

ESS Group, Inc.

Environmental Research Initiatives to Support the Future of Offshore Wind Development



Presentation to

NYSEERDA 2011 Conference

Environmental Monitoring, Evaluation,
and Protection in New York: Linking
Science and Policy

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- Narrow offshore wind development opportunity areas
- Determine environmental research focus areas to help streamline the siting and regulatory review of offshore wind projects
- Assess opportunities for alternative data application
- Lay the groundwork for exploiting a vast, reliable energy source in the US that has yet to be utilized



Challenges in US Offshore Wind Development

- Environmental resource assessments – complicated multi-media, multi-resource area interactions
- Both construction and operational assessments required
- Inter-array and export submarine cable installations
- Regulatory permitting challenges
- Challenge between policy and regulation

Regulatory and Construction Feasibility

- Natural resources
- Geophysical
- Use conflicts
- Human
- Interconnection Feasibility



Natural Resource Considerations

Gaining an understanding of natural resource distribution to reduce impacts and make informed siting decisions.

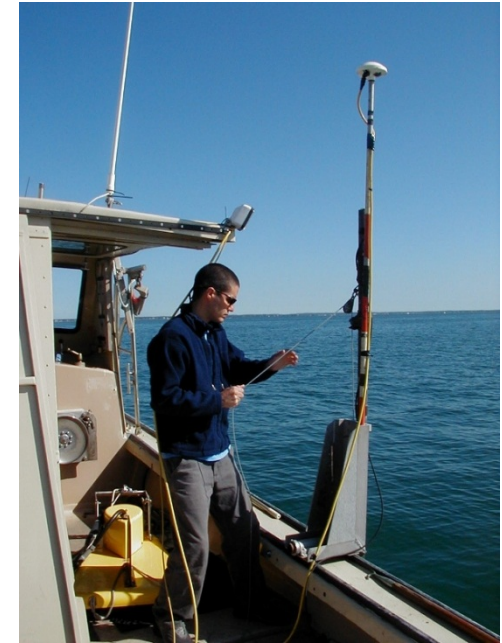
- Mapping near-shore and offshore habitats
- Identifying critical habitats
- Identifying spawning areas
- Documenting known endangered species sightings
- Mapping avian and bat flight trajectories
- Using multiple layers, establish ecological conservation/preservation zones (nearshore and onshore)
- Mapping known shellfish areas



Geophysical Considerations

Understanding local conditions and minimizing the offshore challenges.

- Wind resource - MET towers in potential wind sites and LIDAR
- Wave height and frequency (wave/current modeling)
- Maximum sustained winds and frequency of storm events
- Mapping the sediment and subsurface geology (sonar, sub bottom profiling, seismic reflection profiling, core sampling and magnetometer surveys)
- Bathymetry
- Freshwater ice tracking/mapping – determine risks to turbine foundations and interconnect cables



Physical Obstruction Considerations

Understanding shoreline, near shore, and offshore obstructions can help streamline the site selection and routing process while minimizing construction cost and impact.

- Shoreline protection structures
- Existing infrastructure (cables/pipelines)
- Shipwrecks
- Regulated navigational areas
- Military operations areas
- Anchorages (charted and uncharted)
- Federal navigation projects
- Offshore dumping locations
- St. Lawrence Seaway (Great Lakes)



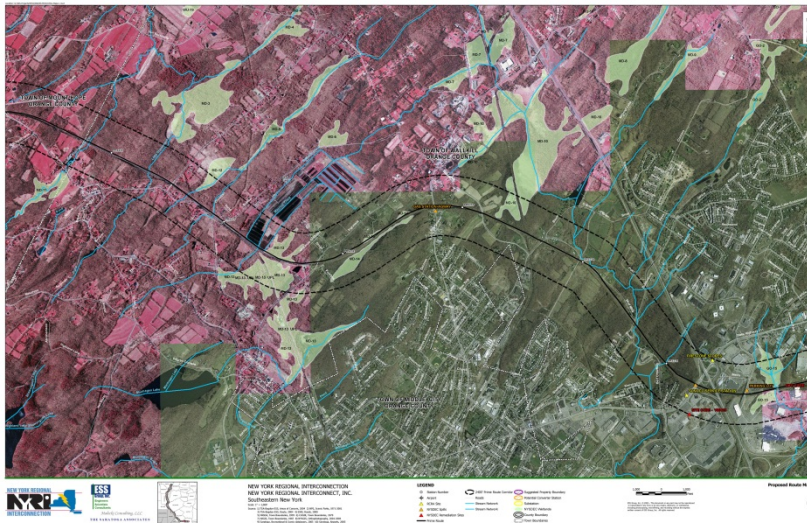
Use Conflicts, Physical Obstructions

Knowing the stakeholders will help developers and regulators anticipate potential impacts to that population.

- Mapping commercial and recreational fishing grounds
- Recreational and commercial vessel traffic (US Coast Guard consultation)
- Cultural and archeological resources (on and offshore)
- Establishing a unified offshore visual protocol - understanding particular visual sensitivities and how siting considerations can play a role – USACE, BLM, NYSDEC policies exist that are limited with respect to offshore wind issues
- Land use mapping
- Fresnel Zones – radio & radar interference
- Aviation flight paths (FAA)

Establishing opportunities for grid connectivity and collocation.

- Mapping substations, capacities, and expansion constraints/opportunities
- Mapping existing transmission lines
- Mapping utility ROWs



Existing Data Sources pertaining to Offshore Development

- NYSDEC – state lands, bird conservation areas, ecological zones, lake contour maps, vegetative communities (limited), tidal wetlands, significant natural communities
- NOAA – geophysical data (generally at sea level), mapping of navigational aids and obstructions
- USFWS - Coastal Barrier Resources System (CBRS), Critical Habitat, Ecosystem Regions, Landscape Cooperation Cooperatives (LCCs), Migratory Bird Conservation, North American Bird Conservation Joint Ventures, National Wetlands Inventory (NWI), National Wildlife Refuge System (NWRS) Boundary Data, National Wildlife Refuge System (NWRS)
- NYSOGS – submerged land easements/grants
- USACE – federal navigation projects
- USGS – upland and nearshore topography
- BOEM – Public information from previously filed applications

Data Deficiencies

- Nearshore and offshore data is commonly too broad for specific siting applications
- Combined review of existing data to focus on best opportunity areas
- More communication and collaboration in creating data sources needed
- Data is often out of date
- Data does not pertain to the specific application of offshore development
- Lack of data pertaining to bathymetry, water depth, and subsurface conditions
 - constructability issue for developers

Data Research Focus Areas

- Establish/refine data collection methods – High tech vs. Low tech
- Bird and bat studies (flight densities and trajectories, and spatial distribution).
- Establish visual modeling protocols - identify a process, resources, and standards
- Sub aquatic vegetation mapping – low altitude aerial mapping
- Wind energy transportation studies – limitations for extreme shallows/depths
- Construction logistics for Great Lakes
- Determine preferred landfall locations based on permit risk and interconnection feasibility
- Population density of marine mammals and protected/endangered species

Identify offshore locations that are economically feasible and technically feasible for wind development and onshore electrical interconnection.

- Research dollars go further when study areas are focused
- Allows agencies and consultants to focus data collection on those specific resources and potential interconnection areas
- Developers can focus on a set palette of offshore and interconnection locations

Determining Agency Collaboration and Grant Opportunities

- Develop database of fishing grounds based on vessel GPS/AIS data
- Develop database of vessel tracks based on AIS data



Making Progress Step by Step

- DOI and BOEM making progress on Rulemaking/Implementation
- US East Coast – Wind Energy Areas (WEAs) as pilot projects
- Electric transmission backbones and interconnection strategies
- Stakeholder interest vetting upfront – BOEM
- Developer initiatives - OWDC & OWC
- Technology curve – reducing impacts and costs to construct

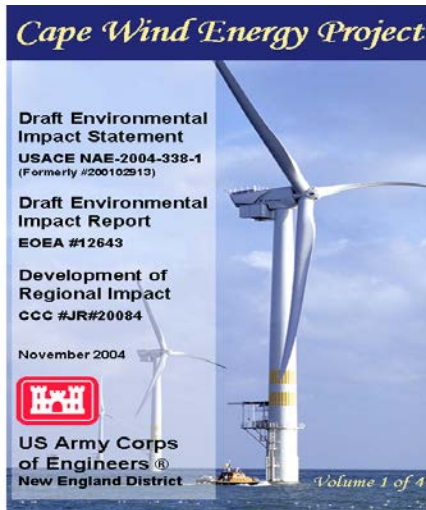


ESS Group, Inc.- Who We Are

- Full-service environmental and engineering consulting firm
- Offices in Massachusetts, Rhode Island, and Virginia
- Broad geographic reach, including international project experience
- Core business in planning, siting, and permitting offshore renewable energy projects
- Consulting from project planning and environmental assessments through compliance monitoring
- Commitment to providing value-added technical excellence and client responsiveness
- Proven success in obtaining approvals and permits for complex energy projects



ESS Representative Project Experience



Cape Wind Project – Nantucket Sound

- 468 MW, 12-mile 115kV AC Link
- Siting, Routing, Environmental Studies and Pre-Construction Monitoring
- Preparation and Submittal of BOEMRE Construction and Operations Plan (COP)
- First BOEMRE Lease for Offshore Wind

Dominion - VA Offshore Wind

- 1,000-2,000 MW Submarine Cable Interconnection
- Preliminary Environmental Analysis
- Permitting Strategy
- Preparation for BOEMRE Competitive Lease Application

OffshoreMW – New Jersey Offshore

- 700 MW, 22-mile, 230 kV AC Link
- Siting, Routing, and Preliminary Environmental Analysis
- Permitting Strategy
- Preparation for BOEMRE Unsolicited Lease Application