

OFFSHORE WIND ENERGY GEOGRAPHIC INFORMATION SYSTEM

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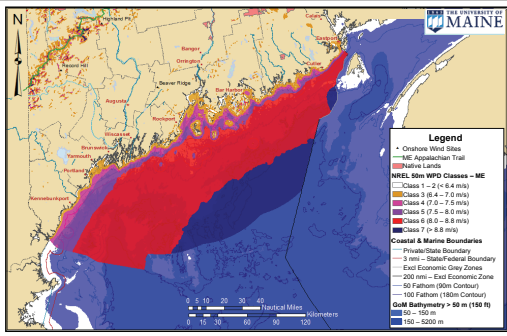
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Introduction

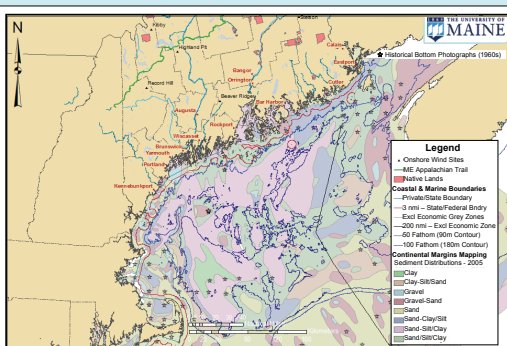
The instability of petroleum fuel markets has led to extreme fluctuations in electrical, gasoline and home heating costs, which point to an economically unsustainable future for Maine residents and consumers. The Gulf of Maine shows tremendous promise for renewable clean energy production through the development of offshore wind farms. Nearly the entire Gulf exhibits commercial-scale winds (NREL Class 4 or better). By current estimates from the University of Maine (UMaine), offshore wind power production potential far exceeds annual electricity demand in the State of Maine, representing a huge, untapped resource.

James W. Sewall Company is working with UMaine through the Gulf of Maine Offshore Wind Development Initiative to investigate wind resource and wind power development potential in the Gulf of Maine in support of the Maine Ocean Energy Task Force (OETF). The study objectives are:

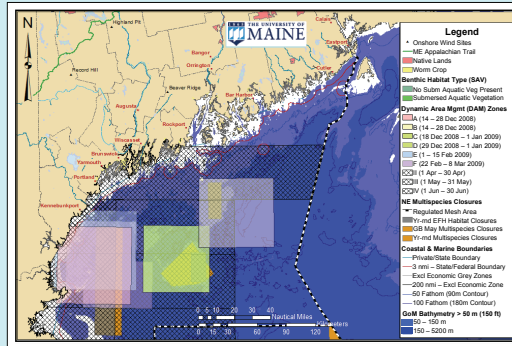
- Quantify the wind power production potential in the Gulf of Maine
- Identify potential sites in the Gulf for siting offshore wind farms
- Rank potential wind farm development sites based on key factors such as wind power potential, environmental resource impacts, cultural resource impacts, coastal economic resource impacts and infrastructure impacts such as electrical grid interconnection, shipping and commerce routes



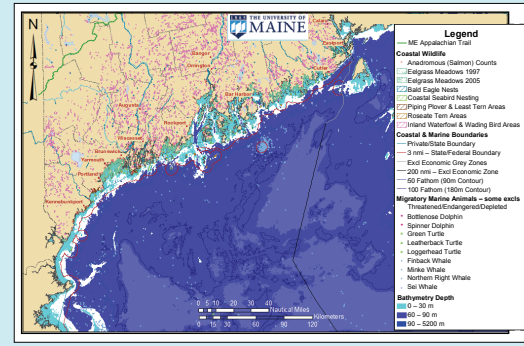
50 meter Mean Annual Wind Speed (NREL)



Physical Characteristics/Physical Environment
Seabed Surficial Sediments



Coastal Economic & Extractive Resource Uses
Worm Harvesting, DAM Zones, Multispecies Closures



Environmental Impacts & Wildlife
Coastal Wildlife Habitats, Migratory Marine Mammals

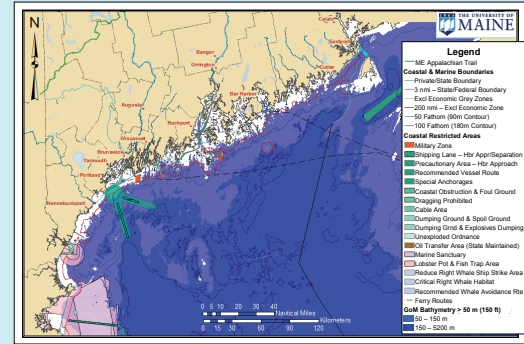
Methods

The Offshore Wind Energy Geographic Information System (OWEGIS) was created with the intent to collect, analyze, and display graphical information to assist in planning, permitting, and the development of offshore wind energy in the Gulf of Maine. OWEGIS was developed using ArcGIS 9.2 Desktop. Data were researched, collected and integrated over approximately an eight month period from October 2008 to June 2009. Data layers were loaded into a personal geodatabase to facilitate geospatial analyses.

Rating criteria used to assess offshore wind development regions of interest were divided into four general categories:

Category	OWEGIS Layers (examples)
Resource Availability – Physical Characteristics / Environment	Mean Annual Wind Speed Mean Seasonal Wind Speed Bathymetry Surficial Sediments
Human Activity Constraints - Coastal Economic & Extractive Resource Uses	Lobster Management Zones Shellfish Collection Regions Aquaculture Leases Worm Harvesting
Cultural & Aesthetic Features	Native Resources Shipwrecks, Lighthouses National & State Parks Finest Lakes & Scenic Rivers
Environmental Impacts & Wildlife	Dynamic Area Management Zones Threatened/Endangered/Depleted species Essential Fish Habitat Bird, bat, mammal migratory routes
Industrial Needs – Infrastructure & Commercial Uses	Military Zones Obstructions & Hazards Airports Shipping Lanes, Traffic Separations
Legal & Permitting Boundaries	Private/State Boundary State/Federal Boundary (3 nmi) 8'g' Revenue Sharing Line (6 nmi) Territorial Seas (12 nmi) Economic Exclusive Zone (200 nmi)

Notes: All Human Activity Constraints (e.g., coastal economic & extractive resource uses, environmental impacts & wildlife, and cultural & aesthetic features) are treated equally for assessment purposes. OWEGIS layers were developed in reference to MMS' Proposed Rule 30 CFR Parts 250, 285, & 290 & the Multipurpose Marine Cadastre OCS Mapping Initiative.



Infrastructure & Commercial Uses
Military Zones, Obstructions & Hazards, Shipping Lanes, Traffic Separations

Conclusions

OWEGIS is being used to support the OETF in identifying and ranking potential areas for offshore wind development based on review and evaluation of over 350 data layers representing key factors that impact the siting and permitting of offshore wind facilities. Maine Law LD 1465 - "An Act To Facilitate Testing and Demonstration of Renewable Ocean Energy Technology", passed June 2009, provides that no later than December 15, 2009, the Maine Department of Conservation shall identify and map up to five areas for testing offshore wind energy technologies and designate one as the Maine Offshore Wind Energy Research Center (OWERC) for wind research and development overseen by UMaine. Sewall & UMaine will use OWEGIS to support siting and permitting of OWERC as part of a plan to build, deploy, test and monitor scaled wind turbines on floating platforms in the Gulf of Maine.

Acknowledgements

Several people have made indispensable contributions to this on-going project. Special thanks go to the Honorable Angus S. King, Jr., Jake Ward, Bob Lindyberg, NREL (Walter Musial, Steve Haymes, Donna Heimiller, Anthony Lopez & Marc Schwartz), the AEWC Offshore Winds Group and the James W. Sewall Company (Chet Bigelow, Brett Hart, Eeva Hedefine, Greg Horne & Justin Mugnai).