

http://www.state.gov/www/global/oes/oceans/980610_los.html

The Ocean Drilling Program (ODP) provides researchers around the world with access to a repository of geological and environmental information recorded far below the ocean surface in sea-floor sediment and rocks. Studying ODP data can give a better understanding of Earth's past, present, and future.

www.oceandrilling.org/ODP.ODP.html

The U.S. National Oceanic and Atmospheric Administration's general page about ocean sciences is clear and informative.

www.websites.noaa.gov/guide/sciences/ocean/ocean.html

A number of conservation organizations are dedicated to change through education. Check out their numerous resources and suggestions for getting involved with ocean conservation groups in your area.

The Center for Marine Conservation:

www.cmc-ocean.org/

The Ocean Project:

www.theoceanproject.org/

Seaweb: www.seaweb.org/

Other Resources: _____

For Kids:

This site has information on the International Year of the Ocean.

www.yoto98.noaa.gov/kids.htm

This site gives fun ways to explore the ocean.

www.fi.edu/fellows/fellow8/dec98/treas.html

Printed Resources: _____

Danger at Sea: Our Changing Ocean, by Seaweb, with a forward by Sylvia Earle, Seaweb, 1999.

Deep Challenge: Our Quest for Energy Beneath the Sea, by Clyde W. Burleson, Gulf / Publishing Company, 1998.

Ship of Gold in the DeepBlue Sea, by Gary Kinder, Vintage Books, 1999.

20,000 Jobs Under the Sea: A History of Diving and Underwater Engineering, by Torrance R. Parker and Wilham B. Lee, Sub-Sea Archives, November 1997.

UNIVERSE BENEATH THE SEA

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UNIVERSE BENEATH THE SEA

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The largest remaining frontier for exploration rests on Earth, miles under water. But visiting the ocean depths is as challenging as navigating the distant reaches of space. Darkness, depth, pressure, and the destructive power of corrosive seawater pose life-threatening hazards that can be addressed only by the most sophisticated technologies. Deep submergence systems developed during the Cold War have offered some solutions to these problems and are now providing unprecedented access to the universe below. In the last ten years, scientists and explorers have learned more than ever before about this world of stranger-than-fiction life-forms and untapped resources. Precious minerals and potential cures for cancer are just a few of the many riches hidden in the Universe Beneath the Sea.



After years of effort, the development of new technology finally promises to open up the deep ocean to commercial exploitation. The sea holds vast oil reserves and valuable microscopic bacteria-rich deep-sea resources that are already being reaped today. In addition, the deep-sea floor holds what promises to be huge amounts of minerals and metals that remain to be mined. And with hopes for a cure for cancer lying on the ocean floor, it's not too fanciful to regard the seas as the next frontier, a veritable field of gold.

Terms: _____

ABE -- Autonomous Benthic Explorer, a deep-ocean robot designed to work for up to a year alone, conducting surveys and monitoring underwater structures and organisms.

black smoker -- Chimney-like deposits caused by seawater that percolates deep in the Earth's crust. Hot rocks or magma heat the water to 350°C (662°F); the hot water rises to the sea floor, carrying dissolved minerals that precipitate in the cold ocean water, forming black "smoke."

Discodermia -- A deep-water sponge that produces a number of chemical compounds including discodermalide, which has anti-tumor properties and is being evaluated as a cancer treatment.

manganese nodules -- Lumps, made of manganese and other elements, which form around rock formations on the sea floor.

ROV -- Remotely operated vehicle, remote-controlled robot-craft that are often used to retrieve objects from the ocean floor.

Fun Facts: _____

-If the ocean's total salt content were dried, it would cover the continents to a depth of 5 feet.

-If mined, all the gold suspended in the world's seawater would give each person on Earth 9 pounds.

-Because its structure and chemistry are very close to that of human bone, coral has been used to replace bone grafts, helping human bones to heal quickly and cleanly.

-Alginates, derived from the cell walls of

brown algae, are used in beer, frozen desserts, pickles, adhesives, boiler compounds, ceramics, explosives, paper, and toys.

The remains of diatoms, algae with hard shells, are used in making pet litter, cosmetics, pool filters, and tooth polish.

National Marine Sanctuaries and the Sustainable Seas Expeditions: _____

Many people are devoted to preserving precious ocean ecosystems and their valuable resources.

In 1972 the United States established the National Marine Sanctuary Program with this goal in mind. Since then, twelve national marine sanctuaries, representing a wide variety of ocean environments, have been designated.

-Marine biologist Dr. Sylvia Earle has chosen these sanctuaries as sites for the Sustainable Seas Expeditions, a project of the National Geographic Society, in partnership with the National Oceanic and Atmospheric Administration and funded by the Richard and Rhoda Goldman Fund. Sometimes called the Lewis and Clark expeditions of the oceans, this project plans to uncover and document undersea habitats and marine species previously seen only rarely or never at all. The project will focus on the twelve marine sanctuaries designated and protected by the U.S. government. Sprinkled through the Atlantic, Pacific, and Gulf of Mexico, the sites represent diverse ecosystems. Few have been studied below 100 feet.

-You can learn more about this endeavor by visiting one of the sanctuaries themselves or going to the official Sustainable Seas Expeditions home page at

www.sustainableseas.noaa.gov/

Things to Think About: _____

- In 1974 the United Nations drafted a sweeping treaty on the Law of the Sea, requiring future entrepreneurs to pay a percentage of their profits from deep-sea mining into a UN fund that would be distributed among the poorer nations.

Subsequent mining of the ocean depths decreased dramatically. In your opinion, who if anyone owns the resources of the sea? Do you think the Law of the Sea treaty was fair? Should entrepreneurial endeavors to mine deep-sea resources be encouraged?

- Americans make up only 4.5 percent of the world's population, but they use about one-third of the world's processed mineral resources and one-fourth of the world's nonrenewable energy sources, like oil and coal.

-Commercial marine fisheries in the United States discard up to 20 billion pounds of non-target fish each year--twice the catch of desired commercial and recreational fishing combined.

-Conservationists continually look for new ways to end these disturbing trends. For example, SOSUS, a U.S. Navy surveillance system originally designed to detect Soviet submarines, is now employed to help conserve the oceans. It is being used to enforce the UN ban on drift nets and track the movement of whales. Also being used are turtle excluder devices, now required on shrimp nets throughout the Gulf of Mexico, Caribbean, and western Atlantic. They reduce sea turtle kill by 97% while still allowing the capture of 98% of the shrimp that enter the nets.

-What are some other things people are doing or could do to conserve our oceans' precious resources?

Internet Resources: _____

The US Navy's Office of Naval Research hosts an informative site on hydrothermal vents.

<http://www.onr.navy.mil/focus/ocean/habitats/vents1.html>

The Sustainable Seas Expeditions project focuses on the twelve marine sanctuaries designated and protected by the U.S. government. It is hoped that scientific research here will help environmentalists and policy makers to protect this invaluable part of our global ecosystem.

www.sustainableseas.noaa.gov/aboutsse/aboutproject/aboutproject.html

The Convention on the Law of the Sea Oceans Conference, held in Monterey, California, in June 1998, discusses U.S. oceans policy.