Regional ocean spatial modeling for siting of wind energy: How NOAA is providing operational Marine Spatial Planning

NCCOS Spatial Planning Team
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New Federal Partnerships

Ocean Intel and the Blue Economy
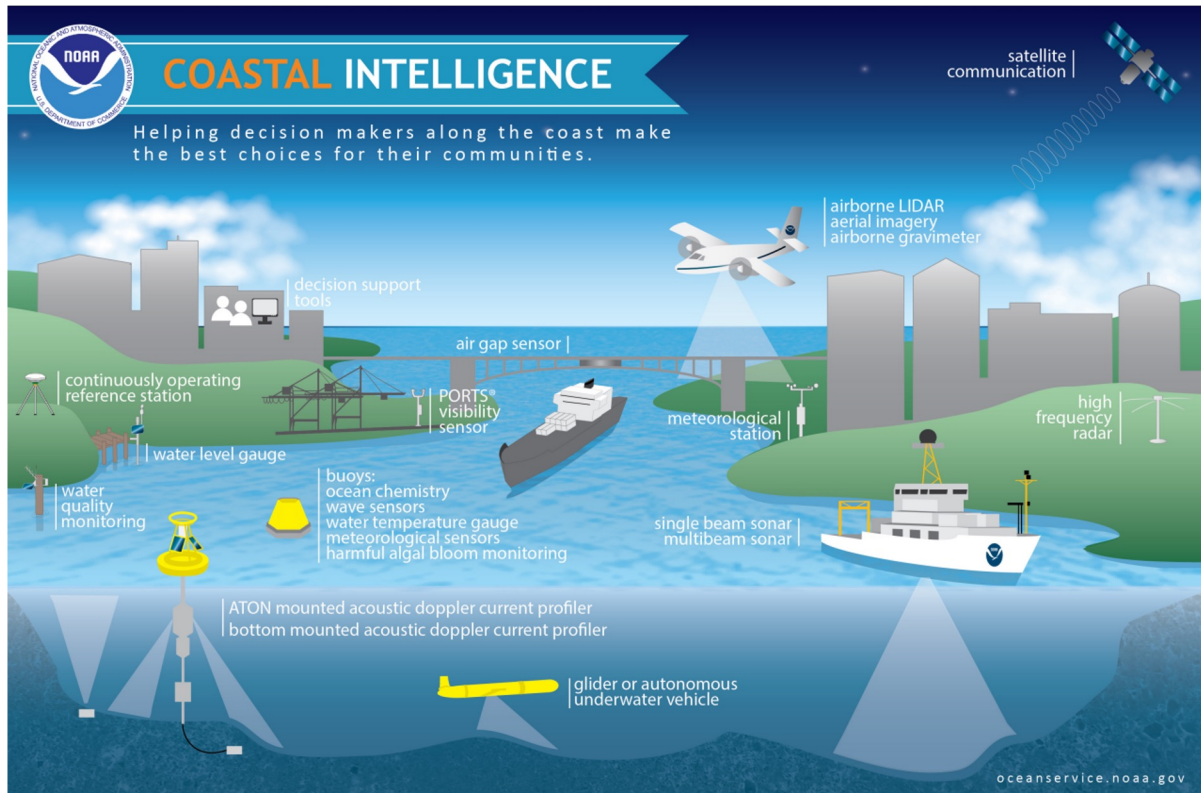
Ocean industries
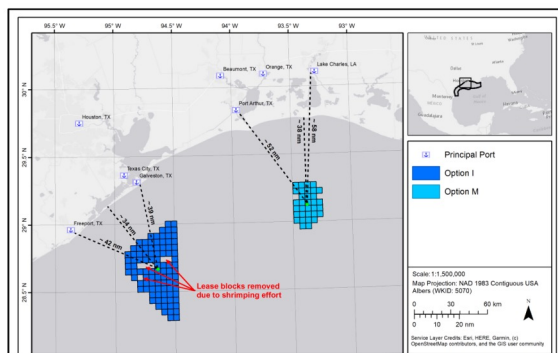

- Tourism and Recreation
- Defense and Public Administration
- Offshore Oil and Gas
- Transportation
- Fisheries and other Bio-products
- Shipbuilding
- Power Generation
- Construction
- Research and Education
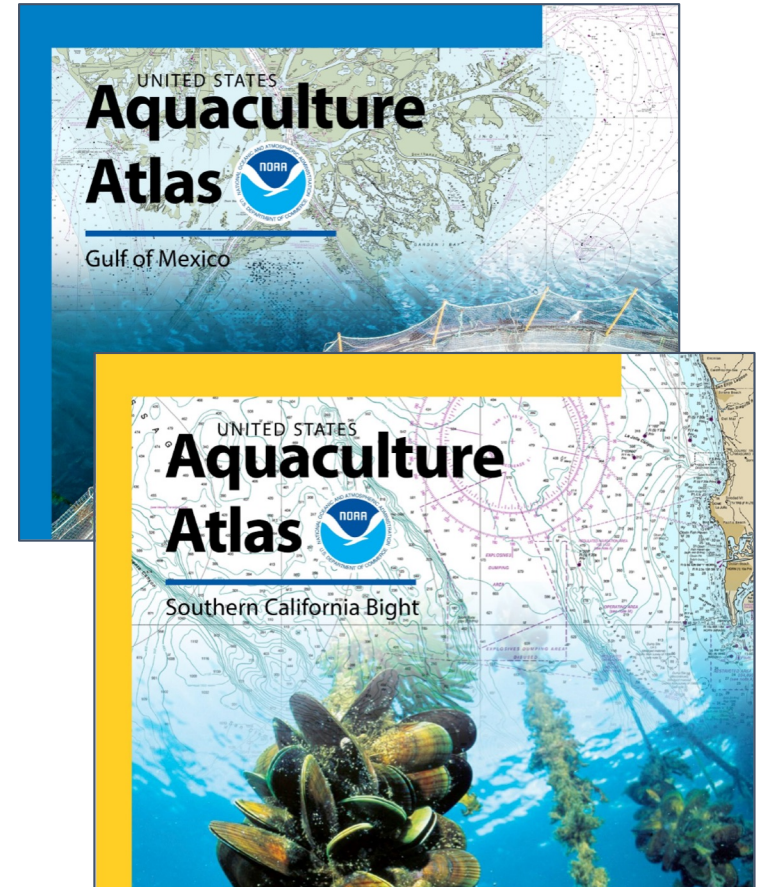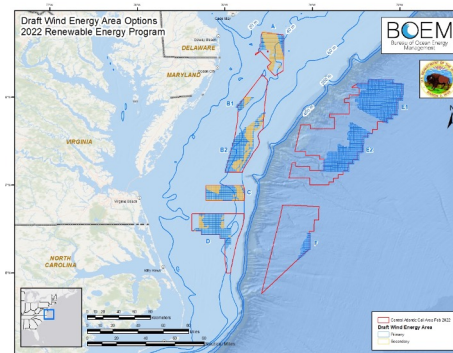- Professional and Business Services*

NOAA Spatial Planning

- Completed 50+ analyses in last 5 years
- Aquaculture Opportunity Areas
- Wind Energy Areas
- State-designated aquaculture use areas
- Spatial planning for Ports/Harbors and farm specific sites
- Tool/app development
- Stakeholder engagement
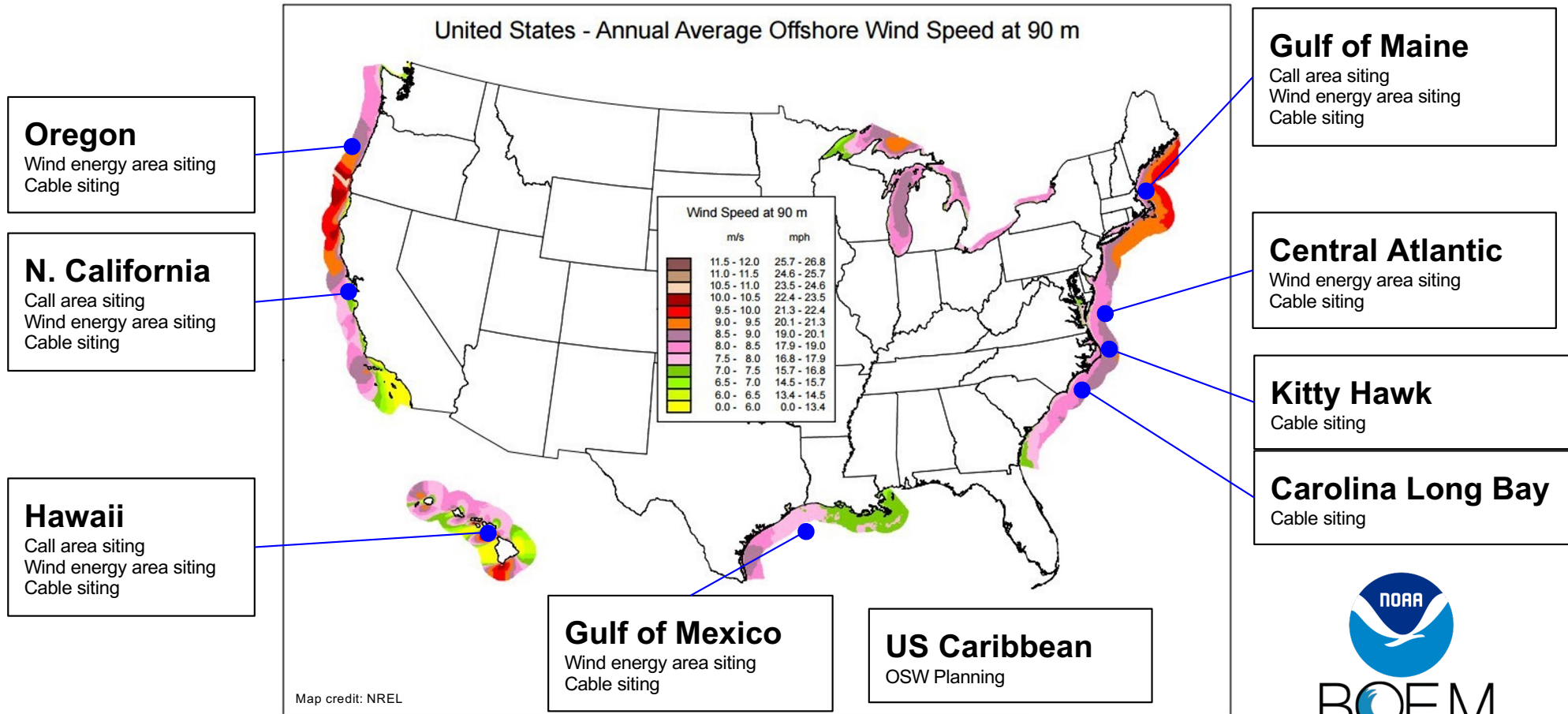- Geospatial science and services

Gulf of Mexico WEAs


Central Atlantic WEAs

Wind Spatial Models Underway

United States - Annual Average Offshore Wind Speed at 90 m

Oregon
Wind energy area siting
Cable siting

N. California
Call area siting
Wind energy area siting
Cable siting

Hawaii
Call area siting
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

Carolina Long Bay
Cable siting

Gulf of Mexico
Wind energy area siting
Cable siting

US Caribbean
OSW Planning

Wind Speed at 90 m

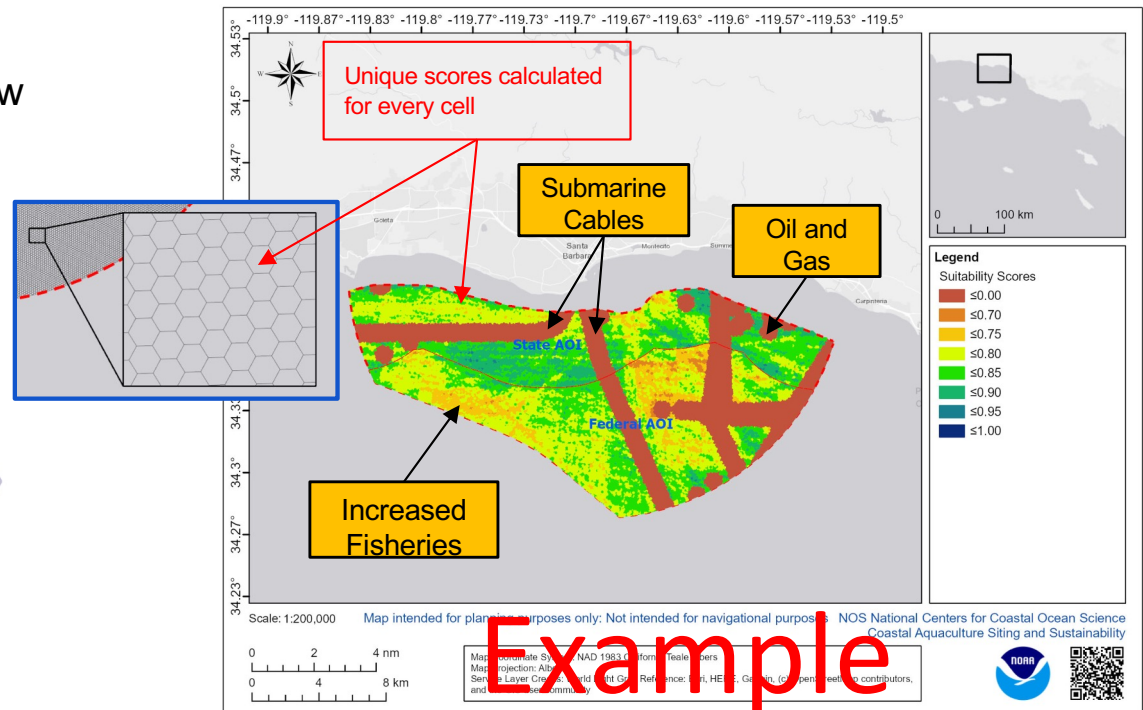| m/s	mph
11.5 - 12.0	25.7 - 26.8
11.0 - 11.5	24.6 - 25.7
10.5 - 11.0	23.5 - 24.6
10.0 - 10.5	22.4 - 23.5
9.5 - 10.0	21.3 - 22.4
9.0 - 9.5	20.1 - 21.3
8.5 - 9.0	19.0 - 20.1
8.0 - 8.5	17.9 - 19.0
7.5 - 8.0	16.8 - 17.9
7.0 - 7.5	15.7 - 16.8
6.5 - 7.0	14.5 - 15.7
6.0 - 6.5	13.4 - 14.5
0.0 - 6.0	0.0 - 13.4

Map credit: NREL

NOAA

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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
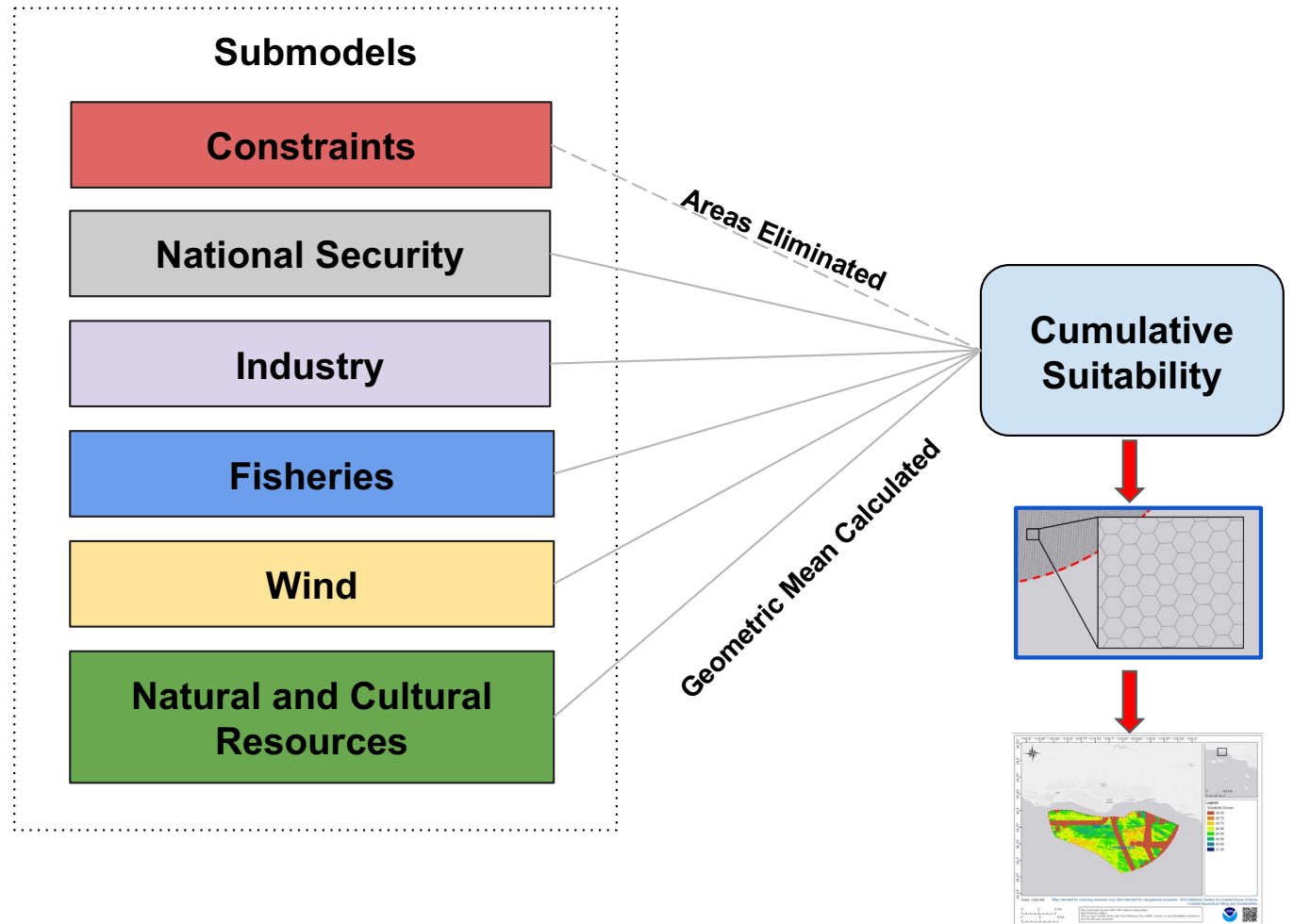Allows for scenario planning
Supports comprehensive environmental review
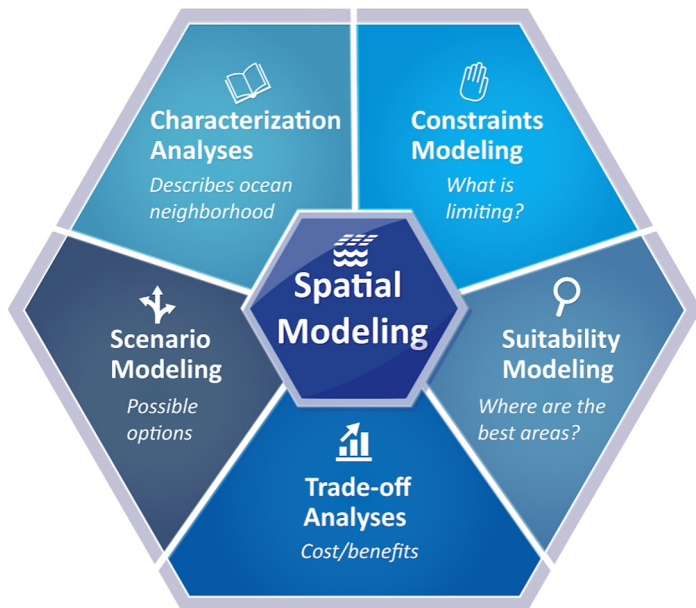
A **spatial suitability model** weights locations relative to each other based on a given criteria.

Spatial Suitability Model

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Bureau of Ocean Energy Management

OPERATING STATUS   CONTACT US   EMPLOYMENT   JOIN OUR MAILING LIST   A⁺

ABOUT BOEM   REGIONS   NEWSROOM   OIL & GA...   ...NERALS

HOME | RENEWABLE ENERGY | STATE ACTIVITIES

Gulf of Maine

Overview   **Commercial Leasing**   Research Lease App

~65 data layers

NOAA BOEM
Bureau of Ocean Energy Management

Gulf of Maine Data Layers under Consideration for Draft Wind Energy Area Suitability Modeling

Contents

Background

In September 2022, BOEM announced enhancements to its area identification process. Through our commitment to use the best available science and modeling approaches, BOEM has partnered with NOAA's National Centers for Coastal Ocean Science (NCCOS) to employ a spatial model that analyzes entire marine ecosystems to identify the best areas for wind energy sites. NCCOS and BOEM are leveraging a team of expert spatial planners, marine and fisheries scientists, project coordinators, environmental policy analysts, and other subject matter experts to develop the Gulf of Maine Offshore Wind Suitability Model (suitability model). An overview of this modeling approach is available here.
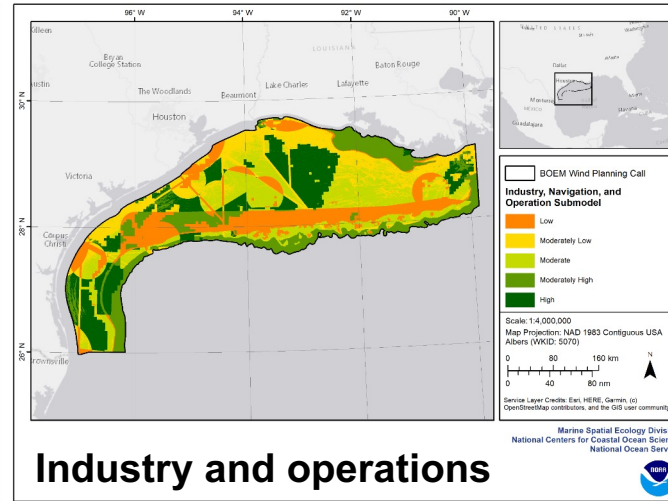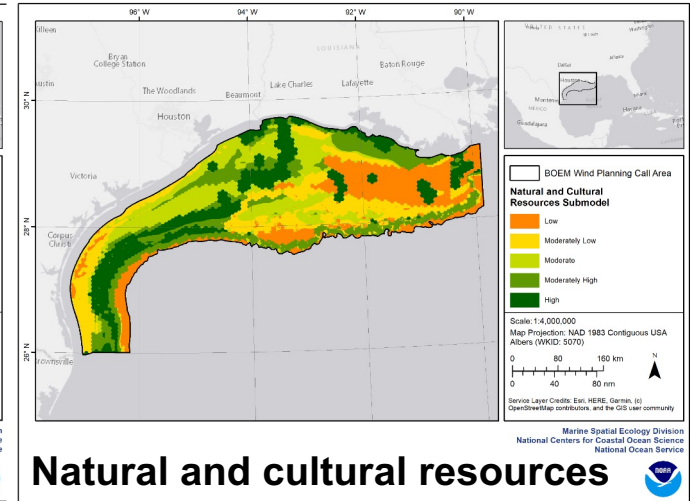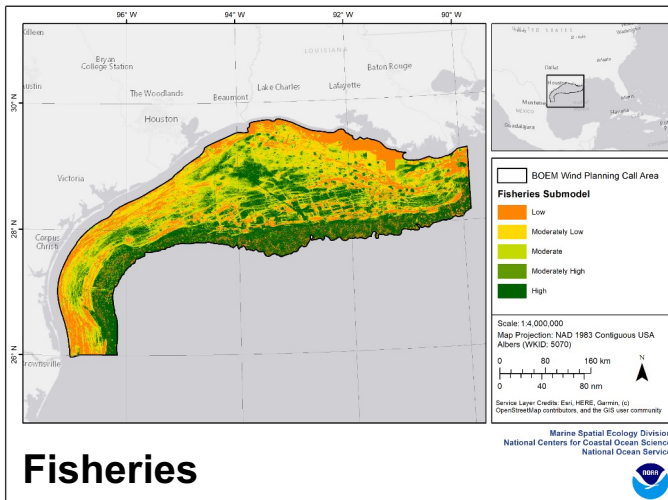
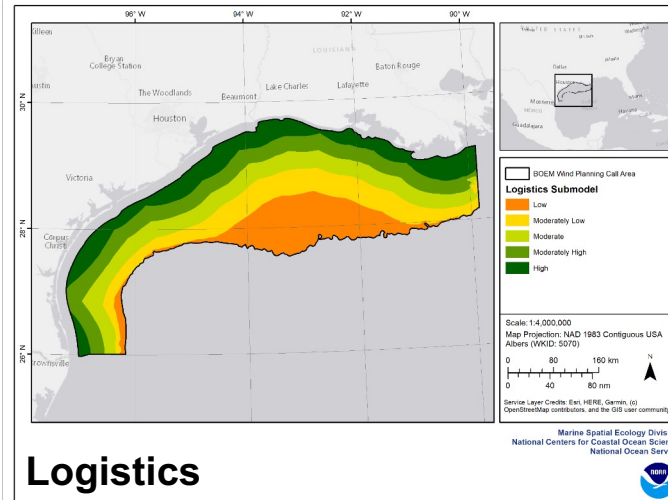# Gulf of Mexico WEAs Example
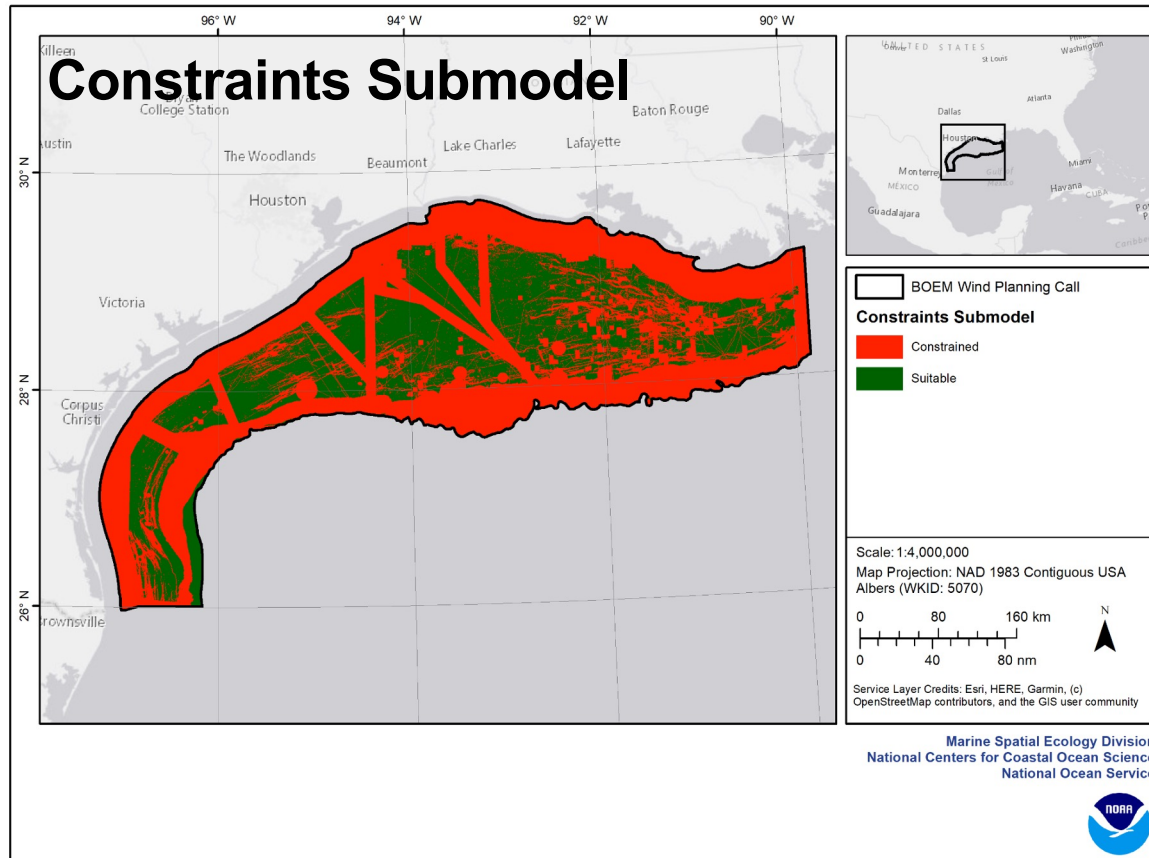
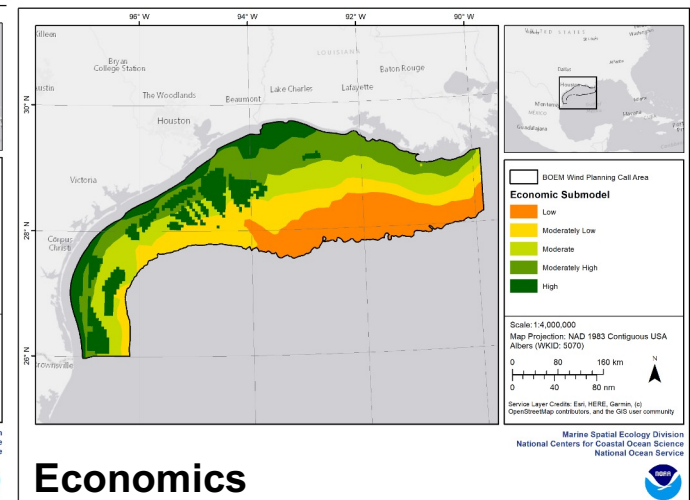# Submodel suitability
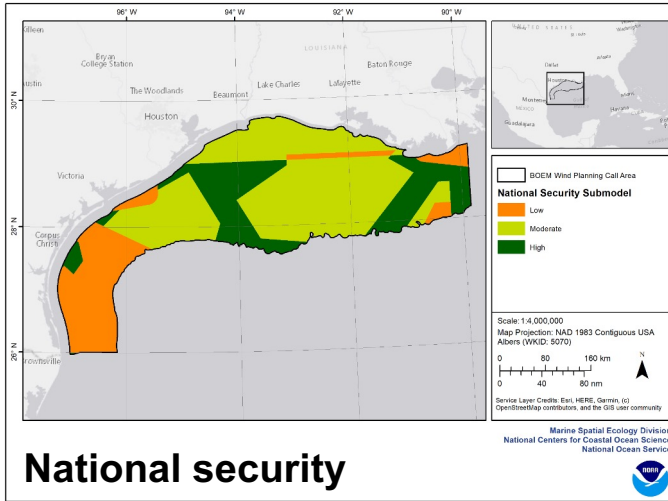
National security
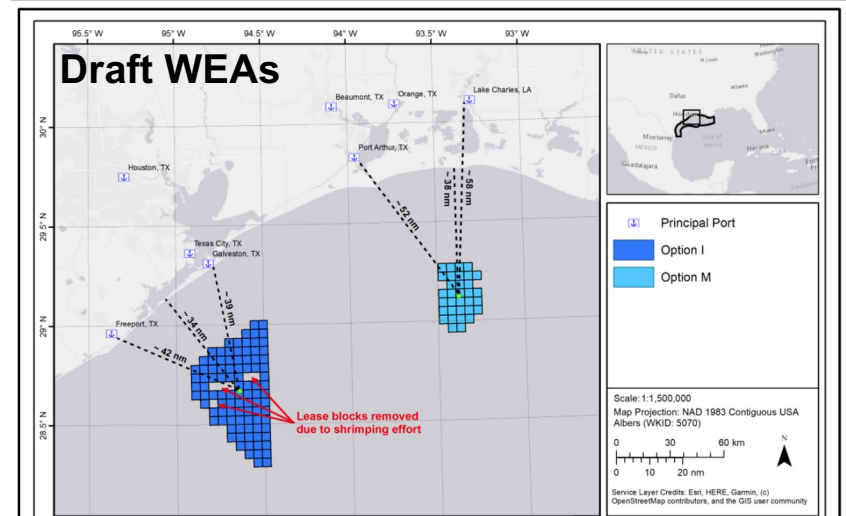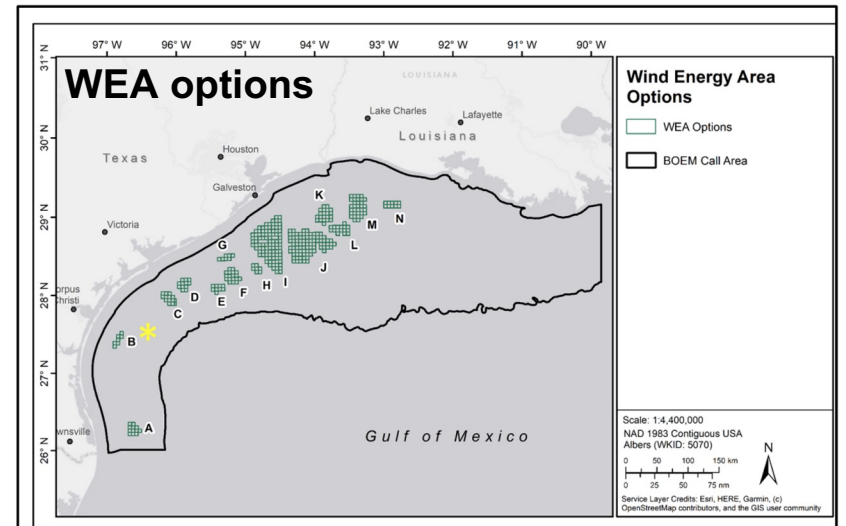

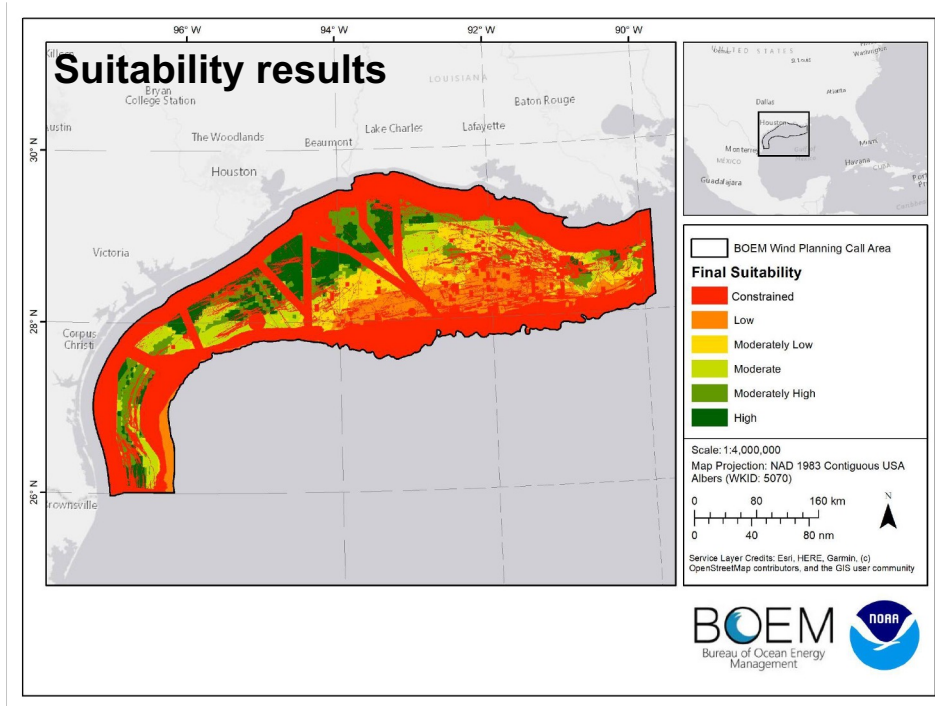Industry and operations

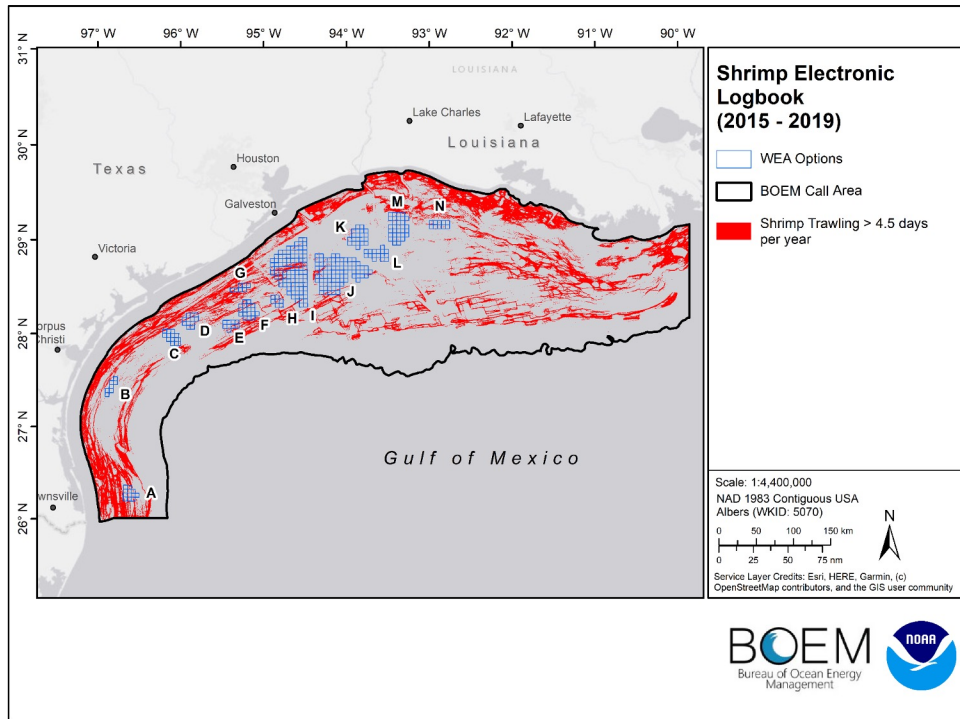Natural and cultural resources

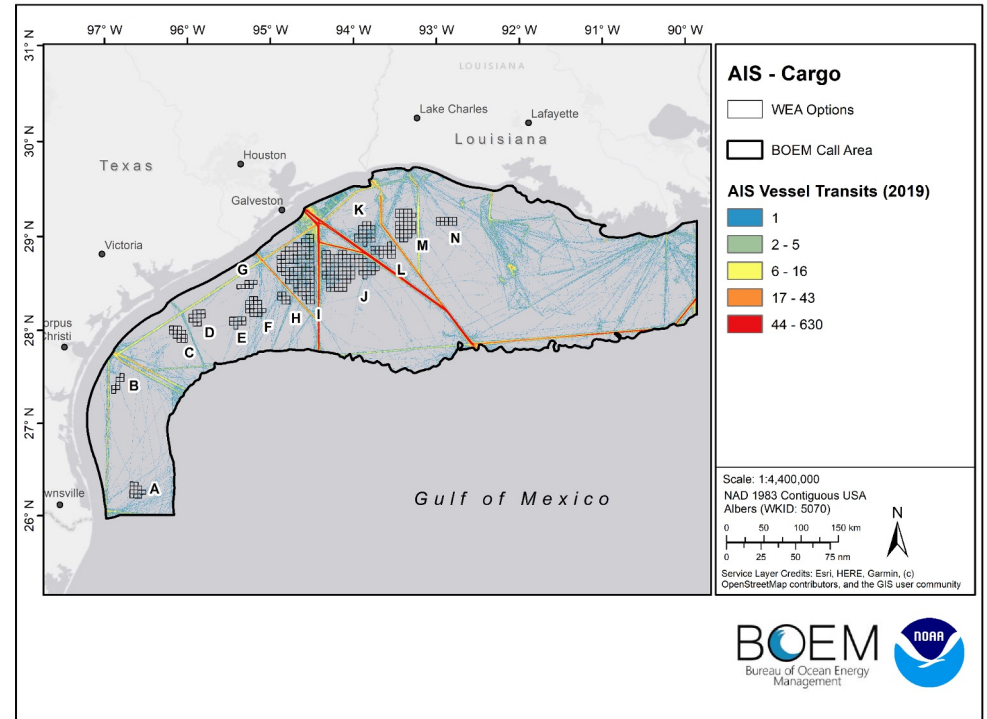Fisheries

Logistics

Economics

Gulf of Mexico WEA model

Model performance examples

Deconflict fisheries

Deconflict shipping industry

Thank you!
Questions/discussion