GoMMAPPS

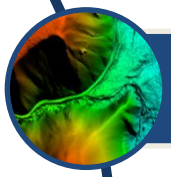
Gulf of Mexico Marine Assessment Program for Protected Species

Planning, Outreach and Education Support

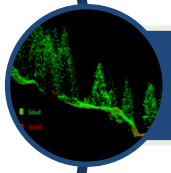
Presented By: Tim Marcella and Cherie Jarvis

Quantum Spatial

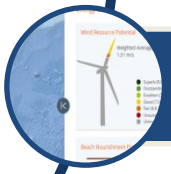
Data Acquisition (lidar, imagery, thermal, hyperspectral, etc.)



Data Processing, Migration & Integration



Data Analysis, Mapping & Analytics



GIS Solutions and App. Development

Onsite Technical Support Services

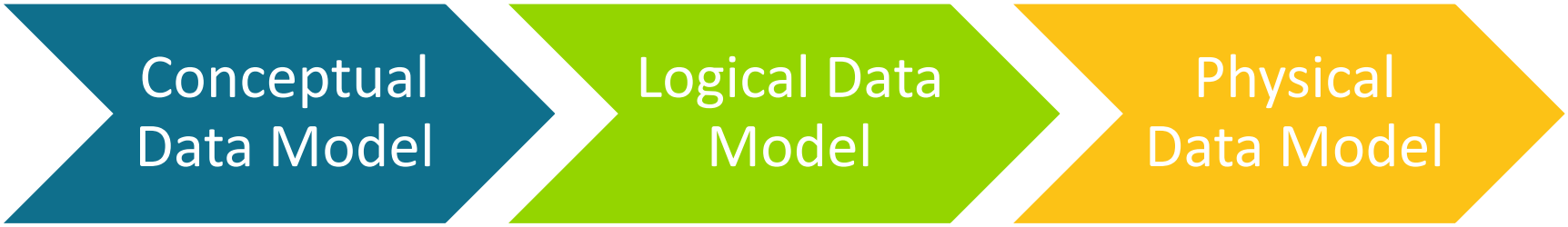
Quantum Spatial's Role

Planning and Outreach Support

1. Create a Historical Data Inventory/Gaps Analysis
2. Recommend a Data Management Framework and Draft Data Model
3. Outreach and Educational Materials
4. Support and Facilitate Stakeholders Collaboration

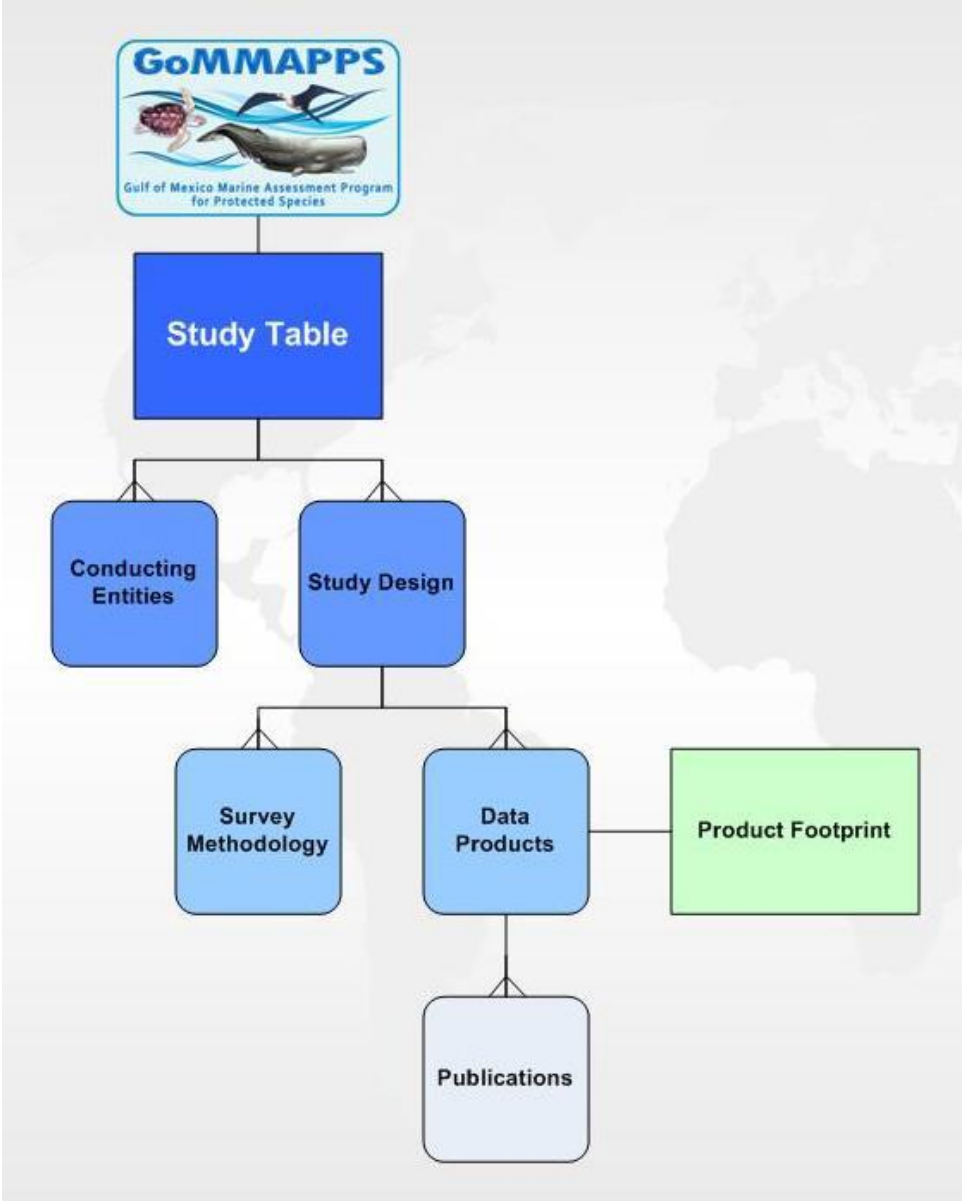
1. Data Inventory/Gaps Analysis

- **Compile a metadata repository**
- **Identify geographic extent of survey effort**
- **Identify Data Gaps – seasonal and spatial**
- **Document Assessment – white paper**



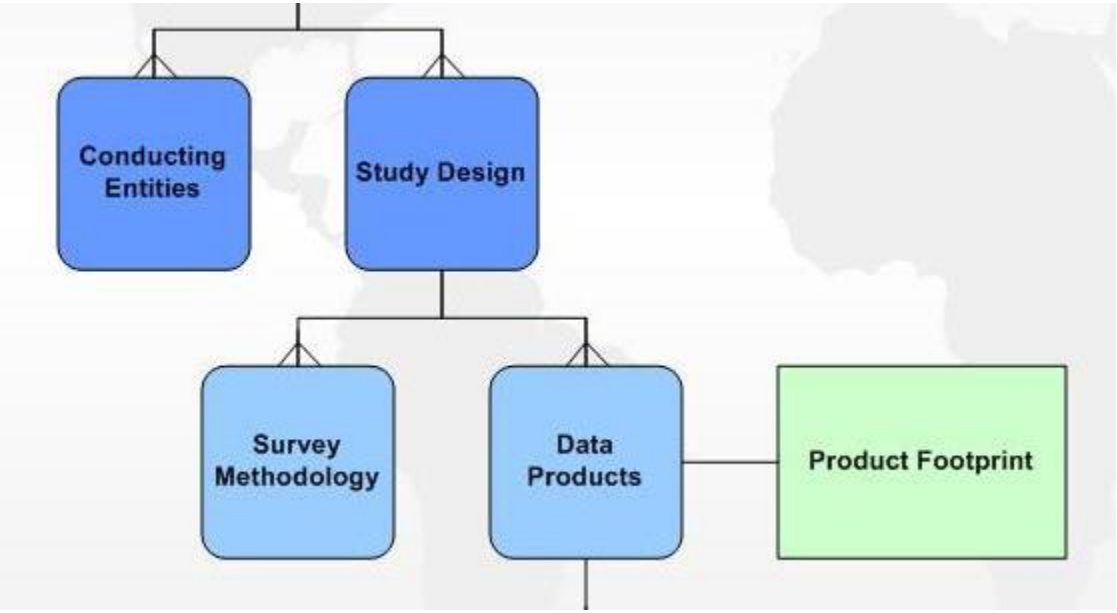
Conceptual Data Model

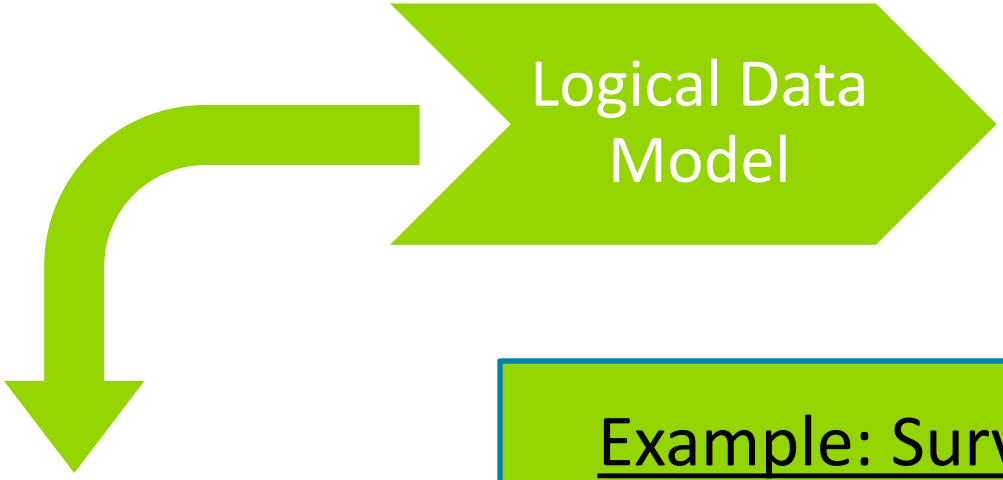
Designed to capture data on past/current and future Gulf of Mexico research projects



Logical Data Model

Further define attributes within each table/layer





Further define attributes within each table/layer

Example: Survey Methodology

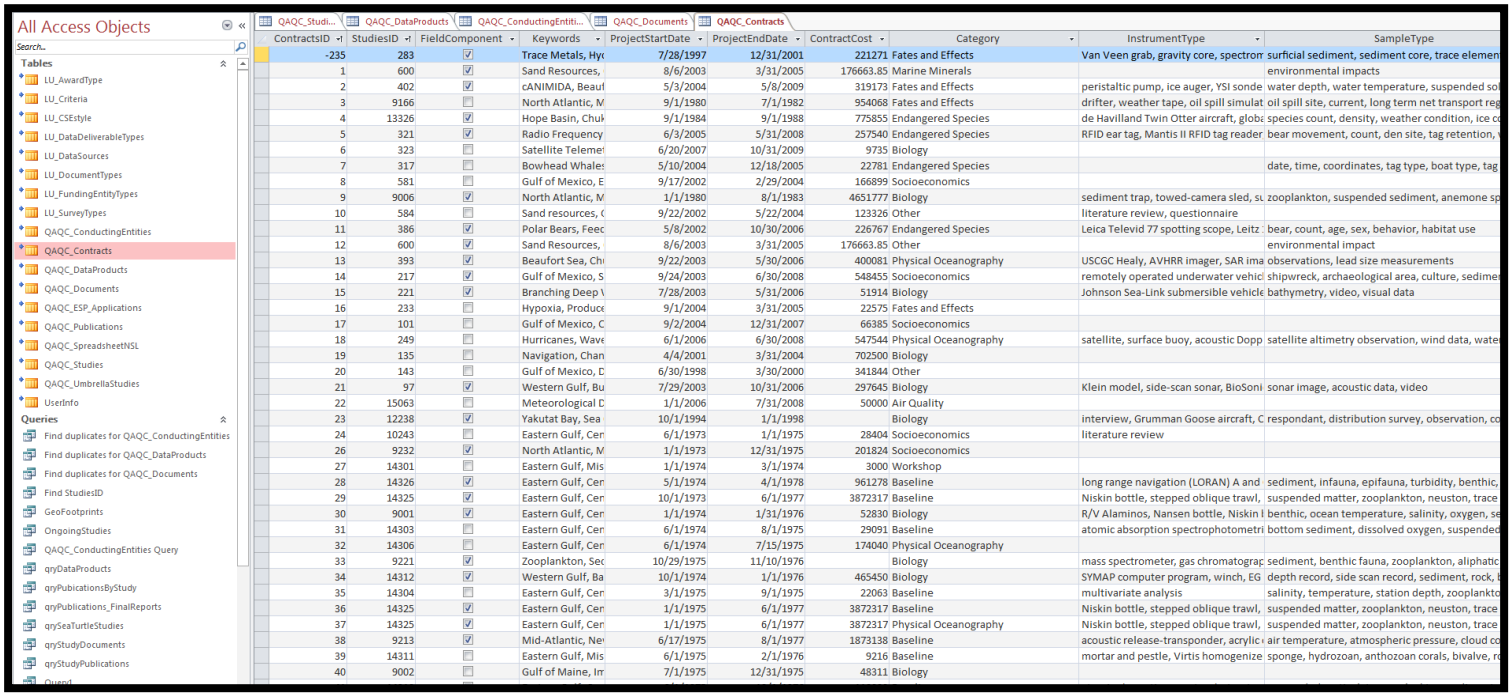
- Survey Type
- Survey Platform
- Survey Extent
- …

Physical
Data Model

An access database will be constructed

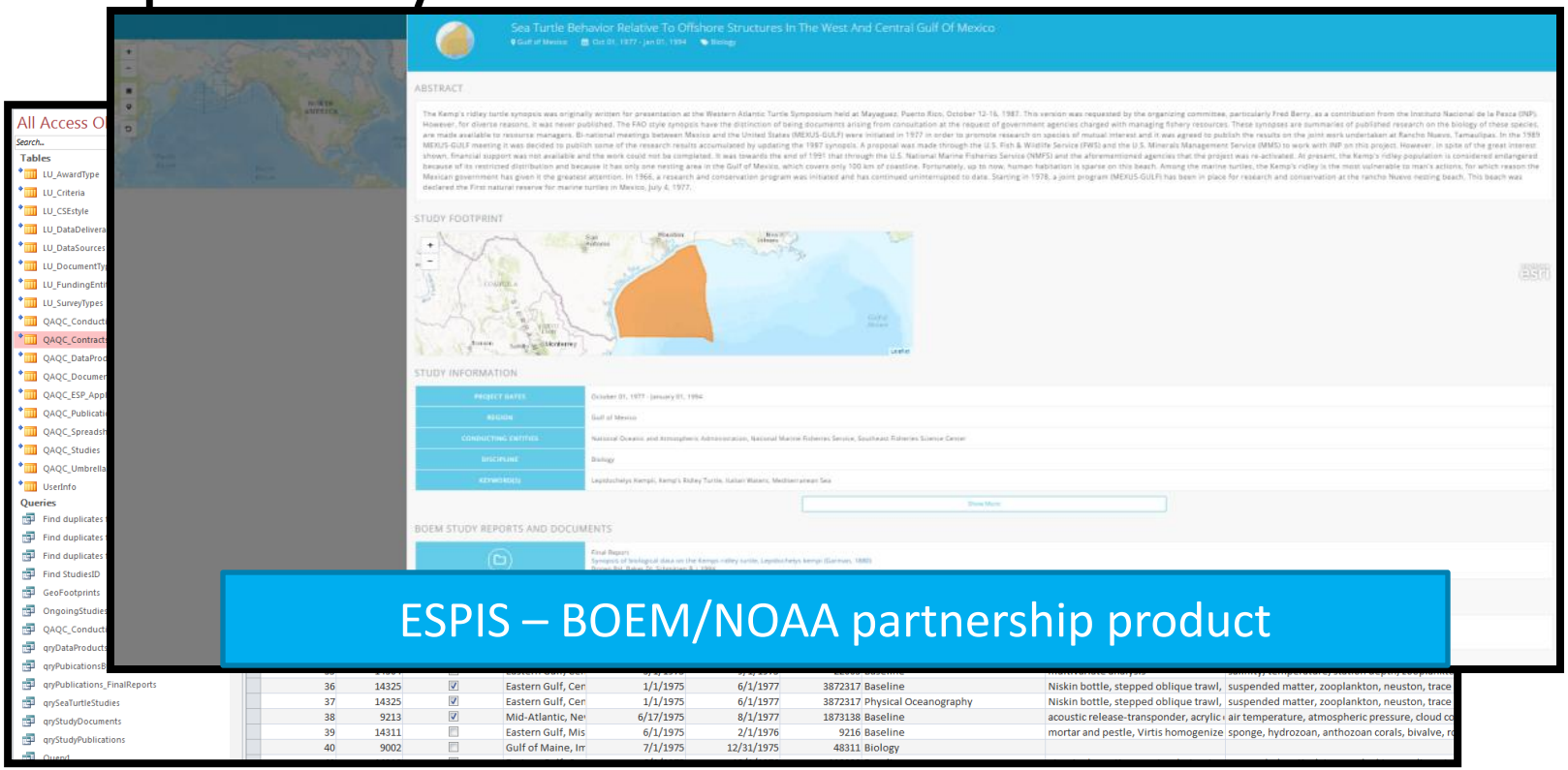
Physical Data Model

Populated with the metadata information



Physical Data Model

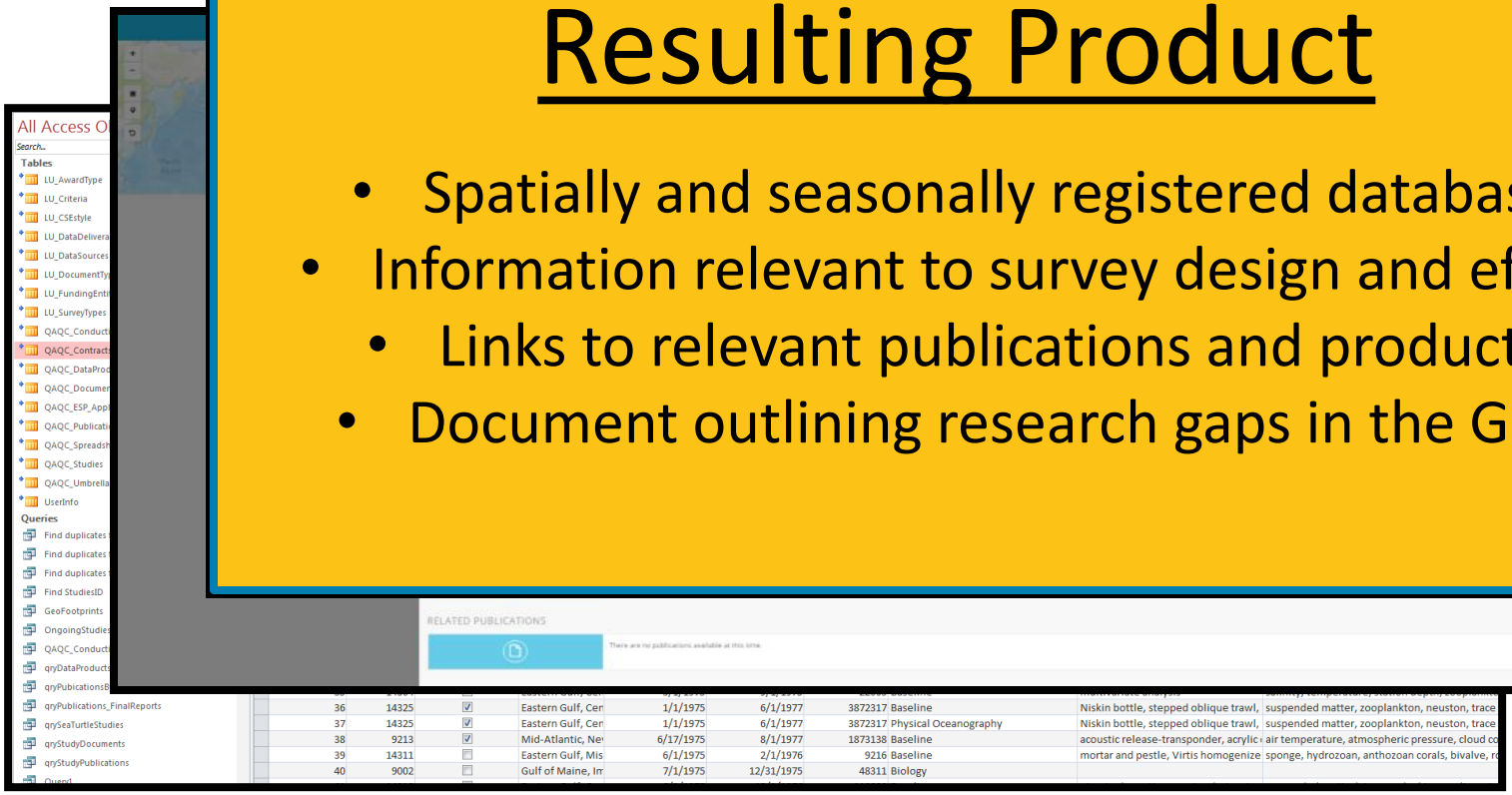
Spatial layer will be linked – similar to ESPIS



Physical
Data Model

Resulting Product

- Spatially and seasonally registered database
- Information relevant to survey design and effort
- Links to relevant publications and products
- Document outlining research gaps in the Gulf



2. Data Management Recommendations

Tiers of Data Management

- Research Study Level
- GoMMAPPS Project Level – Shared Resources
- Public Level

Reviewing AMAPPS data models

3. Outreach/Education

Marine Cadastre

- NOAA/BOEM

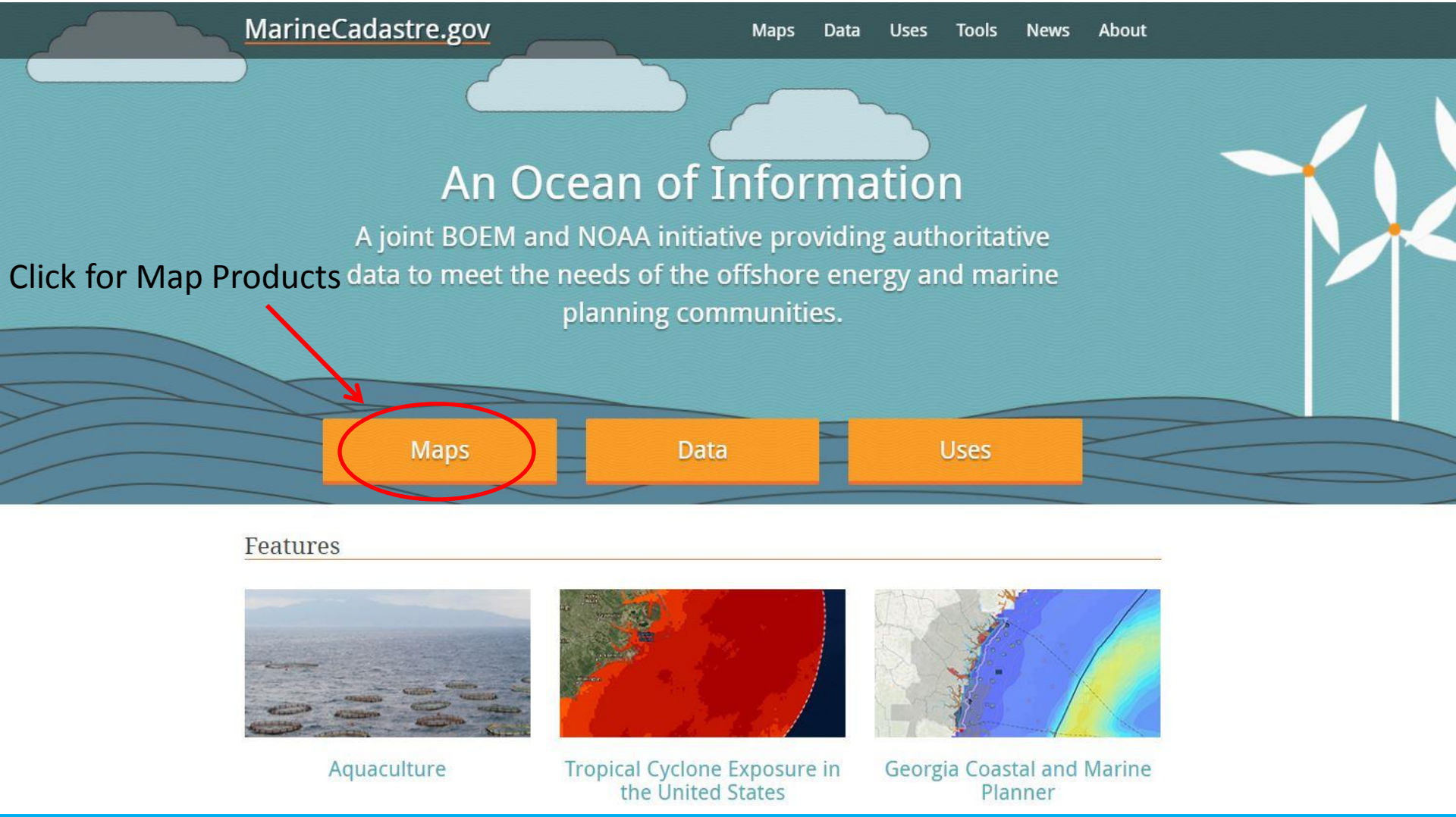
Story Maps

- Descriptive/visual format for displaying spatial data

GoMMAPPS Webpage

- Support content and updates as project progresses

3. Outreach/Education – Marine Cadastre



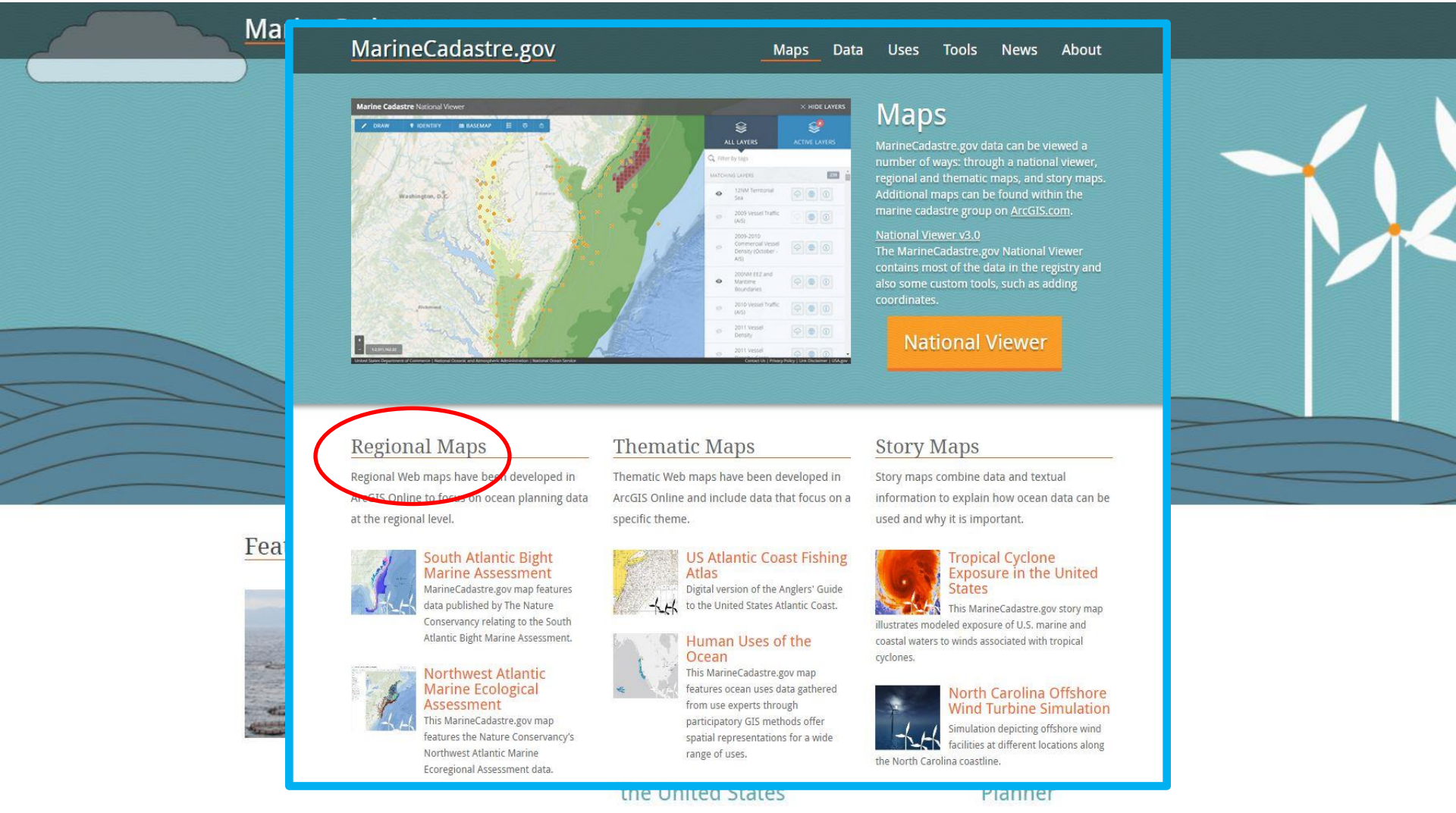
Features

Aquaculture

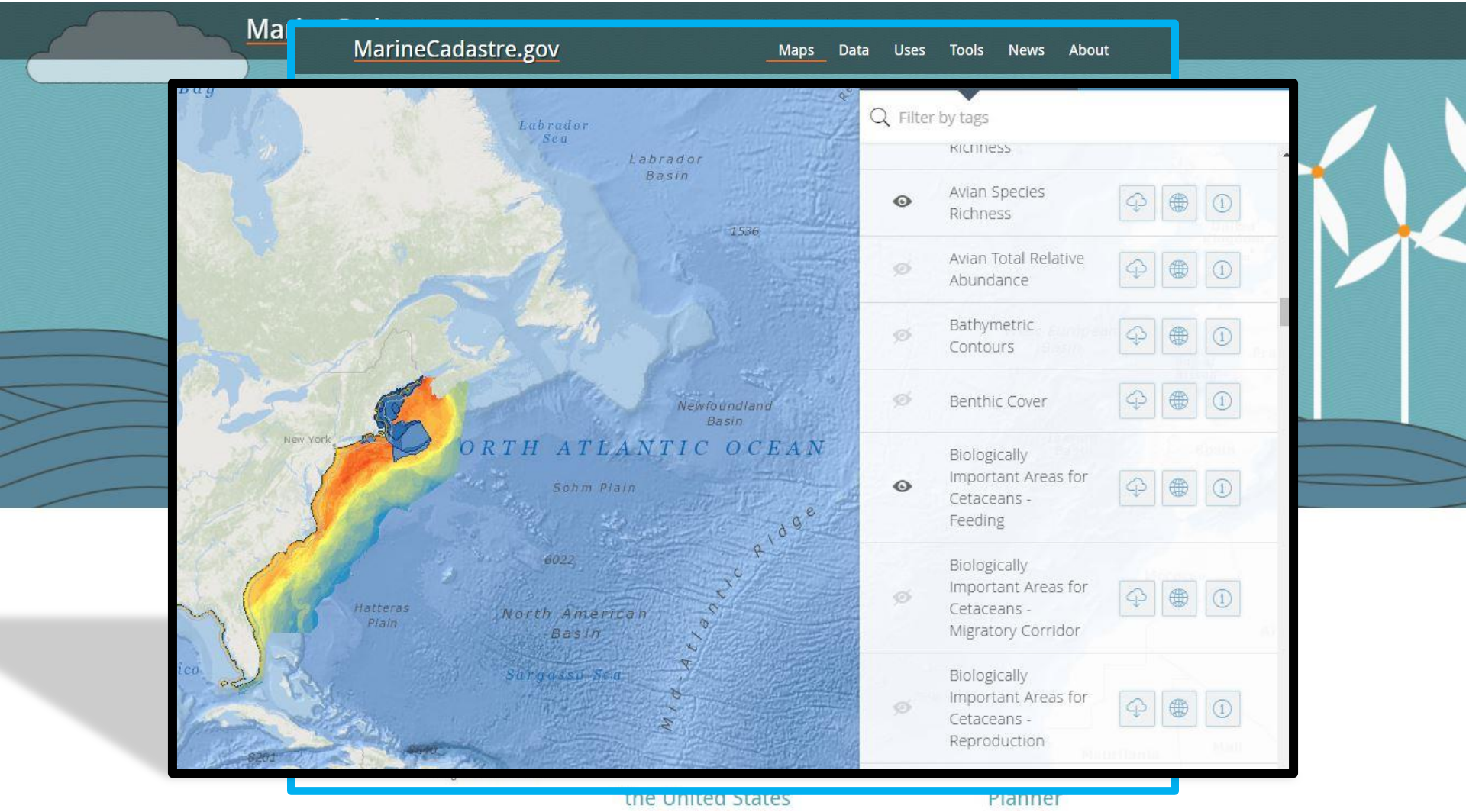
Tropical Cyclone Exposure in the United States

Georgia Coastal and Marine Planner

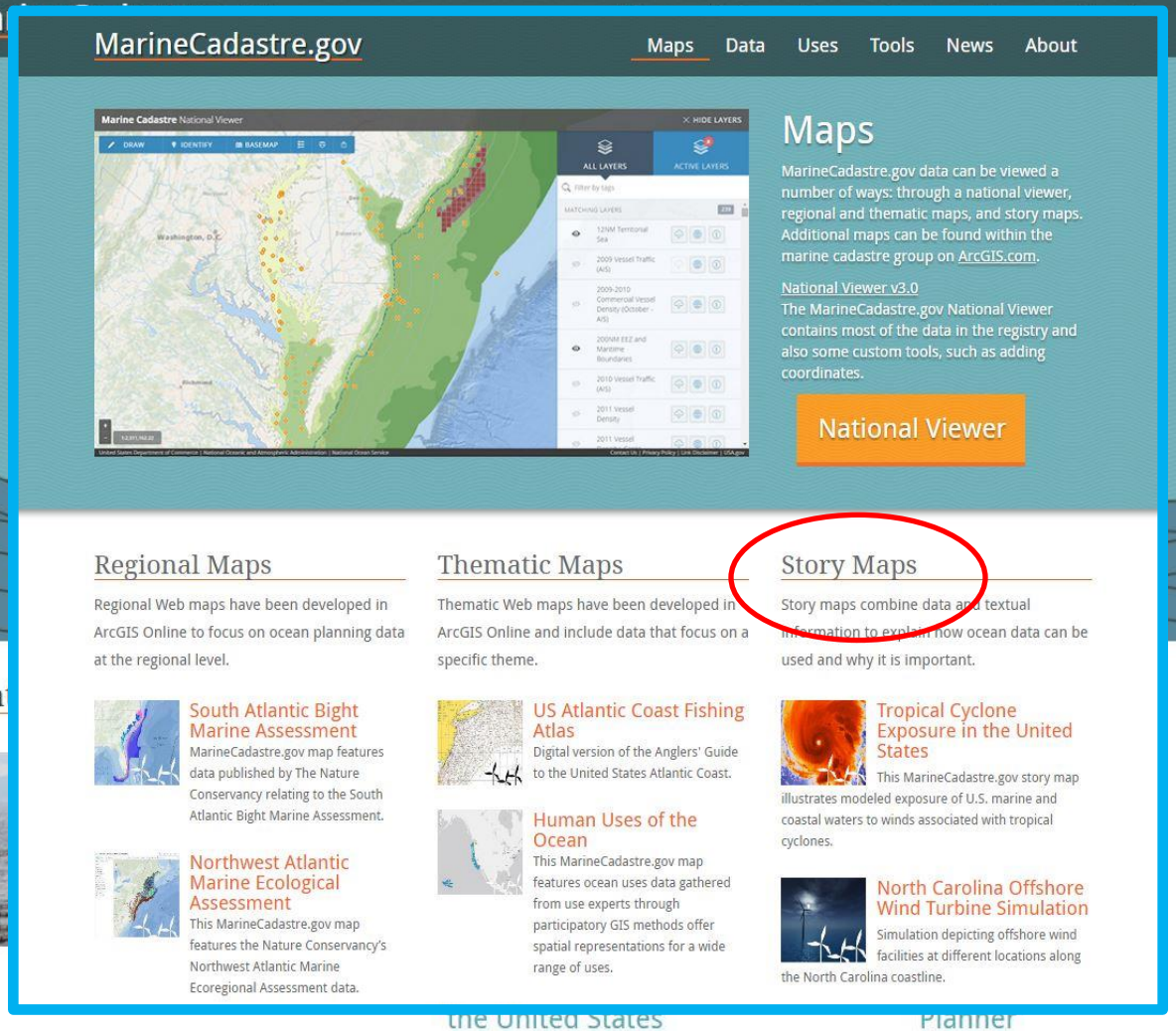
3. Outreach/Education – Marine Cadastre



3. Outreach/Education – Marine Cadastre



3. Outreach/Education – Story Maps



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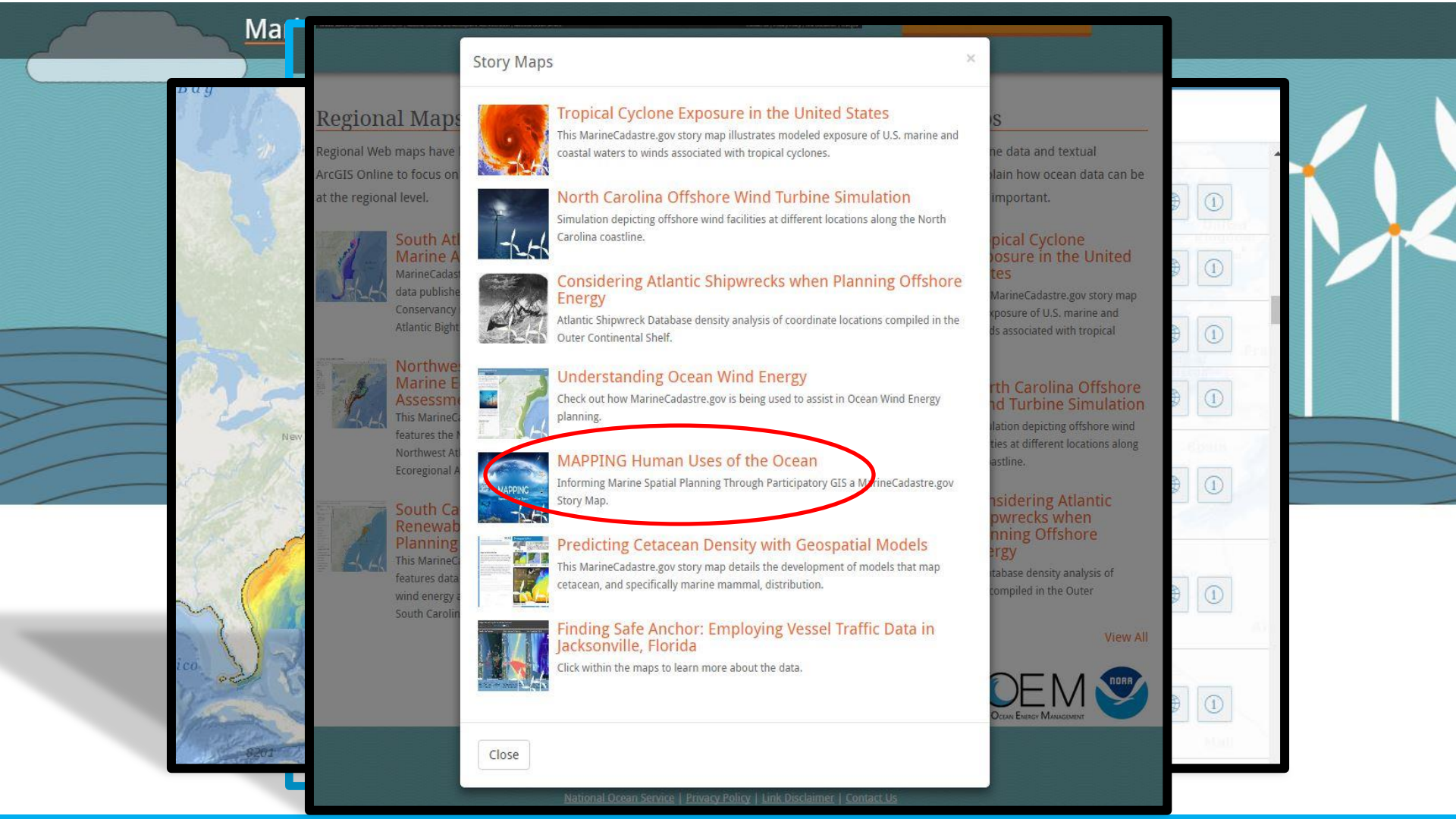


3. Outreach/Education – Story Maps

marinecadastre.gov

BOEM

Predicting Cetacean Density with Geospatial Models

Why do we need cetacean data?

Whales, dolphins, and porpoises are collectively named cetaceans. These marine mammals inhabit many riverine, estuarine, coastal, and marine areas. Many were hunted during the whaling era, and their populations are still recovering. Although commercial whaling has not occurred in U.S. waters in decades, humans continue to increase their use of the ocean and its resources in other ways.

The Marine Mammal Protection Act prohibits activities that would harm or disturb cetaceans, and other marine mammals, and impact their populations. To evaluate possible impacts, managers and stakeholders need to know how cetaceans are distributed geographically, how their distributions change with the seasons, what behaviors they are engaged in, and how many individuals exist in each area. With this knowledge, managers can do their best to avoid causing harm. The National Oceanic and Atmospheric Administration (NOAA) is the federal agency with responsibility for collecting information on where these marine protected species live. Recently, a group of scientists used data collected by NOAA, state agencies, and academic institutions to produce detailed maps of cetacean distributions along the East Coast and Gulf of Mexico by analyzing and modeling how sightings of cetaceans relate to environmental conditions such as water temperature and ocean currents. Explore this interactive story map to dig deeper into the process of creating these maps.

Collecting Cetacean Sightings

Because cetaceans live mainly underwater, co[illegible] the surface only to breathe or rest, they are hard to see. They cannot be detected from satellites (except for the largest whales, and only in ideal

Predicting Cetacean Density with Geospatial Models

Stellwagen Bank National Marine Sanctuary: Photo taken under NOAA Fisheries Permit #605-1904

BOEM Bureau of Ocean Energy Management

MarineCadastre.gov

Marine Geospatial Ecology Lab • Duke University

NOAA

3. Outreach/Education – Story Maps

marinecadastre.gov

BOEM

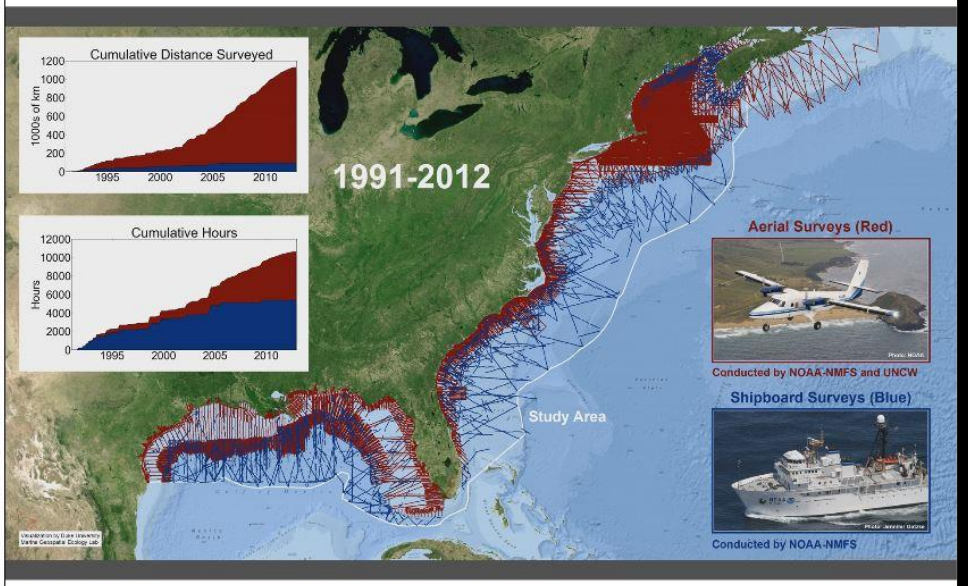
Predicting Cetacean Density with Geospatial Models

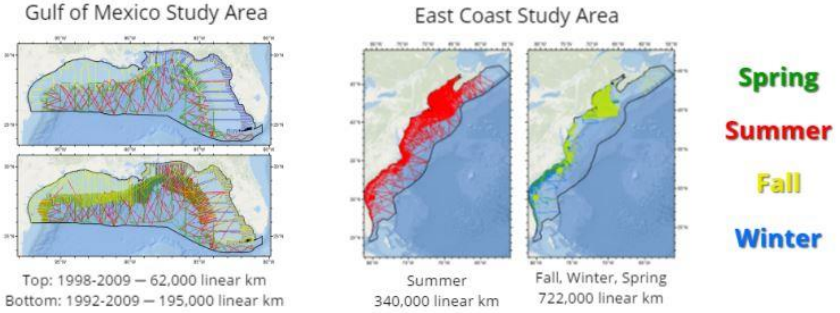
Collecting Cetacean Sightings

Because cetaceans live mainly underwater, coming to the surface only to breathe or rest, they are hard to see. They cannot be detected from satellites (except for the largest whales, and only in ideal conditions). While it is possible to continually monitor the positions of individual animals with electronic tags, it is not practical or cost effective to monitor an entire population this way. Because of these difficulties, scientists must build models that predict cetacean distributions from limited observations, similar to how meteorologists predict the weather.

Scientists start the process by surveying the ocean for cetaceans, using a methodology called *visual line-transect surveying*. Research vessels and low-flying aircraft carry specially trained observers along carefully planned, zig-zagging routes over the ocean. The observers carefully chart the exact locations, times, species names, and numbers of animals spotted along the route. They also maintain a continuous record of environmental conditions, including the roughness of the sea, the weather, the presence of glare from the sun, and other factors that affect their ability to detect animals, so that they may account for these factors when the data are analyzed. Survey teams repeat routes during different seasons and years, and plan new routes, to try to fill in seasonal and geographic gaps in survey coverage.

Aggregated Survey Data 1991-2012





4. Support/Facilitate Stakeholder Engagement

Thank You for your Attention

Project Team

- Cherie Jarvis, P.M.P. – Senior Project Manager
- Tim Marcella, M.S. - Technical Lead/SME
- Alexa Ramirez, M.S., GISP – Data Manager
- Local Subject Matter Expert(s) – defined by the needs of the project.