

# Assessing Wind Power in the Gulf of Maine

## THE MAINE OPPORTUNITY

The instability of petroleum fuel markets has led to extreme fluctuations in electrical, gasoline and home heating costs, creating an economically unsustainable future for citizens and energy consumers. In Maine, state agencies, educational institutions, and key business firms are meeting the challenge through collaboration on renewable energy initiatives, including the development of wind power. The State, which leads New England in land-based wind farm construction, is now evaluating the tremendous promise the Gulf of Maine (GoM) holds for offshore wind energy production. The GoM exhibits commercial-scale winds (NREL Class 4 or better) across nearly its full extent from Cape Cod to Nova Scotia. By University of Maine estimates, offshore wind power production potential in the GoM far exceeds the annual electricity demand in the State, representing a huge, untapped resource.

## THE SOLUTION

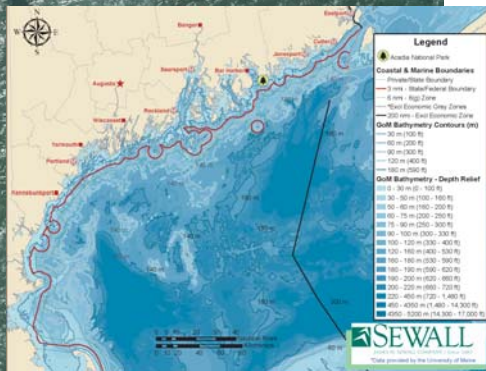
Sewall, working in partnership with the University of Maine through the Offshore Wind Development Initiative, is now bringing the power of geospatial technology to the study of ocean renewable energy and wind power production potential in the GoM. This technology--the Offshore Wind Energy GIS (OWEGIS)--is an innovative ecospatial information system that is being used to identify areas for offshore wind farm development and to rank their potential according to environmental, cultural, economic, and commercial impacts.

OWEGIS comprises over 400 layers of coastal- and marine-related data integrated in an ESRI ArcGIS-based data management system designed to collect, analyze, and display critical environmental resource information. The data, including real-time meteorological and oceanographic data derived from such sources as the Gulf of Maine Ocean Observing System (GoMOOS), are now supporting the siting and permitting of a deepwater wind energy testbed for deploying, monitoring, and evaluating scaled wind turbines on floating platforms.

## THE BENEFITS

With OWEGIS, stakeholders are able to:

- Organize, standardize, and display a wide range of information (environmental, cultural, economic, commercial) from diverse geospatial and temporal sources, combining these data in new ways to model cumulative impacts of ocean renewable energy development on marine ecosystems
- Assess cumulative impacts in an intuitive, interactive and visual manner that facilitates siting decisions and adds transparency to the permitting process



For more information on Sewall's renewable energy solutions, contact: Patrick N. Graham, PE, Director of Renewable Energy Services, at 207 827 4456; pgraham@sewall.com



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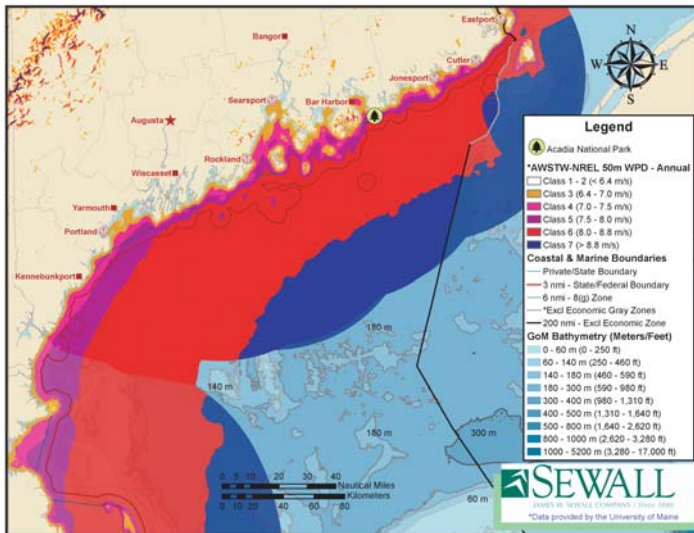
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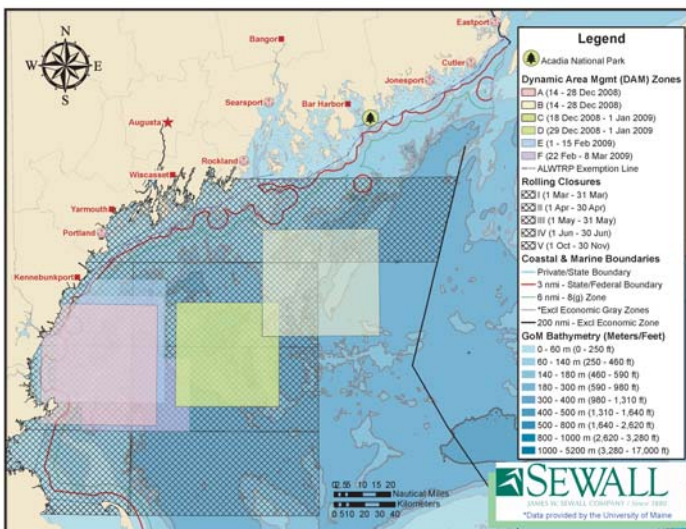
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## THE METHODS

OWEGIS was created with the intent to collect, analyze and display graphical information to support planning, permitting and the development of offshore wind energy in the Gulf of Maine. Data layers were researched, collected and integrated over approximately eight months from October 2008 to June 2009, and were loaded into a file geodatabase to facilitate geospatial analysis. Rating criteria (at right) were used to assess wind development regions of interest in five general categories: resource mapping, human activities, coastal hazards, industrial activities, and legal/permitting boundaries.



50-meter Mean Annual Windspeed



Coastal Economic and Extractive Resource Impacts

- **RESOURCE MAPPING**  
*Physical Characteristics & Environment*
  - Mean annual & seasonal wind speed
  - Bathymetry
  - Surficial sediments
  
- **HUMAN ACTIVITIES**  
*Coastal Economic & Extractive Resource Uses*
  - Lobster management zones
  - Shellfish collection regions
  - Aquaculture leases
  - Dynamic Area Management zones
  - Atlantic Large Whale Take Reduction Plan Line  
*Cultural & Aesthetic Features*
  - Native resources
  - Shipwrecks, lighthouses
  - National & state parks  
*Environmental Impacts & Wildlife*
  - Dynamic Area Management zones
  - Atlantic Large Whale Take Reduction Plan Line
  - Threatened/endangered/depleted species
  - Bird, bat, mammal migratory routes
  
- **COASTAL HAZARDS**
  - Military zones
  - Obstructions & hazards
  - Unexploded ordnance
  
- **INDUSTRIAL ACTIVITIES**  
*Infrastructure & Commercial Uses*
  - Airports
  - Shipping lanes, traffic separations
  - Electric transmission
  
- **LEGAL & PERMITTING BOUNDARIES**
  - Private/state boundary
  - State/federal boundary (3 nautical miles)
  - Territorial seas (12 nautical miles)

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