

MMS OCEAN SCIENCE

VOLUME 4 ISSUE 1
JANUARY/FEBRUARY/MARCH 2007

THE SCIENCE & TECHNOLOGY JOURNAL OF THE MINERALS MANAGEMENT SERVICE



MMS's Expanding and Evolving Mission

MMS Role Spans Decades

GOM Region

Pacific Region

Atlantic OCS

Educating the Next Generation

The OAP and NOPP

Using Data

International Polar Year

Prestigious Robert Avent Medal Awarded to Dr. Tom Ahlfeld

Current Turmoil



MMS *OCEAN SCIENCE* is published quarterly by the Minerals Management Service to communicate recent ocean science and technological information and issues of interest related to offshore mineral recovery, ocean stewardship, and mineral revenues.



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ABOUT THE COVER

Top Left: A spotted moray eel slithers among the reef growth in the tropical Atlantic. Photo courtesy of NOAA.

Top Center: MMS 25th Anniversary

Top Right: Attentive walrus (*Odobenus rosmarus divergens*) inspecting photographer. Photo courtesy of NOAA

Main Photo: Semisubmersible rig. Photo courtesy of www.marad.dot.gov/education/adopt_a_ship

Back Page: Background platform image by Gregory S. Boland

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www.mms.gov

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The Minerals Management Service (MMS) was created in January 1982 as an emerging offshore oil and gas industry was becoming increasingly important to our Nation's energy future. Its creation came nearly 30 years after two milestone Acts were passed by Congress (the Submerged Lands Act and the Outer Continental Shelf Lands Act) and 28 years after the first Outer Continental Shelf (OCS) lease sale was held. The MMS's mission is stated simply – “to manage the mineral resources on the Outer Continental Shelf in an environmentally sound and safe manner and to timely collect, verify, and distribute mineral revenues from Federal and Indian lands” – but its undertaking is complex.

Before MMS became a bureau of the Department of the Interior, Congress was establishing its authority over OCS boundaries, the environment, and leasing programs. The Submerged Lands Act and the OCS Lands Act are the basis of Federal and State jurisdictions on the OCS. The Submerged Lands Act gives the coastal States jurisdiction over the OCS outward from their coast 3 nautical miles. Texas and Florida were granted an extension to 10.35 miles or 3 marine leagues. The OCS Lands Act grants Federal jurisdiction over the OCS and gives the Secretary of the Interior the authority to lease these submerged lands for mineral development. As the need for energy escalated and the awareness of the potential for environmental damage heightened, Congress ratified the National Environmental Policy Act of 1969, the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and the Clean Water Act of 1977. This foundation legislation, along with the Federal Oil and Gas Royalty Management Act, laid the groundwork for the operation of MMS today.



MMS'S EXPANDING AND EVOLVING MISSION

In 1990, the Oil Pollution Act was passed. This Act sought to prevent oil spills from tankers and platforms and ensure the resources were available to clean up any spills that should occur. The MMS assumed a proactive role in reducing the number and size of oil spills by participating in the management of The National Oil Spill Response Test Facility (known as "OHMSETT") and becoming the certifying agency for oil-spill prevention and remediation plans in all offshore oil and gas facilities in State and Federal OCS waters.

The Energy Policy Act of 2005 includes renewable energy, alternate use of existing infrastructure, and 23 different provisions relating to offshore resource management. This Act amends the OCS Lands Act to authorize the Department of the Interior to act as lead agency for certain alternate energy and marine-related uses on the OCS. The Department of the Interior designated OCS Lands Act authority to MMS. As regulator for alternative energy, MMS evaluates proposed projects and is working to

develop a regulatory program that integrates new uses with existing uses of offshore resources. A few of the agency's main goals are to increase and balance the Nation's sources and supplies of energy, to protect the Nation's economic and land use interests, and to encourage new and innovative technologies to help meet our energy needs.

Expanding meteorological and climatic studies at MMS have become especially critical with an increasing awareness of global climate changes. The MMS is funding research to understand the effects of climate change on marine ecosystems, subsistence hunters, energy production, and ocean currents and to find ways to lessen or prevent those changes.

As more is learned about the OCS, more energy resources discovered, more diverse ecosystems revealed, and more technological advancements utilized, MMS and its mission expand to meet the challenge. More can be discovered about MMS and its research projects by visiting www.mms.gov.

Anniversary dates are a time for reflection—an opportunity to look back at all that has been accomplished.

Such is the case for the Minerals Management Service (MMS) in 2007, which is the 25th anniversary for MMS as an agency of the U.S. Department of the Interior.

Fiscal responsibility is only one aspect of MMS, but it is enormous. The agency distributed a record \$2.2 billion in royalty receipts to 34 states during fiscal year 2006, with Wyoming capturing the biggest chunk at over \$1 billion. Add up every year since the agency's creation in 1982, and revenues total about \$135 billion. As continued exploration and development generates revenue in future years, MMS will continue to distribute these important funds so that every American benefits from Federal lands.

In addition to disbursing revenue generated from Federal lands, MMS has spent years overseeing the locations where the resources lie—environments ranging from the icy waters of the Arctic to the tropical surroundings in the Gulf of Mexico (GOM). This diversity meant MMS had to determine and understand the ecosystems in which energy-related activities were taking place. As a steward of the ocean environment, MMS has asked and answered these types of questions, along with many others.



Assistant Secretary C. Steve Allred joins Secretary Dirk Kempthorne, Director Johnnie Burton, Director Magne Ognedal of the Petroleum Safety Authority Norway, and MMS employee Jim Cimato in celebrating the 25th anniversary of MMS.

MMS'S ROLE SPANS DECADES

MMS TIMELINE

1982 MMS designated as the agency responsible for ensuring proper fiscal accountability and management of the mineral revenues (rents, royalties, and bonuses) from Federal and Indian lands.

1985

Only six percent of GOM oil production comes from deepwater wells. Natural gas production from deep water is less than 1 percent of production in 1985.

1990

Nine GOM rigs drill in deepwater (depths greater than 1,000 feet).

1997

MMS's Minerals Revenue Management re-engineered its business processes to become more efficient, cost effective, customer responsive, and to take advantage of current technology.

1999

Twenty-six GOM rigs drill in deep water.

25th Anniversary

Minerals Management Service

1982-2007



The MMS not only supervises lease sales that determine what companies are permitted to explore for resources, the agency also ensures that these companies operate safely to protect workers and the surrounding environment. While these efforts target the prevention of catastrophic incidents, MMS has also planned how to respond if an accident should happen. One of the best ways to fine-tune the response to a major spill is to simulate one and practice responding to it. This practical method of training has been conducted repeatedly at the Oil and Hazardous Materials Simulated Environmental Test Tank (OHMSETT) facility in New Jersey. OHMSETT, maintained and operated by MMS through a contract with MAR, Inc., continues to provide an environmentally safe place to conduct research, test response and cleanup equipment, and train personnel in spill response technologies.

Thousands of miles away, the agency's efforts focused on managing another vital resource—sand and gravel. Our Nation's coastlines have eroded every year, and fierce hurricane seasons in recent years have accelerated the damage. Between 1995 and 2006 alone, MMS provided over 27 million

cubic yards of OCS sand to State, local, and Federal entities in unique sand renourishment projects.

Anniversaries also provide an opportunity for looking forward, and

MMS has good reason to be excited about the future. Passage of the Energy Policy Act of 2005 gave MMS jurisdiction over offshore alternative energy projects such as wave, wind, and solar energy. With initiatives underway, MMS will play a large role in determining the best way to harvest and distribute the power on a large scale while maintaining a focus on existing responsibilities. As this issue went to press, MMS released a draft Programmatic Environmental Impact Statement on alternative energy.

Traditional energy resources are equally exciting in the GOM, where oil and gas exploration and production records are constantly being broken. BP's Atlantis project, located approximately 298 kilometers (185 miles) south of New Orleans in a record water depth of 2,156 meters (7,074 feet), is one of the largest fields ever discovered in the GOM. Using state-of-the-art seismic sensors to find the reservoir and a custom rig to access it, Atlantis production may produce an estimated 200,000 barrels of oil per day. Even amid the enthusiasm, MMS carefully monitors and partners on studies to assess any potential ecological impacts from such projects—remaining focused on the ecology,

microbiology, physiology, geology, and geochemistry of the underwater communities in all regions it oversees.

The MMS's increasing responsibilities encompass new opportunities for securing energy from alternative sources, while managing the hunt for untapped traditional resources using cutting edge technologies. Though it is rewarding to reflect on past accomplishments, MMS is busy securing new energy supplies for our Nation's future generations.

FOR MORE INFORMATION:

OCS Alternative Energy and Alternate Use Program Draft Programmatic EIS

Website: www.mms.gov/ooc/press/2007/press0320.htm

MMS NUMBERS

About **1,700** employees in **20** cities – managing over **1.76 billion** offshore acres of land – overseeing production of about **23 percent** of the natural gas and **30 percent** of the oil produced in the United States.

Source: www.mms.gov/ooc/newweb/NewsRoomMore.htm

2000

More oil is now produced from the deepwater GOM than from the shallow-water GOM.

2001

The Pacific OCS Region surpassed the milestone production mark of one billion barrels of oil and over 1.2 trillion cubic feet of natural gas. Also in 2001, ten GOM rigs drill in ultra-deepwater (5,000 feet of water or greater).

2002

MMS honors two Navajo Nation employees and one Southern Ute Tribe employee with the Joan Killgore Award for their contribution on tribal royalty issues.

2005

Passage of the Energy Policy Act of 2005 gives MMS jurisdiction over offshore alternative energy projects such as wave, wind and solar energy.

2007

MMS celebrates 25 years as an agency of the U.S. Department of the Interior.

Protecting a delicate marine environment while meeting the needs of an energy-dependent Nation can be a juggling act at times. Just ask any of the 600 employees in the Minerals Management Service (MMS) Gulf of Mexico Region (GOMR) office – the petroleum engineers, geophysicists, geologists, marine biologists, oceanographers, other environmental scientists, offshore inspectors, computer personnel, and others who have devoted their lives to maintaining that balance. Throw in an occasional hurricane or two each year, and things can get tough.

While the Region is actually responsible for Outer Continental Shelf (OCS) oil, gas, and other mineral matters from offshore Texas to Maine, most activity is concentrated in the GOM OCS – an area where operators continue setting and surpassing records.

- ▶ In January 2007, 82 exploration wells were being drilled in Gulf waters; 36 of these were in water depths of 1,000 feet or greater (considered deepwater); 11 exploration wells were in 5,000 feet of water or greater (considered ultra-deepwater).
- ▶ Currently there are approximately 4,000 producing platforms, of which about 1,962 are major platforms (954 of these are manned by personnel).
- ▶ Production in the Federal portion of the Gulf OCS amounts to 21 percent of the Nation's natural gas production (just under 5 trillion cubic feet) and about 30 percent of the Nation's oil production (570 million barrels) for 2002.

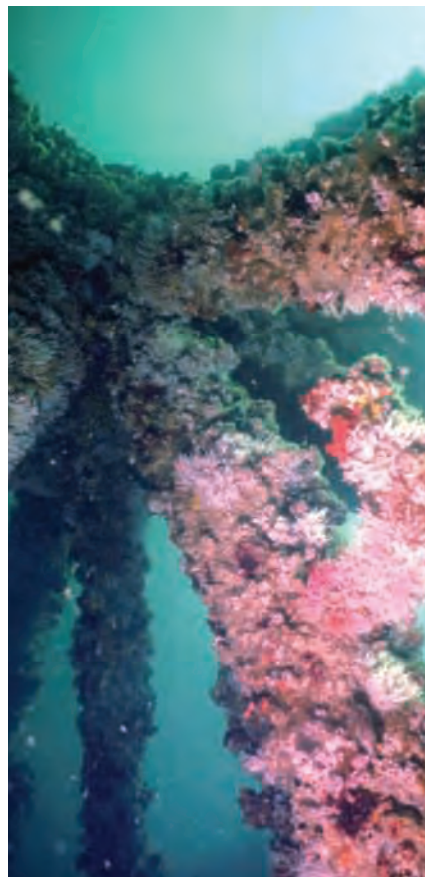
Technology has played and will likely continue to play a huge role in the OCS activity, both for producers and for MMS. Companies interested

in deepwater and ultra-deepwater development are literally having to design and build equipment as they go, and MMS must follow suit with ways to discover what species live in the darkness below and assess what effects oil and gas drilling and production may have on them – and on coastal and human environments.

Amid the activity, busy GOMR employees must approve every exploration well and production proposal, as well as platform and pipeline design to ensure the safety of the operation and its potential effect on the underwater world. Among their responsibilities are protection of important archaeological sites that are home to historic artifacts such as the Civil War Union gunboat *USS Hatteras*, the side-wheel steamer *Josephine*, the World War II German submarine *U-166*, and the passenger freighter it sank, the *S.S. Robert E. Lee*. They must also protect diverse ecosystems like those in the East and West Flower Garden Banks, situated approximately 100 miles southeast of Galveston, Texas, home to numerous species of rays and sharks, sea turtles, and marine mammals.

As new challenges in deepwater leave obsolete rigs in shallower water, MMS works hard to promote the Rigs-to-Reefs program, an initiative established over a decade ago to encourage use of defunct equipment as artificial reefs. Construction material and design make offshore platforms ideal for fish and marine life that would typically become widely dispersed. Efforts in the Rigs-to-Reefs program have resulted in many of the commercial and recreational fishing opportunities in the GOMR.

The 2005 hurricane season, the worst in history, presented unique challenges to the Region's employees but also proved how valuable their efforts have been. Hurricanes Katrina and Rita swept across over 3,000 of the more than 4,000 oil and gas



Platform left in the Gulf for the Rigs-to-Reefs program.

facilities in the GOM. There was no loss of life or serious injury associated with evacuation operations, and all of the subsurface safety valves operated at 100 percent efficiency – sealing oil and gas wells below the ocean floor and protecting the waters from contamination.

The GOMR will likely see more records set in the future, but the one constant will be the many MMS employees hard at work protecting the environment and securing the Nation's domestic energy supply.

FOR MORE INFORMATION:
Gulf of Mexico Region

Website: www.gomr.mms.gov/index.html

Residents on the Pacific coast live amid a variety of landscapes – rocky cliffs, sandy beaches, lush forests – and a relatively moderate climate that allows them to enjoy their outdoor environment most of the year. Another of their valuable resources is the vibrant offshore area, an underwater ecosystem teeming with a diverse mix of marine life. The responsibility for ensuring that oil and gas operations offshore California in Federal waters do not harm these resources belongs to the Minerals Management Service (MMS) Pacific Outer Continental Shelf (OCS) Region, headquartered in Camarillo, California. Partnerships are a big part of the overall management strategy.

The Pacific OCS Environmental Studies Program (ESP), much of which is carried out in cooperation with the University of California, has pioneered research in the ocean along the entire Pacific Coast to increase our understanding of the underwater environment. In many cases, the ESP findings in such fields as physical oceanography, biology, ecology, and socioeconomics represent the only research ever conducted in the ocean along the coast.

Two of the most exciting Pacific partnerships are MARINE and MINT. Scientists from Federal and State government agencies, universities, and private and volunteer organizations form the Multi-Agency Rocky Intertidal Network (MARINE) to monitor important shoreline resources. Key rocky intertidal habitats and species are sampled at sites along the mainland approximately every 10 to 15 miles and along key intertidal beaches on the islands by teams of field biologists, including the MMS Intertidal Team (MINT). MINT biologists team up with those from five university campuses (UC Santa Cruz, UC Santa Barbara, UCLA, UC Davis, and California State University Fullerton) to monitor mussels, sea stars, algae, and other intertidal plants and animals along the coast. The MMS and various agencies and organizations use the information that is gathered to assess environmental effects, manage natural resources, and aid coastal planning efforts.

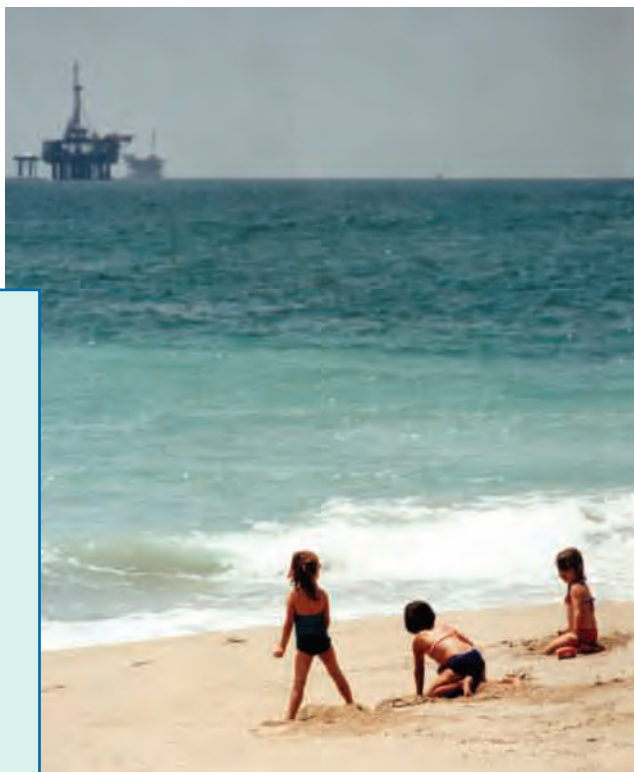
Past and current Pacific OCS Region efforts are critical for preserving the coastal ecosystem and the revenue generated from its recreation

and tourism. The ESP anticipates future research into the potential of ocean-based, renewable energy projects along the Pacific Coast. With the new authority for offshore alternative energy sources provided by the Energy Policy Act of 2005, the Region could soon be involved in the leasing and oversight of alternative energy projects such as harnessing energy from offshore wind, wave or solar sources, extracting natural gas from deepwater methane hydrates, and using existing infrastructure for other energy-related purposes.

With its current projects and the potential for new alternative energy projects, the Pacific OCS Region plays an important role. Having already established effective partnerships with agencies, groups, educational institutions, and industries who share their enthusiasm and concerns will enhance the Region's ability to continue responsible management of offshore resources well into the future.

Pacific OCS Region as of May 1, 2006

Acres Under Lease	400,505
Active Leases	79
Producing Leases	43
Total Oil & Gas Wells Drilled	1,290
Total Development Wells Drilled	962
Total Exploration Wells Drilled	328
Oil & Gas Platforms	23
Miles of Pipeline	188
Companies Operating Pacific OCS Facilities	6



Kids play on the beach in Santa Barbara, California.

Although there is no current energy-related activity in the Atlantic Outer Continent Shelf (OCS), the future may tell another story. All leasing and resource management functions for the planning areas along the Atlantic seaboard (North Atlantic, Mid-Atlantic, South Atlantic and Straits of Florida) are conducted out of the Minerals Management Service (MMS) Gulf of Mexico (GOM) Regional Office. Historically, oil and gas production has been almost nonexistent on the Atlantic OCS. In fact, no Atlantic lease sales have been held since 1983, the last exploratory well was drilled in 1984, and the last remaining leases offshore North and South Carolina were relinquished back to the government in November 2000. In the proposed MMS leasing plan for 2007- 2012, however, one sale is being proposed for offshore Virginia.

In the meantime, excitement is building for alternative energy initiatives. With the passage of the Energy Policy Act of 2005, MMS was assigned jurisdiction over offshore alternative energy projects such as wave, wind, and solar energy.

FOR MORE INFORMATION:

Atlantic OCS

Website: www.gomr.mms.gov/homepg/offshore/atlocs/atlocs.html

Draft Programmatic EIS for the Outer Continental Shelf Alternative Energy and Alternate Use Program

Website: www.ocsenergy.anl.gov

MMS: Our Ocean Role

Website: www.mms.gov/ooc/newweb/publications/OurOceanRoleMMS.pdf

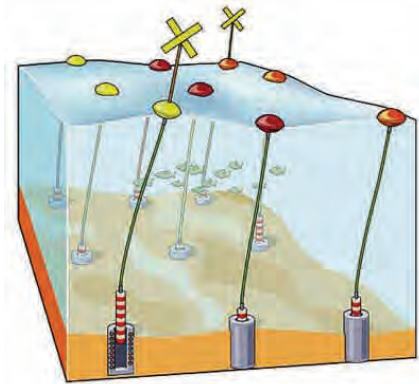
Under this new authority, MMS became the lead Federal agency for regulatory oversight of the Cape Wind Associates LLC, a proposed wind park project consisting of 130 3.6-megawatt wind turbine generators covering 24 square miles off Massachusetts. Another project gaining momentum is the Long Island Offshore Wind Park Project, consisting of 40 3.6-megawatt wind turbine generators covering 8 square miles south of Long Island, New York. In preparing the environmental impact statement for each project, MMS must identify physical, biological, socioeconomic, and human resources that could be affected by each phase of both projects – from construction to decommissioning.

A draft EIS for the Alternative Energy and Alternate Use (AEAU) program has recently been released, and MMS is inviting public comment on it. The draft EIS, which is open to public comment until May 21, 2007, assesses generic impacts from development, operations, and decommissioning of alternative energy or alternate use facilities. It also identifies key issues and mitigation measures that should be considered in subsequent site-specific reviews.

MMS Director Johnnie Burton noted that "The public has a unique opportunity to influence the creation of new and promising uses of our Nation's considerable ocean resources, through submission of written comments on the draft EIS or live input at upcoming hearings."

The EIS focuses on potential alternative energy development that may be initiated in the next 5-7 years, as well as potential alternate uses of offshore facilities.

What does the future hold for the Atlantic OCS area? A potential increased interest in oil and gas exploration to meet the Nation's domestic energy supply, renewable alternative energy sources, and an



Floating wave energy.

DEFINITIONS

Alternative energy:

Fuel sources that are other than those derived from fossil fuels, including wind, solar, biomass, wave, and tidal energy. Typically used interchangeably for renewable energy.

Renewable energy:

Energy resources that are naturally replenishing but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Renewable energy resources include biomass, hydro, geothermal, solar, wind, ocean thermal, wave action, and tidal action.

increased need for sand and gravel in the wake of increasingly erratic hurricane seasons. While nobody can say with certainty what the future holds, MMS will continue to ensure that our Nation benefits from the resources available on Federal offshore lands and will continue to balance resource development against environmental impacts.



At MMS, one of the primary tasks is responsibly managing the Nation's natural gas, oil, and mineral supply. One of the ways that is accomplished successfully is by studying historic phenomena – everything from the ancient organic material that ultimately formed today's crude oil supply to the busy hurricane season in 2005. This mission is also accomplished by looking forward to one of our greatest resources – the next generation. Young people in the classroom today will someday take over our roles as stewards of the environment, and it is up to us to prepare them for the mission. In addition, MMS will need the next generation of scientists and the industry will need a steady supply of qualified workers.

With that in mind, the priorities are to stimulate the curiosity of our young stewards-to-be and spark their interest while educating them about the delicate nature of our planet. Many current MMS programs do that by offering free activities for students of all ages, as well as posters and instruction guides for teachers, through the **Kids' Page** on the main MMS web site (www.mms.gov).

From there, visitors may explore links to a variety of material located on the Alaska Region, Gulf of Mexico Region, and Pacific Region web sites.

- ▶ *Ocean Energy*, a downloadable booklet, tells students about ocean energy resources located in, over, and under the ocean; *The Ocean's Sand, A Natural Resource* includes hands-on exercises about coastal erosion and the importance of sand and gravel.
- ▶ A colorful *How Many Does It Take?* handout reveals the quantity of energy resources (onshore gas wells, solar panels, etc.) that are required to power a city of 100,000 people or to fuel cars for 100,000 people for a year.
- ▶ Students in grades 9-12 get a taste of the real world in a role-playing skit called *Watts It To You?* as they explore ways to make the fictional Golden County energy self-sufficient through inquiry, cooperative problem-solving, and negotiation.
- ▶ In the *Tidepool Math* series, teachers guide students through a series of exercises using a mussel bed to learn the scientific applications of counting and estimating while also learning about the environment through exploration.
- ▶ Yet another link on the MMS Kids' Page invites viewers to read about *Historic Shipwrecks in the Gulf of Mexico*. A teacher's instructional resource for the sidewheel steamship *Josephine* includes fascinating historical information about commerce and maritime transportation, as well as environmental issues.

On these pages you'll find informative resources that pertain to each region at each stop.

On the **Alaska Kids Corner** site, young people can test their knowledge of Alaskan animal names or print a crossword puzzle and coloring project designed to educate and entertain them simultaneously. They can watch short videos about Alaska oil and gas production and learn about ice islands, whale surveys, or volcanoes.

On the **Pacific Kids Playground** pages, teachers and kids will find information about finding and exploring shipwrecks in California, educational posters summarizing research projects, and a fact-filled question and answer section. Links posted there lead to other sites.

On the **Gulf of Mexico Kid's Page**, instructors can download or order free posters, teacher's companions, activity sheets, or games for use in the classroom. They can register their school in the Computers for Learning Program. The MMS has donated more than 1,000 surplus computers to area schools and educational nonprofits under this program.

How many students will become petroleum engineers or marine biologists because of the educational material provided? We may never know. But while MMS continues performing its duties each day – duties that are critical to the Nation's energy resources – it also remains focused on our greatest resource of all: the next generation.

FOR MORE INFORMATION:

MMS Online for Kids

Website: www.mms.gov/alaska/kids/index.htm

Website: www.gomr.mms.gov/homepg/lagniapp/lagniapp.html

Website: www.mms.gov/omm/pacific/kids/educate.htm

THE OAP and NOPP

AN EVOLUTION OF COORDINATION AND LEADERSHIP IN OCEAN SCIENCES AND RESOURCE MANAGEMENT

Recognizing the need for a cooperative nationwide organization that could provide coordination in national oceanographic research and education programs, as well as leadership in increasing the visibility of ocean issues nationally and internationally, Congress established the National Oceanographic Partnership Program (NOPP) in 1997. This important piece of legislation set in motion the vision of an entity dedicated to the coordination, development, and sharing of our ocean knowledge.

In December 2004, President Bush released the U.S. Ocean Action Plan¹ (OAP), the Administration's response to *An Ocean Blueprint*, the final report of the U.S. Commission on Ocean Policy. The OAP called for the ICOSRMI (the Interagency Committee on Ocean Science and Resource Management Integration) to incorporate the activities of NOPP's governing council within its broader mandate, which includes ocean resource management.

One of NOPP's most successful endeavors has been its annual solicitation of proposals on specific topics through Broad Agency



Announcements (BAA). With an average of 12 new projects per year, NOPP supports projects that bring together scientific and lay communities on larger, more comprehensive projects that emphasize shared resources, broader education, and innovative advances in the ocean sciences.

This past year, the Office of Naval Research, on behalf of its NOPP partner agencies and the ICOSRMI, continued this tradition and issued a BAA as part of the U.S. contribution to the International Polar Year (IPY). The topics solicited were (1) the coastal effects of a diminished-ice Arctic Ocean and (2) marine mammals. The research solicitation stated that "Proposals are encouraged that would develop and test prototype ocean observing systems in the Alaska Beaufort and/or Chukchi Sea capable of withstanding or accommodating intra- and inter-annual variability in local ice-ocean conditions. Of particular interest are observational techniques that would monitor marine mammals or fish populations (e.g., using passive or low-intensity active acoustics)."

Successful proposals may complement and expand research already being done by the Minerals Management Service (MMS) Alaska Region. Ongoing MMS-funded studies in Alaska include *Sea Ice Modeling for Nearshore Beaufort and*



Chukchi Seas and a joint MMS/NOPP study entitled *Surface Circulation Radar Mapping in Alaskan Coastal Waters*.

One fascinating example of research being done by private industry that may add to the observational arsenal in the Arctic is the use of drones to study marine mammals. This use of drones is proposed to address environmental and subsistence hunting concerns when offshore seismic survey programs are conducted. Although the idea is untested and initial problems exist, its potential positives include safety, fuel efficiency, and flexibility. New studies are proposed to examine further this promising use of drones. This research is not currently associated with NOPP, but is an example of the kind of study that may prove widely useful in cooperative oceanographic research.

¹ See our Special Interagency OAP Issue! *MMS Ocean Science* Volume 3, Issue 5. [www.gomr.mms.gov/homepg/regulate/ environ/ocean_science/mms_ocean_06_sep_oct.pdf](http://www.gomr.mms.gov/homepg/regulate/environ/ocean_science/mms_ocean_06_sep_oct.pdf)

FOR MORE INFORMATION:

NOPP

Website: www.nopp.org/

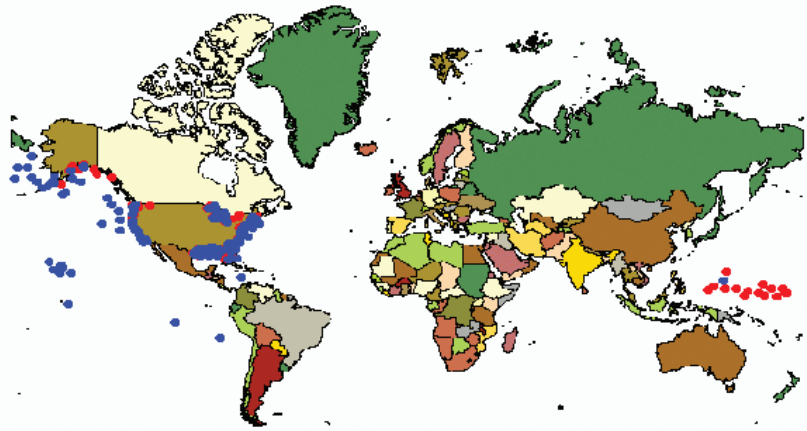
Environmental Programs

Website: www.mms.gov/eppd/sciences/esp/index.htm

Today we have access to more information online than would have been found at the finest universities just 50 years ago. We can communicate, share, and discuss that information with colleagues through online messaging and conferencing instantly. This capacity for collaboration and information-sharing is the key to constructive and productive decisionmaking. With this in mind, the Minerals Management Service (MMS) is building a network of searchable databases in collaboration with academic, industry, and government scientists to allow stakeholders and interested parties to access detailed technical and scientific information online. This storehouse of easily accessible meteorological, geological, social science, and biological information is a powerful source of information from which high-quality planning and decisionmaking can be made by parties working in the Outer Continental Shelf (OCS).

Air quality assessment is an essential part of the evaluation of development and operations plans in the Gulf of Mexico (GOM). Dispersion modeling is used to assess potential onshore air quality impacts from emissions resulting from oil and gas development activities. As with any meteorological model, the quality of the data input determines the quality of the model output. To date, MMS and oil and gas operators have been using a 2-year meteorological dataset (1991-1993) for model input. A recent study, however, began to collect a 5-year dataset to provide more robust input data. The data are being gathered from existing prognostic modeling in the GOM, surface National Climatic Data Center (NCDC) data, and offshore buoys.

The Louisiana Sand Resource Database (LASARD) is a



Map of buoys in the NOAA Marine Environmental Buoy Database. Courtesy of NOAA.

geological database in the GOM that helps locate sand resources off the coast of Louisiana, which may be used for coastal and wetland restoration projects. This database will lead to better quantitative and qualitative assessments of offshore sand resources.

Human activity is the subject of a database in the Alaska region. Seismic activity associated with oil and gas exploration and drilling activity concerned subsistence hunters in the coastal villages in the Beaufort Sea. Of particular concern is the behavior of marine mammals when confronted by human activity such as seismic noise from exploration surveys. The database information was compiled from seismic and geohazard surveys; geophysical surveys from the U.S. Geological Survey; and daily drilling reports for Alaska and the OCS. The database is relatively complete for 1990 to 1998, but to date it is proprietary because of seismic data obtained from oil companies. The database may be available in the future, pending permission from the owners of the seismic data.

One of the largest databases is maintained by the National Oceanographic and Atmospheric Administration (NOAA). The NOAA Marine Environmental

Buoy Database records wind speed and direction, wave height, air temperature and pressure, sea-surface temperature, and other marine data. Data are collected from buoys and from C-MAN (Coastal-Marine Automated Network) stations. C-MAN's can be located on piers, lighthouses, and beaches. The database has an interactive interface and can be fully accessed online.

Collecting, analyzing, and organizing information into useful and user-friendly databases is a difficult process, but the end product greatly increases the quality and quantity of data available to scientists, researchers, and academics. The MMS is dedicated to increasing the storehouse of available knowledge concerning the OCS and its natural resources and environment.

FOR MORE INFORMATION:

Information Databases

Website: http://gsa.confex.com/gsa/2005SE/finalprogram/abstract_83482.htm

Website: www.mms.gov/alaska/reports/2003andOlderRpts/2002-071Vol1.pdf

Website: www.nodc.noaa.gov/BUOY/buoy.html

INTERNATIONAL POLAR YEAR

The polar ice caps are considered two of the most geographically inaccessible points in the world. Yet these harsh and forbidding expanses hold valuable clues about our environmental past and future. New studies have emphasized the delicate balance of ecosystems in the polar regions and revealed recently accelerated changes that could drastically affect that balance.

Recognizing the importance of the regions and the changes each is undergoing, the International Council for Science and the World Meteorological Board recently declared the International Polar Year (IPY) to highlight research that may help us understand global climate changes and to encourage students to consider careers in science and engineering. The “year” will actually span two years (2007-2008) so scientists can take advantage of relatively mild and light conditions available during parts of each year.

A key objective of IPY is to highlight studies being done by scientists, educators, and governmental agencies. The

number and urgency of these studies have increased as signs of climatic changes have emerged in the regions. Acknowledging the need to take a multisystemic and multidimensional approach to the changes in the polar caps—specifically the Arctic—the National Science Foundation’s (NSF) Office of Polar Programs has organized the Study of Arctic Environmental Change (SEARCH), a multiagency initiative to understand the nature of environmental changes in the expanse. The NSF is also studying

our understanding of the Arctic. Through its Alaska office, MMS has funded multiple projects in the region that will help meet the objectives of the IPY, “fill in the gaps” in observational research in the region, and showcase the diverse areas of study available to academic and governmental researchers in the region.

A recently completed MMS study, *Mapping and Characterization of Recurring Spring Leads and Landfast Ice in the Beaufort and Chukchi Seas* (OCS Study MMS 2005-068), collected

A key objective of IPY is to highlight studies currently being done by scientists, educators and governmental agencies.

the implementation of an Arctic Observing Network (AON), which would blend current research capacities, local and regional cultures, diverse disciplines, and real-time observations to create a comprehensive picture of the Arctic’s past, present, and future.

In addition, the Alaska Ocean Observing System (AOOS), located at <http://ak.aaos.org>, provides historic and real-time data and information on the changing marine ecosystem in the Arctic.

The Minerals Management Service (MMS) is charged with the protection and responsible development of the Nation’s offshore energy and mineral resources, which include the Alaskan Arctic, and has made significant contributions to

information on changing ice conditions in the Arctic. An article based on the study suggested that changes in landfast ice conditions in the Arctic may be affecting marine mammal habitat and survival rates, as well as subsistence activities of the native communities. Diminished ice also substantially impacts coastal communities, as the resulting coastal erosion can increase the community’s exposure to destructive waves. According to the article, the “reduced presence of landfast ice in this region of the Arctic...will likely lead to an increase in coastal erosion and may also have profound effects upon subsistence activities, which are intimately linked to the timing of marine mammal migration patterns.” Thawing temperatures are also leading to the breakup of the perennial sea-ice edge as it retreats northward. Another recent MMS field study using high-frequency



Ice floes in the northern Bering Sea. Photo courtesy of NOAA.



Snow-capped mountains tower over a commercial fishing boat in the Arctic.

radar examined the changes in surface currents with changing ice conditions in the Beaufort Sea.

The MMS supports the maintenance of the MMS Alaska Sea Ice Database, which provides scientists with historic and current sea-ice conditions for study and comparison. In addition, ongoing MMS North Slope studies examine the changing weather patterns and ground conditions, in addition to regionwide Arctic modeling efforts of ocean currents, ice, and weather patterns.

Other MMS studies related to the IPY efforts include

- ▶ Four jointly funded DOI projects addressing polar bear monitoring, demographics of feeding bears, use of forward-looking infrared imagery to detect maternal dens, and use of sea-ice habitat by polar bears.
- ▶ Two additional MMS ongoing projects are also studying polar bears and bear population modeling.

The significance of the changes occurring at the polar ice caps is gaining more national and international attention with

the recent news of the breakup of large sections of Canadian polar ice. The news serves to highlight the importance of the IPY and the value of future scientists committed to exploration of the causes and consequences of those changes.

The U.S. National Committee for IPY recommended goals for scientists and agencies (including MMS) involved in the International Polar Year.

- ✓ Use the IPY to initiate a sustained effort aimed at assessing large-scale environmental change and variability in the polar regions.
- ✓ Pioneer new polar studies of coupled human-natural systems that are critical to U.S. societal, economic, and strategic interests.
- ✓ Explore new scientific frontiers from the molecular to the planetary scale.
- ✓ Use IPY as an opportunity to design and implement multidisciplinary polar observing networks that will provide a long-term perspective.
- ✓ Invest in critical infrastructure (both physical and human) and

technology to guarantee that the International Polar Year 2007-2008 leaves enduring benefits for the Nation and for the residents of northern regions.

- ✓ Excite and engage the public, with the goals of increasing understanding of the importance of the polar regions in the global system and, at the same time, advance general science literacy in the Nation.
- ✓ Participate as leaders in International Polar Year 2007-2008.

FOR MORE INFORMATION:

International Polar Year

Website: www.ipy.org
 Website: www.us-ipy.gov
 (U.S. IPY website)

OCS Study MMS 2005-068

Mapping and Characterization of Recurring Spring Leads and Landfast Ice in the Beaufort and Chukchi Seas

Website: www.mms.gov/alaska/reports/2005rpts/2005_068.pdf

AWARDED TO DR. TOM AHLFELD

On March 1, 2007, the George Institute for Biodiversity and Sustainability (GIBS) conducted an international workshop on marine conservation with eight speakers. Dr. Tom Ahlfeld of the Minerals Management Service (MMS) was one of the speakers. Dr. Robert Y. George, President of GIBS, recognized Ahlfeld for his dedicated work on conservation of chemosynthetic ecosystems and the deep-sea coral *Lophelia* reef ecosystems in the Gulf of Mexico. Ahlfeld was awarded the third Robert Avent Medal with a standing ovation from the audience.

“Recognition by your peers is an especially high honor and I am proud to be the 2007 recipient of this medal,” said Ahlfeld. “It has extra meaning to me since I knew Bob Avent as a fellow graduate student at Florida State University, co-worker at MMS, and as a friend.”

The Robert Avent Medal was founded by the board of directors of GIBS in memory of the late Dr. Robert Avent with solemn recognition of his outstanding research contributions on cold coral ecology (*Oculina* reefs off Florida) and dedicated service to MMS for 27 years, with focus on conservation of deep-water ecosystems in conjunction with oil and gas drilling and production activities in the Gulf of Mexico.

The first Avent Medal was awarded to Dr. John Reed of Harbor Branch Oceanographic Institute in 2005. The 2006 Avent Medal was presented to Dr. William Hogarth, Assistant Secretary of NOAA for marine fisheries.

Ahlfeld currently holds the position of biological oceanographer



Dr. Tom Ahlfeld.

“I always was, and still am, amazed by the beauty and diversity of the marine environment.”

and monitoring the biological effects of offshore oil and gas development. Ahlfeld holds a B.S. degree in biology from Loyola University of New Orleans and M.S. and Ph.D. degrees in biological oceanography from Florida State University. He has served as a member of the science advisory panel for Mote Marine Laboratory of Sarasota, Florida, and was selected to deliver the keynote address at the 2003 *Offshore Oil and Gas Environmental Effects Monitoring Workshop* held in Dartmouth, Nova Scotia. He is also a recipient of numerous Federal special achievement awards, including the Department of the Interior Honor Award for Superior Service.

Originally from Miami, Florida, Dr. Ahlfeld’s interest in the sea began at an early age as he spent much of his time on boats in Biscayne Bay fishing, skin diving, and exploring. “I always was, and still am, amazed by the beauty and diversity of the marine environment.”

During recent years, Ahlfeld has served on many U.S. interagency panels dealing with diverse marine environmental issues, including invasive species, coral reef protection, and ecosystem management. Through oral and poster presentations, he has represented MMS at many international conferences dealing with deep-sea corals, chemosynthetic communities, general deep-sea ecology, and monitoring the effects of offshore oil and gas activities on the marine environment.

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Ahlfeld’s recent publications include the following topics: resource management applications of environmental research on chemosynthetic communities associated with hydrocarbon seeps in the Gulf of Mexico; protection of deep-sea corals in the Gulf of Mexico; and monitoring the effects of offshore oil and gas activities on the marine environment.

CURRENT TURMOIL



Hurricane Frances. Photo courtesy of NOAA



Anchor used for mooring of mobile offshore drilling unit (MODU). Since Hurricanes Katrina and Rita, the type of anchor used will get special consideration since it can be critical to the amount of damage a platform incurs when a hurricane strikes.

Hurricanes are one of the most destructive forces on earth, capable of damaging anything in their path. And when what's in their path are oil platforms, personnel, and pipelines on the Outer Continental Shelf (OCS), the potential for damaging and disrupting oil and gas production, transportation, and national energy supplies is enormous. As the steward of OCS energy and marine minerals resources, the Minerals Management Service (MMS) is funding new research to help scientists understand the inner workings of this unpredictable destructive force.

What causes a hurricane? The simplest answer is warm water. But it's much more complicated and harder to predict than that. What makes it complicated is the Loop Current. Normally, the horseshoe-shaped Loop Current streams up from the tropical waters of the Caribbean, moves across the Gulf of Mexico (GOM), and exits at the Florida Straits near Cuba. But the Current varies a lot – it may flow farther east or west, higher or lower in the Gulf. It occasionally flows as high as the Mississippi River Delta. Periodically, the Current will

pinch off deep, warm eddies that travel across the GOM until they eventually die, usually in the western Gulf. According to MMS, the Current travels at 4 knots, or the equivalent of a 60-mile-per-hour, gale-force wind.

Hurricanes over the ocean extract heat from it and draw up waters that generally are cooler. But over the warm Loop Current, the heat content of the waters is large and the drawn-up waters are warmer, allowing hurricanes to strengthen. However, the amount the hurricane may intensify can vary from one storm to another. Many of the other factors that are at work are still unknown or little understood.

One recent MMS wave and current study uses data from fortuitously deployed equipment during Hurricane Ivan (there was no equipment in the area during Hurricanes Rita and Katrina, although both hurricanes are included in the study). The objective of the study is to create a "realistic simulation of circulation throughout the entire water column", determine the length of time "substantial ocean response" lasts, and ascertain where the greatest wave height and fastest current speed were located. The results of this study will

help establish new equipment and safety guidelines in the GOM.

The MMS has recently launched a website to gather information and resources regarding hurricanes. The site will include preparation instructions should a hurricane threaten lives or property, historical hurricane data, and hurricane fact sheets. Users will also be able to track hurricanes through the website.

As more and more is discovered about hurricanes, a stronger, safer environment for offshore energy exploration is emerging. The MMS is strengthening equipment standards, refining communications plans, and raising its inspection and risk assessment standard so the next hurricane season will see a more prepared OCS.

FOR MORE INFORMATION:

Hurricane Research

Website: www.mms.gov/2006Hurricanes/2006HurricaneSeason.htm

Website: www.mms.gov/ooc/PDFs/SafeSafer-2005HurricaneSeasonandBeyond.pdf

Website: www.mms.gov/tarprojectcategories/hurricaneKatrinaRita.htm

MMS – A Leader in Securing the Nation’s Domestic Energy Supply



Chris Oynes

NEW WAVES Late-breaking News & Information

Chris Oynes Named Associate Director of the MMS Offshore Program

Minerals Management Service (MMS) Director Johnnie Burton announced in February the selection of Chris Oynes as the new Associate Director of the agency’s Offshore Minerals Management Program. Mr. Oynes has served as Regional Director of MMS’s Gulf of Mexico Outer Continental Shelf (OCS) Region for the past 13 years.

"Chris Oynes brings to the position of Associate Director a wealth of knowledge and experience about the practices and processes of the Offshore Program, as well as impressive leadership skills," said Burton. "His work has helped to make the OCS a major contributor to the Nation’s energy and economic security," she continued, "and his solid leadership was crucial to MMS Gulf of Mexico Region employees as well as Gulf OCS energy operators before, during, and after the devastating hurricane seasons of 2004 and 2005."

As Associate Director of the Offshore Minerals Program, Mr. Oynes will be responsible for manag-

ing the MMS Offshore Program to help meet the Nation’s energy needs and protect the ocean and coastal environment.

As the Gulf of Mexico Regional Director, Mr. Oynes managed the leasing of OCS lands off five Gulf Coast States for oil, gas, and other mineral development, and supervised the regulation of operations and protection of the environment on those leases, which involves more than 4,000 platforms.

Mr. Oynes has more than 30 years of Federal Government experience with energy matters, including 11 years in Washington, D.C., with MMS in various capacities, most notably as Chief of the Lease Sale Planning Branch and the Leasing Division.

He has received the two highest honor awards that the U.S. Department of the Interior bestows, the Distinguished Service Award and the Meritorious Service Award.

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