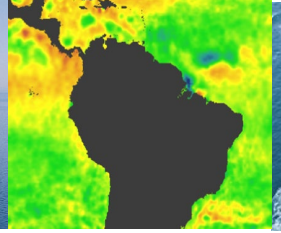



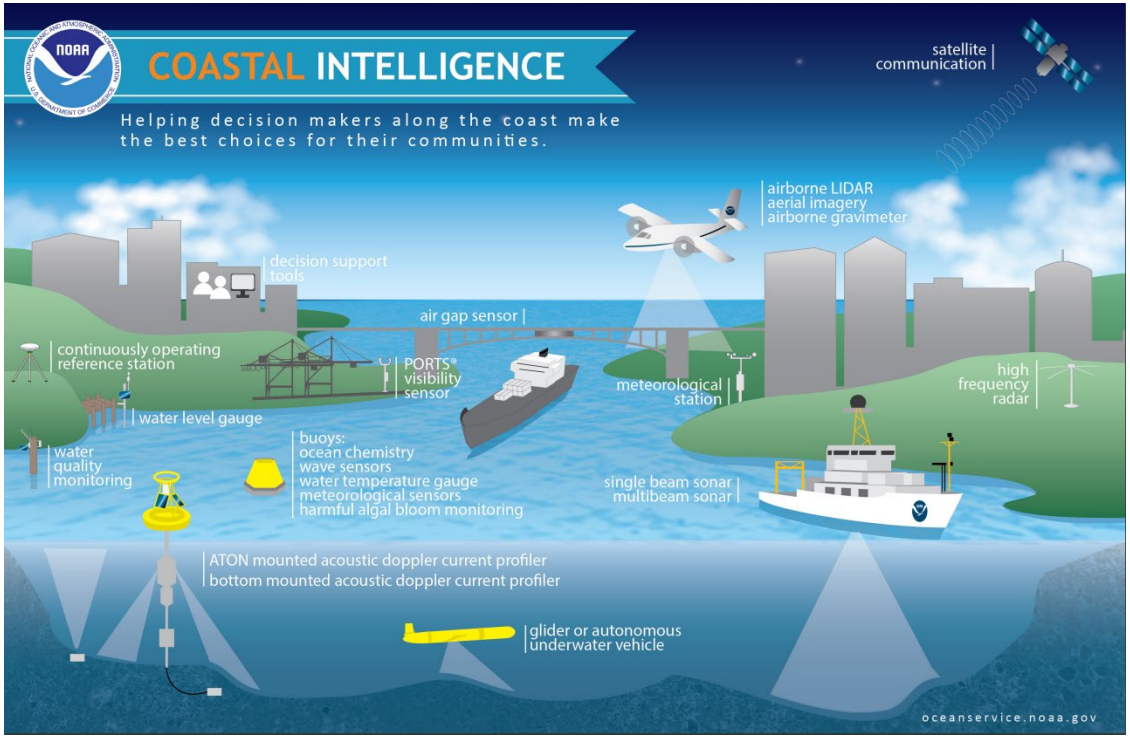

Ocean Planning to Inform Wind Energy Siting

NCCOS | NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE

BOEM
Bureau of Ocean Energy Management

NOAA OSW Spatial Team
James.Morris@noaa.gov

Ocean Intel and the Blue Economy



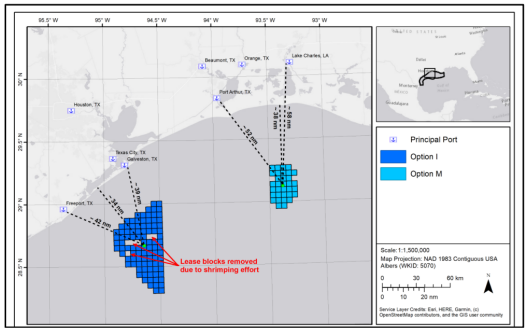
Ocean industries

- Tourism and Recreation
- Defense and Public Administration
- Offshore Oil and Gas
- Transportation
- Fisheries and other Bio-products
- Shipbuilding
- Power Generation
- Construction
- Research and Education
- Professional and Business Services*

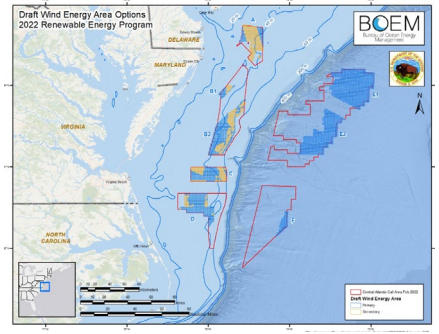
Spatial modeling

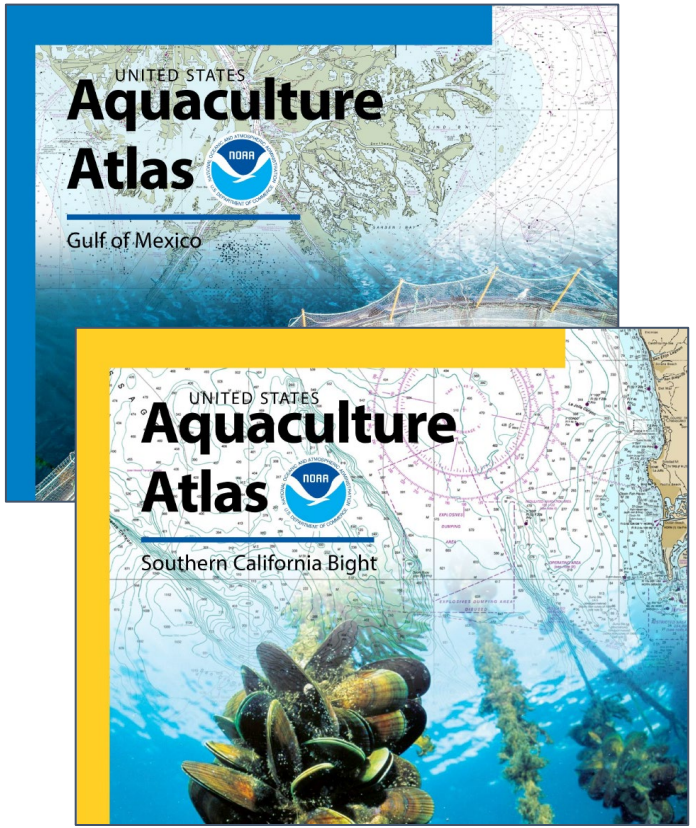
- Completed 50+ analyses in last 5 years
- Aquaculture Opportunity Areas
- State-designated aquaculture use areas
- Spatial planning for Ports/Harbors and farm specific sites
- Wind energy areas

Gulf of Mexico WEAs

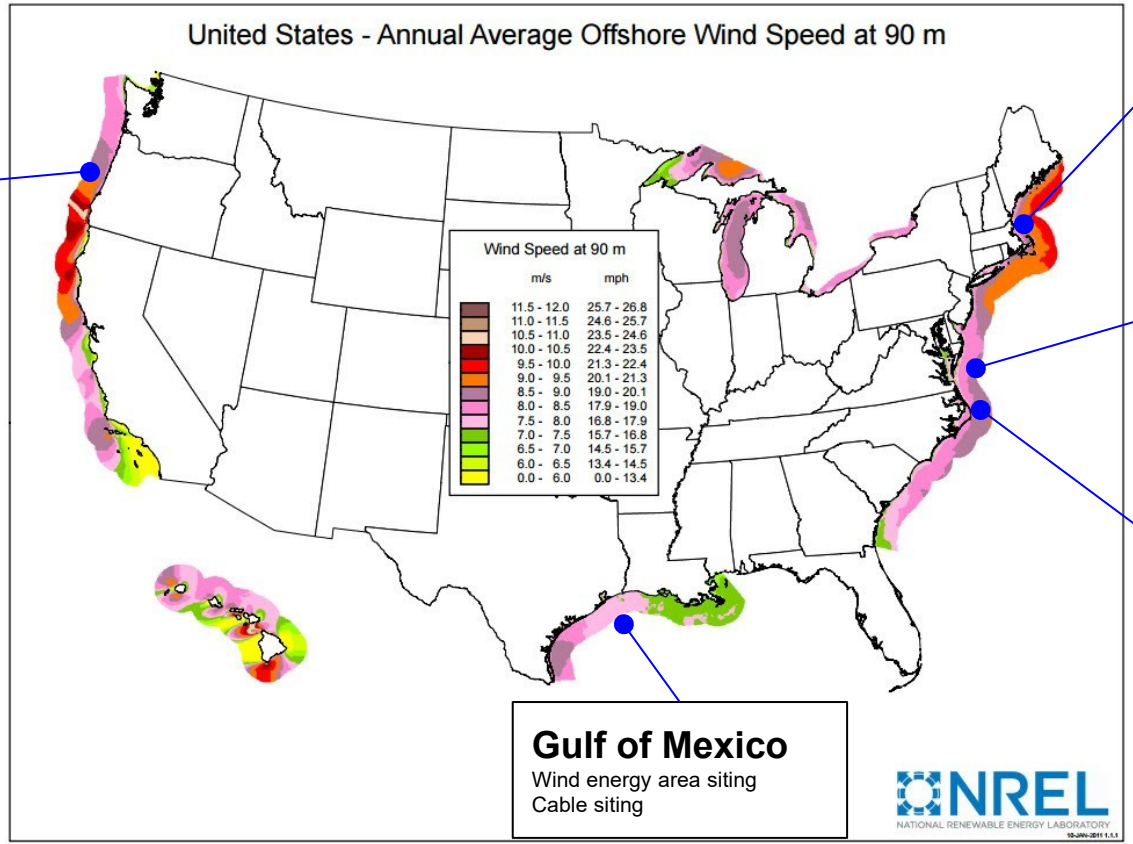


Central Atlantic WEAs





Spatial Models Underway



Oregon
Wind energy area siting
Cable siting

Gulf of Maine
Call area siting
Wind energy area siting
Cable siting

Central Atlantic
Wind energy area siting
Cable siting

Kitty Hawk
Cable siting

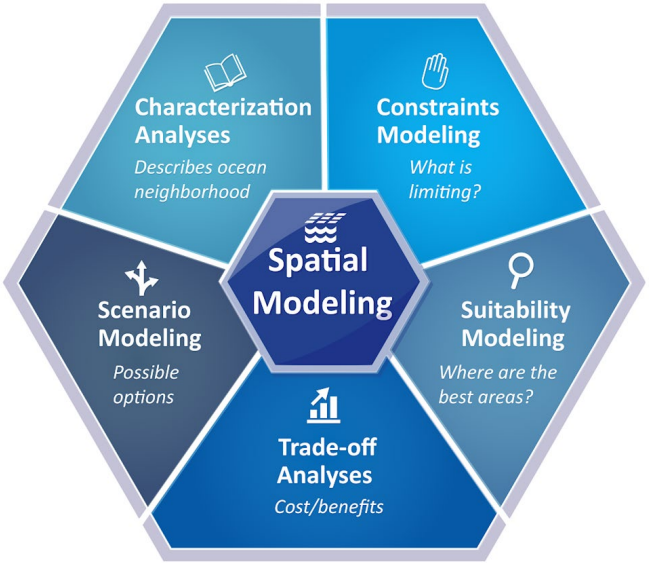
Gulf of Mexico
Wind energy area siting
Cable siting

NOAA

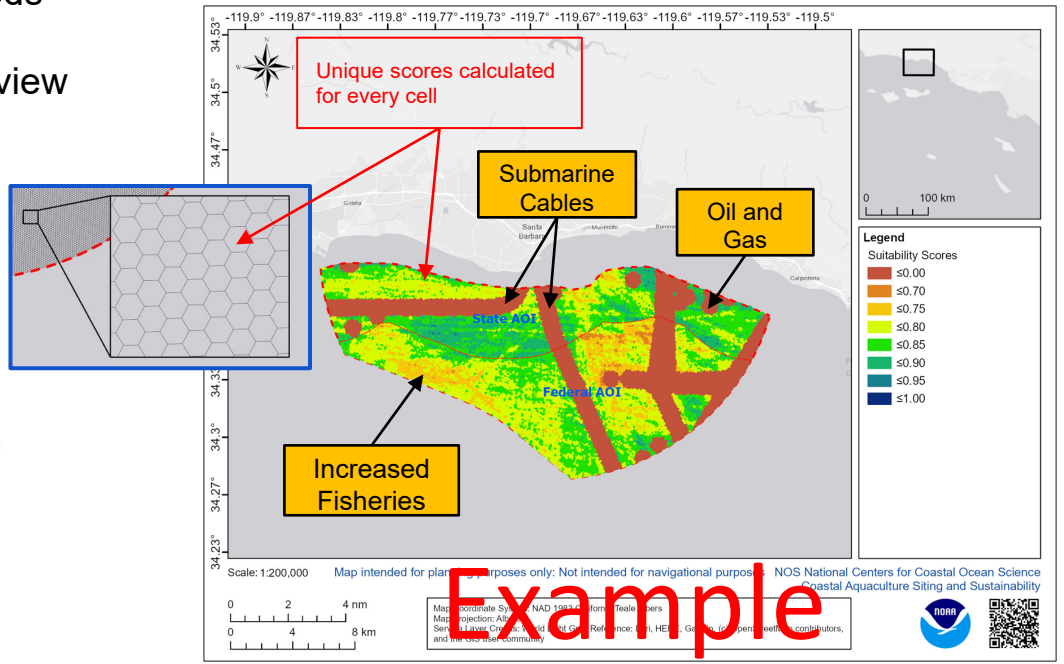
BOEM
Bureau of Ocean Energy Management

Why Spatial Suitability Modeling?

Analyzes the “whole ecosystem”
Identifies hotspots of conflict and opportunity
Requires set rules (weights) and methods
Provides defensible and transparent methods
Allows for scenario planning
Supports comprehensive environmental review



A **spatial suitability model** weights locations relative to each other based on a given criteria.



Spatial Suitability Model

NORTHEAST OCEAN DATA
Maps and Data for Ocean Planning in the Northeastern United States

MarineCadastre.gov
An Ocean of Information
A joint BOEM and NOAA initiative providing authoritative data to meet the needs of the offshore energy and marine planning communities.

NOAA FISHERIES

State Agencies

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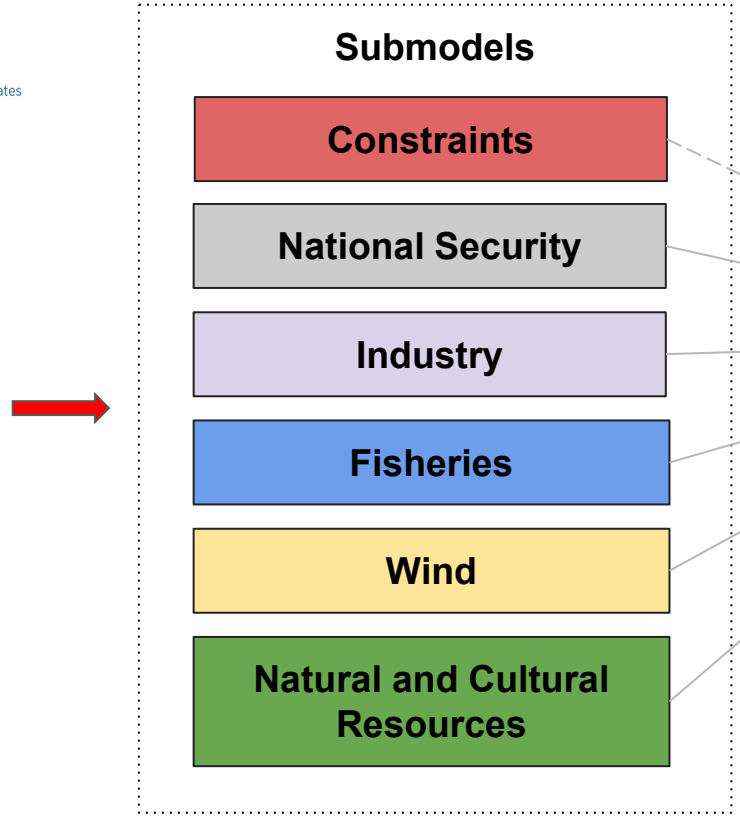
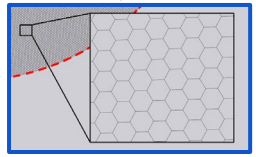
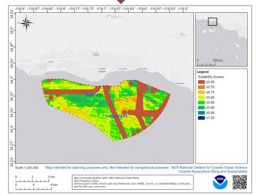
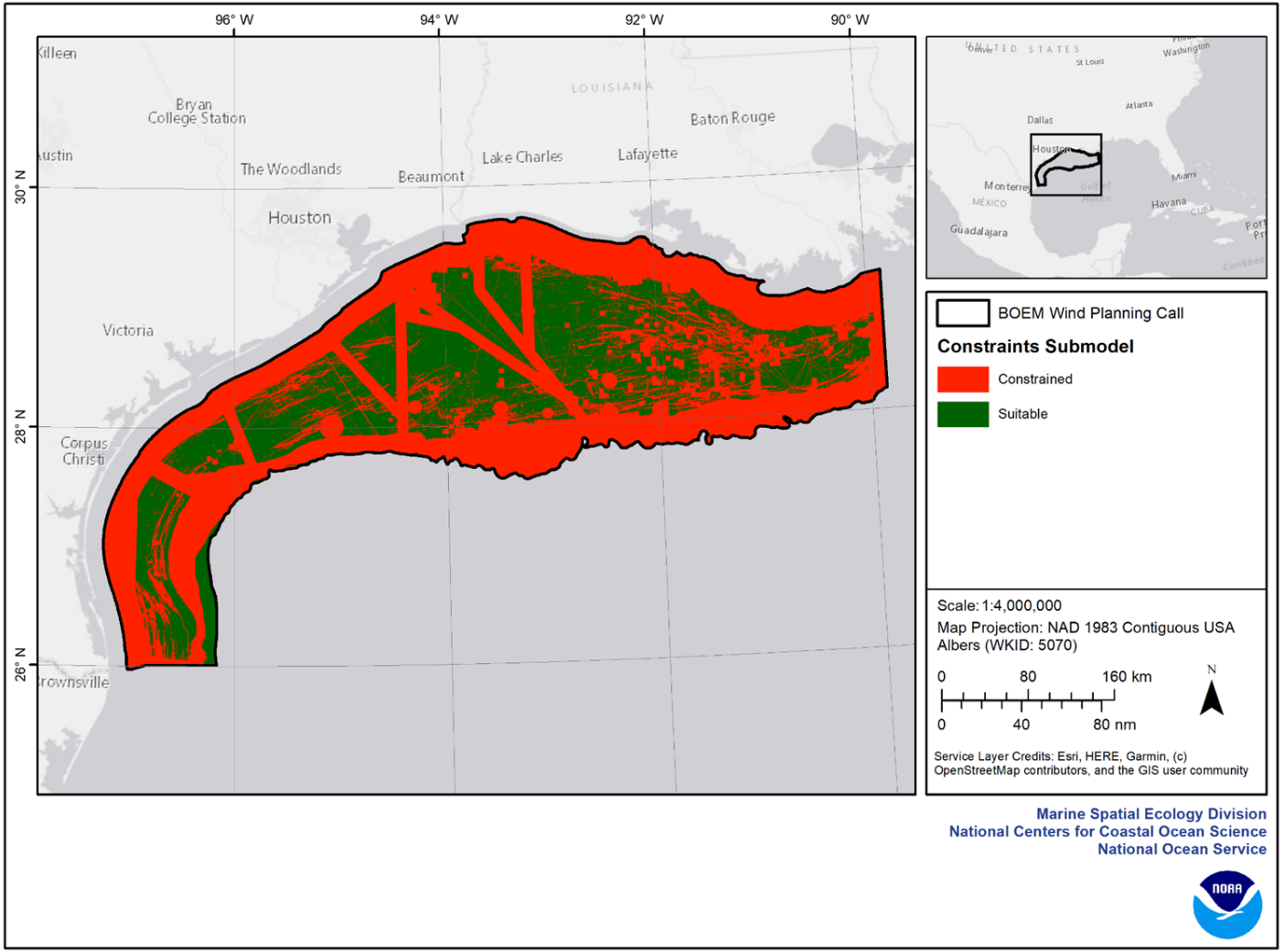


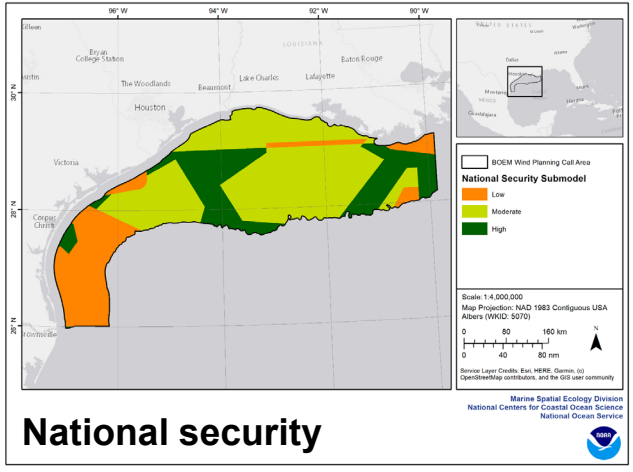




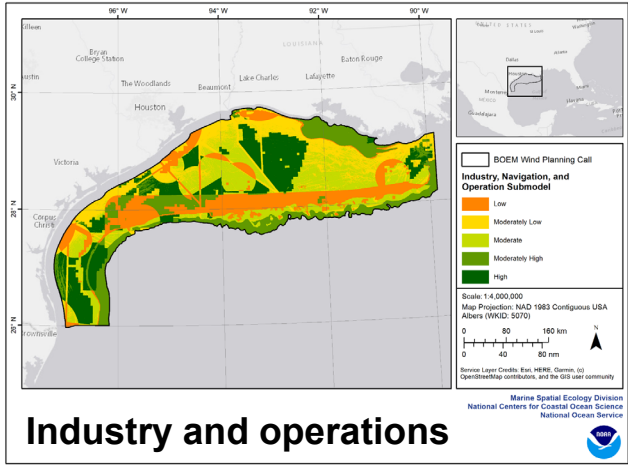
Constraints Submodel



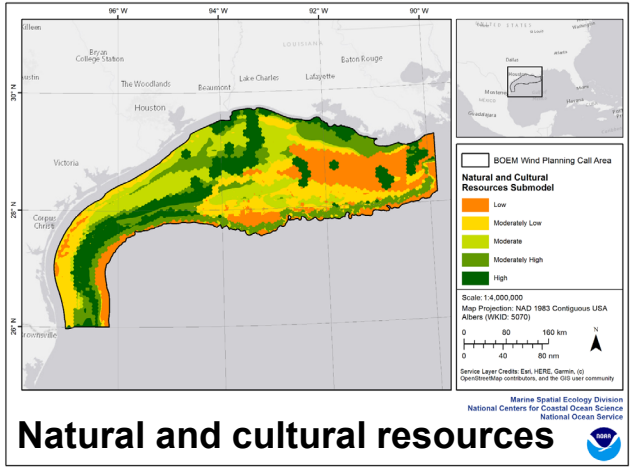
Gulf of Mexico: Wind Energy Area submodels



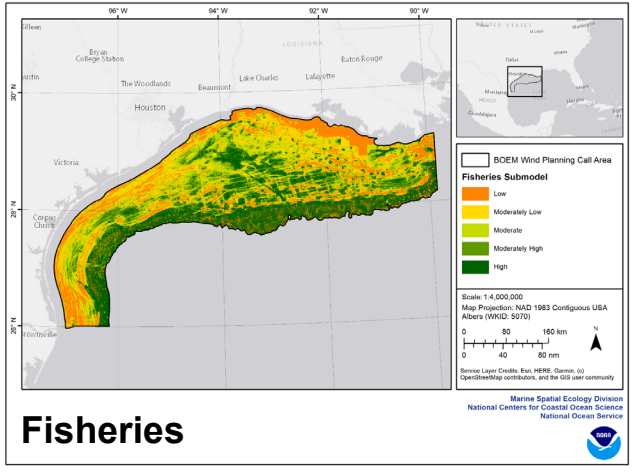
National security



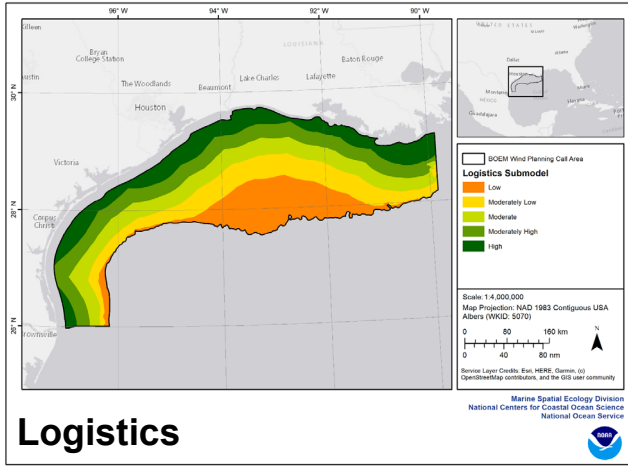
Industry and operations



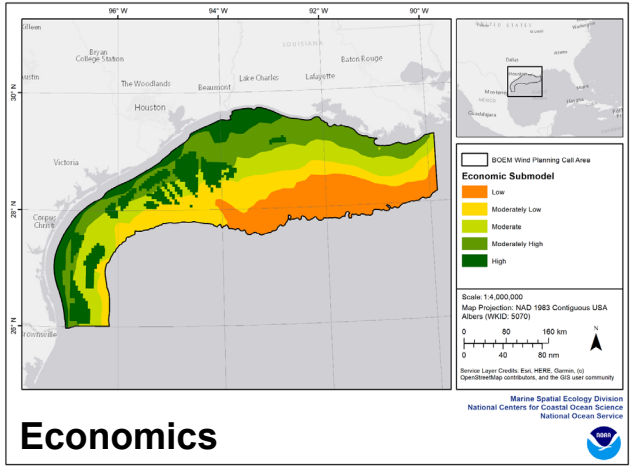
Natural and cultural resources



Fisheries

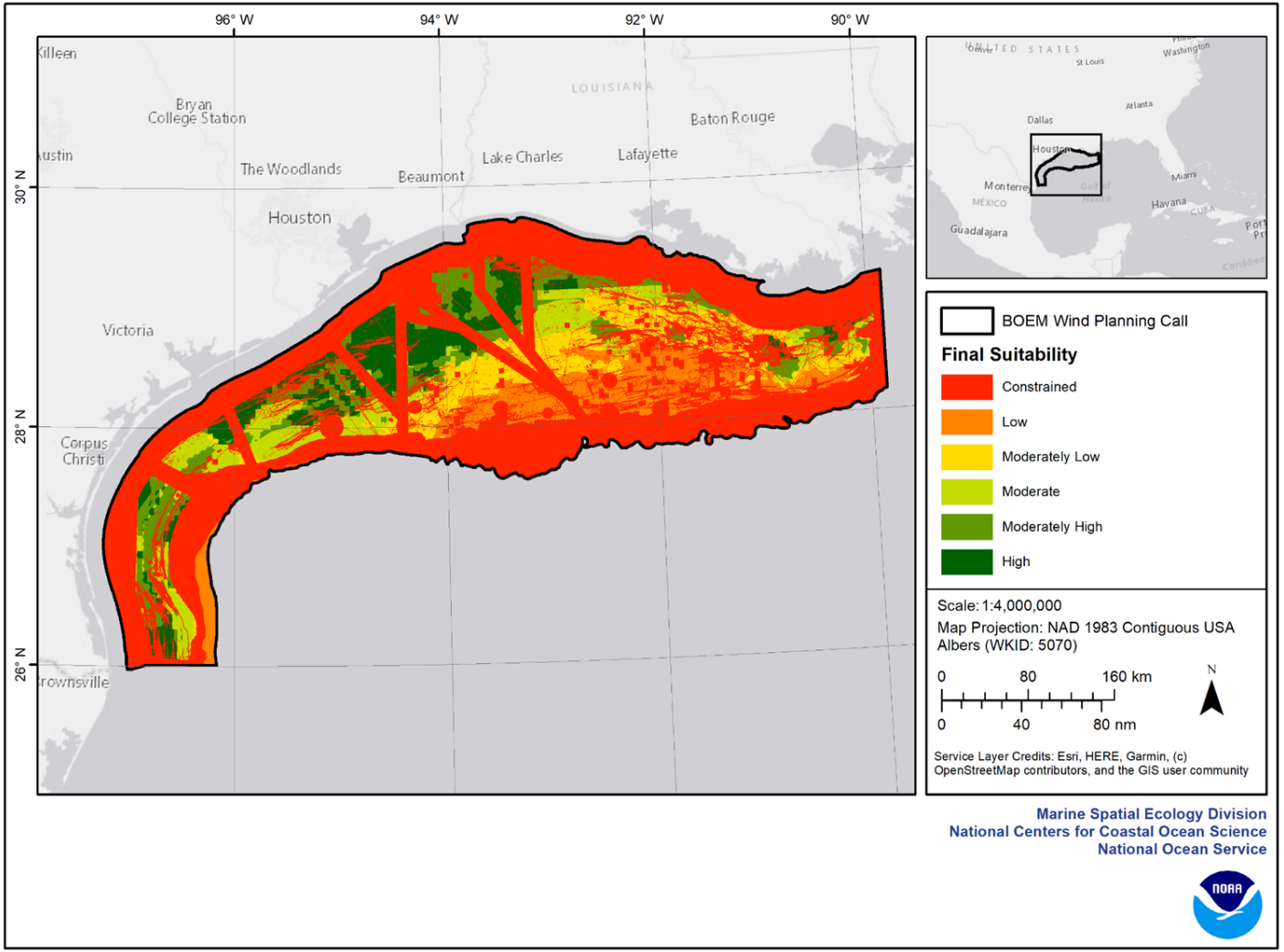


Logistics



Economics

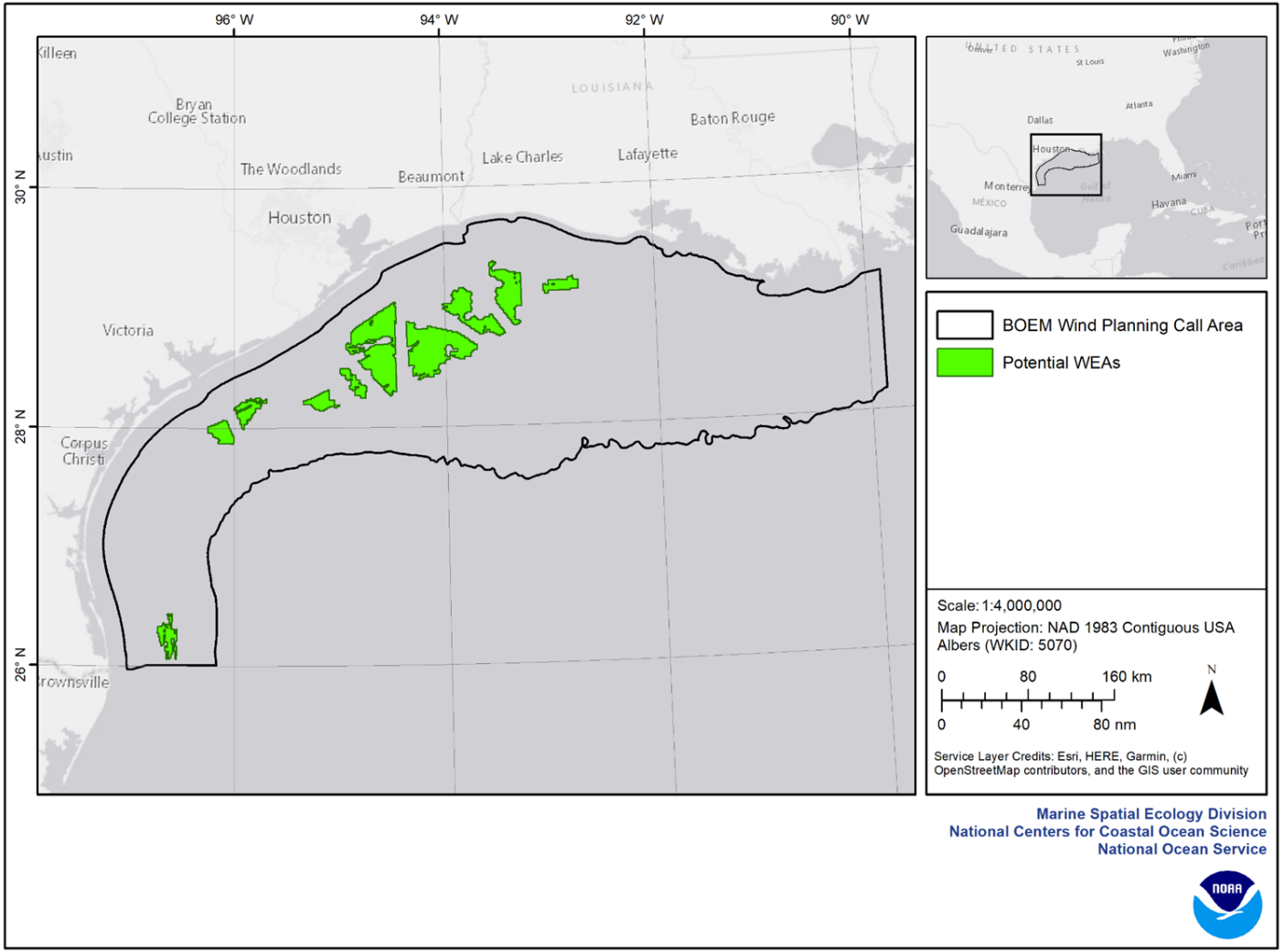
Final Suitability



High-High Clusters

2,413,230 acres

Top scoring clusters at the p=.05 significance level (approx. top 5%)



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Spatial Modeling for Wind Energy

NOAA and BOEM are partnering to develop comprehensive geospatial analyses of our nation's coastal ocean ecosystems to identify optimal areas for the siting of offshore wind energy.

NOAA-BOEM Partnership

The ocean is critical to our nation's economy, national security, food security, and contains some of the most diverse and sensitive habitats and species on the planet. NOAA works to develop and provide coastal and ocean intelligence to support the Blue Economy and protect and conserve natural resources. NOAA and BOEM are partnering to develop comprehensive geospatial analyses of our nation's coastal ocean ecosystems to identify optimal areas for the siting of offshore wind energy.

What Are Spatial Models?

Spatial modeling is a powerful tool for understanding ocean ecosystems and the interactions between humans and natural resources. First, a study area is identified and a hexagon grid (10 acre) is placed over the study area. The goal is to calculate a suitability score for each grid cell. Once the study area has been identified, data representing ocean industries and environments are collected and organized into different "sub-models".

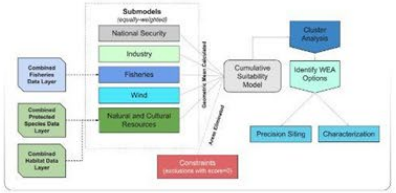
Data Layer Scales

Data are transformed into a common scale so the criteria can be compared. Each data layer is assigned a score between 0 (least suitable) and 1 (most suitable). Data layers that receive a score of 0 are placed in a "constraints" submodel.

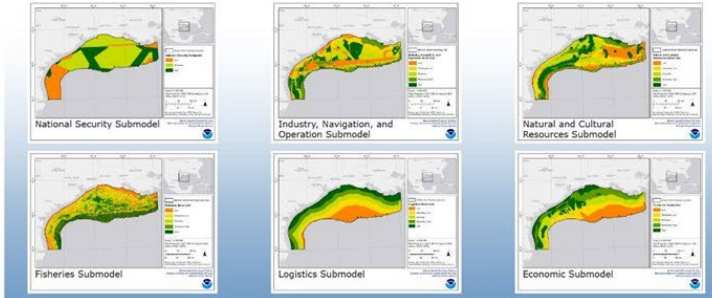
Data Examples	Score
Deep-sea Corals	0.0
Habitat Areas of Particular Concern	0.0
Oil and Gas Pipelines (500-m buffer)	0.0
Oil and Gas Wells (500-m buffer)	0.0
Shipwrecks (500-m buffer)	0.0
Wastewater Discharge (500-m buffer)	0.0
Marine Protected Areas and Preserves	0.3
Hardbottom Habitat	0.4
Unexploded Ordnance	0.5

Suitability Modeling

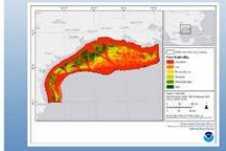
Submodel suitability is determined by calculating the mean score of all the data layers. Final suitability is determined by calculating the mean of all submodels. A cluster analysis is used to identify the highest scoring clusters of cells. This helps us pinpoint better suited areas for wind energy.



1. Submodel Suitability



2. Final Suitability



3. Cluster Analysis

4. Characterization

Thank you!