U.S. Department of the Interior
Bureau of Ocean Energy Management
U.S. Department of Commerce
National Marine Fisheries Service

Project Information Sheet

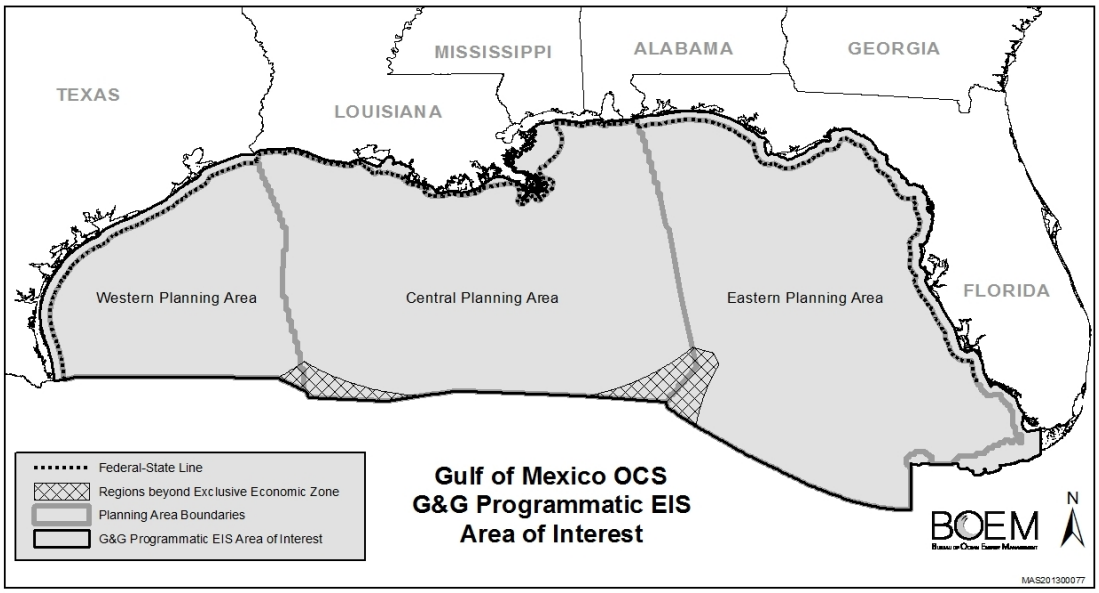
June 2013

Gulf of Mexico Geological and Geophysical Activities Programmatic Environmental Impact Statement

Programmatic Environmental Impact Statement

The Bureau of Ocean Energy Management (BOEM)[1] and National Marine Fisheries Service (NMFS) have issued a Notice of Intent (NOI) to prepare a Programmatic Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321-4347) to evaluate the potential environmental impacts of geological and geophysical (G&G) activities for oil and gas exploration and development, renewable energy, and marine minerals on the Gulf of Mexico Outer Continental Shelf (OCS) and in adjacent State waters.

The Gulf of Mexico G&G Activities Programmatic EIS will examine G&G activities within both Federal and State waters from the coastline out to the Exclusive Economic Zone within all three Gulf of Mexico Planning Areas.



[1] The Bureau of Ocean Energy Management (BOEM) was formerly known as the Minerals Management Service (MMS), which was created in 1982 to improve the management of Federal leasing revenues and which was designated as the Federal agency responsible for development activities on the OCS. Prior to the formation of MMS, the regulation of the Nation's offshore waters or Outer Continental Shelf (OCS) was performed by the U.S. Department of the Interior's Bureau of Land Management's OCS Offices and the Geological Survey's Conservation Offices. There were two operational programs within MMS: Offshore Energy and Minerals Management; and Minerals Revenue Management. In May 2010, Secretary of the Interior Ken Salazar issued Secretarial Order No. 3299 separating MMS's responsibilities into three distinct organizations to carry out the functions once performed by MMS. The MMS was renamed the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) in mid-June 2010, as Director Bromwich was sworn-in, to more accurately describe the scope of the organization's oversight. In October 2010, the revenue collection arm of BOEMRE (formerly MMS) became the Office of Natural Resources Revenue (ONRR). On October 1, 2011, under Secretary of the Interior Ken Salazar and BOEMRE Director Bromwich, BOEMRE was divided into two independent entities: (1) the resource development and energy management functions of BOEMRE, now known as BOEM; and (2) the safety and enforcement functions of BOEMRE, now known as the Bureau of Safety and Environmental Enforcement (BSEE).

As co-Lead Agencies, BOEM and NMFS intend for this Programmatic EIS to provide the necessary information and assessment under NEPA to support informed decisionmaking regarding G&G activities on the OCS for the following:

- future Outer Continental Shelf Lands Act (OCSLA) G&G permits and on-lease ancillary activities; and
- Marine Mammal Protection Act (MMPA) authorizations.

In addition, the preparation of this Programmatic EIS will help to ensure compliance with other applicable laws and statutes that include, but are not limited to, to the following:

- Endangered Species Act;
- Magnuson-Stevens Fishery Conservation and Management Act;
- Coastal Zone Management Act; and
- National Historic Preservation Act.

While State waters are not within the jurisdictional authority of BOEM, NMFS as the Co-Lead Agency for this Programmatic EIS has jurisdiction and permitting authority in Federal and State waters. The Area of Interest (AOI) encompasses adjacent State waters for three reasons:

(1) NMFS requires an assessment of the potential impacts to resources under its jurisdiction;
(2) G&G activities under all three program areas (oil and gas, renewable energy, and marine minerals) could include surveys that cross between Federal and State waters; and
(3) the potential adverse impacts associated with G&G activities introduced into the environment during G&G surveys could affect resources in State waters.

The U.S. Army Corps of Engineers has jurisdiction over such activities in State and Federal waters under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. The U.S. Army Corps of Engineers has established a Nationwide Permit (NWP) (NWP 6 Survey Activities) to regulate G&G activities in State waters. Depending on location, State-issued permits may be required.

The proposed action is for BOEM and NMFS to continue the issuance of permits and/or authorizations under their respective authorities for G&G activities in the U.S. portion of the Gulf of Mexico. The proposed action specifically includes the following:

(1) continuance of BOEM's permitting process and mandates for G&G operations in the Gulf of Mexico subject to regulatory authority as described in 30 CFR 551, 580, and 585; Subsections 8(k) and 8(p) of the OCSLA; and Section 388(a) of the Energy Policy Act of 2005;
(2) continuance of G&G activities conducted under a lease as described in 30 CFR 550; and
(3) issuance of regulations and associated Incidental Take Authorizations under Sections 101(a)(5)(A-D) of the Marine Mammal Protection Act (MMPA) by NMFS for activities included under this proposed action.

Programmatic EIS – Current Schedule*

Notice of Intent	May 2013
Comment Period	May-July 2013
Scoping Meetings	June 2013
Draft Programmatic EIS Published	Mid 2014
Comment Period and Public Meetings	Mid 2014
Final Programmatic EIS Published	Early/Mid 2015
Record of Decision	Mid/Late 2015

*Comment opportunities are in red.

Project History

In 2002, MMS (now known as BOEM) first submitted a petition for MMPA rulemaking to NMFS requesting authorization for the incidental take of sperm whales, as a result of G&G surveys. The NMFS requested that the MMPA petition be sought as a 5-year rule from the Government on behalf of industry versus individual industry requests. In 2003, NMFS published notice of receipt of the petition requesting public comment and review (68 FR 16263).

In 2004, MMS (now known as BOEM) provided NMFS with the Gulf of Mexico G&G Programmatic EA to support the rulemaking and Endangered Species Act consultation. BOEM also submitted a revision to the MMPA petition to include all species of marine mammals per a request from NMFS. Based on NMFS's review of public comments received on the petition (68 FR 16263), the 2004 revised MMPA petition, and the 2004 Gulf of Mexico G&G Programmatic EA and Finding of No Significant Impact, NMFS determined that an EIS was warranted and published an NOI in 2004 (69 FR 67535). This decision was based on a combination of the following factors:

(1) public concern over impacts of oil and gas exploration activities on the marine environment, which includes marine mammals;
(2) proposed use of computer modeling as one of two methods for calculating incidental take levels for marine mammals and sea turtles for a geographic area where multiple seismic sources may be operating simultaneously;
(3) incorporation of a scientifically-based risk assessment for marine mammals;
(4) possible use of energy criteria rather than the current pressure criteria to calculate marine mammal take levels, especially to calculate potential multiple exposures; and
(5) incorporation of new acoustic guidelines for assessing impacts of sound on marine mammals (69 FR 67535, November 18, 2004).

Since the publication of the NOI in 2004, NMFS has worked on the development of the EIS with the agency now known as BOEM serving as a Cooperating Agency. In 2008, NMFS requested that BOEM be a Co-Lead Agency. In 2011, BOEM submitted a revised MMPA petition (76 FR 34656), which contained updated information.

In 2010 following the events of the *Deepwater Horizon* explosion, oil spill, and clean up, the Natural Resources Defense Council and other environmental nongovernmental organizations filed suit against the U.S. Department of the Interior alleging BOEM (then BOEMRE) violated NEPA when issuing authorizations for seismic surveys in the Gulf of Mexico. In 2011, representatives of the oil and gas industry, as well as representatives of the geophysical contracting industry, joined the lawsuit as Intervenor-Defendants. Conditions agreed to by the parties and outlined in the final settlement agreement will be assessed in this Programmatic EIS.

The Gulf of Mexico G&G Activities Programmatic EIS will establish a framework for subsequent NEPA analyses for site-specific actions while identifying and analyzing appropriate mitigation measures to be used during future G&G activities on the OCS in support of the oil and gas, renewable energy, and marine mineral resource programs. The impacts of future site-specific actions will be addressed in subsequent NEPA evaluations, per the Council on Environmental Quality's regulations (40 CFR 1502.20), by a tiering process from this programmatic evaluation.

The scope of the Gulf of Mexico G&G Activities Programmatic EIS includes a NEPA analysis of specific types of G&G activity that can take place pre- and post-lease on the Gulf of Mexico OCS and the potential impacts stemming from those activities. The scope of the Gulf of Mexico G&G Activities Programmatic EIS does not include a NEPA analysis to evaluate a specific proposal for oil and gas, renewable energy, or marine mineral leasing; does not authorize any OCS lease sales; and does not approve plans for OCS oil and gas, renewable energy, or marine mineral exploration and/or development. As mentioned above, the impacts of future site-specific actions will be addressed in subsequent NEPA evaluations.

Uses of Geological and Geophysical Survey Data

The G&G surveys provide information on the potential location, extent, and properties of hydrocarbons and other minerals resources, as well as information on shallow geologic hazards and seafloor geotechnical properties. Industry uses this information to explore, develop, produce, and transport hydrocarbons and nonenergy minerals safely and economically, and for the siting of facilities on the OCS. These G&G activities provide operators with the needed information to make business decisions about acquiring leases and the G&G activities that can take place on-lease. The G&G data are also used for assessing the suitability of seafloor sediments for renewable energy facilities and to evaluate the quantity and quality of marine minerals, primarily sand and gravel, for beach nourishment, wetland restoration, and other federally authorized projects. BOEM needs this information to fulfill its statutory responsibilities under the OCSLA to ensure safe operations, protect environmental and archaeological resources, ensure fair market value for leases, make royalty relief determinations, and conserve oil and gas and other mineral resources on the OCS.

Regulatory Background

The OCSLA mandates that BOEM ensure that the G&G survey acquisition data and information collected by industry and Government are obtained in a technically safe and environmentally sound manner. BOEM's regulations governing seismic survey activities include 30 CFR 551, 580, and 585; Subsections 8(k) and 8(p) of the OCSLA; and Section 388(a) of the Energy Policy Act of 2005. The regulations, in part, state that geological and geophysical activities cannot

- interfere with or endanger operations under any lease or right-of-way easement, right-of-use, scientific notice, or permit issued or maintained pursuant to the OCSLA;
- cause harm or damage to aquatic life, property, or the marine, coastal, or human environments;
- cause harm or damage to any mineral resource (in areas leased or not leased);
- cause pollution;
- create hazardous or unsafe conditions;
- unreasonably interfere with or harm other uses of the area; or
- disturb archaeological resources.

When BOEM reviews a request to acquire seismic survey information and determines that resources of concern (e.g., archaeological, sensitive benthic resources, and protected species) could be adversely affected, the operators/lessees are required to proceed in one of the following three ways:

- employ specific operational procedures to protect the resources of concern;
- adjust the location of the proposed activity(ies) to a distance necessary to prevent disturbance of the resource(s) of concern; or
- perform additional investigations to establish that the potential resources of concern do not exist at the proposed site or will not be adversely affected by the proposed activity.

The most current versions of these regulations can be found at http://www.boem.gov/Regulations/Code-of-Federal-Regulations.aspx.

The NMFS is responsible for the stewardship of the Nation's living marine resources and their habitat. The NMFS statutory responsibilities under the MMPA ensures that the taking ("to harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect"*)* of marine mammals without a permit or exemption is prohibited. Under the MMPA, NMFS is responsible for issuing authorizations for the taking (by harassment) of marine mammals incidental to the permittees conducting G&G activities in Federal and State waters. The NMFS will use this NEPA document to help support the MMPA rulemaking decision of Incidental Take Authorizations to operators and lessees. Through these authorizations, NMFS must also identify the following:

- permissible methods of taking pursuant to the activity and the specified geographical region of taking;
- the means of effecting an unmitigable adverse impact on the species or stock and its habitat and on the availability of the species or stock for "subsistence" uses; and
- requirements for monitoring and reporting, including requirements for the independent peer review of proposed monitoring plans where the proposed activity may affect the availability of a species or stock for taking for subsistence uses.

Contact Information

For further information on the Gulf of Mexico G&G Activities Programmatic EIS, please visit BOEM's website at http://www.boem.gov/GOM-G-G-PEIS/.

If you have questions, please contact Mr. Gary D. Goeke at (504) 736-3233 or by email at gomggeis@boem.gov.

U.S. Department of the Interior
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Special Information

May 2013

BOEM Issues Notice of Scoping Meetings for the Programmatic Environmental Impact Statement for Geological and Geophysical Activities on the Gulf of Mexico

The Bureau of Ocean Energy Management (BOEM) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) are initiating the environmental evaluation for geological and geophysical (G&G) activities on the Gulf of Mexico Outer Continental Shelf (OCS) and adjacent State waters to the shoreline (excluding estuaries). As co-Lead Agencies, BOEM and NMFS are proposing the preparation of a Programmatic Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA). BOEM and NMFS published a combined Notice of Intent (NOI) to Prepare an EIS and Notice of Scoping in the *Federal Register* on May 10, 2013.

BOEM and NMFS will hold public scoping meetings in June 2013 to solicit input on the scope of the proposed Programmatic EIS. The following public scoping meetings are planned for the proposed Programmatic EIS:

Tampa, Florida: Monday, June 10, 2013, Embassy Suites Westshore Tampa Airport Hotel, 555 North Westshore Boulevard, Tampa, Florida 33609; one meeting beginning at 6:30 p.m. EDT;

Fort Walton Beach, Florida: Tuesday, June 11, 2013, Ramada Plaza Beach Resort, 1500 Miracle Strip Parkway, SE, Fort Walton Beach, Florida 32548; one meeting beginning at 6:30 p.m. CDT;

Mobile, Alabama: Wednesday, June 12, 2013, Government Plaza, 205 Government Street, Mobile, Alabama 36644; one meeting beginning at 6:30 p.m. CDT;

Gulfport, Mississippi: Thursday, June 13, 2013, Courtyard by Marriott Gulfport Beachfront MS Hotel, 1600 East Beach Boulevard, Gulfport, Mississippi 39501; one meeting beginning at 6:30 p.m. CDT;

Galveston, Texas: Monday, June 17, 2013, Galveston Hilton, 5400 Seawall Boulevard, Galveston, Texas 77551; one meeting beginning at 6:30 p.m. CDT;

New Orleans, Louisiana: Wednesday, June 19, 2013, Bureau of Ocean Energy Management, 1201 Elmwood Park Boulevard, New Orleans, Louisiana 70123; one meeting beginning at 1 p.m. CDT; and

Silver Spring, Maryland: Thursday, June 20, 2013, National Oceanic and Atmospheric Administration, 1305 East-West Highway, Silver Spring, Maryland 20910; one meeting beginning at 1:00 p.m. EDT.

The scoping meetings are part of the planning process where Federal, State, and local government agencies and other interested parties have the opportunity to aid BOEM and NMFS in determining significant issues and alternatives for analysis in the proposed Programmatic EIS. Comments received during the public scoping meetings and throughout the scoping period will assist BOEM and NMFS in developing the scope of the proposed Programmatic EIS. These early planning and consultation steps are important to ensure that your interests and concerns are communicated to BOEM and NMFS as the Programmatic EIS is developed. Therefore, your attendance at these meetings is encouraged. If you are unable to attend the meetings, you may submit written comments in one of the following ways:

1. In an envelope labeled "Scoping Comments for the Gulf of Mexico G&G Programmatic EIS" and mailed (or hand delivered) to Mr. Gary D. Goeke, Chief, Environmental Assessment Section, Office of Environment (GM 623E), Bureau of Ocean Energy Management, Gulf of Mexico OCS Region, 1201 Elmwood Park Boulevard, New Orleans, Louisiana 70123-2394;

2. Through the regulations.gov web portal: Navigate to http://www.regulations.gov and search for "Geological and Geophysical Exploration Activities on Federal and State Waters of the Gulf of Mexico". (Note: It is important to include the quotation marks in your search terms.) Click on the "Comment Now!" button to the right of the document link. Enter your information and comment, then click "Submit"; or

3. BOEM email address: gomggeis@boem.gov.

Comments should specifically address factors related to the scope of the proposed Programmatic EIS. Written comments should be submitted no later than July 9, 2013.

For further information on the Gulf of Mexico G&G Programmatic EIS, please visit our project website at http://www.boem.gov/GOM-G-G-PEIS/.

For further information on the scoping or Programmatic EIS processes, please contact Mr. Gary D. Goeke at (504) 736-3233.

If you would like to receive announcements for public meetings and the availability of our environmental documents for Gulf of Mexico OCS activities, please submit your name and contact information to BOEM at https://www.data.boem.gov/homepg/data_center/other/gmaillist/subscribe.asp. You may also request to be removed from the current BOEM mailing list in the same way.

June 2013

Types of Geological and Geophysical Surveys and Equipment

Geological and geophysical (G&G) surveys provide information used by government and industry to evaluate the potential for offshore oil, gas, methane hydrate resources, non-energy/marine mineral resources, and geologic hazards. The Bureau of Ocean Energy Management (BOEM) uses this information to fulfill its statutory responsibilities to ensure safe operations, support environmental impact analyses, protect benthic resources through avoidance measures, meet listed species' consultation requirements, ensure fair market value for leases, make royalty relief determinations, conserve oil and gas resources, and perform other statutory responsibilities.

The G&G surveys are conducted within our oceans and waters to:

(1) obtain data for hydrocarbon (oil, gas, and sulphur) exploration and production,
(2) locate and monitor marine mineral resources,
(3) aid in locating sites for alternative energy structures and pipelines,
(4) identify possible manmade, seafloor, or geologic hazards, and
(5) locate potential archaeological and benthic resources.

In general, G&G surveys are typically classified into the following categories by equipment type and survey technique:

- Hydrocarbon Exploration and Development Deep-Penetration Seismic;
- Hydrocarbon Exploration and Development High-Resolution Geophysical (HRG) Seismic;
- Active Acoustic Source HRG Seismic;
- Electromagnetic, Magnetic, Gravity, and Remote Sensing; and
- Geological Testing (Bottom Sampling and Drilling/Coring).

Geophysical Surveys

Hydrocarbon Exploration and Development Deep-Penetration and HRG Surveys

Deep-penetration seismic exploration and development surveys are conducted to obtain data on geological formations from the sediment near-surface to several thousand meters deep (below the sediment surface). A survey vessel or vessels tow a low-frequency acoustic source or sources (usually high-pressure airgun or airgun arrays), sending an acoustic signal that penetrates several thousand feet in the earth's subsurface and is then reflected to surface receivers. These receivers can either be towed in the water column or placed on the ocean bottom. These airguns generate air bubbles that expand and contract in the water column, and the resultant noise levels are generally in the 225-260 decibel range for airgun arrays. The resultant information, which is then processed by exclusive algorithms, enables industry to define strata and geologic structures/hazards and to accurately assess potential hydrocarbon reservoirs. This enables industry to optimally locate exploration and development wells in an effort to maximize extraction and production from a reservoir.

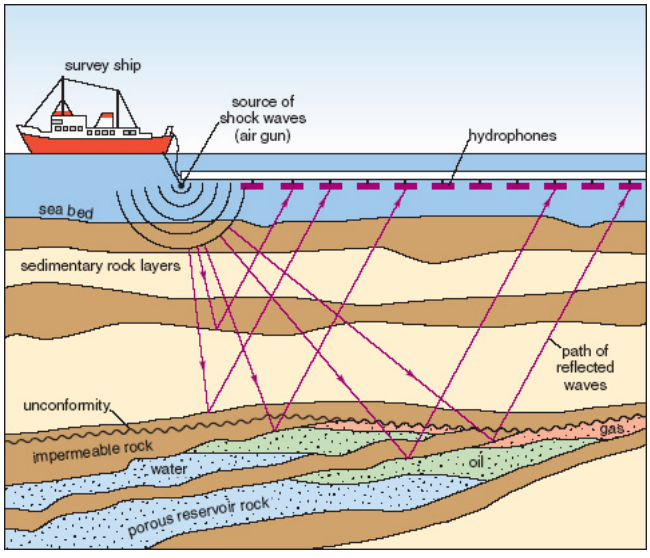

Photo 1. Basic Application of Seismic Data Acquisition in a Marine Setting (USEPA, 2011).

State-of-the-art computer mapping systems use seismic data sets generated by the following seismic survey types:

- **Two-Dimensional (2D) Surveys**: The 2D acquisition involves a single vessel towing a single acoustic array. The receivers are either towed behind the vessel on a long cable (streamer) or placed on the ocean bottom (cables or nodes). The resultant data set is a planar representation of the subsurface. The 2D dataset can generally be acquired for identifying regional structural geology and/or linking known productive areas over large geographic areas to similar geological features.
- **Three-Dimensional (3D) Surveys**: The 3D acquisition involes one or several acoustic source vessels towing multiple receiver cables (or cable/nodal recivers configured on the ocean bottom) to acquire a 3D volume of data. The 3D seismic data have enabled industry to identify, with greater precision, where the most economical prospects may be located. The 3D technology is also used to identify previously overlooked hydrocarbon-bearing zones and new productive horizons. However, because 3D modeling requires much denser data coverage (i.e., closer line spacing) than 2D seismic surveys, areas already covered using 2D techniques may be resurveyed. Variations of 3D surveys include the following:
    1. **Four-Dimensional (4D) Surveys**: The 4D surveys are time-lapse 3D surveys that are repeated over producing fields to characterize production reservoirs. The 4D surveys are used predominantly as a post-reservoir variance over time as a reservoir monitoring tool.
    2. **Wide Azimuth (WAZ)/Coil Multi-Vessel Surveys**: In single-vessel 3D surveys, only a limited subset of the reflected wave field can be recorded because of the narrow range of source-receiver azimuths. Wide, rich, and multi-azimuth acquisition configurations involve multiple vessels operating concurrently in a variety of source vessel-to-acquisitional vessel geometries. Several source vessels (usually 2-4) are used in coordination with single or dual receiver vessels. Coil surveys[1] are a further refinement of the WAZ acquisition of subsalt data. These surveys can consist of a single source/receiver arrangement or a multi-vessel operation with multiple sources, with seismic data being acquired while the vessels follow a circular to spiral path. This method was initially developed as a single-vessel alternative to WAZ surveys but has evolved into a multi-vessel technology.

Photo 2. Typical Marine Seismic Survey Vessel and Towed Array Configuration and Seafloor Imaging Data (USDOI, BOEM, 2013).

- **Nodes and Ocean Bottom Cable Surveys**: Ocean bottom cable surveys were originally designed to enable seismic surveys in congested areas such as producing fields with their many platforms and production facilities. These surveys have been found to be useful for obtaining, repeatable 4D data and four-component (4C) data (seismic pressure, as well as vertical and two horizontal motions of the water bottom, or seafloor), yielding more information about the fluids and rock characteristics in the subsurface. Autonomous nodes, cabled nodes, and ocean bottom cable surveys require the use of multiple ships (usually 2 ships for cable layout/pickup, 1 ship for recording, 1 ship for shooting, and 2 smaller utility boats). New technology has also allowed for autonomous receiving units (nodes) to be deployed by remotely operated vehicles. A particular node or cable can lay on the bottom anywhere from 2 hours to several days, depending on operation conditions. In some cases, nodes or cables may be left on the bottom for future 4D (time-lapse) surveys.
- **Vertical Cable Surveys**: Vertical cable surveys, although now uncommon, are similar to ocean bottom cable surveys in that the receivers are deployed and then acoustic data are output by a source vessel. The receivers are located at several locations along a vertical cable that is anchored to the ocean bottom. These surveys can be conducted in water depths up to about 2,500 meters (m) (8,200 feet [ft]). Cables may be left in place for hours or days, depending on the size of the survey area and operating conditions. The dual airgun array is the same as normally used in 3D streamer surveys.
- **Vertical Seismic Profile (VSP) Surveys**: These surveys are used to obtain wellbore information about the nature of the seismic signal, as well as more information about the geology surrounding the vertical array of sensors. Vertical seismic profiling is a technique carried out by placing sensors down a well borehole before production tubing is placed in the wellbore, during development and production phases, or when a well is abandoned. Seismic airgun sources used in VSP surveys are the same as those used in conventional seismic airgun surveys.

[1] Coil surveys are a proprietary acquisitional technique developed by WesternGeco (Schlumberger).

Active Acoustic Source HRG Seismic Surveys and Equipment

These seafloor- to shallow-focused subbottom penetration surveys are used to identify potential:

- benthic biological communities/habitats,
- archaeological resources,
- seafloor bathymetry,
- geological hazards,
- seafloor engineering, and
- marine minerals.

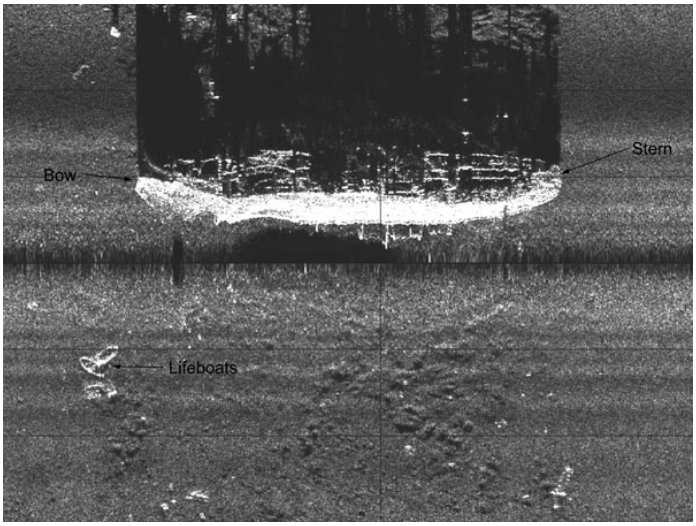

Photo 3. A Sidescan-Sonar Image of the Passenger Freighter *Robert E. Lee,* Collected by the HUGIN 3000 AUV in 2001 (USDOC, NOAA, 2013).

The high-frequency acoustic signal is reflected from sediments near the seafloor surface to several kilometers or more below the seafloor. Such high-resolution data may be used for initial site evaluation for drilling rig or renewable energy structure emplacement and for platform or pipeline design and emplacement. The HRG surveys are also used for the identification of marine minerals or potential sand resources for coastal restoration. High-resolution site survey data obtained at greater depths below the seafloor can also be used for exploration purposes. High-resolution site surveys collect data using a variety of acoustic signal sources.

Some examples of equipment used in HRG seismic surveys include:

Photo 4. Sidescan Sonar Equipment (dual-frequency system) (USDOI, GS, 2013).

Sidescan Sonar: Like other sonars, a sidescan transmits sound energy and then receives and processes the return signal (echo) that has reflected off the seafloor or other objects. Sidescan sonar is a specialized system for detecting objects on the seafloor and mapping seafloor geomorphology, benthic habitats, and surficial sedimentary texture. Sidescan sonar typically consists of three basic components: towfish; transmission cable; and topside processing unit. In a sidescan sonar, the transmitted energy is formed into the shape of a fan that sweeps the seafloor from directly under the towfish to either side, typically to a distance of 100 m (328 ft) or wider. The strength of the return echo is continuously recorded, creating an image of the seafloor. For example, objects that protrude from the bottom create a light area (strong return) and shadows from these objects are dark areas (little or no return) as in Photo 3 above, or vice versa, depending on operator preference (USDOC, NOAA, 2013).

Deep-Tow Sidescan Sonar: Deep-tow, sidescan-sonar surveys are conducted in the Gulf of Mexico primarily for engineering studies involving the placement of production facilities and pipelines. The surveys provide information about seafloor topography and help to identify the presence of sand flows, hydrates, seeps, and potential hard-bottom areas. Operations are conducted from ships towing data communications cables up to 7 kilometers (km) (4.35 miles [mi]) long. This allows operations in water depths up to 3,000 m (9,843 ft) deep. Close to the end of the cable is a 30-45 m (98-148 ft) long section of chain to keep the sensor package (fish) tracking at approximately 25-30 m (82-98 ft) above the bottom. The chain drags along the seafloor, cutting a trench approximately 10 centimeters (cm) wide by 15 cm deep (4 inches [in] wide by 6 in deep). Also included in the sensor package is a pinger for subbottom profiling.

Boomers: The boomer is a broad-band sound source operating in the 3.5-hertz (Hz) to 10-kilohertz (kHz) range. By sending electrical energy from the power supply through wire coils, two spring-loaded plates in the boomer transducer are electrically charged causing plates to repel, thus generating an acoustic pulse. This system is commonly mounted on a sled and towed behind a boat. Dependent on subsurface material types, resolution of the boomer system ranges from 0.5-1 m (1.5-3 ft), with penetration depths ranging from 25-50 m (82-164 ft). The reflected signal is received by a towed hydrophone streamer (USDOI, GS, 2013).

Photo 5. Example of a Representative Boomer Plate System (Applied Acoustic Engineering Ltd., 2011, in USDOI, BOEM, 2012).

Chirp Subbottom Profilers: Chirp systems enable high-resolution mapping of relatively shallow deposits. Chirp systems emit a "swept" frequency signal, meaning that the transmitted signal is emitted over a period of time and over a set range of frequencies (ranging from 3.5-200 kHz). This repeatable (transmitted) waveform can be varied in terms of pulse length, frequency bandwidth, and phase/amplitude. The sonar head is mounted at the bottom of the ship's hull, with the central axes of both transducers oriented directly downward or towed at a constant elevation above the seafloor. Newer chirp systems are able to penetrate to comparable levels as the boomer, yet yield extraordinary detail or resolution of the section. Penetration depths range from about 3 m (10 ft) in coarse sand to about 200 m (656 ft) in finer grained sediments, depending on the frequency range of the outgoing signal and the system employed.

Sparkers: The sparker is an acoustic sound source that generates an electrical arc that momentarily vaporizes water between positive and negative leads. The collapsing bubbles produce a broad band (50 Hz - 4 kHz) omnidirectional pulse that can penetrate several hundred meters into the subsurface. Hydrophone arrays towed nearby receive the return signals. It can operate only in salt water. The sparker system (operated at 50-4,000 Hz) generally yields greater penetration than the boomer or chirp systems, with resolution on the order of a few meters.

Magnetic, Gravity, and Remote Sensing Surveys

Other types of survey activities that provide data on hydrocarbon resources and/or geohazards include controlled source electromagnetic surveys, magnetotelluric surveys, several aerial remote-sensing methods (e.g., radar imaging and aeromagnetic surveys), gravity surveys, and gravity gradiometric surveys.

Electromagnetic Surveys: Electromagnetic surveys are used to help delineate potential oil and gas reservoirs. There are two practical electromagnetic techniques applicable to marine surveys. Both the magnetotelluric (MT) and controlled source electromagnetic (CSEM) methods have been primarily applied in the marine environment in a research mode.

In the MT technique, no electrical currents are induced into the earth, but the receiver device detects the natural electrical and magnetic fields present in the earth. Ships are used to deploy and retrieve the receivers with data loggers. Also attached to the receivers are four arms protruding out from each side of the box with an electrode on each end. These arms are about 20 m (65 ft) long and made of 5-cm (2-in) plastic polyvinyl chloride (PVC) pipe. Inside the recording box is a magnetometer and a long-term data logger, which allows the box to remain on the water bottom for days at a time. The receiver is retrieved by using an acoustic pinger that releases the anchor from the recording box, which then floats to the surface.

In the CSEM technique, two cables (joined together with the second cable a few hundred feet longer than the first) are towed around by a ship. Attached to the end of each cable is a bi- or di-pole, which is a metal cylinder about 3 m (9.8 ft) long and 0.3 m (1 ft) in diameter. At regular intervals, an electrical signal at very low frequencies is input through the cables and into the seafloor. These electrical signals are detected by previously deployed receivers 2-10 km (1.2-6.2 mi) away from the source and arranged in a line or profile. The receiver boxes are attached to degradable concrete blocks like those used in the MT technique. Inside the receiver boxes are recording devices that allow for recording for a few days. When the recording is finished, an acoustic pinger releases the recording box from the anchor, and the recording box floats to the surface for retrieval.

Radar Imaging: Radar imaging by satellite is currently used to detect oil slicks on the sea surface. This is possible because, when the oil molecules reach the sea surface, they form a thin layer that dampens the ocean surface capillary waves. The detection of oil slicks requires quiet water conditions and consequently is limited by sea state as well as satellite position and frequency of coverage. The resolution of the radar images ranges from 8-100 m (26-328 ft) with a swath width range of 50-500 km (31-310 mi). The radar satellite is in a near polar orbit at an altitude of 798 km (495 mi). The cycle time for a duplicate orbit is 24 days, but a common spot on the earth can be revisited every 5 days and surveyed with different viewing parameters. BOEM does not permit or approve radar imaging surveys.

Aeromagnetic Surveys: Aeromagnetic surveys are conducted in the Gulf of Mexico to map for deep crustal structure, salt-related structure, and intra-sedimentary anomalies. The surveys are flown by fixed wing aircraft, with flight lines on the order of 400 km (250 mi) long at a height of 75-150 m (246-492 ft) above the sea surface and flown at speeds of about 220 kilometers per hour (758 miles per hour). Flight line spacing ranges from 500-800 m (1,640-2,625 ft) apart with cross lines. The earth's magnetic field is measured by either a proton precision or cesium vapor magnetometer mounted in a "stinger" projection from the tail of the aircraft. On occasion, two magnetometers are used to measure not only the total magnetic field but also the vertical gradient of the field. Magnetometers also can be towed behind a ship. This usually is in conjunction with a seismic survey, but it can be run as a separate survey.

Gravity Surveys: Marine gravity data can be collected with instruments on the seafloor, in boreholes, in ships, or in helicopters. Most collection points are on ships. Marine gravity meters have, in some cases, been housed in a ship while it is conducting a seismic survey. However, the preferred method has been to use dedicated ships in order to acquire more precise data. With the advent of global positioning system (GPS) navigation and larger, more stable seismic ships, it is now possible to achieve the same order of accuracy with meters placed in seismic ships as in dedicated ships. Data grids for gravity surveys range from 1.6 km x 8 km (1 mi x 5 mi) to 9.7 km x 32 km (6 mi x 20 mi). Gravity data may also be collected using helicopters. However, helicopter surveys are rare in the Gulf of Mexico because of the logistics required to keep the craft in the air for extended periods far from shore.

Gravity Gradiometry: Measuring the earth's gravity gradient is now possible with the release of Department of Defense technology. The instrument is housed in a box located in the center of a survey ship. In shallow water, the ship sails a 0.25 km x 1 km (0.15 mi x 0.6 mi) grid, and in deep water, a 1 km by 2 km (0.6 mi x 1.25 mi) grid is used. Typically, a 20-block area is selected for survey, and this can be completed in about 2 days.

Marine Magnetic Surveys: Marine magnetic surveys measure the earth's magnetic field for the purpose of determining structure and sedimentary properties of subsurface horizons. These surveys are usually conducted in conjunction with a seismic survey, allowing the navigation information to be used for both surveys. The development of low-power digital sensors has allowed the sensor package to be towed behind the seismic source array, which has greatly improved the operational efficiency of magnetic surveys. The sensor is towed behind one of the subarrays of the seismic source array at distances of 50, 100, or 150 m (164, 328, or 492 ft) (behind the array), although a 100 m (328 ft) distance is the most common. The sensor is towed at a depth of 3 m (10 ft) and makes use of depth devices mounted on the cable to maintain a constant depth.

Geological Surveys

Photo 6. Bottom Coring Samples (USDOI, BOEM, 2013).

Geological and geochemical sampling is conducted to obtain samples of the seafloor for physical and/or chemical analyses. Physical analyses are used in engineering studies or geotechnical evaluations for placement of structures such as renewable energy facilities, platforms and pipelines, and marine minerals resource evaluation and prospecting. Chemical analyses (surface geochemical prospecting) are based on the premise that upward migrated petroleum from deep source rocks and reservoirs can be detected in near-surface sediments and are used to evaluate exploration potential. Sometimes a program of bottom sampling and shallow coring is conducted simultaneously using a small marine drilling vessel (USDOI, GS, 1976). Other sampling techniques using towed hydrocarbon "sniffers" are rarely used.

Bottom Sampling

This method is used for retrieving soil samples from the seabed surface. The information obtained can be used for a number of applications including the following:

- bulk sampling for seabed minerals;
- marine aggregate prospecting;
- environmental sampling;
- pre-dredge investigations; and
- ground truth for morphological mapping and geophysical surveys.

Grab Samplers: Grab samplers are one of the most common methods of retrieving sediment samples or biological samples from the seabed. A grab sampler is a device that collects a sample of the topmost layers of the seabed and benthic biota by bringing two steel shells together and cutting a bite from the soil. A typical hydraulic grab sampler will weigh about half a tonne and can operate in water depths down to 200 m (656 ft). Typical sampling rates are between three and four grabs per hour.

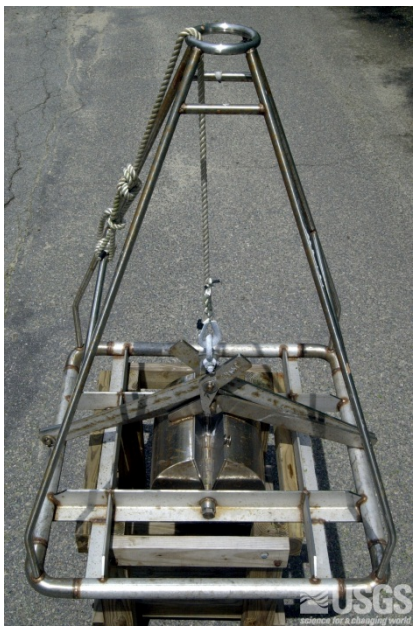

Photo 7. Close Up of Van Veen Sediment Grab Sampler (USDOI, GS, 2013).

Coring

Coring applications can be used to investigate seafloor soils for purposes of[2]

- dredging and inshore engineering;
- offshore oil and gas engineering;
- route surveys for pipelines and cables; and
- providing soil type control for geophysical surveys.

Piston Core: The typical piston core is a 6 m (20 ft) long, 7.5 cm (3 in) diameter pipe with a 910 kilogram (2,000 pound) core weight. In gravity coring, wire is paid out from the coring winch at a fairly fast speed, allowing the corer to hit the bottom with a force proportional to the weight of the corer and the speed at which it is deployed. Penetration into the bottom is limited by the sediment type, friction of the sediment on the outside and inside walls of the core barrel, and the resistance of the water exiting the top of the core barrel. In contrast, a piston corer uses a "free fall" of the coring rig to achieve a greater initial force on impact and a sliding piston inside the core barrel to reduce inside wall friction with the sediment and to assist in the evacuation of displaced water from the top of the corer. The core barrel dimensions are

[2] Source: ISSMGE, 2005.

generally a 6 m (20 ft) long by 7.6 cm (3 in) internal diameter by a 9 cm (3.5 in) outer diameter. Coring at lengths greater than 6 m (20 ft) is possible but not common.

Vibracores: Vibracorers are used wherever soil conditions are unsuited to gravity corers or where greater penetration of the seabed is necessary. Vibracoring generally uses a 7 cm (2.8 in) diameter core barrel mounted on a platform or tripod support assembly and can penetrate sediments in the upper 15 m (50 ft). To penetrate dense sands and gravels, or to reach deeper into stiff clays, the corer's barrel is vibrated, facilitating its penetration into the soil (ISSMGE, 2005). A typical vibracore survey will obtain 15-25 cores, approximately 6 m (20 ft) deep in a 1-square mile (640 acre or 259 hectare) area.

Box Cores: Box corers are used to recover relatively undisturbed block samples of seabed in soft, cohesive sediments. The box corer is a very simple device that envelops an area of seabed then seals the base of its box to retain the sample from further disturbance during recovery. The standard box corer consists of a steel frame incorporating the sample box surmounted by a 200-300 kilogram (441-661 pound) mass. When activated by a self-release trigger system, the box is closed at the bottom by a swivelling base. The total mass of a box corer is in the order of 1.5 metric tons (3,307 pounds) and the sample volume is about 25-30 litres (6.6-8 gallons) (ISSMGE, 2005).

Other Methods

Shallow Borings: Shallow coring is done by conventional rotary drilling equipment from a drilling barge or boat. Penetration is usually limited to the recovery of several meters of consolidated rock.

Heat Flow Measurements: Another tool in limited use in deepwater exploration is a heat flow probe. This technique, used primarily in academic circles as a research tool, provides geochemical and geological information that aids in understanding regional-scale hydrodynamics and the potential for occurrence of hydrocarbons. Heat flow measurements are conducted with a device that looks much like a piston corer. The device measures both temperature gradient and thermal conductivity *in situ* over subbottom depth intervals of up to 6 m (20 ft). The footprint and impact on the sediments is almost identical to that of piston or gravity coring.

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BOEM FACT SHEET

BUREAU OF OCEAN ENERGY MANAGEMENT

BOEM manages the responsible exploration and development of offshore energy and marine mineral resources on the U.S. Outer Continental Shelf (OCS). The bureau promotes energy independence, environmental protection and economic development through responsible management of these resources based on the best available science.

BOEM's offshore oil and gas leasing program considers environmental, social and economic values of the nation's domestically produced energy supply. OCS production accounts for about 24 percent of domestic crude oil and eight percent of domestic natural gas supply. In Fiscal Year 2012, federal leasing revenues for the OCS exceeded $8 billion. The sales value of the oil and gas resources amounted to about $60 billion, and generated about $120 billion in total spending in the economy. These expenditures supported about 700,000 domestic jobs.

As an emerging part of the nation's all-of-the-above energy portfolio, BOEM's OCS renewable energy program provides a new source of domestic energy supply with less carbon emissions. It offers the prospect of more domestic jobs and wages, as well as increased revenues from lease bonuses, rentals on acreage leased, and production operating fees. In the future, BOEM anticipates development of offshore renewable energy from three sources: wind energy, ocean wave energy, and ocean current energy.

In addition to its offshore energy responsibilities, BOEM manages appropriate access to OCS marine minerals such as sand and gravel. BOEM has conveyed 73 million cubic yards of OCS sediment resources for 37 coastal restoration projects in five states, restoring more than 198 miles of coastline. These projects protect billions of dollars of infrastructure and ecological habitats.

Key functions of the bureau include:

- The BOEM **Office of Strategic Resources** is responsible for the development of the **Five Year Outer Continental Shelf (OCS) Oil and Natural Gas Leasing Program.** The office also oversees assessments of oil, gas and other mineral resource potential of the OCS, inventories oil and gas reserves, develops production projections, conducts economic evaluations to ensure fair market value is received by U.S. taxpayers for OCS leases, and prepares official maps and GIS data for the OCS.

- BOEM conducts **Oil and Gas Lease Sales**, and negotiates **Sand and Gravel** agreements. Coastal nourishment projects – or beach nourishment – are one of the primary uses of sand and gravel.

- The BOEM **Office of Renewable Energy Programs** oversees orderly, safe, and environmentally responsible renewable energy development activities on the OCS. The program grants leases, easements, and rights of way for offshore renewable energy. In keeping with the "Smart from the Start" wind energy initiative launched in 2010 by Interior Secretary Ken Salazar, BOEM works directly with federal, state, local and tribal governments through 12 renewable energy task forces. These valuable stakeholder groups help identify wind energy areas and issues related to upcoming offshore renewable energy projects.

- BOEM's **Office of Environmental Programs** conducts environmental reviews, including *National Environmental Policy Act* (NEPA) analyses for each major stage of offshore energy development planning. These analyses inform the bureau's decisions on the Five Year Program and energy leasing and development activities. Additionally, BOEM conducts and oversees environmental studies to inform policy decisions relating to the management of energy and marine mineral resources on the OCS.

- BOEM has three regional offices: New Orleans, La., Camarillo, Calif., and Anchorage, Alaska. The regional offices manage oil and gas resource evaluations, environmental studies and assessments, leasing activities, including the review of exploration plans and development plans, fair market value determinations, and geological and geophysical permitting.

BOEM Organizational Structure

U.S. Department of the Interior
Bureau of Ocean Energy Management

General Information

June 2013

Marine Mammal Protection Act
A Law Enforced by
National Marine Fisheries Service

The Marine Mammal Protection Act of 1972 (MMPA) was enacted in response to increasing concerns among scientists and the public that significant declines in some species of marine mammals were caused by human activities. The MMPA established a national policy to prevent marine mammal species and population stocks from declining beyond the point where they ceased to be significant functioning elements of the ecosystems of which they are a part.

The Department of Commerce through the National Marine Fisheries Service (NMFS) is charged with protecting whales, dolphins, porpoises, seals, and sea lions. Walrus, manatees, otters, and polar bears are protected by the Department of the Interior through the U.S. Fish and Wildlife Service.

The MMPA established a prohibition on the taking of marine mammals in U.S. waters. It defines "take" to mean "to hunt harass, capture, or kill" any marine mammal or attempt to do so. The Marine Mammal Incidental Take Program is tasked with the implementation of Section 101(a)(5)(A-D) of the MMPA, as amended (16 U.S.C. 1371(a)(5)), which provides a mechanism for allowing, upon request, the "incidental," but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographic region. These "incidental take" authorizations, also known as Letters of Authorization or LOA's, require that regulations be promulgated and published in the *Federal Register* outlining the following:

- permissible methods and the specified geographical region of taking;
- the means of effecting the least practicable adverse impact on the species or stock and its habitat and on the availability of the species or stock for "subsistence" uses; and
- requirements for monitoring and reporting, including requirements for the independent peer-review of proposed monitoring plans where the proposed activity may affect the availability of a species or stock for taking for subsistence uses.

The Bureau of Ocean Energy Management (BOEM) intends to use the Gulf of Mexico Geological and Geophysical (G&G) Activities Programmatic Environmental Impact Statement (EIS) analyses to support an application for rulemaking under the MMPA. BOEM intends to apply for rulemaking under the MMPA on behalf of the G&G industry. The rulemaking would cover G&G survey activities supporting the oil and gas, renewable energy, and marine minerals programs. Industry would then be allowed to apply for individual (company) permits under the rulemaking. Since NMFS is a co-Lead Agency on the Programmatic EIS, they will use the document to support a decision on whether or not to issue regulations under the MMPA.

More information on the MMPA can be found at http://www.nmfs.noaa.gov/pr/laws/mmpa/.

U.S. Department of the Interior
Bureau of Ocean Energy Management

General Information

June 2013

Endangered Species Act
A Law Enforced by
National Marine Fisheries Service
and
U.S. Fish and Wildlife Service

Congress passed the Endangered Species Act (ESA) on December 28, 1973, recognizing that the natural heritage of the United States was of "esthetic, ecological, educational, recreational, and scientific value to our Nation and its people." It was understood that, without protection, many of our Nation's living resources would become extinct. The purpose of the ESA is to conserve threatened and endangered species and their ecosystems. There are more than 1,900 species listed under the ESA. The U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) share responsibility for implementing the ESA.

A "species" is considered

- endangered if it is "in danger of extinction throughout all or a significant portion of its range"; and
- threatened if it is "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."

Federal agencies are directed, under Section 7(a)(1) of the ESA, to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Federal agencies must also consult with NMFS and FWS, under Section 7(a)(2) of the ESA, on **activities that may affect a listed species**.

These interagency consultations, or Section 7 consultations, are designed to assist Federal agencies in fulfilling their duty to ensure Federal actions **do not jeopardize** the continued existence of a species or destroy or adversely modify critical habitat.

Should an action be determined by NMFS or FWS to jeopardize a species or adversely modify critical habitat, a biological opinion is issued. A biological opinion identifies Reasonable and Prudent Alternatives that would allow the project to move forward without violating Section 7(a)(2) consultation.

Biological opinions document NMFS's and/or FWS's opinion as to whether the Federal action is likely to jeopardize the continued existence of listed species or to result in the destruction or adverse modification of critical habitat. Where appropriate, biological opinions provide an exemption for the "take" of listed species while specifying the extent of take allowed. Under the ESA, "take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Through regulations, the term "harm" is defined as "an act which actually kills or injures wildlife." Such an act may include "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering." Reasonable and Prudent Alternatives are necessary to minimize impacts from the Federal action and the Terms and Conditions with which the action agency must comply.

As Federal agencies that may be authorizing activities (permitting geological and geophysical surveys) that may affect listed species, the Bureau of Ocean Energy Management must consult with NMFS and FWS under Section 7 of the ESA. The NMFS issuance of permits under the Marine Mammal Protection Act is a Federal action subject to the interagency cooperation requirements of Section 7 of the ESA. The NMFS is required to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of habitat for such species.

More information on the ESA can be found on the following websites:

NMFS Website
http://www.nmfs.noaa.gov/pr/laws/esa//

FWS Website
http://www.fws.gov/endangered/

NOAA FISHERIES SERVICE

The primary objective of this management must be to maintain the health and stability of the marine ecosystem; this in theory indicates that animals must be managed for their benefit and not for the benefit of commercial exploitation. The effect of this set of requirements is to insist that the management of animal populations be carried out with the interest of the animals as the prime consideration.
– House of Representatives, No. 707, 92nd Congress, 1st Session, 18, 22 [December 4, 1971]

Office of Protected Resources and the Marine Mammal Protection Act

The Marine Mammal Protection Act of 1972 was enacted in response to increasing concerns among scientists and the public that significant declines in some species of marine mammals were caused by human activities. The Act established a national policy to prevent marine mammal species and population stocks from declining beyond the point where they ceased to be significant functioning elements of the ecosystems of which they are a part. Nowhere else in the world had a government made the conservation of healthy and stable ecosystems as important as the conservation of individual species.

The Department of Commerce through the National Marine Fisheries Service is charged with protecting whales, dolphins, porpoises, seals, and seal lions. Walrus, manatees, otters, and polar bears are protected by the Department of the Interior through the U.S. Fish and Wildlife Service. The Animal and Plant Health Inspection Service, a part of the Department of Agriculture, is responsible for regulations managing marine mammals in captivity.

Innovative Features

In addition to shifting the focus of conservation from species to ecosystems, the Act contains many innovative features never before established in legislation. It:

- Presented a single comprehensive federal program to the place of former state-run programs;
- Included protection for population stocks in addition to species and subspecies. A population stock is “a group of marine mammals of the same species or smaller taxa in a common spatial arrangement that interbreed when mature;”
- Shifted the burden from resource managers to resource users to show that proposed taking of living marine resources would not adversely affect the resource or the ecosystem;
- Established the concept of “optimum sustainable populations” (OSP) to ensure healthy ecosystems. Prior to the Act, the management of marine species was aimed at producing a “maximum sustainable yield” (MSY) to ensure the species replenished itself for an adequate harvest in subsequent years; and
- Directed federal agencies to seek changes in international agreements, such as the Whaling Convention and the North Pacific Seal Convention corresponding to the Act.

Protection

The MMPA established a moratorium on the taking of marine mammals in U.S. waters. It defines “take” to mean “to hunt harass, capture, or kill” any marine mammal or attempt to do so. The inclusion of harassment in the definition was a groundbreaking action by Congress. Exceptions to the moratorium can be made through permitting actions for take incidental to commercial fishing and other nonfishing activities; for scientific research; and for public display at licensed institutions such as aquaria and science centers.

The moratorium generally does not apply to Alaska natives who live on the Alaskan coast. The MMPA contains provisions allowing for take for subsistence use or to create and sell “authentic articles of handicrafts and clothing” without permits or authorizations. The taking must not be “accomplished in a wasteful manner,” and the Secretaries of Commerce and the Interior may regulate the taking of a depleted species or stock, regardless of the purpose for which it is taken.

What You Can Do

People can positively affect changes in our ecosystems and help protect marine species by learning about the issues and changing behaviors. You can make a difference. Go to www.nmfs.noaa.gov/pr or www.mmc.gov to find out more about marine mammal species and stocks.

NOAA FISHERIES SERVICE

Nothing is more priceless and more worthy of preservation than the rich array of animal life with which our country has been blessed. It is a many-faceted treasure, of value to scholars, scientists, and nature lovers alike, and it forms a vital part of the heritage we all share as Americans.
-President Richard Nixon – Statement upon signing the Endangered Species Act, December 28, 1973

The Endangered Species Act - Protecting Marine Resources

Congress passed the Endangered Species Act (ESA) on December 28, 1973, recognizing that the natural heritage of the United States was of "esthetic, ecological, educational, recreational, and scientific value to our Nation and its people." It was understood that, without protection, many of our nation's living resources would become extinct.

The purpose of the ESA is to conserve threatened and endangered species and their ecosystems. There are more than 1,900 species listed under the ESA. A species is considered endangered if it is in danger of extinction throughout all or a significant portion of its range. A species is considered threatened if it is likely to become endangered in the future. The U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) share responsibility for implementing the ESA. NMFS is responsible for 94 marine species, from whales to sea turtles and salmon to Johnson's sea grass.

Protection, Conservation, and Recovery

The listing of a species as endangered makes it illegal to "take" (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to do these things) that species. Similar prohibitions usually extend to threatened species. Federal agencies may be allowed limited take of species through interagency consultations with NMFS or USFWS. Non-federal individuals, agencies, or organizations may have limited take through special permits with conservation plans. Effects to the listed species must be minimized and in some cases conservation efforts are required to offset the take. NMFS' Office of Law Enforcement works with the U.S. Coast Guard and other partners to enforce and prosecute ESA violations.

NMFS, the Protected Resources Program, and the ESA:

The Protected Resources program conserves and recovers marine resources by doing the following:

- Listing species under the ESA and designating critical habitat (section 4);
- Developing and implementing recovery plans for listed species (section 4);
- Developing cooperative agreements with and providing grants to States for species conservation (section 6);
- Consulting on any Federal actions that may affect a listed species to minimize the effects of the action (section 7);
- Partnering with other nations to ensure that international trade does not threaten species (section 8);
- Investigating violations of the ESA (section 9);
- Cooperating with non-federal partners to develop conservation plans for the long-term conservation of species (section 10); and
- Authorizing research to learn more about protected species (section 10).

Why Save Endangered Marine Species?

Although occasional extinction of species is natural, extinctions are currently occurring at a rate that is unprecedented in human history. Each plant, animal, and their physical environment is part of an ecosystem and part of a much more complex web of life. Because of this, the extinction of a single species can cause a series of negative events to occur that affect many other species. Endangered species also serve as "sentinel" species to indicate larger ecological problems that could affect the functioning of the ecosystem and likely humans as well. As importantly, species diversity is part of the natural legacy we leave for future generations. The wide variety of species on land and in our oceans has provided inspiration, beauty, solace, food, livelihood, medicines and other products for previous generations. The ESA is a mechanism to help guide conservation efforts, and to remind us that our children deserve the opportunity to enjoy the same natural world we experience.

Most of the problems in the current health of our environment are caused by people. However, people can also positively affect changes in our ecosystems and help endangered species recover by learning about the issues and changing behaviors. You can make a difference. To learn more, go to ***www.nmfs.noaa.gov/pr*** or ***www.fws.gov/endangered***