BOEM Bureau of Ocean Energy Management

Updating BOEM's Environmental Sensitivity Methods and Models to Support Oil, Gas, and Wind Energy Development

20th Meeting of the Standing Committee on Offshore Science and Assessment

July 11th & 14th 2022

Timothy White | Office of Environmental Programs

BOEM Information Need

- **Updating BOEM's Environmental Sensitivity Methods and Models to Support Oil, Gas, and Wind Energy Development**

  - Section 18(2)(G) of the Outer Continental Shelf Lands Act of 1953, as amended (OCSLA; 43 U.S.C. § 1331) :

    - decisions regarding exploration and development will be in part based on consideration of **"the relative environmental sensitivity and marine productivity of different areas of the Outer Continental Shelf."**

BOEM Infor

- **Updating BOEI** **nergy Development**
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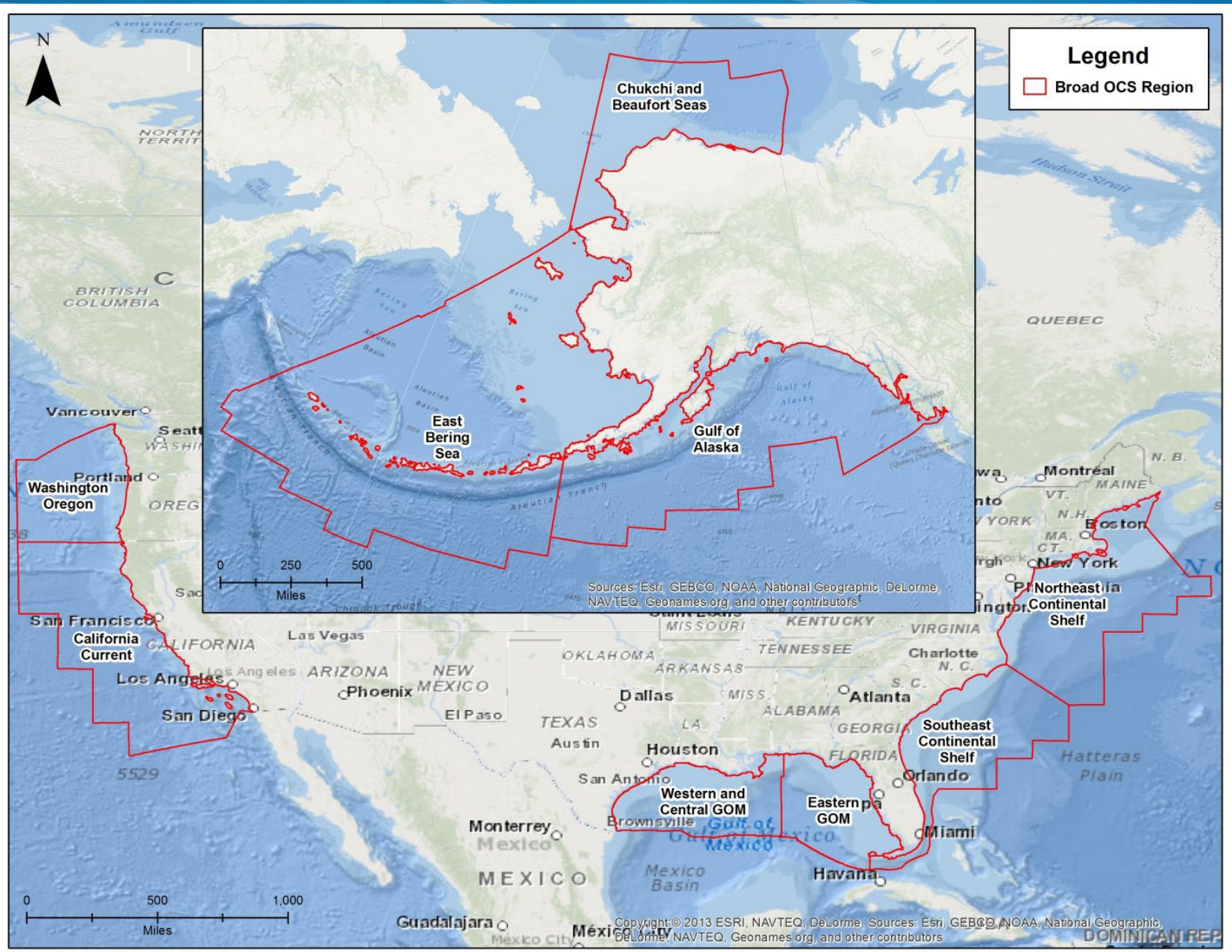
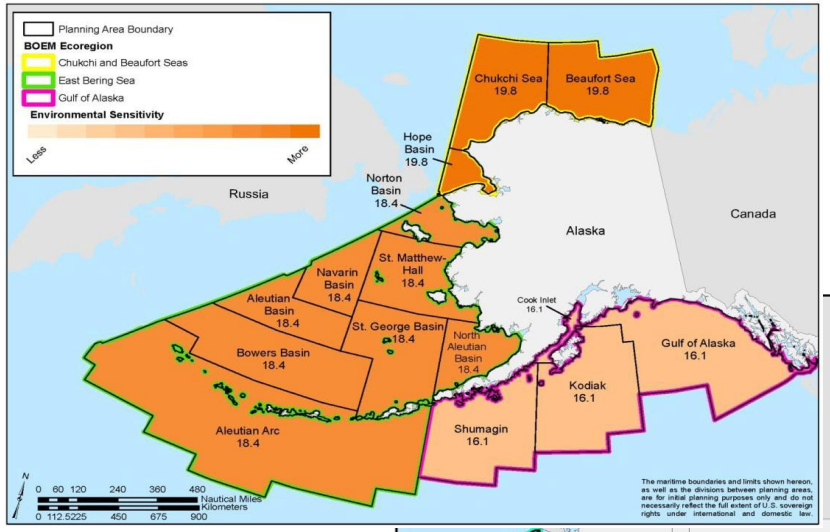


PICOC Summary

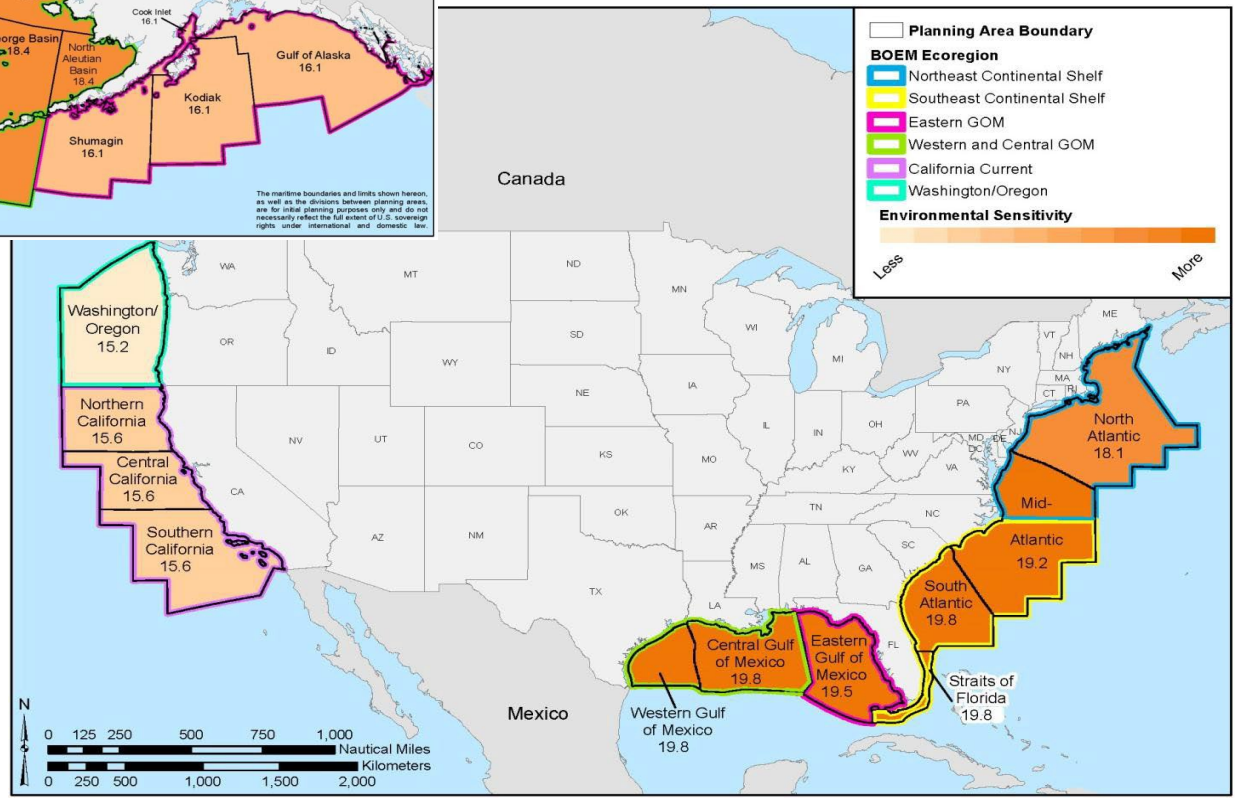
Problem	Expansion of BOEM's activities require continued development of a more refined version of our sensitivity and productivity analyses.
Intervention	Hierarchical expansion of open products sourced from regional databases.
Comparison	Relative environmental sensitivity and productivity of BOEM's 26 OCS Planning Areas and aggregated ecoregions.
Outcome	Products will inform BOEM's National and Renewable Energy Programs with updated and open-source models of environmental sensitivity and marine productivity
Context	All BOEM regions

Background



Applicable to large geographic scales that required relatively lower level of detail and resolution

Planning areas shaded according to the magnitude of the sensitivity scores.

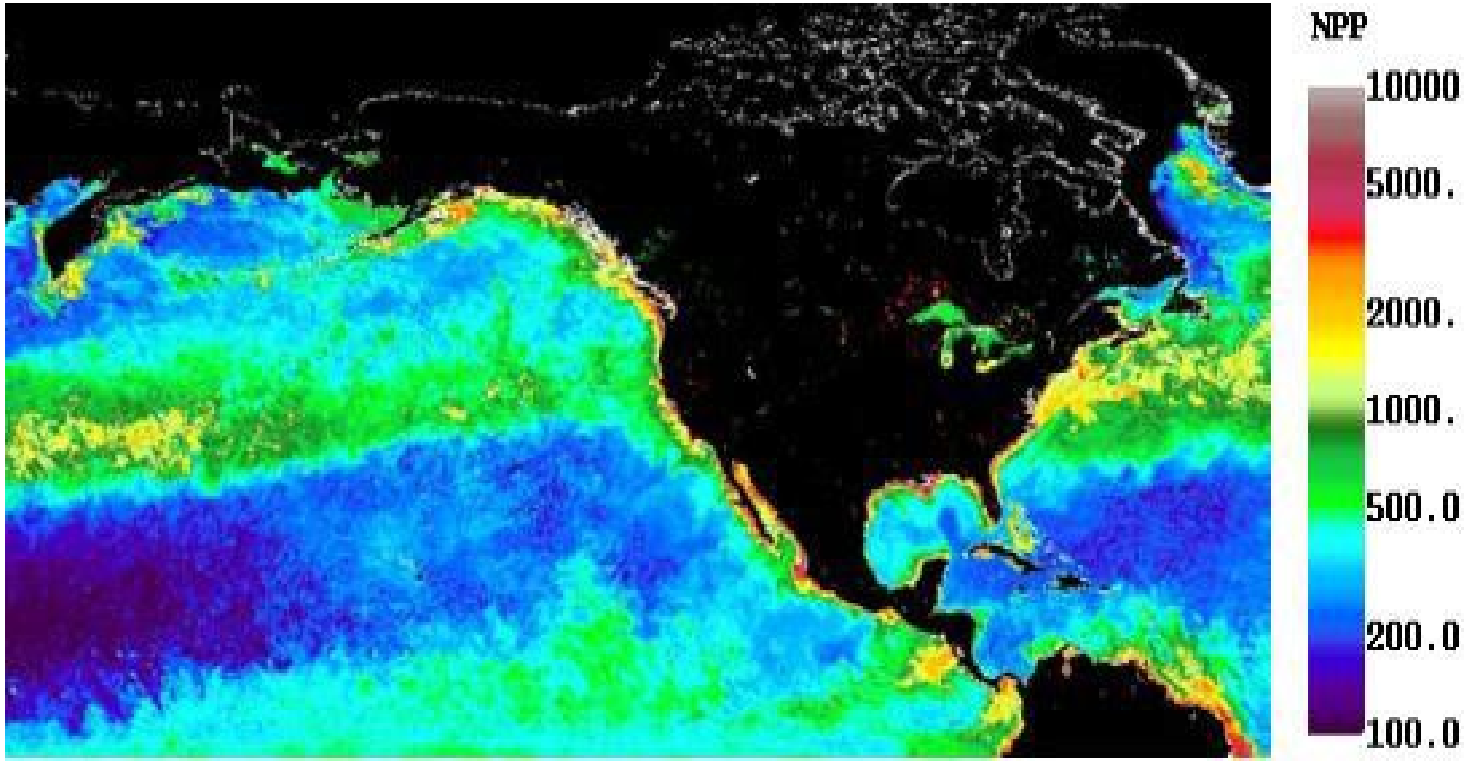


Background

Marine productivity products

- Focus on primary productivity in marine water column

- Average net primary productivity for each planning area.



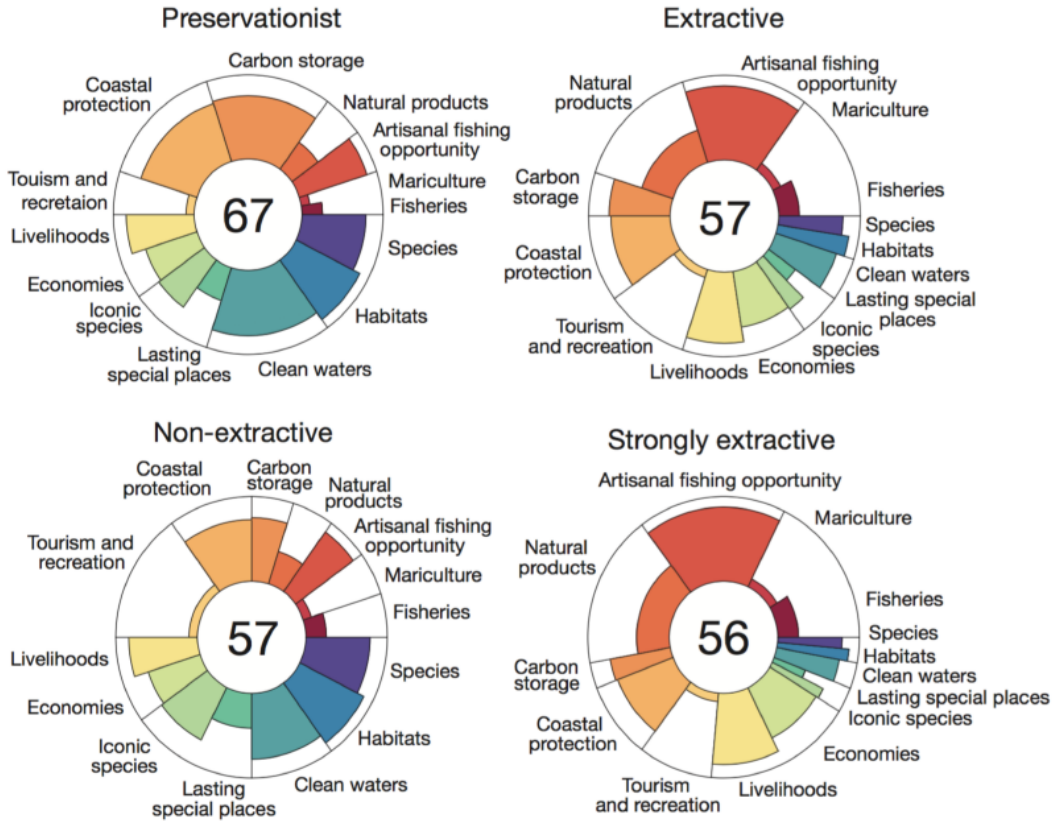
Example of spatial variability in modeled net primary productivity (NPP)

Study Objectives

- Hierarchical expansion
- For planning areas with sparse data, high-level reporting (e.g., report cards)
  - with lots of data, can do a tradeoff analysis, then move to more specific areas

Methods

- Example from Ocean Health Index of varying perspectives
- BOEM:
  - Planning Areas
  - Ecological spectrum



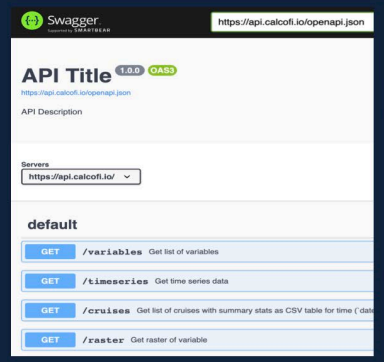
(Best et al. 2022)

Methods

Continuum of data products

Least Level of **Interpretation** *Most*

Most Level of **Technical expertise** *Least*

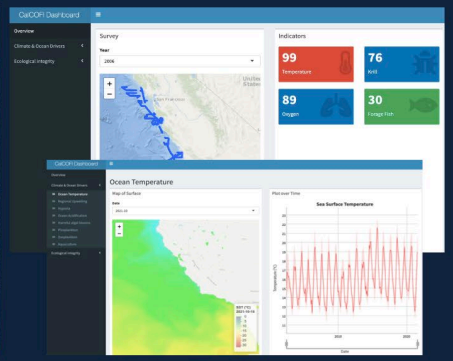


CalCOFI API

Technical experts

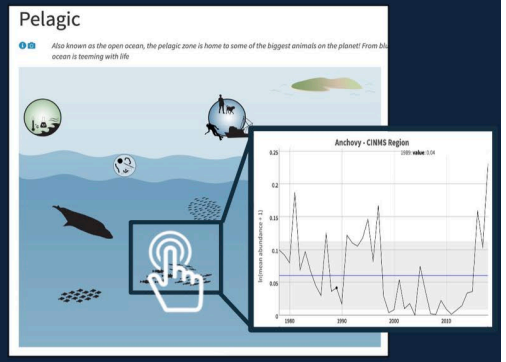
CA ocean observing system data portal

Researchers



State of the CA Current dynamic dashboard app

Advisory groups & managers

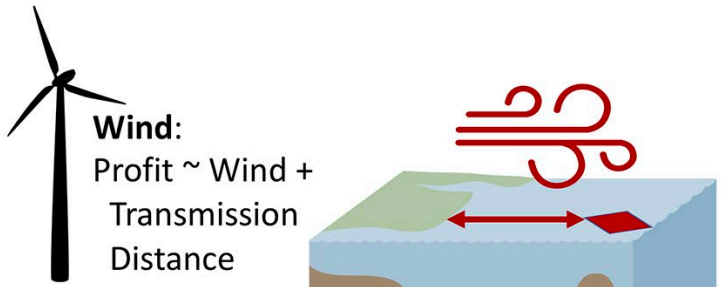


Web-enabled NMS Condition Report

Decision makers, educators, engaged public

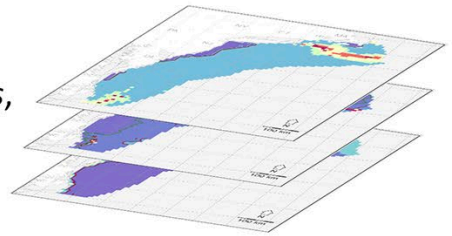
(Satterthwaite et al. 2022)

Methods

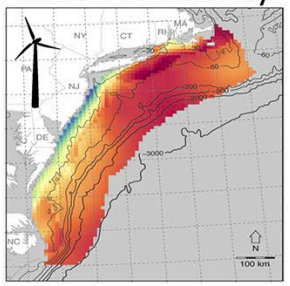


Wind:
Profit ~ Wind +
Transmission
Distance

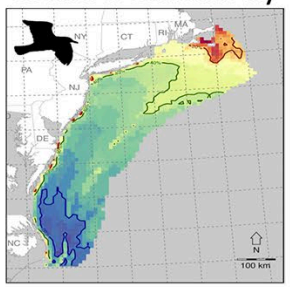
Seabirds:
1. *Larus marinus*,
…,
21. *Oceanites oceanicus*



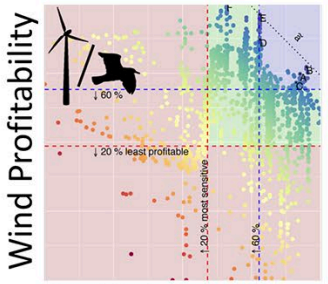
Wind Profitability



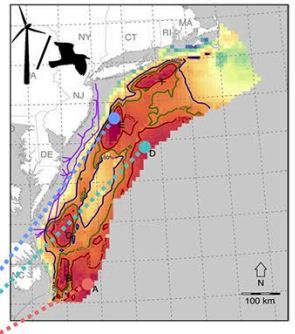
Seabird Sensitivity



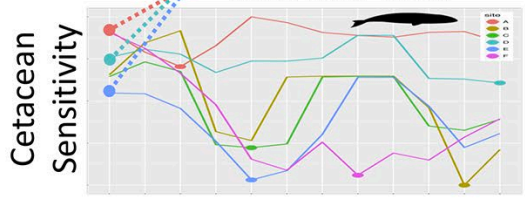
Tradeoff Plot



Utility Map

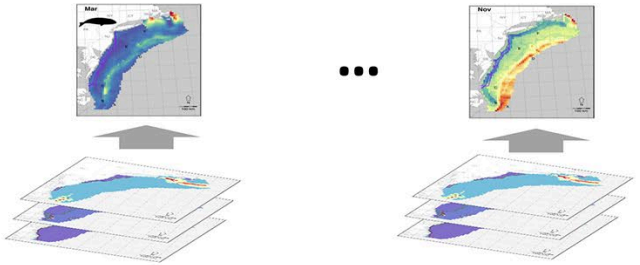


Sites over Time



1. Jan, …, 12. Dec

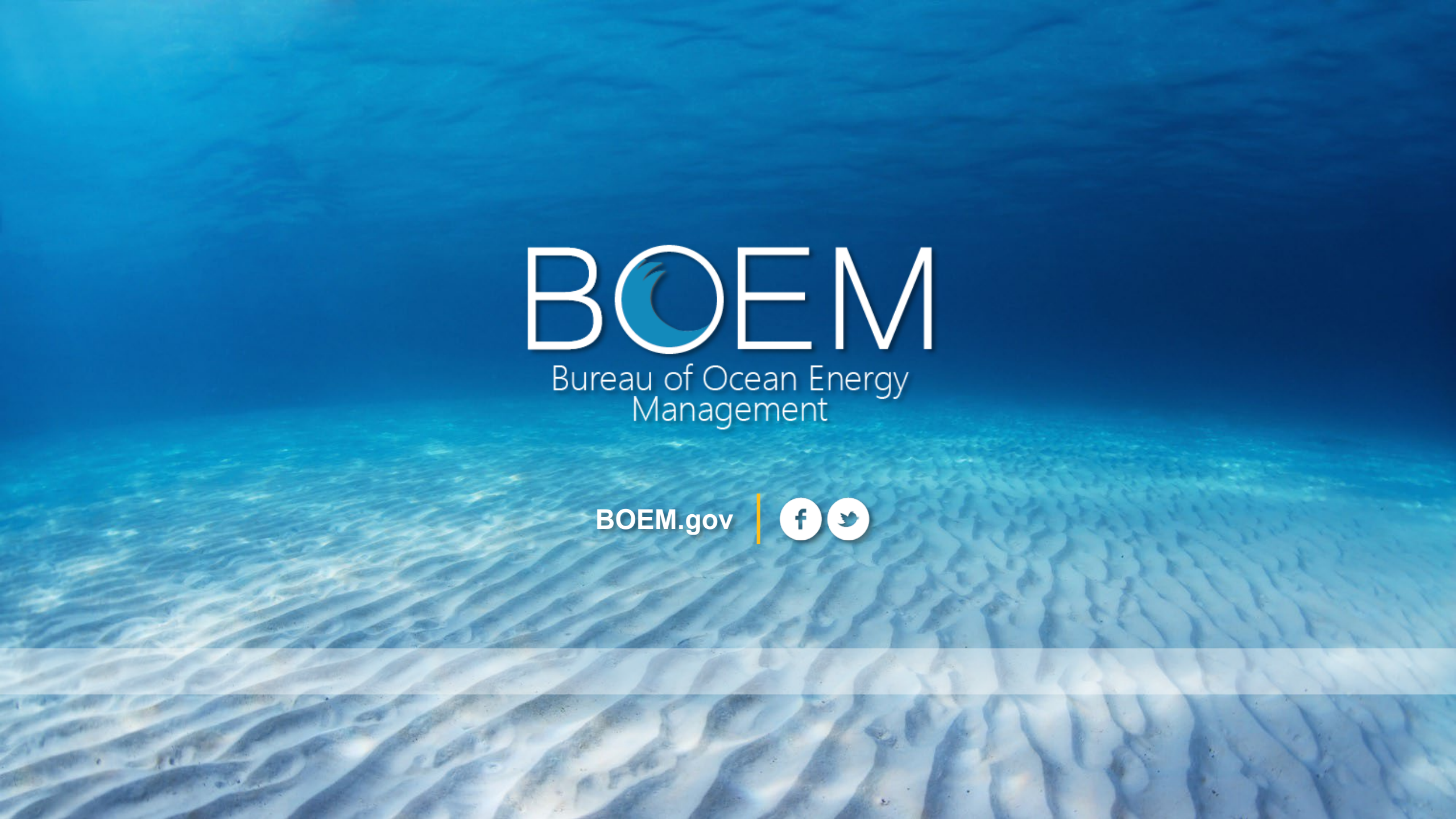
Cetaceans:
1. *Balaenoptera musculus*,
…,
29. *Lagenorhynchus albirostris*



(Best and Halpin 2019)

Research Questions

How should we integrate scale dependence and areas with sparse datasets into our sensitivity analyses?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