Environmental Program

June 2014

BOEM

Bureau of Ocean Energy Management

U.S. Department of the Interior

March 3, 1849

THIS PAGE INTENTIONALLY BLANK

ENVIRONMENTAL PROGRAM
BUREAU OF OCEAN ENERGY MANAGEMENT

This paper provides an overview of the environmental program within the Bureau of Ocean Energy Management (BOEM). While not an exhaustive description of the environmental laws, executive orders, regulations or policies BOEM must comply with or develop, the paper does provide a sense of how they are integrated with science across all program areas and regions to fulfill BOEM's environmental stewardship responsibilities. It also discusses ongoing activities and issues, and will be updated periodically.

William Yancey Brown
Chief Environmental Officer and
Director, Office of Environmental Programs

THIS PAGE INTENTIONALLY BLANK

ENVIRONMENTAL PROGRAM
BUREAU OF OCEAN ENERGY MANAGEMENT
JUNE 2014

OVERVIEW

The Outer Continental Shelf Lands Act (OCSLA) requires the Bureau of Ocean Energy Management (BOEM), in coordination with the Bureau of Safety and Environmental Enforcement (BSEE), to provide effective environmental safeguards for Outer Continental Shelf (OCS) exploration and production of oil and natural gas; renewable energy sources such as offshore wind, wave and currents; and non-energy minerals including sand and gravel. OCSLA also assigns responsibility to BOEM for managing and ensuring environmental protection in respect to any OCS activities for "marine-related purposes" using facilities currently or previously authorized under the statute. BOEM manages 1.7 billion acres on the Outer Continental Shelf.

MISSION

To excel in developing and applying science and law for environmental protection in energy and mineral activities on the Outer Continental Shelf.

VISION

To be recognized as a global leader in environmental protection for offshore energy and mineral development.

These responsibilities require BOEM to assess the environmental impact of OCS development and provide guidance concerning the place, time, and nature of activities to be authorized. BOEM addresses these requirements through its Environmental Program (Program). The Program is intended to inform decision-makers and the public about potential environmental impacts of OCS energy and mineral resource development, how to prevent or mitigate those impacts, and how to monitor impacts and measures for environmental protection. This information supports and guides decision-making not just within BOEM but also by other agencies and stakeholders.

The Environmental Program includes the Environmental Assessment and the Environmental Studies functions described below. The Program staff incorporates diverse expertise including marine and coastal biology, chemical and physical oceanography, avian and marine mammal biology, acoustic science, geology, meteorology, risk modeling, sociology, economics, archaeology, environmental policy, management, and law. BOEM's environmental functions are organized administratively into the Office of Environmental Programs (OEP) in the Washington, D.C., area, including the Environmental Assessment and Environmental Science Divisions; the Office of Renewable Energy, also in the D.C. area; and the three BOEM regions: the Gulf of Mexico, Alaska, and the Pacific. BOEM staff work in teams across regions and program offices, with leadership provided by those whose backgrounds and capabilities best address the issues as related to subject matter at hand. Furthermore, the Environmental Program is committed to continuous staff improvement through training and feedback and through recruitment and retention of the best talent available. The Program is also committed to partnerships and to

genuine, continuing interaction with all stakeholders, including Federal, state, and local governments; tribes and other organizations of native peoples; civil society; and business.

ENVIRONMENTAL ASSESSMENT

BOEM's Environmental Assessment function addresses environmental impacts and the environmental requirements defined by a constellation of Federal statutes, executive orders and regulations. Its work is informed by the best available science, drawing from the Environmental Studies Program and other research. The actions reviewed include authorization of geological and geophysical (G&G) exploration activities; plans for leasing; lease sales and approvals; exploration plans; development and productions plans; and development operations coordination documents. The activity also reviews more specific authorizations and permits, including the decommissioning of oil and gas platforms, which may be approved and enforced by the Bureau of Safety and Environmental Enforcement (BSEE) but whose environmental assessment is supported by BOEM. The bureau's environmental assessments not only take a hard look at environmental impacts and alternatives to proposed actions, but they also identify measures to mitigate impacts which can be translated into requirements for operators through regulatory vehicles such as permit stipulations and notices to lessees.

Statutory Responsibilities

BOEM's legislative mandates for environmental protection are diverse. Under OCSLA, BOEM must consider impacts from OCS development on the marine, coastal, and human environments. The impacts considered include but extend far beyond the geographic area within the OCS where energy and minerals resources are produced. The marine environment covered extends landward to salt marshes and wetlands; the coastal environment includes "the terrestrial ecosystem from the shoreline inward to the boundaries of the coastal zone;" and the human environment is defined to include the "physical, social, and economic components . . . which determine the state, condition, and quality of living conditions, employment, and health of those affected . . ." OCSLA §2(g), (h), and (i).

OCSLA and the National Environmental Policy Act (NEPA) establish the overall framework for BOEM's studies, assessments, and standards for environmental protection in resource development on the OCS. Section 5(a) of OCSLA provides a general environmental mandate, specifying that the Secretary of the Interior –

> "may at any time prescribe and amend such rules and regulations as he [she] determines to be necessary and proper in order for the prevention of waste and conservation of the natural resources of the outer Continental Shelf . . ."

"Conservation of the natural resources" of the OCS has been held in Federal court opinions to include more than minerals. For example, the 9th Circuit has ruled that the term includes "marine life, recreational potential, and aesthetic values . . ." *Union Oil Co. v. Morton*, 512 F.2d 743, 749 (9th Cir. 1975). Other environmental standards in OCSLA differ with activity but include the following responsibilities of the Secretary of the Interior, for which BOEM and BSEE are now responsible –

- A limitation that geological and geophysical exploration for mineral resources not be "unduly harmful to aquatic life . . ." OCSLA §11(a)(1).

- Regulations providing for the suspension or temporary prohibition of activity under a lease "if there is a threat of serious, irreparable, or immediate harm or damage to life (including fish and other aquatic life) . . . or to the marine, coastal, or human environment . . ." OSCLA §5(a)(1).

- Regulations providing for the cancellation of *any* lease or permit if the Secretary determines after a hearing that continued activity would "probably cause serious harm or damage to life (including fish and other aquatic life) . . . or to the marine, coastal, or human environment" (and also determines that the "threat of harm or damage will not disappear or decrease to an acceptable extent within a reasonable period of time" and that the "advantages of cancellation outweigh the advantages of continuing such lease or permit in force . . ." OSCLA §5(a)(2).

- A requirement to disapprove oil and gas exploration plans if the Secretary determines that any proposed activity under a plan "would probably cause serious harm or damage to life (including fish and other aquatic life) . . . or to the marine, coastal, or human environment" and "cannot be modified to avoid such condition." OCSLA § 11(c)(1) and §5(a)(2)(A)(i).

- A requirement that the Secretary disapprove an oil and gas development and production plan if "the lessee fails to demonstrate that he can comply with the requirements of this Act [OSCLA] or other applicable Federal law . . ." OCSLA § 25(h)(1)(A).

- A requirement that the Secretary disapprove an oil and gas development and production plan if she determines because of "exceptional circumstances" that "(i) implementation of the plan would cause "serious harm or damage to life (including fish and other aquatic life), . . . or to the marine, coastal, or human environments . . . (ii) the threat of harm or damage will not disappear or decrease to an acceptable extent within a reasonable period of time, and (iii) the advantages of disapproving the plan outweigh the advantages of development and production." OCSLA § 25(h)(1)(D).

- A requirement for the Secretary to ensure that any production, transportation, or transmission of energy from sources other than oil and gas (such as wind or ocean tides, currents or waves) is carried out in a manner that provides for protection of the environment. OCSLA §§ 8(p)(1)(C) and (4)(B).

NEPA and implementing regulations of the Council on Environmental Quality (CEQ) require BOEM and other Federal agencies to prepare an environmental impact statement (EIS) including evaluation of alternatives before taking a major action that will significantly affect the quality of the human environment. NEPA is BOEM's principal vehicle for reviewing environmental impacts and engaging public participation in the process. Programmatic environmental impact statements may be prepared initially if a proposed action is broad in nature (e.g. approval of a Five Year Program) and then followed by more specific subsequent environmental reviews that are "tiered" to the programmatic statement. If uncertain whether an EIS is required, BOEM and other agencies may prepare a less detailed environmental assessment (EA) and, based on that review, decide whether to prepare an EIS, a "supplemental" EIS, or to make a finding of no significant impact (FONSI). Federal agencies may also provide for a "categorical exclusion"

(CE) of an action from EIS preparation under NEPA if the agency determines that the action does not individually or cumulatively have a significant effect on the human environment.

Other Federal laws give protection to specific resources that may be impacted by OCS activities authorized by BOEM. Compliance with the Endangered Species Act of 1973 (ESA) and the Marine Mammal Protection Act of 1972 (MMPA) are particularly significant components of BOEM's Environmental Program.

The ESA requires that BOEM not take any action likely to jeopardize the continued existence of any species listed as endangered or threatened or to destroy or adversely modify critical habitat of listed species. If an action by BOEM may affect a listed species, the bureau is required to consult with either the National Marine Fisheries Service (NMFS), for primarily marine species, or the U.S. Fish and Wildlife Service (FWS), for species whose lives are more closely tied to land (e.g. polar bears).

Polar Bear.
Photo: US Fish & Wildlife Service

As is the case for NEPA assessments, an ESA consultation may be specific or programmatic. If any of the agencies involved believe that a formal consultation is warranted, then BOEM will prepare a "biological assessment" to inform itself and other Federal partners about the presence of listed species and impacts of the action on them. NMFS or FWS then reply with a "biological opinion," which gives an opinion on whether the action is likely to jeopardize a listed species or adversely modify its critical habitat. If jeopardy or adverse modification is concluded, a biological opinion often includes "reasonable and prudent measures" that will avoid those consequences, and NMFS or FWS may also issue an "incidental take statement" that authorizes taking otherwise prohibited by the ESA. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. BOEM's activities are mostly limited to potential "takes" by harassment (marine noise) or harm (i.e. habitat loss) that are incidental to the activities. It should be noted that, with extremely limited exceptions rarely exercised, no Federal agency action or taking, whether intentional or incidental, can be authorized under the ESA if it is likely to jeopardize the continued existence of a listed species. This non-discretionary requirement, with a long and continuing history of judicial review, requires the highest level of scientific depth and quality, clarity in assessment, and coordination with the NMFS and FWS.

The Marine Mammal Protection Act is similarly non-discretionary and challenging in its requirements for science and assessment. Similar to the ESA, the MMPA prohibits the "take" of any marine mammal species, which includes "harassment," unless authorized by NMFS or FWS (depending on the species). "Harassment" is in turn defined by the MMPA to include –

> "annoyance . . . which – (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment]." 16 U.S.C. §§1362 (18).

As for the ESA, BOEM's authorizations under the MMPA do not typically include intentional taking of marine mammals, with the exception of "harassment" to keep animals away from places where they might cause harm or be harmed (e.g. polar bears near facilities). However Level A and, especially, Level B harassment can constitute incidental taking and is a significant issue in BOEM's assessments. When it occurs, incidental taking by harassment may be authorized by NMFS or FWS if the impact is "negligible" and the methods employed cause the "least practicable adverse impact." A key area issue for BOEM research is potential incidental taking through effects on cetacean behavior from use of air guns in seismic acoustic exploration.

BOEM's environmental assessment function also addresses the complex requirements of other laws including the Coastal Zone Management Act, with state program consistency generally required; the Magnuson-Stevens Fishery Conservation and Management Act, which requires review and protection of "essential fish habitat"; the Clean Air Act, which nationwide is typically managed by the U.S. Environmental Protection Agency (EPA) at the Federal level but which for the OSC in the western and central Gulf of Mexico and offshore the North Slope Borough of Alaska in managed by BOEM and BSEE; the Clean Water Act, administered by EPA at the Federal level; the National Historic Preservation Act, with particular focus on identifying and protecting shipwrecks and submerged settlements on the OCS; and the Migratory Bird Treaty Act, whose restrictions on taking migratory birds are implemented by the FWS.

Coordination with BSEE

Coordination with BSEE requires an additional, relatively new, effort by BOEM's Environmental Assessment staff. Since May 21, 2010, when Secretarial Order 3299 allocated responsibilities of the former Minerals Management Service to BOEM, BSEE, and the Office of Natural Resources Revenue (ONRR), BOEM has been responsible for more general decisions concerning OCS activities, such as approval of leasing plans, lease sales, explorations plans, and development and production plans. Consistent with BOEM's decisions, BSEE has been responsible for more specific decisions including issuance of permits to drill and other specific authorizations, stipulations, and conditions for operators, as well as enforcement and platform decommissioning.

Both BOEM and BSEE must comply with the laws generally applicable to federal agencies, including NEPA, the ESA, and the MMPA. However it is in the interest of government efficiency in expense and time for BOEM and BSEE to avoid redundant reviews. Consequently, BOEM and BSEE have agreed that BOEM will undertake studies, environmental assessments, and consultations with a view to providing the environmental information and guidance needed for decisions by both BOEM and BSEE. The bureaus have also agreed that BOEM will supplement studies, assessments and consultations if BSEE concludes that more information is needed for its decision-making. This new interagency relationship requires a new level of effort for coordination and procedural integration.

Major Cross-Cutting and Regional Assessment Documents

BOEM's environmental assessments include the development of programmatic environmental impact statements for the Bureau's Five Year Program; for renewable energy activities; for geological and geophysical (G&G) activities in the Atlantic, the Gulf of Mexico, and Alaska; and for the Marine Minerals Program. BOEM's growing role in marine planning is likely to increase the use of programmatic EISs and comprehensive planning. Marine planning identifies areas most suitable for various types or classes of activities in order to reduce conflicts among uses, reduce environmental impacts, facilitate compatible uses, and preserve critical ecosystem services to meet economic, environmental, security, and social objectives.

BOEM follows programmatic statements with individual EISs, environmental assessments, findings of no significant impact, or determinations that a categorical exclusion applies. In this phased process, BOEM prepares hundreds of additional site-specific NEPA documents annually for decisions on proposed oil and gas operations, including operators' plans for exploration and development, pipeline permit applications, geophysical survey and geological sampling permit applications, structure removal, and other related industry activities. In FY 2013, BOEM completed over 500 environmental assessments for such activities following lease issuance.

Divers exploring coral growth on platform legs. BOEM photo

In FY 2014 and 2015, BOEM will continue work on a programmatic EIS for the next Five Year Program (2017-2022) and intends to use a new format to improve the EISs' accessibility and use in decision-making. In February 2014, BOEM completed a programmatic EIS for G&G activities in the Atlantic, prepared jointly by staff in the Gulf of Mexico and in the Washington, D.C., area. In coordination with BSEE, BOEM is reviewing existing categorical exclusions and developing appropriate revisions. One change has already been implemented following the *Deepwater Horizon* incident: BOEM is preparing EAs rather than relying on CEs for all new and revised exploration or development plans in deep water and for other plans when unique environmental concerns are identified. BOEM also provides guidance for national OCS environmental policy.

Assessments in the Gulf of Mexico Region: In 2014 and 2015, BOEM's Gulf of Mexico Region will complete or advance several major NEPA documents. These include a programmatic EIS for Gulf of Mexico G&G activities, prepared jointly with BOEM staff in the Washington, D.C., area; an EIS for a scheduled Eastern Planning Area lease sale; a supplemental EIS considering new studies following the *Deepwater Horizon* explosion and oil spill, including available data from the Natural Resource Damage Assessment and Restoration process; and EISs for lease sales in the Central and Western Gulf of Mexico. These new activities follow the completion of the programmatic EIS for Atlantic G&G activities in February FY 2014, referenced above, and a supplemental EIS for lease sales in the Gulf's Central and Western Planning Areas that was completed in FY 2013.

In FY 2014 and 2015, BOEM also expects to complete NEPA documents for decisions on many G&G permit applications, pipeline applications, exploration plans, development operations coordination documents (including deep- and ultra-deep water activity), and facility decommissioning. In FY 2013, BOEM prepared NEPA documents for 299 plans for the Gulf; 103 pipeline applications; 57 G&G permit application; applications for 34 ancillary activities; and applications for 270 structure removals. BOEM expects FY 2014 and FY 2015 numbers to be the same or slightly higher.

Assessments in the Alaska Region:
BOEM's 2012-2017 Five Year Program includes sales in the Cook Inlet, Beaufort Sea and Chukchi Sea Planning Areas. Although the first of these sales, Chukchi Lease Sale 237, is not scheduled until calendar year 2016, the Alaska Region is already working on components of the NEPA analyses that will be used to support decisions regarding the sales in these areas. Presuming industry interest will increase in the Alaska OCS, BOEM must work diligently to keep pace. BOEM is also moving forward with a supplemental EIS for Chukchi Lease Sale 193, which was held in 2008. The 9th Circuit Court of Appeals invalidated a previous EIS for Lease Sale 193 in January 2014, and BOEM is taking steps in response.

More generally, BOEM Alaska is working with other agencies and stakeholders to understand the impacts of OCS activities on the Arctic marine environment. The bureau is currently a cooperating agency to NMFS's lead in preparing a programmatic EIS for Arctic G&G activities, and the BOEM will conduct NEPA analyses in FY 2014 and 2015 to support decision-making on specific G&G permits. The Alaska Region is particularly committed to close interaction with Alaskan natives and the integration of traditional knowledge into interpretive documents and decision-making. The cold winter temperatures, presence of ice, and limited infrastructure obviously add challenges to OCS development.

Walrus surfacing offshore Alaska.
Photo: Mary Cody, BOEM

Assessments in the Pacific Region: BOEM's Pacific Region conducts environmental assessments for conventional and renewable energy activities. BOEM's conventional energy assessments focus on development and production from 23 existing OCS facilities, largely in support of BSEE environmental enforcement. Support for BSEE includes NEPA documents, assisting in enforcement of mitigation measures, and review of the measures' effectiveness.

Platform Hogan, Carpinteria, offshore California.
Photo: BOEM

The Carpinteria Offshore Field Redevelopment Project is a priority. The project involves drilling laterally from an existing platform in the Federal OCS to produce oil and gas from leased areas in adjacent state waters. BOEM and the California State Lands Commission are jointly developing an environmental impact report/environmental impact statement for the various approvals for this project. Final decisions by BOEM and the California State Lands Commission are expected by late summer 2014.

BOEM will also continue working with agencies and other stakeholders to advance research and commercial renewable energy projects on the Oregon and Hawaii OCS. WindFloat Pacific has submitted a commercial wind lease request to BOEM for a project offshore Coos Bay, Oregon, and the bureau plans to complete an environmental review of the project by the first quarter of FY 2016 before making a decision on lease issuance. In May 2014, the Department of Energy announced approval of a grant to provide up to $47 million of support for the project. BOEM has also received a research lease request for a grid-connected wave energy test facility on the OCS offshore Newport, Oregon. The lease requires a FERC license in addition to BOEM approval, and the bureau plans to cooperate with FERC on environmental review before making a leasing decision in FY 2016.

Floating Wind Turbine.
Photo: Courtesy of Principle Power

Two draft commercial wind lease requests have been submitted to BOEM for an OCS area offshore the island of Oahu, Hawaii. BOEM will conduct environmental assessments of the requests if the Department of Defense determines that the proposed use of the area is compatible with national security and military operations. BOEM also anticipates receiving a request in FY 2014 or FY 2015 to authorize placement of power lines for transmitting electricity between the islands of Oahu and Maui that is generated by renewable energy facilities on Hawaii's OCS. BOEM expects to complete environmental review of the request in FY 2016.

Other Renewable Energy Assessments: The number of renewable energy environmental analyses in 2014 and 2015 will depend on the level of developer interest, whether leases are competitive or non-competitive, and the time required to collect information for site assessment and construction operations plans.

ENVIRONMENTAL STUDIES PROGRAM

BOEM's Environmental Studies Program function was established in 1973 by OCSLA, which directed the Secretary of the Interior, now through BOEM, to –

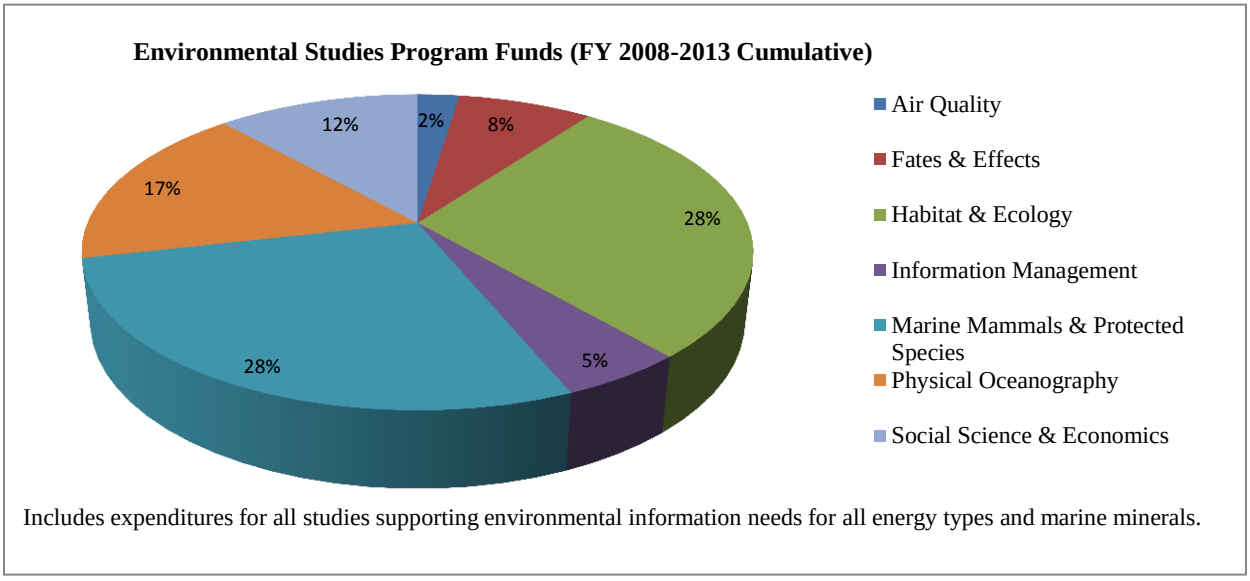
> ". . . conduct a study of any area or region included in any oil and gas lease sale or other lease in order to establish information needed for assessment and management of environmental impacts on the human, marine, and coastal environments of the outer Continental Shelf and the coastal areas which may be affected by oil and gas or other mineral development in such area or region." 43 U.S.C. §1346(a)(1).

". . . to predict impacts on the marine biota which may result from chronic low level pollution or large spills associated with outer Continental Shelf production, from the introduction of drill cuttings and drilling muds in the area, and from the laying of pipe to serve the offshore production area, and the impacts of development offshore on the affected and coastal areas." 43 U.S.C. §1346(a)(3).

"Subsequent to the leasing and developing of any area or region, [to conduct] such additional studies as he deems necessary and shall monitor the human, marine, and coastal environments of such area or region in a manner designed to provide time-series and data trend information which can be used for comparison with any previously collected data for the purpose of identifying any significant changes in the quality and productivity of such environments, for establishing trends in the areas studied and monitored, and for designing experiments to identify the causes of such changes." 43 U.S.C. §1346(b).

BOEM's studies address each of these OCSLA mandates. The discoveries and information generated through the studies program inform decisions by BOEM and BSEE concerning implementation of OSCLA, NEPA, ESA, MMPA, and other applicable laws discussed above. The decisions include actions on regulations, measures for impact mitigation, stipulations to leases, notices to lessees, permits, and enforcement. BOEM works to address science needs for multiple OCS energy and mineral resource uses and to consider studies independently underway, and within that context, to design and implement effective research for decision-making.

A major, continuing emphasis is to understand the release, transport, fate, and effects of oil and other materials that may be discharged or spilled in the marine environment. Research on spill response is also a priority, conducted in close cooperation with BSEE's Oil Spill Program. The graph below provides a break-down of study funding by discipline.



Includes expenditures for all studies supporting environmental information needs for all energy types and marine minerals.

Beginning in FY 2014, BOEM is developing a far-reaching, continuing collaboration with the National Research Council (NRC) of the National Academy of Sciences, with a view to

establishing an NRC committee dedicated to the needs of BOEM. The committee's functions may include periodic comprehensive review of BOEM's programs; addressing questions of particular interest to the bureau; participating in annual environmental study program reviews with the OCS Scientific Committee; providing peer review; facilitating stakeholder discussions of controversial issues; informally advising on recruitment; and providing facilities and support for meetings in Washington and at Irvine, California, and Woods Hole, Massachusetts, where the National Academy has offices, designed to facilitate scientific meetings BOEM anticipates beginning support for this collaboration in FY 2014 and continuing support in FY 2015.

Because of its quality, scale, and duration, BOEM's Environmental Studies Program is a leading contributor to the growing body of scientific knowledge about the nation's marine and coastal environment and is a major U.S. science agency. BOEM is committed to the highest level of scientific and scholarly integrity, as set forth by the Interior Department's Scientific and Scholarly Integrity Policy, by the Office of Science and Technology Policy, and by the President.

Research Partnerships

Many BOEM studies are partnerships, including, for example, research addressing seismic noise impacts on marine mammals, environmental effects of sand and gravel extraction, real-time monitoring of environmental parameters, and long-term ecosystem monitoring in the Gulf of Mexico, Alaska and the Pacific. Partnerships with Federal partners are typically through memoranda of understanding or agreement with individual agencies and with the National Oceanographic Partnership Program (NOPP), a collaborative community of Federal agencies, academia, the private sector and non-governmental organizations working to improve knowledge of the ocean environment.

The NOAA Ship Ronald H. Brown is used in many BOEM-NOAA research missions. NOAA photo

For example, BOEM is currently supporting ship-based marine mammal and bird studies in cooperation with the FWS and National Oceanographic and Atmospheric Administration (NOAA). A new effort for FY 2014 involving NOPP is the "Marine Arctic Ecosystems Study: A Multi-Agency Partnership" (MARES). This multi-agency project is intended to enhance arctic research coordination and improve regulatory decisions and NEPA analyses pertinent to lease sales in the Beaufort Sea, with the potential to include the Chukchi Sea. Participation in NOPP and with other partners will continue in FY 2015. Use of NOAA ships and research vessels over the decades under the NOPP framework has been integral to the success of many of BOEM's studies and ability to gather first-hand information about the marine environment.

Collaborations with the academic community are undertaken through BOEM-supported Coastal Marine Institutes located at the University of Alaska-Fairbanks and at Louisiana State University, as well as through several units within the Cooperative Ecosystem Studies Unit Network. These partnerships allow the contributing parties to leverage resources, extend the scope (both duration

and area) of the research, and maximize the utility of results. Partners in the CMI as well as NOPP endeavors bring funds, equipment, facilities and personnel to support collaborative efforts. Many projects include opportunities to train students and contribute to the next generation of environmental leaders.

BOEM's Award-Winning Studies

On January 16, 2014, Secretary Jewell announced the winners of the Department of the Interior's Partners in Conservation Award, including two partnerships from BOEM. The PIC Awards recognize programs implemented through partnerships that represent excellence in conservation achievements; that further the Department's mission; that exemplify innovation and best practices for collaborative partnerships; and that build capacity for partnerships and conservation sustainability.

Continuing the recognition BOEM partnership studies have received in the past, two studies involving two BOEM partnerships recently won the DOI Partners in Conservation Award.

One titled "Developing Environmental Protocols and Monitoring to Support Ocean Renewable Energy and Stewardship" was developed in response to increased interest in offshore renewable energy. BOEM collaborated with the Department of Energy (Office of Energy Efficiency and Renewable Energy – Wind and Water Power Program) and NOAA's Office of Oceanic and Atmospheric Research, National Ocean Service, and NMFS using the NOPP framework. The partnership involved other Federal agencies, academic institutions, private companies and public stakeholders to conduct a suite of eight projects with a total value of $4.7 million. The partnership study topics broadly include baseline environmental information gathering, identification and evaluation of best management practices and protocols, evaluation of technologies for environmental assessment and monitoring, development of protocols and GIS tools to assist with facility siting, and the social and cultural implications of renewable development. All projects directly support sustainable management of energy by developing or providing baseline information for tools that assist managers in evaluating selected locations for their appropriateness for siting an offshore renewable energy facility. These tools to evaluate sites improve managers' ability to select appropriate offshore sites for leasing and development, and minimize conflicts.

The Kraken II ROV is equipped with all the tools needed for collecting deepwater specimens. Image: Deepwater Canyons 2012 Expedition, NOAA-OER/BOEM.

The second studies award winner was "Exploration and Research of Mid-Atlantic Deepwater Hard Bottom Habitats and Shipwrecks with Emphasis on Canyons and Coral Communities." This collaboration is among diverse organizations, including three Federal agencies, 11 academic institutions, a state museum, and two private companies conducting research on deep-sea communities and historical shipwrecks off the mid-Atlantic coast. Utilizing cutting-edge technologies, including robotic underwater vehicles, benthic landers and instrumented moorings, results have included the

discovery of abundant deep-water coral habitats and perhaps the largest methane seep community in the world. Knowledge of unique biological and cultural resources in deep water is necessary for offshore energy management decisions, and the science resulting from this study will be directly utilized by managers to strengthen the protection and conservation of these habitats from potential impacts related to energy development.

The Studies Development Plan

BOEM's environmental studies include multiple layers of review to ensure that the best projects relevant to BOEM's mission are selected. Each year, BOEM environmental staff solicit input from stakeholders and identify priority studies based on scientific merit, feasibility, relevance to decision-making (including timing), and cost. Potential studies are presented in an annual Studies Development Plan that addresses a three year time horizon. The study plan is peer reviewed internally through "subject matter expert" teams and others, and external review is provided by the OCS Scientific Committee, a Federal advisory committee whose 15 non-Federal members are appointed by the Secretary of the Interior. A representative from BOEM and a representative from NOAA serve as non-voting Federal members. The OCS Scientific Committee advises the Secretary, through the BOEM Director, on the feasibility, appropriateness, and scientific value of the program. Once proposed studies are critiqued by the OCS Scientific Committee, they are evaluated again before funding by program staff leadership, principally with reference to decision-making relevance, timing, and budget constraints. The study program is adjusted as changing circumstances require, and studies are added or removed or partners changed.

National Studies

The studies development plan includes research relevant to knowledge and decision-making at all levels within BOEM, and many studies are of global interest. These studies are currently grouped under the heading of "national studies" in the development plan and managed centrally by BOEM's Office of Environmental Programs, although BOEM's regional offices and Renewable Energy Program staff participate in and may lead projects. Leadership is all about the people and not where they go to work. The fundamental distinction of national studies is that they are intended to address issues of recognized broad interest rather than of more specific interest to a region or program.

The national studies include a long-term partnership with the Smithsonian's National Museum of Natural History to preserve biological specimens from Federally-funded research and to maintain and provide quality assurance for the databases associated with the specimens. Since the bureau's partnership with the Smithsonian began in 1979, almost 400 new species have been described from the BOEM collection. Tissue archiving has begun as part of the program, allowing DNA sequencing in the future.

Smithsonian researchers have described and archived almost 400 marine life samples gathered through BOEM-funded research. Photo: Greg Boland, BOEM

In collaboration with NOAA, BOEM also supports MarineCadastre.gov – a mapping website that allows visitors to view information concerning marine waters of the United States by geospatial units, including information on boundaries, infrastructure, human uses, energy potential, and other data sets. BOEM is specifically supporting work to enhance the website's public dissemination of environmental data sets, reports and other study products maintained by BOEM in its Environmental Studies Program Information System (ESPIS) and in other systems.

Information on the studies BOEM will undertake in FY 2014 is available through the BOEM website, and the list of FY 2015 studies will be available later this year. Studies planned in FY 2014 address the impacts of spills and new renewable energy development, and also include projects to improve baseline characterizations and trend information. Special focus this year is given to work on marine mammals, birds, marine acoustics, marine hydrokinetics, sea ice, air quality, and long-term and cumulative impact, with an emphasis on partnerships to conduct studies.

Some specific examples of National-level studies planned for FY 2014 include:

- Developing BOEM's Access to Protected Species Occurrence Data for Impact Analyses and Rule-making
- Continued Archiving of Outer Continental Shelf Invertebrates by the Smithsonian Institution National Museum of Natural History
- Marine Arctic Ecosystems Study: A Multi-Agency Partnership
- Propagation Characteristics of High-Frequency Sounds Emitted During High-Resolution Geophysical Surveys

Since the Energy Policy Act of 2005 granted BOEM authority over offshore renewable energy development, BOEM has expanded the breadth of studies related to the environmental impacts of renewable energy in the areas where development is likely to occur. BOEM's renewable energy program works with many agencies, universities and other stakeholders to identify critical data gaps. In FY 2013, BOEM initiated three new studies to address Atlantic coast science needs for renewable energy development, and six additional studies were launched in FY 2014. Current priorities are real-time observations of facility development, environmental and socioeconomic effects of port modifications, development impacts on marine mammals and birds, and effects of electromagnetic fields on biota. Several ongoing studies are expected to be completed in FY 2014 addressing bird abundance, hard bottom communities in canyons, air quality, cultural resources and the fates and effects of chemicals associated with wind turbines.

Gulf of Mexico Region Studies: Long-term environmental monitoring is combined with experimental research to give Gulf of Mexico OCS decisions a firm scientific base. Studies in

the Gulf of Mexico Region analyze and explore the ecology of every ocean province – from coastal marsh to ocean abyss – recognizing that oil and gas activities affect all habitats and that new technologies are facilitating activities in deeper waters. BOEM is especially challenged to provide the information and oversight needed for developing these new frontiers where biological and other environmental information currently is sparse and often outdated. The bureau emphasizes studies addressing deep waters of the Gulf offshore both the U.S. and Mexico.

One priority is additional deepwater current observations that can be used to validate the basin-wide ocean current model BOEM uses for the Gulf of Mexico. The *Deepwater Horizon* explosion and oil release has given impetus to revising baseline conditions and answering fundamental biogeochemical questions. For instance, a modeling effort is currently underway to hindcast the *Deepwater Horizon* oil spill plume in vertical and horizontal directions and to validate these results with available observations. More must be learned about the behavior of spilled oil and oil mixed with dispersants, including particularly the interaction of dispersed oil with deepwater sediments. Post-*Deepwater Horizon*, the proliferation of damage assessments, recovery studies, and restoration projects provides a unique opportunity to develop a long-term comprehensive monitoring network that unifies existing monitoring programs and fills gaps in current monitoring. The challenge is to meet the needs of multiple ocean uses with a large-scale, integrated monitoring system that operates under common scientific goals to protect the environment, detect natural and anthropogenic change, and assess recovery.

Alaska Region Studies: BOEM's FY 2015 study efforts in the Alaska Region will focus on foundational research in the Beaufort and Chukchi Seas and new research in the Cook Inlet Planning Area. Strengthening collaborative research opportunities is a priority, including incorporation of traditional knowledge in research and interpretive materials. Other priorities are data synthesis; updating and improving oil spill risk analysis models; enhancing spill detection technologies and "nowcast" instrumentation; improving baseline monitoring of shore-zone habitats; improving ice forecast modeling; and generating a revised baseline for social indicators in North Slope communities. In FY 2015 and beyond, depending on the availability of funds, BOEM plans to conduct broad seabed surveys in the Chukchi Sea that integrate bathymetry, archaeological resources, and ice gouge occurrence data. Future Cook Inlet research will focus on monitoring ecological processes and benthic invertebrate habitats.

Pacific Region Studies: In the Pacific Region, BOEM studies address the environmental impacts of oil and gas production, marine hydrokinetic wave energy conversion, and wind energy conversion. The area covered includes the OCS offshore California, Oregon, Washington, and Hawaii. Partners have a key role in Pacific Region studies; external stakeholders submitted eight proposals in FY 2013, including joint or individual proposals from the National Park Service, U.S. Geological Survey, Bureau of Land Management, NOAA, the State of California, and the State of Hawaii. All the proposals were reviewed through the studies program

Pacific researchers determine the diversity and cover of intertidal organisms along the shore. BOEM photo

process, and funding priority was given for acquiring baseline information in areas where information is non-existent or limited, for studies to anticipate direct impacts at potential lease sites, and for monitoring offshore energy structures and devices after installation.

For conventional energy, the Pacific Region's priorities are better information for oil spill trajectory modeling and a synthesis of 30-years of research concerning how fish and invertebrate populations at oil and gas production platforms influence the marine ecology of the Pacific coast. Renewable energy study priorities include several issues for the OCS offshore Hawaii and Oregon.

In Hawaii, BOEM's focus is locating submerged and shoreline cultural sites, determining seabird presence and ecology, performing a biogeographic assessment of marine species, and mapping human uses from the shore to the exclusive economic zone limit.

In Oregon, priorities include observing the effect of power cables on species sensitive to electromagnetic fields, assessing benthic environments where facilities may be installed, and improving understanding of seabird oceanic flight behavior. In response to a request from the State of Oregon, BOEM worked with diverse experts to examine existing and ongoing research concerning renewable energy and identify research gaps. The results are published as *Oregon Marine Renewable Energy Environmental Science Conference Proceedings* and are available on BOEM's website. In response to another request from the State of Oregon, BOEM is working to address environmental questions associated with wave and wind energy development in the Pacific Northwest, to synthesize new research and existing information, to distill research into products that agencies and resource managers can use, and to identify and prioritize study gaps for technologies and potentially affected environmental systems.

Non-energy Marine Minerals: BOEM, through its Marine Minerals Program (MMP), is also responsible for managing non-energy minerals (primarily sand and gravel) on the ocean floor. As stewards of these resources, BOEM must ensure that the removal of any mineral resource is conducted in a safe and environmentally sound manner, and that any potentially adverse impacts on the marine, coastal, or human environments are avoided or minimized. Marine minerals are used primarily in coastal restoration projects, including beach nourishment and wetlands restoration. Beach nourishment is the replenishment of beach sand by natural or artificial means.

Two current high priority areas for the bureau are (1) working with the 13 Atlantic coast states affected by Hurricane Sandy, and (2) continuing to actively lease OCS sand for restoration projects associated with the Deepwater Horizon Spill under the RESTORE Act and the Natural Resource Damage Assessment (NRDA) process. BOEM assesses environmental impacts, NEPA reviews and consultation under other laws, and based on those reviews develops mitigation measures or other requirements for inclusion in agreements or leases for observation when sand is dredged and transported. These requirements

Belle Pass, Louisiana Pumpout for Caminada Headland Restoration.
Photo courtesy of Weeks Marine

include items such as restrictions on the time and place of dredging, lighting, equipment, and buffers surrounding cultural resources and priority biodiversity habitat.

BOEM has invested more than $30 million over the past 20 years to identify non-energy resources on the OCS, conduct world-class scientific research, and lease OCS resources to coastal communities in need. Information from environmental research and resource identification has informed environmental assessment and leasing decisions concerning the use of OCS sand resources in beach nourishment and coastal restoration.

Global Issues: BOEM's environmental science expertise is often sought for intergovernmental and international forums where global issues such as the Arctic, sea level rise, climate change and coral health as indicators of changes in the ocean, and other issues are discussed. BOEM is a member of the International Offshore Petroleum Environmental Regulators (IOPER) collaborative, and the bureau is currently developing recommendations for consideration by IOPER on keystone institutional steps for governments with less experience in offshore energy development to consider as they address the matter.

Domestically, BOEM is well represented in the Interagency Arctic Research Policy Committee (IARPC), while internationally BOEM actively participates in the Arctic Council to advance scientific collaboration and best practices in the region. The United States chairmanship of the Arctic Council from 2015-2017 is an opportunity to make progress on those topics. The Arctic Council consists of the eight Arctic states: Canada, Denmark (including Greenland and the Faroe Islands), Finland, Iceland, Norway, Russia, Sweden and the United States. Six international organizations representing the Arctic Indigenous Peoples have permanent participation status.

COVER PHOTOS

Cover Background:
Piping Plover – stock image

Center column:

Crab atop *Lophelia* coral in the Gulf of Mexico.
Photo: Lophelia II mission 2012, NOAA-OER/BOEM

Walrus resting on Alaska ice – stock image

Coral and fish in the Flower Garden Banks, Gulf of Mexico
Photo: Courtesy of Gregory Boland, BOEM

Right column:

Blue Angelfish – stock image

Whale – stock image

Sea lions resting on mooring buoy, Santa Barbara Channel platform, California.
BOEM photo

BOEM promotes energy independence, environmental protection and economic development through responsible, science-based management of offshore conventional and renewable energy and marine mineral resources.

Visit us at www.boem.gov, and

- BOEM -