



MMS Securing Ocean Energy & Economic Value for America

Minerals Management Service

www.mms.gov

MMS

Bringing Ocean Science into the Classroom



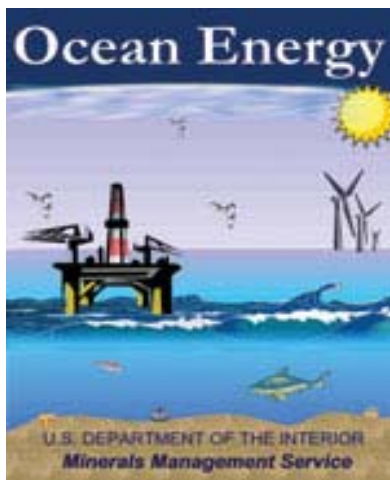
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Fall 2006

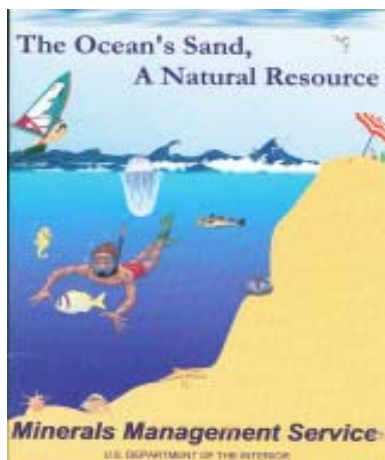
The Minerals Management Service (MMS), part of the U.S. Department of the Interior, oversees 1.76 billion acres of the Outer Continental Shelf (OCS), managing offshore energy and minerals while protecting the human, marine, and coastal environments through advanced science and technology research. The OCS provides 30 percent of oil and 23 percent of natural gas produced domestically, as well as sand used for coastal restoration. Furthermore, MMS collects, accounts for, and disburses mineral revenues from Federal and American Indian lands, with fiscal year 2004 disbursements totaling about \$8 billion, and more than \$143 billion since 1982. The Land and Water Conservation Fund, which pays for acquisition of state and federal park and recreation land, is the recipient of nearly \$1 billion a year.

Educational Materials

The Minerals Management Service (MMS) announces the availability of posters, teacher's companions, classroom activities, and lesson plans. These instructional materials are free and can be obtained through the MMS Homepage at www.mms.gov/mmskids/, or by contacting the regional offices. Ordering information is also listed on page 11.

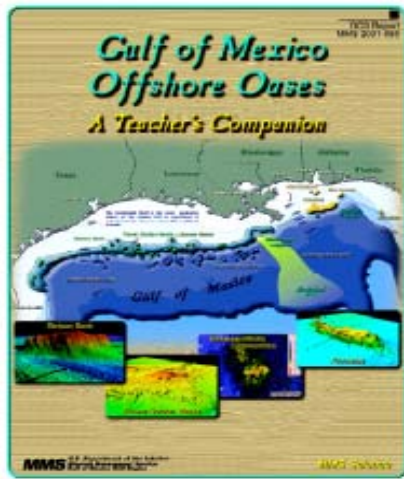


Ocean Energy is a 20-page teacher's guide to the many energy resources in, over, and under the ocean. Teachers can use the background information, presentations, and hands-on activities to study both renewable and nonrenewable ocean energy resources. Topics discussed in this guide include petroleum and natural gas, oil and gas seeps, methane hydrates, solar energy, wind energy, wave energy, and ocean thermal energy conversion. These topics also relate to National Science Standards at the intermediate level.

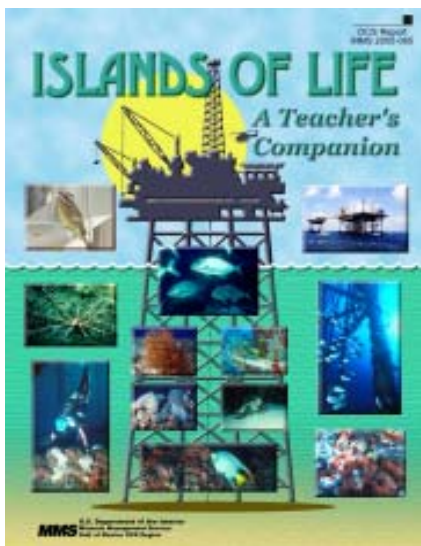


The Ocean's Sand, a National Resource introduces students (grades 4-12) to the importance of offshore sand and gravel deposits to coastal communities. The lesson plan contains background information on beaches, the causes and effects of erosion, beach nourishment activities, and environmental challenges. Hands-on activities that illustrate the geological processes and characteristics of various beach environments are also included.

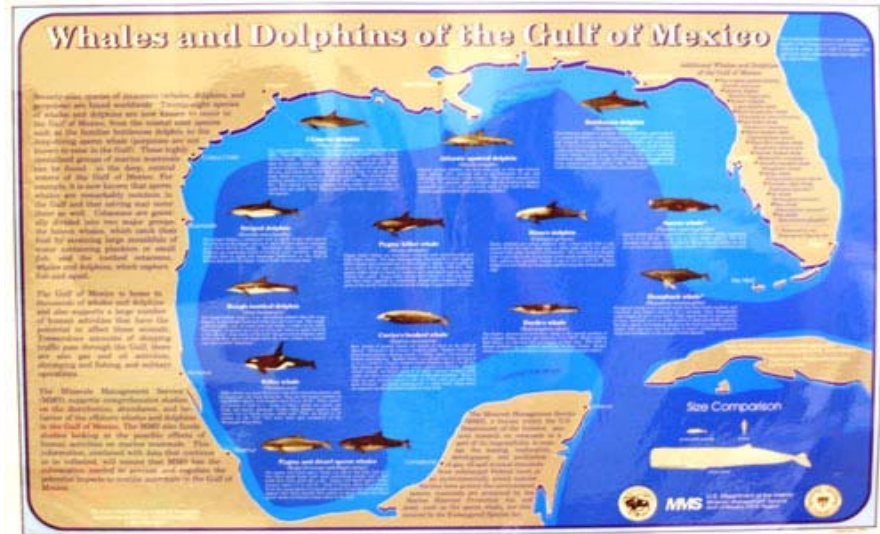
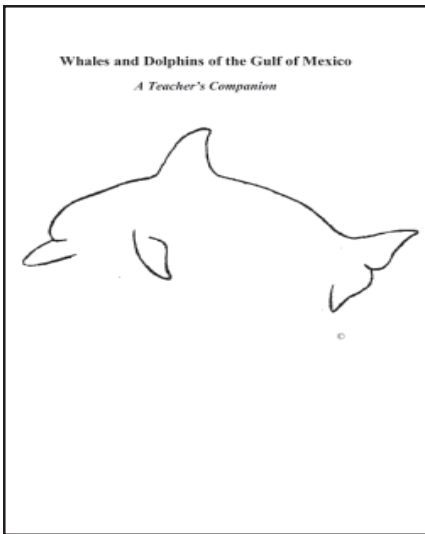
4 Gulf of Mexico OCS Region



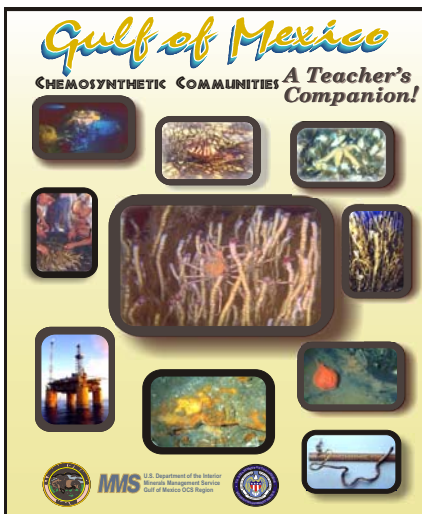
Gulf of Mexico Offshore Oases teacher's companion guides teachers and students through an astonishing, colorful display and explanation of three specific topographic features and associated marine life, and offers information and activities developed for grades 6-12. The companion contains an extensive glossary of terms, word puzzles, taxonomic drills, and other suggested activities. The poster highlights several various seafloor habitats in the Gulf and their geologic origins, as well as the abundant marine animals associated with these extraordinary ecosystems.



Islands of Life is a 23-page teacher's companion, part of a biological science curriculum, that explains the function of offshore platforms and the families of living things that call them home, and also suggests classroom projects. The poster depicts many of the forms of animal marine life on and around the thousands of oil and gas platforms in the Gulf of Mexico. It also demonstrates that marine life and Federal offshore production not only coexist, but that the manmade offshore structures provide an artificial reef system that fosters and intensifies marine life in areas where it might not otherwise proliferate.

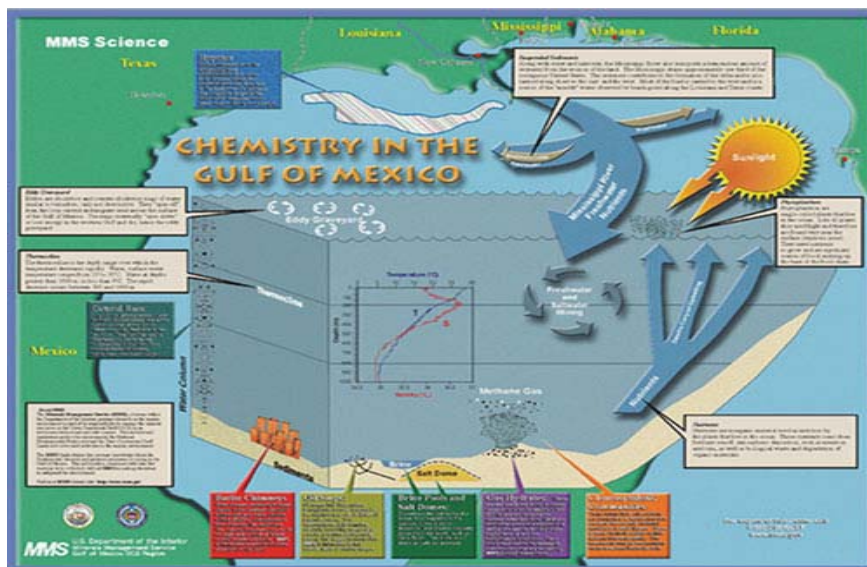
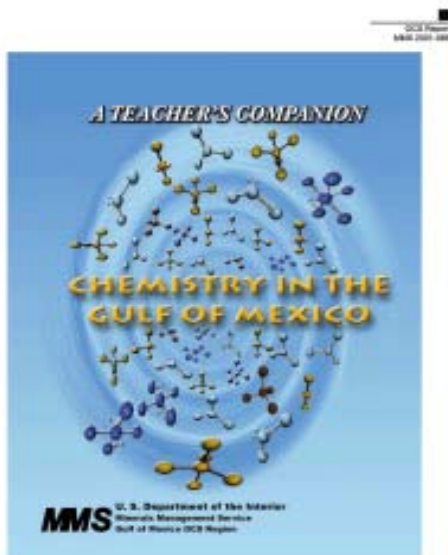


Whales and Dolphins of the Gulf of Mexico teacher's companion provides basic biological information on the marine mammal species that occur in the Gulf, describes governmental protection of these animals, and suggests activities for the classroom. The poster is for teachers who want to introduce their students of any age to some of the Gulf's most fascinating inhabitants - cetaceans. Many people are surprised to learn that 28 of the 79 species of whales and dolphins occurring worldwide are found in the Gulf of Mexico. This poster illustrates and describes many of the whales and dolphins found in the Gulf of Mexico. While many people are familiar with the common bottlenose dolphin, people are amazed to discover that killer whales and sperm whales also call the Gulf home.

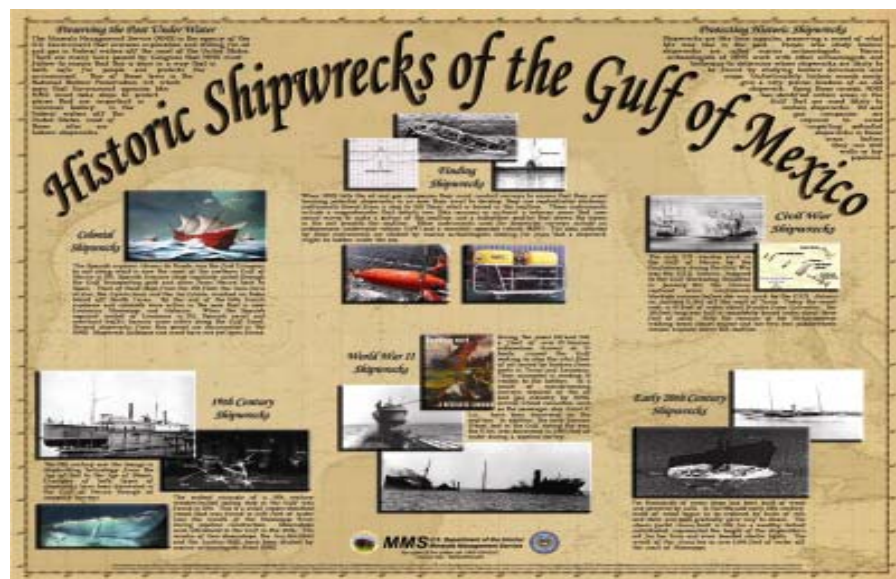
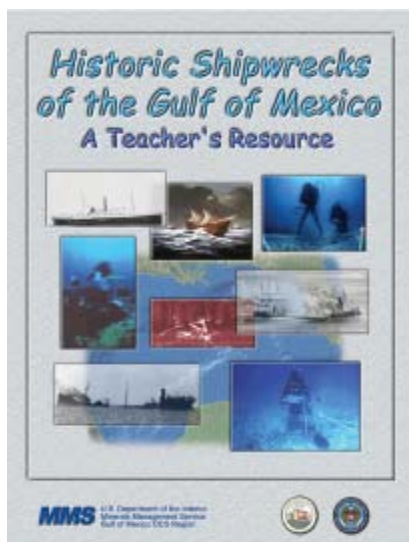


Chemosynthetic Communities in the Gulf of Mexico is a teacher's companion that introduces the concept of chemosynthetics to students at the middle and high school levels, contains a glossary of terms, examples of different types of chemosynthetic communities as well as a crossword puzzle. The poster brings students to the floor of the Gulf to discover remarkable deep-sea animals that literally live on dissolved gases. These recently discovered chemosynthetic communities consist of tube worms and mussels that live in areas of natural oil and gas seepage. Within these organisms live symbiotic bacteria that convert methane and hydrogen sulfide into food. In this way, the tube worms and mussels provide a home for the bacteria, while the bacteria provide the animals with an energy supply.

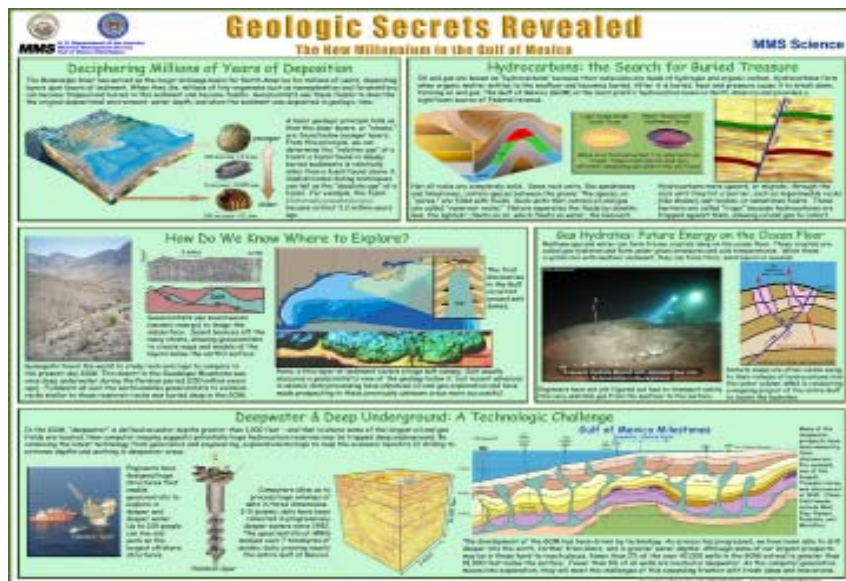
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Chemistry in the Gulf of Mexico is a teacher's companion designed to complement a basic chemistry class, grades 10-12. It encourages the student to understand the natural chemical processes that are occurring in the Gulf. These include precipitation of barite chimneys, dissolution of salt to form brine pools, and migration of oil and gas that form seeps and support life.



Historic Shipwrecks of the Gulf of Mexico is a poster and teacher's resource that feature some of the fascinating historic shipwrecks that have been identified in the Gulf of Mexico through oil and gas industry-related surveys, including the sidewheel steamship *Josephine*, found off the coast of Mississippi in 1997. The *Josephine* booklet and the historic shipwreck poster can be used to promote classroom discussions about commerce, maritime transportation, technology, historic preservation of marine cultural resources, scientific investigative techniques, and environmental issues.



Geologic Secrets Revealed: The New Millennium in the Gulf of Mexico, focuses on the search for energy resources, including oil, natural gas, and gas hydrates, on and deep below the seafloor of the Gulf of Mexico. This poster will help grades 11-12 learn how drilling data, geophysical (seismic) data, and information gained through the study of tiny microfossils and nannofossils enable scientists to identify and explore for potential hydrocarbon traps many thousands of feet below the seafloor. Highlighted also are advancements in technology that increase the ability to explore for oil and gas in offshore areas that were previously inaccessible, both in terms of water depth and drilling depths below the seafloor.

Additional Information

For easy display, all posters are single sided and measure about 24 by 30 inches. The companions are in a three-hole punched, loose-leaf format for easy reproduction and filing.

Visit our Kid's Page for additional information that will further your knowledge about the Gulf of Mexico Region, science careers, and resources on general topics related to the Minerals Management Service activities. Listed below are some samples of what you will find on our Kid's Page:

Careers and Opportunities

Careers in Science features ten scientists from the MMS Gulf of Mexico Region who talk about their chosen profession and share their experiences.

Classroom Activities

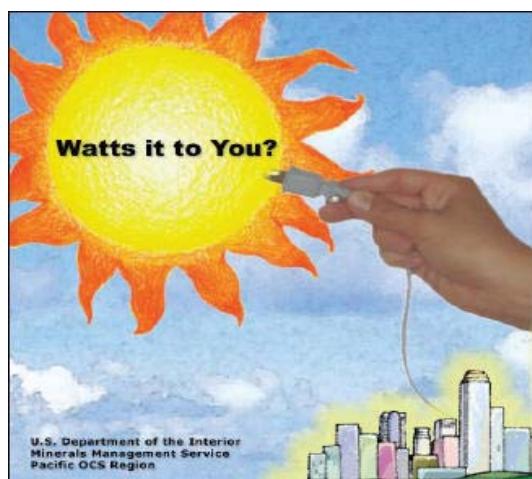
Drilling for Oil Game (PDF formatted file, 6.63 Mb) has easy to follow instructions that show how to construct and conduct a classroom activity that allows students to drill for oil. This activity can be adopted for use at any age level, and in conjunction with lessons on geology, geography, the environmental sciences, and math. It can also be used as a fun activity for younger children.

Activity Sheets (PDF formatted file) is a collection of two-page classroom activity sheets for elementary students that may be reproduced for distribution. These include:

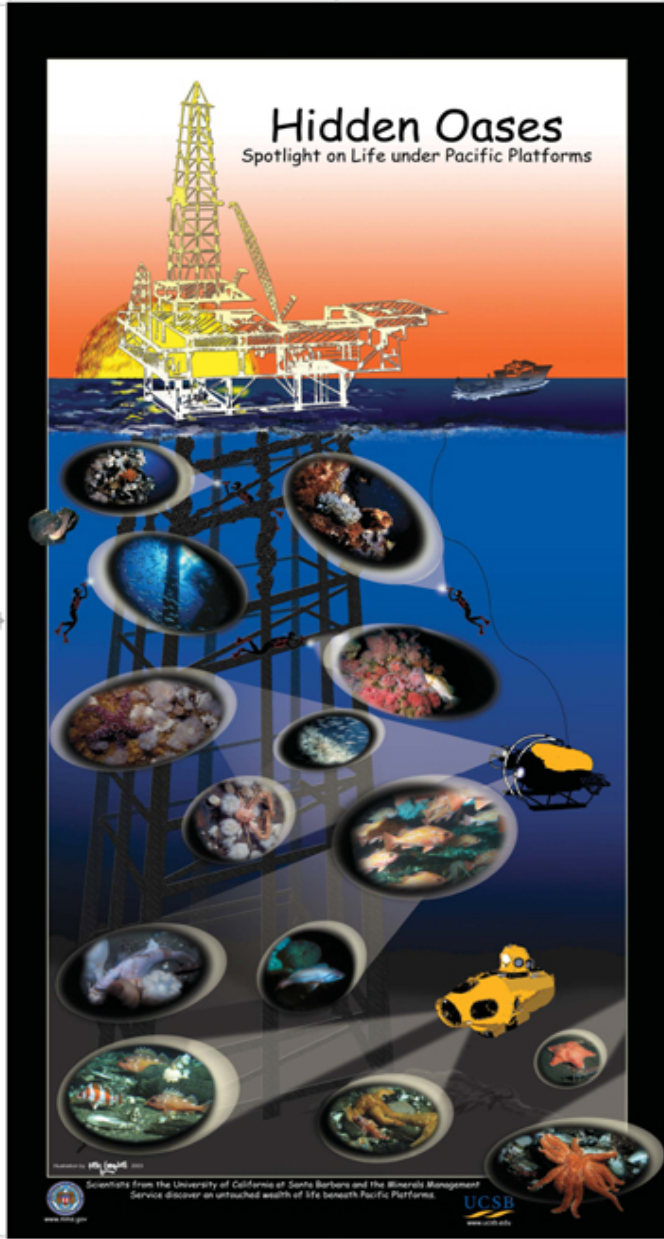
- Ballast & Stability Lab Experiment
- What is Crude Oil Word Puzzle
- Offshore Oil & Gas Platform Maze
- Rigs as Reefs Coloring Sheet



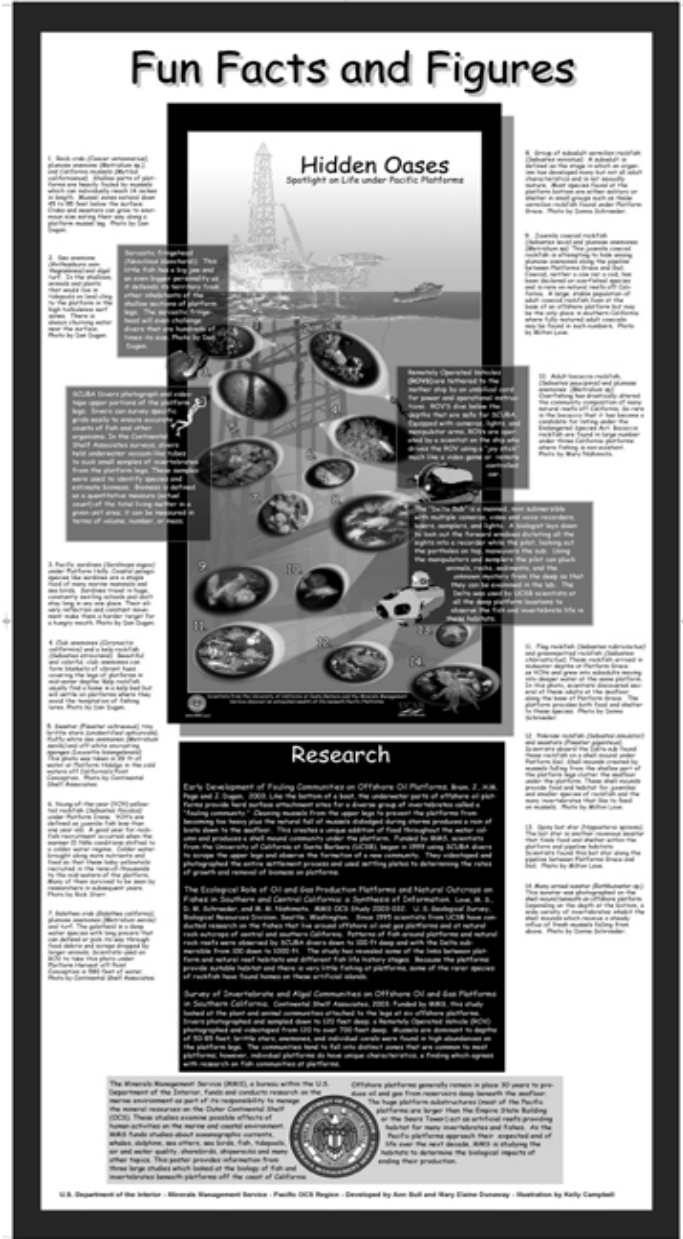
How Many Does It Take?, lists for kids various types of energy sources produced from nuclear plants, hydroelectric dams, offshore gas production, onshore gas wells, wave turbines, wave plants, and solar panels, and how much of these many energy resources it takes to power a city of 100,000 people or to fuel cars for 100,000 people for a year.



Watts it to You?, a curriculum roleplay for high school students that teaches them to explore energy self-sufficiency through inquiry, cooperative problem-solving and negotiation skills. Students assume the role of an energy stakeholder and work together to develop a county energy plan to increase the amount of electricity produced locally.



Front of Poster

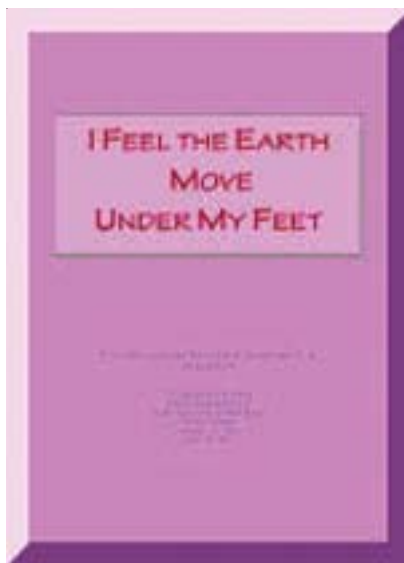


Back of Poster

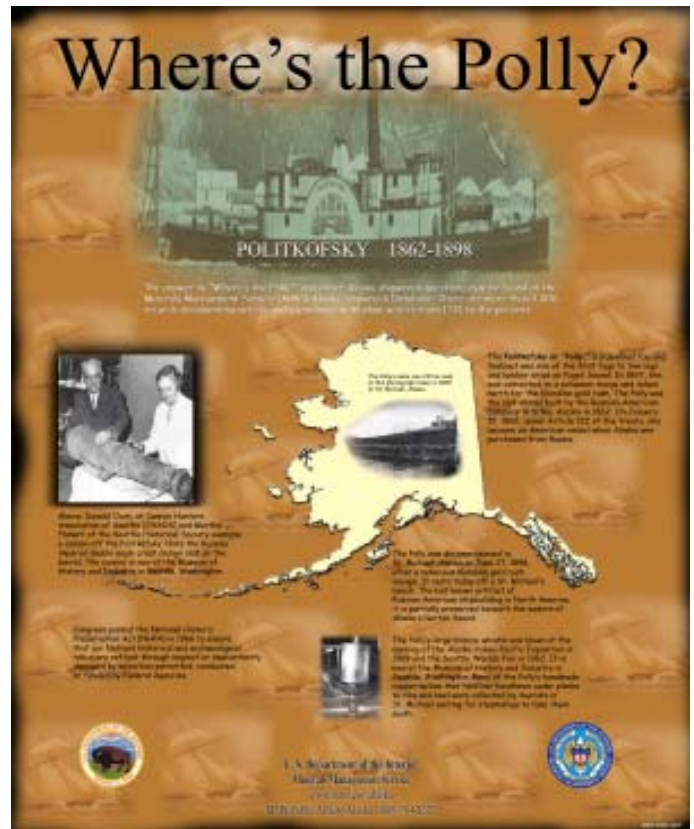
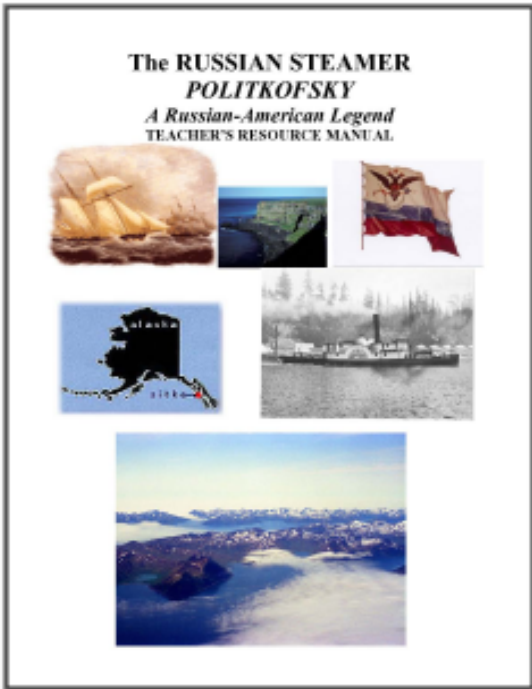
Hidden Oases discovers diverse habitats found beneath oil and gas platforms off the coast of California. This two-sided educational poster is a colorful summation of three ongoing research projects on Pacific platforms conducted by the MMS and the University of California, Santa Barbara. Students will learn how biologists study marine life on and around these large manmade structures in the Pacific Ocean. The poster includes background on each research project and identifies the tools used by biologists to conduct their research.



Tidepool Math, an award-winning math-based curriculum, investigates environmental change in California’s rocky shoreline habitat. Students can see photos of fixed intertidal photoplots to learn mathematic and scientific principles, while at the same time learn to appreciate rocky intertidal habitats, their fragility, and the need to protect and conserve this resource. The K-8 curriculum introduces students to scientific applications of counting and estimating. The high school curriculum introduces students to simple statistical concepts. Curricula, colorful flashcards and intertidal photos are available on one CD. **Also available in Spanish.**



I Feel the Earth Move Under My Feet: Activities Illustrating Why and How Earthquakes Occur is for teachers who want to introduce their students (grades 3-6) to the geologic processes that cause earthquakes. This lesson contains background on plate tectonics, earthquakes in southern California, and resource and earthquake preparedness guides are also included.



Where's the Polly?, describes the sidewheel tug and towboat, *Politkofsky*, which embodies many of the major themes in Alaska and U.S. history. As the Polly steamed up the bays and waterways of Alaska, she witnessed many historic changes, including Alaska's transfer from Russia to the United States, early fur-trading, and the Klondike Gold Rush. She steamed the icy Gulf of Alaska and carried weary workers throughout the Puget Sound before coming to rest on the seabed in St Michael Bay. The poster and accompanying teacher's guide provide a vehicle to study the history of the last great frontier—Alaska.

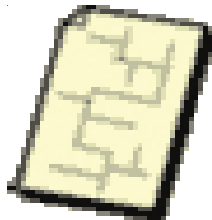
Kids Corner - Activity Pages



Match Alaskan Animals
With Their Name



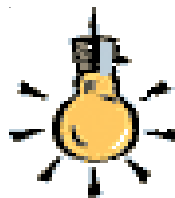
Geology Coloring Lessons



Alaska Crossword Puzzle



Which Creature Doesn't
Belong in Alaska?



Find It - A Puzzle About Petroleum

Just for Kids is an activity book aimed at students in grades 1-4. It contains a crossword puzzle about Alaska, a "Name the Animals of Alaska" quiz, "Find It," a search for everyday items made from petroleum, a geology lesson, and the quiz, "Which Creature Doesn't Belong in Alaska?"

MMS: Sharing Ocean Science with America's Educators

The Minerals Management Service is committed to working with America's educators to improve access to real world ocean science and increasing interest in and understanding of our marine and coastal environments. As the Department's offshore minerals resource manager, MMS is working to:

- Promote an understanding of the role MMS plays in identifying, recovering, and regulating America's offshore energy and other mineral resources.
- Make available to teachers the wealth of geologic, engineering, environmental, and economic data acquired by the MMS in order to safely obtain and manage these ocean resources.
- Promote an understanding of how America's offshore public lands play a role in meeting the Nation's energy needs and how it may play a role in meeting these needs in the future.
- Provide career role models and support in the areas of science and math.

The MMS work in science education includes curriculum development, student internships, classroom presentations, teacher workshops, educational events, collaborative partnerships, and field trips for students and educators. We encourage you to visit our website and explore our educational materials at www.mms.gov/mmskids/

Ordering Information

Headquarters (HDQRS)

Office of Public Affairs
Minerals Management Service
381 Elden Street, MS 4001
Herndon, VA 20170
(703) 787-1011
FAX (703) 787-1938
mms.gov/mmskids
For additional information or outreach opportunities,
contact Ms. Nicolette Nye at nicolette.nye@mms.gov

Alaska Region (AK)

Information Resource Center
Minerals Management Service
3801 Centerpoint Drive, Suite 500
Anchorage, AK 99503-5823
(907) 334-5206 or 1-800-764-2627
FAX (907) 334-5202
akwebmaster@mms.gov
For additional information or outreach opportunities,
contact Ms. Robin Cacy at robin.cacy@mms.gov

Gulf of Mexico Region (GOM)

Public Information Office
Minerals Management Service
1201 Elmwood Park Blvd, MS 5034
New Orleans, LA 70123-2394
(504) 736-2519 or 1-800-200-GULF
FAX (504) 736-2620
gomr.mms.gov/homepg/lagniapp/lagniapp.html
For additional information or outreach opportunities,
contact Ms. Caryl Fagot at caryl.fagot@mms.gov

Pacific Region (PAC)

Public Information Office
Minerals Management Service
770 Paseo Camarillo
Camarillo, CA 93010-6064
(805) 389-7612 or 1-800-672-2627
FAX (805) 389-7689
mms.gov/omm/pacific/kids/teachers.htm
For additional information or outreach opportunities,
contact Mr. John D. Romero at john.romero@mms.gov

Note: Because of limited quantities, bulk orders cannot be accepted.



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