

MMS OCEAN SCIENCE

VOLUME 5 ISSUE 2
APRIL/MAY/JUNE 2008

THE SCIENCE & TECHNOLOGY JOURNAL OF THE MINERALS MANAGEMENT SERVICE

**Water World:
MMS Stewardship
and Supervision
of the Ocean
Environment**

**Bringing Up
the Past: "Mardi
Gras" Shipwreck
Excavation**

**Reaching Out:
Establishing
Limits on the
Continental Shelf**

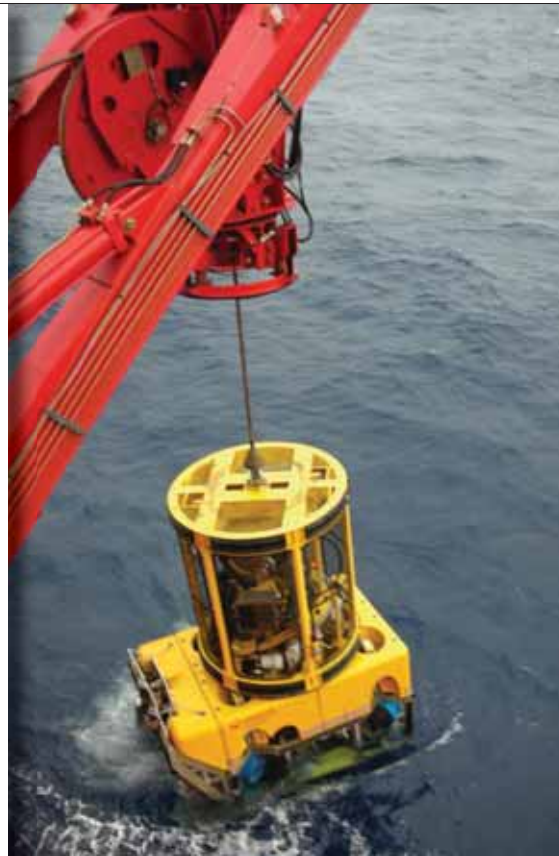
**Sounds of
the Sea:
Sperm Whale
Research in the
Gulf of Mexico**

**New
Development in
the Gulf of Mexico**

**Pushing
New Limits**

**Oil and Gas
Revenues Fund
the Future**

**Ocean Sciences
Meeting in Orlando**



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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: ROV (remotely operated vehicle) used in "Mardi Gras" Shipwreck excavations. Credit: Florida Public Archaeology.

Top Right: Zigzag coral (*Madrepora oculata*). Credit: NURC/UNCW and NOAA/FGBNMS, Voyage to Inner Space; taken in the Gulf of Mexico Bright Bank.

Middle Right: One of the skimming systems about to be tested at Ohmsett.

Main Photo: Hall Island near St. Matthew Island in the Bering Sea. Credit: U.S. Fish & Wildlife Service.

Back Page: Background platform image by Gregory S. Boland.

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APRIL/MAY/JUNE 2008 Volume 5 Issue 2

- 3 Water World**
MMS Stewardship and Supervision of the Ocean Environment
- 4 Bringing Up the Past**
"Mardi Gras" Shipwreck Excavation
- 6 New Frontiers on the Horizon**
- 7 Reaching Out**
Establishing Limits on the Continental Shelf
- 8 Sounds of the Sea**
Sperm Whale Research in the Gulf of Mexico
- 10 New Development in the Gulf of Mexico**
- 11 Pushing New Limits**
Ohmsett Tests High-Capacity Skimming Systems
- 12 Oil and Gas Revenues Fund the Future**
- 14 Ocean Sciences Meeting in Orlando**
- 16 New Waves**
Late-Breaking News & Information

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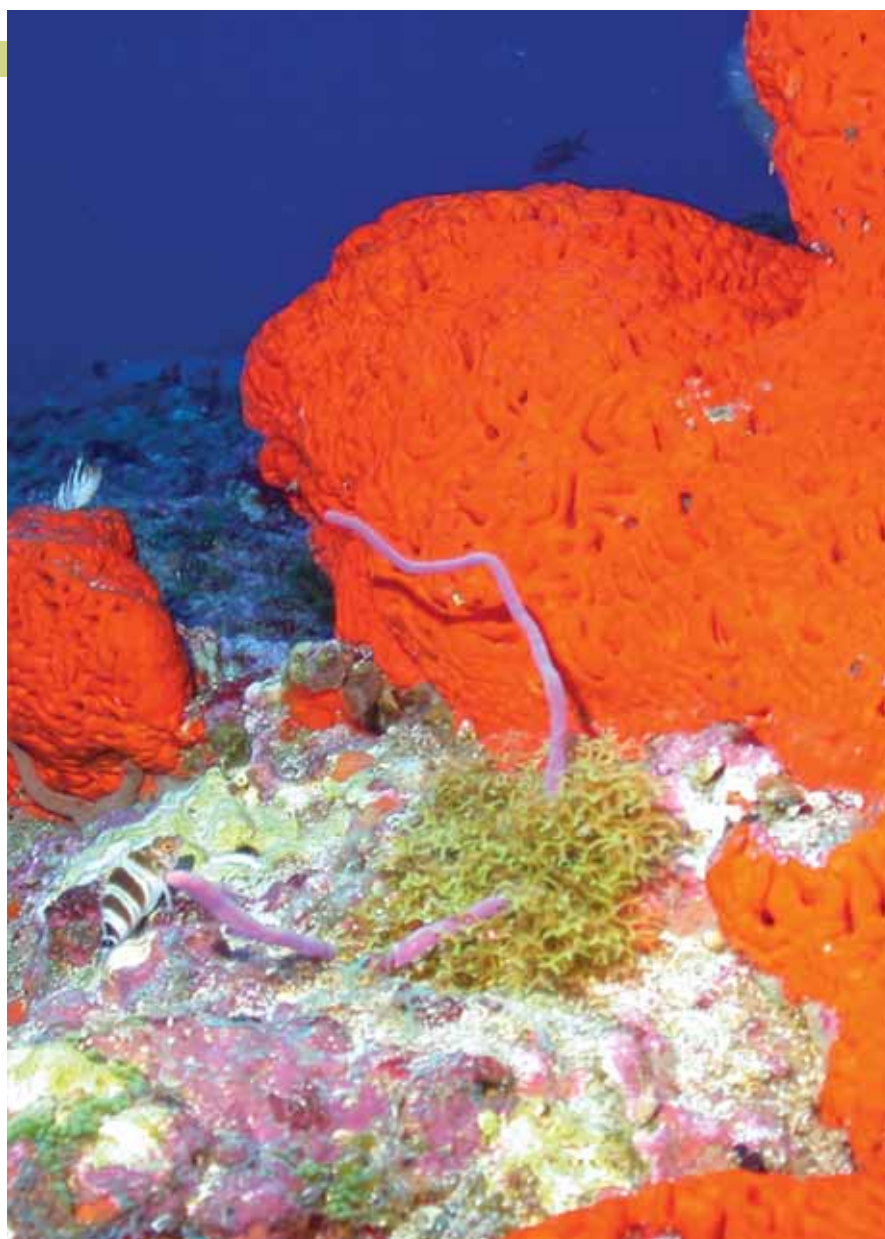
ASA Oceanography describes

Earth as a “water planet”: oceans cover over 70 percent of the earth’s surface. Clearly, protecting these vital resources is no small task.

The Minerals Management Service (MMS) is dedicated to doing its part to protect the ocean environment against environmental impacts and to support responsible development of the Nation’s energy resources. This includes extensive research to preserve the precious marine ecosystems and provide the scientific foundation for MMS’s demanding industry standards, noted MMS Director Randall Luthi.

Partnerships are important to MMS’s ability to accomplish its mission as a steward of the ocean environment. Through collaboration with corporations, educational institutions, government agencies, and research institutions, MMS has access to cutting-edge methodologies and techniques, tools, and processes. This allows MMS’s teams of scientists to lead valuable studies for the responsible development of energy resources.

Domestic resources are important to the Nation’s economy and new technology is expanding production possibilities—it is estimated that undiscovered fields in the Outer Continental Shelf may hold 86 billion barrels of oil and 420 trillion cubic feet of gas (2006, mean estimates). The royalty revenue generated by energy production on Federal and American Indian lands provides economic benefits to the Nation: in 2007 alone, MMS disbursed \$11.7 billion to the U.S. Treasury, Tribes, states, and individual



WATER WORLD: MMS Stewardship and Supervision of the Ocean Environment

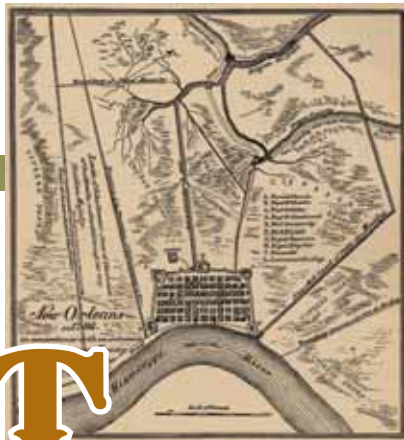
Elephant ear sponge (*Agelas clathrodes*). Photo courtesy of NURC/UNCW and NOAA/ FGBNMS, *Voyage to Inner Space*, taken in the Gulf of Mexico McGrail Bank.

allottees. Since MMS began its agency operations in 1982, it has disbursed over \$175 billion!

Each discovery presents new challenges, and MMS is meeting

them head-on and delving deeper into the vast ocean, continuously gaining and sharing knowledge about how to best protect our valuable natural resources.

BRINGING UP THE PAST



Left: New Orleans, Louisiana in 1798. Image courtesy of University of Texas Map Collection.

“Mardi Gras” Shipwreck Excavation UnCOVERS 200-Year-Old Artifacts

The Minerals Management Service (MMS) helps protect archaeological sites on the Outer Continental Shelf (OCS), in accordance with the National Historic Preservation Act (NHPA) of 1966. Through marine archaeology (the study of human interaction with the sea) and work with partners, MMS helps conserve, protect, and preserve historic OCS sites during environmental studies and oil and gas activities. Historic shipwrecks and Native American artifacts are some examples of the findings of marine archaeologists.

FOR MORE INFORMATION:

MMS Archaeology

Website: www.gomr.mms.gov/homepg/regulate/environ/archaeological/introduction.html

Mardi Gras Shipwreck

Website: www.flpublicarchaeology.org/mardigras/crew/

Website: <http://nautarch.tamu.edu/mardigras/>

Society for Historical Archaeology

Website: <http://sha.org/>

Through the use of x-ray technology, a maker's mark was identified, which indicated the maker, *T. Harris & Son*, the place of manufacture, London, and the day and night uses of the spyglass or telescope.



Another batch of artifacts included a wine bottle and a small glass bottle embossed with 'LONDON.' This bottle's style gives another clue to the date of the shipwreck. According to the Glass Glossary published by Parks Canada (1989:26-27), this type of bottle was molded in two pieces and contained mustard. The date range for these mustard bottles is from 1750 to 1880.



The Mardi Gras shipwreck, for example, is a 200-year-old shipwreck discovered in 2002 by oil-field inspection crews surveying the Mardi Gras Transmission Pipeline. The ship is about 40 miles off the coast of Louisiana in the deepwater of the Gulf of Mexico, but its exact identity is a mystery yet to be solved.

Work on the site began in May 2007 when archaeologists from MMS and Texas A&M University conducted the deepest non-commercial scientific excavation to date. Below 4,000 feet of water, artifacts from the ship were recovered with the help of off-the-shelf industry equipment, such as a remote operated vehicle and large artifact retrieval tools, able to withstanding the extreme deepwater pressure. Excavation continued through June 2007. Conservation of the artifacts is ongoing at the Conservation Research Laboratory at Texas A&M University.

Among the discoveries were artifacts most likely dating from the Louisiana Purchase and the War of 1812, including



Four of the bottles collected.

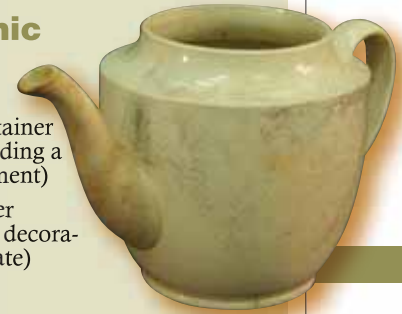


A sand clock (hourglass).

Artifacts found at the "Mardi Gras" Shipwreck

Ceramic

- ✦ Bottle
- ✦ Caster (a container for holding a condiment)
- ✦ Charger (larger decorative plate)
- ✦ Bowl
- ✦ Jugs
- ✦ Pitcher
- ✦ Place settings (three, including a plate, tea bowl*, and saucer)
- ✦ Platters
- ✦ Teapot*
- ✦ Tureen (broken)



Glass

- ✦ Bottles (for wine and beer)*
- ✦ Condiment bottle*
- ✦ Inkwell with traces of ink*
- ✦ Pane of glass

Organic material

- ✦ Bone scales (from utensils)
- ✦ Rigging elements
- ✦ Small brush (likely a toothbrush)

Metal

- ✦ Anchor
- ✦ Arms and edged weapons
- ✦ Buttons
- ✦ Cannon
- ✦ Coins (Spanish)
- ✦ Ship's stove (cast-iron)
- ✦ Spoons (three, pewter)

Composite *(contain more than one material category)*

- ✦ Carpenter's plane
- ✦ Mill (likely a coffee grinder)
- ✦ Spyglass or telescope*
- ✦ Watch face and bezel (enameled iron)

* Image shown in this article



Left: MMS's exhibit at the 2008 Conference on Historical and Underwater Archaeology held January 9–13, in Albuquerque, NM. Pictured center are MMS staff Jack Irion, Chris Horrell, and Melanie Damour.

Right sidebar: The majority of the ceramic assemblage is undecorated creamware, but stoneware and pearlware were also found. Such lighter-colored creamware generally dates from 1775 to 1820, particularly table and tea wares.

objects from France, Great Britain, Mexico, and possibly the United States. The artifacts included items made of ceramic, glass, metal, and organic and composite materials. The ship's stern encrustation was also retrieved, containing artifacts within the concretion. Conservators are now working to carve out of the layers. Once the conservation is complete, the artifacts will be donated to the Louisiana Department of Culture, Recreation, and Tourism for exhibition at the Louisiana State Museum.

In January of 2008, MMS archaeologists presented initial findings from the excavation at the Society for Historical

Archaeology's 2008 Conference on Historical and Underwater Archaeology.

Discovering, excavating, identifying, and conserving or preserving materials that can tell us more about our past are some of the ways the MMS helps protect and conserve the history of the U.S. and of the Gulf Coast while also managing the energy resources of the OCS.



A single inkwell arrives at the Conservation Research Laboratory at Texas A&M University. After conservation treatment, the final product is ready for display. The inkwell still contains traces of ink.

ON THE HORIZON

Although the expansion of alternative power sources is high on the Nation's energy agenda, progress in developing such sources, especially those on the Outer Continental Shelf (OCS), is not moving as fast as some might hope. The growth of offshore alternative energy activities and alternate uses of offshore facilities has enormous potential, but consideration must be given to potential short- and long-term adverse effects on sensitive marine ecosystems.

The Minerals Management Service (MMS), a bureau of the U.S. Department of the Interior, was granted authority over alternative energy activity and alternate use of existing facilities on the OCS by the Energy Policy Act of 2005, and is currently formulating rules and methodologies for the uncharted frontiers of emergent energy resource development. As part of this undertaking, MMS recently announced the adoption of 52 "best management practices" to ensure development is done in an environmentally appropriate manner. Although the agency is adopting these standards, MMS will, at its discretion, consider each project on a case-by-case basis.

FOR MORE INFORMATION:

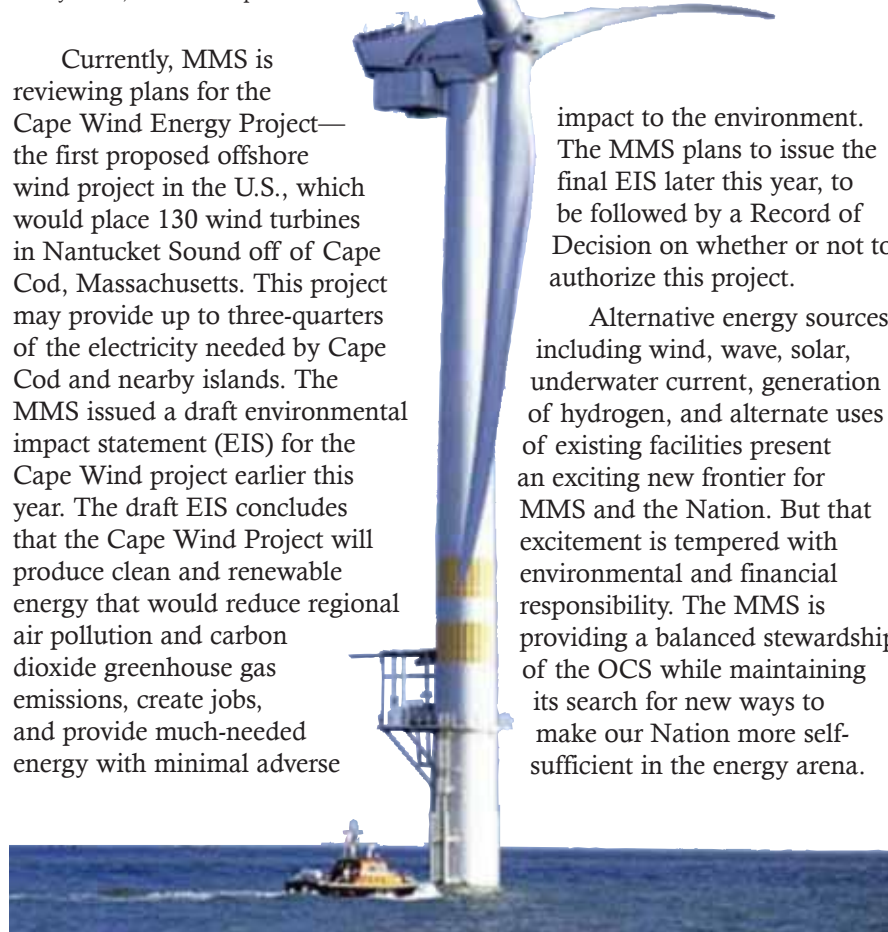
- Website: www.mms.gov/offshore/RenewableEnergy/RenewableEnergyMain.htm
- Website: www.mms.gov/ooc/press/2008/press0114.htm
- Website: www.mms.gov/ooc/press/2008/press0110.htm
- Website: www.mms.gov/tarprojectcategories/AlternativeEnergy.htm
- Website: www.mms.gov/ooc/PDFs/AlternateEnergy-relatedUsesontheOCS.pdf



Above: A Gulf crewboat is silhouetted in a Gulf of Mexico sunset. Photo courtesy of NOAA's America's Coastlines Collection, taken in Louisiana by Commander Grady Tuell, NOAA Corps.

Currently, MMS is reviewing plans for the Cape Wind Energy Project—the first proposed offshore wind project in the U.S., which would place 130 wind turbines in Nantucket Sound off of Cape Cod, Massachusetts. This project may provide up to three-quarters of the electricity needed by Cape Cod and nearby islands. The MMS issued a draft environmental impact statement (EIS) for the Cape Wind project earlier this year. The draft EIS concludes that the Cape Wind Project will produce clean and renewable energy that would reduce regional air pollution and carbon dioxide greenhouse gas emissions, create jobs, and provide much-needed energy with minimal adverse

Below: Inspecting an offshore energy farm. Photo courtesy of GE Energy.



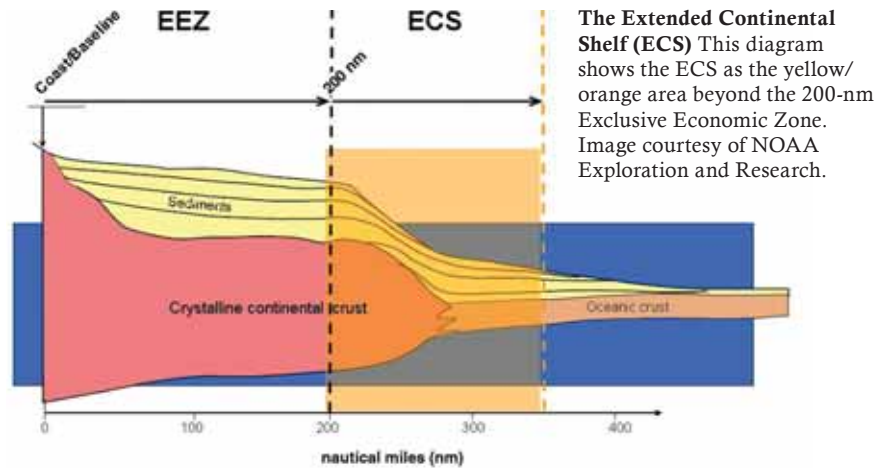
impact to the environment. The MMS plans to issue the final EIS later this year, to be followed by a Record of Decision on whether or not to authorize this project.

Alternative energy sources, including wind, wave, solar, underwater current, generation of hydrogen, and alternate uses of existing facilities present an exciting new frontier for MMS and the Nation. But that excitement is tempered with environmental and financial responsibility. The MMS is providing a balanced stewardship of the OCS while maintaining its search for new ways to make our Nation more self-sufficient in the energy arena.

ESTABLISHING LIMITS ON THE CONTINENTAL SHELF REACHING OUT

As technology advances the ability to move farther and deeper into the vast ocean, the question arises of who has the rights to the ocean's highly valuable natural resources. Article 76 of the 1982 United Nations Convention on the Law of the Sea (UNCLOS) allows coastal States to establish their continental shelves within 200 nautical miles (nm) of their shores, and the Minerals Management Service (MMS) is helping the U.S. establish its outer Extended Continental Shelf (ECS) limits in compliance with this internationally accepted law.

Although the U.S. is not a party to UNCLOS, it is seeking to gain legal certainty of entitlement to its ECS. These efforts include the collection and analysis of scientific data to map the U.S. outer limits, including depth, shape, and geophysical seabed characteristics. When sovereign rights are established, a State has control over both living and nonliving resources on its shelf, such as oil, gas, hydrates, minerals, and sedentary animal life. Additionally, the State controls all scientific research with regard to its ECS.



According to the National Oceanic and Atmospheric Administration (NOAA), the U.S. would like to extend its continental shelf limits to seabed areas beyond 200 nm, establishing rights to the natural resources on the seabed and sub-seafloor. To accomplish this, an ECS Task Force has been created to ensure that the limits are created in accordance with international law, using data collected from MMS, NOAA, and other collaborating agencies.

The mission of MMS is to create a balance between securing economic value and protecting the

ocean's natural environment. The current U.S. Outer Continental Shelf (OCS) is 1.76 billion acres, with the potential for undiscovered resources exceeding 86 billion barrels of oil and 420 trillion cubic feet of natural gas. Exploration and discovery of OCS domestic oil and gas economically benefits the U.S. It also furthers understanding of the marine environments from which those resources are found; studies and surveys for energy resources have resulted in discovery of chemosynthetic communities, deep-sea corals, and even historical shipwrecks. Providing the right balance allows our Nation to reap the benefits of its resources while protecting them at the same time.



This spectacular "blue marble" image is the most detailed true-color image of the entire Earth to date. Using a collection of satellite-based observations, scientists and visualizers stitched together months of observations of the land surface, oceans, sea ice, and clouds into a seamless, true-color mosaic of every square kilometer (.386 square mile) of our planet. Photo courtesy of NASA Goddard Space Flight Center.

FOR MORE INFORMATION:

- Website: www.mms.gov/eppd/reports/OceanExploation.pdf
- Website: www.explore.noaa.gov/special-projects/ecs-initiative/view
- Website: www.publicaffairs.noaa.gov/releases2007/aug07/noaa07-043.html
- Website: www.ngdc.noaa.gov/nndc/struts/results?eq_0=2007/04&op_3=eq&v_3=N&t=102750&s=3&d=10,6,11



Sperm Whale Research in the Gulf of Mexico

Sperm whales (*Physeter macrocephalus*).
Photo courtesy of NOAA's Ark - Animals Collection.

Sperm whales (*Physeter macrocephalus*) are an endangered species found in the world's oceans. A population resides year-round in the deep water of the Gulf of Mexico (GOM). As the oil and gas industry moves into deeper waters, the Minerals Management Service (MMS) has undertaken research to address potential impacts from these activities.

In 2002, MMS launched a Sperm Whale Seismic Study (SWSS) to address the potential effects of offshore seismic surveys on sperm whales in the GOM. Conducted as a multi-institutional, interdisciplinary research project through the Texas A&M Research Foundation, this study included scientists from Ecologic, Oregon State University, Scripps Institution of Oceanography, Texas A&M University, Texas A&M University-Galveston, University of Colorado, University of Durham in the United Kingdom, University of Saint Andrews in the United Kingdom, University of South Florida, and Woods Hole Oceanographic Institution. Funding sponsors were MMS, National Science Foundation, Office of Naval Research, Industry Research Funders Coalition, and the National Fish and Wildlife Foundation.

The objectives of SWSS were to

- (1) establish baseline information on the biology and behavior of sperm whales in the northern GOM,
- (2) characterize sperm whale habitat use in the northern GOM, and
- (3) determine possible changes in behavior of sperm whales when subjected to human-made noise, particularly from seismic airgun arrays used for offshore oil and gas exploration and geological monitoring.

The SWSS study consisted of four summers of fieldwork in 2002–2005 and approximately 5 years of satellite tag data transmission (2002–2006), followed by analysis and synthesis. The study area was the continental slope of the northern Gulf of Mexico, with focus on the region along the 1000-meter isobath between Mississippi Canyon and De Soto Canyon between 86°W and 91°W longitude. In field year 4, the satellite-tag (S-tag) work was done in the northwest Gulf to provide information for comparison with the main study area. During SWSS, there were four S-tag cruises (2002–2005), two digital-tag (D-tag) cruises with controlled exposure experiments using airguns on seismic vessels provided through the International Association of Geophysical Contractors (2002) and Industry Research Funders Coalition (2003), one cruise for a sperm whale survey and habitat characterization study conducted concurrently with the D-tag cruise in 2003, and two mesoscale population study cruises aboard a 46' Hunter sailboat (2004–2005).

The SWSS collected a substantial body of data on sperm whales and their environment in

FOR MORE INFORMATION:

MMS

Website: www.mms.gov/swss/

Website: www.gomr.mms.gov/homepg/regulate/enviro/ongoing_studies/gm/GM-05-02-and-GM-01-04C.html

Texas A&M

Website: <http://seawater.tamu.edu/SWSS/>

Press Releases

Website: www.gomr.mms.gov/homepg/whatsnew/newsreal/2002/020918.html

Website: www.gomr.mms.gov/homepg/whatsnew/techann/2006/tech2006-034.pdf



The science party assembles for an all-hands safety briefing and group picture aboard the Research Vessel *Gyre* on June 2, 2005. Pictured are Ann Jochens, Carol Roden, Rhoni Lahn, Deborah Epperson, Dan Engelhaupt, Suzanne Yin, Joel Ortega, David Lundquist, Alyson Azzara, Craig Hayslip, Rocio Cooley, Aaron Thode, Eddie Webb, Sarah Heimlich, Glenn Gaily, Chris Wingard, Lars Bejder, Charlie Short, Andy Szabo, and Ladd Irvine.

- Sperm whales in the Gulf and in other oceans have similar diving and underwater behaviors.
- Some groups of sperm whales in the Gulf were mixed-sex groups of females/immatures and other were groups of bachelor males. Typical group size for mixed groups was 10 individuals, which is smaller than group sizes in some other oceans.
- The typical feeding and foraging behaviors of the Gulf sperm whales are similar to those of sperm whales in other oceans,

the northern Gulf of Mexico over 4 years of field work. The analysis and interpretation of these data provide insights into daily and seasonal movements, abundance, group structure, diving and other behaviors, habitat characteristics and preferences, and response to airgun sounds for sperm whales in the northern Gulf of Mexico.

Principal conclusions from this study include

- SWSS results support conservation of sperm whales in the northern Gulf of Mexico as a discrete genetic stock.
- Sperm whales are present year-round in the Gulf, with females generally having significant site fidelity and males and females exhibiting significant differences in habitat usage.
- The sperm whale population off the Mississippi River Delta likely has a core size of about 140 individuals.
- Gulf sperm whales appear to be physically smaller than sperm whales in other oceans.

although differences in defecation rates suggest possible differences in feeding success.

- In the otherwise oligotrophic Gulf of Mexico, the eddy field contributes to development of regions of locally high surface productivity that, in turn, may create conditions favorable for trophic cascade of surface production to the depths where Gulf sperm whales dive to forage.
- There appeared to be no horizontal avoidance to controlled exposure of seismic airgun sounds by sperm whales in the main SWSS study area.
- Data analysis suggests it is more likely than not that some decrease in foraging effort may occur during exposure to full-array airgun firing compared to the post-exposure condition, at least for some individuals.
- Knowledge of the acoustic propagation and airgun sound characteristics is critical to developing the capability for accurate predictions of exposures and the modeling of potential resulting effects.



Binoculars known as “big eyes” are key instruments for marine mammal visual surveys.

MMS uses two types of tagging to track sperm whales

Satellite tags (S-tags) transmit the surfacing location of tagged sperm whales to a satellite. Information is then correlated with additional satellite remote-sensing oceanographic data and locations of active seismic vessels and offshore platforms. S-tags indicate seasonal, long-term (months), broad-scale response to industry activities over large distances.

Digital tags (D-tags) record received sound levels and underwater swimming behavior of sperm whales. The D-tag provides a method to determine short-term (hours) sperm whale behavioral responses to test sound sources or ongoing seismic surveys, and to determine normal sperm whale diving behavior and vocalizations.

NEW DEVELOPMENT IN THE GULF OF MEXICO



A sunset in the Gulf of Mexico. Photo courtesy of NOAA's National Weather Service Collection, taken in Sarasota Beach, Florida, by Mary Hennig.

In 2002, after completing an in-depth environmental and safety review, the Minerals Management Service (MMS) announced that it would begin accepting applications for the first floating production storage offloading (FPSO) facility in the Gulf of Mexico (GOM). In April 2008, the Brazilian oil company Petrobras took the vision of this new facility in the GOM one step further when its development plans for the Cascade-Chinook oil and gas project were approved by MMS.

Oil and gas operators in the Gulf submit their development plans in a package called a Development Operations Coordination Document (DOCD). The document outlines the details of the proposed development, including activity schedules, geological and geophysical information, information needed for environmental analysis, and spill response information. It is reviewed to determine if there are any drilling or environmental hazards present that could be a problem, as well as to determine any potential effects on the environment from the proposed activities. During the DOCD review, MMS conducts an environmental assessment of the proposal, which may

result in a Finding of No Significant Impact under the National Environmental Policy Act (NEPA).

The MMS gave the four States potentially affected by the FPSO proposal (Alabama, Louisiana, Mississippi, and Texas) the opportunity to review the proposal. All four States concurred with the proposed activities. Petrobras' plans to use an FPSO have already received a conceptual approval from MMS; the DOCD presented the first actual proposed operations of the project.

Located approximately 165 miles off the coast of Louisiana in 8,200 feet of water, the FPSO will be the first floating oil and gas facility in the GOM with the ability to process, store, and offload large volumes of crude oil. Natural gas will also be processed by the FPSO, but it will be transported to shore by pipelines.

Although this type of facility will be new to the GOM, FPSO's have been used since the 1970's

in Australia and Brazil, in the Mediterranean Sea, the North Sea, the South China Sea, and also off the West Coast of Africa. There are over 70 FPSO's across the world, allowing access to remote oil fields in the deep water of the Outer Continental Shelf (OCS). If an oil or gas discovery is far from existing pipeline infrastructure, the FPSO can be used to harvest those once unobtainable resources. An FPSO is typically shaped like a ship and has the ability to store oil in its hull. The oil is then offloaded to shuttle tankers for transportation to shore.

Next for Petrobras will be an MMS review for approval of their Deepwater Operations Plan. The plan, which outlines the specific details and capabilities of the FPSO facility and associated new technologies, must be approved before production can commence. To prepare for production, MMS has teamed with the U.S. Coast Guard to clarify their respective responsibilities in this unique situation. The MMS will be responsible for regulating the GOM exploration, drilling, well completion, development, production, pipeline transportation, storage, well servicing, and workover activities. Offshore facilities, mobile offshore drilling units, tank vessels, and offshore supply vessels will be under the jurisdiction of the U.S. Coast Guard.

With the extensive review and oversight of the proposed activities before and during operations, MMS will be able to protect the ocean environment in the GOM while advancing deepwater oil and gas technology. Maintaining this balance enables MMS to secure the Nation's domestic energy supply and generate economic value for America.

FOR MORE INFORMATION:

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

Website: www.gomr.mms.gov/homepg/whatsnew/newsreal/2008/080429.pdf

Website: www.gomr.mms.gov/homepg/whatsnew/newsreal/2002/020102.html

OHMSETT TESTS HIGH-CAPACITY SKIMMING SYSTEMS PUSHING NEW LIMITS

Safety is a top priority for the Minerals Management Service (MMS). To achieve the safest possible operations, continuous advances and improvements are necessary for up-to-date monitoring of oil and gas activities on the Outer Continental Shelf (OCS).

In the 1970's, the Technology Assessment and Research (TAR) Program was established to provide industry resources for the Best Available and Safest Technologies. Through the TAR program, MMS conducts research to improve technology used for oil-spill response. This Oil Spill Response Research (OSSR) Program brings together knowledge and funds from partnerships with industries, universities, other government agencies, and the international community.

The OSSR testing, research, and training is conducted at Ohmsett, a full-scale, oil-spill response facility operated and maintained by MMS. Located in Leonardo, New Jersey, this facility provides a controlled marine environment where oil-spill cleanup methods and equipment can be safely tested without incurring environmental impacts. The tests are performed under realistic ocean conditions and using real oil to provide accurate results of a device's cleanup capabilities.

In March, Ohmsett tested replacement skimmer heads for

FOR MORE INFORMATION:

Website: www.ohmsett.com

Website: www.mms.gov/tarphome

Website: www.mms.gov/taroilspills

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



Above: The manifold and oil distribution system above the collection tanks on the bridge. The photo also shows one of the skimming heads being lifted out of the tank with the new crane system.
Left: Skimmer heads being tested.



the FRAMO Transrec 350 system, sponsored by Tesoro Maritime Company (an oil-spill response organization). The device is a high-capacity skimming system for large, open-ocean oil spills and is capable of recovering over 400 gallons of oil per minute (gpm) from the ocean's surface—double the rate of Ohmsett's previously tested oil distribution system. The purpose of the test was to identify a more efficient skimmer head compatible with the Transrec 350. To accomplish this task, Tesoro evaluated four different skimming heads in crude oil. The Ohmsett oil distribution system and recovery tank manifolds were modified for each test to safely accommodate the expected recovery rate of 400 gpm. Ohmsett staff and engineers designed

and built a new higher capacity system, and the facility can now safely transfer oil for testing large open-ocean skimming systems.

The testing was observed by oil-spill response organizations, consultants, manufacturers, State and Federal regulatory agencies, nongovernmental organizations, and more than 30 representatives from the funding oil and shipping companies. These partnerships and the valuable training gained from Ohmsett's testing and research provide MMS with information necessary to make regulatory decisions for industry operation on the OCS. These regulations ensure the protection of the ocean against environmental impacts during the procurement of our Nation's oil and gas resources.

OIL AND GAS REVENUES

FUND THE FUTURE

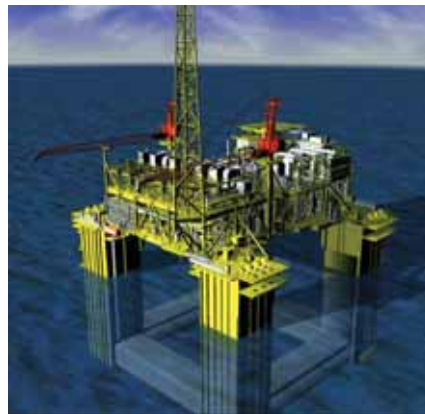
Offshore oil and gas revenue is an important source of income for the U.S. Government. The Gulf of Mexico Energy Security Act of 2006 provides for the sharing of oil and gas revenues with those states whose coasts border offshore energy development in Federal waters. The Act is intended to help fund coastal conservation, restoration, hurricane protection, and mitigation of effects from OCS activities.

Oil- and gas-producing states bordering the Gulf of Mexico (GOM), as well as the coastal political subdivisions mandated by the Act, will share 37.5 percent of oil and gas leasing revenue received from Fiscal Year 2007 to Fiscal Year 2016, from the “181 East” and “181 South” leases. Each State will receive a minimum of 10 percent, and there is a \$500 million cap on funds beyond 2016. Sharing of revenues from all Gulf leases issued after December 20, 2006, will take place from Fiscal Year 2017 and beyond. The Gulf States with revenue-sharing provisions include Alabama, Louisiana, Mississippi, and Texas. Distribution to the Gulf States will be inversely proportional

to the distance between points on the coastline of each producing State and the geographical center of the leased block.

On March 19, 2008, the Minerals Management Service’s (MMS) GOM Lease Sale 224, located in the Eastern Planning Area, became the first oil and gas sale to initiate immediate revenue sharing. Bonus bids, rental payments, royalties, and all future revenue from Lease Sale 224 will be included in the percentage allotted to the Gulf producing States. Furthermore, the Land and Water Conservation Fund will receive 12.5 percent of the revenue, benefiting State conserva-

Independence Hub



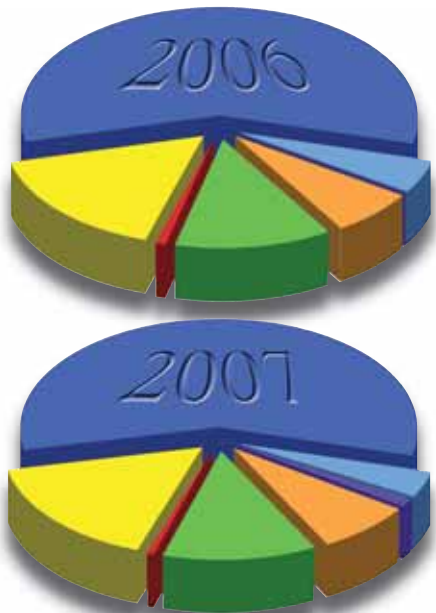
tion projects. State revenue shared is capped at \$500 million per year above receipts in the newly-opened lease areas.

According to the Report to the OCS Policy Committee from the Coastal Impact Assistance Working Group, the revenue sharing program serves two fundamental purposes: (1) to fund projects that will mitigate the environmental and economic impact of OCS energy development, including the need for infrastructure and public services; and (2) to help sustain development of nonrenewable energy sources.

The MMS estimates that revenue shared between the States will total \$3.1 billion through 2022 and could reach \$59.6 billion through 2067. These funds will enable States to meet many educational, environmental, and infrastructure needs in their communities.

The GOM provides 25 percent of the domestically-produced oil in the U.S. and 15 percent of the natural gas. Moreover, this industry creates over 30,000 jobs associated with exploration and production of

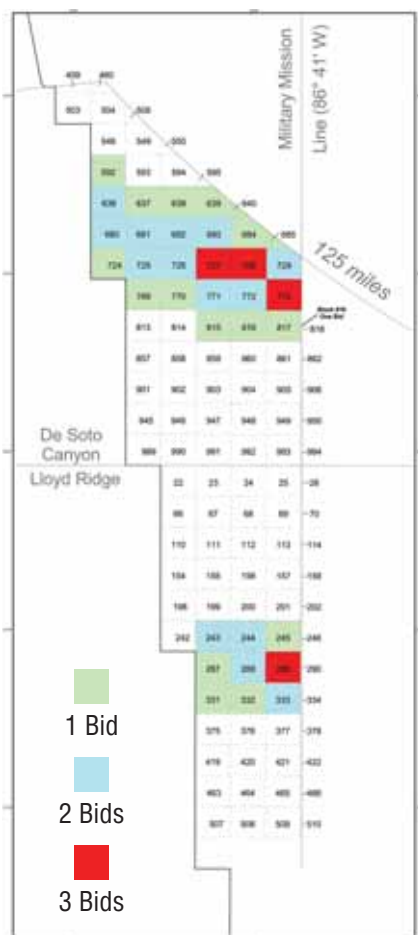
Distribution Recipient	2006 (millions \$)	2007 (millions \$)
American Indian Tribes & Allottees	\$641.40	\$464.99
Historic Preservation Fund	\$-	\$150.00
Land & Water Conservation Fund	\$898.30	\$899.00
Reclamation Fund	\$1,639.10	\$1,469.92
State Share: Offshore 8(g)	\$82.40	\$67.65
State Share: Onshore	\$2,127.90	\$1,904.67
U.S. Treasury	\$7,432.30	\$6,715.09
ANNUAL TOTAL	\$12,821.40	\$11,671.32



Source: MMS, Minerals Revenue Management, 2006 and 2007

energy resources. The States' economic gains from the revenue sharing will help MMS ensure that the Nation benefits from the domestic oil and gas activities on the OCS.

Eastern Gulf of Mexico Planning Area Lease Sale 224 March 19, 2008



MMS Incorporates Revenue Sharing Rules

Establishes Rules for Providing Funds to Coastal States

The Minerals Management Service (MMS) proposes to issue regulations for distribution of qualified Outer Continental Shelf (OCS) revenues from certain Federal Gulf of Mexico leases in accordance with the provisions of the Gulf of Mexico Energy Security Act of 2006 (GOMESA). The regulations document the formula and methodology for calculating and allocating revenues to the Gulf producing States of Alabama, Louisiana, Mississippi, and Texas and their eligible coastal political subdivisions based on detailed parameters set by Congress.



John Rodi, Deputy Region Director for GOMR, gives a tour of the bid processing room for Lease Sale 204 to MMS Director Randall Luthi and his Chief of Staff, Holly Hopkins.

“MMS is pleased to issue this regulation to implement the revenue sharing provisions of GOMESA for these coastal states,” said MMS Director, Randall Luthi. “Alabama, Mississippi, Louisiana, and Texas will all benefit from MMS lease sales.”

The first lease sale with immediate revenue sharing leases was Sale 224, held on March 19, 2008. GOMESA authorizes that 37.5 percent of all revenue, including bonus bids, rentals, and production royalty, will be shared among the four States and their subdivisions. From that percentage and based on the actual location of the blocks bid on in that sale, the Fiscal Year 2008 allocation of bonuses and first-year rentals under this program would be as follows: Alabama – 30 percent; Mississippi – 27 percent; Louisiana – 32 percent; and Texas – 11 percent.

Qualified OCS revenues are allocated among the Gulf producing States based on a formula that incorporates the State’s proximity to certain tracts in the Gulf of Mexico Eastern Planning Area and a small section in the Central Planning Area.

FOR MORE INFORMATION:

Website: www.mms.gov/mmab/PDF/WebPageOCSPMeetingHerndonVAMarch2008/Oynes%20GOMESA%20030608.pdf

Website: www.mms.gov/ooc/press/2008/press0319.htm

Website: www.mms.gov/ooc/press/2008/FactSheet-MMSGOMSecurityActMARCH202008.htm

Website: <http://ncseonline.org/NLE/CRSreports/07Dec/RL33493.pdf>

MEETING IN ORLANDO

OCEAN SCIENCES

March 3-7, 2008

The 2008 Ocean Sciences Meeting was held from March 3-7, 2008, in Orlando, Florida. This year marked the 14th Ocean Sciences Meeting and was co-sponsored by four nonprofit organizations: the American Society of Limnology and Oceanography; the American Geophysical Union; The Oceanography Society; and the Estuarine Research Federation.

The meeting's theme, "*From the Watershed to the Global Ocean*," expanded the standard ocean topics to include the oceanic land-margin, acknowledging the connections between the land and sea. Over 3,500 oral and poster presentations, plenary lectures, and panel discussions were conducted over the course of the conference.

Many presenters working on Minerals Management Service (MMS)-funded studies attended the meeting, exhibiting multiple posters and delivering presentations. Sessions led by MMS highlighted the

Beaufort Sea studies and activities related to the Continuation of Arctic Nearshore Impact Monitoring in Development Area (cANIMIDA). Another key topic was Gulf of Mexico deepwater studies, such as "Interrelations Among the Chemistry, Geology and Biology of Hydrocarbon Seep Communities in the Deep Gulf of Mexico." These presentations included

- * Variability in Cross Island (Arctic Alaska) Subsistence Whaling: An Examination of Natural and Anthropogenic Factors
- * Circulation in the Landfast Ice Zone of the Alaskan Beaufort Sea
- * Modeling Circulation in the Landfast Ice Zone
- * From Local to Extreme Environments—Bringing the Deep-Sea to the GLOBE Network
- * Measuring Bioavailable Hydrocarbons in the Nearshore Beaufort Sea: Comparison of Caged Mussels and Semipermeable Membrane Devices
- * Under-Ice Interaction and Mixing of Spring Floodwaters with Continental Shelf Water in the Alaskan Beaufort Sea
- * Defining Natural River-Shelf Interactions for Trace Metals in the Coastal Beaufort Sea
- * Hydrocarbons and Metals in Tissues of Benthic Crustaceans and Molluscs from the Near-Shore Beaufort Sea: Possible Effects of Oil and Gas Development
- * Physical and Biological Research Efforts to Evaluate the Use of Offshore Sand for Louisiana Coastal and Barrier Island Restoration
- * The Ecology of Arctic Lagoons in a Changing Climate: Are Terrestrial Inputs of Organic Matter Important?
- * Hydrocarbon Distribution in Sediments of the Nearshore Beaufort Sea
- * Fluid-Gas Expulsion on the Deep Gulf of Mexico Continental Slope: Geologic Framework for Chemosynthetic Community Sites
- * Nested Classification of Gulf of Mexico Seep Communities from Benthic Photography
- * Biogeographic and Bathymetric Trends in the Seep Communities Below 1,000 m in the Northern Gulf of Mexico

FOR MORE INFORMATION:

2008 Ocean Sciences

Website: www.aslo.org/orlando2008

Book of Abstracts

Website: <http://aslo.org/orlando2008/files/2008osm-abstracts-wrk.pdf>

Environmental Studies Program

Website: www.gomr.mms.gov/homepg/espis/espisfront.asp

Sponsored by



- * Phylogenies of Key Taxa from Deep-Sea Chemosynthetic Communities in the Gulf of Mexico and Relationships with Other Taxa from Around the World
- * Stable Isotope-Determined Trophic Position of Benthic Invertebrates in the Vicinity of Gulf of Mexico Hydrocarbon Seeps
- * Microbial Activity and Community Composition in Sediments Associated with Brine Seeps on the Lower Continental Shelf, Gulf of Mexico.

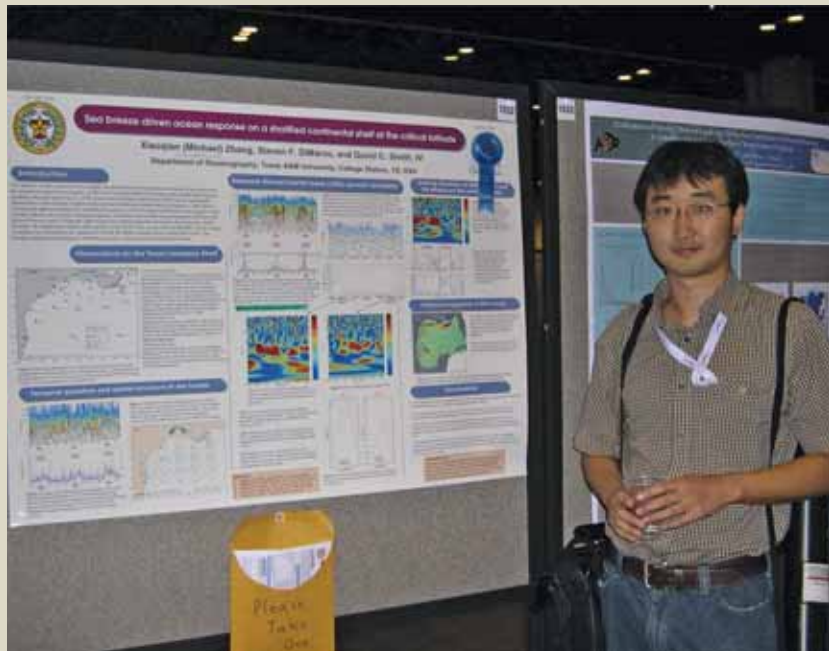
The MMS-funded research allows for these projects and numerous others to explore the ocean environment. Since the establishment of the MMS Environmental Studies Program (ESP) in 1973 (part of the Bureau of Land Management until MMS became a Federal agency in 1982), MMS has sponsored over 700 environmental research projects as well as provided over 2,000 research reports. These reports, which are available to the scientific community and the public, can be accessed from the MMS website through the Environmental Studies Program Information System (ESPIS).

Through studies and collaborations with educational institutions, industry professionals, and other Federal agencies, advanced research will provide information on long-term and short-term environmental effects associated with oil and gas production. Current ESP themes are

- * Accelerated Deepwater Activities
- * Monitoring Marine Environments
- * Seismic and Acoustic Impacts

- * Social and Economic Impacts
- * Oil-Spill Research Techniques
- * Air Quality Impact Assessment
- * Platform Decommissioning
- * Information Management
- * Marine Minerals Activities

As a result of the valuable research contributions from these skilled professionals and dedicated partners, MMS continues to be equipped with the best information available to make decisions regarding the environmentally sound development of the Nation's natural resources.



Xiaoqian (Michael) Zhang standing in front of his poster at the 2008 Ocean Sciences Meeting. The blue ribbon he received is at the top right-hand corner of the poster. Photo courtesy of Steven DiMarco.

Oceanography Student Wins Outstanding Presentation Award

Xiaoqian (Michael) Zhang, a Ph.D. student in Oceanography in the Texas A&M College of Geosciences, won the “Outstanding Student Presentation” award at the 2008 Ocean Sciences Meeting.

Zhang’s presentation, “Sea Breeze Driven Ocean Response on a Stratified Continental Shelf at the Critical Latitude,” described the spatial structure and temporal evolution of sea breeze and the associated coastal ocean response to sea breeze on the Texas–Louisiana shelf. His research showed that the ocean response depends significantly on a number of factors, including the characteristics of sea breeze, river associated stratification, latitude, and coastal and bathymetric curvature.

MMS

A steward of the ocean environment

NEW WAVES

Late-Breaking News & Information

Secretary of the Interior Kempthorne Presents Cooperative Conservation Award

At a ceremony in the Nation's capital, Secretary of the Interior Dirk Kempthorne recognized the partnership of the University of Alaska Coastal Marine Institute (CMI) and the Minerals Management Service (MMS) as one of 21 recipients nationwide of the Department of the Interior's Cooperative Conservation Award.

The 21 awards recognize the work of more than 700 groups and individuals who achieved excellence in conservation through collaboration and partnerships.

"These outstanding partnerships and cooperative efforts represent a fundamental way in which our Department provides stewardship for America with integrity and excellence," Secretary Kempthorne said.

The award to the University of Alaska CMI and MMS recognizes the partnership's outstanding contributions to collecting and disseminating environmental



Sea ice in the Beaufort Sea, with the Brooks Range mountains in the background to the south. Photo courtesy of the U.S. Fish & Wildlife Service.



information for use in key decisions in oil and gas exploration and development within the Alaska Outer Continental Shelf.

"In its first 14 years of operation, 49 organizations have made matching contributions, leveraging \$13 million of MMS funds into \$26 million worth of relevant marine-based research," the award noted. "This partnership strengthens research in the areas of fisheries protection, biomonitoring, physical oceanography, and the fate of oil in the marine environment."

The award recognizes conservation achievements resulting from the cooperation and participation of individual landowners, citizen groups, private sector, nongovernmental organizations, and Federal, State, local, and tribal governments.

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