel borrow areas and OCS aliquots with sand resources layers.
- **New Submarine Cable Infrastructure and Proposed Actions**: The Portal Team works with private sector developers to create maps showing the alignments of submarine telecom and power cables. New will be added as data becomes available. Discussions with developers have also centered on the possibility of added proposed/draft alignments to bolster public outreach and awareness.
- **Shipwreck Data**: The Shipwreck Density layer will be expanded to cover state waters, including major bays and rivers. The map will be based on data presented in the Wrecks and Obstructions layer/AWOIS database.
- **2020 rAIS**: Consistently among the most frequently used data layers on the Portal, the AIS vessel transit count maps should be updated on an annual or semi-annual basis. The team will work with the Marine Cadastre, Northeast and federal agencies to create 2020 annual maps and monthly maps presented with the Portal's slider/animation feature.
- **USCG Proposed Studies and Areas**: The Portal Team partnered with the Coast Guard to produce several maps in 2020 showing Port Access Route Study (PARS) areas, proposed anchorage grounds and potential fairways along the Atlantic Coast. These maps will be updated and replaced as needed to support public outreach and analysis by users.
- **Combined Submarine Cables Map**: The Marine Cadastre team has begun work on a new map that would combine the existing NASCA cables layer (last updated 2015), NOAA charted cables layer (2012), and other known maps of cables that have been constructed more recently. The Portal Team will contribute data including its maps showing Mid-Atlantic telecom cables built since 2016 and the Virginia wind energy power cable.
- **Ocean Disposal Sites**: The Marine Cadastre is creating a new map that better reflects the boundaries of offshore disposal areas (active and closed). The Portal's current layer will be replaced when this map is ready.

Oceanography

- **Regional Bathymetry, Seabed Forms, Soft Sediments by Grain Size:** Through grant support from the Virginia Coastal Zone Management Program, The Nature Conservancy is developing a peer-reviewed decision support tool to help contextualize siting of wind energy projects and avoid and monitor potential negative environmental impacts of these projects in the Northeast and Mid-Atlantic. As part of the project, the TNC team will create updated versions of these three maps which date back to the Portal's inception. The Regional Bathymetry layer remains a top 10 most activated layer each year.
- **MARACOOS Oceanography**: The Portal Team and MARACOOS successfully partnered last year to produce seasonal maps showing surface currents along the East Coast. The collaboration will continue this year to create new long-term data layers that summarize MARACOOS' real-time data.
- **Fronts and NPP**: The Portal houses a collection of seasonal Fronts Probability and Net Primary Productivity maps spanning from 2010 through 2019. These maps will be updated to reflect the most recent seasons available.

Recreation

- **Recreational Data**: The team will explore options for further breaking down AIS vessel transit count data into new categories that represent recreational activities (e.g. whale watching cruises, SCUBA trips, sightseeing tours) and will engage industry and other participants in these activities to obtain input on approaches and to review draft products.

Renewable Energy

- **Wind Areas:** The team will work with BOEM and the states to update the Portal with new and updated federal/state wind lease and planning area boundaries expeditiously to help inform the public on pending issues.
- **Reorganization/Expansion/Project Tracking**: In late 2019, the team began reorganizing its Renewable Energy theme to account for some wind projects graduating from the earliest planning stages to levels where they are permitted, under construction or operational. The availability of more specific information on project specs, such as power cable routes or project envelopes, has prompted the need for additional data layers. This work will continue in 2020 as more details on Mid-Atlantic projects emerge.
- **Data from Wind Developers:** Offshore wind companies with interests in the Mid-Atlantic have been conducting intensive research on the ocean floor, ocean conditions, marine life and more within potential wind farm areas. The Portal

Team will stay engaged with these users and partner with them to load relevant data on the site when available and in consultation with the OMDT.

Security

- **Wind Compatibility Assessment**: The Department of Defense has displayed an updated wind compatibility assessment map at public hearings that takes into account the potential impact of turbine heights on air traffic monitoring from land. Inquiries have been made to obtain this data, but it has not yet been released. The team will continue to work with DoD to obtain clearance to post this map.
- **Security Data**: The team will continue to maintain and update its security map layers as needed in consultation with the Navy/Department of Defense and Marine Cadastre.

Socioeconomic

- **ENOW Updates:** The Portal's Ocean Economics GDP layer is based on NOAA ENOW Explorer statistics from 2016. The team will inquire as to whether more recent data will be available in light of completion of the 2020 Census.

Water Quality

- **Offshore Discharge:** The Marine Cadastre team is in the process of creating a new map layer showing points where wastewater is discharged offshore. When complete, this map will replace the Offshore Discharge layer, which was created by Rutgers in 2012 and may be out of date.
- **Updated Acidification Data**: The team will work with MACAN as it continues to deliver map data related to coastal and ocean acidification in the Mid-Atlantic. There are currently seven Acidification Monitoring Locations maps in Marine Planner.
- **EPA Impaired Waters**: The Mid-Atlantic and Northeast teams are evaluating options for GIS products showing ocean areas, estuaries and terrestrial water bodies with known pollution issues. The teams began testing map layers and consulting with EPA personnel in 2020 to determine which offered the most current data and consistent methodologies.
- **Marine Debris/Balloon Litter**: A draft map layer was created in 2020 depicting the sites of marine debris catalogued by volunteers through MARCO's balloon litter removal campaign. The Portal Team will continue to consult with MARCO

and the volunteer leaders to determine how best to represent the data as map products.

- **Harmful Algal Blooms:** Users have expressed interest in seeing maps depicting harmful algal blooms or other marine stressors added to Marine Planner. The availability of products available via federal or other sources will be investigated for inclusion.

Part II: IT Support and Application Development

Tech Support and Maintenance

The Portal's maintenance and software management needs are handled by Ecotrust, of Portland, Oregon. Ecotrust participates in the Portal Technical Team's bi-weekly calls and other meetings as necessary to keep the team up to date with project status, plan and discuss strategies, lend expertise when appropriate, and stay informed of issues identified by both the team and users. Ecotrust is on call throughout the week as the first line of defense in the event of site outages; problems with the site's Open Layers, Django and Wagtail software; or other technical issues that arise. This work includes dealing with identified priority bugs, shortcomings in the user interface or user experience for both general users and administrators, performance issues, and site uptime.

Ecotrust is also the lead for planned system upgrades and maintenance. Taking advantage of its West Coast location, the staff often handles significant system work at times that are after hours in the Mid-Atlantic, ensuring the least level of disruption to users. In the year ahead, Ecotrust and the Portal Team will also work together to maintain the Mid-Atlantic Ocean Data Portal Management Guide, which serves as the manual for making changes and additions to the Portal through Wagtail and Django.

Upgraded Tools and Capabilities

Last year presented a rare opportunity to modernize the Portal's outdated technology stack. Marine Planner had been built on OpenLayers 2, a version of the open source system that was last upgraded in 2013. The Portal Team had sought to upgrade to a newer version since 2016, but the move was cost-prohibitive. Ecotrust was contracted by the West Coast Portal Team in 2019 to upgrade its equivalent of Marine Planner, which was also built on an old OpenLayers version. The West Coast Portal Team agreed to share the coding necessary for that transition, via Ecotrust, with the Mid-Atlantic Team in exchange for some of the custom coding produced for the Mid-Atlantic Portal in recent years (such as the Ocean Stories section). This arrangement reduced the cost of updating the Portal from a figure in the $100,000-$150,000 range to the ~$20,000 range – a savings of perhaps 80-90 percent. In addition to improving the site's performance and security, the newer version of OpenLayers will unlock new possibilities on the tool creation and site administration sides in 2021 and beyond.

The timeline for the long-awaited OpenLayers update was also advanced by news that the Portal's cloud service, WebFaction, would no longer support the software after December 2020. Thus, work simultaneously began on migrating the site to Amazon Web Services (AWS) in November. Given that significant portions of coding would have to be re-created in the Portal's new home, it was decided that the best course was to rapidly complete the technology stack upgrade so this work would not have to be redone later. Testing and bug repair work and re-implementation of legacy features (i.e. linear measurement & sessional user-added ArcGIS WMS layers) on the upgraded Portal will continue in early 2021 as any issues are discovered.

The Portal Team has conducted numerous training sessions with state and federal agency staffs, consultants, educators, NGOs and others in recent years and solicited the participants' input on improvements/changes they'd like to see made to the site. Team members also spend a significant amount of time presenting at conferences, responding to inquiries, and engaging stakeholders in the identification of data or functionality needs. Based on these trainings and discussions, as well as consultations with Ecotrust, we have compiled the following priority list of enhancements to be considered in 2021 based on funding levels. The list is ranked with "High Priority" and "Medium Priority" improvements (lower priorities have been documented, but it is assumed that there is likely not enough funding to implement all of the changes listed here). As is the case with the data priorities in Section 1, these targets may change based on the needs that arise over the course of the year.

HIGH PRIORITY

Stack Update: OpenLayers 6.x, Django 2.x, Python 3.x

Critical upgrade required for several of the other proposed updates, and to take advantage of any other upgrade performed for the West Coast Ocean Data Portal. This will also result in a performance boost and more maintainable code with up-to-date documentation.This work was substantially completed in the final quarter of 2020; testing, bug repair and the re-implementation of legacy features will continue in early 2021.

Rebuild Linear Measurement & Services Input Tools

The code for these two existing tools was not compatible with OpenLayers 6. Adjustments will be made to ensure they function as users expect immediately upon the migration.

Decouple Staging and Production Servers

Remove “Staging” from the database used by “Production” and implement a clean solution to craft what is wanted on the Staging site and instantly/seamlessly update Production from Staging when the time is right.

Improved WMST (Time) Slider Logic

Improved speed, reduced load for adding sliders/animations based on WMST technology to the map.

Private Groups

Currently users can join and create public groups for sharing drawings around certain data types. Private groups would allow organizations to do this work without having to make their work/data public, and enable them to selectively add users using IDs and either passwords or group moderators. No assurances of anonymity would be given, and we would retain the right to view their data and close their group if needed. We should develop a code of conduct to back up those actions.

Feature Service Capabilities

The OpenLayers 2 technology stack was not compatible with map feature services, which are being used more commonly by GIS sites (including the Marine Cadastre). With coding adjustments, the OL6 version of the Portal can ingest these services.

MEDIUM PRIORITY

Expanded Drawings Tool

With the Drawings tool in MyPlanner, users currently may only draw, save, and share polygons with descriptions. These will report their area, and nothing else. Enabling users to draw and share points & lines would allow for different types of data and maps to be compiled from user input, and would report coordinates and lengths, respectively. (Note: A Linear Measurement tool was created in 2019, but those lines can’t be saved.) The tool can also be upgraded to allow changes to the fill color, line color, and line-width of drawings. May need to be re-written if implemented on OpenLayers 2 then migrated to OpenLayers5.

MyPlanner Tool Buttons

Create buttons in the Top-Right of the mapping tool (alongside the buttons for printing, short URLs, etc.) to quickly take logged-in users into the Drawings and Bookmarks workflow.

New Ocean Story Layout Options

Identify specific upgrades to create more dynamic/compelling Ocean Stories. This may include switching to a vertical map split, control over how much of the screen is “map”, and offering new widgets for inserting content, data, and other media.

Improved Admin Form for Managing WMST (Time) Layers

The current WMST form identifies what values are available for the time field, but lists them as very verbose and difficult to understand timestamps. This upgrade would replace this with an optional drop-down box using human-readable options.

Layers Appear in Data Catalog Alongside their “Companions”

Currently companion layers are not available via the Data Catalog unless they also serve as independent layers, associated with a visible category. This upgrade would allow “companion-only” layers to appear beside their associated layers under those layers’ categories. This will Include a checkbox for administrators to choose if they want this behavior on any given layer.

Part III: Data Production and Systems Administration

The Grant F. Walton Center for Remote Sensing and Spatial Analysis (CRSSA), Rutgers University, has been on the Portal Team since its inception, and continues to provide support for the site's operations through data development/management, IT/web services/server management, technical operations and advisory roles. The following outlines CRSSA's roles and responsibilities during 2020 and projected for the 2021 time period.

Data Production and Management

CRSSA's geographic information systems (GIS) database development and management for the Portal, can be categorized into the following: 1) in-house data production; 2) management of in-house published web services and their source GIS data; 3) external/existing web service preparation for Portal integration, 4) publishing data layers to the Portal viewer and data catalog, and 5) enhanced visualization/slider.

In-House Data Production

CRSSA actively participates on the Technical Team, working in coordination with team members to develop data development actions to meet Portal goals as identified by MARCO and the OMDT. When these targeted data sets are not available through existing authoritative sources or from the data originator, CRSSA has developed, processed, and published these data sets in-house in coordination with the Technical Team and data sources. Examples of in-house data publishing activities in 2020 include National Marine Sanctuary Boundaries (Mallows Bay-Potomac River and Monitor), Carl N. Shuster Jr. Horseshoe Crab Reserve, Coastal Virginia Offshore Wind Turbine Locations, and various U.S. Coast Guard Proposed Anchorage Areas and Port Access Route Studies (PARS) that were made available for public review on the Portal. Other data published that required web service reformatting for the Portal include NOAA Hurricane Tracks Since 1980 in the North Atlantic (data and slider) and NOAA Observed Deep-Sea Corals and Sponges. These geospatial datasets are developed and prepared for visualization through cartographic representation in geographic information systems software (Esri ArcGIS is utilized by the CRSSA team). Other production tasks include the composition and/or assembly of data layer descriptions and metadata documentation, reviewed by the source organization for completeness and presentation.

Management of In-house Published Web Services and GIS data

These in-house produced data are then published to web services utilizing ESRI's ArcServer application so the data can be ingested into the Portal. Web services published to the Portal server, along with their associated GIS data, are managed, maintained and updated by CRSSA. From the source data to the published services, these data are inventoried for the purpose of both an active or longer term/legacy database, as well as primarily to revise in-house published data when necessary as identified by the Technical Team. In 2021, this inventory will continue with planned data activities.

External/Existing Web Service Preparation for Integration

In addition to in-house produced and hosted data, external web services are a vital data source for the Portal. CRSSA works with the Technical Team in evaluating these services for integration and display as needed. There are a variety of external web services sources visualized on the Portal, primarily, as of 2020, from federal (e.g. NOAA and BOEM), university (e.g. Duke University), and from the Northeast Ocean Data Portal. As with in-house data production, ancillary information such as data layer descriptions, metadata documentation, and data source links are assembled.

For bulk imports of large sets of external web services (e.g. Marine Life Library), Ecotrust has developed codes/scripts to facilitate this import process. CRSSA and the Technical Team works with Ecotrust during this process to assist as needed. An example of previous efforts is the import of Duke University's Marine Life Library, and subsequent updates into the Portal (2019, 2020).

Publishing Data Layers to the Portal Viewer and Data Catalog

For both in-house and external web services to be integrated into the Portal viewer and data catalog, the data layers must be prepared for visualization on the Portal platform. As of 2020, CRSSA is primarily responsible for this role utilizing the web interface administrative tool developed and actively maintained by Ecotrust. Entries to be populated include the web service links, data descriptions, source/originator links, and other associated text. All work is currently performed on the Portal 'Staging' or 'Sandbox' working sites for data review before being pushed to the public Portal application. Staging is the primary and final location for data review. Once approved, these data and metadata appear in the Portal viewer and data catalog, respectively.

Sliders and Animations

The Portal's slider and animation tool was updated in 2020 by Ecotrust to include an activation button available in the Viewer table of contents next to the data layer name. This enables the user to easily click, follow, activate, and control the slider tool in the

Viewer's Active tab. The team will continue to apply this capability to temporal datasets in 2021, including the AIS 2020 Monthly Transit Count maps for each vessel class (All Vessels, Cargo, Passenger, Tanker, Tug/Tow, Pleasure Craft/Sailing, Fishing, and Other).

CRSSA activities in 2020 included the creation of the following sliders: AIS 2018 and 2019 Monthly Transit Counts, BOEM Monthly Offshore Wind Speed, NOAA Hurricane Tracks Since 1980 in the North Atlantic (by decade), Sea Turtles Seasonal Slider, Tagged Loggerhead Sea Turtle Density (monthly slider). Also in 2020, sliders were produced for the Shifting Species animations by The Nature Conservancy.

Systems Administration/Server

CRSSA maintains an ESRI ArcGIS Server on the Rutgers University network for in-house published web services and GIS data. The web services are published using ArcGIS Server's map service capabilities, which allows maps, features, and attribute data to be available inside many types of client applications. There has been a trend to start making GIS data available as feature services, which allow for editing of GIS data and the ability to manipulate layer symbology. CRSSA will be evaluating the pros and cons of feature services, and may start to provide feature service access to specific GIS layers based on stakeholder feedback.

CRSSA collaborates with Ecotrust to continually improve the capabilities of both the front- and back-end of the Portal application. For their part, Ecotrust actively responds and acts to improve the Portal's administrative tool under their scope of work for the Portal Project, as well as other customized and rapid tool fixes as needed.

Coordination/Planning Calls

Much of the work described throughout this document is coordinated through bi-weekly Portal Technical Team calls, as well as regular interaction via email and calls as needed. The team also coordinates quarterly calls with state and federal partner members of the Ocean Management Data Team, or OMDT. Members of the Portal Team also hold a monthly call with their counterparts from the Northeast Portal and the Marine Cadastre to discuss matters of shared interest. Portal team members collaborate in producing the agendas, notes and minutes for the Tech Team and OMDT calls, and expect to continue these interactions in 2021.

Part IV: Communications and Outreach

The COVID-19 pandemic was disruptive in terms of eliminating opportunities for in-person exposure, including demonstrations at conferences, kiosks at public events, and trainings for public agency staffs. Yet in 2020, the Portal Team was highly active in its communications work, delivering dozens of online trainings and presentations via virtual platforms. The future of the pandemic is unpredictable, but it is anticipated that the Portal's virtual-only approach will be maintained for at least the first half of 2021. The feedback generated through the use of the Portal in these engagements will continue to play an important role in guiding data development and releases this year and beyond. **The Portal team will work with partners at the federal, regional, and state level to communicate and engage with the stakeholders and communities across the Mid-Atlantic.**

Training Sessions and External Engagement

The Portal team fielded several requests for demonstrations and trainings in 2020, including from a team developing a portal for Canada's East Coast and sessions for offshore wind company staffs. Such engagements have been highly effective both in building a community of practitioners and collecting feedback/observations that help the team plan and prioritize improvements. The team will continue to accommodate these requests, whether online or in person, as time, resources and safety considerations permit.

Portal Team members will work with the states, Ocean Mapping Data Team (OMDT), **federal agency partners, and regional partners such as MARACOOS,** to identify opportunities to show the Portal at conferences and events, with possible examples to include:

- The 2021 Mid-Atlantic Ocean Forum, to be held virtually in the spring
- Delaware Coast Day, annually held in Lewes in the fall, and N.J. Sea Grant Ocean Fun Day, held at Sandy Hook in the summer (both depending on state of pandemic)
- Wildlife Conservation Society training for NYC school teachers, typically held in spring or summer

The team will seek to have a presence at state or agency meetings related to ongoing management or regulatory actions, especially those that are using the Portal. Finally,

opportunities will be sought to place team members on panels that can reach strategically important new user groups and enter the Portal for notable awards.

Webinars

The Portal's "How Tuesday" series and topical webinars with partners have been successful vehicles for instructing practitioners and engaging new users. These sessions can offer beginner-focused overviews of the site or specialized sessions about new features and products geared toward industry sectors, governments, working groups. Recordings are posted to the Webinars page, Portal Blog and in some cases, the How to Use the Portal's Tools page, where they serve as educational resources for those who couldn't attend.

Webinar topics frequently revolve around the release of new data and tools. The Portal may offer these and other webinars TBD in 2021:

- A "Portal 101" session for users of all levels
- Fishing data webinars timed with the rollout of products created through the MARCO/NROC/RODA collaboration
- Webinars for other high priority data updates identified in this work plan
- A webinar focused on TNC wind evaluation tool and the oceanography data the project produces for the Portal
- A follow-up webinar with Coast Guard personnel on actions/data related to PARS and proposed anchorages
- A lesson on using the Portal's advanced tools, timed to when upgrades to the drawings tool, private groups, etc. are complete (see Part II)

Portal Blog

The News page (portal.midatlanticocean.org/news/), commonly known as the "Portal blog," is a key tool for keeping audiences engaged and informed. Content produced in this section also significantly improves the site's overall search engine visibility. As a matter of practice, all significant data additions, new/improved tools or other important developments are promptly reported in this section.

Typical topics include announcements and instructional guidance for new data and tools; MARCO news with Portal implications; a dedicated page with links to press releases from partner agencies (states, NOAA, BOEM, et al) related to ocean planning; recordings of How Tuesday webinars; links to news articles about Portal; stakeholder profiles and other articles relevant to audience.

Ocean Stories

Part story map platform and part digital magazine, the Ocean Stories section is a unique public outreach tool for the Portal. The stories and their signature scrolling data map feature have been effective for reaching non-traditional users, such as K-12 students and professionals in the industries that are profiled. The Portal's migration to OpenLayers 6 (discussed in Part II) may open the doors to dynamic new layout options that will make this feature more engaging for users.

The team will pursue story topics that fill gaps in terms of unrepresented users, highlight new data products and promote case studies showing people who have used the Portal to solve problems or aid decisions, and seek unique story angles that can provide human dimensions to map data. Stories that may be produced in 2021 include, but are not limited to:

- **DEIJ Features**: To further progress on the Diversity, Equity, Inclusion and Justice goals established by the Mid-Atlantic Committee on the Ocean (MACO) and MARCO, efforts will be made to identify stories featuring BIPOC ocean users and influential figures.
- **Hudson Canyon Feature**: A team member will seek opportunities to ride along on a party boat trip to one of the East Coast's legendary fishing spots, interviewing the captain and passengers (depending on pandemic/safety considerations).

Older Ocean Stories will be maintained and edited to include updated information and new layers that help tell the story as they become available.

Twitter and E-List Blasts

Now with approximately 700 followers, the Portal's Twitter account is used to promote new features, upcoming webinars, events with Portal Team presence and respond to questions from users. The communications lead monitors the account daily and frequently uses hashtags to tie messages to larger conversations and trending topics.

The team maintains a Campaign Monitor email account to produce an electronic newsletter to its list of over 1,000 registered users and other subscribers. These email blasts are one of the Portal's most effective means for sharing details about upcoming webinars, links to blog posts about new data, MARCO ocean planning events and more. The communications lead will maintain the e-list, add new registered Portal users and those who provide contact information (via sign-up sheets at Portal kiosks, etc.) on a rolling basis.

Page Improvements and Maintenance

In addition the activities outlined above, the communications lead will conduct general maintenance of the site's editorial content and pages. Typical tasks include:

- Regular additions to the Calendar page with Portal/MARCO events and other events relevant to Portal community.
- Keep informational pages such as Data Catalog and Needs & Priorities up to date as new Portal products come online.
- Evaluate needs for new pages and site organizational changes.

Portal Instructional Resources

A frequent piece of feedback from in-person training sessions is how useful the How to use the Portal's tools page is for those who need a quick primer on performing a task or locating data. This page must be updated continually with new instructional content about the latest data and tools and to account for old assets that become outdated.

The team will produce videos, written guidance, diagrams, fact sheets, and other appropriate resources geared toward instructing people to use the portal. An emphasis will be placed and making these materials simple enough for any lay user to follow.

Case Studies

A Case Studies page was created with examples of how the Portal is being used to make decisions, solve problems and improve projects throughout the Mid-Atlantic. These examples are typically documented in the form of single-page fact sheets that can serve as leave behinds for meetings with decision makers (the list also contains links to Ocean Stories that serve as good case studies). These case studies will be expanded in 2021 to include new stories that demonstrate the Portal's utility.

Other Miscellaneous Tasks

- Fielding questions from the public submitted through the Portal's online form and email account, portal@midatlanticocean.org.
- Troubleshooting calls and share-screen sessions with users as needed.
- Development and editing of content on the MARCO website related to the Portal and ocean planning. Assist with basic MARCO web IT issues, sourcing/posting of new images, loading videos to YouTube/posting to site.
- Staffing Portal kiosks at MARCO events and other conferences.

Analytics

The Portal's traffic on Google Analytics will be monitored for trends and spikes in use that may inform the team's work. The following page contains some Google Analytics figures summarizing traffic on the Portal for the one-year period running from November 1, 2019, through October 31, 2020.

Top Layers of 2020

November 1, 2019-October 31, 2020

(Source: Google Analytics)

1. BOEM Active Renewable Energy Lease Areas
2. BOEM Active Renewable Energy Lease Areas by Lease Number and Company
3. Artificial Reefs
4. BOEM Wind Planning Areas
5. NEFSC Trawl Extent
6. Unsurveyed area (avian, annual)
7. All Vessel Transit Counts (2017)
8. Regional Bathymetry
9. Party & Charter Boat
10. Virginia Offshore Wind Cable Alignment
11. BOEM Identified NY Bight Call Areas
12. South Fork Wind Farm Proposed Cable Route
13. BOEM Identified NY Bight Draft Wind Energy Areas of Recommendation (11/14/2018)
14. Anchorage Areas
15. Benthic Habitats (North)
16. Danger Zones & Restricted Areas
17. Benthic Habitats (South)
18. Offshore Wind Energy Technology Zones
19. NYS Identified Wind Energy Area of Consideration
20. Submarine Canyons
21. Scallop 2015-2016 (<5 knots)
22. Deep Sea Corals (Observed)
23. Fathom Lines
24. Bottom Trawl > 65 ft 2011-2015
25. Surfclam/Ocean Quahog 2015-2016 (<4 knots)

APPENDIX: Marine Life Data Work Plan Table

Work Plan for the FY20 Regional Ocean Partnership (ROP)

Regional Ocean Data Sharing Initiative

Northeast Regional Ocean Council (NROC)

Mid-Atlantic Regional Council on the Ocean (MARCO)

December 2020

The following work plan is organized by priorities identified by MARCO and NROC. Under each task, subtasks include descriptions of partner entities that will provide data products and/or assist in analysis and presentation methods, whether the product will be updated/developed by MDAT or will be shared by an existing program, and if the subtask can be completed in 2021.

As part of this work plan development process, MARCO and NROC also identified data priorities that are currently being addressed by existing programs or partner entities, but for which data products will not be complete until 2022. Descriptions of these future data products are included in the work plan below so that expert work groups can discuss and consider these products in the context of the current work plan. In addition, inclusion of future data products in work group discussions will allow MDAT and portal teams to prepare for and support the eventual integration of these products into the portals.

Task	**Partners, in addition to MARCO, NROC, and MDAT**	**New product development by MDAT or integration of data from another program**	**Can be completed by** **Dec. 2021**	**Status**
A. Hold kick-off calls with MARCO, NROC and potential project participants to further define work plan priorities				Complete
B. Develop work plan				Complete
C. Develop subcontracts				

D. Re-establish and convene work groups a. Introductory meeting in Jan/Feb 2021 b. Periodic work group meetings throughout subsequent tasks				
1. Develop cetacean and turtle distribution and range shifts data products - 10%				
A. North Atlantic Right Whale (NARW) monthly model updates; update summary products	Cetacean and turtles work group	New, by MDAT	Yes; fall 2021	
B. NARW models range shifts pre- and post-2011	Cetacean and turtles work group	New, by MDAT	Yes; fall 2021	
C. Composite overlay of all NARW dynamic management areas, 2002-2018	Cetacean and turtles work group, NEFSC	Integration of data products from NEFSC into Portals	Yes	
D. Humpback and other species monthly model updates; update summary products	Cetacean and turtles work group	N/A	No, 2022	
E. Explore potential development of sea turtle data products a. Presence/absence map created by MDAT b. Integrate NEFSC products derived from AMAPPS	Cetacean and turtles work group, NEFSC	a. Likely a new product created by MDAT; b. Integration of data products from NEFSC into Portals	TBD	
2. Develop avian distribution and range shifts data products - 10-15%				
A. Coordinate with NCCOS team to prepare for presentation and documentation of range shift data products in Portals in 2022	NCCOS, BOEM, Avian work group	Integration of data products from NCCOS/BOEM into Portals	Yes	

B. Movement information data products a. Piping plover migration routes (tracks) b. Probability of occurrence for Common Terns, Roseate Terns, Piping Plover, and Red Knots across Atlantic OCS in late 2021	USFWS, BOEM, Avian work group, Movement information work group	Integration of data products from USFWS into Portals	Yes	
3. Develop fish distribution and range shifts data products – 25-40%				
A. Update existing NEFSC data products with most recent data to complete the current decadal product (i.e., spring and fall 2010-2019); update summary products; update online hosting services for individual and summary products	Fish work group	New, by MDAT	Yes	
B. Develop additional summary products and focal subset of individual species products for previous decades (i.e., 1970-1979, 1980-1989, 1990-1999, 2000-2009)	Fish work group	New, by MDAT	Yes for NE; Partially complete for MidA	

C. Leverage the NEFMC and MAFMC work on the Northeast Regional Habitat Assessment (NRHA) a. Coordinate with NRHA team to review early model outputs with work group and prepare for presentation and documentation of modeled data products in Portals in 2022 b. Update NEAMAP and state fish trawl data (Integrate NRHA presence/absence data, or more, if available)	NEFMC, MAFMC, NRHA work group, Fish work group	Coordination with and integration of NRHA data into Portals	Pending the NEFMC/MAFMC work and timeline	
D. Update sea scallop distribution maps (drop camera, UMass SMAST), and dredge survey data (NEFSC)	UMass SMAST, NEFSC, Fish work group	Integration of data products from NEFSC and SMAST into Portals	Yes	
4. Develop species sensitivity and risk data products for multiple taxa - 25-45%				
A. Cetacean climate vulnerability (leveraging the [NOAA Atlantic Marine Mammal Climate Vulnerability Assessment])	NOAA OST, Cetacean work group	New, by MDAT	Yes, pending NOAA OST publication timeline	
B. Cetacean risk to ship strikes – layers showing high risk areas for NARW, humpback whale and cetacean species groups (AIS data overlay)	Cetacean work group	New, by MDAT	Yes	
C. Explore cetacean sensitivity to chronic and event-based sound with work group	Cetacean work group	Exploration of potential methods with WG	TBD	
D. Fish species sensitivity to disturbances associated with submarine cable projects	Fish work group (build on Massachusetts WG report)	New, by MDAT	Yes	

5. Develop products that address best practices for the use of data and information - 5%				
A. Develop guidance document or other tool for using and interpreting species distribution model outputs (e.g., understanding input data density and sources, seasonal vs. monthly products, uncertainty)	MARCO/NROC marine life work groups, NROC Best practices work group	New guidance product to accompany data	Yes	
B. Develop guidance document, infographic, and/or other tool to indicate how marine life observations collected by industry or other entities may be integrated into existing marine life data products or used to validate existing marine life models	MARCO/NROC marine life work groups, NROC Best practices work group	New guidance product to accompany data	Yes	
6. Develop final report - 5%				
Documents all work group input by species/topic, describes methods and references data products completed and incorporated into the Portals by the end of 2021, and describes the path forward for updating remaining marine life products by species/topic in 2022.				