

THE SCIENCE & TECHNOLOGY JOURNAL OF THE MINERALS MANAGEMENT SERVICE



Looking Forward

The 5-Year Program

The Atlantic OCS

Where's the Polly?

Everything You Wanted to Know about Oil and Gas Leasing

MODU's and FPS's in Hurricane Ivan

Well Under Way – Mars Platform Repairs

Multipurpose Marine Cadastre

MARCH/APRIL 2006

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ABOUT THE COVERS

Top: A fixed platform in the Gulf of Mexico.

Bottom: A diver examining growth on a platform leg in the Gulf of Mexico. Photo by Gregory S. Boland.

Several photos in this issue are courtesy of BP Exploration and Production.

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Left: A jack-up rig used to drill for oil and gas on the Outer Continental Shelf.

Below top: Part of the cabling system used to deploy Horn Mountain spar in the Gulf of Mexico.

Below bottom: A stack of pipeline that will be used to transport gas and oil from the development field to shore. The pipeline diameters are 16, 20, 24, and 28 inches.





s energy consumption reaches an all time high and we depend more and more on foreign energy sources - some of which have questionable stability and security the need to develop, manage, and conserve our national energy resources has become more important than ever. As steward of the natural resources on the Outer Continental Shelf (OCS), the Minerals Management Service (MMS) is responding to that need. As part of that response, MMS is preparing its legislatively-mandated 5-Year Plan for the Leasing Program. After receiving feedback from all interested parties on the draft plan, MMS will release a final plan as a blueprint for the future leasing program.

At the same time as oil and gas exploration goes deeper, new technologies are attracting developers to older, more shallow fields closer to shore.

LOOKING FORWARD

These fields hold resources that may now be profitably removed. As exploration expands, MMS and its regional offices are working closely with State and local governments, academic institutions, and industry to work cooperatively on nearshore and deepwater exploration and to develop long-term goals consistent with regional needs.

As more knowledge about the OCS and its ecosystems is gained, MMS is working with its academic and industry partners to ensure that as much data as possible is available to students, academicians, and industry scientists for study. The MMS is partnering with several academic institutions, such as the University of Alaska, to develop data storage and distribution systems that are flexible and user friendly.

The Energy Information Administration estimates that the demand for natural gas in the United States will rise by 42 percent over the next 20 years. Looking forward, MMS will continue to encourage and develop new research frontiers, alternative fuels, and energy sources. By decreasing the Nation's reliance on oil and natural gas and promoting other energy sources, MMS is striving to ensure our Nation will have enough energy to meet its future needs.

З

THE 5-YEAR PROGRAM

he vast natural resources of the Outer Continental Shelf (OCS) are vital to our Nation's economy and security. It is the responsibility of the Minerals Management Service (MMS) to develop 5-year leasing programs to encourage resource management of the OCS and to protect those resources. The 2007-2012 5-Year Program is the seventh since the program was mandated by the OCS Lands Act of 1978.

The MMS has set forth a realignment of OCS planning areas in the GOM.

There are currently 26 planning areas on the OCS. The increasing number and type of both traditional and nontraditional energy, alternative energyrelated, and other activities on the OCS made the realignment necessary, and the new Federal OCS offshore administrative boundaries were announced in January 2006 by MMS.

As the 5-Year Program is being developed, MMS is also cataloging the inventory of undeveloped oil and gas resources as directed by Congress as part of the Energy Policy Act of 2005. At present, an estimated 85.9 billion barrels of oil and 419.9 trillion cubic feet of natural gas remain undiscovered on the OCS. This includes all oil and gas resources, including deepwater, that are considered technically recoverable.

A total of 21 OCS lease sales are proposed in the 2007-2012 5-Year Program. The public, State and local governments, and industry interests are encouraged to submit their recommendations during the draft development phase of the plan. There will be a 90-day final comment period in the summer of 2006. The final program will be approved in the spring of 2007.

2007-2012: 5-Year Program Proposed Areas for Leasing



The above map depicts the location of the 26 planning areas on the Outer Continental Shelf. These areas comprise over 1.78 billion acres of Federal lands.

WAITING TO BE DISCOVERED THE ATLANTIC OCS

elatively limited oil and gas exploration and production has occurred on the Atlantic Outer Continental Shelf (OCS) when compared with the Gulf of Mexico (GOM). Ten oil and gas lease sales were held in the area between the mid-1970's and the mid-1980's. Forty-seven exploratory wells were drilled. Those wells produced only five hydrocarbon discoveries – all of which have been abandoned as noncommercial. There are currently no oil and gas leases off the Atlantic coast.

Leasing and resource management activities for the Atlantic OCS area have been divided into four areas for planning purposes:

- 1. The North Atlantic Planning Area extends from Maine to New Jersey and includes over 92 million acres. Eight wells have been drilled and five discoveries have been made. However, there are currently no active leases in the area.
- 2. The Mid-Atlantic Planning Area extends from Delaware to North Carolina and includes over 113 million acres. This area had the most lease sales (5) and the most exploratory wells drilled (32). However, no discoveries have been made and no leases are currently active. A proposed lease sale in the 5-Year Program is located in this area.
- 3. The South Atlantic Planning Area extends from South Carolina to Florida and includes over 54 million acres. Only one lease sale has been held here and no leases are currently active.
- 4. The Straits of Florida encompasses over 9.5 million acres. Only one lease sale has been held here and no leases are currently active.

As part of the proposed leasing 5-Year Program in the Mid-Atlantic Planning Area, the Minerals Management Service (MMS) has proposed a single lease sale to evaluate the potential for oil and gas



The Atlantic Planning Areas showing the proposed area for leasing off of Virginia.

development off the coast of Virginia. The proposal was issued and open for a comment period that ended in April. Another comment period will be opened in the summer of 2006. Current presidential withdrawals or congressional moratoria have placed more than 85 percent of the OCS around the lower 48 states off limits to energy development, including all areas off Virginia.

"The idea of leasing Federal waters off the coast of Virginia comes in response to discussion in the State's legislature about the potential of energy development off its coast," MMS Director Johnnie Burton said. "However, no offshore development will occur off of Virginia unless the State's congressional delegation works to lift the moratorium," said Burton. The MMS is working to ensure a leasing plan is in place if Virginia seeks to end the moratorium and encourage offshore oil and gas development. The MMS estimates there are approximately 85.9 billion barrels of oil and 419.9 trillion cubic feet of natural gas that may be technically recoverable from all Federal offshore areas. The estimate for both oil and gas increased about 15 percent compared with the 2001 report.

A significant amount of environmental study would be required and State moratoria would have to be lifted before any exploration of the Mid-Atlantic Planning Area could be considered. However, as our Nation's oil and gas needs grow, the Atlantic OCS may become a more attractive and viable area for exploration.

FOR MORE INFORMATION:

Draft Proposed OCS Oil and Gas Leasing Program 2007-2012

Website: www.mms.gov/5-year/ 2007-2012main.htm

Where's the Polly?

1862-1898 POLITKOFSKY

The answer to "Where's the Polly?" and other Alaskan shipwreck questions may be found at the Minerals Management Service's (MMS) Alaska Shipwreck Database. There are more than 4,000 records documenting wrecks and strandings in Alaskan waters from 1741 to the present.



bove: Donald Clark, of Cann n Hunter Association of Seattle (CHAOS) and Martha Flahart of the Seattle Historical Society examine a cannon off the Politkofsky. Note the Russian imperial double eagle crest design cast on the barrel. The cannon is now at the Museum of History & Industry in Seattle, Washingtor

> Congress passed the National Historic Preservation Act (NHPA) in 1966 to ensure that our Nation's historical and archaeological relics are not lost through neglect or inadvertently damaged by activities permitted, conducted or funded by federal agencies.



The Polly's large bronze whistle was blown at the opening of the Alaska-Yukon-Pacific Exposition in 1909 and the Seattle Warlds Fair in 1962. It is now at the Museum of History and Industry in Seattle, Washington, Many of the Polly's handmade copper spikes that held her handhewn cedar planks to ribs and seel were collected by tourists in St. Michael waiting for steamships to take them south

1898 after a notorious Klondike

ifact of Re ssian-Am

It rests today off a St. Michael's beach. The last kn

rican shipbuilding in N t is partially preserved beneath the waters of Alaska's Norto

U. S. Department of the Interior **Minerals Management Service**



The Politkofsky or "Polly," a sidewheel tug and towboat was one of the first tugs to tow logs and lumber ships on Puget Sound. In 1897 she was converted to a schooner barge and taken north for the Klondike gold rush. The Polly was the last vessel built by the Russian American Company in Sitka, Alaska in 1862. On January 15, 1868 wuden Article III. of the treacty the

15, 1868 under Article III of the treaty, she became an American vessel when Alaska was

purchased from Russia.

To learn more about Alaska Shipwrecks, go to: http://www.mms.gov/alaska/ref/ships/index.htm. Copies of the poster may be requested by contacting MMS Public Affairs - Alaska 1-800-764-2627.

EVERYTHING YOU WANTED TO KNOW ABOUT OIL AND GAS LEASING

he process of leasing blocks on the Outer Continental Shelf (OCS) for oil and gas exploration and research is an important issue for everyone. The Federal regulations that protect marine and land ecosystems, ensure the safety of offshore personnel, ensure the fair and speedy collection and accounting of rovalties, and secure dismantling of abandoned wells and leases fills volumes of pages. Yet, everything you need to know about oil and gas exploration leasing can be found in one book from the Minerals Management Service (MMS), Leasing Oil and Natural Gas Resources - Outer Continental Shelf.

It contains a wealth of historical information about oil and gas drilling on the OCS – from the first offshore well in 1896 to the first free-standing offshore well owned by Pure Oil/Superior Oil in 1938. It describes the discovery of oil in Prudhoe Bay in the early 1970's as well as the ultra-deepwater wells being drilled today. A detailed timeline of developments on the OCS is included in the appendix section of the book.

The history of leasing on the OCS is also included in *Leasing Oil and Natural Gas Resources - Outer Continental Shelf.* Submerged land located from approximately 3 miles (varies by state) from a State's coast to 200-300 miles offshore is potentially available for lease. In 1954, the first offshore oil and gas lease sales were held and the Federal Government has conducted lease sales ever since.

One important section of the book is a detailed explanation of the process of drafting the 5-year Programs mandated for the OCS. The leasing program must take into account the following considerations: 1) existing geographical, geological, and ecological information about the area; 2) a balance of risks and benefits; 3) location with respect to regional and national energy markets; 4) location with respect to other uses such as fisheries, sea lanes, deepwater ports, and other current and anticipated

LEASING OIL AND NATURAL GAS RESOURCES OUTER CONTINENTAL SHELF



Leasing Oil and Natural Gas Resources - Outer Continental Shelf

uses of the area; 5) the interest of potential oil and gas producers in the development of the area; 6) laws, goals, and policies of the affected States as identified by the Governors of that State; and 7) the relative environmental sensitivity and marine productivity of the area.

Included in the book is an explanation of OCS leasing procedures, the process potential lessors must follow to be considered as a bidder, and the criteria MMS uses to accept or reject a potential bid. Additionally, the process of determining fair market value for the lease is explained.

Leasing Oil and Natural Gas Resources -Outer Continental Shelf is an invaluable resource for anyone with an interest in leasing in the OCS. It may be accessed through the MMS website at http://www.mms.gov/ld/PDFs/ GreenBook-LeasingDocument.pdf

n the Gulf of Mexico (GOM), mobile offshore drilling units (MODU's) and floating production systems (FPS's) are operating safely and efficiently around the clock to help meet our Nation's oil and gas needs. Hurricanes in the GOM, however, endanger that safe and efficient system. As the steward of the Nation's offshore oil and gas resources and protector of its marine environment and ecosystems, the Minerals Management Service (MMS) ensures that engineering and operational systems are in place that will ensure safe production and distribution of those resources while leaving the marine environment that surrounds it unharmed. To fulfill its mission, MMS sponsors studies

MODU's AND FPS's IN HURRICANE IVAN

of equipment and structures in the Gulf and how they withstand hurricanes such as Ivan, Katrina, and Rita. Lessons learned from these studies help engineers and production personnel make design and operational changes to better prepare for future storms.

During Hurricane Ivan, four FPS's and five semisubmersible MODU's were found to have moved from their stations. In Hurricanes Katrina and Rita, nineteen MODU's were set adrift. The consequences of drifting vessels depend on its location, the direction in which it drifts, the speed at which it drifts, what components it drags with it along the seafloor, and what it encounters along the way. Fortunately, there was no loss of life on these units or environmental damage as a result of this powerful storm. Damage to the equipment itself, however, was extensive.

Drilling rig packages located on FPS's are fastened to the deck of the offshore

Opposite page: The mobile offshore drilling unit, *Ocean Confidence*. Owned and operated by Diamond Offshore.

platform by large diameter bolts, weldments (welded joints), braces, or other means. The fastening method must withstand hurricane winds and the acceleration of the deck itself from currents and waves. The MMS has commissioned studies of the sea fastenings that failed during Hurricane Ivan. These studies will find out if the criteria used in their design was adequate to meet the stresses of a 100-year storm such as Ivan, whether the fastenings were installed properly, and whether preparations to meet the storm were adequate. One hundred and fifty facilities and 10,000 miles of pipeline were in the direct path of Hurricane Ivan, and many more facilities and pipelines along the storm's edges were affected. One MODU moved approximately 3,000 feet and four others drifted up to 70 miles. The moorings that failed during the hurricane will be studied for their design adequacy and installation.

The results of the studies will reveal if improvements in the design or a total design overhaul are needed. Decisions that will weigh the costs of "tweaking" versus totally redesigning the fastening and mooring systems can then be made, and consideration can be given to the chance of stronger storms over the next 10 years. After reviewing the study and meeting with its industry partners, MMS will establish any necessary changes, in accordance with its ongoing mission, that would better protect personnel, production, and the environment that surrounds them.

FOR MORE INFORMATION:

Hurricane Ivan Research:

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

Below: Examples of different types of production platforms used in the offshore environment. Floating production systems (FPS's) would include the sea star, tension leg platform, and spar, which are all anchored to the bottom by cables.



MINERALS MANAGEMENT SERVICE

WARS PLATFORM REPAIRS WELL UNDER WAY

As this year's hurricane season approaches, oil companies are still dealing with the destructive effects of last year's record-setting season. While none of the damage was irreparable, oil producers and the Minerals Management Service (MMS) have lost billions of dollars in revenue and royalties. And in a time of increasing demand for energy, the Nation lost unfettered access to the oil and gas produced in and transported from the Gulf of Mexico (GOM).

As of March 2006, approximately 25 percent of GOM production (6% of the Nation's domestic production) remains shut down. At least 140,000 barrels a day of that oil production was lost from Shell's Mars platform. The problem? During Hurricane Katrina, the massive drilling rig derrick on the facility collapsed onto the production deck below and its 12-ton anchor was dragged across two sections of the Mars pipeline system connecting the platform to south Louisiana.

The Mars platform is an enormous structure located about 130 miles southeast of New Orleans. The production from the platform makes it one of the largest GOM discoveries in more than 25 years. Pipelines carry oil from the platform to a point 40 miles away, where it connects to a 24-inch line. It then carries the oil 55 miles to Fourchon, Louisiana. Its final destination is a salt dome cavern with a 3 million barrel capacity capable of distributing to five major pipeline systems.

Even though repairs of the damaged pipeline is of vital importance, its repair has highlighted the shortage of qualified workers and specialized equipment, which are making the recovery more difficult. Because no other ships capable of doing the job were in the area, an icebreaker from the North Sea was brought in to help repair the pipeline. This ship had the necessary available square footage on the deck to make it possible to hold both pipeline and repair equipment. It was also capable of remaining above the repair location for weeks.

Repairing the damaged pipelines also required new and innovative techniques. New methods of connecting the broken line, new supports for the repair, and new methods of completing the repair underwater were used. New computer programs allowed repairs to be tried in virtual space before they were tried on the seafloor. Men and equipment worked around the clock to ensure the pipeline repairs were made quickly and



The Shell Mars platform before and after Hurricane Katrina in September 2005.

safely and that the repaired pipeline was more stable than the one it replaced.

To ensure no oil escaped into the surrounding environment during the repair and replacement of the pipeline, a special pollution container was constructed and connected to a subsea pump. The pump, in turn, was connected to the Environmental Response Ship, the *Louisiana Responder*. The pump ensured that any leakage generated as the pipelines were flushed out was transported to holding tanks on the *Louisiana Responder*.

Repairs to the pipeline are expected to be completed by the summer of 2006, and Mars is expected to restart in the second half of this year. It is estimated that production from Mars will be greater than ever before, reaching and exceeding pre-Katrina levels.



The Miocene Epoch is in the Neogene Period of the Geologic time scale.

The Promise of Wilcox

hat started out as a test well into formations of the Miocene epoch yielded a surprise for drillers – a thick hydrocarbon-rich sand section not previously known to yield such potential reserves. The promise of this Lower Tertiary sand section, called the Wilcox trend, in ultra-deepwater Gulf of Mexico (GOM) continues to be encouraging with the recent announcement of discoveries on BHP Billiton's Cascade prospect (located in 8,200 feet of water) and Chevron/Devon's Jack prospect (located in 7,000 feet of water).

The Wilcox trend was deposited as sands of a delta in the Lower Tertiary epoch. Both the Miocene epoch (which started 23 million years ago) and the Lower Tertiary (from 66 to 38 million years ago) are part of the Cenozoic period – the most recent of the three major subdivisions of geologic history. Some scientists believe the Wilcox trend may cover 34,000 square miles and hold up to 15 billion barrels of recoverable oil reserves.

These discoveries and earlier Lower Tertiary finds have spurred great interest for prospects in the area. Recent lease sales in the Western GOM have seen strong bidding activity. The announcement of royalty relief for ultra-deepwater discoveries has also made the area more attractive. The interest in ultra-deepwater exploration is likely to continue to increase as more is discovered about this potentially world-class reservoir.

CHARTING A PHYSICAL, SOCIAL, AND POLITICAL MAP OF THE OCS MULTIPURPOSE MARINE CADASTRE

o say the mission of managing the Nation's Outer Continental Shelf (OCS) resources is challenging and complicated is an understatement. But the Minerals Management Service (MMS) is coordinating the establishment of a Multipurpose Marine Cadastre that will make its mission, and that of other OCS stakeholders, much easier. The project is ambitious and will require the cooperation of Federal, State, local, territorial, and tribal entities working in partnerships.

The purpose of the cadastre is to establish a physical, social, and political map of the OCS. The cadastre will show what resources are in the OCS, who claims those resources, who needs them, what restrictions affect them, and who has responsibility for each acre. The MMS's Mapping and Boundary Branch will coordinate the development and implementation of the Multipurpose Marine Cadastre with input from other agencies such as the National Oceanic and Atmospheric Administration (NOAA), which will supply National Marine Sanctuaries data for the project, and the U.S Fish and Wildlife Service, which will provide National Wildlife Refuge data.

The MMS is committed to open communication with all interested parties – which may consist of overlapping rights, interests, and responsibilities – and to ensuring that each stakeholder sees the "big picture"



and the need for mutual cooperation to ensure the cadastre is fully realized.

It is clear that, for the Multipurpose Marine Cadastre to be workable, those who make decisions about the OCS must have all the information about rights, restrictions, and responsibilities in the OCS and how they interact with each other. Data must include

- a universal grid system and a national baseline;
- the boundaries of the Submerged Land Act and Territorial Submerged Land Act (which include Federal, State, territorial, revenue-sharing, and administrative boundaries);
- a leasing map;
- all maritime boundaries and zones, including the Exclusive Economic Zone (200 nautical miles) and contiguous zone (24 nautical miles);
- marine managed areas;
- marine protected areas; and
- administrative boundaries.

Additional information needed includes locations of pipelines and undersea cables; artificial reef sites; You can't expect others to follow the rules if you can't reasonably describe your boundaries.

military, aquaculture, and archaeological sites; and the location of oil and gas platforms, structures, and leases.

In developing and implementing the Multipurpose Marine Cadastre, several key elements must be acknowledged. The cadastre must be dynamic – adapting to a changing world, changing knowledge, and changing needs. The cadastre must be multidimensional – addressing rights and restrictions in the air, water surface, water column, seabed, and subsurface. Finally, the cadastre must be balanced between development and protection of the resources it charts.

Before it began the project, MMS realized that the data gathered and integrated must meet the standards of the shareholders who will use the information. Of equal importance is making the data readily accessible to those who need the information and to the public in general. To meet that goal, plans are ongoing to have the Multipurpose Marine Cadastre available online through the MMS website at www.mms.gov/ld/maps.htm

Tidal Datums – MHHW, MHW, MLW, and MLLW are examples of tidal datums. Private/State land varies by state.

Baseline – the X's represent the salient points of the baselines (MLLW in the U.S.).

Bay Closing lines – used to separate inland water bodies from the open sea.

Marine Protected Areas – reserved by Federal, State, territorial, tribal, or local laws or regulations. State Seaward – generally extends 3 nautical miles from the baseline (exceptions: west Florida, Texas, and Puerto Rico extend to 9 nautical miles). Often called Submerged Lands Act boundary or Federal/State boundary. **Revenue Sharing** – boundary extends 3 nautical miles beyond the State seaward boundary – 27% to State.

Territorial Sea – extends 12 nautical miles from the baseline. Often referred to as the marginal sea.

Contiguous Zone – extends 24 nautical miles from the baseline. Executive Order 9/99.

OCS Lease Blocks – subdivision of the OCS within U.S. jurisdiction for mineral leasing.

EEZ (Exclusive Economic Zone) – out to 200 nautical miles from the baseline or as determined by treaty.

Continental Shelf – no U.S. claim to date (UNCLOS Article 76).



For more information, see http://www.csc.noaa.gov/mbwg/htm/outreach.htm

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



A Great Blue Heron, which is native to Gulf Coast wetlands. Photo by Herb Stein, USFWS.

NEW MAYES Late-breaking News & Information

CIAP Benefits Coastal Areas

he Coastal Impact Assistance Program (CIAP) was created by the Energy Policy Act of 2005 (EPAct) to assist States that have had coastal impacts from offshore oil and gas activities. The CIAP is administered by the Minerals Management Service (MMS) and will disburse \$250 million for each fiscal year 2007-2010.

The three part mission of the CIAP is to provide guidance to eligible States and coastal political subdivisions (CPS's) to develop their Coastal Impact Assistance Plan, disburse funds (via a grant program) in a timely manner, and effectively monitor Plan implementation. The CIAP funds will be divided between eligible States and CPS's (boroughs, counties, and parishes) based on a formula defined by EPAct. Revenues collected from offshore oil and gas activities will fund the program.

The CIAP funds can be used by States and CPS's for one or more of the following categories:

- 1. projects and activities for the conservation, protection, or restoration of coastal areas, including wetlands;
- 2. mitigation of damage to fish, wildlife, or natural resources;
- 3. planning assistance and the administrative costs of complying with the Act;
- 4. implementation of a federally approved marine, coastal, or comprehensive conservation management plan; and
- 5. mitigation of the impacts of Outer Continental Shelf activities through funding of onshore infrastructure projects and public service needs.

Projects can be as diverse as monitoring sea turtles, building a bridge, or restoring wetlands. Coastal communities will be asked to participate in identifying the projects through public meetings organized by the States and CPS's. For more information about this program, visit the MMS website at: www.mms.gov.

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