

Ecosystem Dynamics: An Examination of the Relationships between Environmental Processes, Primary Productivity, and Distribution of Species at Higher Trophic levels

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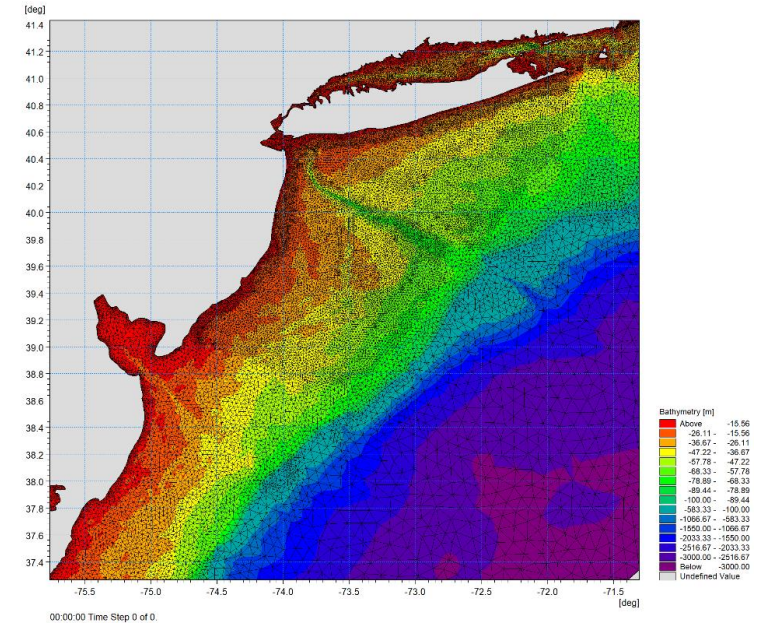
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GOALS

- Support NYSERDA's goal of advancing development and operation of offshore wind in a cost-effective and *environmentally sensitive manner*.
- Predict when and where *sensitive species* may occur during construction activities to help inform real-time mitigation.
- Inform siting, impact assessment, and adaptive management.



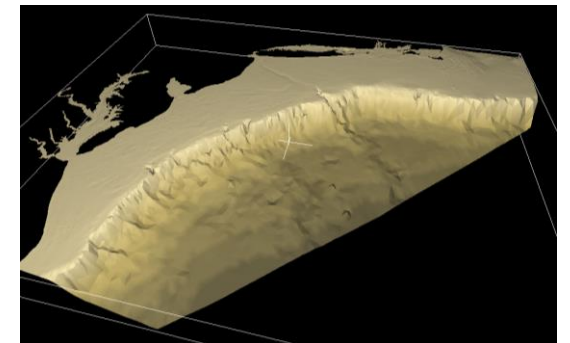
<https://www.fisheries.noaa.gov/new-england-mid-atlantic/endangered-species-conservation/greater-atlantic-region-sea-turtle-program>

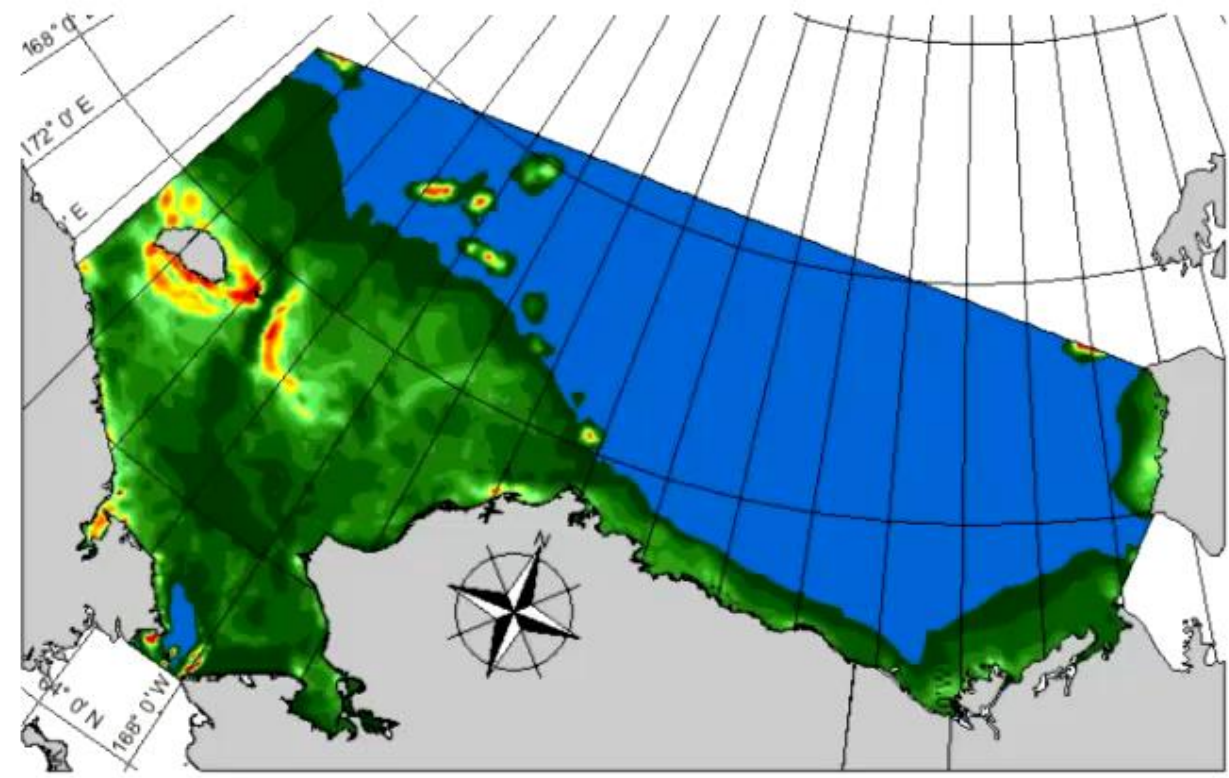
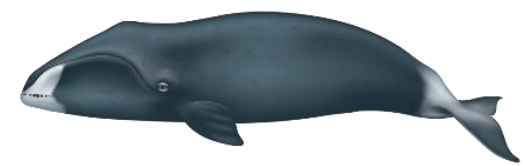
METHODOLOGY

- Develop spatially and temporally dynamic information on oceanographic characteristics.
- Apply a multi-year 3-D hydrodynamic model to enable integration of ecosystem and observational data.
- Support future assessments using data and innovative dynamic habitat and agent-based (individual-based) modelling techniques to predict wildlife distribution and use patterns.
- Develop four dynamic habitat models and two agent-based models driven by dynamic habitat variables.
- Identify sensitive model variables and important data gaps.



<https://www.fisheries.noaa.gov/species/fin-whale>





Indicates if the animal is in an exploratory mode (red) or foraging (blue)

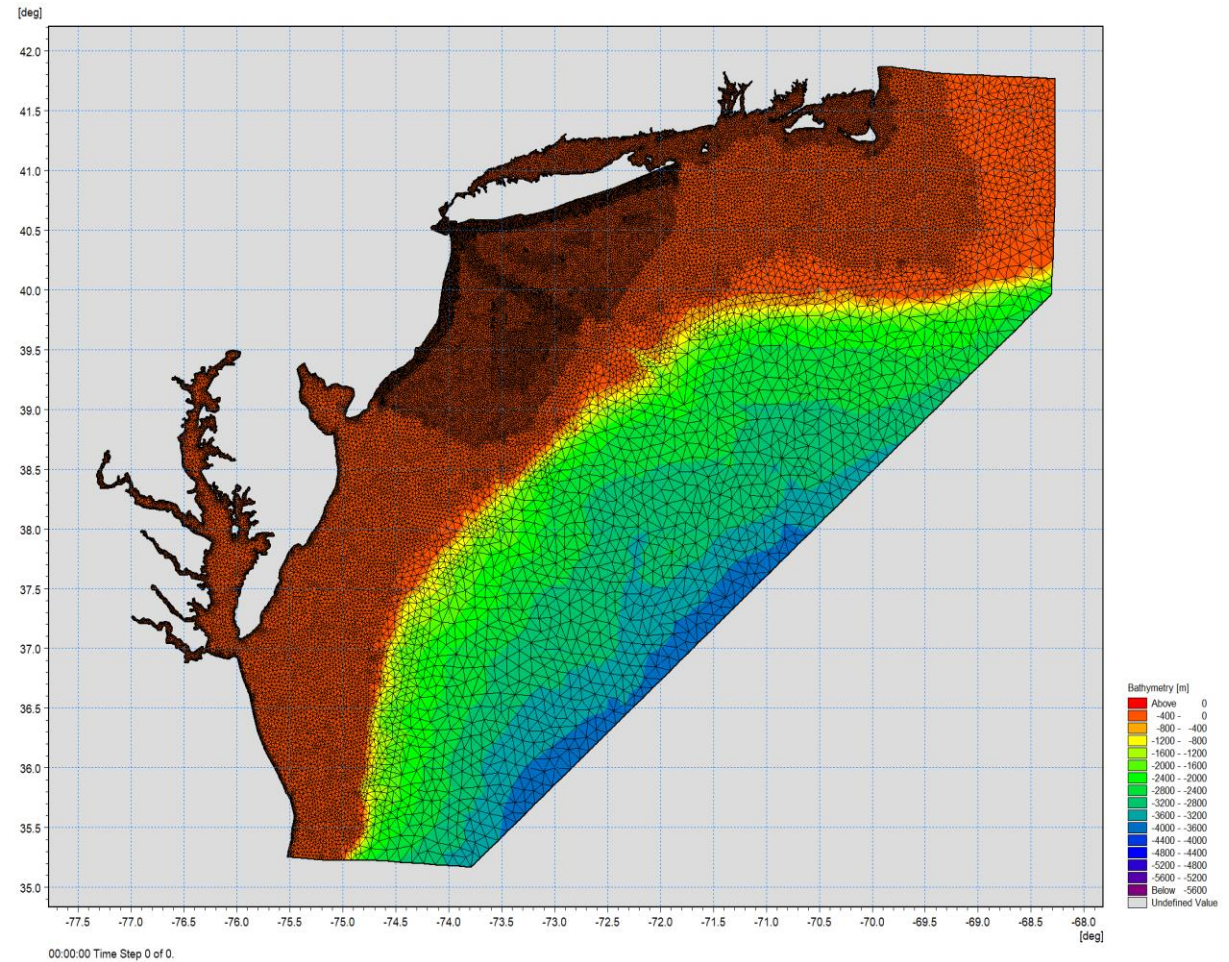
- Above 1.1
- Below 1.1

Habitat Suitability Index

■	Above 0.98
■	0.91 - 0.98
■	0.84 - 0.91
■	0.77 - 0.84
■	0.70 - 0.77
■	0.63 - 0.70
■	0.56 - 0.63
■	0.49 - 0.56
■	0.42 - 0.49
■	0.35 - 0.42
■	0.28 - 0.35
■	0.21 - 0.28
■	0.14 - 0.21
■	0.07 - 0.14
■	0.01 - 0.07
■	Below 0.01
■	Undefined Value

PROGRESS AND OUTCOMES TO DATE

- Draft regional and local hydrodynamic model developed.
- **Four** taxa selected for dynamic habitat models (fin whale, red-throated loon, northern gannet, and loggerhead turtle).
- **Two** taxa selected for agent-based models (fin whale, red-throated loon).
- Observational, met-ocean, and primary production data acquired and converted to shapefiles for modeling.



<https://www.fisheries.noaa.gov/species/fin-whale>
<https://ebird.org/species/retloo>
<https://ebird.org/species/norgan>
<https://www.fisheries.noaa.gov/species/loggerhead-turtle>