


Marine Conservation Workshop



Deepwater Coral and Chemosynthetic Communities: Application of Research Results to the Development of Protective Measures in the U.S. Gulf of Mexico



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Minerals Management Service (MMS) Mission

To manage the mineral resources on the OCS in an environmentally sound & safe manner and to timely collect, verify, and distribute mineral revenues from Federal and Indian lands.

MMS Responsibilities

- **Administration of**
 - 1.76 billion acres
 - 8,100 leases
 - 4,000 production facilities
- **OCS Production**
 - 23% of U.S. natural gas
 - 30% of U.S. crude oil



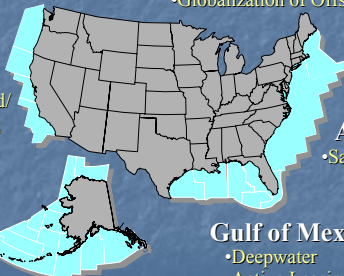
Environmental Laws Affecting the Offshore Oil & Gas Program

- National Environmental Policy Act** → Includes environmental analysis & protection in project planning
- Federal Water Pollution Control Act (Clean Water Act)** → Regulates discharges from oil & gas activities into marine waters
- Clean Air Act** → Regulates air emissions from industrial activities
- Coastal Zone Management Act** → Assures compliance with state coastal area protection plans
- Endangered Species Act** → Protects threatened & endangered species
- Marine Mammal Protection Act** → Protects marine mammals
- Fishery Conservation and Management Act** → Protects essential fish habitat
- National Historic Preservation Act** → Protects archaeological resources, including those on the ocean floor

MMS Activities

National

- Safety/Environment Performance
- Globalization of Offshore Industry



Pacific

- Developed/Producing Leases

Atlantic

- Sand and Gravel

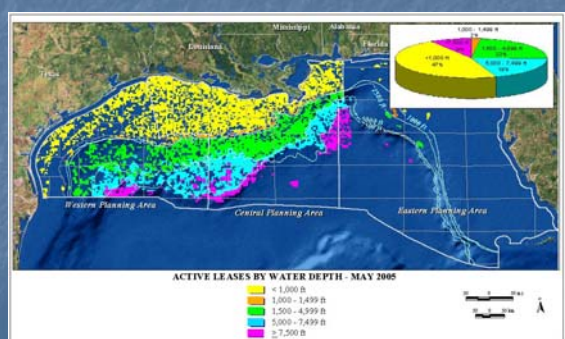
Alaska

- Liberty
- Northstar
- Beaufort Sea & Cook Inlet Leasing

Gulf of Mexico

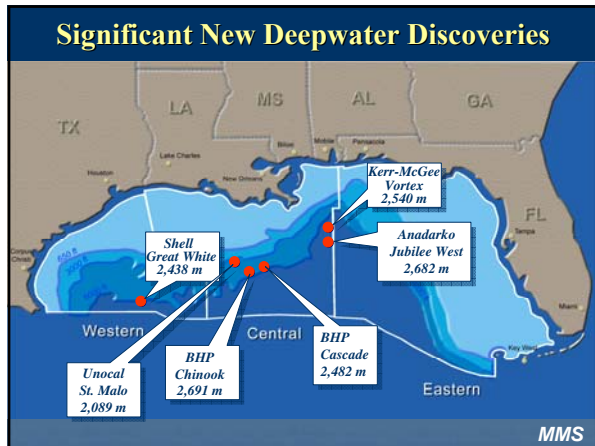
- Deepwater
- Active Leasing
- Sand and Gravel

Active Leases



ACTIVE LEASES BY WATER DEPTH - MAY 2005

- < 1,000 ft
- 1,000 - 1,499 ft
- 1,500 - 4,999 ft
- 5,000 - 7,499 ft
- ≥ 7,500 ft



Lophelia Project

Characterization of Northern Gulf of Mexico deepwater hard bottom communities with emphasis on *Lophelia*, a deepwater coral

Lophelia Project

Objectives:

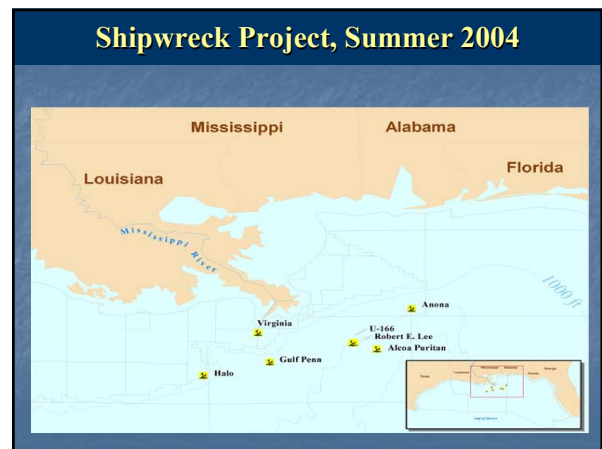
- Select sampling sites representing known and probable areas of exposed hard bottom at depths >300 m
- Characterize types of non-chemosynthetic megafaunal communities living on hard substrates
- Describe environmental conditions that result in observed distribution and development of high density communities associated with extensive *Lophelia* growth

Lophelia Project Schedule

- Johnson Sea Link manned submersible missions in 2004 & 2005
- Coordination with US Geological Survey for trophic, microbial, and genetic studies of *Lophelia*
- Sample and data analysis – 2006
- Final Report – Completed late 2006

Shipwreck Project, Summer 2004

Archaeological and biological analysis of World War II shipwrecks in the Gulf of Mexico: a pilot study of the artificial reef effect in deepwater



Chemosynthetic Communities of the Upper Continental Slope – Research Results

- Chemosynthetic fauna associated with Gulf of Mexico hydrocarbon seeps are similar to those of hydrothermal vents.



Research Results (Continued)



- Currents at relevant depths can disperse larvae across the entire upper continental slope.
- Upper depth limit for Gulf of Mexico chemosynthetic communities is between 400 and 500 meters.

Research Results (Continued)

- Remote sensing surveys can narrow and refine search patterns.
- Larval recruitment from external locations could recolonize community sites.



Research Results (Continued)

- Gas hydrates are more important to seep community ecology than anticipated.



The Iceworm (*Hesiocaeca methanicola*)




Research Results (Continued)

- In contrast to rapid tube growth at hydrothermal vents, cold seep tubeworms grow very slowly.
- It is estimated that worms 2 meters in length are from 170-250 years old.




Research Results (Continued)

- Significant production of an oil field does not appear to affect the health of chemosynthetic communities




Investigation of Chemosynthetic Communities on the Lower Continental Slope of the Gulf of Mexico

- Major study co-funded by MMS and NOAA through the National Oceanographic Partnership Program (NOPP)
- Objectives:
 - Characterize known or newly discovered chemosynthetic and *other hard bottom* communities at depths below 1,000 m in the Gulf of Mexico
 - Determine the degree of sensitivity to anthropogenic impacts
 - Use a variety of approaches and methodologies
 - Determine similarities and differences with shallower communities





Investigation of Chemosynthetic Communities on the Lower Continental Slope of the Gulf of Mexico

- Develop or improve remote methodologies for detecting the presence of these communities
- Develop predictive capabilities for MMS use in establishing mechanisms for avoidance of impacts




Case Study — Protection of Deepwater Benthic Communities

- Short-notice policy actions - implemented by Notice to Lessees (NTL's)
- Guidelines to oil and gas industry – special lease stipulation or regional requirement
- Backed by Code of Federal Regulations
 - Title 40 Protection of the Environment
 - Title 30 Mineral Resources
- MMS recognized chemosynthetic communities in the GOM as significant biological communities requiring protection from oil and gas impacting activities

Case Study — Protection of Deepwater Benthic Communities

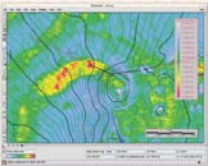
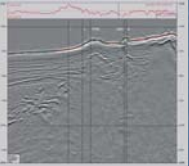
- Initial Notice to Lessees **NTL 88-G11** required only simple avoidance
- MMS-funded studies determined sensitivity and habitat value leading to modification of NTL
- Current **NTL 2000-G20** *Deepwater Chemosynthetic Communities* now includes avoidance distances



Ongoing Environmental Protection

Biological Review Process

- All plans and pipeline applications in water depths 400 m and deeper
- Use operator's hazard survey and environmental report
- 3-d seismic usually provided, but also have access to entire Gulf slope 3D seabed seismic amplitude data in-house

(Brighter colors representing higher reflectivity, carbonate or hydrate)

Ongoing Environmental Protection

ROV Survey NTL 2003-G03

- Gulf slope divided into 18 grid areas by depth and longitude
- Each grid requiring number of ROV surveys (5-10) from operating drilling units demonstrating no unexpected sensitive biological communities
- As of January 2005, 66 ROV surveys received, four grids adequately covered



Thank You

