BOEM

Bureau of Ocean Energy Management

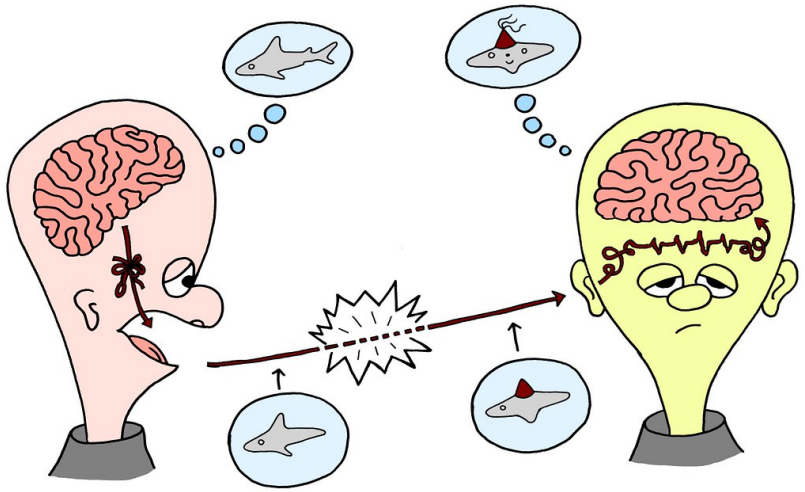
Collaboration and Decision Making with Ocean Mapping and Reporting Tools

Christine Taylor (BOEM)

Maritime Industry Knowledge Exchange– 8/19/2021

Maps…

- Are important visuals for communications
  - Get everyone on the same page quickly
- Provide a quick way to discern multiple on the ground/in the water issues at hand
  - Best locations for a project – physical conditions, distance to a resource
  - Potential conflicts for use – physical conditions, other uses, species interactions
- Often provide data that is actionable
- Easily **shared** in a digital format and can be updated with other existing data to help tell the whole story



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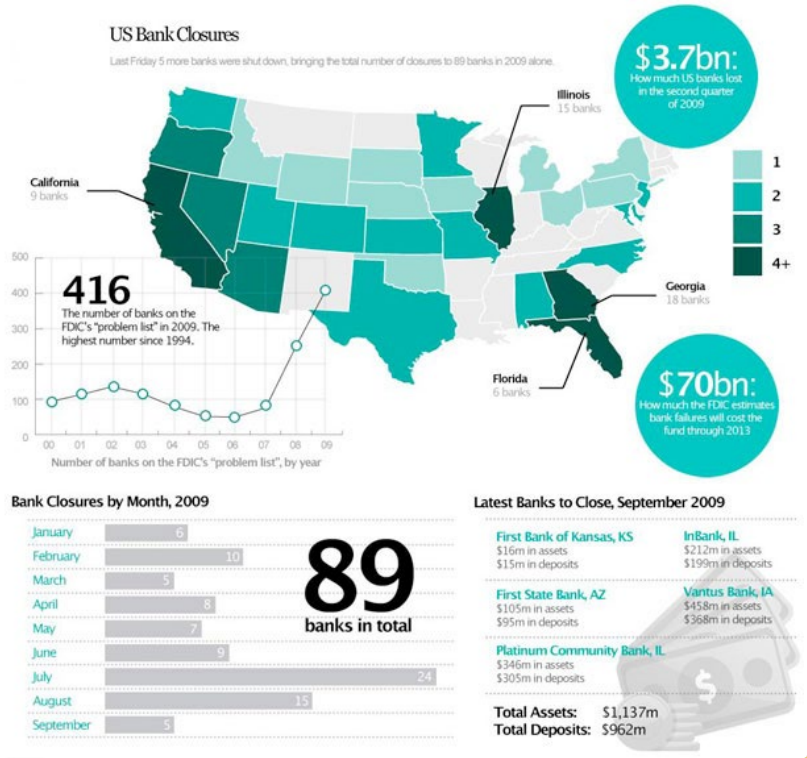
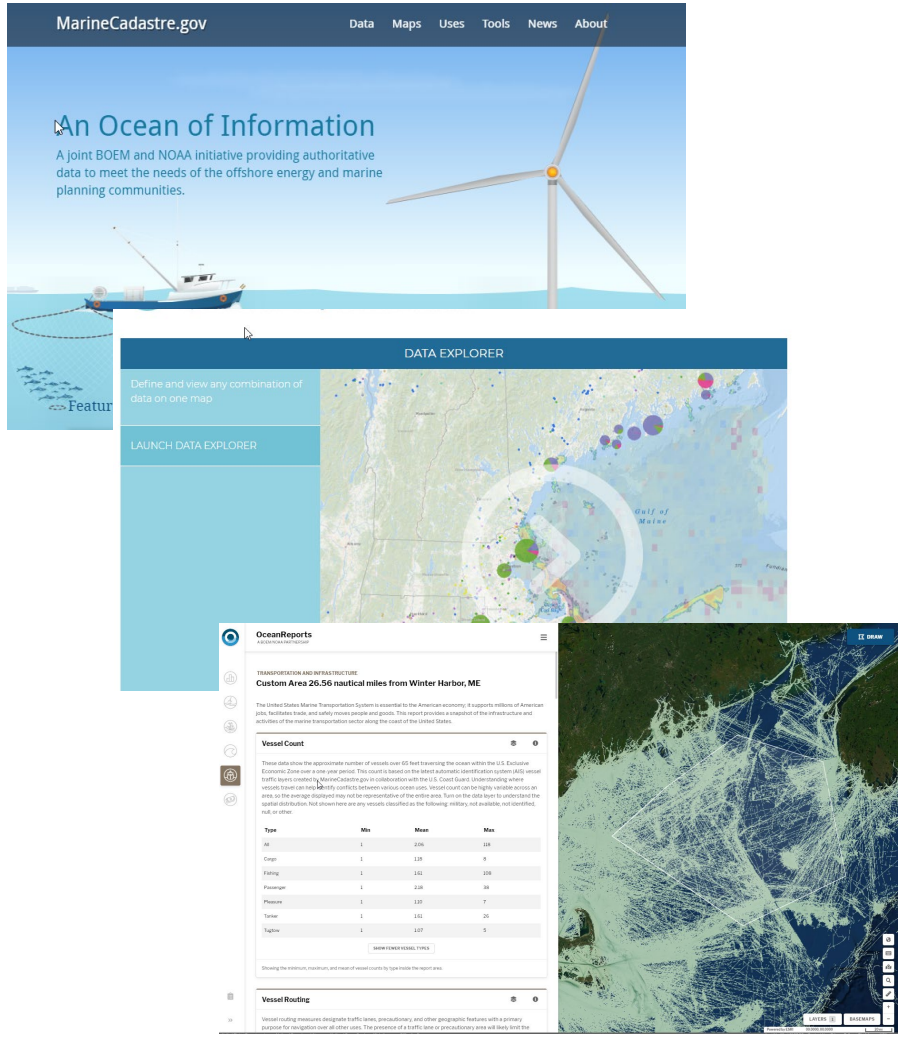
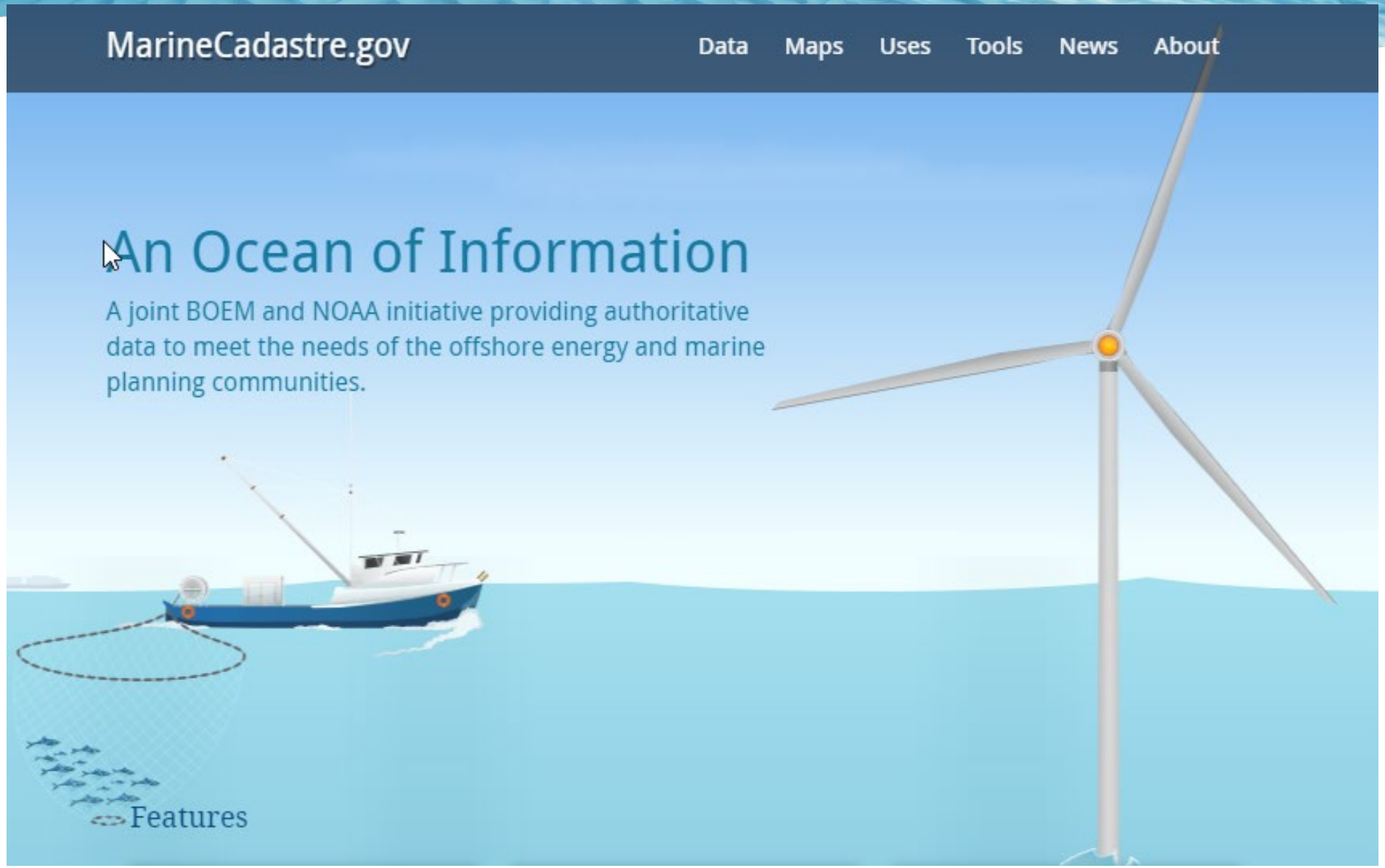


Maps & Decision Tools

- **MarineCadastre.gov**
  - Authoritative, mostly federal data
  - Map viewer/ID tools/Data download
  - Historical AIS data
- **Regional Ocean Data Portals**
  - Authoritative, federal, state, local data
  - Map viewer/ID tools/Data download
  - Maps by topic area
- **Ocean Reports**
  - Map viewer/Custom Area Report/Data download/Data from MarineCadastre.gov
  - A MarineCadastre.gov Tool



MarineCadastre.gov



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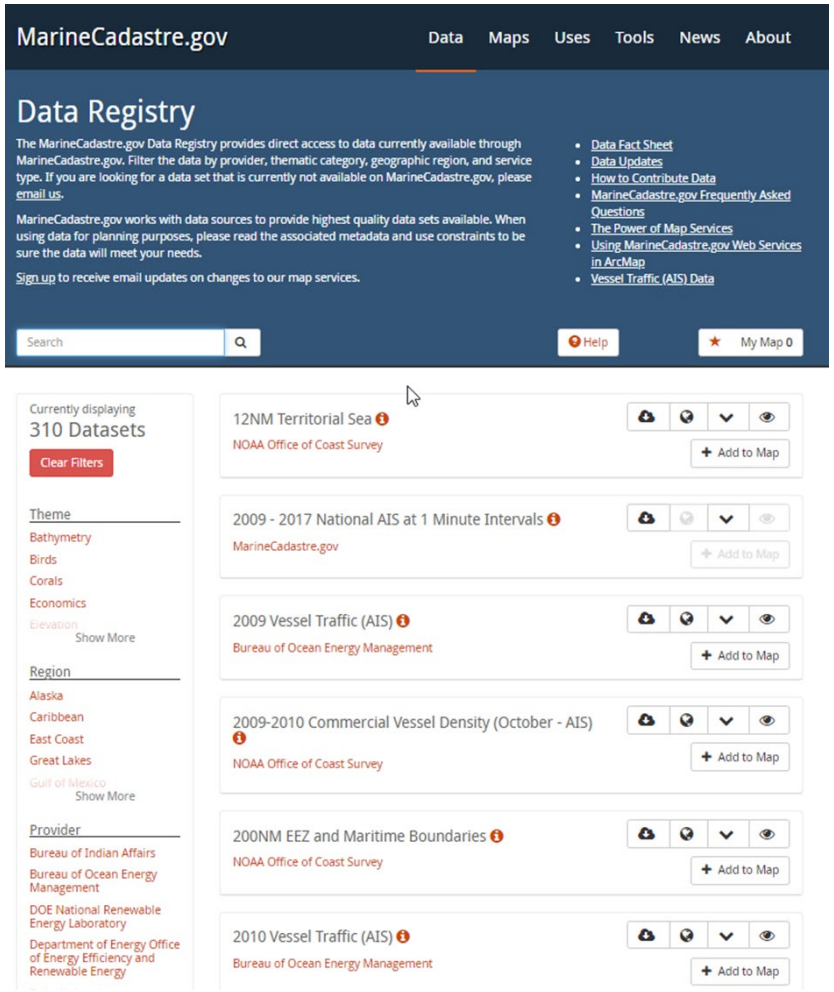
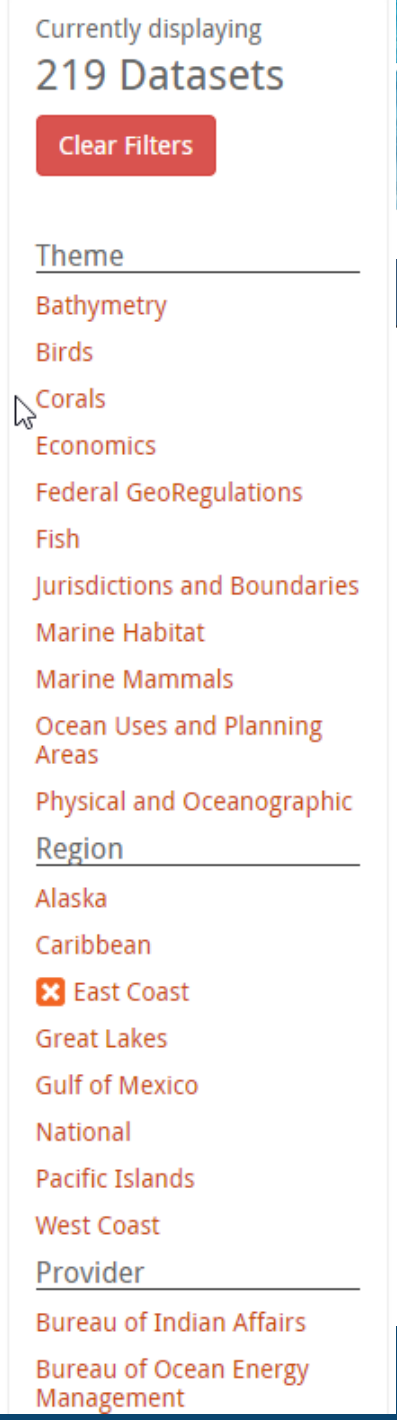
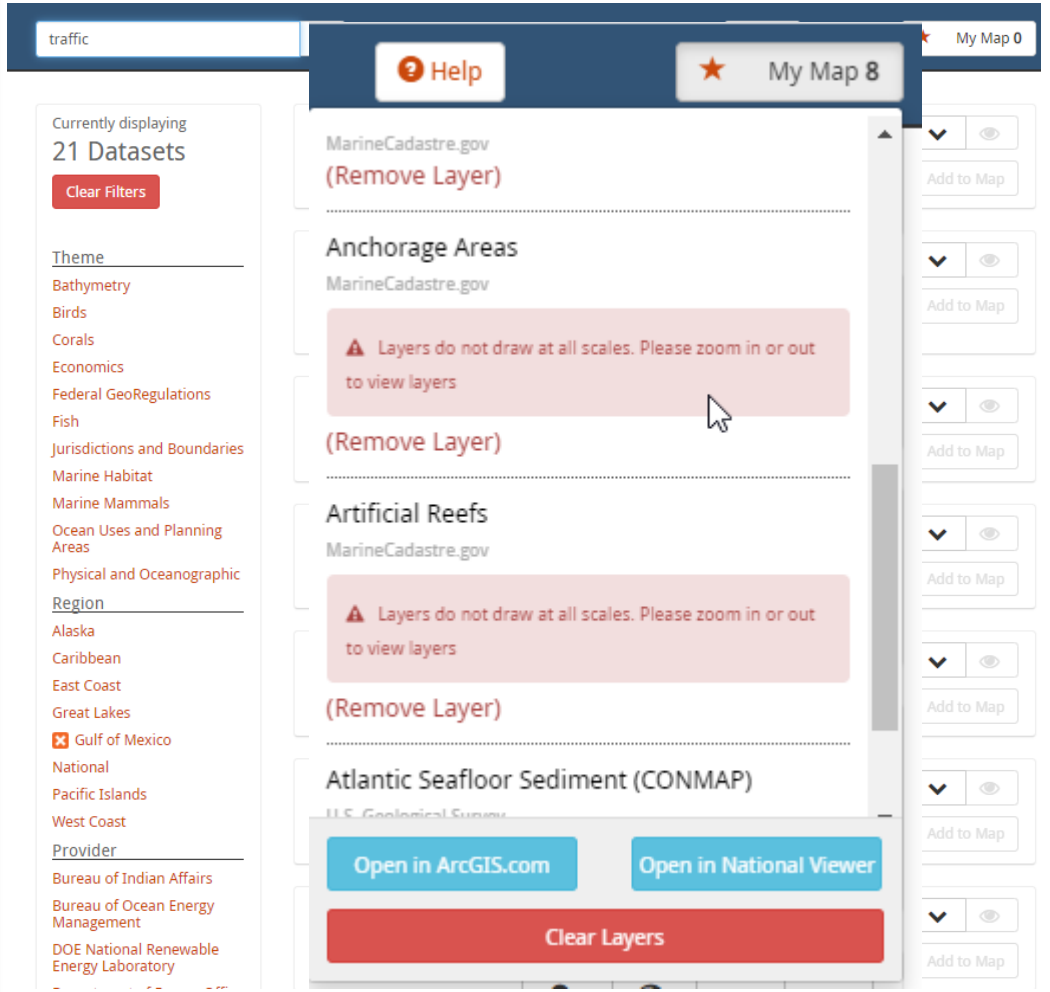
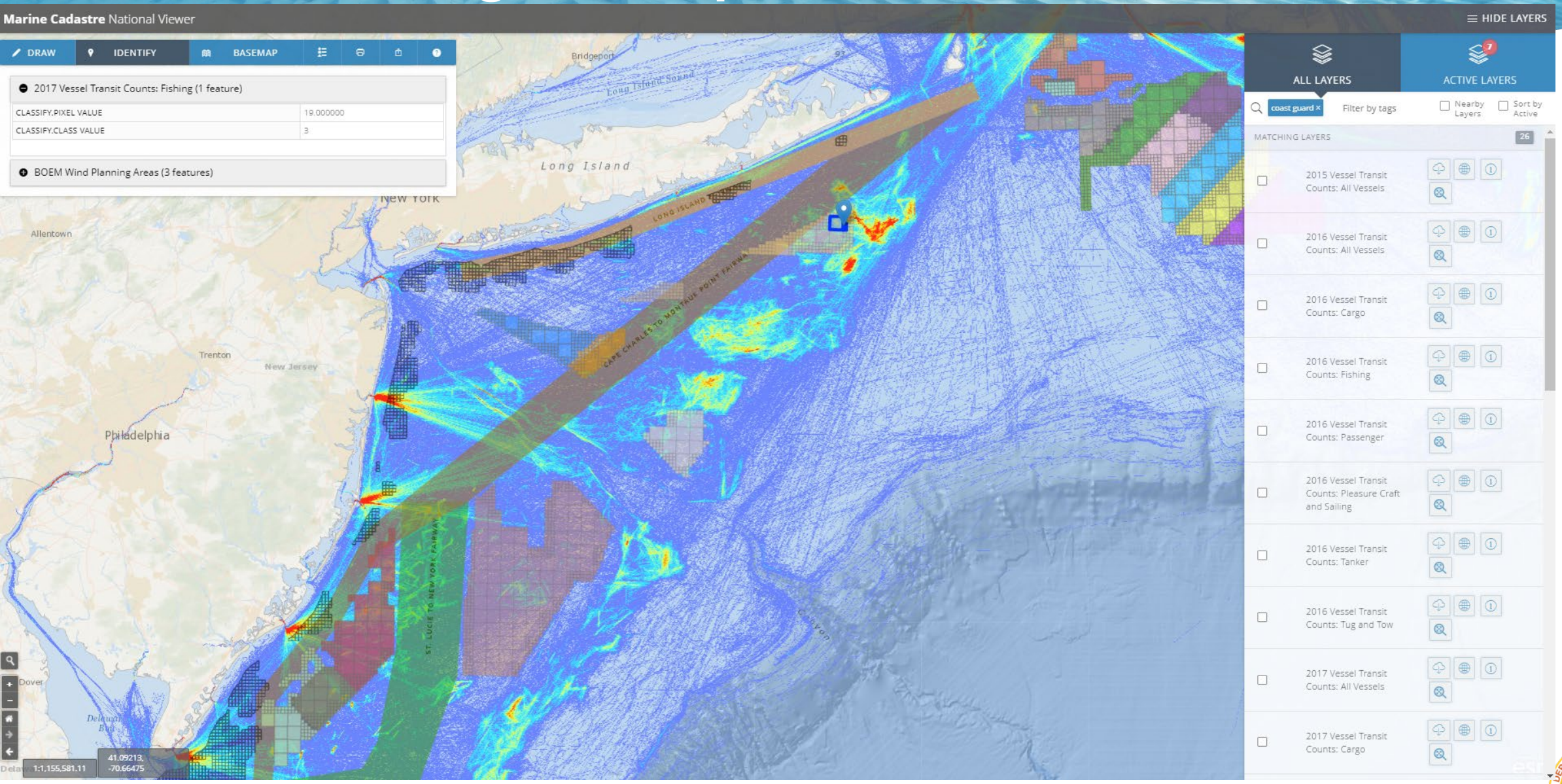




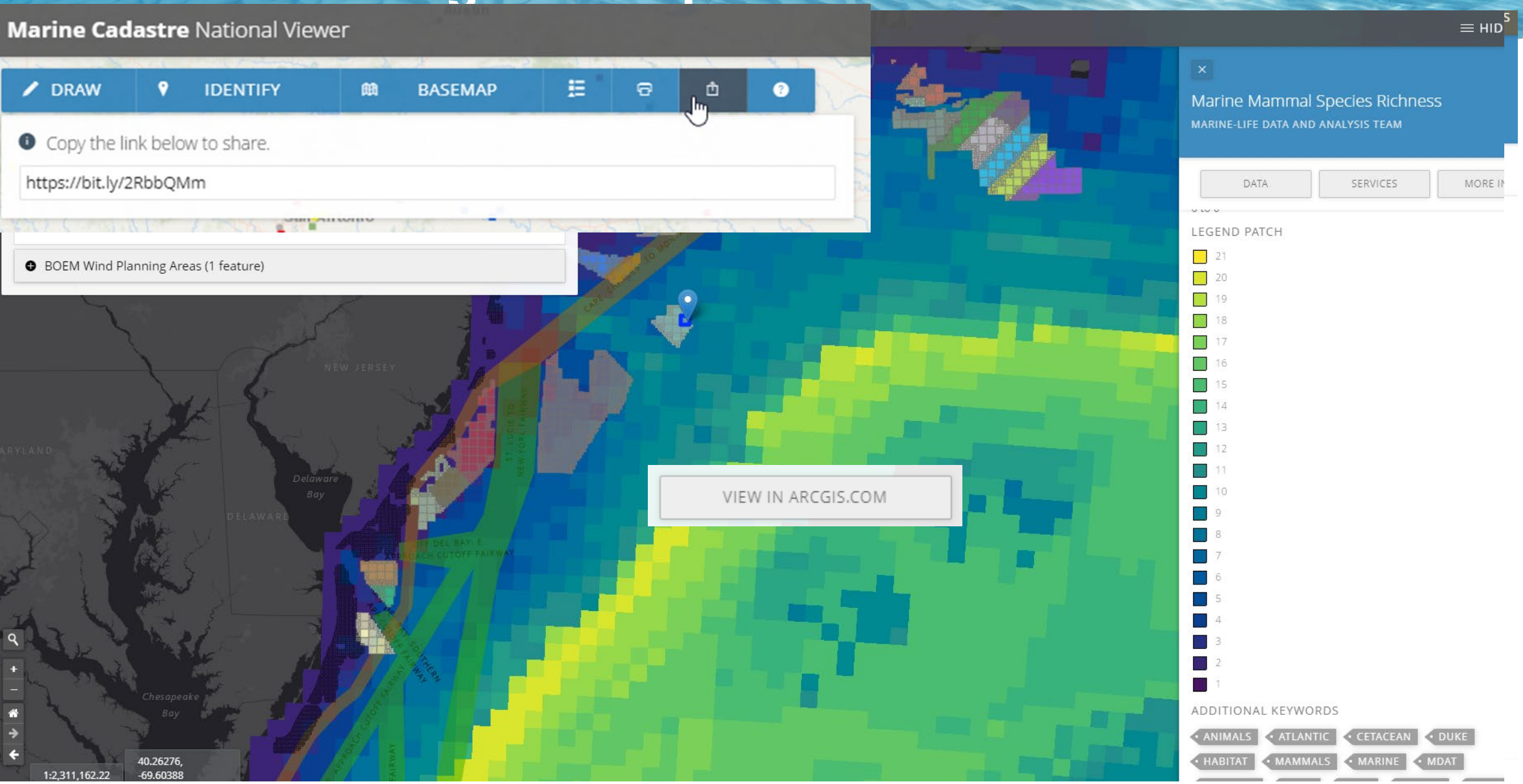


MarineCadastre.gov – Map Viewer

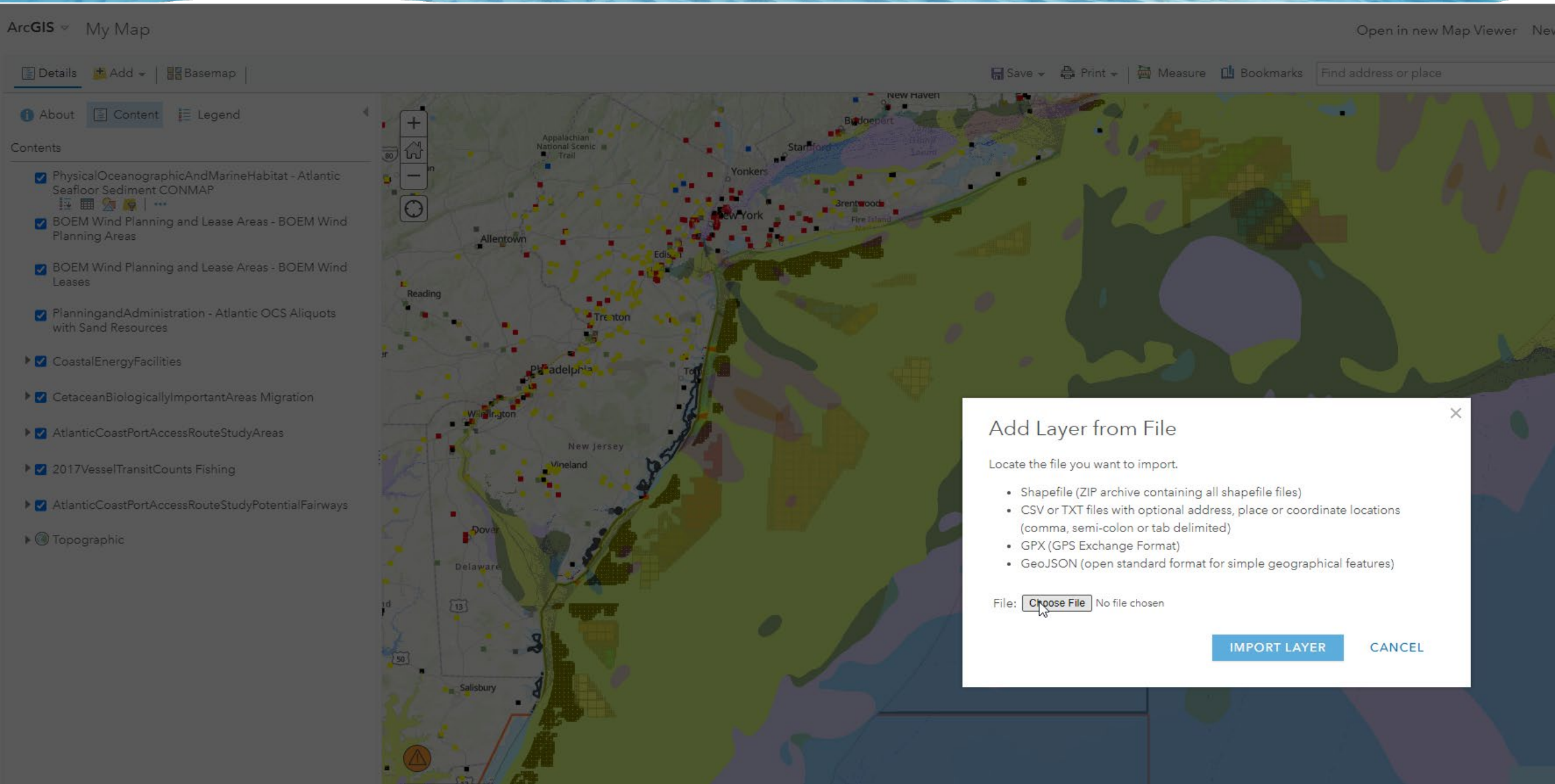


BOEM Bureau of Ocean Energy Management

MarineCadastre.gov – Map Viewer



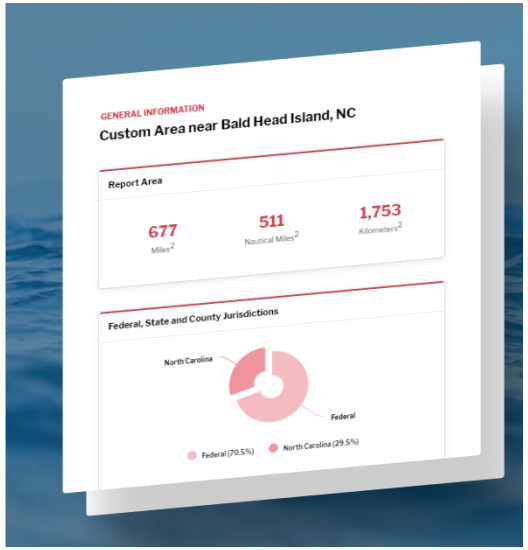
MarineCadastre.gov – Map Viewer

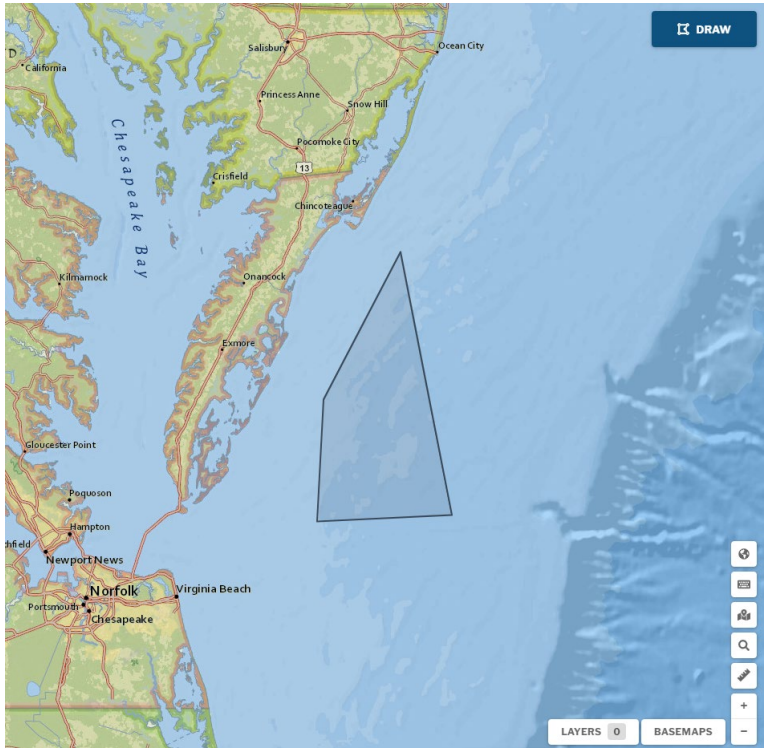


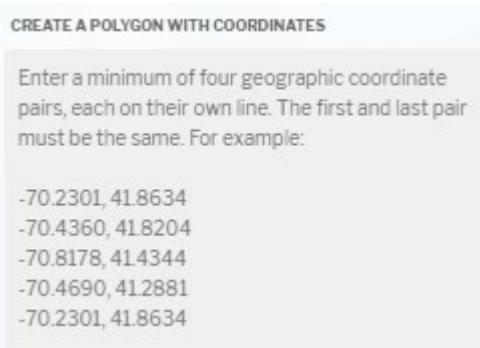

OceanReports
Unlocking Ocean Intelligence, Empowering Ocean Decisions
https://marinecadastre.gov/oceanreports

Ocean Reports Components

- **Draw your own area – results in about 2 seconds**
  - Move it around if you don't get the results you need
  - Or use known coordinates







6 Chapters, 80+ layers, 67 infographics

Chapter Theme	Symbol	Infographic Reports Available			
General Information		Report Area Depth/Elevation Populated Places Federal/State/County Jurisdictions	Congressional and Legislative Districts Federal Statutes Tribal Lands		
Energy & Minerals		Offshore Wind Potential Offshore Wind Planning Areas Offshore Wind Energy Leases OCS Revenue Sharing Areas Oil and Gas Potential	Oil and Gas Planning Areas Oil and Gas Leases Energy Facilities OCS Blocks with Sand Resources	Beach Nourishment Projects Surficial Sediment Texture Ocean Disposal Sites Federal Sand and Gravel Leases	
Transportation & Infrastructure		AIS Vessel Count Vessel Routing N. Atlantic Right Whale Management Areas Anchorage Areas Pilot Boarding Areas	Ports Coastal Maintained Channels Danger Zones/Restricted Areas Unexploded Ordnances Formerly Used Defense Sites	Wrecks/Obstructions Cables and Pipelines Wastewater Outfalls Aquaculture Oil Lightering Zones	Deepwater Ports Oil/Gas Platforms Oil/Gas Wells
Natural Resources		Endangered Species ESA-Critical Habitat Designations Habitat Areas of Particular Concern Managed Highly Migratory Species Audubon Important Bird Areas	Protected Areas Artificial Reefs Shallow Corals Deep-sea Sponge/Coral Obs. Deep-sea Coral Habitat Suitability	Historical Lighthouses Cetacean Biologically Important Areas	
Oceanographic & Biophysical		Wave Height, Period and Direction Wind Speed and Direction Current Speed and Direction at Depths Sea Surface Height Water Temp/Salinity	Nitrates Phosphates Silicates Aragonite Light Attenuation KD PAR	Light Attenuation KD 490 Chlorophyll a Concentration	
Economics & Commerce		Ocean Job Contributions GDP of Ocean Economy Contributions by Sector	Census Statistics Fishing Economic Value (North and Mid Atlantic)		

Custom Area 11.37 nautical miles from ...

GENERAL INFORMATION

Congressional and Legislative Districts

2
Congressional Districts

5
State Districts

- US Congressional Districts
- State Senate
- State House

Showing all districts within 24 nautical miles of the report area, or the closest one if none are within 24 nautical miles.

Federal Statutes

Federal statutes cover a broad variety of legal restrictions and permitted activities within state and U.S. federal waters. It is important to know these statutes and where they are applicable before planning for any activities in these waters. Those listed below apply within the area of interest outlined in this report. Please note that other federal statutes with complex or uncertain geographic boundaries may exist in the area and can be found by using the Ocean Law Search tool.

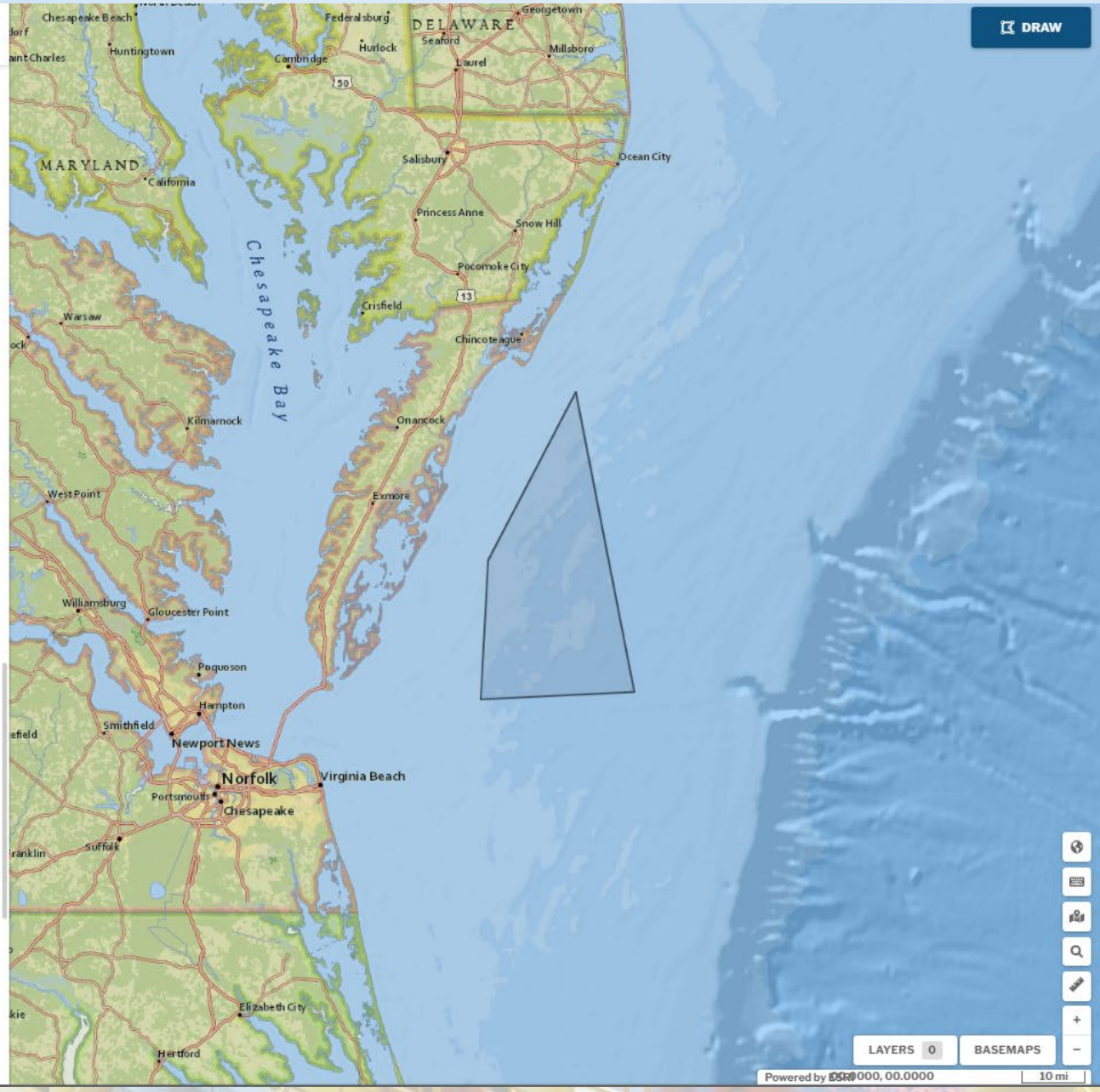
- Act to Prevent Pollution from Ships and MARPOL 73/78
- Clean Water Act
- Coastal Zone Management Act
- Comprehensive Environmental Response, Compensation, and Liability Act
- Endangered Species Act
- Energy Policy Act
- Magnuson-Stevens Fishery Conservation and Management Act
- Marine Debris Research, Prevention and Reduction Act
- Marine Mammal Protection Act
- National Environmental Policy Act
- National Historic Preservation Act
- National Marine Sanctuaries Act
- Outer Continental Shelf Lands Act

Showing federal statutes that apply inside the report area.

Indian Land Areas

The relationship between federally recognized tribes and the United States is one between sovereigns, that is, between a government and a government. This principle, which is grounded in the United States Constitution, has helped to shape the long history of relations between the federal government and these tribal nations. So too has the federal government's historic policies of forced relocation and assimilation.

The following are the current known boundaries of indian land areas located nearest to this area. However, because of relocation policies, many tribes



Energy & Minerals

Offshore Wind Potential
Offshore Wind Planning Areas
Offshore Wind Energy Leases
OCS Revenue Sharing Areas
Oil and Gas Potential
Oil and Gas Planning Areas
Oil and Gas Leases
Energy Facilities
OCS Blocks with Sand Resources
Beach Nourishment Projects
Surficial Sediment Texture
Ocean Disposal Sites
Federal Sand and Gravel Leases

Custom Area 11.37 nautical miles from ...

ENERGY AND MINERALS

DRAW

water, and biofuels) is increasing and can help reduce greenhouse gas production. Wind energy projects are currently planned for the Atlantic coast. Hawaii and California are also considering wind projects. At the same time, the continued development of conventional oil and gas resources is critical to meeting current U.S. energy needs. America's coastal and marine waters also provide sand and gravel, which is used to restore hundreds of miles of coastline and protect billions of dollars in infrastructure and ecological habitats from coastal erosion and destructive storms.

Offshore Wind Resource Potential

Areas with annual average wind speeds of 7 meters per second (m/s) and greater, at 100-meters (328-feet) heigl sufficient wind resources suitable for offshore development. Our nation's offshore wind resource potential, with development, is predicted to be more than 2,000 gigawatts of capacity per year. This is nearly double the nation' percent of the potential available areas were built by 2050, they could support 160,000 jobs, reduce power sect reduce greenhouse gas emissions by 1.8 percent. Floating wind platforms could potentially provide access to de greatest wind capacity, expanding this potential.

8.50
Weighted Average (m/s)

1,980,5
Potential Houses Suppo

2,028.
Area with suitable wind r

- Outstanding (9.0+)
- Superb (8.5)
- Excellent (8.0)
- Good (7.5)
- Fair (7.0)
- Unsuitable (< 7.0)

Potential houses calculations assume that only areas of good or better quality (> 7 m/s wind speed) are developed to maximum capacity.

Additional Information

In 2016, the average annual electricity consumption for a U.S. residential utility customer was 10,766 kilowatt hours (kWh), an average of 897 kWh per month. Louisiana had the highest annual electricity consumption at 14,881 kWh per residential customer, and Hawaii had the lowest at 6,061 kWh per residential customer.

(Turbine Name Plate Capacity (Based on National Renewable Energy Laboratory conversion 3MW/km2) * Hours per year (8,760) * Capacity Factor (.4)) / Average Household Electricity Use (in megawatt hours per year)

[1] U.S. Department of Energy offshore wind potential
[2] U.S. Energy Information Administration FAQ

One meter per second is equivalent to approximately 2.25 miles per hour.

Check the metadata page for more information, or use the download link to get the latest available geospatial layer.

Legend

- Outstanding (9.0+)
- Superb (8.5)
- Excellent (8.0)
- Good (7.5)
- Fair (7.0)
- Unsuitable (< 7.0)

LAYERS 1 BASEMAPS

Natural Resources

Endangered Species
ESA-Critical Habitat Designations
Habitat Areas of Particular Concern
Managed Highly Migratory Species
Audubon Important Bird Areas

Protected A
Artificial Re
Shallow Cor
Deep-sea Sp
Deep-sea Co

DRAW

Custom Area 11.37 nautical miles from ...

NATURAL RESOURCES AND CONSERVATION

Cetacean Biologically Important Areas

Biologically important areas are places essential for specific species or species groups of cetaceans for migration, or feeding or reproduction, or areas that are permanently populated with small resident populations. Many cetacean species (whales and dolphins) are threatened or endangered and serve as important apex predators in their respective ecosystems. Cetaceans can be especially susceptible to noise, entanglement in fishing gear, and disturbances from other human activities. Activities in areas corresponding to a biologically important area may require consultation with regional experts to determine sites that will minimize interactions with threatened and endangered cetacean species.

Name	Type	Area	Count
North Atlantic right whale	Migration	Eastern Atlantic	1

Showing biologically important areas by species and type inside the report area and within 10 nautical miles.

DISPLAY LAYER

Audubon Important Bird Areas

The state Audubon societies have designated Audubon important bird areas, which involve identifying, monitoring, and protecting places for ecologically important bird species. These include coastal areas, but most state important bird areas do not consider areas over open ocean. Each area designates the birds that use these important areas for breeding, nesting, feeding, or migration. Because these are highly mobile animals, it is important to know what birds are in the area of interest when considering a project that may affect these areas or disturb the birds, many of which are protected by the Migratory Bird Act, and in some cases the Endangered Species Act. For more information, visit the Information for Planning and Consultation (IPaC) website.

Site Name (in order of distance from report area)			
Barrier Island/Lagoon System	Explore Data	Learn More	View Report
Assateague Island IBA	Explore Data	Learn More	View Report
Maryland Coastal Bays IBA	Explore Data	Learn More	View Report
Pocomoke-Nassawango IBA	Explore Data	Learn More	View Report
Delmarva Bayside Marshes	Explore Data	Learn More	View Report
Lower Delmarva	Explore Data	Learn More	View Report
Somerset-Wicomico Marshes IBA	Explore Data	Learn More	View Report
Back Bay	Explore Data	Learn More	View Report
Chesapeake Bay Islands	Explore Data	Learn More	View Report
Outer Banks Inshore Ocean	Explore Data	Learn More	View Report

Audubon

BARRIER ISLAND/LAGOON SYSTEM

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Name Barrier Island/Lagoon System

Status Recognized

Priority Global

Proposed Criteria A1, A2, A3, A4i, A4iii, A4iv, B1, B3, B4i, B4ii, B4iv

Confirmed Criteria D1, D3, D4i, D4ii, D4iii, D4iv, D4v, D4vi, D4vii, A1, A4i, A4ii, B1, B4i

State Virginia

Counties Accomack, Northampton

Central Coordinates 37.53000, -75.68278

Area (acres) 260,076

Elevation (meters) Min: Max:15 Avg:8

Bird Conservation Region

New England / Mid-Atlantic Coast

SITE DESCRIPTION

The Virginia Barrier Island Lagoon System includes the seaward margin of the lower Delmarva Peninsula from the mouth of the Chesapeake Bay to the MD-VA border. This location is the most important bird area in Virginia and one of the most important bird areas along the Atlantic Coast of North America. The area has been designated as a UNESCO Biosphere Reserve, a Western Hemisphere Shorebird Reserve Site with international status, is the site of a National Science Foundation Long-term Ecological Research site, and is the focus of a multi-organizational partnership dedicated to bird conservation. The area includes the most pristine chain of barrier islands along the Atlantic Coast, extensive salt marshes, inter-tidal mudflats, and open water. Although much of the system is currently owned by government agencies and conservation organizations, numerous conservation challenges remain. For a fact sheet on this IBA, including a map, click here|http://www.audubon.org/bird/iba/virginia/Documents/Barrier%20Island_Lagoon%20System.pdf

ORNITHOLOGICAL SIGNIFICANCE

This IBA supports the higest diversity and density of birds of conservation concern within Virginia. It supports significant populations of multiple sensitive bird species throughout the year as well as significant species assemblages for Barrier Island/Beach and Coastal Marsh bird communities. Several beach-nesting species such as the Piping Plover, Wilson?s Plover, American Oystercatcher, Gull-billed Tern, Least Tern, and Black Skimmer that are of high regional or national concern nest exclusively or nearly so within this system. The area supports the most significant breeding populations in the state of waders such as the Little Blue Heron, Tricolored Heron, Snowy Egret, Glossy Ibis, and Black-crowned Night Heron. Marsh-nesting species such as the Forster?s Tern, Seaside Sparrow, and Saltmarsh Sharp-tailed Sparrow also have their center of abundance here. During migration, the area is of international significance as a stopover area for Whimbrel, Short-billed Dowitcher, and Red Knot. In addition, the area supports significant wintering populations of Nelson?s Sharp-tailed Sparrow, Atlantic Brant, and Dunlin. Other at-risk species supported on the site below threshold levels include the Peregrine Falcon, Barn Owl, Bald Eagle, and Northern Harrier.

SPECIES DATA AND CRITERIA

Common Name	Date	Seasonal/Daily	Season	Observed	Density (#km/2)	Units	Proposed	Confirmed
American Black Duck	2003	S	breeding	10		Breeding pairs	-	-
	Source:	Bydrowski, T. and G. Costanzo. 2003. Progress report: Survey of breeding Black Ducks on the Virginia Barrier Islands, Spring 2003. Unpublished Report. VDGIF, Richmond, VA.						
	2005	S	breeding	20		Breeding pairs	-	-
	Source:	Arquilla, B. 2005. The impact of predator reduction on the productivity of American Black Ducks and other ground-nesting avifauna on the Virginia Coast Reserve. Unpublished data.						
American Oystercatcher	2003	S	breeding	525		Breeding pairs	-	A4i ,B1
	Source:	Wilke, A. L., B. D. Watts, B.R. Truitt, and R. Boettcher. 2005. Breeding season status of the American Oystercatcher in Virginia. USA. Waterbirds 28: 308-315.						
Bald Eagle	2005	S	breeding	3		Breeding pairs	-	-
	Source:	Watts, B.D. and M.A. Byrd. 2005. Virginia bald eagle nest and productivity survey: Year 2005 report. Center for Conservation						

RS 1 BASEMAPS

Oceanographic & Biophysical

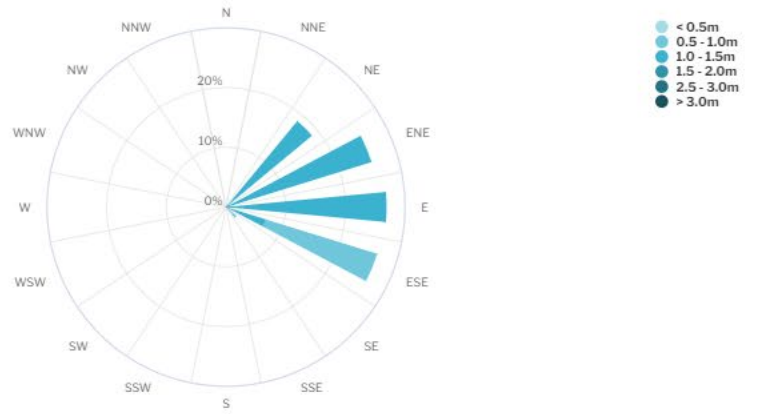
Wave Height, Period and Direction
Wind Speed and Direction
Current Speed and Direction at Depths
Sea Surface Height
Water Temp/Salinity
Nitrates
Phosphates
Silicates
Aragonite
Light Attenuation KD PAR
Light Attenuation KD 490
Chlorophyll a Concentration

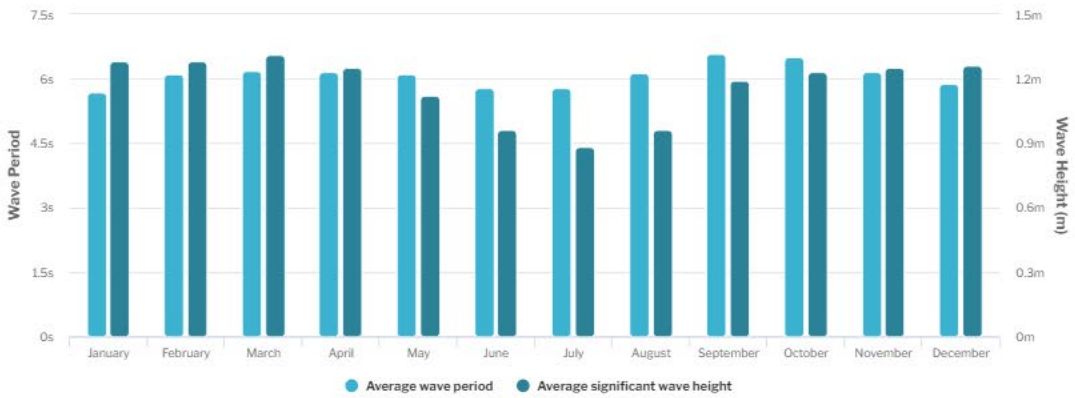
Custom Area 11.37 nautical miles from ...

OCEANOGRAPHIC AND BIOPHYSICAL

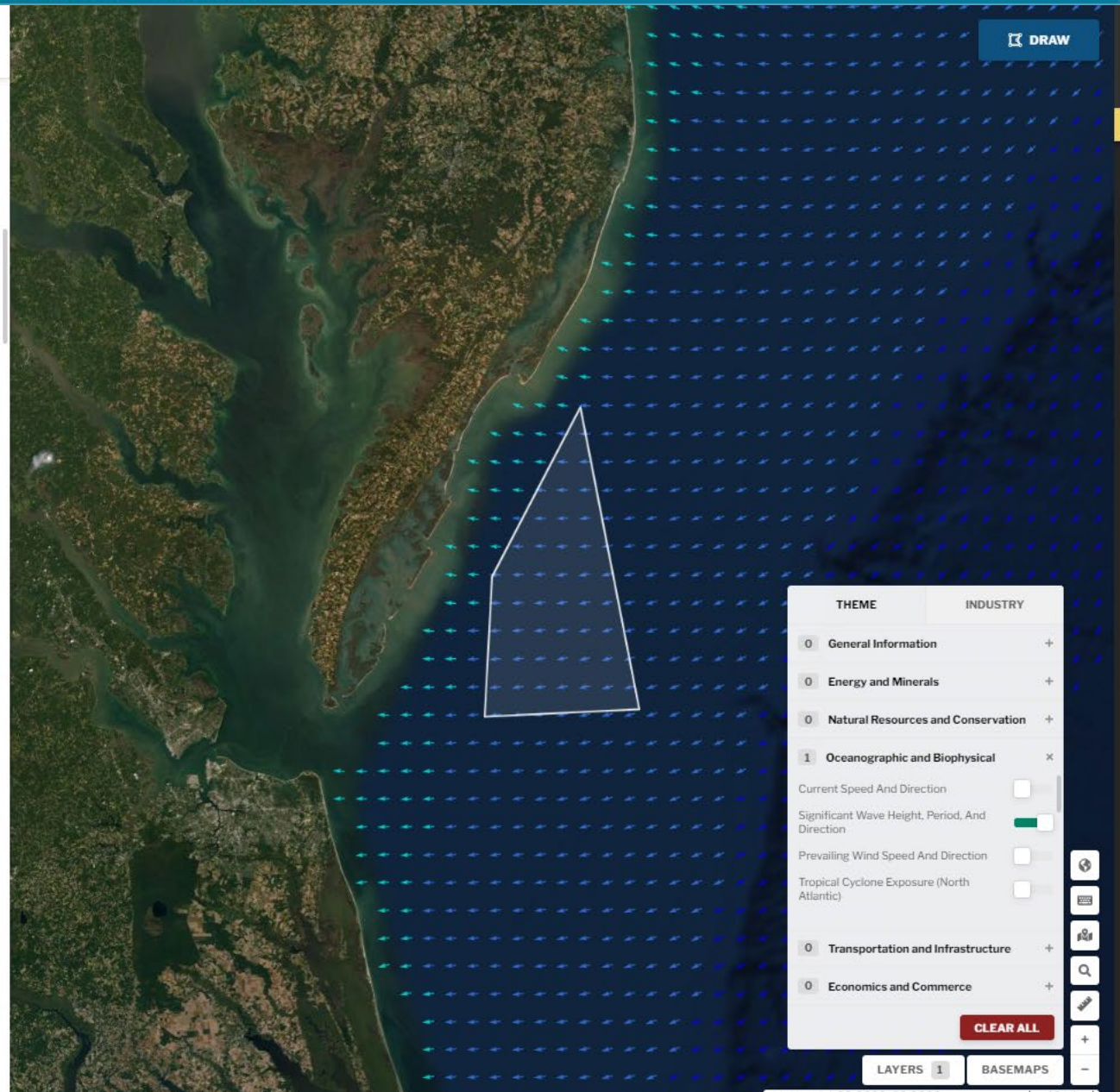
Significant Wave Height, Period and Direction

Significant wave height roughly corresponds to the mean wave height of the highest one-third of waves in a given location. It is an important parameter representative of the statistical distribution of ocean waves and is an indicator of the local wave climate. Wave period represents the average time between two successive wave crests. Wave direction indicates the average directionality of local waves. Knowledge of local wave conditions are important in determining compatible areas for the design of in-water infrastructure. The wave rose and mapped wave vectors indicate the direction that waves are coming from (arrowheads on the map indicate the direction that waves are moving towards).





Data used to derive infographic includes the monthly mean significant wave height, wave direction, and mean wave period inside the report area.



Transportation & Infrastructure

AIS Vessel Count
Vessel Routing
N. Atlantic Right Whale Management Areas
Anchorage Areas
Pilot Boarding Areas

Ports
Coastal Maintained Channels
Danger Zones/Restricted Areas
Unexploded Ordnances
Formerly Used Defense Sites

Wrecks/Obstructions
Cables and Pipelines
Wastewater Outfalls
Aquaculture
Oil Lightering Zones

Deepwater Ports
Oil/Gas Platforms
Oil/Gas Wells

OceanReports
A BOEM/NOAA PARTNERSHIP

TRANSPORTATION AND INFRASTRUCTURE

Custom Area 11.37 nautical miles from Chincoteague, VA

The United States Marine Transportation System is essential to the American economy; it supports millions of American jobs, facilitates trade, and safely moves people and goods. This report provides a snapshot of the infrastructure and activities of the marine transportation sector along the coast of the United States.

Vessel Count

These data show the approximate number of vessels over 65 feet traversing the ocean within the U.S. Exclusive Economic Zone over a one-year period. This count is based on the latest automatic identification system (AIS) vessel traffic layers created by MarineCadastre.gov in collaboration with the U.S. Coast Guard. Understanding where vessels travel can help identify conflicts between various ocean uses. Vessel count can be highly variable across an area, so the average displayed may not be representative of the entire area. Turn on the data layer to understand the spatial distribution. Not shown here are any vessels classified as the following: military, not available, not identified, null, or other.

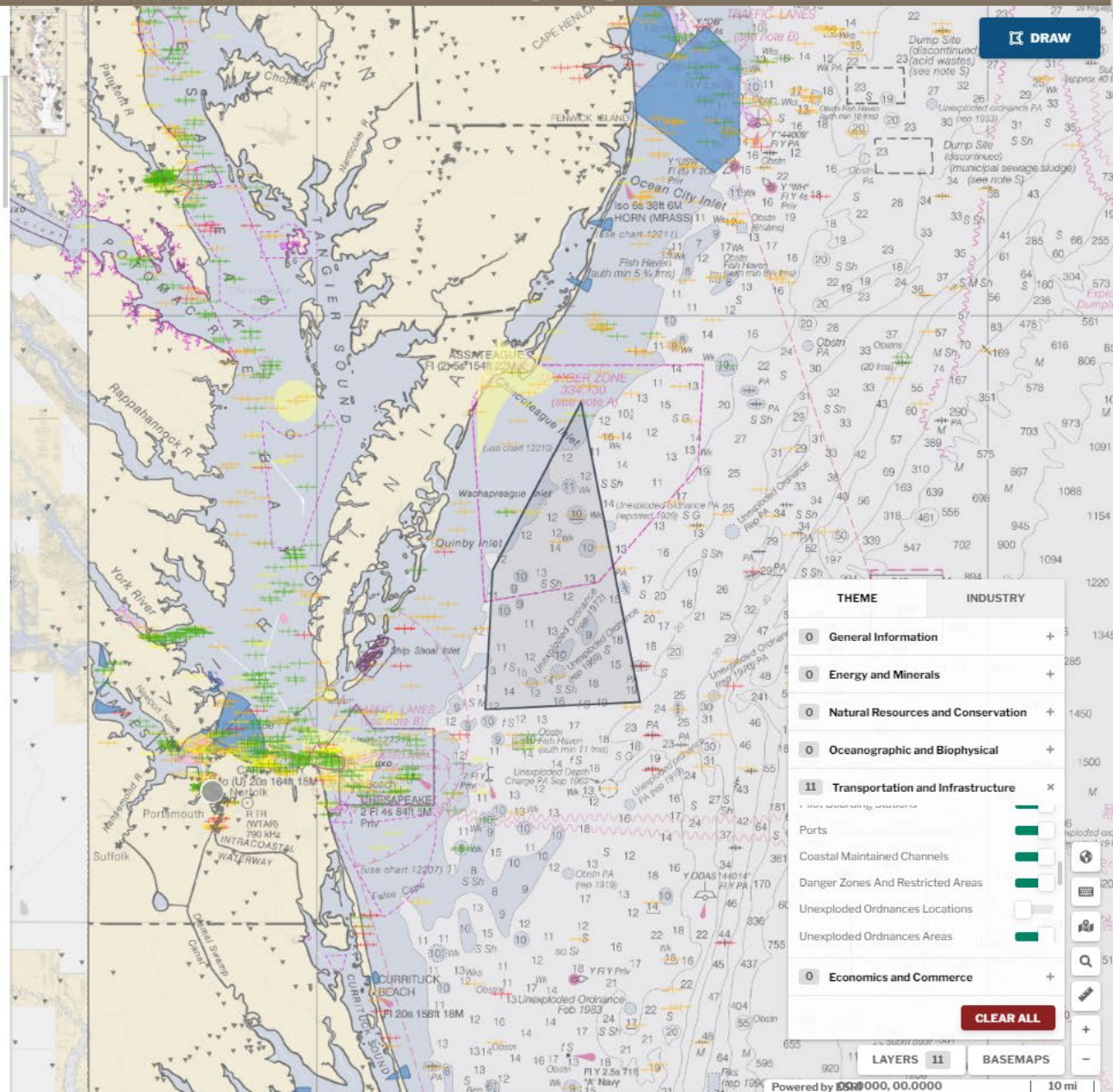
Type	Min	Mean	Max
All	1	6.36	111
Cargo	1	3.89	102
Fishing	1	2.61	16
Passenger	1	1.27	7
Pleasure	1	1.54	10
Tanker	1	1.08	7
Tugtow	1	1.79	20

Showing the minimum, maximum, and mean of vessel counts by type inside the report area.

Vessel Routing

Vessel routing measures designate traffic lanes, precautionary, and other geographic features with a primary purpose for navigation over all other uses. The presence of a traffic lane or precautionary area will likely limit the placement of a temporary or permanent structure in those areas.

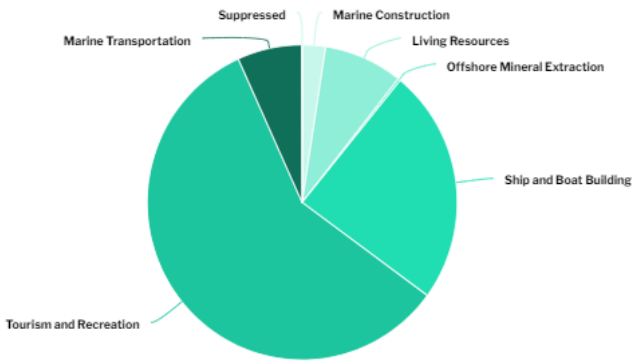
The data are not applicable to this location.



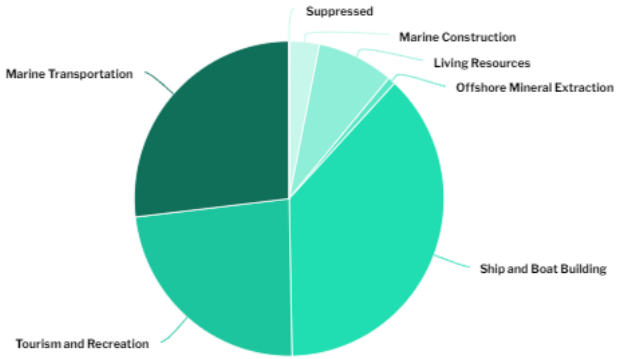
Custom Area 11.37 nautical miles from ...

ECONOMICS AND COMMERCE

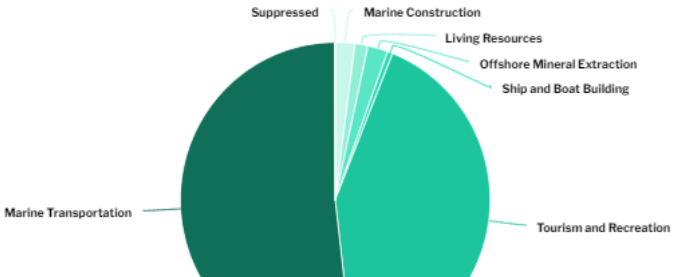
North Carolina

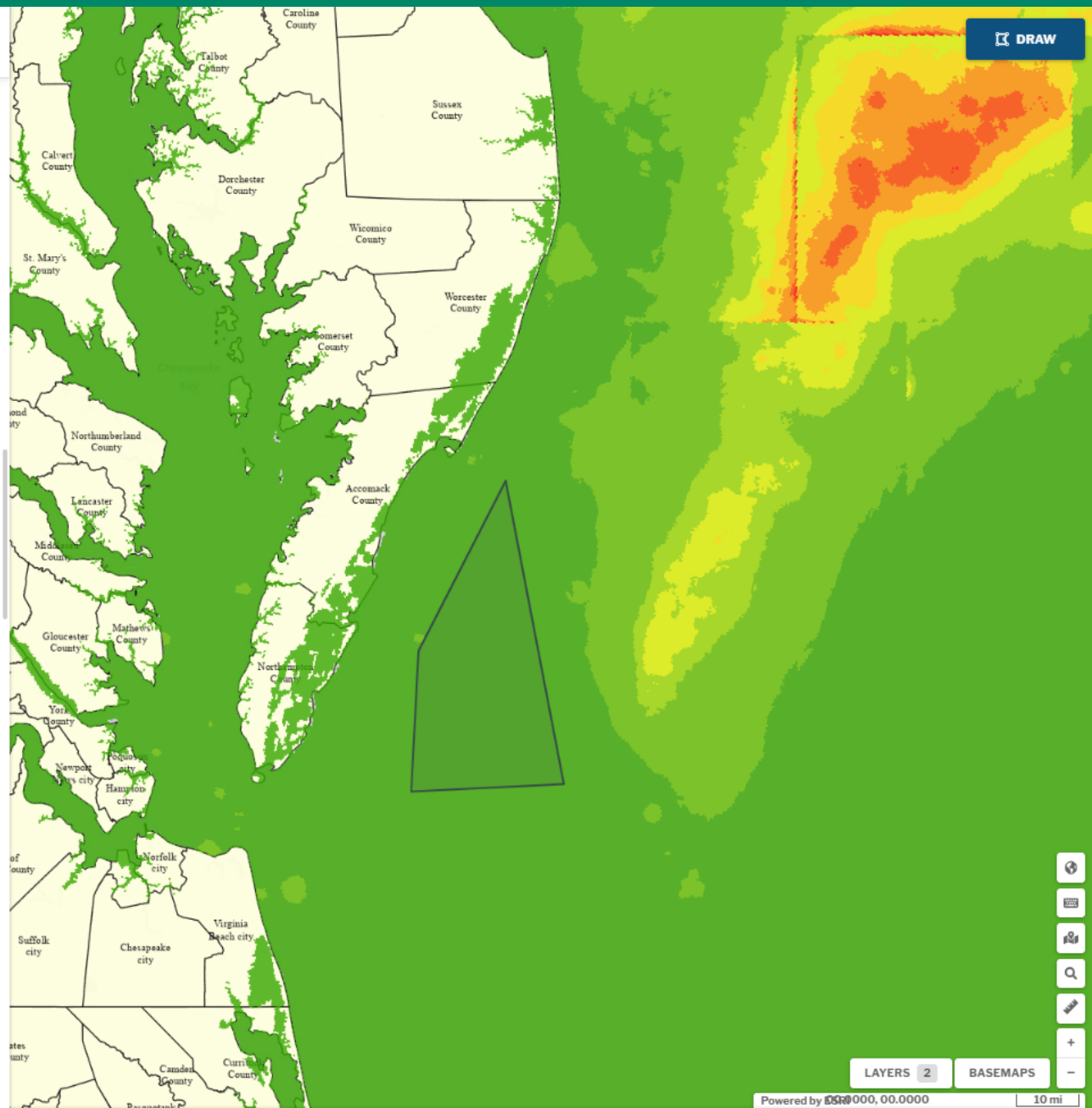


Virginia



Maryland

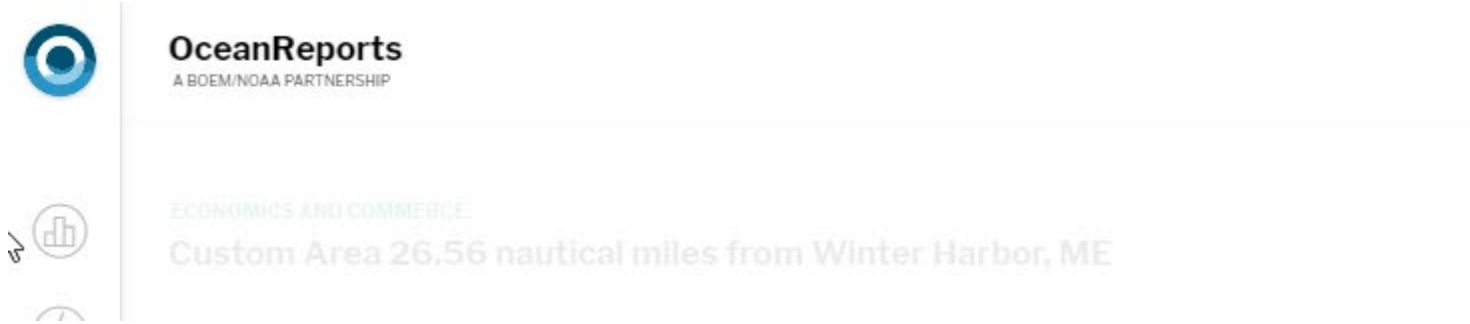




Available tools

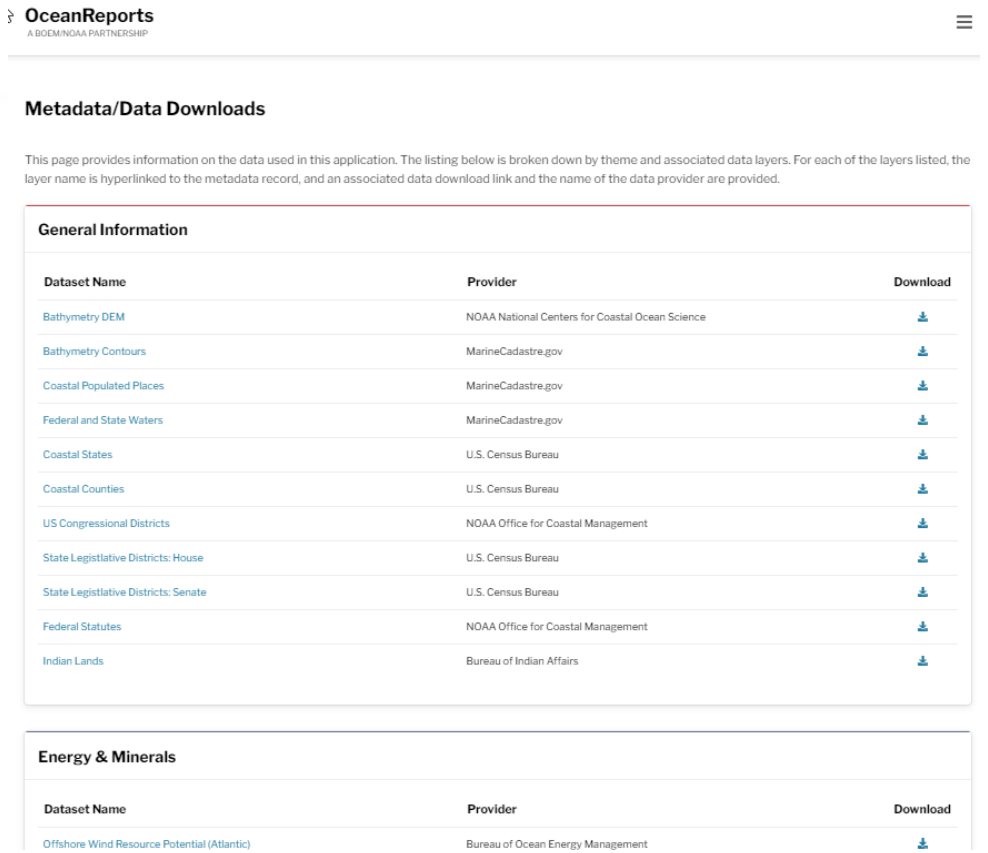
- **Special Tools**
  - Coordinate entry
  - Return to original location on map
  - Measure distances
  - Change base maps
  - Display map layers

Available tools

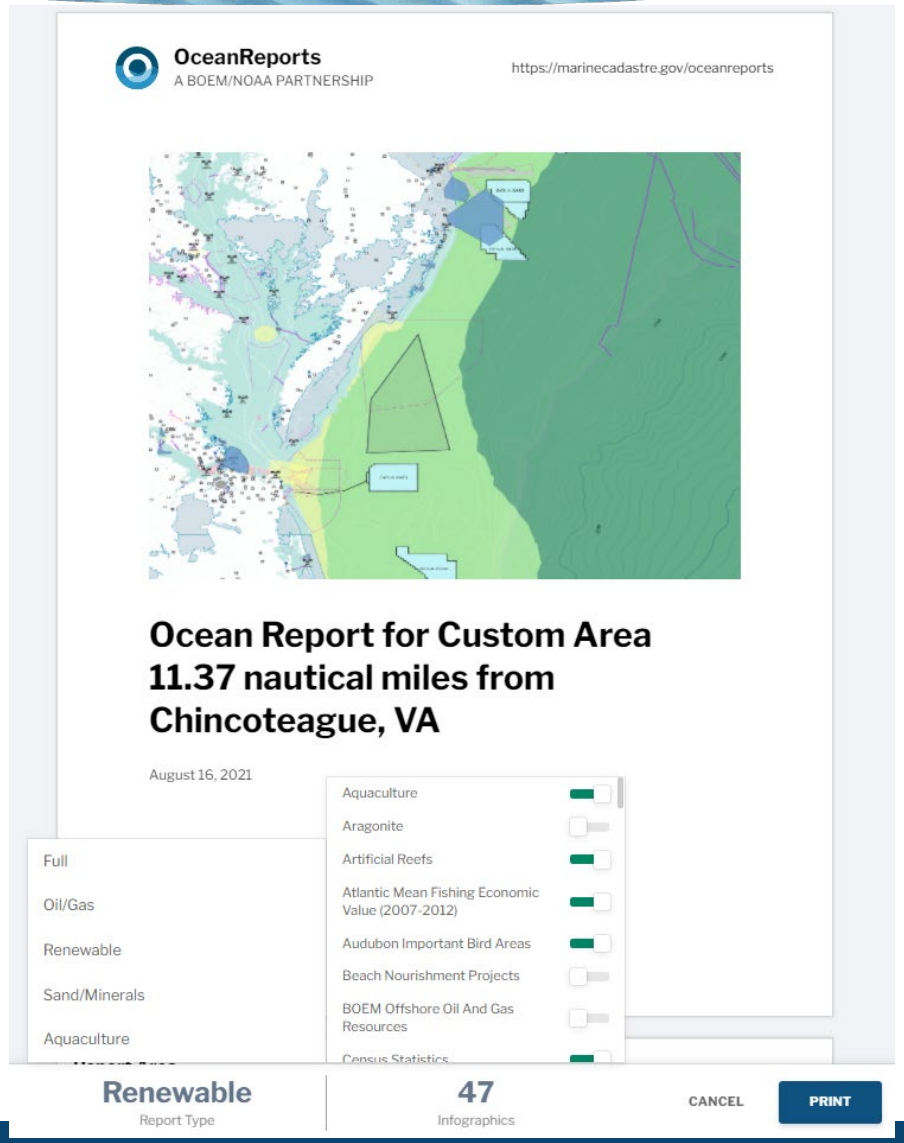


- Print a pdf version
- Share with others/keep for later
- Investigate further (metadata, downloads)

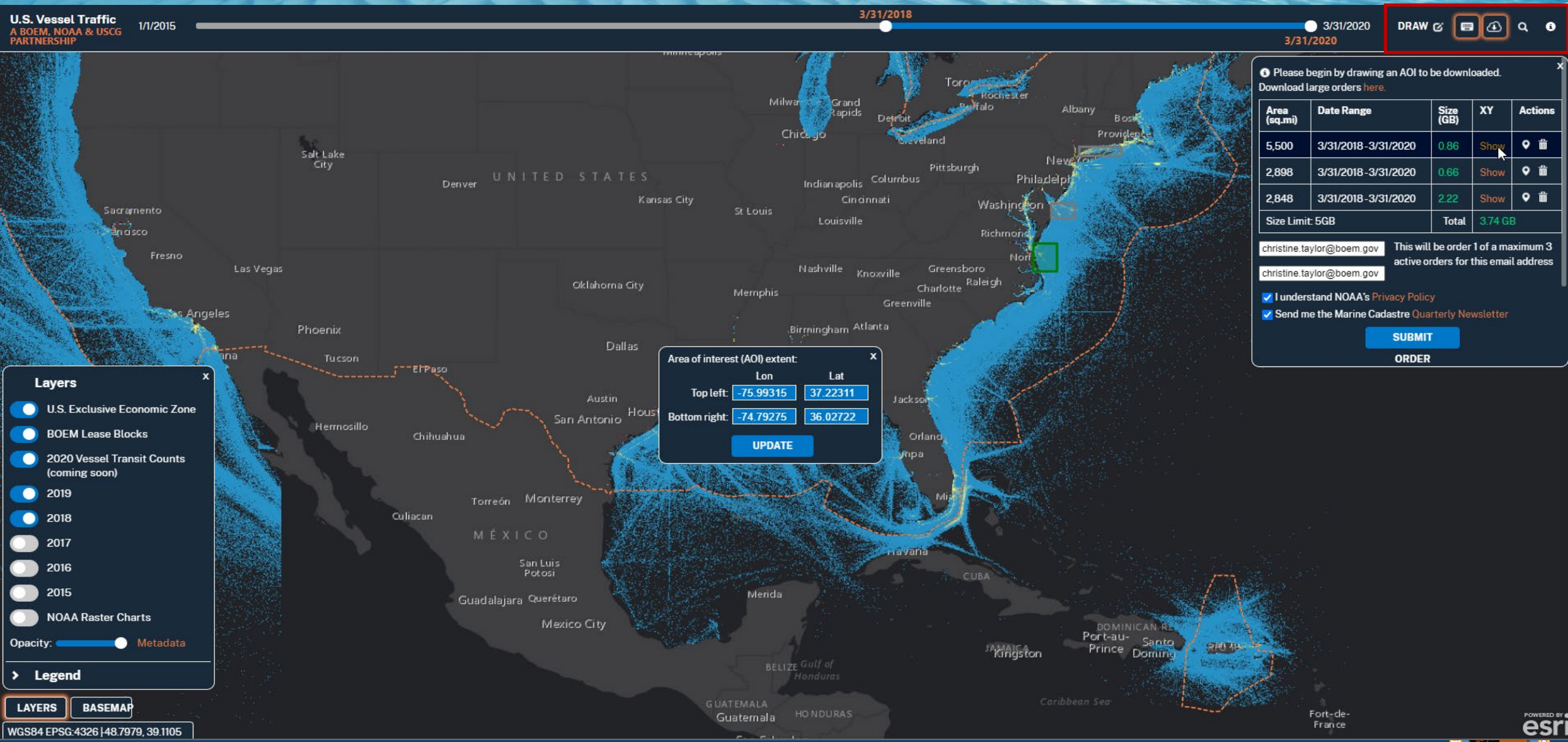
https://bit.ly/3iPMqyW



- **Print Report**
  - Gives you all the infographics and links
  - Allows you to choose to turn off infographics you don't need
  - Or you can choose a preset grouping by industry



AccessAIS


U.S. Vessel Traffic
A BOEM, NOAA & USCG PARTNERSHIP
1/1/2015
3/31/2018
3/31/2020
3/31/2020
DRAW
Please begin by drawing an AOI to be downloaded.
Download large orders here.
Area (sq.mi) | Date Range | Size (GB) | XY | Actions
5,500 | 3/31/2018 - 3/31/2020 | 0.86 | Show
2,898 | 3/31/2018 - 3/31/2020 | 0.66 | Show
2,848 | 3/31/2018 - 3/31/2020 | 2.22 | Show
Size Limit: 5GB | Total | 3.74 GB
christine.taylor@boem.gov
christine.taylor@boem.gov
This will be order 1 of a maximum 3 active orders for this email address
I understand NOAA's Privacy Policy
Send me the Marine Cadastre Quarterly Newsletter
SUBMIT
ORDER
Area of interest (AOI) extent:
Lon
Lat
Top left: -75.99315 37.22311
Bottom right: -74.79275 36.02722
UPDATE
Layers
U.S. Exclusive Economic Zone
BOEM Lease Blocks
2020 Vessel Transit Counts (coming soon)
2019
2018
2017
2016
2015
NOAA Raster Charts
Opacity:
Metadata
Legend
LAYERS
BASEMAP
WGS84 EPSG:4326 | -48.7979, 39.1105
UNITED STATES
MÉXICO
CUBA
Salt Lake City
Denver
Kansas City
St Louis
Chicago
Detroit
Cleveland
Pittsburgh
Indianapolis
Columbus
Cincinnati
Louisville
Nashville
Knoxville
Greensboro
Raleigh
Charlotte
Greenville
Memphis
Oklahoma City
Dallas
Austin
San Antonio
Houston
El Paso
Tucson
Phoenix
Las Vegas
Fresno
Sacramento
Los Angeles
Hermosillo
Chihuahua
Culiacan
Torreón
Monterrey
San Luis Potosi
Guadalajara
Querétaro
Mexico City
Merida
Havana
Kingston
Port-au-Prince
Santo Domingo
Jamaica
Belize
Gulf of Honduras
Guatemala
Honduras
Caribbean Sea
Fort-de-France
Albany
Washington
Philadelphia
Richmond
Atlanta
Birmingham
Orlando
Jackson
Rochester
Buffalo
Grand Rapids
Milwaukee
Minneapolis
Toronto
Boston
Providence
New York
Tampa
Miami
DOMINICAN REP.
POWERED BY esri

BOEM

Bureau of Ocean Energy Management

BOEM.gov

Christine Taylor | Christine.taylor@boem.gov |703-787-1606

MarineCadastre.gov

MarineCadastre.gov/OceanReports

Northeast and Mid-Atlantic Ocean Data Portals

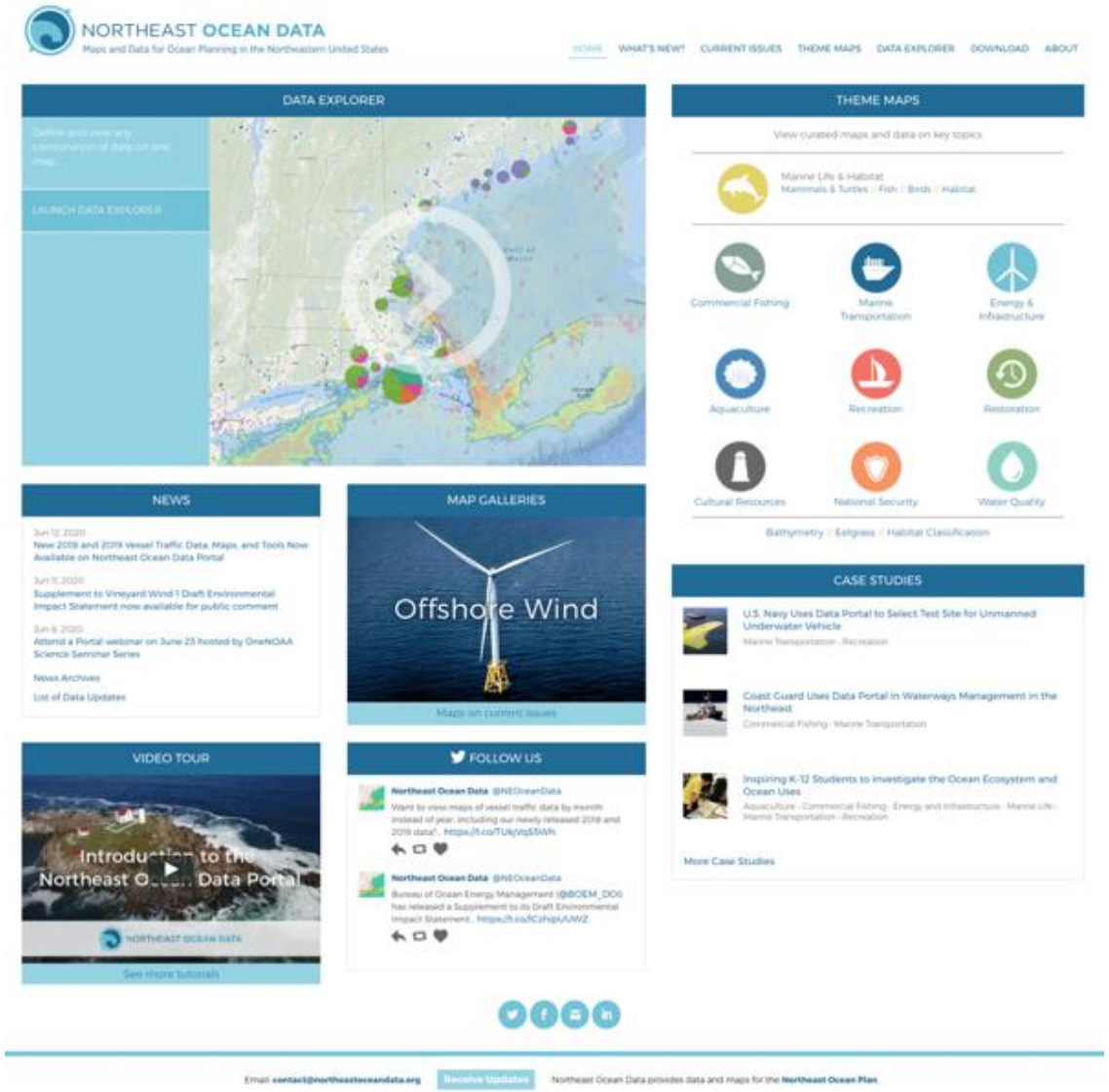
Nick Napoli

Offshore Wind and Maritime Industry Knowledge Exchange August 19, 2021

MARCO
MID-ATLANTIC REGIONAL
COUNCIL ON THE OCEAN

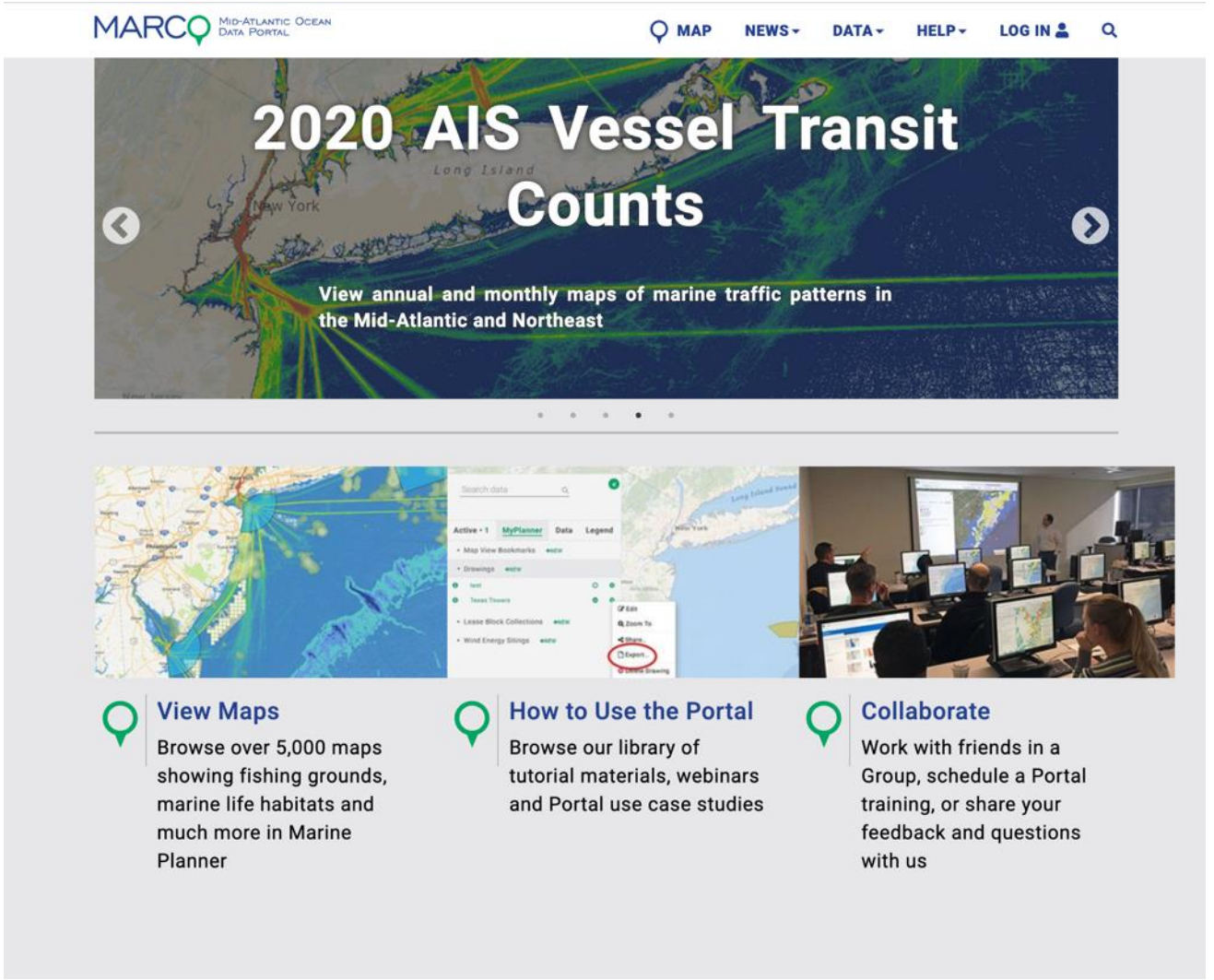
MARCO MID-ATLANTIC OCEAN DATA PORTAL

Northeast Ocean Data Portal

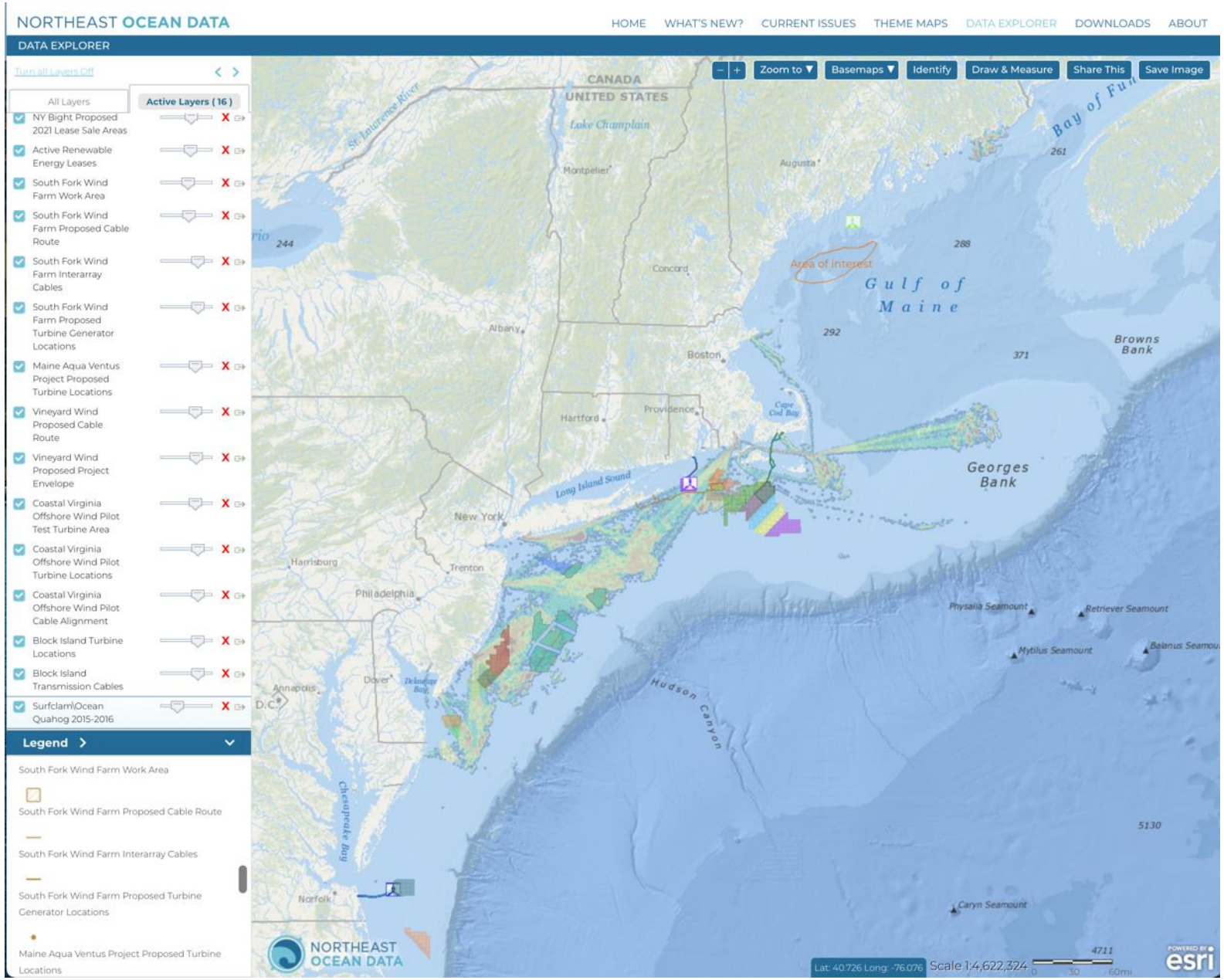


www.NortheastOceanData.org

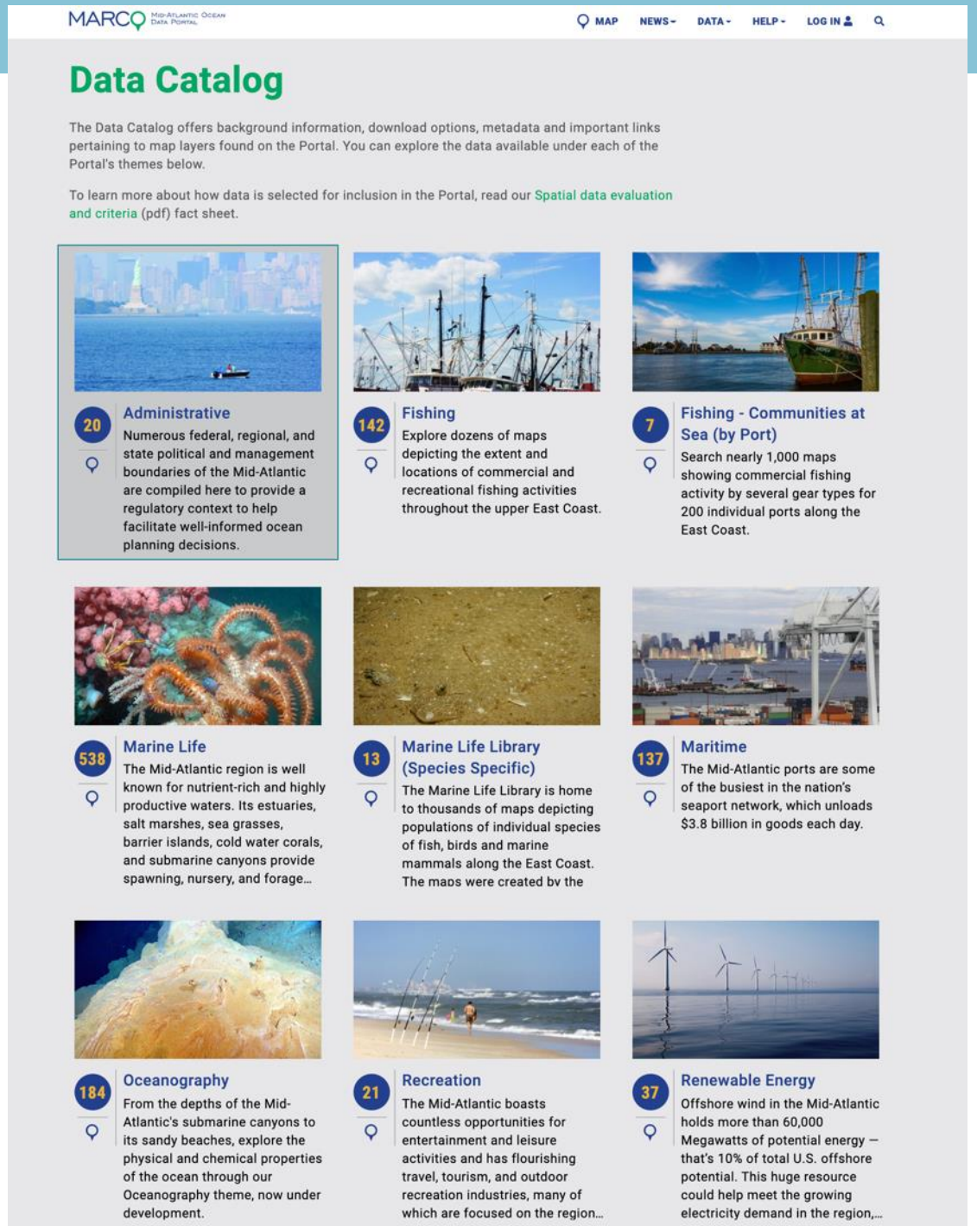
MARCO Mid-Atlantic Ocean Data Portal



www.portal.midatlanticocean.org/



- Map products showing the footprint and changes over time for economic activities and ecological resources
- Products derived from federal, state, tribal, research/academic, and stakeholder sources
- Informed and vetted by regional experts, agencies, and stakeholders



Ocean Activities and Economics Themes

- Administrative & management areas
- Commercial fishing
- Aquaculture
- Energy
- Marine transportation or maritime
- National security
- Recreation
- Culture
- Socioeconomic

Ocean Resources and Conditions Themes

- Marine mammals & sea turtles
- Fish
- Birds
- Habitat & other marine life
- Oceanography
- Bathymetry
- Geology, sand & sediment
- Water quality

WHO USES THE PORTAL AND HOW?

SOME EXAMPLES

NORTHEAST **OCEAN DATA**
www.NortheastOceanData.org

Selected location of new ocean observing buoy

Deep Sea Coral Amendment development and public review

NERACOOS
NORTHEASTERN REGIONAL ASSOCIATION OF COASTAL OCEAN OBSERVING SYSTEMS

New England Fishery Management Council

Analyses of vessel traffic patterns and other ocean activities to support Port Access Route Studies (PARS)

Compile resource and human activity data for clients

CONSULTANTS

Siting of first shellfish farm in federal waters

OCEAN INDUSTRY

Inform the location of proposed Ocean Dredged Material Disposal Sites

Points offshore wind developers to the Portal and links to Portal resources

BOEM
Bureau of Ocean Energy Management

US Army Corps of Engineers

NGOs

RESEARCHERS

GENERAL PUBLIC

K-12 teachers

Explore data and print maps to support public comment on agency actions

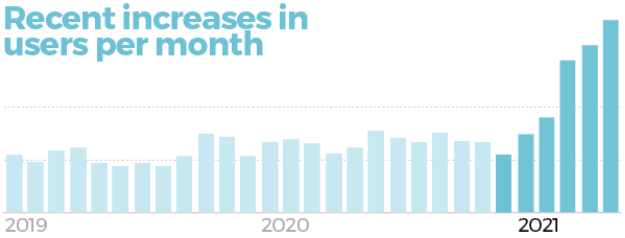
Plan routes to avoid ocean users for Autonomous Under-water Vehicle tests

NEW ENGLAND STATES

Three New England states (MA, RI, CT) and NY used Portal data for state ocean plans and then contributed state data back to the Portal

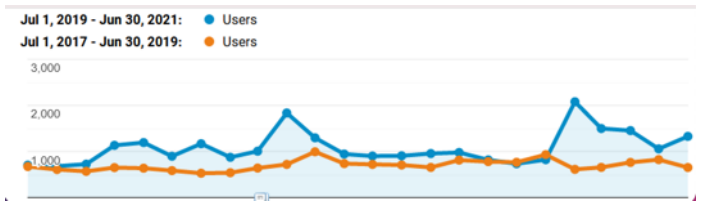
MARCO Mid-Atlantic Ocean Data Portal

Recent increases in users per month



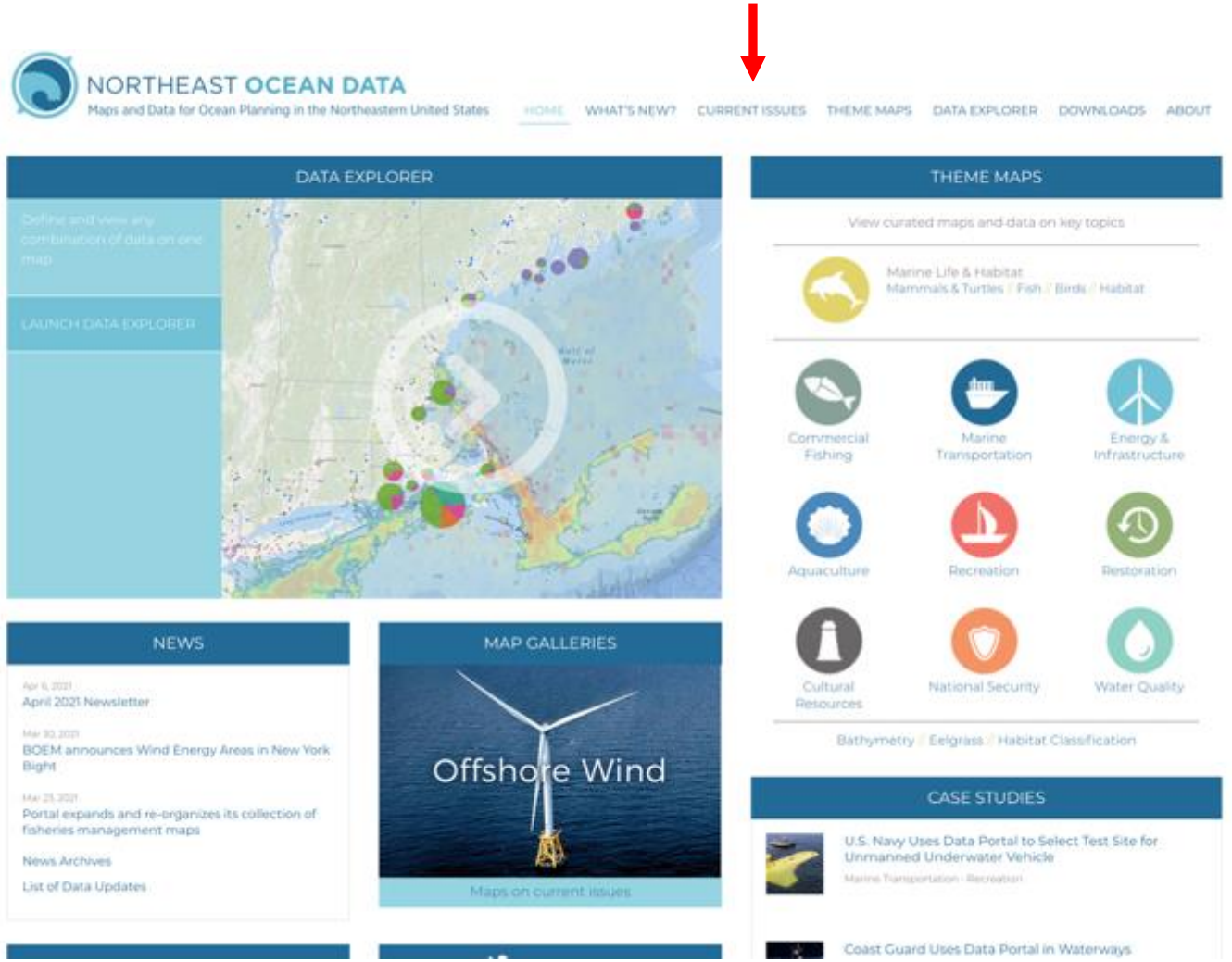
Increased layer hits during public meetings and events

(Sept - Dec 2018 wind energy meetings



Current Issues

- Quick access to maps and information for agency actions and proposed projects
  - Offshore Wind
  - USACE Public Notices (including proposed aquaculture and cable projects)
  - USCG Proposed Actions (including proposed anchorages and Port Access Route Studies)
  - Deep Sea Corals
  - Ocean Disposal Sites (archived)



Offshore Wind Areas on the Portals

NORTHEAST OCEAN DATA

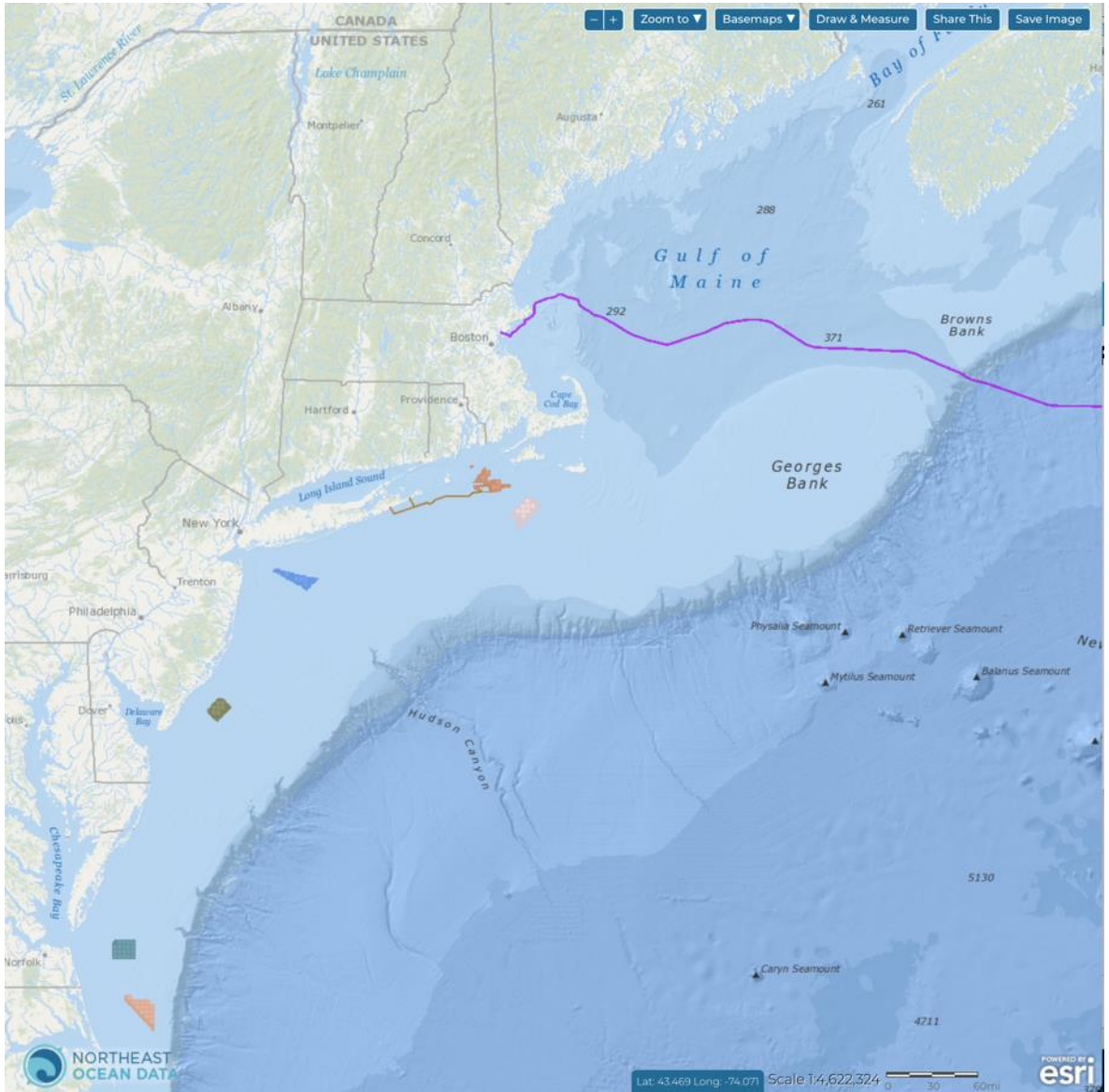
DATA EXPLORER

Turn all Layers Off

All Layers | Active Layers (20)

Keyword Search

- Administrative Boundaries
- Marine Transportation
- National Security
- Energy & Infrastructure
  - Infrastructure
  - Planning Areas
    - Operational Installations
    - Permitted Projects
    - Projects in Review
    - Lease Areas
    - Planning Areas



MARCO Mid-Atlantic Ocean Data Portal

Search data

Active | MyPlanner | Data | Legend

- Administrative
- Fishing
- Fishing - Communities at Sea (by Port)
- Marine Life
- Marine Life Library (Species Specific)
- Maritime
- Oceanography
- Recreation
- Renewable Energy
  - PLANNING AND LEASE AREAS
  - OFFSHORE ENERGY PROJECTS UNDER REVIEW
  - PERMITTED PROJECTS
  - OPERATIONAL OFFSHORE ENERGY PROJECTS

Offshore Wind Areas on the Portals

https://www.northeastoceandata.org/offshore-wind-projects/

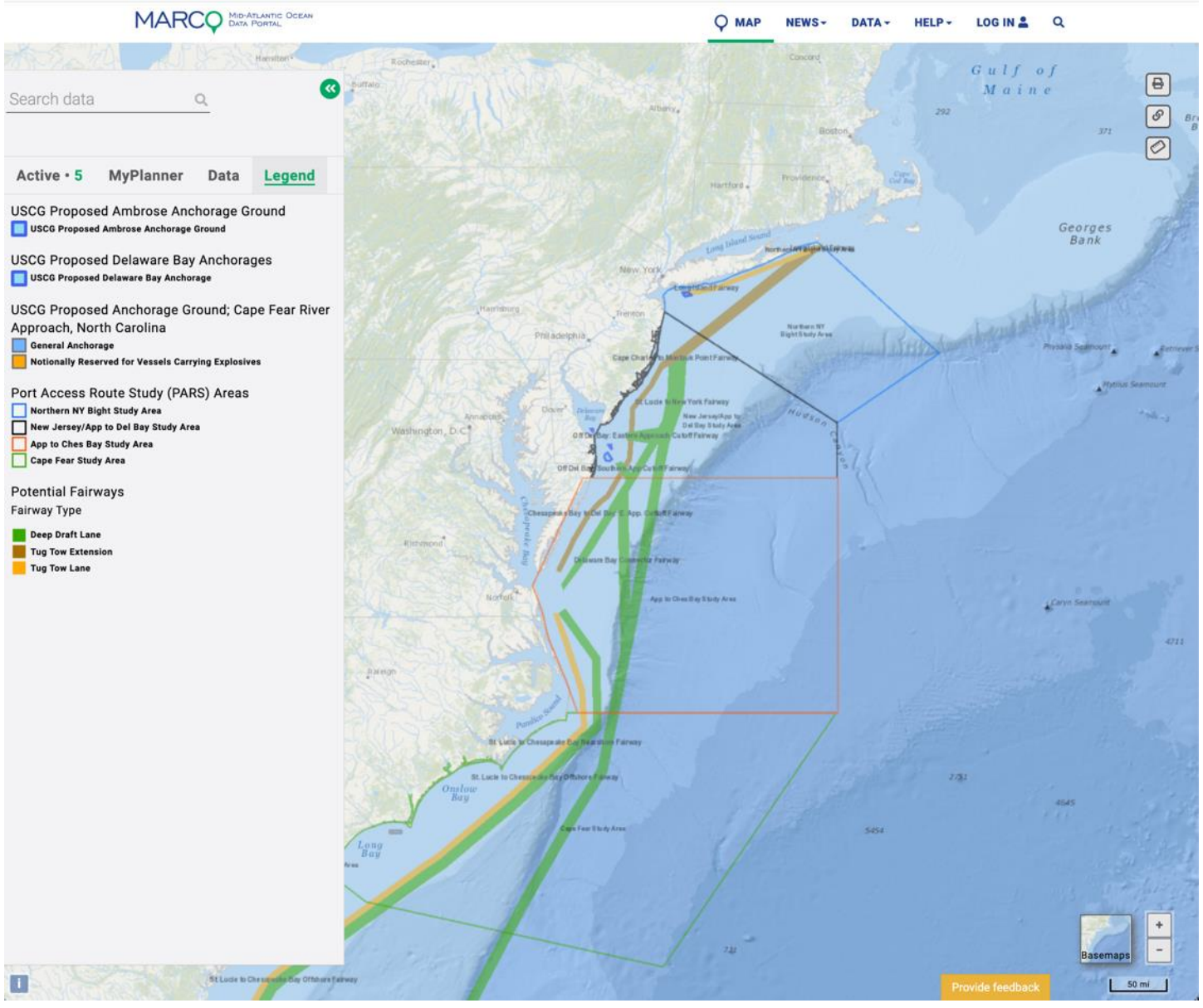
OFFSHORE WIND PROJECTS

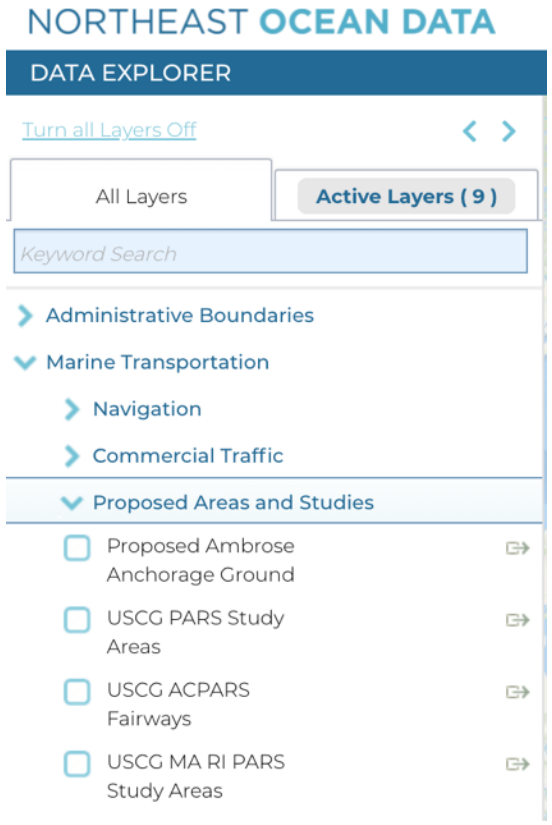
Click the links in the table below to access information associated with operational and proposed offshore wind energy projects from Maine to North Carolina. Links lead to the U.S. Bureau of Ocean Energy Management's (BOEM's) pages on each project, interactive Portal maps of each lease area where a project is located, and interactive Portal maps of any available project-specific data. For a series of maps related to offshore wind in the Northeast, visit the Offshore Wind Map Gallery.

BOEM is the lead federal agency authorized to issue leases, easements, and rights of way to allow for renewable energy development on the Outer Continental Shelf (OCS). The four distinct phases of BOEM's renewable energy program are shown below the table. Other entities, including the National Oceanic and Atmospheric Administration (NOAA) and states, also have roles in the development and permitting process, which is beyond the scope of this web page.

Project Name (Linked to BOEM page with details and public meeting info)	**Lease Number** (Linked to Portal map)	**Lessee / Parent Company**	**Status**	**Project Footprint, Cable Route(s), and/or Turbine Locations (as available)**
Block Island Wind Farm	State lease	Deepwater Wind New England LLC / Orsted North America Inc.	Operation	Map
Coastal Virginia Offshore Wind - Pilot	OCS-A 0497	Commonwealth of Virginia Department of Mines Minerals and Energy	Operation	Map
Vineyard Wind 1	OCS-A 0501	Vineyard Wind 1 LLC / Avangrid Renewables LLC & Copenhagen Infrastructure Partners	BOEM ROD	Map
South Fork Wind Farm	OCS-A 0517	South Fork Wind LLC / Orsted North America Inc. & Eversource	BOEM FEIS	Map
Coastal Virginia Offshore Wind - Commercial	OCS-A 0483	Virginia Electric and Power Company – Dominion Energy	BOEM NOI	Map
Empire Wind	OCS-A 0512	Empire Offshore Wind LLC / Equinor Wind US & BP	BOEM NOI	Map
Ocean Wind 1	OCS-A 0498	Ocean Wind LLC / Orsted North America Inc. & PSEG	BOEM NOI	Map
Revolution Wind	OCS-A 0486	Revolution Wind LLC / Orsted North America Inc. & Eversource	BOEM NOI	Map
Kitty Hawk	OCS-A 0508	Avangrid Renewables LLC	BOEM NOI	Map
Vineyard Wind South (Phase 1: Park City Wind)	OCS-A 0534	Vineyard Wind LLC / Avangrid Renewables LLC & Copenhagen Infrastructure Partners	BOEM NOI	
Bay State Wind	OCS-A 0500	Bay State Wind LLC / Orsted North America Inc. & Eversource	COP Submitted	
Skipjack Wind 1	OCS-A 0519	Skipjack Offshore Energy LLC / Orsted North America Inc.	COP Submitted	
US Wind	OCS-A 0490	US Wind Inc	COP Submitted	
Sunrise Wind	OCS-A 0487	Sunrise Wind LLC / Orsted North America Inc. & Eversource		
Mayflower Wind	OCS-A 0521	Mayflower Wind Energy LLC / EDP Renewables & Shell		
Beacon Wind	OCS-A 0520	Beacon Wind LLC / Equinor Wind US & BP		

USCG Proposed Areas and Studies



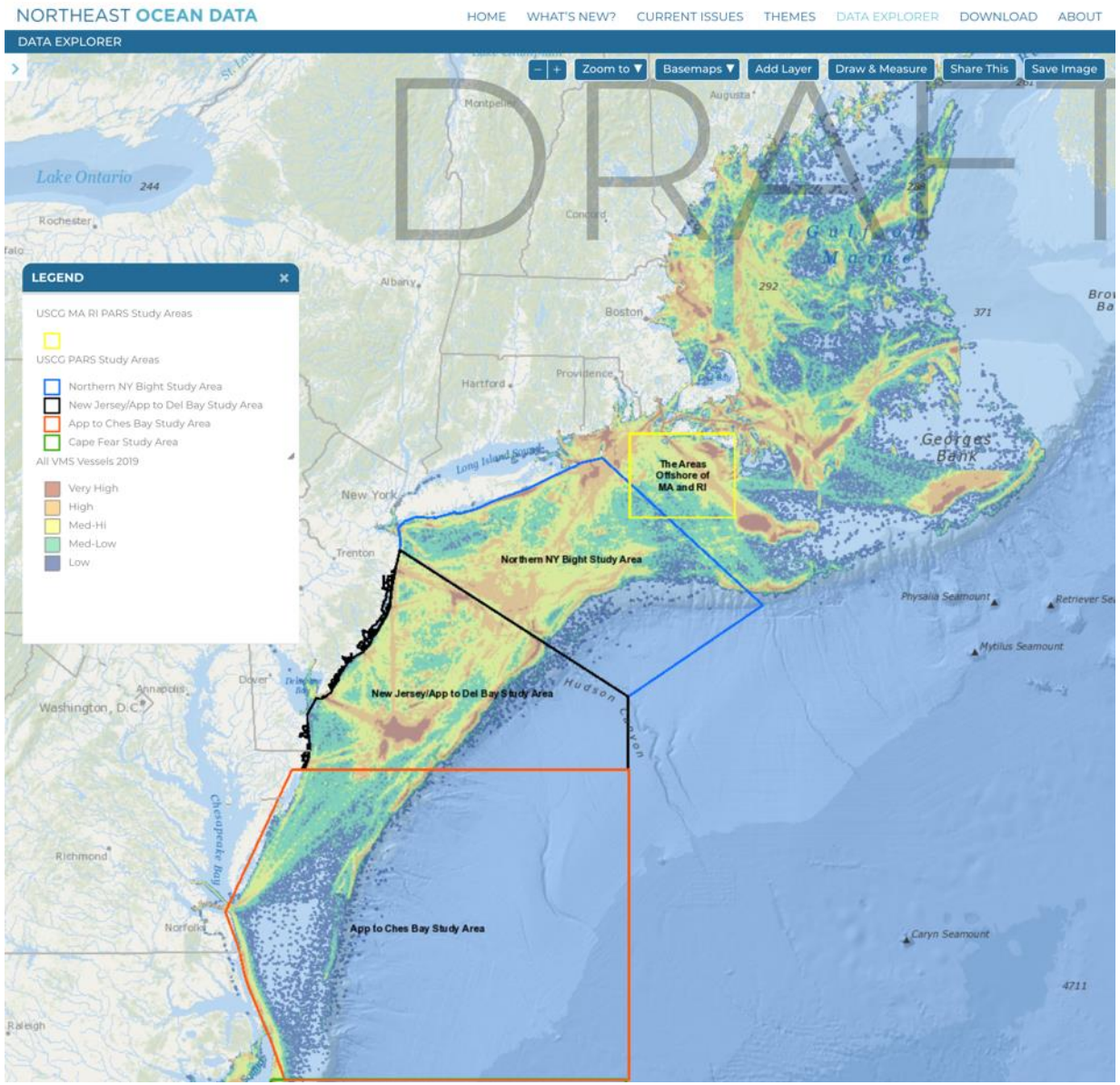


Maritime Industry Data on the Portals

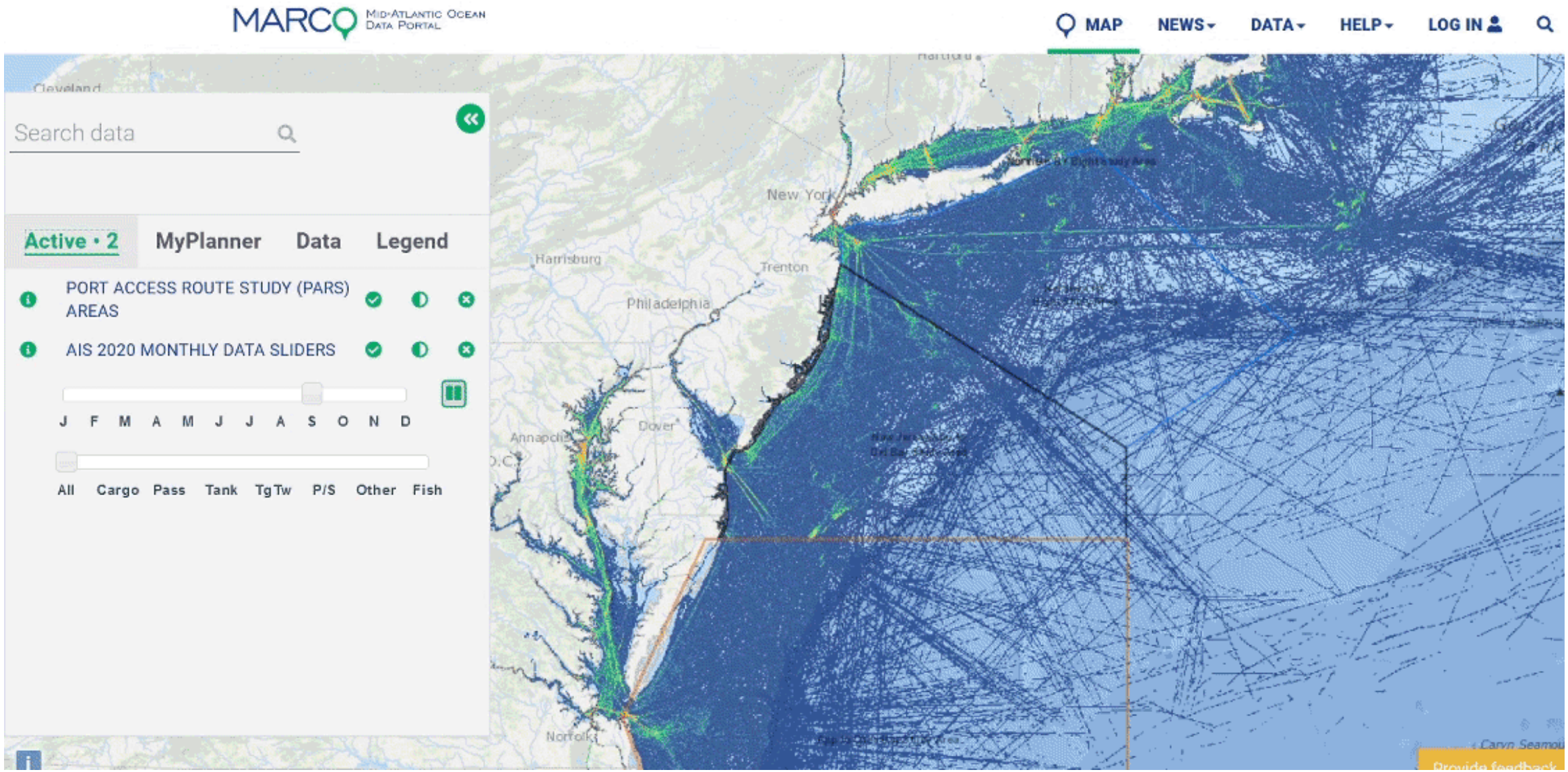
- **Commercial fishing**
  - Recently reviewed by the industry with the assistance of RODA
  - Vessel Monitoring System
  - Communities at Sea
  - Management Areas

- **Maritime or marine transportation**
  - Routing measures and other important operational areas
  - Vessel traffic from AIS
  - Reviewed by USCG, NOAA, BOEM, port operators groups, and safety and security forums

- **Recreation**
  - Boating
  - Whale watching
  - SCUBA
  - Other coastal recreation



Maritime Industry Data on the Portals



Contacts

Nick Napoli
NROC Ocean Planning Director
MARCO Senior Advisor
nicknapoli01@gmail.com

Emily Shumchenia
Manager, NE Ocean Data Portal
Director, Regional Wildlife Science Entity
emily.shumchenia@gmail.com

Karl Vilacoba
Manager, Mid-Atlantic Ocean Data Portal
kvilacob@monmouth.edu

BOEM

Knowledge Exchange

MARINE SPATIAL PLANNING

Cheryl Stahl, DNV

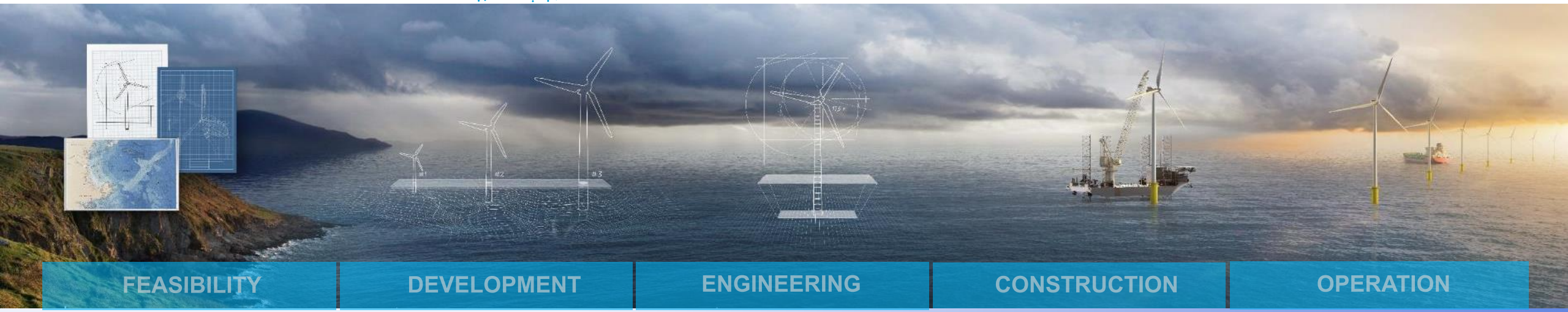
Amilynn Adams, USCG

DNV

U.S. Department of Homeland Security
United States Coast Guard

DNV

WHEN TRUST MATTERS



Driven by our purpose, to safeguard life, property and the environment, DNV empowers our customers and their stakeholders with facts and reliable insights so that critical decisions can be made with confidence. DNV is the world's leading classification society and a recognized advisor for the maritime and energy industries. We deliver world-renowned testing, certification and technical advisory services helping businesses assure the performance of their organizations, facilities, people and supply chains.

150 yrs Shipping

45 yrs Oil & Gas

30 yrs Renewables

U.S. Coast Guard Navigation Center

Waterways Risk Analysis and Support Division

Homeland Security

U.S. Department of Homeland Security
United States Coast Guard

Navigation Safety Analyses and Spatial Data

Data sources used in assessing navigation safety

- Which data?
- How it is used?

Outputs from spatial data analysis of navigation safety

- Marine traffic analysis
- Incident/accident modelling

Looking forward

- Where we are headed?
- How we intend to get there

Homeland Security

U.S. Department of Homeland Security
United States Coast Guard

Spatial Data

(sources/types and inherent challenges)

Spatial Data Sources - Vessels

USCG - AIS

Nationwide AIS (NAIS)
S-AIS
USCG business systems

ESRI's US Vessel Traffic, https://livingatlas.arcgis.com/vessel-traffic/

Marine Cadastre - AIS

NOAA/BOEM
Quality Routines
Publically available
Time-series archive

NOAA Fisheries - VMS

Vessel Monitoring System
Monitored fisheries (not all fisheries are monitored)
Magnuson-Stevens Fisheries Management and Conservation Act data confidentiality requirements.

Data Quality

"The best way to improve data quality is to remove the humans."

Challenges

Counting Boats
Counting Tracks
Vessel Categories
Vessel Characteristics

Opportunities

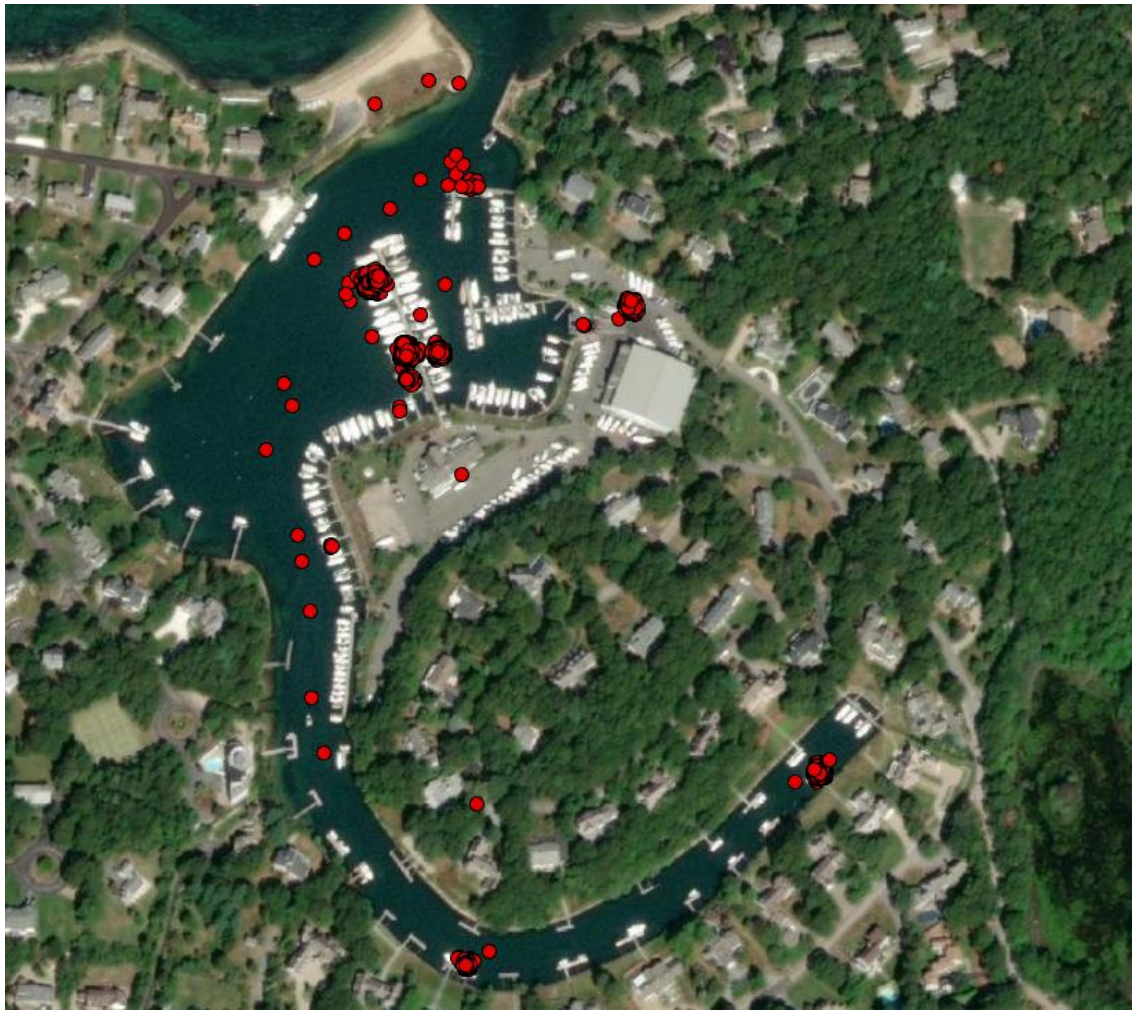
Web Scraping
Authoritative Registries
ArcGIS tools
Partnerships

ITU
python
IHS Markit
Power BI
ArcGIS Pro
IALA

Homeland Security

U.S. Department of Homeland Security
United States Coast Guard

Data Quality Challenge



How many boats are in the harbor?

Homeland Security

U.S. Department of Homeland Security
United States Coast Guard

Data Sources used in Navigation Safety Risk Assessment

- Navigation Safety Risk Assessment is required by USCG/BOEM for all offshore wind developments
- Requires a considerable amount of spatially distributed data (or in lieu, statistics)
  - Wind
  - Wave
  - Tide/current
  - Bathymetry
  - Visibility
- Other marine uses, i.e., fishing and recreation
- Vessel transits not included in AIS data
- Non-marine uses, i.e., DoD
- Cargoes
- Areas with special rules for transit, i.e., Pilots on board
- Sizes of structures in the lease area
- Locations of structures and export cable
- Historical data on accidents/incidents

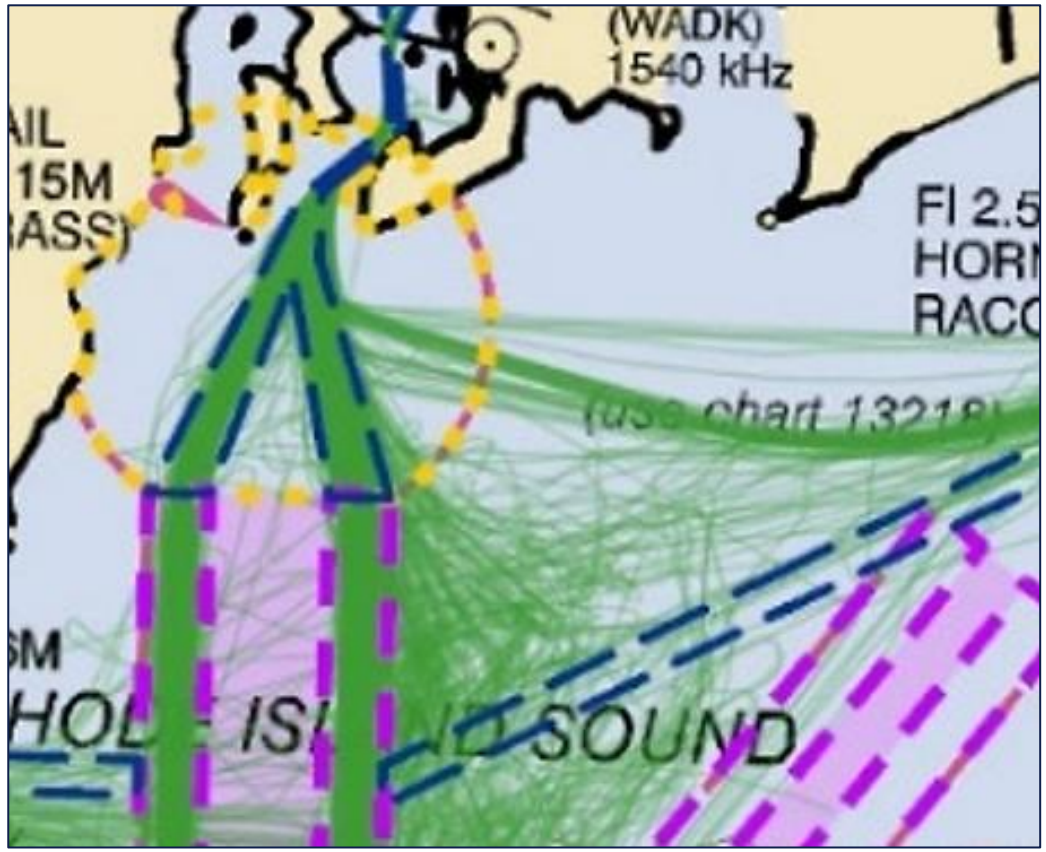
Almost all of the data is obtained for each wind farm assessment – quality has improved over time

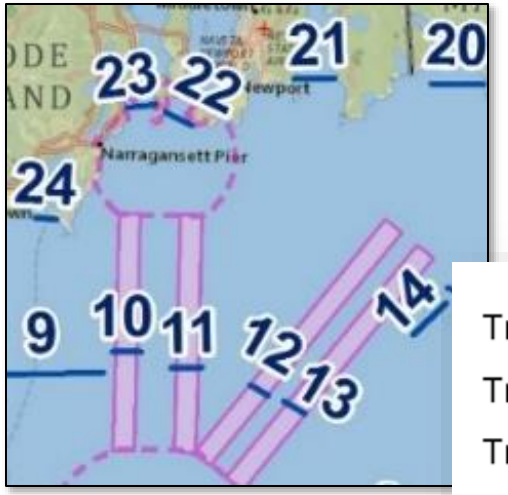
Data Sources - Summary

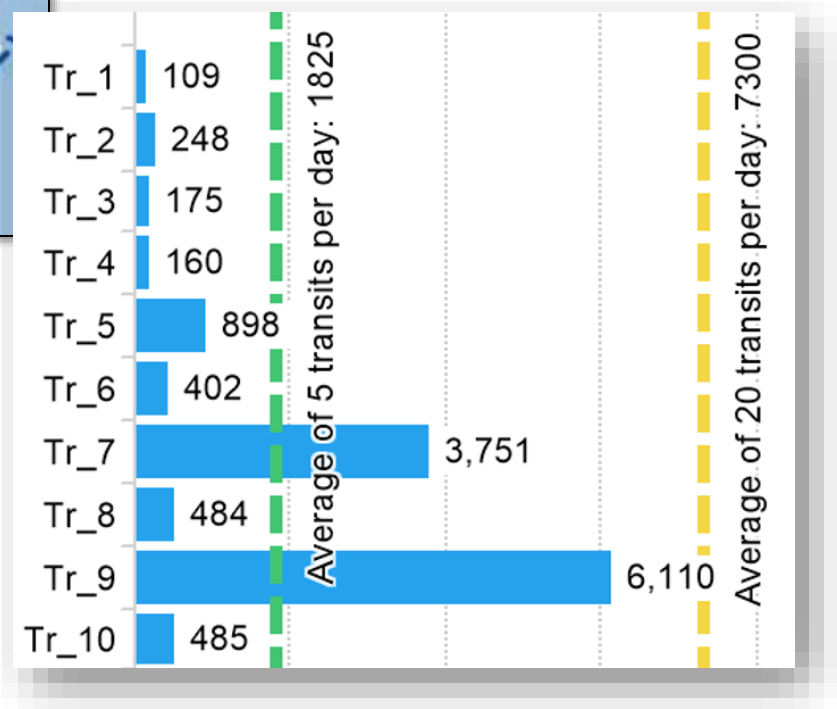
- AIS is a primary data input
  - Quality routines are important
  - Has limitations due to carriage requirements
- VMS data has confidentiality/limitations
- Data quality and resulting products are improving over time

Example Output of Spatial Data Analysis for Navigation Safety

Output of Spatial Data Analysis - Traffic Surveys





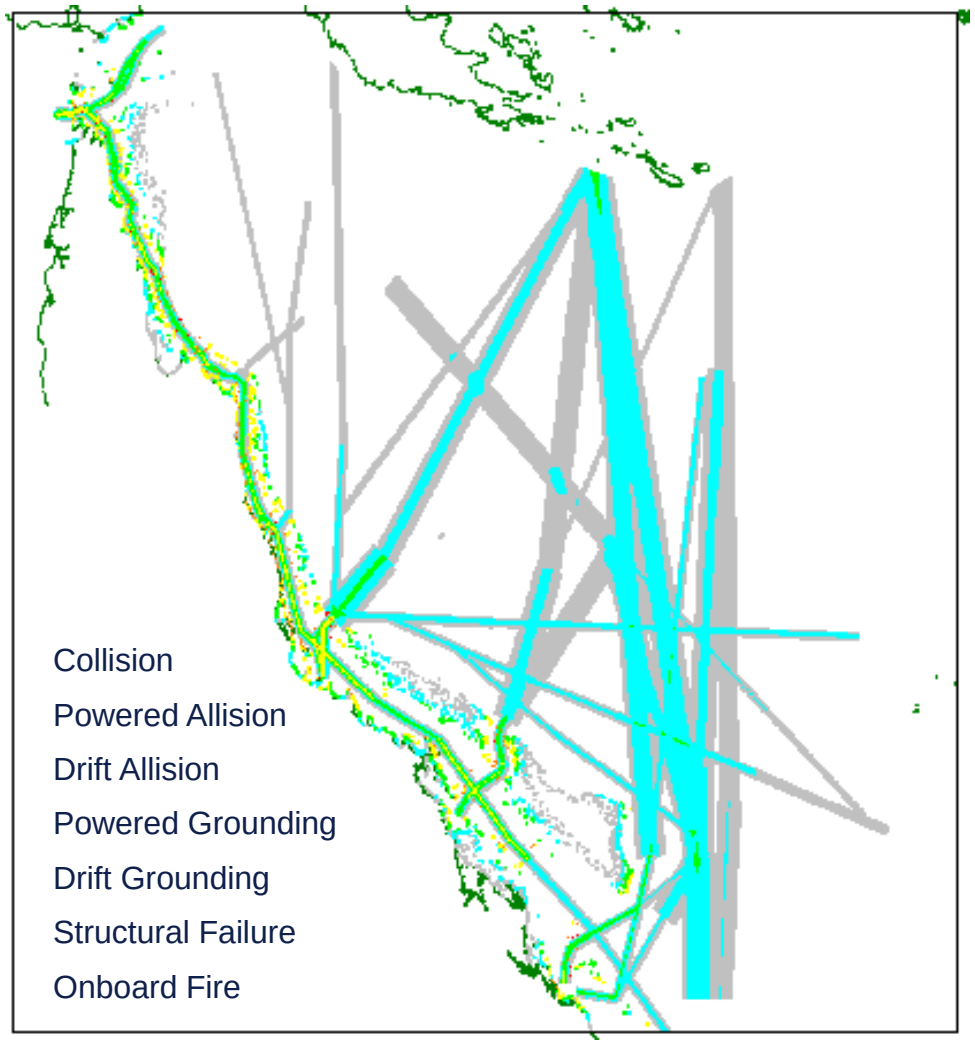


Outputs of Vessel Incident Modeling in MARCS

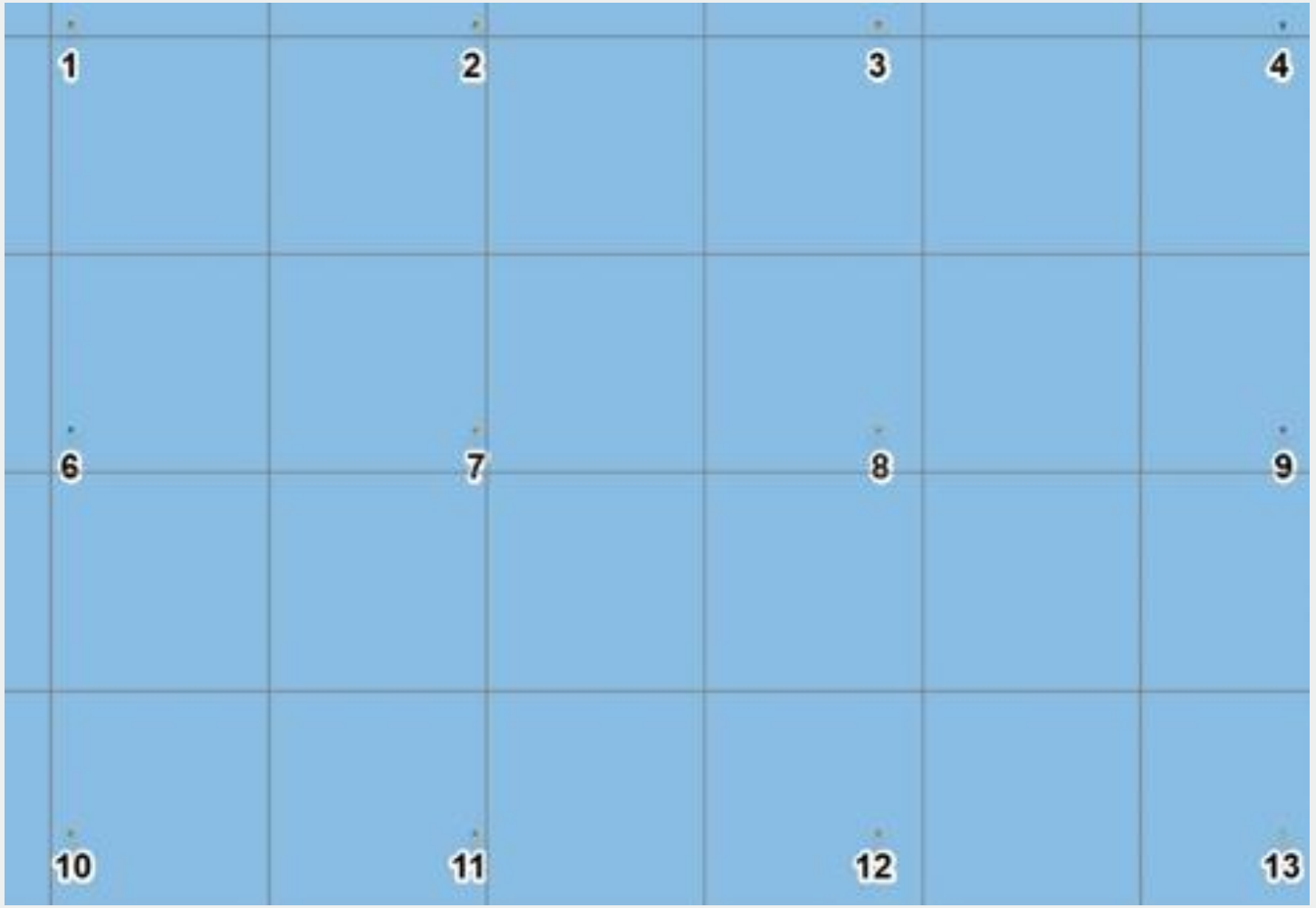
MARCS was built to evaluate change in risk from (1) new vessel traffic; new cargoes (spills/fires); (2) maritime mitigation measures

Example output types:

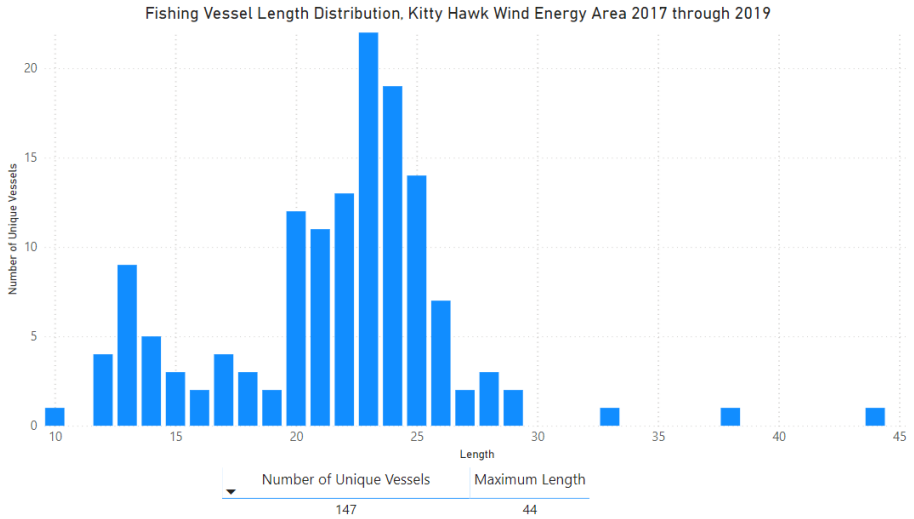
- Accident frequency – used for wind farms
- Consequence and frequency
- As function of location (grid cell), accident type, vessel type, and lane (route)
- Spill risk (volume/year)
- Sum (integrate) over different variables to provide many different types of results

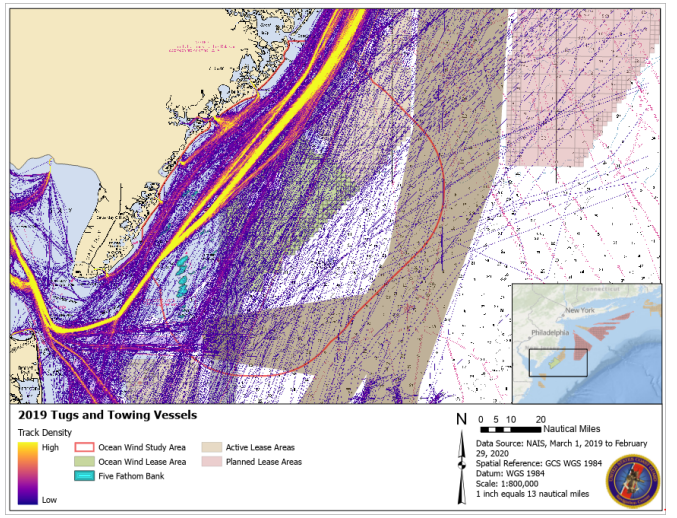


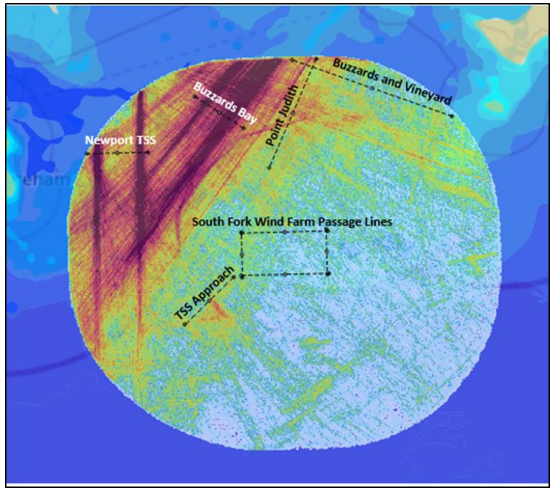
Limitations of Spatial Output
Example: Allision Risk in a Wind Farm – to scale

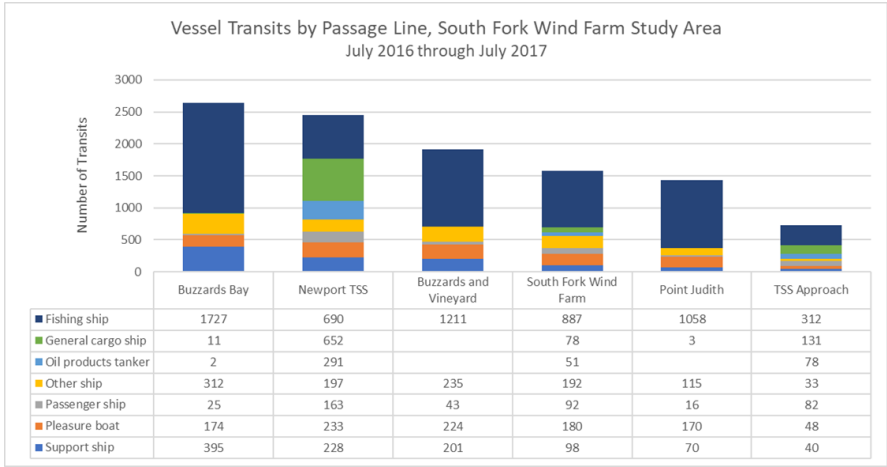


Data Analysis Outputs – Traffic Surveys









	Buzzards Bay	Newport TSS	Buzzards and Vineyard	South Fork Wind Farm	Point Judith	TSS Approach
Fishing ship	1727	690	1211	887	1058	312
General cargo ship	11	652		78	3	131
Oil products tanker	2	291		51		78
Other ship	312	197	235	192	115	33
Passenger ship	25	163	43	92	16	82
Pleasure boat	174	233	224	180	170	48
Support ship	395	228	201	98	70	40

Homeland Security

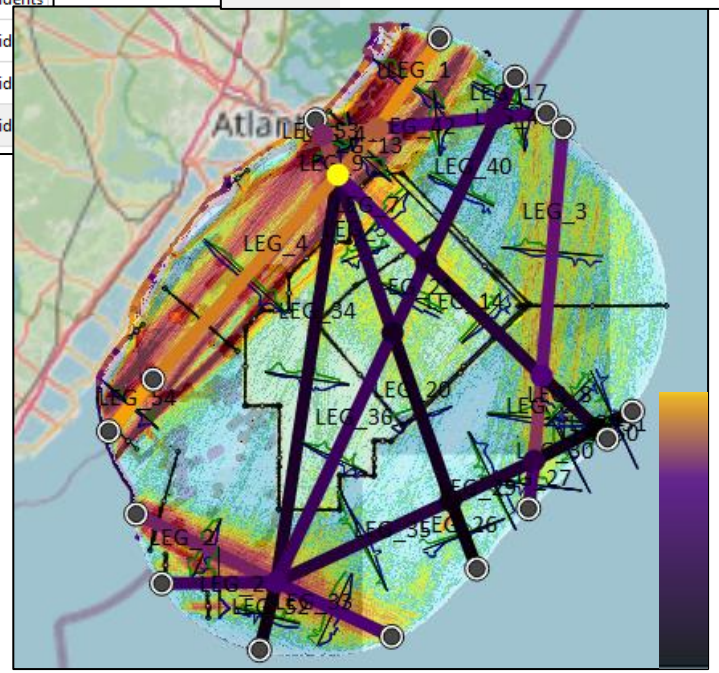
U.S. Department of Homeland Security
United States Coast Guard

Data Analysis Outputs – Incident Frequency Modeling

	OW19_Alpha	Unit
Powered Grounding	1.306	Years between incidents
Drifting Grounding	19.11	Years between incidents
Total Groundings	1.223	Years between incidents
Powered Allision	---	Years between incidents
Drifting Allision		Years between incidents
Total Allisions	---	Years between incidents
Overtaking	6,975	Years between incidents
HeadOn	1,831	Years between incidents
Crossing	2,015	Years between incidents
Merging	3.498e+04	Years between incidents
Bend	3.488e+04	Years between incid
Area	---	Years between incid
Total Collisions	804.6	Years between incid

Item: HeadOn — Striking / Struck — Filter: Leg: LEG_17

	e oil ta	Oil products tanke	nical ta	is tank	tainer	General cargo ship	lk carr	o cargo	Passenger ship	ast ferr	Support ship	Fishing ship	Pleasure boat	Other ship	Struck sum
Crude oil tanker															
Oil products tanker		3.39535e-10				6.65906e-10			2.72359e-12		4.1735e-09	1.14349e-09	2.79965e-09	3.37431e-09	1.24991e-08
Chemical tanker															
Gas tanker															
Container ship															
General cargo ship		6.65906e-10									1.07063e-08	2.59824e-09	6.14648e-09	7.78144e-09	2.78983e-08
Bulk carrier															
Ro-Ro cargo ship															
Passenger ship		2.72359e-12									4.05813e-11	9.54312e-12	2.28451e-11	2.92466e-11	1.0494e-10
Fast ferry															
Support ship		4.1735e-09				1.07063e-08			4.05813e-11		1.54088e-08	4.92114e-09	1.264e-08	1.52624e-08	6.31526e-08
Fishing ship		1.14349e-09				2.59824e-09			9.54312e-12		4.92114e-09	1.28595e-09	3.30737e-09	4.14038e-09	1.74061e-08
Pleasure boat		2.79965e-09				6.14648e-09			2.28451e-11		1.264e-08	3.30737e-09	8.28055e-09	1.04343e-08	4.36312e-08
Other ship		3.37431e-09				7.78144e-09			2.92466e-11		1.52624e-08	4.14038e-09	1.04343e-08	1.20311e-08	5.30532e-08
Striking sum		1.24991e-08				2.78983e-08			1.0494e-10		6.31526e-08	1.74061e-08	4.36312e-08	5.30532e-08	2.17745e-07



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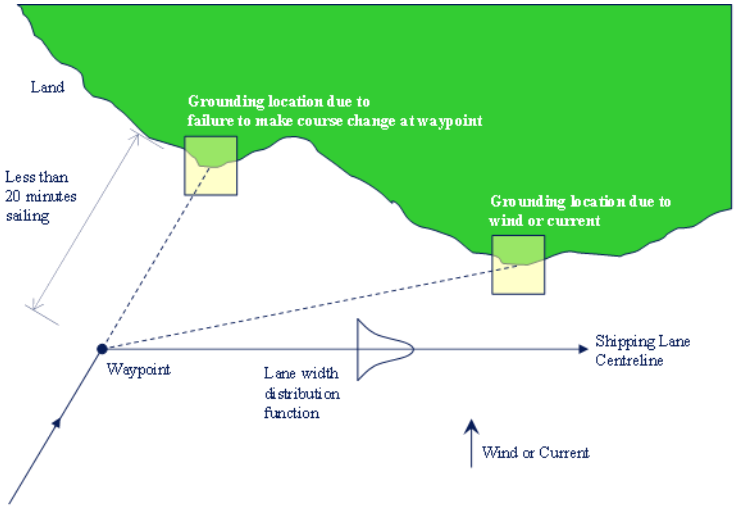
Spatial Data Outputs - Summary

- Two different models
- Similar methodologies
- Both built on 50-year old frameworks of fault/event trees that are still valid
- Underlying failure data are overly pessimistic - could be updated to reflect more recent maritime risk controls.
- Model correlation to historical data increases with lots of quality data.



Frequency = (Frequency of vessels on lane aligned on location) x (Probability of failure to make course change)
Frequency = (Frequency of vessels in lane) x (Probability of inattention) x (Probability of wind/wave to shore)

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The Future of Spatial Data in Navigation Safety Analyses

- Improved data has enabled
  - Higher quality (more realistic) analyses and outputs
  - Support better decision making
  - Identification of meaningful mitigation measures
- Increased collaboration w/ stakeholders and agencies
  - Brings focus on the aspects of concern
  - Increases understanding of interpretation/use of the outputs and conclusions

Future of Waterways Risk Analysis & Modeling

Expand quantitative analysis and visualization
- Colocation Analysis (encounters)
- Space-Time Cubes (congestion)
- Simulation (measure precautionary area effectiveness)

Project models into the future
- Machine learning
- Forest-based classification and regression
- Incorporate climate change driven impacts

Technical collaboration
- Partner with industry, academia, other government agencies
- Leverage ESRI GIS expertise via DHS enterprise agreement
- Participate in fora, symposia, conferences, knowledge exchanges

Thank You!

Cheryl Stahl, DNV
cheryl.stahl@dnv.com

Amilynn Adams, USCG
amilynn.e.adams@uscg.mil