

# MMS

# OCEAN SCIENCE

VOLUME 6 ISSUE 1

JANUARY/FEBRUARY/MARCH 2009

THE SCIENCE & TECHNOLOGY JOURNAL OF THE MINERALS MANAGEMENT SERVICE



**Starting the  
New Year in the  
Crescent City:  
25th Gulf of  
Mexico Region ITM**

**Marco Polo:  
Full-Scale  
Monitoring of  
a Deepwater  
Tension-Leg  
Platform**

**Mapping Oil  
Thickness in  
Coastal and  
Offshore Waters**

**Gulf Sturgeon:  
A Peculiar  
Prehistoric  
Fish**

**Alaska Research  
Forum**

**The Hunt for the  
Real *Western  
Empire***



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 energy recovery, ocean stewardship, and mineral revenues.



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#### ABOUT THE COVER

Top left: Thickness sensor mounted on skid of helicopter for testing at Ohmsett.

Top middle: Blacksmith fish (*Chromis punctipinnis*) swim under a platform off the Santa Barbara coast.

Top right: Tombstone of Walter Hobb in St. Michael's Cemetery, Pensacola, Florida. Hobb, captain of *Western Empire*, died two days before the ship's last voyage.

Main photo: Marlin semisubmersible platform in the Gulf of Mexico, USA. Photo courtesy of BP. © BP p.l.c.

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

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# MMS OCEAN SCIENCE

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- 3 Starting the New Year in the Crescent City:**  
25th Gulf of Mexico Region ITM
- 4 Gulf of Mexico Region Leasing Activity Update**
- 5 Petroleum Engineer**  
Michael Else
- 6 Marco Polo:**  
Full-Scale Monitoring of a Deepwater Tension-Leg Platform
- 8 Mapping Oil Thickness in Coastal and Offshore Waters**
- 10 Gulf Sturgeon:**  
A Peculiar Prehistoric Fish
- 11 Alaska Research Forum**
- 12 The Hunt for the Real *Western Empire***
- 15 Coastal Impact Assistance Program Helps Coastal Areas**
- 16 New Waves**  
Late-Breaking News & Information

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[www.mms.gov](http://www.mms.gov)

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**T**he Minerals Management Service (MMS) relies on the most current research, tools, and methodologies to carry out its mission of managing offshore energy resources and preserving and protecting the ocean environment. To this end, each MMS region hosts an Information Transfer Meeting (ITM), a forum in which academic, agency, and private industry specialists can share what they have learned during their research for MMS's Environmental Studies Program.

In the Gulf of Mexico Outer Continental Shelf Region (GOMR), these professional forums have been held since 1980. Initially held annually, the GOMR ITM is now held every two years. The ITM fosters information sharing and supports the community of scientists and specialists whose important work helps MMS succeed in its mission.

This January, after the holiday break, researchers and specialists began 2009 by congregating in an historic hotel in New Orleans' French Quarter. From January 6-8, 2009, GOMR ITM participants shared data, findings, and other information in a setting congenial to professional and technical curiosity and discussion.

During each of the three days, three subject-based sessions ran concurrently. Session subjects included sand and gravel, hurricanes, alternative energy, deepwater benthic habitats, climate change, hydrates, air quality, socioeconomics, platform and hard-bottom ecology, the Coastal Impact Assistance Program, and marine archaeology. Paper topics ranged from photographic studies of seep and coral communities to the role of shipyards in perpetuating bayou culture and from genetic



## STARTING THE NEW YEAR IN THE CRESCENT CITY: 25TH GULF OF MEXICO REGION ITM

Cover of Proceedings: Gulf of Mexico Information Transfer Meeting, January 2009.

discontinuity among regional populations of *Lophelia pertusa* to paleotempestology (prehistoric hurricane activity).

While there were many highlights, the alternative energy, hurricane, and marine archaeology sessions were perhaps the most heavily attended. The alternative energy session included a summary of Federal alternative energy regulations and the rulemaking progress; a description of potential environmental impacts and the progress of related environmental studies; and updates about several offshore wind and alternate use projects. The hurricane session

included papers on hurricane damage potential, reconnaissance, hindcasting, research at the National Hurricane Center, and prehistoric hurricane activity. The marine archaeology session included a discussion of viewshed analysis methods being developed to assess visual impacts of offshore wind power projects; a description and video about the "Battle of the Atlantic"; and the documentary video, "Mystery of the Mardi Gras Shipwreck."

Previous ITM proceedings are available on the MMS website. Presentations from the 25th ITM will be available later this year.

### FOR MORE INFORMATION

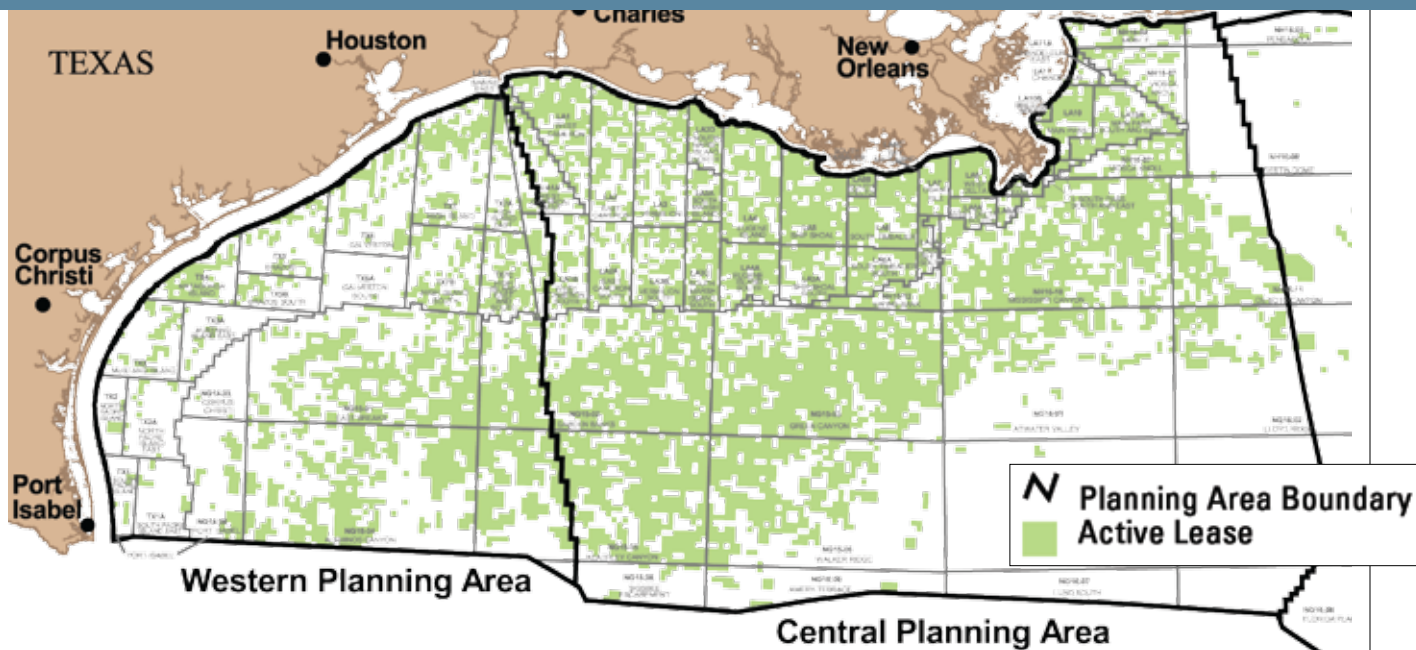
#### Information Transfer Meeting (ITM)

[www.gomr.mms.gov/homepg/regulate/environ/itm.html](http://www.gomr.mms.gov/homepg/regulate/environ/itm.html)

#### ITM Proceedings

[www.gomr.mms.gov/homepg/regulate/environ/studies/info\\_transfer\\_proceed.html](http://www.gomr.mms.gov/homepg/regulate/environ/studies/info_transfer_proceed.html)

# GULF OF MEXICO REGION LEASING ACTIVITY UPDATE



Map of the Gulf of Mexico Western and Central Planning Areas, as of January 14, 2009.

**L**easing activity in the Gulf of Mexico Region makes a significant contribution to the Minerals Management Service's (MMS) mission to "manage the ocean energy and mineral resources on the Outer Continental Shelf (OCS) and Federal and Indian mineral revenues to enhance public trust benefits, promote responsible use, and realize fair value." Funds from high bids are distributed to the general fund of the U.S. Treasury, shared with the producing states, and set aside for special uses benefiting all states.

## **Leases Awarded through Western Gulf of Mexico Lease Sale 207**

The MMS has accepted high bids valued at \$483,959,404 and awarded 313 leases to the successful high bidders who participated in Western Gulf of Mexico Oil and Gas Lease Sale 207. Fifty-three companies submitted 423 bids on 319 tracts in the Western Gulf at Lease Sale 207, which was held on August 20, 2008, and included 18.3 million acres off the Texas coast.

The highest bid accepted on a tract was \$61,110,000 made by Statoil Gulf of Mexico LLC for Alaminos Canyon Block 380. This tract, which is in deep water (greater than 6,562 feet [2,000 meters]), received 3 bids.

## **Final Notice of Sale for Central Gulf of Mexico Lease Sale 208**

The MMS issued the final notice for Central Gulf of Mexico Lease Sale 208; the final notice of sale (FNOS) was published in the *Federal Register* on January 14, 2009, and a corrected FNOS was

published on January 22, 2009. Lease Sale 208 will be held in New Orleans on March 18, 2009.

The proposed sale includes approximately 6,458 unleased blocks that cover more than 34.6 million acres offshore Louisiana, Mississippi, and Alabama. Among these are approximately 4.2 million acres, known as the 181 South Area, which has not been offered for lease since 1988.

Base rental rates for leases issued in this sale have been increased by \$0.75 per acre in water depths less than 200 meters (656 feet) and by \$1.50 per acre in water depths of 200 meters or more. For the first time, rental rates will be increased for all leases with initial terms of more than 5 years and for leases with an approved extension of the initial lease period.

The OCS produces approximately 27 percent of the Nation's oil and about 15 percent of its natural gas. Responsibly managing mineral and energy resources on the OCS is a key element in MMS's mission of providing the Nation with economic value, protecting the ocean environment, and ensuring activities are conducted safely.

### FOR MORE INFORMATION

**Central Gulf of Mexico Lease Sale 208 Information**  
[www.gomr.mms.gov/homepg/lseale/208/cgom208.html](http://www.gomr.mms.gov/homepg/lseale/208/cgom208.html)

**Western Gulf of Mexico Lease Sale 207 Information**  
[www.gomr.mms.gov/homepg/lseale/207/wgom207.html](http://www.gomr.mms.gov/homepg/lseale/207/wgom207.html)

**Lease Sale 207 Bid Evaluation Results**  
[www.gomr.mms.gov/homepg/lseale/207/207bidev.html](http://www.gomr.mms.gov/homepg/lseale/207/207bidev.html)



Mik Else (MMS), John Mehlhoff (Bureau of Land Management), Allan Shareghi (MMS) at the Montana Technical Career Fair, University of Montana, 2008.

**M**anaging the mineral and energy resources on the Outer Continental Shelf (OCS) requires the talents and expertise of a range of Minerals Management Service (MMS) employees. In this issue of *Ocean Science* (OS), we interviewed Michael Else, Petroleum Engineer and Technical Manager of MMS Safety and Technology Research.

**OS: Mik, how did you come to work for MMS?**

**ME:** I guess I was the square peg for the square hole. MMS was advertising for a Petroleum Engineer. I had earned my BS in Petroleum Engineering in 1983 from the University of Montana and spent 8 years doing engineering work in industry, so it seemed like a good match. For me, the decision was easy; I compared my early days in the heat-drenched oil patch of Bakersfield and the cool ocean breeze at MMS's Pacific Regional Office in Camarillo, California. The ocean breeze won.

**OS: You must work with people from many areas, countries, and disciplines.**

**ME:** The U.S. oil and gas industry's need for technical specialists such as engineers, geophysicists, and marine biologists attracts people from around the world. I've had the good fortune to meet and work alongside people from many countries with very diverse backgrounds.

**OS: What's your pet project right now?**

**ME:** I manage about 18 research studies on an annual basis, focusing on offshore operational challenges related to safety and technology. The Marco Polo Joint Industry Project (JIP) is of particular value because it will help us understand

and prepare offshore facilities to withstand hurricane-force winds and waves.

The project studies the performance of deepwater tension-leg platforms (TLPs); the Marco Polo TLP is located 160 miles (257 kilometers) south of New Orleans in 4,300 feet (1,311 meters) of water. The JIP partners share the costs to install and monitor electronic sensor equipment that measures the loads and motions of the platform under various environmental conditions.

**OS: What keeps your job exciting to you?**

**ME:** Research with an obvious, immediate means to improve design, reduce injuries, and better protect the environment. I'm proud to be part of an agency that works hard to serve the needs of the American public. And interacting with some incredibly brilliant minds from around the world on cutting-edge technology makes for a good day.

When I started college in 1979, the deepwater offshore was the new frontier for oil and gas development. At that time, the U.S. was assessing our vulnerability to world oil market fluctuations after the embargo of 1973–1974; domestic oil production in the deeper waters of the OCS got a lot of attention. Back then, offshore installations were primarily fixed leg platforms in water depths up to 1,000 feet (304 meters). Floating platforms like Marco Polo were still on the drawing board. It's a thrill not only to have witnessed this remarkable transformation but to be a part of it 25 years later. Now we are drilling in water depths greater than 10,000 feet (3,048 meters) with wells stretching to over 40,000 feet (12,192 meters). Remarkable!

**OS: How does your work contribute to MMS's mission?**

**ME:** As we explore deeper waters of the Gulf of Mexico and frigid waters off Alaska, new and daunting obstacles test the limits of our equipment, personnel, and operations. If we can't overcome these obstacles, our progress stops. As the technical manager of MMS Safety and Technology Research, my job is to help identify and find solutions for those obstacles.

**OS: What's coming next?**

**ME:** More research! I'm working on two new research announcements for Fiscal Year 2009; the first focuses on our core research areas of alternative energy, safety, and oil-spill response, and the second on hurricane research to better understand and protect against conditions like those experienced during Hurricanes Gustav and Ike.



# MARCO POLO:

The Marco Polo tension-leg platform. Photo courtesy of MODEC International.

## FULL-SCALE MONITORING OF A DEEPWATER TENSION-LEG PLATFORM

**T**he Minerals Management Service's (MMS's) Technology Assessment and Research (TA&R) program is at the center of many exciting research projects that contribute to improving safety and knowledge for exploring and developing energy and mineral resources on the Outer Continental Shelf (OCS).

According to Michael Else, MMS engineer, the Marco Polo Joint Industry Project is of particular interest because it will help MMS and industry better prepare for hurricane-force winds and waves. This information is increasingly more valuable as exploration and development move into deep and ultra deep water.

The Marco Polo project is a Joint Industry Project (JIP); project partners share costs, data, findings, and analysis. Sharing funding and findings with other participants achieves a higher level of work at a lower level of tax-payer funding. The Marco Polo JIP was formed in 2003 with 10 partners who are joint funders and provide technical guidance; monitoring equipment was installed in 2004. In 2005 MMS joined the JIP.

The Marco Polo field lies in 4,300 feet (1,311 meters) of water and is located in Green Canyon, 160 miles (257 kilometers) south of New Orleans, Louisiana. It is operated by

Anadarko Petroleum. Discovered in April 2000, the field produced its first oil in March 2004.

The Marco Polo JIP aims to verify the design methods of deepwater tension-leg platforms (TLP's) by evaluating the loads and motions of the platform under various environmental conditions.

The world's deepest TLP, Marco Polo has a stable, pre-conditioned, four-column hull and is pre-tensioned to the ocean floor by 2x4 columns. Apart from the steel deck, the payload of the platform is 12,676 tons (11,500 metric tons), at a displacement of 30,216 tons (27,412 metric tons).

## The TLP's are very stiff in pitch and roll. To counter environmental forces they develop large righting moments. If tendons are damaged, the hull's stiffness responds with a pendulum effect.

Some of the issues in design and operation that need to be resolved are platform motions; tensions in tendons and risers; behavior of tendons and risers; extreme loads and fatigue life of the platform; and actual wind, wave, and current conditions.

The monitoring equipment installed by Maritime Research Institute Netherlands (MARIN) began collecting continuous data in June 2004. The project was recently extended two years to allow for more monitoring, data collection, and analysis.

According to Else, "The timing of our equipment installation in 2004 was very fortunate; we were able to capture the intense conditions during Hurricanes Ivan (2004), Katrina and Rita (2005), and, most recently, Gustav and Ike (2008). Three of these hurricanes passed within 60 nautical miles (160 miles; 111 kilometers) of Marco Polo and have provided a wealth of data."

It's an understatement to say that Else is excited about the Marco Polo JIP. As he points out, "The unprecedented nature of this work and the data being generated led other researchers to approach us for the real-time information being generated from Marco Polo. To date, MMS has entered into one working agreement with MARIN and are currently negotiating with a U.S. research company to share data that will benefit our respective efforts."

When this research is complete in January 2010, findings will be shared not only with JIP members but also with others through technical papers and lectures, international conferences, workshops, and technical journals. Also, after the Marco Polo JIP's 5-year confidentiality period, the results of this work will be available on MMS's TA&R website.



Below the surface of the Marco Polo TLP. Graphic courtesy of MODEC International.



Hurricane Gustav approaching the Gulf Coast with windspeeds of 155 mph on August 31, 2008. Photo courtesy of NASA.

### FOR MORE INFORMATION

#### **TA&R Description of the Marco Polo Project**

[www.mms.gov/tarprojects/610.htm](http://www.mms.gov/tarprojects/610.htm)

[www.mms.gov/tarprojects/564.htm](http://www.mms.gov/tarprojects/564.htm)

#### **Deepwater Development Systems in the Gulf (Basic Options)**

[www.gomr.mms.gov/homepg/offshore/deepwatr/options.html](http://www.gomr.mms.gov/homepg/offshore/deepwatr/options.html)

# MAPPING OIL THICKNESS IN COASTAL AND OFFSHORE WATERS



Natural oil and gas seep offshore Coal Oil Point, California.

**F**or more than 20 years, the Minerals Management Service (MMS), through the Technology Assessment and Research (TA&R) program, has been actively funding and conducting research to improve the knowledge, technologies, and methodologies used to detect, contain, and clean up oil spills.

Two such undertakings, TA&R Project 544 and TA&R Project 594, were designed to develop a portable, easy-to-operate aerial sensor to detect and accurately map the thickness and distribution of an oil slick in coastal and offshore waters in realtime.

Thanks to the oil thickness and mapping system developed through these two projects, response to the December 2008 oil spill off the coast of Santa Barbara, California, was effective and efficient.

The oil thickness sensor and mapping system had been operationally flight-tested during overflights of the Coal Oil Point, California, natural oil seeps. The system acquired, processed, and

disseminated digital geographic information system (GIS)-compatible oil slick distribution products in near realtime through five cameras mounted inside a California Department of Fish and Game (CDFG) airplane. One infrared camera recorded heat, one was equipped with a filter that could see red images, one saw blue, and two recorded images in the green range. The colors indicated the depth of floating oil and so enabled analysts to calculate the amount spilled.

In December 2008, a finger-sized hole in a pump line leaked some 34 barrels of oil approximately 6 miles (10 kilometers) off the coast of Santa Barbara County, California, leaving an oil slick 1.5 miles long and 200 feet wide (2.4 kilometers long and 61 meters wide). The MMS and the CDFG's Office of Spill Prevention and Response put the new sensor and mapping system to work.

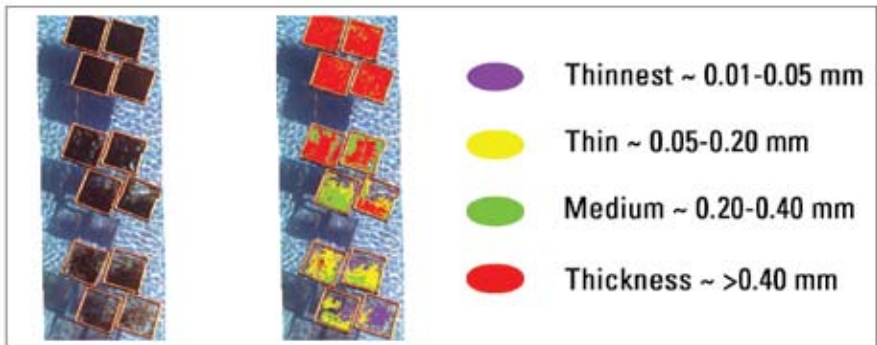
Being able to quickly determine oil thickness patterns within a spill at sea is vital for efficient planning and management of spill-response activities. Before the development of

the new sensor, such determinations were often made by airborne visual observations, which require specially-trained observers and are prone to errors due to variations in illumination, water color, and other environmental conditions. Relying on observers sometimes resulted in an inaccurate estimate of the amount of oil present.

Previous technology (e.g., synthetic aperture radars, hyperspectral instruments, and laser fluorosensors) lacked the ability to measure oil film thickness, was expensive and not always readily available, or required aircraft to fly very close to the ocean surface, which sometimes resulted in a thin line of data corresponding to the laser's track along the plane's flight line.

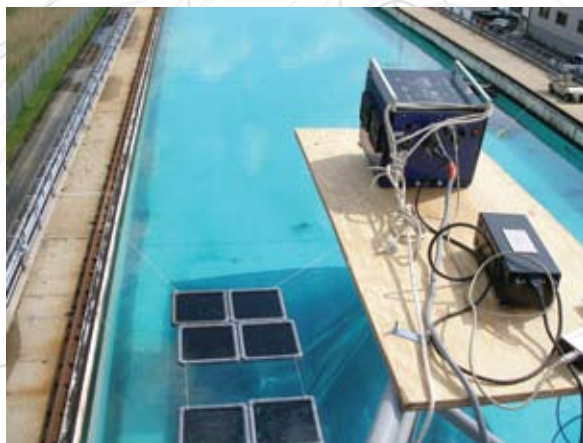
The new multispectral aerial sensor, however, relies on a color imager to record and spatially map the reflectance patterns on the ocean surface—in both contaminated water and clear water nearby. Software then compares and classifies the





Results from thickness sensor testing at Ohmsett.

image pixels into oil thickness classes based on their individual spectral characteristics. In addition to producing an accurate GIS-compatible map of the oil features, the system eliminates the subjectivity of the observer-dependent visual approach.



Testing the oil-spill sensor and mapping system at Ohmsett.

When the December 2008 spill off the coast of Santa Barbara County was reported, contractors from Ocean Imaging (OI) Corporation flew over the spill site. Initial photographs indicated that response vessels on the scene were not recovering oil in the thickest areas of the slick. OI's use of the digital multispectral camera and thermal imager produced detailed maps that showed the exact locations and levels of thickness of the oil on

the water. Spill responders received this information electronically in near realtime and were able to reposition recovery vessels to more effectively remove the most oil.

The quick and efficient response to the spill off the coast of Santa Barbara County shows that MMS-funded research projects result in practical contributions to making better

emergency response decisions. The development of the aerial thickness mapping system is another success story from the MMS Oil-Spill Response Research Program.

The objective of TA&R Project 544 was to develop an algorithm that would enable the measurement of oil-slick thicknesses using multispectral aerial imagery. The project also examined the feasibility of developing a relatively economical, portable aerial oil-spill mapping system. Realtime operational verification flights over natural oil seeps were carried out in October 2005. The sensor package was successfully tested at Ohmsett in May 2006.

Later in 2006, MMS initiated a second phase of the project (TA&R Project 594) to develop a portable, easy-to-operate, aerial sensor to detect and accurately map the thickness and distribution of an oil slick in coastal and offshore waters in realtime. The California Department of Fish and Game Office of Spill Prevention and Response, a partner on this project, provided technical expertise. The project included five separate overflights over natural oil seeps off Santa Barbara.

**FOR MORE INFORMATION**

**TA&R Project 544**

[www.mms.gov/tarprojects/544.htm](http://www.mms.gov/tarprojects/544.htm)

**TA&R Project 594**

[www.mms.gov/tarprojects/594.htm](http://www.mms.gov/tarprojects/594.htm)

**California Chronicle**

[www.californiachronicle.com/articles/84229](http://www.californiachronicle.com/articles/84229)

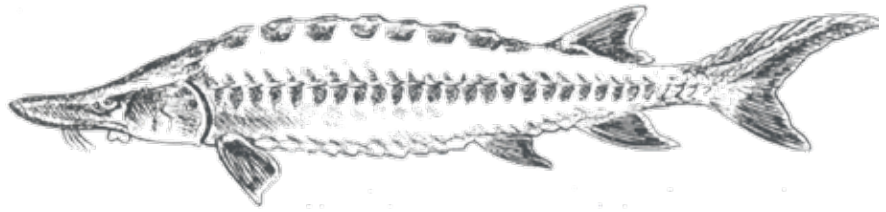
**Coast Guard News**

<http://coastguardnews.com/update-to-oil-spill-regulators-respond-to-platform-spill-off-the-coast/2008/12/09/>

# GULF STURGEON: A PECULIAR PREHISTORIC FISH

**T**he Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is neither as charismatic as the sea otter nor as majestic as the North Pacific right whale. But its ancestry, lifecycle, and peculiar behaviors make this one of the most interesting marine species protected by the Endangered Species Act (ESA).

The fossil ancestry of the Gulf sturgeon (a subspecies of the Atlantic sturgeon) dates back 225 million years. Over time, its appearance has changed very little. Reaching lengths up to 9 feet (2.74 meters) and weighing up to 300 pounds (136 kilograms), this prehistoric fish is armored with heavy plates (scutes) along its back and sides. Its tube-like snout is marked by whiskers (barbels) and its tail is shark-like. This is no friendly-looking fish, but it is not an aggressive species.



Gulf sturgeon (*Acipenser oxyrinchus desotoi*). Illustration courtesy of U.S. Geological Survey.

Once common in river systems from Tampa, Florida, to the Mississippi River, the Gulf sturgeon was valued for its eggs (caviar). Over-harvesting in the 19th century dramatically reduced the population. In Florida, for example, between 1886 and 1901 the annual harvest increased from 1,500 to 84,000 pounds (680 to 38,102 kilograms). Now considered “threatened” under the ESA, Gulf sturgeon are found in freshwater rivers from Florida’s Suwannee River to Louisiana’s Pearl River. The population in the Apalachicola River, a designated critical habitat, was estimated at fewer than 400.

Like the salmon, the Gulf sturgeon is anadromous: in spring they migrate from their saltwater habitat to freshwater rivers to spawn. Also like salmon, these fishes’ migration is impeded by dams on freshwater rivers. Unlike

salmon, sturgeon do not die after they spawn but can live to be over 40 years old!

After adult and subadult Gulf sturgeon (both spawning and nonspawning) migrate into freshwater rivers, they eat very little. When they return to the Gulf of Mexico in the fall they regain weight by feeding on bottom-dwelling organisms, such as amphipods (small shrimp-like crustaceans), isopods (small crustaceans), and marine worms.

Fasting is not the Gulf sturgeon’s only peculiar behavior. During spawning, males make sounds similar to creaking door hinges. But perhaps most unusual is their leaping—Gulf sturgeons are known to leap suddenly out of the water, sometimes up to 6 feet (1.82 meters)! The flamboyant leaps, which can be dangerous to humans, are almost constant during June through August and increase as the number of water recreationists increases.



U.S. Fish & Wildlife Service biologist and intern with a Gulf sturgeon. Photo courtesy of Paul A. Lang, U.S. Fish & Wildlife Service.

Kingdom:	Animalia
Phylum:	Chordata
Class:	Osteichthyes
Order:	Acipenseriformes
Family:	Acipenseridae
Genus:	<i>Acipenser</i>
Species:	<i>oxyrinchus</i>
Subspecies:	<i>desotoi</i>

## FOR MORE INFORMATION

### Gulf Sturgeon, NOAA’s Office of Protected Resources

[www.nmfs.noaa.gov/pr/species/fish/gulfsturgeon.htm](http://www.nmfs.noaa.gov/pr/species/fish/gulfsturgeon.htm)

### “Mystery of Florida’s Giant Jumping Sturgeon Solved?” National Geographic News

<http://news.nationalgeographic.com/news/2006/10/061030-sturgeon.html>

Over 400 people gathered in Anchorage, Alaska, October 28-30, 2008, for three days of talks highlighting research conducted for the planning and management of oil and gas activities in the U.S. and Canadian Beaufort Sea and onshore areas. The first “United States and Canada Northern Oil and Gas Research Forum: Current Status and Future Directions in the Beaufort Sea, North Slope and Mackenzie Delta” was held simultaneously with the Minerals Management Service’s (MMS) Alaska Region Eleventh Information Transfer Meeting (ITM).

The forum was conceived by personnel from MMS’s Alaska Region and the Department of Indian and Northern Affairs Canada as a chance for U.S. and Canadian scientists, industry, and regulators to focus on sharing research programs and future directions for northern oil and gas development. The forum was planned and carried out by departments and agencies of both the U.S. and Canada. This forum is meant to become an important communication tool to help regulators, industry, and communities become better informed about existing research, learn about future directions, and understand how this information is used in decisionmaking.

The forum featured over 20 poster sessions and nearly 50 oral presentations by U.S. and Canadian authors in the sessions of Technical-Engineering; Socio-cultural/Socio-economic; Biological Sciences; and Physical Sciences. In addition, there were three panel discussions: U.S. and Canadian Management Research Needs and Priorities; U.S. and Canadian Industry Research Priorities; and Facilitated Wrap Up-Next Steps-Closing Remarks.

The MMS shared nine of its ITM presenters to form a solid foundation



Attendees at the Research Forum in Anchorage, Alaska.

for this first forum. Information about ongoing environmental research on Alaska’s Outer Continental Shelf was also covered at the concurrent MMS ITM in 25 additional presentations. These included topics about protected species, biological studies, social sciences and economics, fates and effects, physical oceanography, and multidisciplinary topics. The MMS convenes periodic ITM’s and other public meetings to present study results in a public forum and to facilitate the expression of multiple perspectives on scientific questions.

An abstract volume for the forum was published and is available on the North Slope Science Initiative (NSSI) website. A final report containing the abstracts and slide presentations, and a summary of the meeting and facilitated closing discussion will be available on the NSSI and MMS Alaska Region’s websites. The presentations from and proceedings of the MMS Alaska ITM will be available on the MMS Alaska Region’s website.

#### FOR MORE INFORMATION

##### **Alaska ITM Agenda**

[www.mms.gov/alaska/ess/itm/ITM\\_agenda.pdf](http://www.mms.gov/alaska/ess/itm/ITM_agenda.pdf)

##### **MMS Alaska Website**

[www.mms.gov/alaska/](http://www.mms.gov/alaska/)

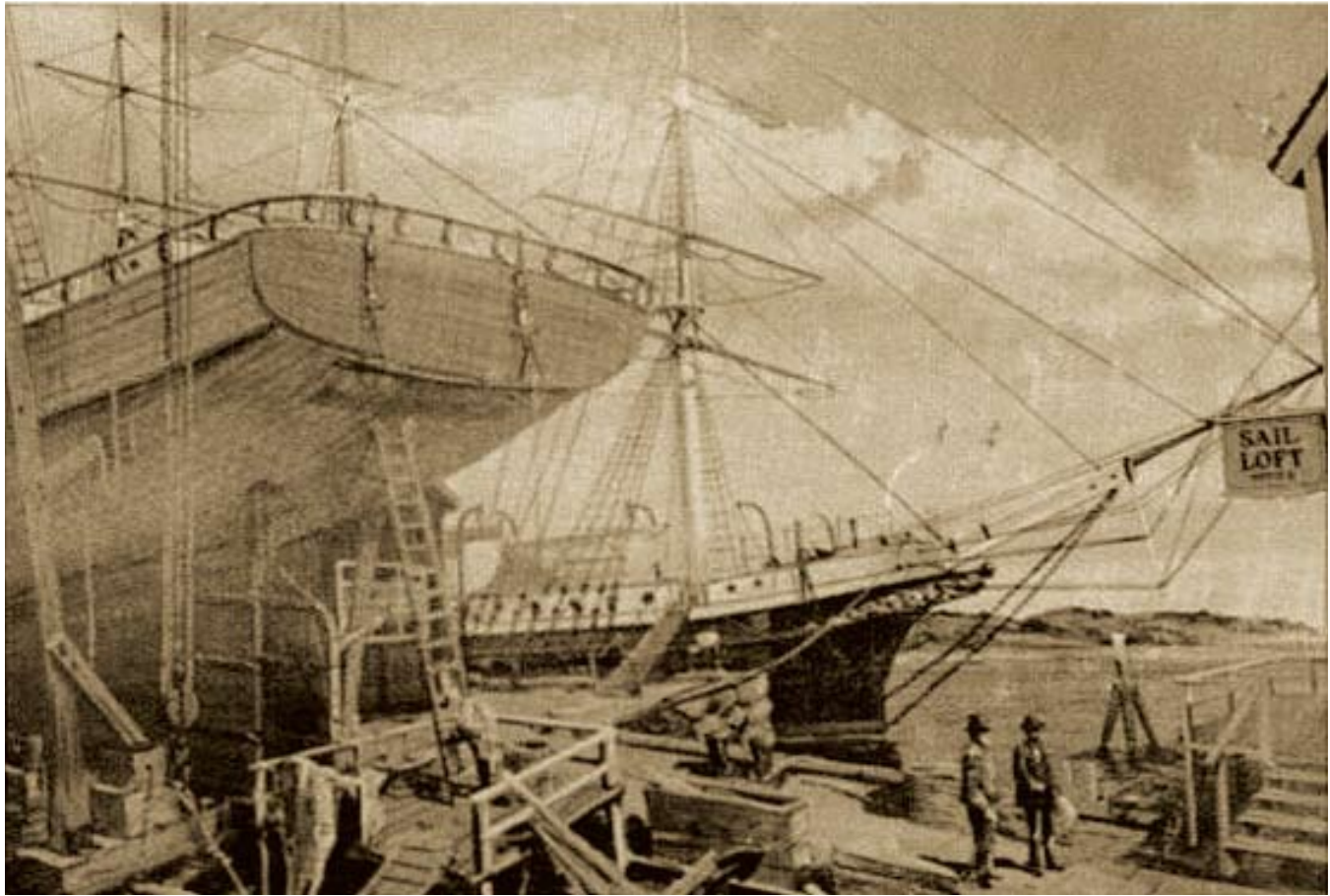
##### **North Slope Science Initiative**

[www.northslope.org/](http://www.northslope.org/)

##### **Research Forum Agenda**

[www.mms.gov/alaska/ess/itm/ForumAgendaOctober10-24-08.pdf](http://www.mms.gov/alaska/ess/itm/ForumAgendaOctober10-24-08.pdf)

# WESTERN EMPIRE



Shipbuilding in Quebec, Canada, where *Western Empire* was built.

**A**s part of its permitting process and as mandated by Section 106 of the National Historic Preservation Act, the Minerals Management Service (MMS) often requires remote-sensing surveys to identify potential cultural resources on the seafloor. Important archaeological discoveries are often made in this way, adding to our understanding of the Nation's history and earlier maritime uses of the Gulf of Mexico. As energy exploration and development move into deeper waters, a previously unexplored resource is also being explored.

This is the story of one such shipwreck lying in approximately 1,350 feet (411 meters) of water on the bottom of the Gulf of Mexico.

A few of the World War II shipwreck sites in the Gulf have been positively identified because their relatively recent losses were well-documented and their names or other features were visible on their hulls. But identifying older wooden shipwrecks in deep water is a different matter and is often tentative at best. These sites are more difficult to reach and, because of their age and composition, often yield fewer clues.

The potential identification of many shipwrecks is based on a predictive model and MMS's proprietary GIS database, which contains over 3,000 entries of historic and recent shipwrecks in the Gulf. This model builds on previous databases that modeled locations based on their historically reported locations. One assumption of the model was that shipwrecks would most likely be located within 5 miles (8 kilometers) of their reported locations.

However, as industry surveys moved into deep water and



The windlass of the unidentified ship. Windlasses are machines used to lift or haul heavy objects, usually ship anchors.

## “... after making a voyage of more than five hundred miles without a hand at her helm.”

outside the “high-probability areas,” it became apparent that this assumption was no longer applicable. For example, the steamship *New York* (1846) was discovered not 5 but 200 miles (not 8 but 322 kilometers) from where the MMS model had placed her.

In response, a new study was undertaken in 2000 to refine and revise the shipwreck database. The study included more primary and historical sources, such as newspaper reports and other archived records. Still, the strengths and weakness of the model are evident and overall reliability of the model is only as good as the initial research. This is the case with the true—and truly remarkable—story of *Western Empire*.

A 19th-century wooden shipwreck located in deep water (at approximately 1,350 feet [411

meters]) was identified as *Western Empire*, which was believed to have succumbed to the sea on September 18, 1876. The site had been reported in the early 1980’s after a remote-sensing survey for Shell. Texas A&M researchers explored the site and, using the database developed for MMS, inferred the identity of *Western Empire*. Based on historic information at that time and the site’s approximate dimensions, archaeologists felt confident with the identification. But that confidence didn’t last long.

*Western Empire* was one of nine oceangoing ships in the “Empire” series built in Quebec between 1860 and 1863 by William Baldwin and Henry Dinning for English commercial firms. *Indian Empire* was the first, launched in 1860. Other “Empires” included *Colonial*,

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### WESTERN EMPIRE DISASTER

#### Particulars of the Loss of the Vessel.

#### Estimated Value of Ship and Cargo.

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PENSACOLA, Fla., Sept. 24, 1876.  
The British ship *Western Empire*, 1265 tons burden, which sailed from here on the 11th, sprung a leak on Monday night, the 13th, when about two hundred miles from land. The pumps were manned and the vessel put before the wind and headed for the shore. When within 125 miles of land she began to show signs of capsizing and lost steering way. The tuns were cut away, but as she had on a large deck load of lumber it was impossible to keep her up. The crew took to the two boats and remained by her side all night, when, next morning, seeing she was breaking up they left her and endeavored to reach the land.

The smallest boat, it was discovered, could not live in the terrible sea, so all the men (twenty-four) got into the longboat, and managed to get within two miles of the beach off St. Vincent's Island, when they capsized amid the breakers. Seven of the crew who could not swim were drowned, despite the earnest efforts of their companions to save them. The second mate was among the drowned. The remnant of the crew, seventeen men, hung on to the keel of the longboat and finally drifted ashore, and arrived here this morning, having been picked up by a passing fore-and-after, whose name I did not learn.

Capt. Walter Hobbs, commander of this vessel, died suddenly here a few days before she sailed, and was buried here. The *Western Empire* was under charge of the first mate, and was "homeward bound." Estimated value of vessel and cargo, \$67,000.  
Yours,  
SANDY MERLEN.

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*Daily Picayune* article, one of the historic resources used to solve the mystery of *Western Empire*.

*Celestial, Western, Eastern, French, Northern, British, and Southern.*

*Western Empire* transported goods and people to and from Liverpool and India at least three times between 1864 and 1865 before changing owners. By 1868 she was involved in trade between London and Australia. Her adventures included one mutiny. The last survey of the vessel, 1869-1870, shows that she was no longer a passenger carrier but most likely carried cargo.

Bound for her home port in London on September 11, 1875, *Western Empire* sailed out of

## The case of *Western Empire* teaches the importance of solid research and critical analysis of the archaeological and historical record ...

Pensacola, Florida, for what would be her last voyage. Caught in a storm in the Gulf of Mexico, she was abandoned and presumed lost. After 10 days at sea in long boats, seven crew members drowned trying to make their way back to shore.

Most secondary sources list the wrecking event as September 18, 1876, a year after she left Pensacola. This suggests a problem with the historic record. Through historic research it was later determined from a newspaper article in the *Daily Picayune* (of New Orleans) that *Western Empire* was abandoned during a heavy storm on September 18, 1875, not 1876.

Still, the physical remains located on the bottom of the Mississippi Canyon Area of the Gulf of Mexico and the approximate location of the loss matched the

dimensions of *Western Empire* and correlated with the information in the MMS database. For a while, the identification of the site as the remains of *Western Empire* was accepted until further historical information came to light.

In an October 1875 Galveston, Texas, newspaper account, a schooner captain reported seeing *Western Empire* in the Gulf, after she was thought to have sunk: “mizzen mast standing, signal flag flying in mizzen rigging, fore and main masts lying alongside, both anchors hanging under her bow.” No one was seen on board; weather conditions prevented boarding.

How, then, could *Western Empire* have been seen in the Gulf just a week or so later? Additional historic research was necessary to solve this mystery.

A November 1875 article in a Pensacola, Florida, newspaper reported that “the abandoned ship has been found, after making a voyage of more than five hundred miles without a hand at her helm.” According to the account, *Western Empire* had been “caught in the reflux current”: “the masterless ship drifted with the influence of the gulf stream . . . swept through the straits of Florida and on toward the Atlantic until she was discovered 30 miles north of Jupiter inlet, swinging to an anchor.” Indeed, *Western Empire* was found 30 miles (48 kilometers) north of Jupiter Inlet on the Atlantic coast of Florida!

District Court proceedings show that Benjamin Baker, a wrecker near Key Largo, Florida,

learned of and began searching for the “water logged and dismasted vessel” on October 15, 1875.

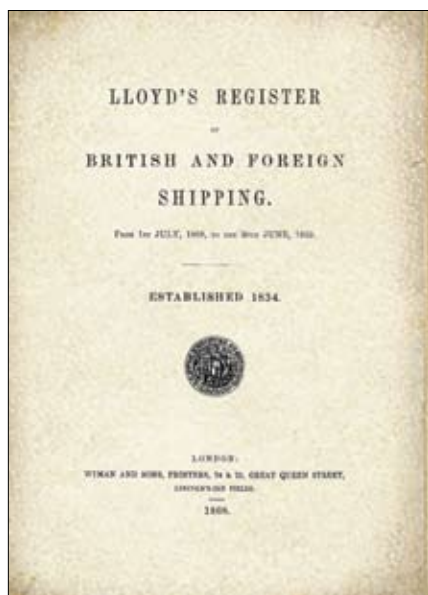
*Western Empire* was found by Baker on November 3, 1875, “full of water with a load of timbers and dismasted and totally abandoned.”

According to Dr. Chris Horrell, MMS marine archaeologist, the ship was likely already in the Loop Current when a Category 3 hurricane entered the Gulf: “*Western Empire* was caught up in the Loop Current and spit out through the Straits of Florida, catching a ride on the Gulf Stream. She likely would have continued on to Europe had her anchors not caught the sand bar just off Florida.”

What, then, is the vessel formerly believed to be *Western Empire*? Researchers at Texas A&M, using a remotely-operated vehicle and a one-person submersible, gathered hours of video data that, on close inspection, suggest that the site is much older than initially believed and may date to the first quarter of the 19th century. Future archaeological and historical investigations may uncover her age, nationality, function, and, it is hoped, her name and history.

The case of *Western Empire* teaches the importance of solid research and critical analysis of the archaeological and historical record, and demonstrates MMS’s commitment to rigorous inquiry into and protection of our Nation’s maritime heritage.

*Note: This article is based on Chris Horrell’s paper “The British Merchant Ship Western Empire: A Lesson from the Archives,” presented at the Society for Historical Archaeology Conference in York, England, in 2005, and under peer review for publication in Historic Archaeology.*



Lloyd's shipping register, 1868, one of the historic resources used to solve the mystery of *Western Empire*.

**A**s a steward of the ocean environment, the Minerals Management Service (MMS) understands the importance of the shorelines of coastal states involved in the exploration and development of the Federal Outer Continental Shelf (OCS) energy resources. Protecting and rebuilding coastal areas is a priority for MMS.

The Coastal Impact Assistance Program (CIAP), established by the Energy Policy Act of 2005, authorizes funds to be distributed to oil- and gas-producing states to assist in conserving, protecting, and restoring coastal areas. Under CIAP, the Secretary of the Interior is authorized to distribute \$250 million for each fiscal year 2007 through 2010 to eligible producing States and coastal political subdivisions. The Secretary delegated this authority to MMS.

Eligible states with an MMS-approved CIAP Plan may submit grant applications for projects included in the plan. To date, Alaska, Louisiana, Mississippi, and Texas have MMS-approved CIAP Plans. Mississippi's Plan, for fiscal years 2007-2010, was approved in February 2009. Texas's Plan, approved in January 2009, makes more than \$48 million for fiscal year 2007 available through Federal grants to the State and 18 counties to conserve, restore, and protect coastal areas.



South shore of Grand Lake, Louisiana, Hurricane Katrina surge-scoured intermediate marsh peninsula. Photo courtesy of John Barras, U.S. Geological Survey.

### ***Protecting Grand Lake, Louisiana***

The MMS has awarded a \$10.6 million grant to the State of Louisiana through CIAP for its Grand Lake Shoreline Protection project, which is located in the Mermentau Basin in Cameron Parish, Louisiana.

In the Grand Lake area, erosion rates range from 11 to 32 feet (3.4 to 9.8 meters) per year. The year-long Grand Lake Shoreline Protection project, a part of Louisiana's CIAP

plan approved in November 2007, will construct a breakwater about 37,800 feet (11,521 meters) long on Grand Lake's south shore. The breakwater will protect the shoreline from further erosion and will promote accretion between the breakwater and the shore, thereby mitigating adverse impacts on adjacent fresh marsh.

Grants awarded through CIAP help ensure that States supporting the Nation's energy needs receive assistance to protect their coastal communities and environments.

#### FOR MORE INFORMATION

#### **“Grand Lake Shoreline Protection Project Status,” Louisiana Coastal Wetlands Conservation and Restoration Task Force**

[www.lacoast.gov/reports/display.asp?projectNumber=ME-21a&reportType=general](http://www.lacoast.gov/reports/display.asp?projectNumber=ME-21a&reportType=general)

#### **“High Tides on the Texas Coast,” Texas Comptroller of Public Accounts**

[www.window.state.tx.us/comptrol/fnotes/fn0712/coast.html](http://www.window.state.tx.us/comptrol/fnotes/fn0712/coast.html)

#### **MMS Coastal Impact Assistance Program**

[www.mms.gov/offshore/CIAPmain.htm](http://www.mms.gov/offshore/CIAPmain.htm)

#### **MMS Press Releases**

[www.gomr.mms.gov/homepg/whatsnew/newsreal/2009/090112.pdf](http://www.gomr.mms.gov/homepg/whatsnew/newsreal/2009/090112.pdf)

[www.gomr.mms.gov/homepg/whatsnew/newsreal/2009/090203.pdf](http://www.gomr.mms.gov/homepg/whatsnew/newsreal/2009/090203.pdf)

# MMS: A steward of the ocean environment

## NEW WAVES

Late-Breaking News & Information

### *New Leadership Selections*

#### **Ron Brinkman**

has been appointed Senior Staff Geophysicist in the Resource Evaluation Office.

In 1973, Brinkman earned a BS degree in Mathematics with a minor in Earth Sciences from the University of New Orleans. He began his Federal career in 1977 with the U.S. Geological Survey, where he worked in physical science positions. In 1982, Brinkman was hired as a Staff Geophysicist by the Minerals Management Service (MMS), Gulf of Mexico Region. He is widely regarded in the geophysical community as a key contact person in seismic issues. He has over 25 years of seismic permitting experience.

As Senior Staff Geophysicist, Brinkman will oversee seismic compliance and policy issues for all MMS Regional Offices, develop a tactical work plan, and facilitate communication and coordination on internal and external seismic survey issues.

#### **David Trocquet**

was recently selected as the new District Manager for the Minerals Management Service's (MMS) New Orleans District Office, Field Operations. Trocquet has worked in the New Orleans District since 1996, most recently as District Drilling Engineer.

In 1982, Trocquet earned his BS degree in Petroleum Engineering from Louisiana State University; later, he furthered his education by completing graduate courses in computer science and petroleum engineering. Before joining MMS as a staff petroleum engineer in 1988, he spent 5 years in oil and gas industry positions.

In his new position as New Orleans District Manager, Trocquet will manage a range of functions, such as accident investigations, civil penalty reviews, drilling permit reviews, and safety inspections.

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