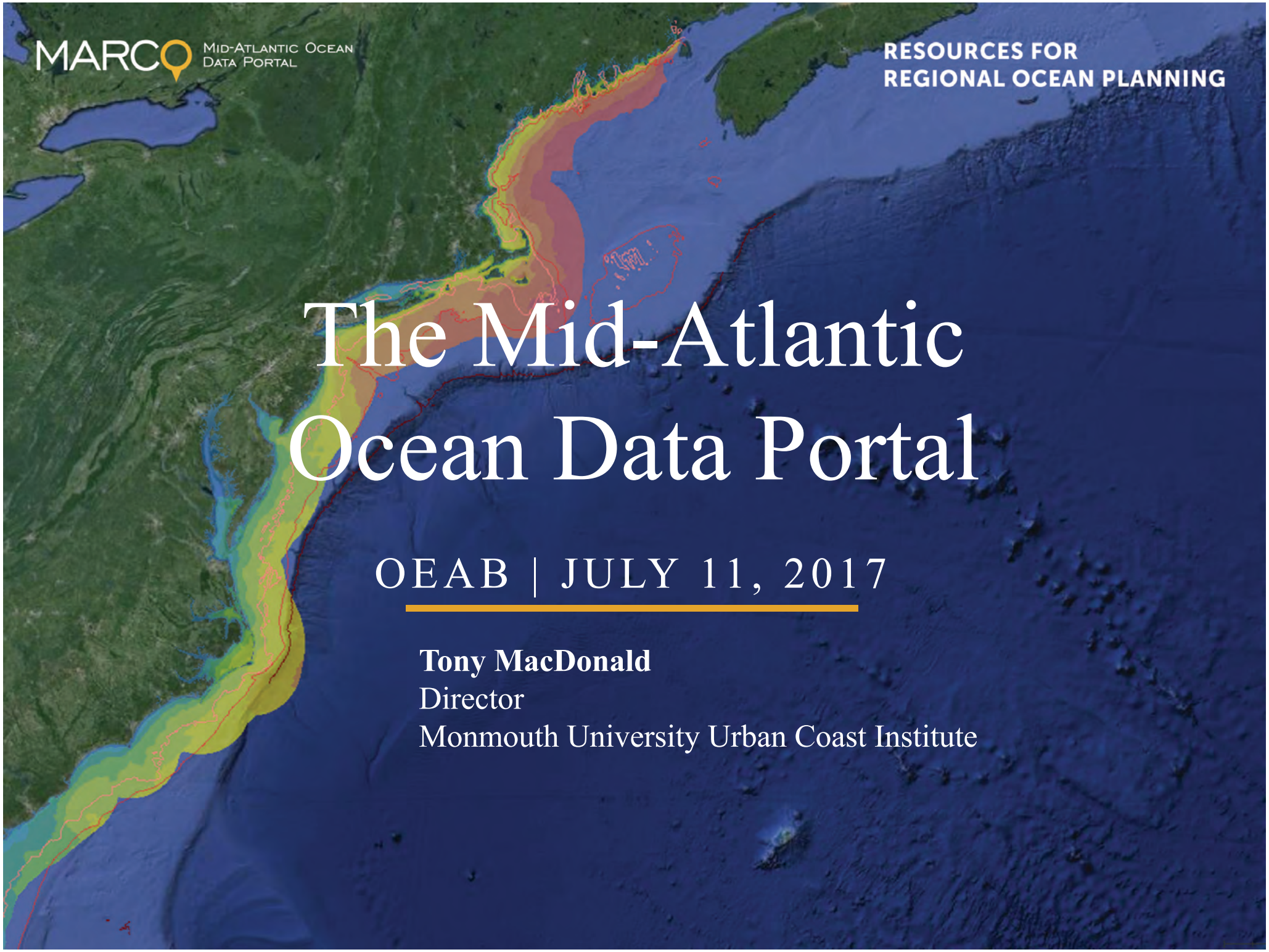
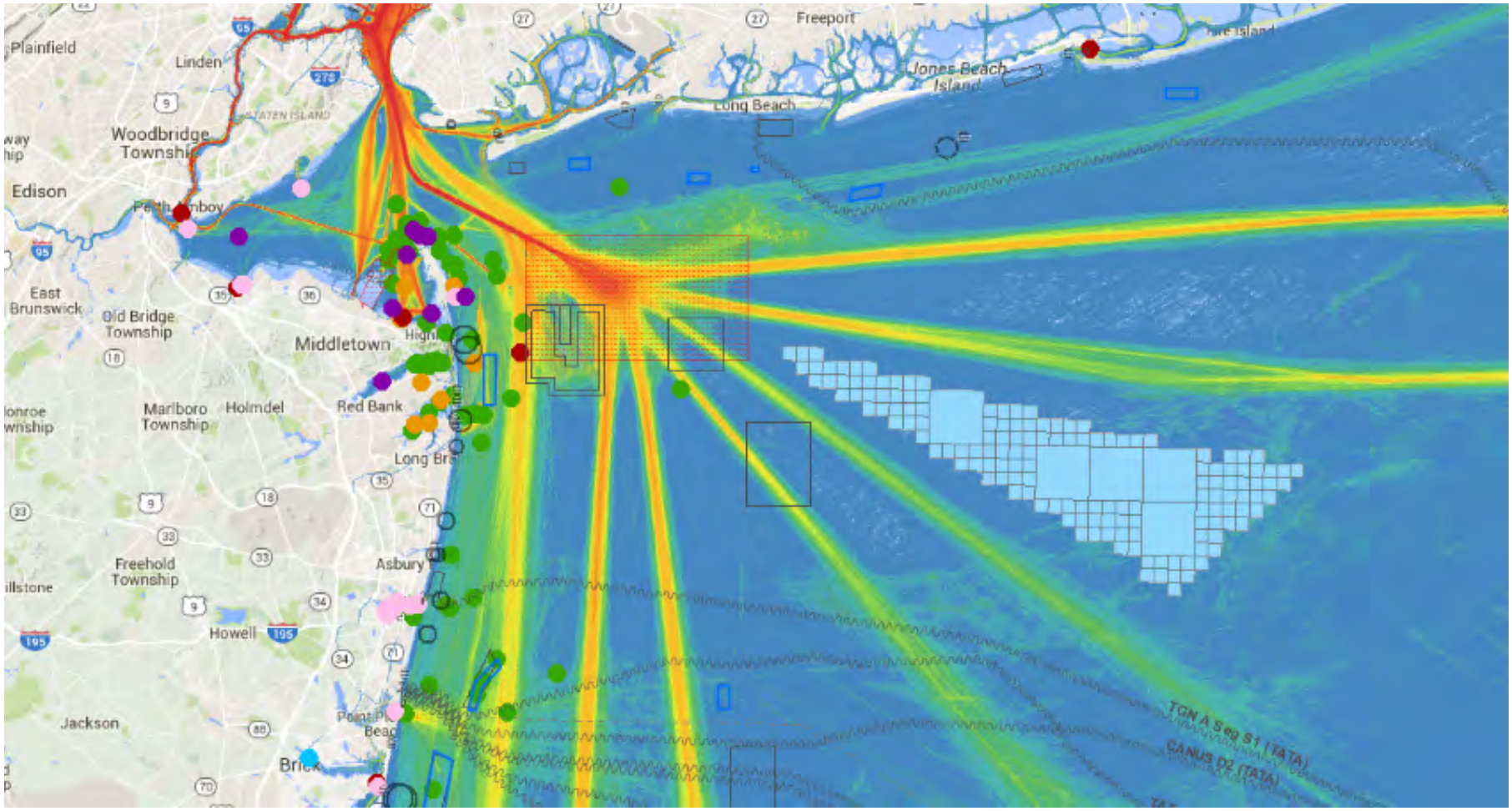


The Mid-Atlantic Ocean Data Portal

OEAB | JULY 11, 2017

Tony MacDonald
Director
Monmouth University Urban Coast Institute

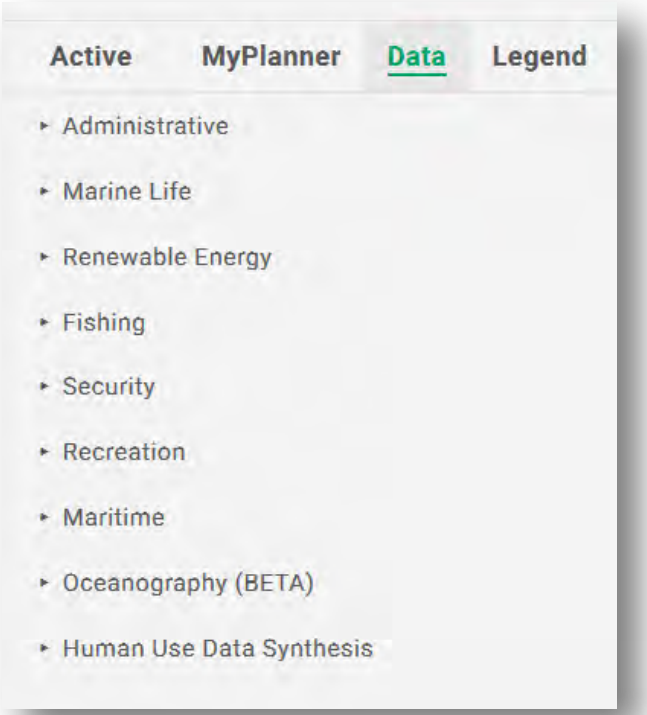
The Ocean Is a Busy Place …



MARCO Mid-Atlantic Ocean Data Portal

What's on the Portal?

- 3,000+ map layers organized under 11 themes
- Ocean planning and educational resources: Portal news blog, "Ocean Stories," calendar, webinars
- Users can create and join groups to collaborate and share maps



MARCO Mid-Atlantic Ocean Data Portal

Ocean Stories

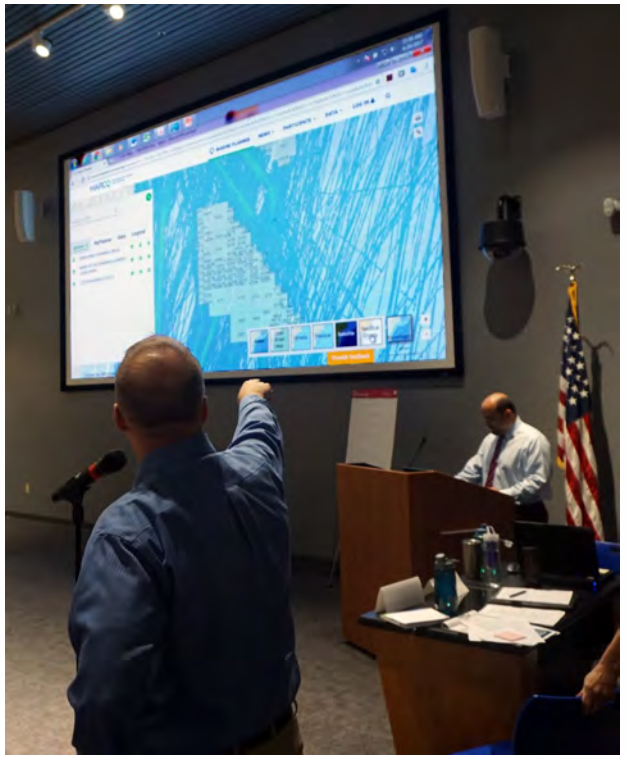
MARCO Mid-Atlantic Ocean Data Portal

Mid-Atlantic Regional Ocean Action Plan

"All RPB member entities should use the Data Portal as an important, but non-exclusive, source of information to help identify potential conflicts, impacts, and potentially affected stakeholders."

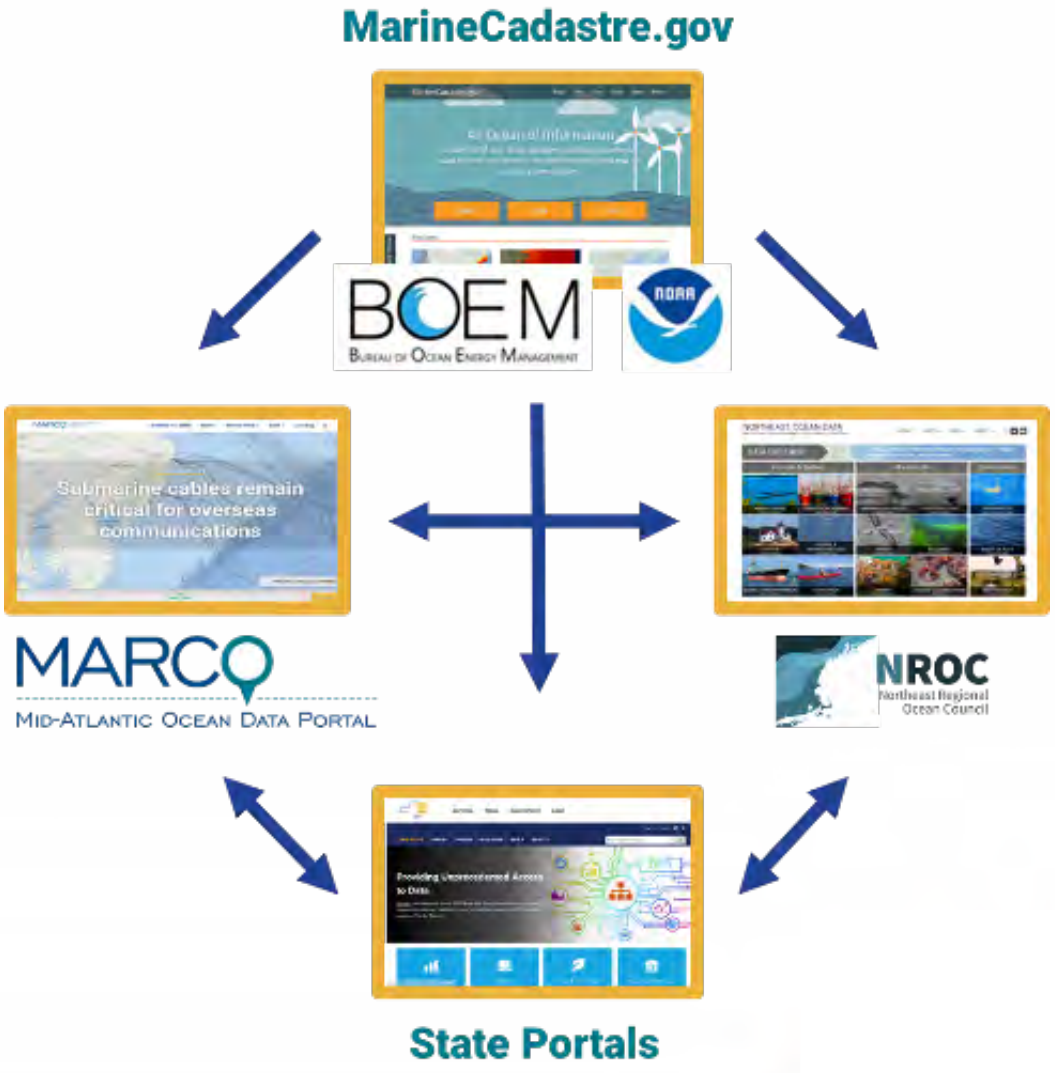
Data Partnerships & Collaboration

- Portal Team/MARCO works closely with RPB to identify key data needs.
- Ocean Mapping Data Team serves as point group for guidance.
- Currently developing datasets to further Ocean Plan implementation
- Frequently share and develop data with Northeast, federal agencies states



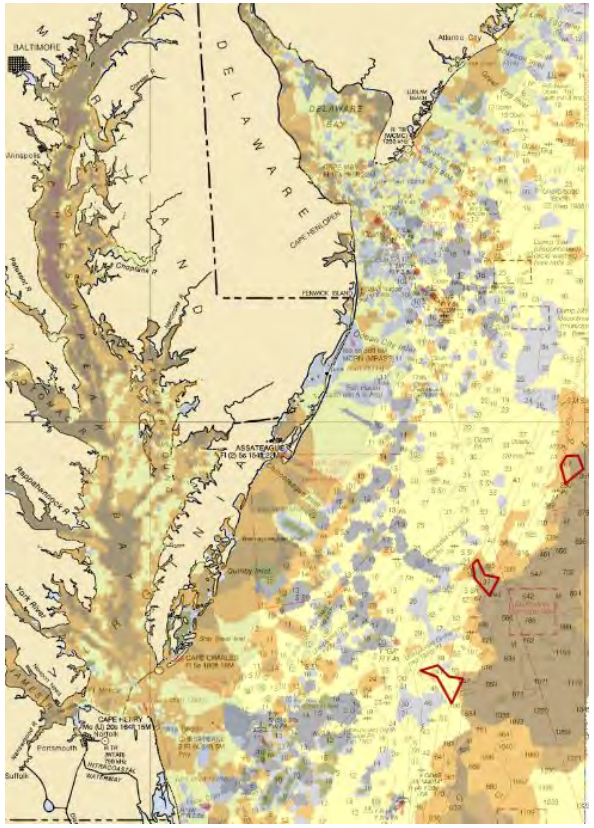
MARCO Mid-Atlantic Ocean Data Portal

Relationship Among Federal, Regional and State Portals



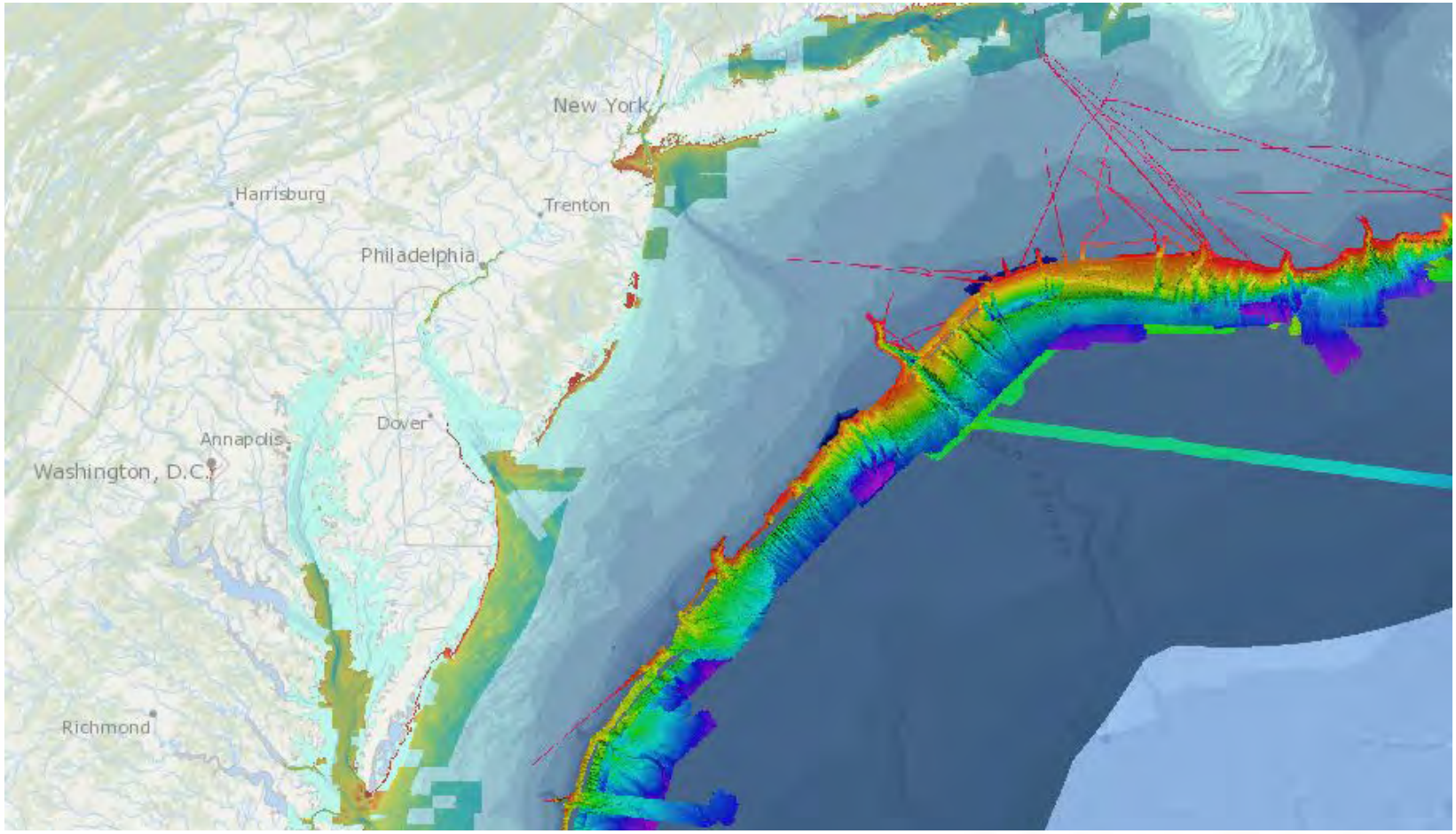
Oceanography Data

- 27 data maps in Oceanography theme, with more under development
- Maps illustrating bathymetry, acidification monitoring sites, seabed forms, sediments by grain size, canyon areas
- 20 maps illustrating net primary productivity and fronts probability by season and year



MARCO Mid-Atlantic Ocean Data Portal

Regional, Okeanos and NOAA/NOS Bathymetry Map Layers



MARCO Mid-Atlantic Ocean Data Portal

Okeanos Explorer Bathymetry

The data displayed here is a compilation of data collected during the Atlantic Canyons Mapping cruises. The multibeam products are generated by the Okeanos Explorer's Mapping Data Team at the Center for Coastal and Ocean Mapping Joint Hydrographic Center at the University of New Hampshire after each mission. For each cruise, additional data are available by visiting the Atlantic Canyons Mapping Data Viewer.

Source: NOAA Ship Okeanos Explorer

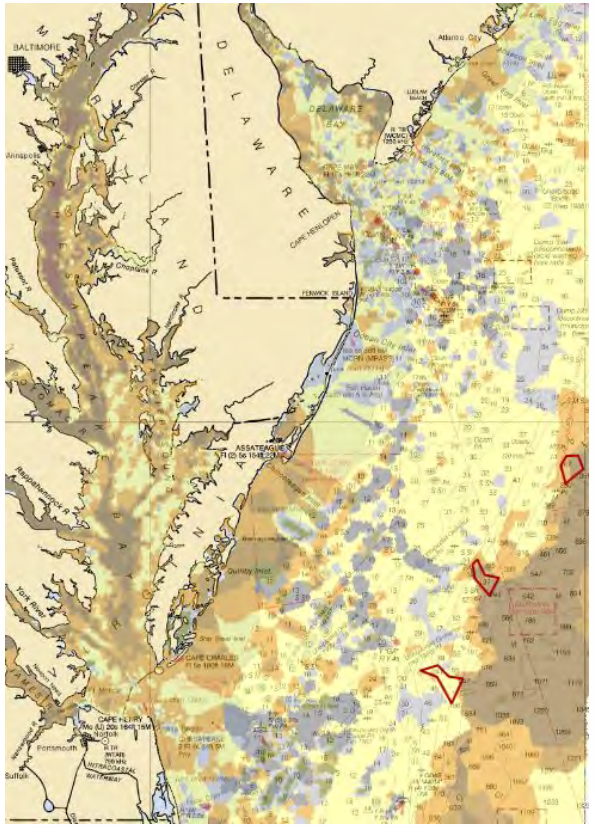
Notes:

These data not to be used for navigation. Although these data are of high quality and useful for planning and modeling purposes, they are not suitable for navigation.

MARCO Mid-Atlantic Ocean Data Portal

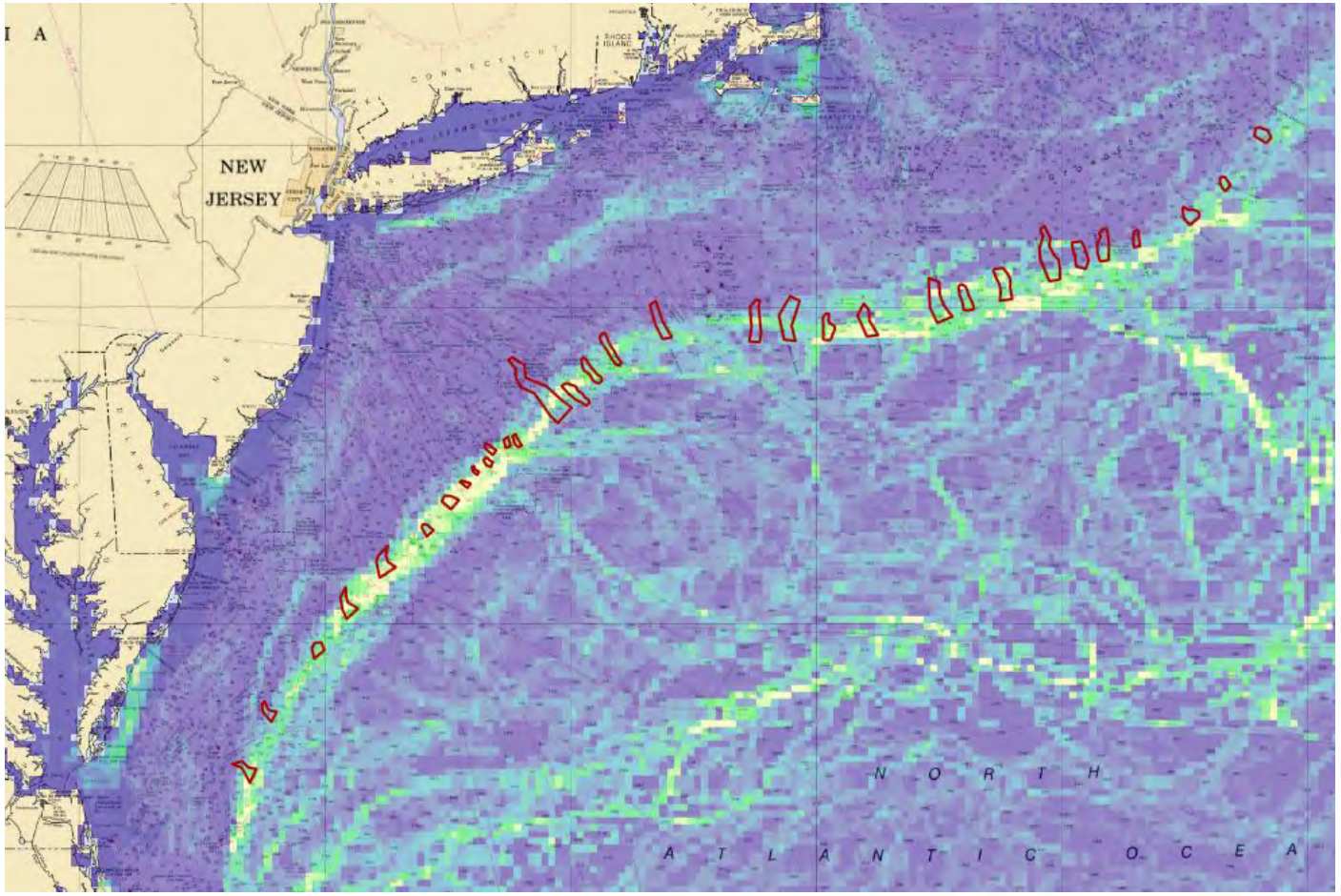
Sample of MARCO/MAFMC Okeanos Research Requests

- Validation/refinement of coral habitat prediction models and new models showing diversity and abundance
- Improved data on fish species distribution and abundance, seasonality and habitat requirements
- Assessing/monitoring demonstrated and anticipated effects on canyons from various disturbances
- Expanded multibeam mapping (especially from 100-500M, including canyon heads and shelf) with backscatter processed to create maps of bottom habitat types



MARCO Mid-Atlantic Ocean Data Portal

2013 Spring Max Fronts Probability and Canyons Map Layers



MARCO Mid-Atlantic Ocean Data Portal

2013 Spring Max Fronts Probability

Fronts play an important role in upper ocean processes. Fronts can impact ocean fisheries, for example, by influencing the spatial distribution of biological productivity and by controlling the accumulation of marine debris, which serves as a beacon to higher trophic levels. The NOAA CoastWatch Oceanic Front Probability Index measures the probability of sea surface temperature front formation based on data from NOAA's GOES satellites. These data represent seasonal 'max' values of ocean fronts for Spring 2013 and were generated using fronts probability data available from CoastWatch. The data were processed to monthy rasters, then computed into composites representing seasonal maximum values. The seasons are as follows: Winter- January, February, December; Spring- March, April, May; Summer- June, July, August. Fall- September, October, November.

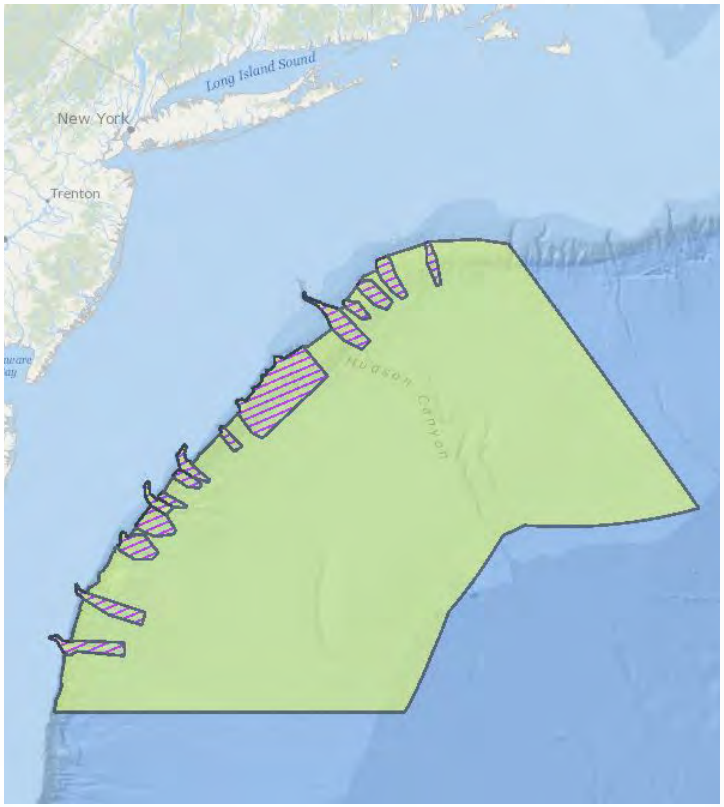
Source: NOAA CoastWatch, NOAA NOS, NOAA NWS Monterey Regional Forecast Office; seasonal composites, Rutgers University

Notes:

The Oceanic Front Probability Index is an EXPERIMENTAL dataset, distributed for scientific evaluation. The source dataset by NOAA CoastWatch is based on sea surface temperature (SST) data; daily SST averages were calculated, then an edge detection algorithm was applied to identify fronts. The index for front probability was then calculated using the number of times a pixel is counted as a front divided by cloud free days for the time period. This helps to eliminate days in which the fronts are masked out by clouds. NOAA CoastWatch accepts no liability for use of these data products. NOT to be used for navigation.

Case Study: Mid-Atlantic Coral Conservation

- With aid of Portal data, fishermen, conservationists and MAFMC worked together to ID likely coral habitats
- Discussions led to a compromise: 38,000 square miles placed off limits to bottom-tending gear
- Frank R. Lautenberg Deep-Sea Coral Protection Area named for longtime New Jersey Senator



MARCO Mid-Atlantic Ocean Data Portal

Success Story: MAREA Cable Line

- TE SubCom (on behalf of Facebook and Microsoft) used the portal as one source of information to ensure the highest capacity submarine cable to eventually cross the Atlantic is sited to reduce conflict with bottom dredges and trawling.

- Many ocean stories on the portal website

MARCO Mid-Atlantic Ocean Data Portal

RESOURCES FOR OCEAN PLANNING

PORTAL USE CASE: VIRGINIA BEACH-BILBAO CABLE

Project Details

Even in this wireless age, undersea cables are responsible for carrying over 95 percent of all overseas communications. These sprawling fiber optic lines can cost hundreds of millions of dollars to lay across the ocean, and when damaged, are often extraordinarily difficult to repair.

So when TE SubCom of Eatontown, New Jersey, recently began laying a new submarine communications cable from Virginia Beach to Bilbao, Spain, the company was determined to take every possible precaution to ensure its safety. To that end, TE's engineers consulted the Mid-Atlantic Ocean Data Portal – particularly its commercial fishing data maps – to design an alignment that was least threatened by bottom-tending activities such as dredging and trawling. Once complete, the 4,000-mile MAREA line – commissioned by owners Facebook and Microsoft – will be the highest-capacity submarine cable ever to cross the Atlantic and the first to connect the U.S. to southern Europe.

The Portal's Commercial Fishing VTR and VMS collections contain dozens of maps illustrating concentrations of fishing activity by gear type and catch type over several time ranges. By studying these maps, TE was able to locate fishing hot spots that should be avoided.

USER
TE SubCom

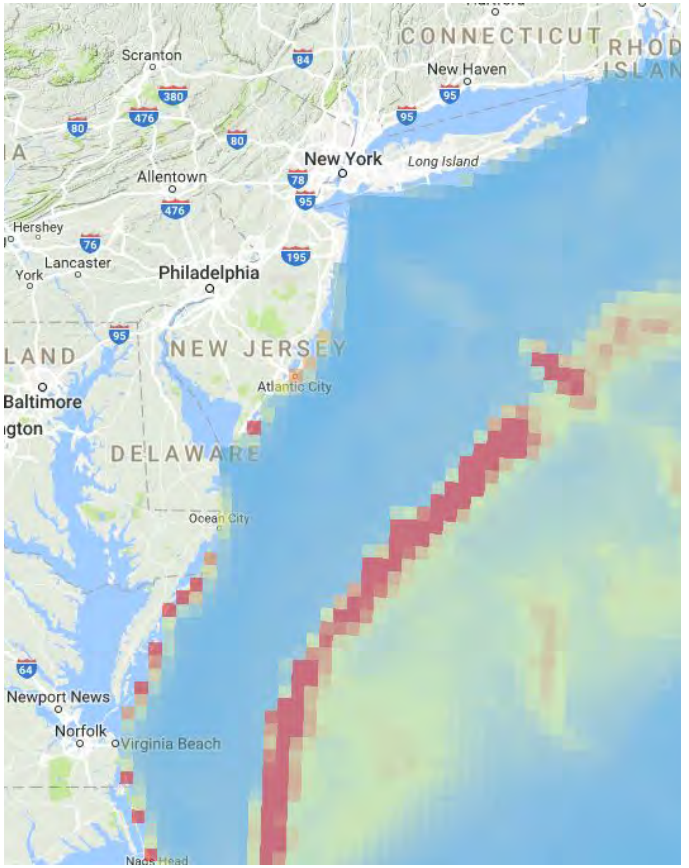
LOCATION
Virginia Beach, VA, and Eatontown, NJ

Map: Commercial scallop fishing concentrations and submarine cable locations.

MARCO Mid-Atlantic Ocean Data Portal

Marine Life & Data Analysis Team (MDAT) Project

- Created one of largest online collections of marine life maps in world
- Searchable library of thousands of maps showing populations/abundance for species of fish, birds and mammals
- Being used to identify Ecologically Rich Areas (ERAs) in the Mid-Atlantic
- Research and data collection conducted by Duke University Geospatial Ecology Lab



Framework for Identifying ERAs

- Draft Framework included in Draft Mid-Atlantic Regional Ocean Action Plan - Summer 2016

- Five ERA components:
  1. Productivity
  2. Biodiversity
  3. Species abundance
  4. Rarity
  5. Vulnerability

Framework for Identifying ERAs (cont'd)

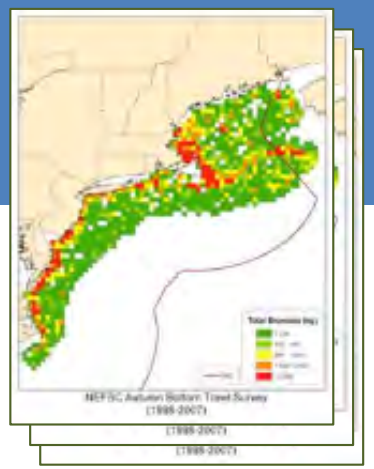
Additions to Draft Framework:

- Data sets to be cross- checked with known species of Indigenous cultural importance
- Four types of ERAs
  - Fixed
  - Clustered
  - Ephemeral
  - Ambulatory

RPB approved March 21, 2017

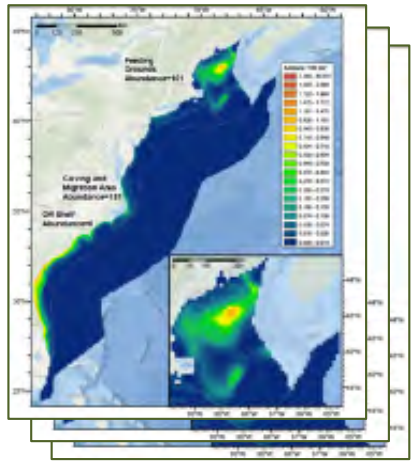
Presented for finalization today June 20, 2017

MDAT Data Review – Species Data



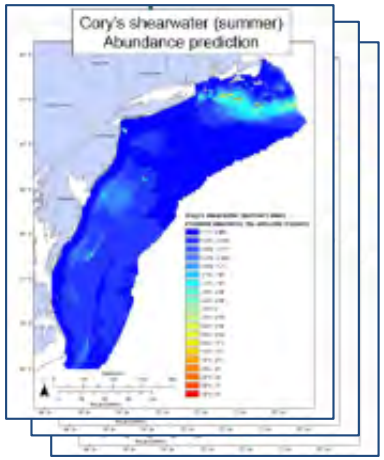
Fish

- 82 species
- Biomass
- 1979-2014; 2005-2014



Mammals

- 29 species / guilds
- Predicted density
- Monthly, Annual



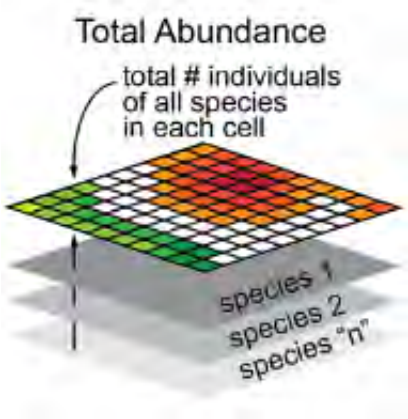
Avian

- 40 Species
- Predicted relative density and occurrence
- Seasonal, Annual

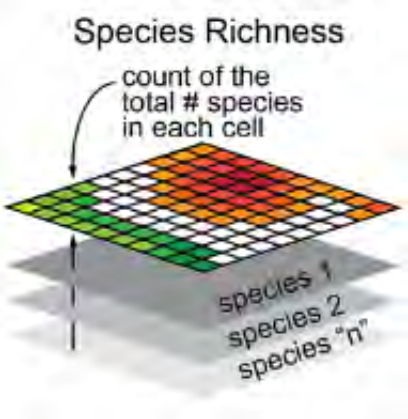
MDAT Data Review - Summary Products

For species groups:

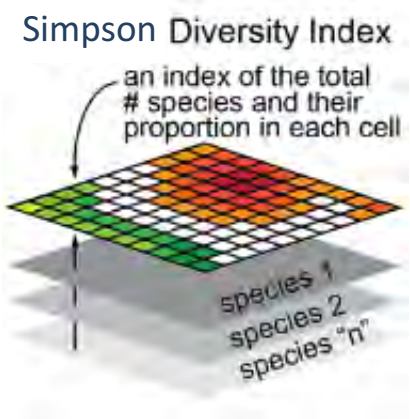
1. Group Abundance / Biomass



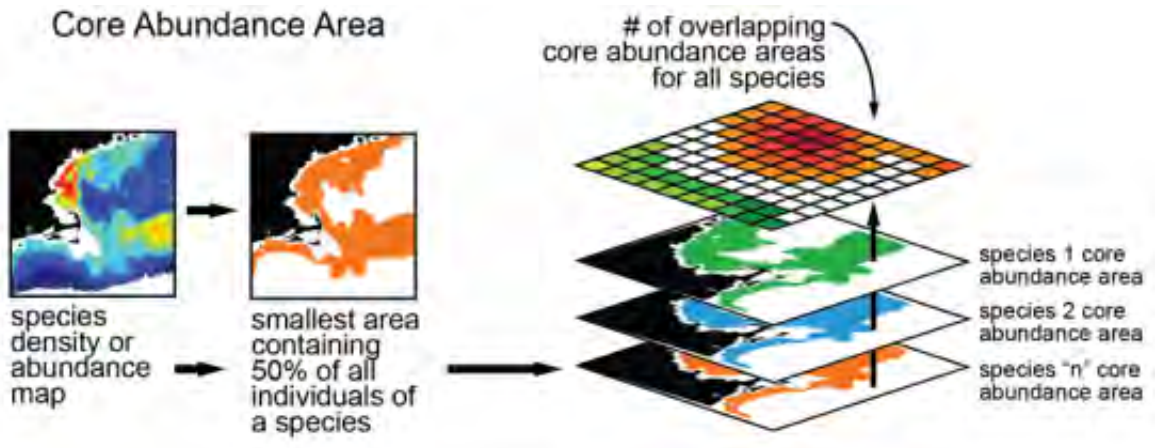
2. Species Richness



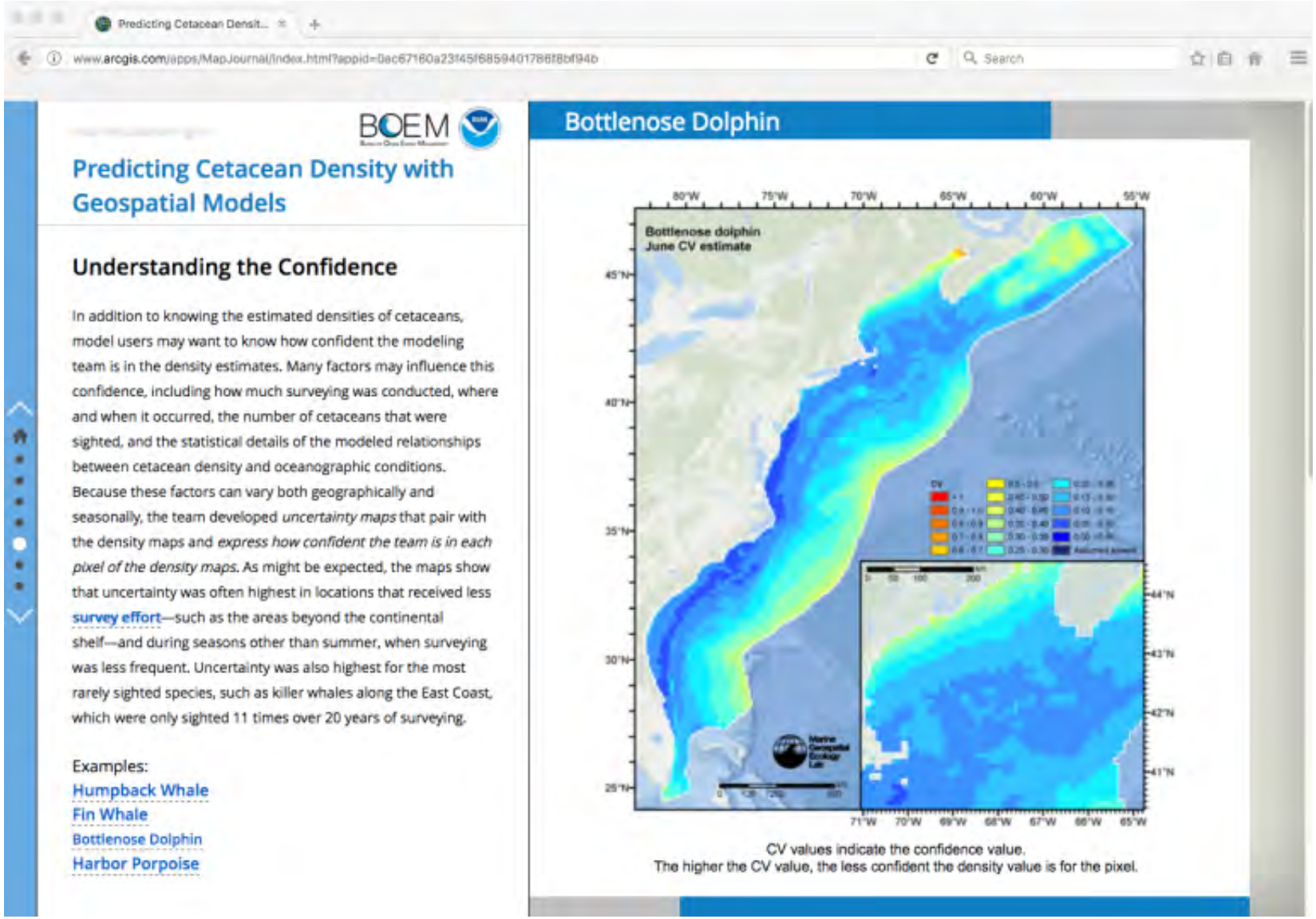
3. Biodiversity Index



4. Core Abundance / Biomass Area Richness



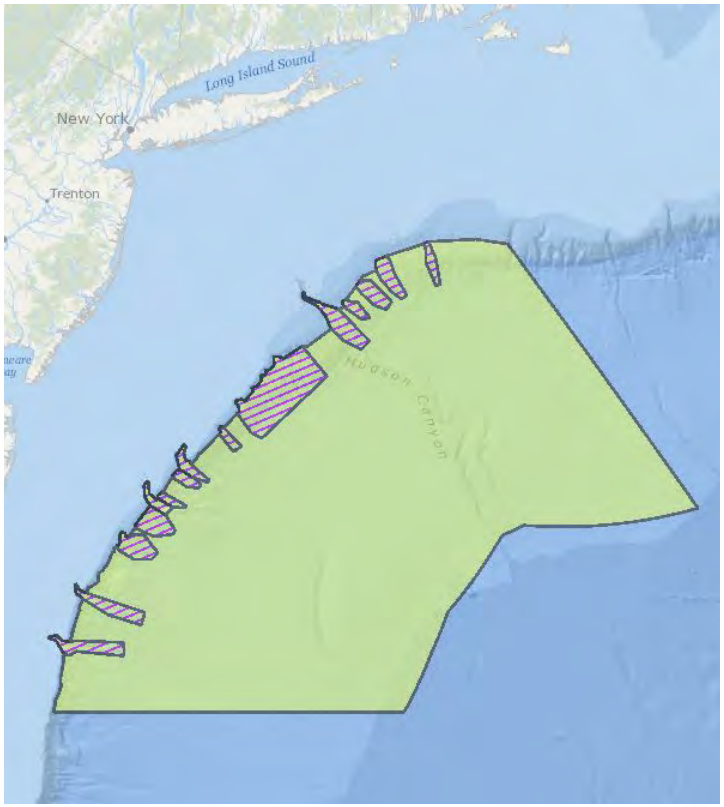
Data Communication – Existing model story map



https://goo.gl/yTM9fH

What's Next?

- More recent and past years of VTR and VMS fishing data, searchable by port
- More current years of Automatic Identification System (AIS) vessel traffic maps
- Oceanography data showing surface and bottom temps over time, more current fronts and productivity layers
- A collection of maps illustrating offshore sand resource locations and mining activities in Mid-Atlantic

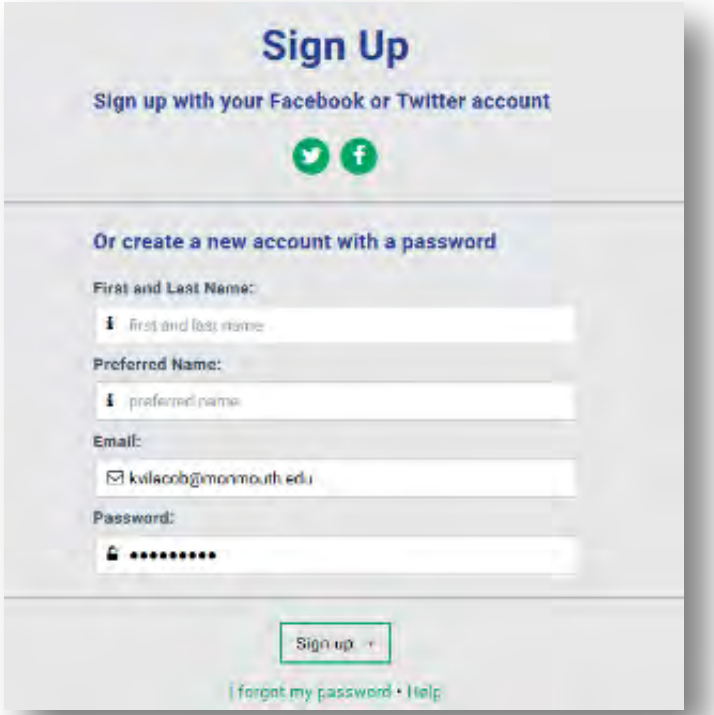


MARCO Mid-Atlantic Ocean Data Portal

Register for an Account

- Visit portal.midatlantic.org and fill out our form. It's free and easy! You can even use your Facebook or Twitter account

- Registering for an account unlocks the full potential of the Portal



MARCO Mid-Atlantic Ocean Data Portal