

OFFSHORE RENEWABLE ENERGY

Atlantic Study
Highlights

2017



The **Bureau of Ocean Energy Management (BOEM)** is responsible for overseeing renewable energy development on the Outer Continental Shelf (OCS) in an environmentally sound manner.

BOEM works closely with Federal resource management agencies to identify information needs to support decisions about siting of offshore renewable energy facilities.

On the **Atlantic OCS in 2017**, BOEM is funding more than **\$8 million** in new and continuing projects for the collection of information regarding protected species, social, economic, and cultural resources, and environmental monitoring.

Below is a sample of the projects BOEM is funding:

Fishery Physical Habitat and Epibenthic Invertebrate Baseline Data Collection

The Northeast Fisheries Science Center is assessing and characterizing benthic habitat and the epibenthic macroinvertebrate community in existing and proposed wind energy areas from Massachusetts to North Carolina via multibeam sonar, and optical (still and video) imaging of the seafloor. The final report is available at www.boem.gov/espis/5/5647.pdf.

Spatial and Temporal Distributions of Lobsters and Crabs in the Rhode Island/Massachusetts Wind Energy Area

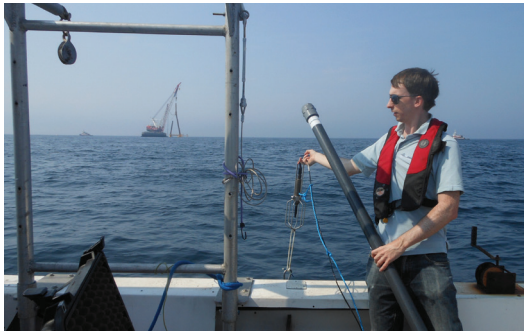
This project, led by University of Rhode Island, will help to fill a data gap in lobster abundance surveys. In partnership with Rhode Island-based commercial lobster fishermen, this project uses a ventless trap survey to establish baseline knowledge of lobster occurrence and environmental conditions in the offshore lease area.

The final report for the first two years of field work is available at www.boem.gov/Spatial-and-Temporal-Distributions. The study will be extended in 2018 for an additional year.



Electromagnetic Field (EMF) Impacts on Elasmobranch (shark, rays & skates) and American Lobster Movement and Migration from Direct Current Cables

The focus of this research by the University of Rhode Island is to determine the actual electromagnetic field emissions associated with undersea power cables and response to these fields by sensitive receptor organisms, including the American Lobster and skate. The final report is available at www.boem.gov/espis/5/5659.pdf.



Real-time Opportunity for Development Environmental Observations (RODEO)

This continuing study first evaluated Block Island Wind Farm during its installation and early operation. Researchers record activities as they occur, monitor sound in the air and water during pile driving and operation, and evaluate bottom-disturbing activities. A final report on cable-laying disturbance is available at www.boem.gov/ESPIS/5/5596.pdf. Other reports will be published in 2018.



Atlantic Marine Assessment Program for Protected Species (AMAPPS)

BOEM partnered with the U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration Fisheries to collect data on the seasonal distribution and abundance of seabirds, marine mammals, and sea turtles using aerial and shipboard surveys. BOEM will use the identified areas of high usage by these species to reduce conflicts with wind energy development. A final report for the 2010-2014 surveys is available at www.boem.gov/espis/5/5638.pdf.



Atlantic Offshore Wind Energy Development: Values and Implications for Recreation and Tourism

BOEM used a stated-preference survey to estimate offshore wind power's potential impact on recreational beach use on the East Coast. 1,723 beachgoers were shown visual simulations of an offshore wind facility at different distances from shore and asked whether the projects might affect their beach experience or cause them to alter their trip plans. BOEM will use the results in planning efforts for offshore wind development and to inform decision makers on the potential impacts to coastal recreation and tourism. The final report is available at www.boem.gov/espis/5/5662.pdf.



Comprehensive Seafloor Substrate Mapping and Model Validation in the Atlantic

Relatively sparsely distributed data and statistical interpolation are used to create maps of the composition of the seafloor used to identify fish habitat. The study will validate the existing substrate and sediment models and provide finer-resolution substrate and habitat data in areas selected for ground-truthing. A final report will be available in 2019.

ENVIRONMENTAL STUDIES

Electromagnetic Fields (EMF)



The **Bureau of Ocean Energy Management (BOEM)** is responsible for overseeing renewable energy development on the Outer Continental Shelf (OCS) in an environmentally sound manner.

One issue of concern is **the effects of electromagnetic fields (EMF) on marine species**. Electromagnetic fields are generated by cables when an electric current is flowing through them. Some marine species can sense the EMF, raising concern that the cable may act as a barrier for migration.

The following BOEM-funded studies address this issue:

Effects of EMF from Transmission Lines on Elasmobranchs and other Marine Species

BOEM funded a literature synthesis to understand sensitive marine species and the potential effects of exposure to EMFs from offshore power cables. The study includes a review of existing information and a model to describe and quantify predicted EMF from power cables connected to offshore renewable energy projects.

The final report is available at www.data.boem.gov/PI/PDFImages/ESPIS/4/5115.pdf.

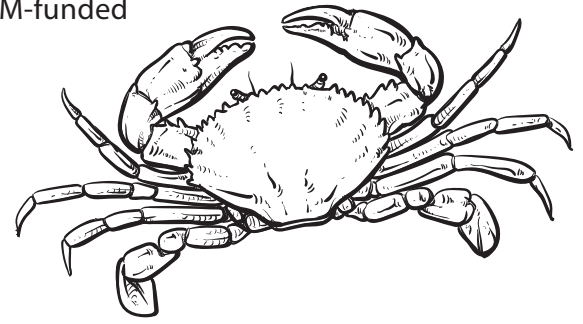
EMF Impacts on Elasmobranch (shark, rays, and skates) and American Lobster Movement and Migration from Direct Current Cables

BOEM funded direct measurement of both electric and magnetic field from two HVDC cables connected to Long Island, NY: 330 MV (Cross Sound) and 660 MV (Neptune) using state of the art sensors. Field experiments using lobster and skates used acoustic telemetry technology to detect real-time movements in 3-D to evaluate effects of an energized section of the Cross Sound cable.

The final report is available at www.boem.gov/espis/5/5659.pdf.

Potential Impacts of Submarine Power Cables on Crab Harvest

Relying on local professional fishermen and using existing cables, BOEM-funded researchers are testing crabs to see if they will cross through EMF to reach baited traps. Researchers have tested over 400 rock crabs in the Santa Barbara Channel. Results suggest rock crabs will cross an unburied 35 kV AC power cable to enter baited commercial traps.



A final report will be available in Summer 2018. Results were reported by Science News at www.sciencenews.org/article/magnetismunderwater-power-cables-doesnt-deter-sea-life.



Renewable Energy in situ Power Cable Observation

Submarine transmission cables that power offshore oil platforms in the Pacific Region provide a unique opportunity to assess potential behavior and reaction of electromagnetic-sensitive species to industry activities. This study measures the strength, spatial extent, and variability of EMFs along both energized and unenergized cables.

No response, attraction or repulsion to EMF from a 35 kV AC in situ power transmission cable has been observed. A final report is available at www.boem.gov/2016-008.

Assessment of Potential Impact of Electromagnetic Fields from Undersea Cable on Migratory Fish Behavior, Period Covering January 2014 - June 2016

Building on tracking work in San Francisco Bay on Chinook salmon and green sturgeon, this study examined historical data in relation to a high voltage direct current cable, the Trans Bay Cable.

While there was some statistically measurable response to the cable by fish, the response did not hinder the migration of the species. A final report is available at www.boem.gov/2016-041.



For more information about BOEM's Environmental Research, contact Dr. Mary Boatman at mary.boatman@boem.gov or visit www.boem.gov/Renewable-Energy-Environmental-Studies

Wind Energy Commercial Leasing Process



In 2009, Department of the Interior announced final regulations for the Outer Continental Shelf (OCS) Renewable Energy Program, which was authorized by the **Energy Policy Act of 2005 (EPAct)**.

DOI's **Bureau of Ocean Energy Management (BOEM)** is responsible for implementing these regulations, which provide a framework for issuing leases, easements and rights-of-way for OCS activities that support **production and transmission of renewable energy**, including offshore wind, ocean wave energy, and ocean current energy.

Importance of Stakeholder Engagement

To help inform BOEM's planning and leasing process, BOEM has established Intergovernmental Renewable Energy Task Forces in states that have expressed interest in development of offshore renewable energy.

The role of each Task Force is to collect and share relevant information that would be useful to BOEM during its decision-making process.

To date, **14 BOEM Intergovernmental Task Forces have been established** in:

California | Delaware | Florida
Hawaii | Maine | Maryland
Massachusetts | NEW JERSEY
New York | North Carolina | Oregon
RHODE ISLAND | SOUTH CAROLINA
and Virginia

Task Force meetings have helped identify areas of significant promise for offshore development and provided early identification of, and steps toward resolving, potential environmental and use conflicts.

The Process

BOEM's renewable energy program occurs in four distinct phases: (1) **planning and analysis**, (2) **leasing**, (3) **site assessment**, and (4) **construction and operations**. The figure below outlines BOEM's process for authorizing wind energy leases:



Planning and Analysis

The Planning and Analysis phase seeks to identify suitable areas for wind energy leasing consideration through collaborative, consultative, and analytical processes that engage stakeholders, tribes, and State and Federal government agencies.

This is the phase when BOEM conducts environmental reviews and consultations with Tribes, States, and natural resource agencies.



Leasing

The Leasing phase results in the issuance of a commercial wind energy lease. Leases may be issued either through a competitive or noncompetitive process. A commercial lease gives the lessee the exclusive right to subsequently seek BOEM approval for the development of the leasehold.

The lease does not grant the lessee the right to construct any facilities; rather, the lease grants the right to use the lease area to develop its plans, which must be approved by BOEM before the lessee can move on to the next stage of the process.



Site Assessment

The Site Assessment phase includes the submission of a Site Assessment Plan (SAP), which contains the lessee's detailed proposal for the construction of a meteorological tower and/or the installation of meteorological buoy(s) on the leasehold.

The lessee's SAP must be approved by BOEM before it conducts these "site assessment" activities on the leasehold. BOEM may approve, approve with modification, or disapprove a lessee's SAP. It is also during this phase that the lessee would conduct site characterization surveys and studies (e.g., avian, marine mammal, archeological).



Construction and Operations

The Construction and Operations phase consists of the submission of a Construction and Operations Plan (COP), which is a detailed plan for the construction and operation of a wind energy project on the lease.

BOEM conducts environmental and technical reviews of the COP and decides whether to approve, approve with modification, or disapprove the COP. Prior to the end of the lease term, the developer must submit a plan to decommission facilities.

For more information about BOEM's Leasing Process, email us at renewableenergy@boem.gov or visit www.boem.gov/Renewable-Energy

BOEM's

Renewable Energy

Program



In 2009, Department of the Interior announced final regulations for the Outer Continental Shelf (OCS) Renewable Energy Program, which was authorized by the **Energy Policy Act of 2005 (EPAct)**.

These regulations provide a framework for issuing leases, easements, and rights-of-way for OCS activities that support production and transmission of energy from sources other than oil and natural gas.

DOI's **Bureau of Ocean Energy Management (BOEM)** is responsible for overseeing offshore renewable energy development in Federal waters. Since the regulations were enacted, BOEM has worked diligently to oversee responsible renewable energy development.

Commercial Leasing

A commercial lease gives the lessee the exclusive right to seek BOEM approval for the development of a leasehold. It allows a lessee to conduct survey activities for site characterization but does not grant the right to construct any facilities.

Office of Renewable Energy Programs Statistics



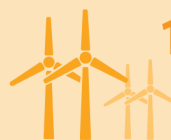
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competitive lease sales

\$68 million+ in winning bids



for over **1.4 million** acres

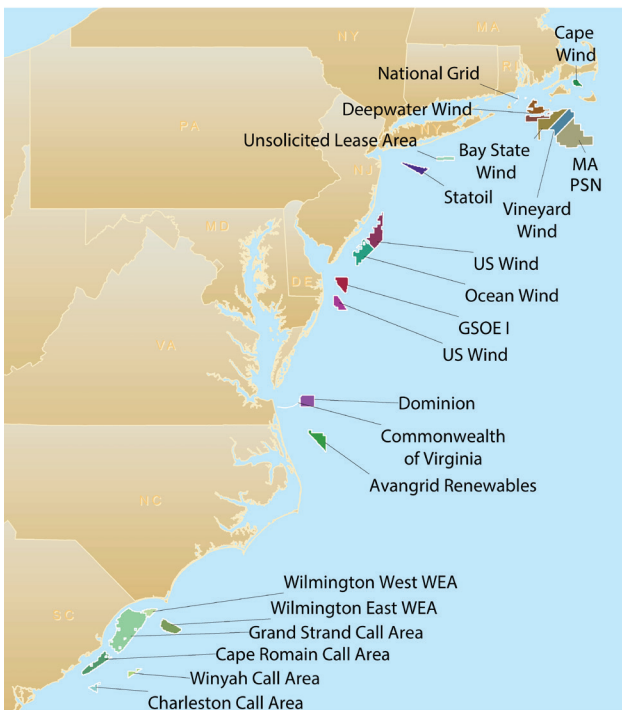


12 offshore leases with over

17 GW of total capacity

Current Lease Status

LESSEE	STATE	ACREAGE	LEASE #, YEAR	NEXT STEP
Cape Wind Associates, LLC	MA	29,425	OCS-A 0478, 2010	Lease Relinquishment
Garden State Offshore Energy I	DE	96,430	OCS-A 0482, 2012	SAP
Deepwater Wind New England, LLC	RI/MA	97,498	OCS-A 0486, 2013	SAP
Deepwater Wind New England, LLC	RI/MA	67,252	OCS-A 0487, 2013	COP
Virginia Electric and Power Company	VA	112,799	OCS-A 0483, 2013	SAP
US Wind Inc.	MD	79,707	OCS-A 0490, 2014	COP
Vineyard Wind	MA	166,886	OCS-A 0501, 2015	COP
Bay State Wind, LLC	MA	187,523	OCS-A 0500, 2015	COP
Ocean Wind, LLC	NJ	160,480	OCS-A 0498, 2016	SAP
US Wind Inc.	NJ	183,353	OCS-A 0499, 2016	SAP
Statoil Wind US, LLC	NY	79,350	OCS-A 0512, 2017	SAP
Avangrid Renewables, LLC	NC	122,405	OCS-A 0508, 2017	SAP



BOEM has published a Proposed Sale Notice (PSN) for two additional leases offshore Massachusetts. The PSN has a 60-day public comment period. BOEM is also in the planning stages for areas offshore New York, South Carolina, California, and Hawaii.

In addition to the leases above, BOEM received the following unsolicited research lease applications:

BOEM received two research lease requests from the Virginia Department of Mines, Minerals and Energy (DMME). In response to both requests, BOEM determined there was no competitive interest. One of the research leases associated with the proposed Virginia Offshore Wind Technology Advancement Project (VOWTAP) was executed in March 2015.

A research lease request for a wave energy test site in Federal waters offshore Oregon was submitted to BOEM by Oregon State University. BOEM determined there was no competitive interest and continues to process the research lease request.

For more information on what is happening in each of our coastal states, please visit www.boem.gov/Renewable-Energy-State-Activities