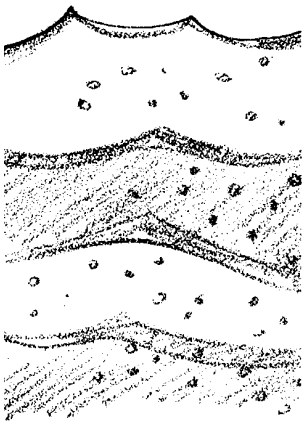
People and the Sea: Issues

Lesson by Susan Wertz, North Thurston School District, Lacey, Washington.

Key Concepts

1. Marine waters provide many valuable resources for humans.

2. Human use of the oceans threatens many marine habitats and organisms and endangers many of the very marine resources humans utilize.



Background

The oceans play important roles in global ecosystems by, among other things, shaping weather patterns, regulating atmospheric gases, recycling nutrients and harnessing solar energy. They also offer an abundance of resources for humans, including food, oil and gas, and minerals. Ocean waters are used for shipping and waste disposal. Shorelines, especially those along the sheltered and rich estuaries, provide sites for industry, housing, recreation and tourism. What effects do these human uses have on estuaries and the oceans as a whole?

We know that:

- Populations of some marine organisms are declining. For example, all United States salmon stocks outside of Alaska are decreasing. Populations of some marine mammals, such as Stellar Sea Lions, are declining despite protection from hunting.
- Many of the waste and contaminants produced by human activities end up in the ocean. Contaminants are waterborne in rivers, drainage pipes, or storm runoff and settle to the bottom as water movement slows. Humans also deposit some waste in deep water in the open ocean, but most pollution comes from land, shipping activities or from atmospheric pollution.

  According to World Resources 1990-1991, major contaminants of ocean water are, in order of importance:

  1) nutrients from urban sewage and rural runoff
  2) microbial contaminants from sewage
  3) plastics from land and sea disposal
  4) synthetic organic compounds such as pesticides and industrial chemicals
  5) oil from routine transport and spills.

- Plastic litter is found in all the world's oceans. Nonbiodegradable and buoyant plastic bottles, bags, sheeting, pellets, six-pack-container rings and balloons wash up on beaches and kill fish, turtles, birds and marine mammals that eat them or become tangled in them.
- Ocean fishing, a major source of food and jobs, is threatened by overfishing, loss of spawning and rearing areas of marine fish, and pollution.

Teaching Hints

"People and the Sea: Issues" uses issue teams to create posters, videos, handouts, or oral presentations to familiarize students with a variety of current important issues facing us as we utilize the resources of the world's oceans.

Procedure

1. Ask students why they think estuaries are important. Ask them why all the world's oceans are important. It might be useful to list their ideas on an overhead transparency or chalkboard.
2. Ask students if they have ever seen any evidence of water pollution or other problems that threaten oceans or bodies of water near where they live. They may draw on their own experience or on what they have seen in the media. List these problems on the board or transparency.
3. Ask each student to rank these pollution sources and other problems in order of seriousness. Allow the students to define what "seriousness" means. For example, some students may choose to guess which types of pollution occur in the greatest quantity. Others may interpret "seriousness" as the degree to which something is harmful either to humans or to all of marine life.
4. Now ask the students to work in teams (2-4 students per team works well) to create a new list with which all the students in the team agree. There may be some threats to oceans that your students do not think of. You may wish to add them to the class list of types of pollution and ask the groups to consider them as well when they are ranking issues.
5. Have teams share their lists with the whole class and explain their thinking. How did they define "seriousness"?
6. Ask the whole class to choose the top issues by consensus or vote. Each group will examine one issue, so ask the class to pick the number of top issues equal to the number of teams in the class.
7. Each team will now choose, draw or be assigned one ocean issue to research. They will look specifically for information explaining the magnitude and dangers of that type of pollution or problem. They must find new information the class has not yet discussed. We have included a brief description of selected, current issues and contacts to get you started. They

may use magazine articles accessed through the Reader's Guide or computer indexing system if your school has one. Newspapers, television reports and books make good sources as well.

8. Create a forum for groups to share their information. For example, groups may create posters, videos or one page hand-outs or share their information orally.
9. Bring this activity to a close by asking students to revisit their earlier rankings. Would they change their lists? There may be heated differences of opinion.

   By now your students may be depressed, angry or overwhelmed by this study of issues threatening marine environments. The next section engages students in doing something about marine issues.

Key Words

entanglement - incidental kill of marine life by becoming snared in nets (or net fragments) intended for another species

entrapment - in this case, the snaring of dolphins in tuna nets

issue - in this case, when two or more people (or groups of people) disagree about an environmental problem and /or its solution

law of the sea treaty - United Nations treaty defining the rights and obligations of countries regarding wide variety of ocean issues

offshore oil drilling - oil exploration and production on the continental shelf

Issue Action Team Topics

1. THE WHALING CONTROVERSY: The International Whaling Commission declared a moratorium on the commercial hunting of whales, yet a few countries continue to take whales. Why do these countries continue to whale? Are the hunted whales endangered? What has been the response from the U. S. Government to these countries?

   CONTACT: Embassy of Iceland, Embassy of Norway, International Whaling Commission, Greenpeace, Sea Shepherd Conservation Society, U.S. State Department.

2. TUNA-DOLPHIN ENTRAPMENT: For reasons that scientists do not fully understand, schools of yellowfin tuna in the Eastern Tropical Pacific Ocean commonly swim beneath schools of spinner dolphins. Tuna fishermen make use of this phenomenon by setting mile-long "purse seine" nets around the dolphins, in order to catch the tuna underneath. In so doing, tens of thousands of spinner dolphins are caught and drowned in tuna nets each year. The Marine Mammal Protection Act (MMPA) of 1972 calls for the reduction of marine mammal kills "to insignificant levels approaching zero mortality", yet the capture of dolphins continues by the U.S. and foreign commercial tuna fleets. How severely is the population of spinner dolphins impacted by the tuna industry? Are alternative fishing methods available? Are the alternatives more harmful to the ecosystem? Is our government enforcing the MMPA?

   CONTACT: Earth Island Institute, Greenpeace, Starkist Foods, Van Camp Seafood Company, National Marine Fisheries Service, House Subcommittee on Fisheries and Wildlife Conservation, Marine Mammal Commission.

3. DRIFT NET ENTANGLEMENT: The incidental kill of marine life in drift nets used by commercial fishing fleets has received increasing attention in recent years. Made of long lasting plastic monofilament, drift nets reach up to several miles in length and over a hundred feet in depth. Invisible to marine life, they may entangle and kill whales, dolphins, seals, turtles, sea birds, and several species of shark. Some marine biologists are concerned that the stocks of both commercial and non-commercial fish populations are being significantly reduced by this method of fishing. What is known about drift nets and their effects on marine life? What dangers are posed by lost or discarded fishing gear? How is the practice regulated by government? What is the position of the fishing industry?

   CONTACT: Center for Marine Conservation, Entanglement Network, Greenpeace, Sea Shepherd Conservation Society, National Marine Fisheries Service, Marine Mammal Commission.

Issue Action Team Topics

4. GLOBAL AND LOCAL MARINE POLLUTION: Marine pollutants can be divided into two categories. Point source pollutants originate from a single location, such as a sewage or industrial waste discharge pipe, storm drain, or smokestack. Non-point sources are dispersed. Examples include pesticide runoff, trash, and acid rain. All can take a toll on marine ecosystems, as evidenced by the toxic levels of trace metals found in beluga whales of the St. Lawrence Seaway, DDT found in brown pelicans, and plastic trash that entangles or is ingested by marine wildlife. Solutions to these problems are as varied as their sources. Choose a specific pollution problem of interest to you.

   CONTACT: Greenpeace, Environmental Protection Agency, Center for Marine Conservation, National Marine Pollution Program Office, National Ocean Industries Council.

5. WASTE DISPOSAL AT SEA: The Environmental Protection Agency is responsible for regulating the incineration and dumping of wastes at sea in U.S. waters. This issue has received renewed attention with the publicity surrounding barges of garbage illegally dumped at sea and the ocean incineration of toxic wastes. The U.S. recently signed MARPOL, an international treaty which regulates the disposal of wastes in international waters. What substances are currently dumped or burned at sea? What kinds of disposal do these laws allow and prohibit? What are the known effects of waste disposal at sea? What are the alternatives to ocean dumping?

   CONTACT: Environmental Protection Agency, Chemwaste, Greenpeace, Center for Marine Conservation, National Marine Pollution Program Office, The Oceanic Society, Sub Seabed Disposal Program.

6. RESEARCH AND EXPLORATION OF THE SEAS: Historically, science is driven by the demands of the times. For example, in the nineteenth century, sailors and marine scientists charted the winds and ocean currents to shorten the travel time for traders, a prominent use of the seas. In the twentieth century, the drive to utilize the ocean's resources has produced new underwater capabilities and scientific research has flourished. We have explored the ocean abyss with the deep-sea submersibles like ALVIN, returning with unknown specimens of marine life and new understandings of the deep sea. Oceanographers study long-term climatic patterns by comparing the chemistry of the sea today with that recorded in ancient coral reefs. Resources of the sea are being utilized in medicine. Corals contain compounds which may be of use in fighting cancer and other diseases. The chitin (pronounced kite-in) found in a pile of waste crab shells contain a compound that may be worth its weight in gold.

   CONTACT: Monterey Bay Aquarium Research Institute, Joint Oceanographic Institution, National Ocean Industries Association, NOM.

Issue Action Team Topics

7. LEGISLATIVE REPORT CARD: Confirm that Congress or your local state legislature is in session. Become informed about pending legislation relating specifically to marine issues. What are your representatives' views on these issues? Are they aware of them? Can you persuade them to act? To find out, write with a list of questions, asking them to state their positions on issues of importance to you. Be sure to include a return address. Write to candidates if there are election campaigns taking place in your area. New laws affecting marine policy originate in committees of Congress. Regulations to implement existing or new policies are usually written by the agency with jurisdiction. Other groups update lists of proposed laws that deal with the marine environment.

   CONTACT: The President, your congressional and senatorial representatives, House Sub-Committee on Fisheries and Wildlife Conservation, National Ocean Policy Study, National Marine Fisheries Service, Environmental Protection Agency, Secretary of Commerce, and other branches of government, the Oceanic Society, Center for Marine Conservation.

8. GLOBAL CLIMATE CHANGES: The atmosphere is linked to the ocean along its entire surface area, creating a dynamic system between the two. In coastal areas, much of the climate is determined precisely by seasonal ocean currents. Periodically, the El Nino phenomenon appears and wreaks havoc on normal weather patterns, flooding certain regions with record rainfall while leaving other regions scorched by sun and drought. On a global scale, scientists are studying the greenhouse effect to monitor and predict the effect of warmer weather and rising ocean levels. How do the oceans influence weather? How predictable is it? What evidence supports the idea of the greenhouse effect? What causes El Nino, and when is it expected to return? Choose a specific weather-related topic such as the green-house effect or El Nino to investigate.

   CONTACT: NOAA, Joint Oceanographic Institution, National Weather Service.

9. SCUBA AND EXPLORATION TECHNOLOGY: From SCUBA regulators and dive computers to deep- sea submersibles, the technology of underwater exploration is full of brilliant examples of inventiveness and applied physics. How does this equipment work, and what does it allow us to do? And, what is on the drawing boards for future explorations?

   CONTACT: Monterey Bay Aquarium Research Institute, NOM, National Ocean Industries Association, Joint Oceanographic Institution.

Issue Action Team Topics

10. OFFSHORE OIL DRILLING: From Massachusetts to California and Alaska, the debate over offshore oil exploration rages on. The controversy covers a range of issues, including concerns about national security, environmental degradation in the short and long-term, and whether more domestic oil production is even a desirable goal at this time. What are the different positions in this debate, and how may we reconcile them?

    CONTACT: Chevron Oil Inc., Exxon Corporation, Save Our Shores, Mineral Management Service, American Petroleum institute, National Ocean Industries Association, The Oceanic Society.

11. FOOD RESOURCE DEVELOPMENT: From fish farming to abalone aquaculture, people around the world are increasing their catch of seafood by giving nature a helping hand. What are the methods of mariculture? What types of seafood are utilized? What is the future of today's fisheries as increasing catches continue to reduce the global stocks of commercial fish?

    CONTACT: Worldwatch Institute, National Marine Fisheries Service, World Wildlife Fund, Entanglement Network, American Fisheries Society.

12. LAW OF THE SEA TREATY: In 1982, 117 nations signed the United Nations Law of the Sea Treaty. The treaty defines the rights and obligations of countries for a long list of ocean issues, including new territorial boundaries, exclusive economic zones, fisheries, ocean mining, pollution control, and scientific research. The United States did not sign. Parts of the treaty dealing with deep ocean mining issues were unacceptable to the Reagan Administration. As a result, where the U.S. stands in relation to the international community of signatories is uncertain. What are the major articles of the treaty? What were the U.S.'s objections? What is the current status of the treaty? What are the consequences of not signing? How can the U.S. support appropriate management of the seas?

    CONTACT: Marine Information Service (Law of the Sea Treaty pamphlet), U.S. Department of Commerce, Council on Ocean Law, Office of Oceans and Polar Affairs.

ISSUE-ACTION ADDRESSES

U.S. GOVERNMENT
The Honorable President, The White House, Washington, DC 20510

United States Senate, Washington, DC 20510 ,

US House of Representatives, Washington, DC 20515

House Subcommittee on Fisheries, Wildlife Conservation and the Environment, 544 House Annex 11, Washington, DC 20515 (for legislation concerning the marine environment)

National Ocean Policy Study, Senate Commerce Committee, 527 Hart Senate Office Building, Washington, DC 20510 (for legislation concerning the marine environment)

Department of Commerce Public Affairs Office, National Oceanic and Atmospheric Administration, 14th Street and Constitution Avenue NW, Washington, DC 20230 (for marine research and exploration)

National Marine Pollution Program Office, Rockwall Building, Room 610, 11400 Rockwall Pike, Rockville, MD 20852 National Weather Service, 8060 13th Street, Silver Spring, MD 20910

Ocean and Coastal Resource Management, National Ocean Service, 2001 Wisconsin Avenue NW, Washington, DC 20235

National Marine Fisheries Service, Universal Building, 1825 Connecticut Ave. NW, Washington, DC 20235 (for government position on tuna-dolphin issue and all fisheries matters)

Department of Energy, Sub Seabed Disposal Program, Geological Repositories Office, 1000 Independence Ave SW, Washington, DC 20585 Environmental Protection Agency

Office of Marine and Estuarine Protection, WH-556M, 401 M Street SW, Washington, DC 20460 (monitors and regulates water quality and ocean dumping)

Department of the Interior, Minerals Management Service, 18th and C Street NW, Washington, DC 20240 (for oversight of the offshore oil lease sale program)

Marine Mammal Commission, 1625 1 Street NW Suite 300, Washington, DC 20005

Department of State, James Baker 111, Secretary of State, 2201 C Street NW, Washington, DC 20520 (for certification of compliance with U.S. laws by foreign countries)

Office of Oceans and Polar Affairs, OES/OPA, Room 5801, 2201 C Street NW, Washington, DC 20520 (support for the Secretary of State)

NON-GOVERNMENTAL ORGANIZATIONS

American Fisheries Society, 5410 Grosvenor Lane, Bethesda, MD 20814 American Petroleum Institute, 2101 L Street NW, Washington, DC 20037 (oil industry)

Center for Marine Conservation, 1725 DeSales Street NW, Washington, DC 20036 (plastics, entanglement, legislation, and marine pollution)

Chevron Oil Corporation, 225 Bush Street, San Francisco, CA 94104

Council on Ocean Law, 1709 New York Ave. NW Suite 700, Washington, DC 20006 (law of the sea treaty, international cooperation)

Earth Island Institute, 300 Broadway, Suite 28, San Francisco, CA 94133 (tuna-dolphin and drift net entanglement)

Embassy of Iceland, 2022 Connecticut Ave. NW, Washington, DC 20008 (a whaling nation)

Embassy of Japan, 2520 Massachusetts Ave. NW, Washington, DC 20008 (a whaling nation)

Embassy of Norway, 2720 34th NW, Washington, DC 20008 (a whaling nation)

Entanglement Network, c/o Defenders of Wildlife, 124419th Street NW, Washington DC, 20036 (all plastic and net entanglement issues)

Exxon Corporation, 1251 Avenue of the Americas, New York, NY 10020-1198

Greenpeace USA, 1611 Connecticut Ave. NW, Washington, DC 20009

Joint Oceanographic Institution, 1755 Massachusetts Ave. NW Suite 800, Washington, DC 20036 (consortium of universities and oceanographic research facilities)

Marine Information Service, Sea Grant College Program, Texas A&M University, College Station, TX 77843 (law of the sea treaty pamphlet)

Monterey Bay Aquarium Research Institute, 886 Cannery Row, Monterey, CA 93940 (deep sea research facility with unmanned remote-operated vehicle)

National Ocean Industries Association, 1050 17th Street NW, Washington, DC 20036 (oil and gas industry association)

The Oceanic Society, 153616th Street NW, Washington, DC 20036 (ocean dumping, legislation and policy)

Pacific Whale Foundation, P.O. Box 1038, Kihei Azeka Pl., Suite 303, Maui, Hl 96753 (works to prevent extinction of all marine mammals)

Save Our Shores, PO Box 1560, Santa Cruz, CA 95061 (opposes offshore oil drilling)

Sea Shepherd Conservation Society, P.O. Box 7000 S, Redondo Beach, CA 90277 (advocates direct action in the protection and conservation of marine mammals)

Star-Kist Foods, Inc., 180 East Ocean Boulevard, Long Beach, CA 90802 (tuna cannery)

Van Camp Seafood Company, 901 Chouteau Ave., St. Louis, MO 63164 (tuna cannery)

Waste Management Inc., (in the business of waste disposal and incineration at sea)

Woods Hole Oceanographic Institute, (conducts marine research and exploration, home base for ALVIN)

World Wildlife Fund, 1250 24th Street NW, Washington, DC 20037

Worldwatch Institute, 1776 Massachusetts Avenue NW, Washington, DC 20036 (research and policy consultants to government)

INTERNATIONAL ORGANIZATIONS

Inter-American Tropical Tuna Commission (IATTC), c/o Scripps Institution of Oceanography, La Jolla, CA 92093 (international research body that studies tuna-dolphin entanglement)

International Whaling Commission, The Red House, Station Road, Histon, Cambridge CB4 4NP ENGLAND (UN-sponsored body that regulates whaling activities)

Secretariat, Laws of the Sea Treaty, United Nations, Room 1827A, New York, NY 10017