

MMS OCEAN SCIENCE

VOLUME 6 ISSUE 4

OCTOBER/NOVEMBER/DECEMBER 2009

THE SCIENCE & TECHNOLOGY JOURNAL OF THE MINERALS MANAGEMENT SERVICE



Mapping Out a National Ocean Policy

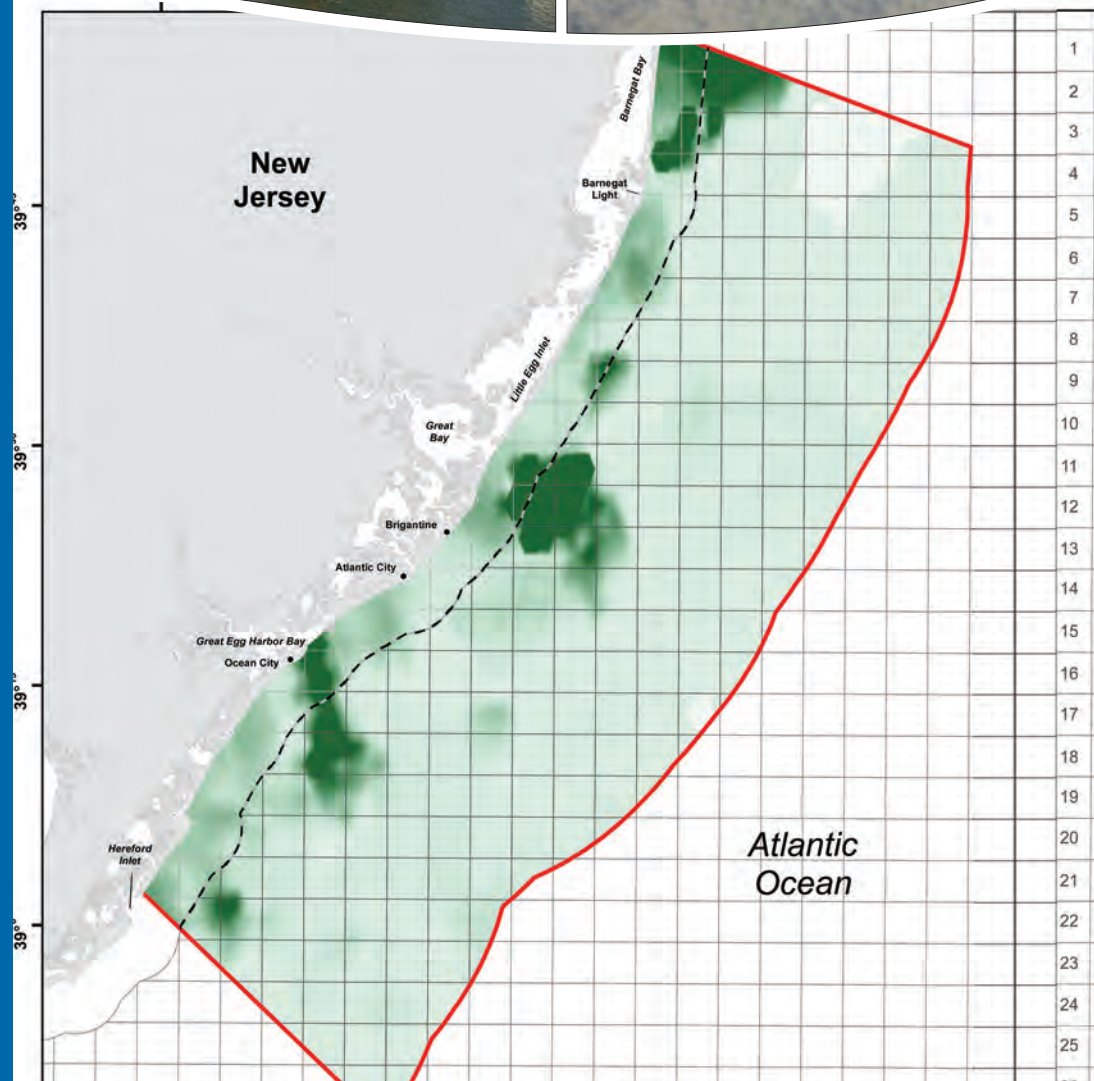
What is Coastal and Marine Spatial Planning?

The Multipurpose Marine Cadastre: A Tool for Sharing Marine Spatial Data

Three Atlantic States' Coastal and Marine Spatial Planning Efforts

MMS's Environmental Studies Program: Science That Never Sleeps

Partnerships Helping the Flower Garden Banks Grow



Special Coastal and Marine Spatial Planning Issue!

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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This marine spatial planning issue of *OCEAN SCIENCE* was co-edited by Dr. James Kendall, Chief, Environmental Division, MMS.

ABOUT THE COVER

Top left: Wind turbines along the coast, at sunset.

Top middle: Perdido production platform in the Gulf of Mexico. Photo courtesy of Shell.

Top right: The piping plover (*Charadrius melodus*), a threatened species along the Atlantic Coast.

Main photo: New Jersey Baseline Ecosystem Study map showing the spatial distribution of total bird density.

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

All photos courtesy of Minerals Management Service unless otherwise noted.

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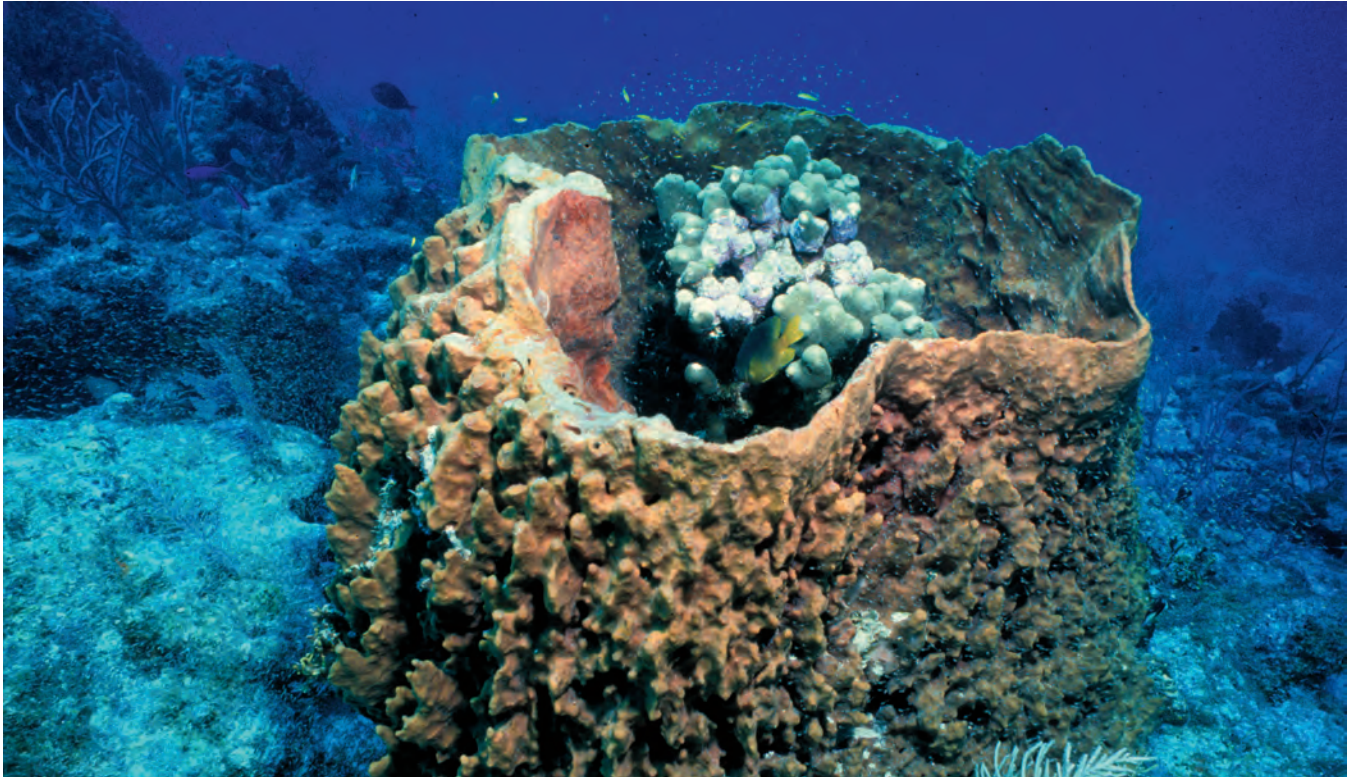
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www.mms.gov

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Marine spatial planning facilitates the efficient use of the ocean while protecting habitats and the species using those habitats like this barrel sponge with finger coral (*Porites*) inside and small fish fry above. Photo courtesy of National Marine Sanctuaries.

With the ever-expanding uses of coastal and ocean areas there is a need now, more than ever before, to consider the entire range of uses and users. From the basic concept of their value as ecosystems and habitats to their economic importance to communities, a more comprehensive approach must be taken during planning and decisionmaking processes. Today, this approach is referred to as Coastal and Marine Spatial Planning, or CMSP.

The principles of CMSP are not new to the Minerals Management Service (MMS). Many have been integral to how we have carried out our day-to-day regulatory and stewardship responsibilities. For example, MMS has a long history of managing offshore energy and marine minerals by working collaboratively with other Federal agencies, coastal States,

and countless other stakeholders. These efforts strive to avoid conflicts among multiple users engaged in everything from navigation, recreation, commercial and recreational fishing, and military training, as well as for the protection of sensitive ecological habitats.

In fact, in their final report, *An Ocean Blueprint for the 21st Century*, the U.S. Commission on Ocean Policy found that “today the OCS oil and gas program has a well institutionalized and reasonably comprehensive management regime.” Further, the Commission went on to say, “the program seeks to balance the many competing interests involved in offshore energy activity, requires state and local government input in federal decisions, and specifies detailed procedures to be followed by those seeking offshore leases.”

Together with an adaptive

and ecosystem-based approach to management, MMS views CMSP as a collaborative process of working with all stakeholders to utilize the most up-to-date scientific information and state-of-the-art geospatial tools to make the best possible decisions as transparently as possible. The same can be said for the Department of the Interior as a whole, where stewardship, conservation, and regulatory responsibilities extend nearly seamlessly from upland areas, through river basins, watersheds, estuaries, and coastal wildlife refuges to coastal and oceanic national parks and wildlife refuges and the lands beneath our oceans. It is for these reasons, and in support of President Obama’s goal of developing a national framework for CMSP, that we have devoted this issue of *MMS Ocean Science* to *Coastal and Marine Spatial Planning*.

MAPPING OUT A NATIONAL OCEAN POLICY

Our oceans, coasts, and the Great Lakes are critical to our Nation. We depend on their diverse ecosystems for valuable energy resources, food, national security, recreation, shipping, trade, and transportation—all of which also provide jobs. Their habitats are also home to numerous species.

Like many of our federally managed onshore lands, our oceans and coasts are under increasing pressure and stress. Some of the challenges include potential conflicting uses, pollution, habitat loss, rising sea levels, ocean acidification, and degraded water quality. New uses, such as aquaculture and renewable energy development, will bring new pressures, including space use conflicts.

Maintaining healthy, resilient, and sustainable oceans and coasts is a primary concern and responsibility of local, State, and Federal agencies, and other groups and stakeholders. As demands on our coastal and marine resources increase, we must increase the coordination and vigilance of our stewardship.

To meet these challenges, the Interagency Ocean Policy Task Force was established by President Obama on June 12, 2009. Led by Council of Environmental Quality Chair Nancy Sutley, the Task Force includes senior policy-level officials from the executive departments, agencies, and offices represented on the Committee on Ocean Policy (established December 17, 2004, by Section 3 of Executive Order 13366).

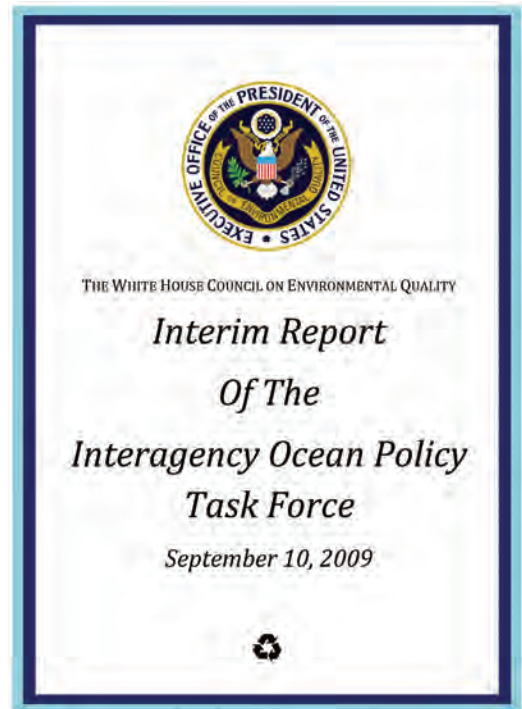
The Task Force is responsible for developing recommendations which address:

1. A national policy that provides for an adaptive management approach to ensure and enhance the protection, maintenance, and restoration of the health of our ocean and coastal economies, ecosystems, heritage, and resources.
2. A policy-coordinated framework that ensures and improves integration and collaboration across jurisdictional lines, including coordination with the Homeland Security Council and the National Security Council.
3. An implementation strategy that identifies and prioritizes national policy objectives.
4. A coastal and marine spatial planning framework that is comprehensive, ecosystem-based and that addresses conservation, economic activity, user conflicts, and sustainable uses of marine resources, consistent with international law.

An Interim Report, released on September 17, 2009, for public comment, includes the first three recommendations. Input from stakeholders and interested parties

began in August with regional public meetings and other public involvement activities. The report offers proposals for a more integrated comprehensive national approach to uphold our stewardship responsibilities and ensure accountability for our actions.

The fourth recommendation—a coastal and marine spatial planning framework for the conservation and sustainable use of our ocean resources—was released on December 14, 2009, for public review and comment.



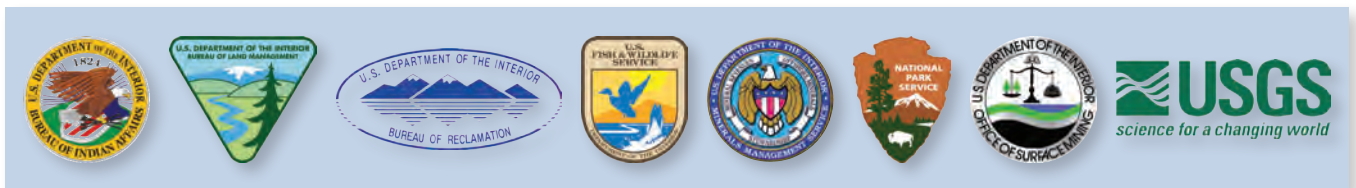
FOR MORE INFORMATION:

Interim Report of the Interagency Ocean Policy Task Force

www.whitehouse.gov/administration/eop/ceq/initiatives/oceans/

Presidential Memo on a National Policy for the Oceans, Our Coasts, and the Great Lakes

www.whitehouse.gov/assets/documents/2009ocean_mem_rel.pdf



Bureaus within the Department of the Interior.

The objective of coastal and marine spatial planning (CMSP) is to help us manage marine areas in ways that balance multiple and often conflicting uses and needs, such as ecological, economic, and sociological interests. At its most basic, CMSP entails identifying activities that take place, the locations of those activities, jurisdictions, and habitats.

As a process for identifying the spatial and temporal distribution of human activities in coastal and marine areas, CMSP can lead to many benefits. Done well, it can reduce conflicts among users, increase regulatory efficiency, help maintain and improve ecosystems and ecological processes, and facilitate newly emerging industries such as renewable energy.

Several States are pursuing the principles of CMSP to help them develop plans to manage their State waters. Oregon, for instance, has a long history of ocean planning, such as the Territorial Sea Plan adopted in 1994. As part of the work of the New York Ocean and Great Lakes Ecosystem Conservation Council, New York has begun a spatial planning effort for its marine and Great Lakes waters.

Atlantic States with a high potential for offshore wind energy development—such as Massachusetts, New Jersey, and Rhode Island—are using CMSP principles to ensure that they make responsible decisions about activities in their waters.

At the national level, to better protect and responsibly manage our ocean resources, the Minerals Management Service (MMS) has been using many of the concepts of CMSP to help us in our efforts to take a more adaptive and ecosystem-based approach to our stewardship activities. More specifically, in our day-to-day work, especially the leasing process itself, we collaborate with Federal, State, and local agencies and other stakeholders to identify and minimize user conflicts, protect the environment, and balance multiple needs.

Through our environmental and technical research and the development and use of cutting edge geospatial tools, we continually update and advance information that guides our stewardship of the ocean environment.

For example, MMS, in cooperation with the National Oceanic and Atmospheric Administration (NOAA) and other Federal agencies, led the development of the Multipurpose Marine Cadastre (MMC). This web-based spatial information system shows how a particular marine area is being used, the legal boundaries, and more. We can also see what natural resources, habitats, ecosystems, and species are in that area.

With CMSP and cutting-edge tools, decisionmakers have the best available and most current data to make better informed, transparent decisions.



Wind turbines, Horns Reef, Denmark. Photo courtesy of Vestas Wind Systems A/S.

FOR MORE INFORMATION

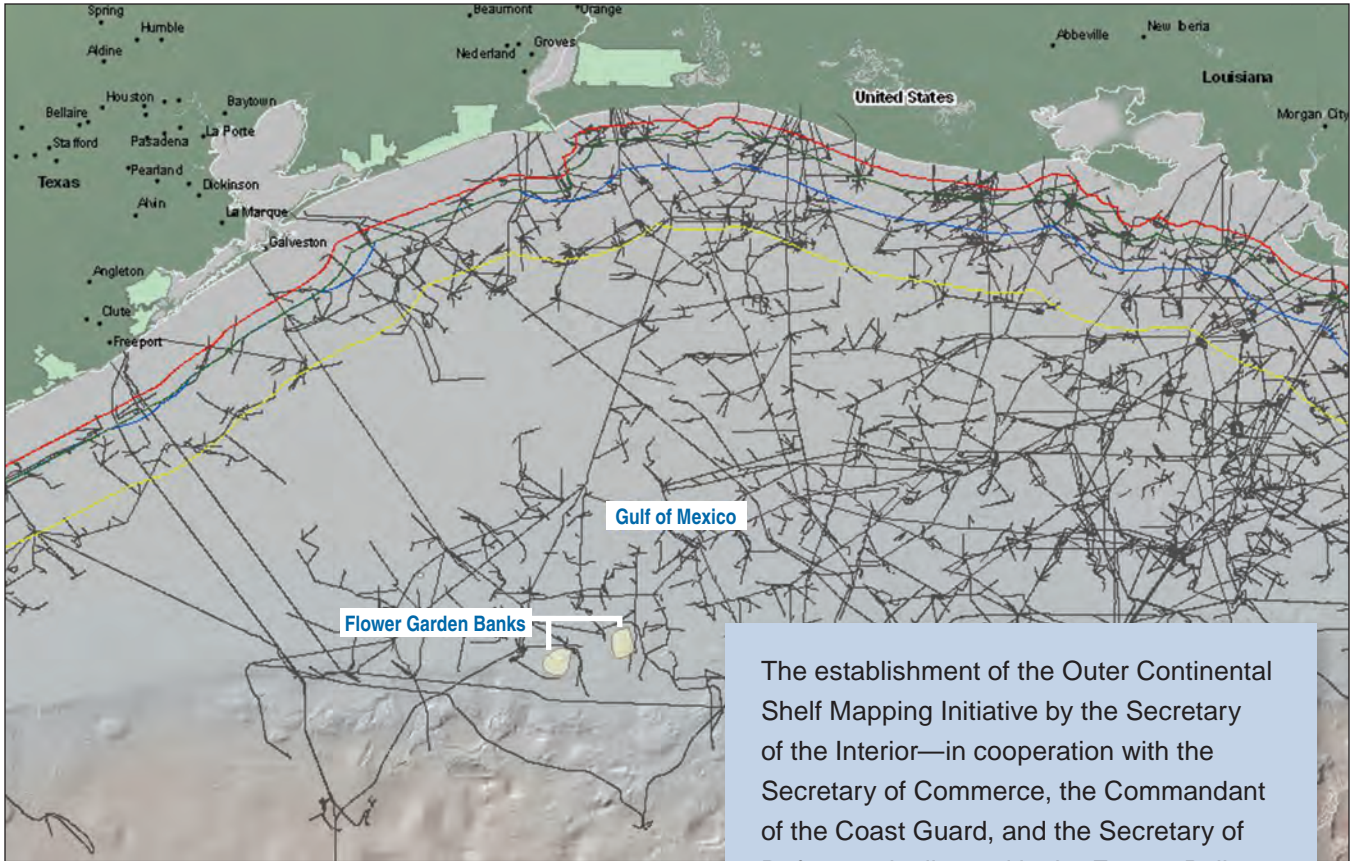
Multipurpose Marine Cadastre Viewer, MMS

www.mms.gov/offshore/mapping/Viewer.htm

Marine Spatial Planning, NOAA

www.msp.noaa.gov/

THE MULTIPURPOSE MARINE CADASTRE: A TOOL FOR SHARING MARINE SPATIAL DATA



This MMC view of the Flower Garden Banks National Marine Sanctuary shows nearby pipelines, coastal national wildlife refuges (light green areas), and relevant boundaries established by U.S. and international law.

Our oceans and coasts are becoming more crowded. As renewable energy development moves offshore, accurate, directly-accessible spatial information about the Outer Continental Shelf (OCS) becomes more imperative for responsible stewardship. Keeping track of spatial information, such as the many boundaries, rights, responsibilities, and restrictions, is a daunting task. But now direct access to cadastral marine information is readily available to users online and free of charge.

The Minerals Management Service (MMS) continues its coastal and marine spatial planning (CMSP) efforts by coordinating the development and implementation of the Multipurpose Marine Cadastre (MMC). This marine information system brings together data layers about environmental, physical, political, and social aspects of the OCS. In a single, interactively generated map, users can see all official boundaries, rights, restrictions, and responsibilities in State and Federal waters.

The establishment of the Outer Continental Shelf Mapping Initiative by the Secretary of the Interior—in cooperation with the Secretary of Commerce, the Commandant of the Coast Guard, and the Secretary of Defense—is directed in the Energy Policy Act of 2005, Section 388. The Initiative's goal is to assist decisionmaking related to renewable energy uses on the OCS. The MMS responded in 2006, in cooperation with NOAA and other agencies and groups, by leading the development of the MMC.

WHAT IS CADASTRAL DATA?

The geographic extent of the past, current, and future rights and interests in real property, including the spatial information necessary to describe the geographic extent. "Rights and interests" are the benefits or enjoyment in real property that can be conveyed, transferred, or otherwise allocated to another for economic remuneration.

What's a cadastre?

A *cadastre* is a registry of ownership, tenure, boundaries, land use, legal location and coordinates, and other information about spatial areas. The term is derived from the Late Latin *capitastrum*, which refers to a register of the poll tax, and the Greek *katastikhon*, which means a list, line by line.

Generally, a *cadastral survey* investigates land ownership. A *cadastral map* is a map that shows boundaries and ownership of parcels of land. An early example of a cadastral survey is the Domesday Book completed in England in 1086 for William the Conqueror.

Cadastral surveys are the basis of title to all land that is now or has been part of the Public Domain of the U.S. For example, the Department of the Interior's Bureau of Land Management operates the Cadastral Survey program, which conducts legal boundary surveys for many Federal agencies, such as the Bureau of Indian Affairs, the Bureau of Reclamation, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the National Park Service, and the U.S. Forest Service.

This multidimensional, evolving information system integrates layers of data to provide partners, coastal States, tribes, commercial industry, and the academic community with resources for planning purposes. Each partner agency or group is responsible for updating their data.

Having up-to-date data is the key for any comprehensive view of sometimes-overlapping boundaries. Core cadastre layers, or jurisdictional boundaries, include, for example, Submerged Lands Act Boundaries, Contiguous Zones, National Marine Sanctuaries, Coastal Indian Lands, Coastal National Wildlife Refuges, Outer Continental Shelf Lease Blocks, and MMS Planning Areas. Key supporting data layers to inform CMSP efforts include oil and gas well location sites, drilling platforms,

pipelines, active oil and gas leases, shipwrecks and obstructions, and military zones.

In developing the MMC, the MMS collaborated with many agencies and groups, including the National Oceanic and Atmospheric Administration (NOAA), the U.S. Fish and Wildlife Service, the National Park Service, The Nature Conservancy, and California Coastal Conservancy, to name a few. A new version of the MMC, with enhanced tools and information, will be available in 2010.

Coastal and marine spatial planning tools, like the MMC, facilitate MMS's efforts to pursue an ecosystem-based approach to management and, thus, our goal of safe and responsible use of our shared marine resources.



The Nature Conservancy 
Protecting nature. Preserving life.™


Coastal
Conservancy



THREE ATLANTIC STATES' COASTAL AND MARINE SPATIAL PLANNING EFFORTS

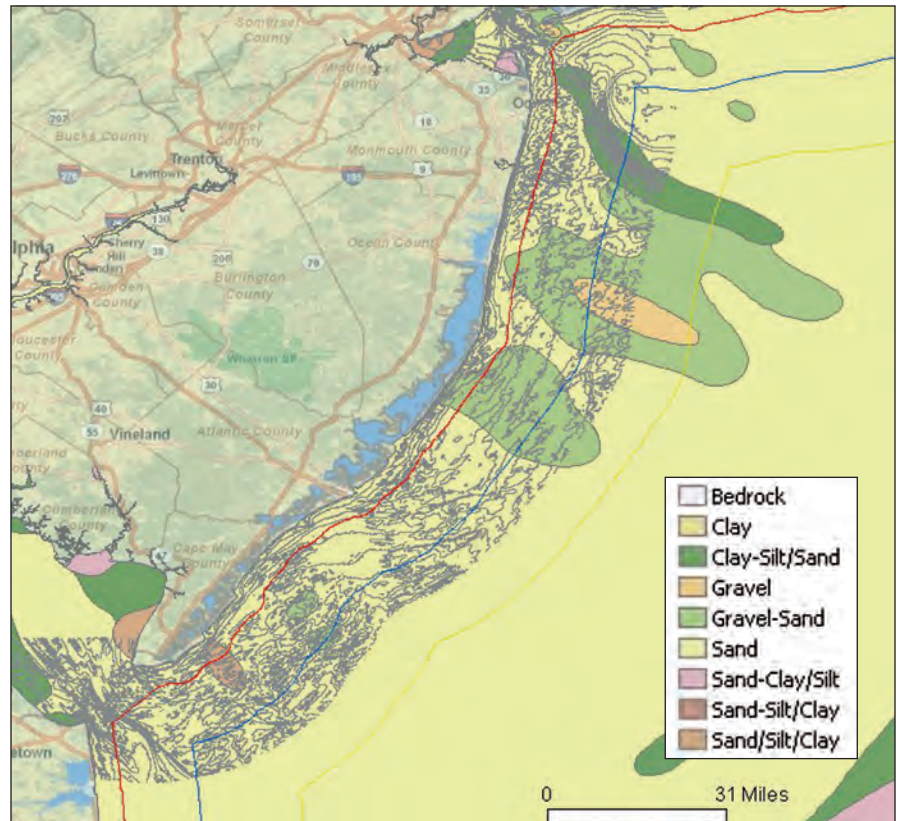
One question underpins all resource management at the local, State, Federal, and international levels: How do we balance competing and multiple uses, allow for responsible development of resources, and protect and enhance the environment?

As offshore renewable energy in the U.S. gets closer to becoming a reality, Federal and State agencies are identifying habitats and biological resources, other ongoing uses and users, and investigating potential impacts along with the best sites for renewable energy facilities. This information is foundational for ecosystem-based management discussions and for transparency. Several States are already focusing on coastal and marine spatial planning principles to enhance their stewardship of their coasts and waters.

The Commonwealth of Massachusetts is pioneering the effort to develop a comprehensive Ocean Management Plan. The Plan is being developed by the Executive Office of Energy and Environmental Affairs, in consultation with a 17-member ocean advisory commission and a science advisory council.

Mandated by the Commonwealth's Oceans Act of 2008, the Ocean Management Plan aims to manage development in Massachusetts waters, balancing natural resource preservation with traditional and new uses, such as renewable energy. A draft was released for review in June 2009 and public hearings were held in September.

New Jersey has an aggressive mandate to include renewable energy sources in the State's energy portfolio. By 2021, each supplier/provider that serves retail customers in the State must include, in



U.S. Marine Cadastre view of the New Jersey coast, showing bathymetry contours (dark grey) and Atlantic seafloor sediments.

the electricity it sells, 22.5 percent renewable energy.

The Office of Science at the New Jersey Department of Environmental Protection is conducting an environmental baseline study to shed light on potential effects of wind farm development in their coastal waters. The Office of Science is working closely with the Minerals Management Service, other Federal agencies involved in regulating offshore wind farms, and other agencies.

The study area—about 1,300 square nautical miles—includes areas potentially viable for energy development. To answer questions about which species use what areas and to what degree, the \$7 million study is documenting the number and locations of birds, marine

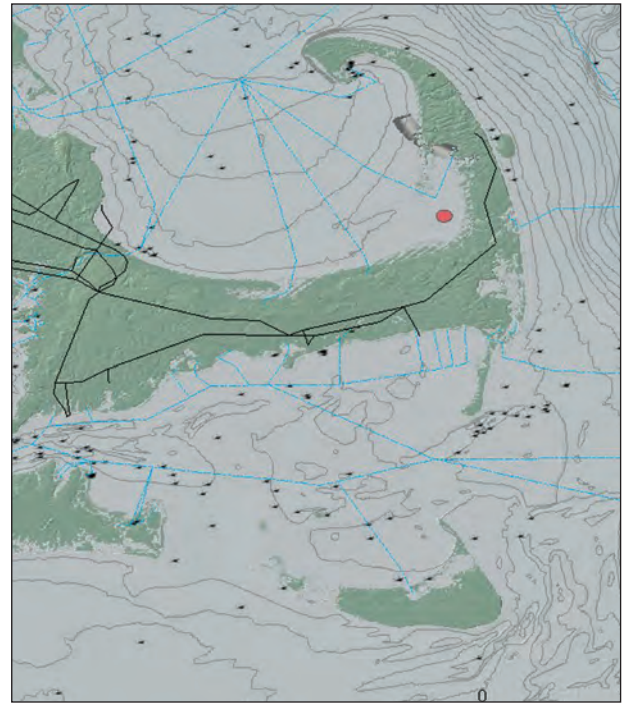
mammals, and sea turtles in New Jersey's waters.

Rhode Island is working on an Ocean Special Area Management Plan (SAMP) to define "use zones" for its waters. The project, begun in 2008, uses a research and planning process that integrates public involvement and the best available science. Led by the State's coastal management agency, the Rhode Island Coastal Resources Management Council, the project has technical support from scientists and experts at the University of Rhode Island and Rhode Island Sea Grant Program.

The "use zones" are intended to protect and enhance current uses, including habitat and commercial and recreational uses, while providing for future uses. The SAMP is expected to



Detail of Massachusetts coast from: *The New England coasting pilot from Sandy Point of New York, unto Cape Canso in Nova Scotia and part of Island Breton*.... Cyprian Southack; London, 1734. Courtesy of the Library of Congress, Geography and Map Division.



MMC view of a section of Massachusetts' coast, showing shipping lanes (bright blue lines), transmission lines (black lines), military danger zones (red), bathymetry contours (grey lines), and shipwrecks and obstructions (small black figures).

be released in August 2010.

Among the SAMP team's accomplishments are the following: mapping commercial and recreational fishing areas, with fishermen; mapping marine transportation paths of freight and passenger vessels; characterizing wave and storm surge; and identifying the distribution and relative abundance of marine mammals and sea turtles. Regarding the latter, researchers have developed detailed analyses showing the seasonal occurrences of more than 30 species of marine mammals and 4 species of sea turtles.

Though site-specific assessments will be necessary before any facilities are permitted, comprehensive data about the current uses and potential effects of future uses are crucial to responsible ecosystem-based management.

"Each state knows what they are faced with, particularly the environmental, social, and economic issues. Each state should customize their data-gathering information to get at those specific issues The key messages are understanding what the marine environment is like and the implications of having offshore energy facilities, and partnering with federal agencies that will eventually be authorizing them." Maureen Bornholdt, Program Manager, MMS Office of Renewable Energy Programs

FOR MORE INFORMATION

Massachusetts Ocean Management Plan

www.mass.gov/?pageID=eoeatopic&L=3&L0=Home&L1=Ocean+%26+Coastal+Management&L2=Massachusetts+Ocean+Plan&sid=Eoea

Ocean/Wind Power Ecological Baseline Studies, New Jersey Department of Environmental Protection, Office of Science

www.nj.gov/dep/dsr/ocean-wind/index.htm

Rhode Island Ocean Special Area Management Plan

<http://seagrant.gso.uri.edu/oceansamp/>

MMS'S ENVIRONMENTAL STUDIES PROGRAM: SCIENCE THAT NEVER SLEEPS

Because the myriad interactions of the natural and human worlds are dynamic, we never stop learning about them. The more we learn, the better and more balanced our decisions can be. Renewable energy development in the U.S. is relatively new. It calls for a management approach that takes into account uncertainties and it relies on the best available science.

Three recently awarded Minerals Management Service (MMS)-funded studies show MMS's commitment to acquiring new information and developing more efficient marine spatial planning tools to ensure a more comprehensive view of our Nation's marine resources.

The Atlantic and Pacific Outer Continental Shelf (OCS) areas have high potential for offshore renewable energy development. Also used for fishing, shipping, recreational boating, sand and gravel extraction, and military uses, these areas have high potential for space-use conflicts, as well.

A new study, "Outer Continental Shelf Alternative Energy and Space-Use Conflicts and Related Mitigation," will identify potential space-use conflicts among renewable energy development and other marine activities on the Pacific and Atlantic OCS. Social scientists will carry out field research in coastal communities and meet with citizens, local fishermen, shipping operators, and other interested parties to help identify potential areas and causes of space-use conflicts and to discuss possible mitigation. The study data will populate a geospatial database and mapping system, a tool that will help MMS make better, balanced decisions about

siting and monitoring of renewable energy development.

Given the Atlantic OCS Region's potential for renewable energy activity and the possibility of new oil and gas activity, MMS is developing more comprehensive information about the ecology of the Atlantic region. A recently funded study will result in a searchable EcoSpatial Information Database (ESID). The ESID will reference ecological information sources, describe their geographic coverage, and include spatially referenced data from those sources. The geographic information system (GIS)-based database will also include biologic data about benthic habitats, commercially important species, migratory pathways, and spatial and temporal distribution and habitat use. The GIS-based database will also include data about topography, sediment, salinity, temperatures, and currents. An important new marine spatial planning tool, the ESID will support our ecosystem-based management approach to MMS-permitted activities.

To protect and properly manage historic shipwrecks and prehistoric sites, MMS requires energy companies to carry out remote-sensing surveys before they conduct any bottom-disturbing activities, and then submit an analysis of the gathered data. Targets identified as potential archaeological resources must then be avoided or investigated. This mitigation strategy, which complies with pertinent laws, has led to the discovery and protection of many sites and resources, such as the *U-166*, a German U-boat. However, its effectiveness has been only minimally tested.

In an ongoing study in the Gulf of Mexico OCS Region,



A view of the ocean from Great Head, Acadia National Park, Maine. Photo courtesy of the U.S. National Park Service.

MMS archaeologists will evaluate the strategy's effectiveness by determining if the sites identified by remote sensing do, in fact, have archaeological significance. The study, "Archaeological Analysis of Submerged Sites on the Gulf of Mexico Continental Shelf," will groundtruth, positively identify, and assess the potential National Register significance of probable shipwreck sites in the Gulf of Mexico.

Since 1973, MMS's Environmental Studies Program has sponsored, funded, and managed over 2,000 research projects in the OCS. What we learn helps to guide our adaptive and ecosystem-based approach to management, as we broker responsible access to offshore resources.

FOR MORE INFORMATION

MMS Environmental Studies
www.mms.gov/eppd/sciences/esp/index.htm

Archaeological Analysis of Submerged Sites on the Gulf of Mexico Outer Continental Shelf

www.gomr.mms.gov/homepg/regulate/environ/ongoing_studies/gm/GM-09-04.html

Ongoing Renewable Energy Studies, MMS

www.mms.gov/offshore/RenewableEnergy/Studies.htm

PARTNERSHIPS HELPING THE FLOWER GARDEN BANKS GROW

The Flower Garden Banks off the coasts of Texas and Louisiana demonstrate the beneficial results of collaborative ecosystem-based management.

Their health is evidence that lease stipulations can provide effective mitigation of impacts from offshore energy operations and that long-term monitoring can provide for adaptive management.

In 1973, as oil and gas companies began exploring the deeper waters of the Gulf of Mexico, the Minerals Management Service (MMS), then the Bureau of Land Management, began extensive studies of the Banks and sponsored opportunities for public input. These studies led to protection of the reef communities, thanks to individuals, industry, universities, State and Federal agencies, and conservation groups.

One management tool MMS used was the lease stipulation: specific protective measures—requirements added to the lease—that reflected the initial uncertainty about impacts of production near the Banks. The lease stipulation set a no-activity zone and a four-mile shunt zone around the reefs. The lease stipulation also required lessees to monitor environmental conditions at production sites and at the Banks themselves, in accordance with MMS guidelines.

As we learned more about the Banks, it became clear that the protective measures were effective. The initial requirements were modified in an adaptive manner, as appropriate.

For example, years of monitoring by MMS and the lessees indicated that shunting was working and that no damage was being done to the Banks or the adjacent biota.

However, damage was being caused by vessels anchoring on the



A single colony of staghorn coral (*Acropora palmata*) known at the East Flower Garden Bank. Photo courtesy of Flower Garden Banks National Marine Sanctuary.

reefs, rather than by oil and gas exploration activities.

The Gulf Reef Environmental Action Team conceived of, and the MMS participated in, a solution: mooring buoys were installed at the Banks so that vessels can tie up easily and not drop anchor.

Partnerships and long-term monitoring led to the protection of the Banks and their designation in 1992 as a National Marine Sanctuary, while still allowing tourism and oil and gas exploration nearby.

Lease stipulations continue to be modified as necessary (adaptive management) and Notices to

Lessees and Operators are issued based on new information from ongoing studies and monitoring.

Thanks to the cooperation of diverse stakeholders, the Banks continue to provide habitat for a variety of marine species, a destination for recreational divers, and important information about reef ecosystems for researchers and resource managers. With the National Oceanic and Atmospheric Administration (NOAA), MMS continues to monitor this precious ecosystem, and the NOAA sanctuary manager is involved in all proposed oil- and gas-related activities near the Banks.

FOR MORE INFORMATION:

Environmental Studies Program Results at the East and West Flower Garden Banks

www.gomr.mms.gov/homepg/regulate/environ/flow_gar/flowgard.html

OFFSHORE OIL AND GAS LEASING

The Minerals Management Service (MMS) manages approximately 1.7 billion acres on the Outer Continental Shelf (OCS) with approximately 43 million acres under lease (over 8,000 active leases) and accounting for about 15 percent of the U.S. domestic natural gas production and about 27 percent of domestic oil production. The MMS has cradle-to-grave oversight responsibility for oil and gas leasing activities on the OCS.

As would be expected, such a process must rely on effective collaboration and coordination with State and Federal agencies, industry, and others, as well as the most up-to-date environmental and socioeconomic information available.

When one considers the continuous stakeholder involvement and geospatial nature of the information on which decisions are based—a process that incorporates coastal and marine spatial planning concepts as well as those of adaptive and ecosystem-based management—collaboration becomes much more than a goal. It becomes essential to the process.

Results of the most current research, surveys, and monitoring are included at several stages of the leasing process, as well as in the development of lease stipulations and Notices to Lessees and Operators (NTL's). Being able to respond quickly to new scientific information is a key part of MMS's adaptive approach to resource management.

First, a 5-year oil and gas leasing program is prepared and submitted to the Secretary of the Interior for review and approval. The program includes a schedule of proposed lease sales and shows, as precisely as possible, the location, size, and timing of leasing activity.

Developing a 5-Year Program follows a statutorily mandated process that includes three separate comment periods, two separate draft proposals, a final proposal, and the development of an environmental impact statement. The process typically takes 2½ years. After the Secretary approves the Proposed Final Program, it goes to Congress. The new 5-Year Program will take effect 60 days after it is submitted to Congress.

No specific lease sale can be held unless it is included in an approved 5-Year Program. Whether MMS holds a lease sale depends on a sale-specific analysis. Like the 5-year process, the lease sale process includes opportunities for public input, analysis, and documentation required under the National Environmental Policy Act (NEPA), and Coastal Zone Management Act (CZMA) certification. Geospatial information permeates and is a critical component of the process.

Lease stipulations are further requirements/guidelines that may be added to a lease in response to concerns raised by coastal States, Federal agencies, and other stakeholders. Examples include required biological



Purple finger sponge in a field of yellow pencil coral (*Madracis mirabilis*) at the East Flower Garden Bank.

surveys of sensitive seafloor habitats, archaeological resource surveys and reports to determine the potential for historic or prehistoric resources, special operating procedures near military bases or their zones of activity, and other restrictions. Lease stipulations are legally binding, contractual provisions designed as mitigating measures to address specific concerns.

Lessees must also comply with rules and regulations that may be issued *after* the lease is awarded. These typically provide for natural resource conservation, safety, and waste prevention. The MMS issues NTL's to quickly notify operators about changes in practices or procedures for complying with rules, regulations, and lease stipulations and/or to clarify requirements to convey information.

Before exploratory drilling can begin, an Exploration Plan (EP) and its supporting information must be submitted to MMS for approval. Each EP must contain a certification of consistency with approved Coastal Zone Management (CZM) programs of States that could be affected by the exploration activities. For each well, a lessee must have an approved Application for Permit to Drill that includes lease-specific conditions to address matters specific to conditions in the area.

Day-to-day operations include performance-based and prescriptive requirements to ensure safety, conserve natural resources, and protect the environment. If the lease owner fails to comply, the leases may be forfeited or canceled.

If oil and/or natural gas are discovered, a Development and Production Plan (DPP) or Development Operations Coordination Document (DOCD) must be submitted for MMS approval. The DPP or DOCD includes the number and locations of wells, their structure type, and how the oil and natural gas will be

transported to shore. The DPP/DOCD must also have CZM certification.

At all post-activity stages, MMS conducts NEPA reviews and analyses and complies with other laws and regulations that apply to offshore operations. These reviews lead to decisions about how, when, and where activities can be conducted.

Part of MMS's success is its presence at offshore facilities. The MMS monitors compliance with regulations throughout the permitting process and during operations. But nothing compares to MMS personnel in the field ensuring that operators are complying with the regulations. In fact, on average, MMS has carried out between 20,000 and 25,000 annual inspections.

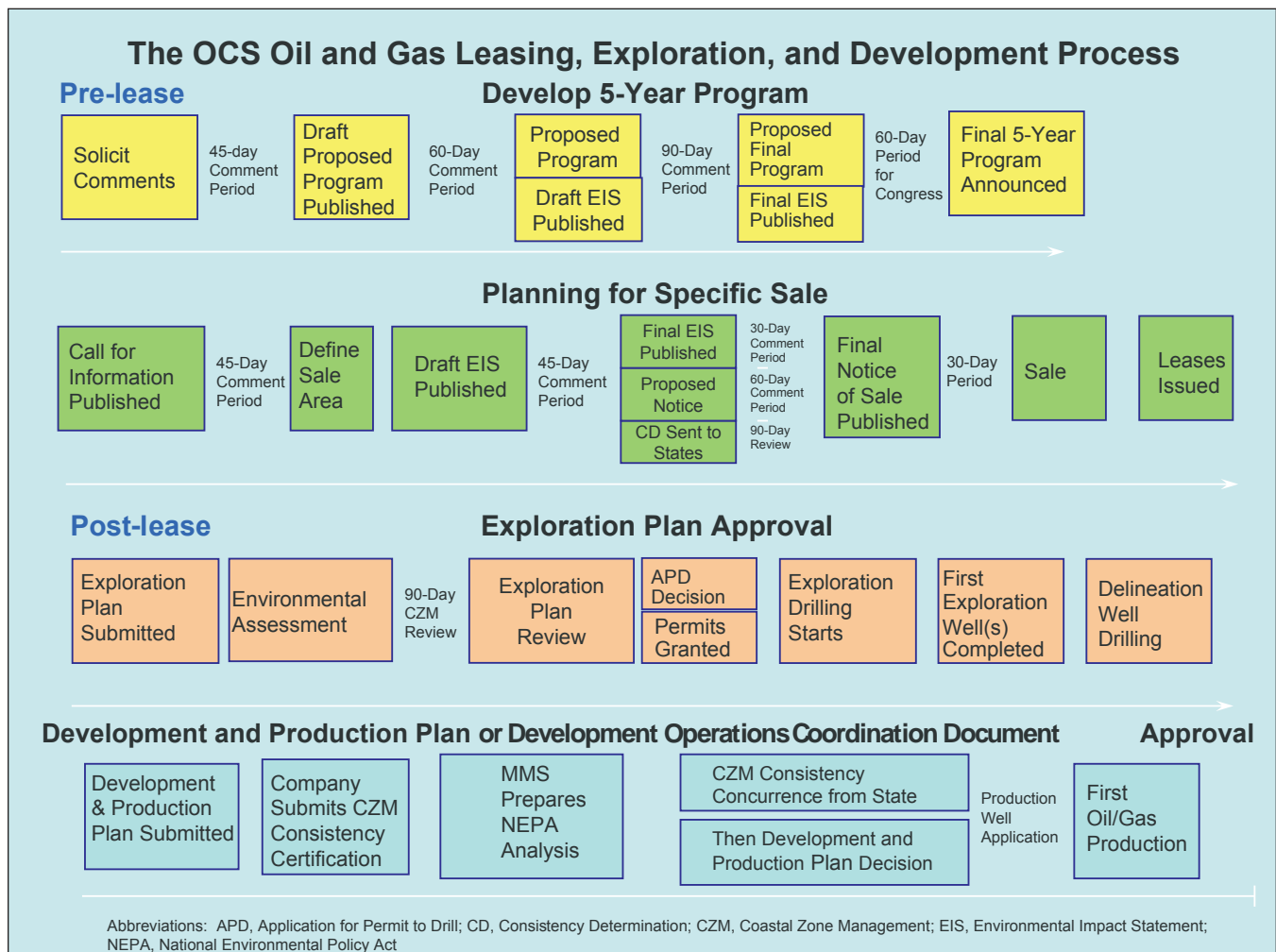
FOR MORE INFORMATION

“Oil and Gas Leasing on the Outer Continental Shelf,” MMS

www.mms.gov/OffshoreOilGasLeasingProcess.htm

Leasing and operation activities on the OCS are subject to some 30 Federal laws administered by Federal departments and agencies. Some of these are as follows:

1. Clean Air Act
2. Clean Water Act
3. Coastal Zone Management Act
4. Endangered Species Act
5. Federal Water Pollution Control Act
6. Marine Mammal Protection Act
7. National Environmental Policy Act
8. National Historic Preservation Act
9. Outer Continental Shelf Lands Act
10. Ports and Water Safety Act



Managing the exploration and development of energy resources on the Outer Continental Shelf (OCS) while protecting the environment is a challenge that the Minerals Management Service (MMS) meets on a daily basis. Cutting-edge tools and technologies are giving researchers and scientists more timely information than ever before.

By facilitating collaboration and an unprecedented sharing of data and information, new technologies vastly expand the potential for adaptive management and mitigation.

Advanced tools and technologies—combined with long-term studies—also help us understand the effects of climate change on our marine environment.

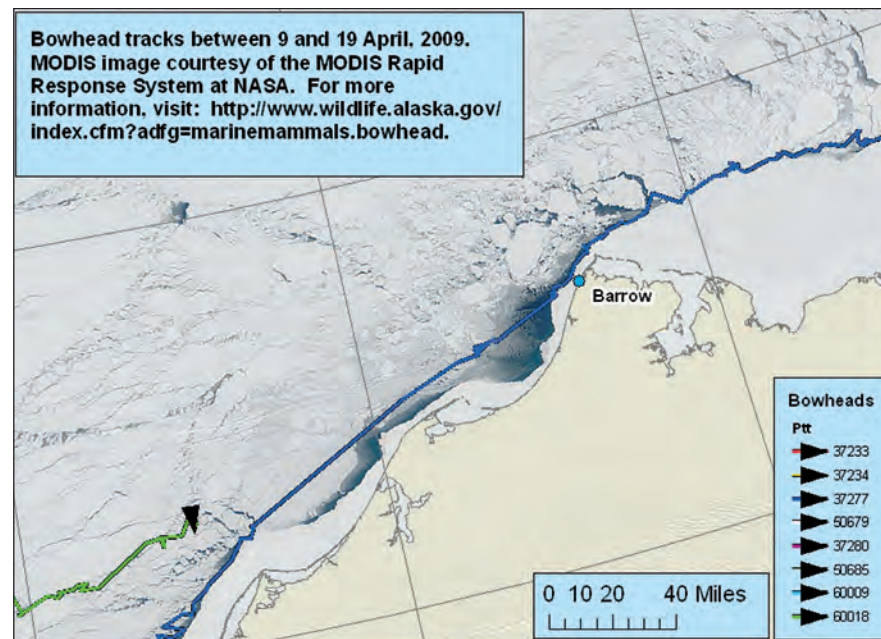
Tools, then and now. In the 1980's, research on marine mammals and birds and their environments followed a lengthy, often circuitous course. Months, and sometimes years, passed between gathering data in the field and releasing reports.

Now, climate change, environmental conditions, and animal populations are changing so rapidly that we literally see the differences from year to year.

Technology and research tools are keeping pace. Sophisticated satellite technology, computers and software, mass storage, and miniaturized instruments make near-real-time monitoring one of the most exciting advances in resource management.

Information can be quickly—sometimes instantly—shared with researchers, resource managers, and the public.

Satellite transmitters now routinely report marine mammal locations and behaviors. Instruments carried by marine mammals record oceanographic conditions. These tools can also record sounds, like marine mammal



A tagged bowhead whale moves along the edge of “fast ice” (unbroken solid ice, in solid grey) on one side and, on the other side, ice through which it can surface for air. Photo courtesy of Alaska Department of Fish & Game.

vocalizations and noise from ships and other anthropogenic activities.

Moorings provide invaluable information about animals and climate change. Some record measurements of ocean conditions continuously for longer than a year. Passive acoustic listening moorings use hydrophones and high-storage capacity to record vocalizations and ambient noise continuously for a year. Others broadcast, via satellite, summaries of whale calls and are linked with websites that can be monitored in near-real-time.

In the field, research and monitoring data can be input and instantly converted into useful formats, such as summaries and tables. Adding additional data downloaded from a global positioning network (GPN), researchers display animals' movements with current data about ice coverage, water depth, and other environmental characteristics.

Equally important, as soon as reports are written, papers published, and data gathered, they can

be shared electronically and globally.

See for yourself! Several MMS-funded projects in the Alaska OCS Region use new technologies, partnerships, and data sharing, enhancing our stewardship.

Bearded seals (*Erignathus barbatus*), a key component of Arctic marine ecosystems, are an important subsistence resource to the Native peoples of coastal northern and western Alaska. But little is known about their abundance, foraging ecology, seasonal movements, and haul-out behavior. To remedy this, MMS is funding a multiyear project, carried out by the National Oceanic and Atmospheric Administration's (NOAA) National Marine Mammal Laboratory (NMML), to capture and tag adult bearded seals in the Bering and Chukchi Seas.

Tagging began in Kotzebue Sound in June 2009. Mounted on the seal's head with epoxy, one tag gives data about timing and depth of the seal's dives. Attached to the seal's rear flipper, a different

kind of tag relays information for up to 3 years about haul-out timing and seasonal movements.

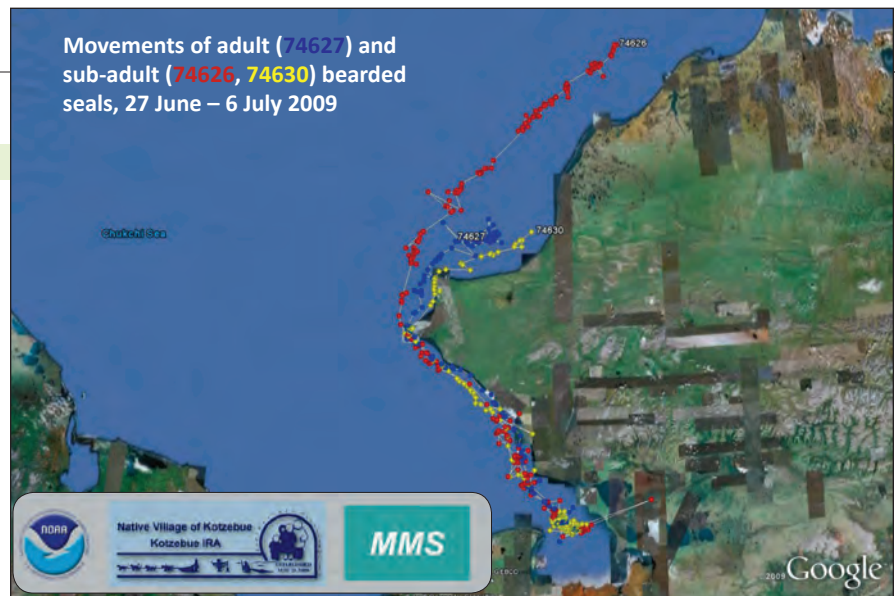
The adult bearded seal study is a collaboration among the Native Village of Kotzebue, Alaska Department of Fish & Game, University of Alaska Fairbanks, and the NMML.

Since 1979, MMS has studied the fall migration of bowhead whales (*Balaena mysticetus*) through the Beaufort Sea. The Bowhead Whale Aerial Survey Project (BWASP), funded by MMS and managed by NMML (since 2007), continues to gather data vital to helping us understand not only several marine mammal species but also the effects of climate change.

The BWASP flight summary reports include information about bowheads, belugas, walrus, bears, bearded seals, and other animals. Tracking maps are sent in emails and are viewed on the Internet. Combined with GPN and geographic information system data, such as sea state, maps can be instantly generated and shared.

An MMS-funded University of Alberta study of polar bears (*Ursus maritimus*) in the Canadian Beaufort Sea area provides data about the population structure of polar bears in North America and how they use land, nearshore, and OCS habitats at various life stages. A website will soon be online where users can see monthly movements of tracked polar bears.

Interactive websites are also an efficient way of sharing information. Methods, data, findings, and resulting publications are often available on the Internet. While this research has been conducted to facilitate the responsible development of offshore marine resources, it is available for use by researchers and students, who can download study data and other information for analyses.



Paths of three tagged adult bearded seals. As the seasonal ice was rapidly disappearing, all three seals moved north along the coast to points between Cape Lisburne and Point Franklin. Image courtesy of Peter Boveng, NMML.



Core team members capture and tag bearded seals in Kotzebue Sound, Alaska, June 2009. Left to right: John Jansen (NMML), Virgil Naylor (Alaska Native hunter), Shawn Dahle (NMML), and Jeff Barger (Alaska Native hunter). Photo courtesy of Michael Cameron, NMML.

FOR MORE INFORMATION

Bearded Seal Study, Native Village of Kotzebue

http://kotzebueira.org/current_projects3.html

Bowhead Whale Aerial Survey, National Marine Mammal Laboratory

www.afsc.noaa.gov/NMML/cetacean/bwasp/flights_BWASP.php

Satellite Tracking of Western Arctic Bowhead Whales, Alaska Department of Fish & Game

www.wildlife.alaska.gov/index.cfm?adfg=marinemammals.bowhead

MMS Alaska OCS Region Environmental Studies

www.mms.gov/alaska/ess

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MMS: A steward of the ocean environment

NEW WAVES

Late-Breaking News & Information

MMS Collaborates with Atlantic States' Renewable Energy Task Forces

In April 2009, President Obama announced that the Minerals Management Service (MMS) had finalized the framework for renewable energy development on the Outer Continental Shelf (OCS). This framework establishes the process for granting leases, easements, and rights-of-way for offshore renewable energy development activities, such as the siting and construction of wind generation facilities on the OCS. It also provides for MMS to use task forces in carrying out its responsibilities for authorizing OCS renewable energy activities in partnership with State, local, and tribal governments, and Federal agencies.

At the invitation of State governors, MMS establishes intergovernmental task forces to consult with States, local, and tribal governments and Federal agencies about renewable energy leasing and development on the OCS.

Interagency task forces for several Atlantic States have begun holding or have scheduled meetings, and others States are gearing up.

Delaware's first task force meeting was held on October 29, 2009. Rhode Island held its first meeting on November 17. The Commonwealth of Massachusetts' task force held its first meeting on

November 19. New Jersey's first meeting was held on November 24. Virginia's task force held its first meeting on December 8, 2009. Maryland's meeting is tentatively set for February 2010.

Maine is considering asking MMS to form a task force. North Carolina held their meeting on December 15, 2009, to discuss the purpose and composition of a task force.

The MMS is working with Maryland, New York, North Carolina, and South Carolina to form task forces.

Interior Secretary Salazar talks about the potential of alternative energy development on Atlantic Outer Continental Shelf. To the right is Delaware Senator Tom Carper. Photo courtesy of Tami Heilemann, Department of the Interior.

