

Treasured Waters: Protecting Our Coastal And Marine Resources

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Treasured Waters



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Treasured Waters: Protecting Our Coastal And Marine Resources

Most fresh water eventually flows to the ocean. Whatever affects water inland, even far away from coastal areas, eventually impacts the health and quality of coastal and marine waters. Picture a clean, clear mountain stream, tumbling downhill and flowing into a small river. The river grows as other streams flow into it, and eventually nears a coast where the fresh water mixes with salt water and becomes an estuary, which finally flows into the ocean. Stream water may start out clean, but how clean is it when it finally reaches the ocean?

To answer this question, it is necessary to track the water's path. As water moves downstream, it may absorb sulfur dioxide from acid rain that falls onto the landscape and into the stream. It may contain bacteria from farm animal waste, or nitrogen from fertilizers washed into the water as it flows through agricultural and residential areas. Sediments flow into the river from eroding stream banks or nearby development/construction sites. Oil, trash, and raw sewage can wash into the water from combined sewer and stormwater systems during a rain storm.

A mixture of toxic chemicals and heavy metals might enter the waterway as by-products from industrial operations or from street runoff.

Most pollutants will end up in coastal and marine waters, potentially causing alteration or loss of habitat, reductions in numbers of species that live in these waters, and increases in floating trash and debris. In turn, fish and shellfish may disappear or may be too contaminated to eat, swimming may be prohibited or restricted, and other recreational and commercial opportunities may be lost.

Why is it so important that we ensure the health and quality of our coastal and marine environments? The answer can be found by examining the many benefits we derive from these resources. Coastal and marine waters provide some of the most diverse and biologically productive species habitat in the country. This is especially apparent in estuaries, where fresh water and salt water mix. The variety of species supported by these areas, including a large number of endangered species, is unparalleled.



In addition, coastal and marine waters are valued by many people in the United States, both as a place to live and as a place to play. Coastal areas are also a favorite recreational destination for many vacationers. Large commercial segments of the U.S. economy are dependent, at least partially, on coastal resources, among them aquaculture, fisheries, shellfishing, mineral extraction, tourism, and shipping. Because so many people are drawn to, or dependent on, coastal and marine waters, they are under considerable environmental stress, and protecting these resources is important.



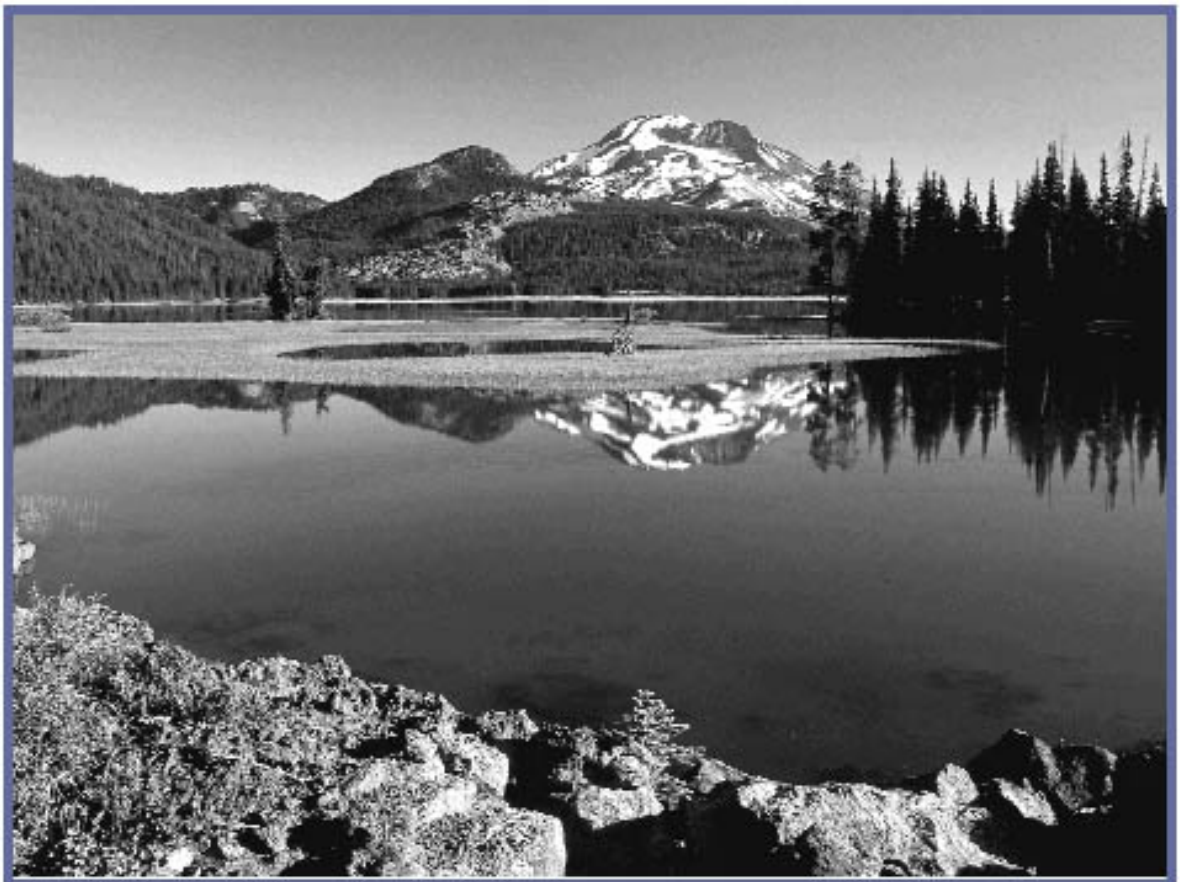
How do we protect our coastal and marine environments from pollution in order to preserve benefits such as these? To effectively protect these resources, we must search for both sources of pollution and potential solutions. Many of the Environmental Protection Agency's (EPA) water protection programs are managed to account for activities occurring throughout the watershed. A watershed is a geographic area in which all sources of water, including lakes, rivers, estuaries, wetlands, and streams, as well as ground water, drain to a common surface water body, carrying along any pollutants that are present. Using watersheds as the basis for identifying environmental impacts on coastal and marine waters allows us to gain a better understanding of the pollutant problems we are confronting, and helps point us in the right direction to find solutions.

EPA manages a wide array of programs designed to protect the health of the nation's coastal and marine waters. A number of these programs focus specifically on protecting coastal and marine waters, others on pollutant sources that are found inland, far from coastal areas, but which nevertheless have a profound impact on coastal and marine ecosystems. This publication highlights both types, briefly describing programs designed to protect upstream resources, and focusing in more detail on those that directly affect coastal and marine waters. Most importantly, it will illustrate how using a comprehensive watershed protection approach helps these programs work in concert to protect coastal and marine waters.

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| <p>"Coastal waters support 28.3 million jobs and generate \$54 billion in goods and services each year."</p> | <p>"More than half the U.S. population lives in the nation's 411 coastal counties which accounts for 11% of the land area (excluding Alaska)."</p> | <p>The recreational fishing industry contributes \$30 billion to the U.S. economy annually."</p> | <p>"Tourism-related businesses serve 180 million Americans visiting the coast each year for recreation."</p> |
|--|--|--|--|

Upstream Watershed Programs

The goal of EPA's watershed protection efforts is to promote the effective use and integration of a broad range of programs, information, and tools for protecting water quality throughout the system. Some EPA programs, by their nature, have a special emphasis upstream. The point source protection program controls pollutants by issuing permits to industries and sewage treatment plants that discharge directly into our nation's inland waters. The nonpoint source program controls pollutants such as nitrogen and sediments that run off land and into the nation's waters when it rains. Wetlands programs focus on the preservation and creation of wetlands, which play a critical role in improving water quality and providing habitat for wildlife. Collaborative efforts among these programs improve stream and river conditions, thus reducing the amount of pollution that eventually reaches estuaries and coastal and marine waters.



Coastal and Marine Programs

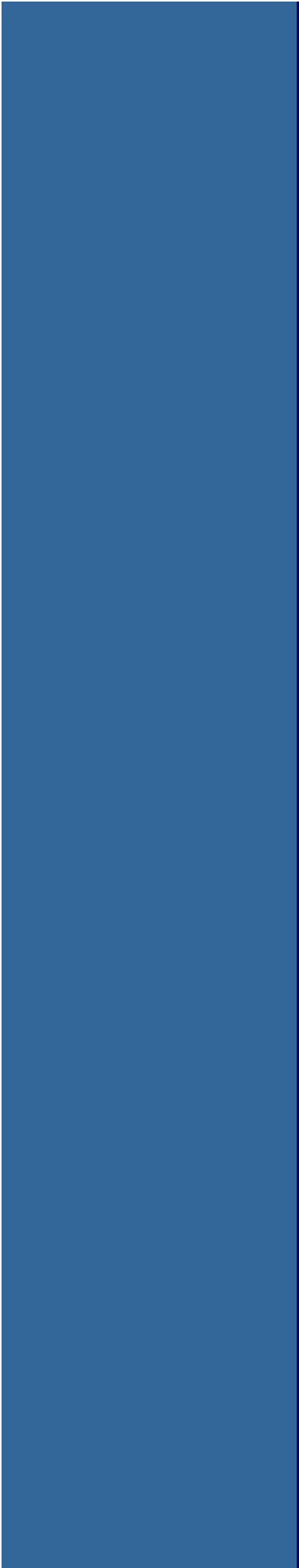
The National Estuary Program

The National Estuary Program (NEP) was created in 1987 as part of the Clean Water Act. Twenty eight estuaries participate in this program, which is designed to bring communities together to protect and restore their estuaries. Each local NEP uses consensus-building techniques among local, state, and federal government officials, interest group representatives, and the general public to make decisions about the future of their own estuaries through the development of a comprehensive management plan. Each NEP's plan is a blueprint for action to restore the estuary by identifying and recommending necessary actions within a watershed.

The NEP offers an opportunity to create partnerships with all levels of government, the private sector and the public to achieve their goals of estuary and coastal watershed protection. This type of community-based environmental protection relies on all stakeholders to define problems and set priorities to assist in finding solutions to the degradation of their estuarine resources. By actively involving the public throughout the planning process, citizens directly participate in creating a new vision for their community.

The NEP process has the ability to resolve and mitigate identified problems through quick action. Local NEPs are encouraged to develop and implement action plans to demonstrate to the public their capability in recognizing community problems and developing workable solutions. The Massachusetts Bays NEP, for example, discovered that the illegal dumping of waste oil from automobiles and boats contributed significant amounts of pollutants into the waters of Massachusetts and Cape Cod Bays. In response, the City of Revere purchased a waste oil collection tank for local residents who change their own motor oil, giving them an environmentally safe disposal alternative.

The NEP also promotes citizen involvement and outreach. The Puget Sound Water Quality Authority in Washington State has facilitated 208 public involvement and education projects including: Adopt-a-Beach programs, multilingual materials on water quality, a private/public partnership for cleaning and protecting a sub-watershed, homeowner education about septic systems, and a course to teach home builders to protect the environment during construction projects.



The NEP has facilitated agreements that may not otherwise have transpired. Phillippi Creek, which flows into Florida's Sarasota Bay, contains dangerous levels of bacteria and viruses, and is too polluted for swimming. Experts have found that septic tanks are polluting the creek by discharging directly into the water tables that flow into the creek. In a voluntary agreement, the City of Sarasota, which is a participant in the NEP process, is providing sewage treatment service to Sarasota County residents along the creek.

Coastal Nonpoint Sources

Coastal waters are affected by both point and nonpoint sources of pollution, with the latter a significant and, in many cases, dominant form of pollution impacting coastal water bodies. Discharges from pipes are point sources of pollution. Nonpoint source pollution occurs when rain water washes over streets, yards, and farmlands and carries oils, pesticides, and fertilizers into rivers, estuaries, and oceans. Recognizing the negative impacts these pollutant sources have on estuarine and coastal water quality, Congress passed the Coastal Zone Act Reauthorization Amendments in 1990. This Act requires states to develop plans and management measures to protect coastal waters from nonpoint pollution impacts. It further requires that plans must be coordinated with other existing federal and state water quality protection programs, so that all protection efforts are integrated and potential overlap is reduced. The Coastal Nonpoint Source Program also requires that states provide ample opportunities for the public to be involved in developing and implementing protection plans. States have been working on their plans since 1993, and, after approval by EPA and the National Oceanic and Atmospheric Administration, implementation will begin.



Effects of nonpoint source sediment run-off on Colonial Deep Water Port of Bladensburg, MD in Prince George's County. Credit: S.C. Delaney/EPA

Vessel Sewage Discharges

Commercial and recreational boating play an important economic role in the U.S. Unfortunately, such activities contribute to environmental degradation and public health problems. The combined effects of waste discharges from many boaters, especially in confined areas of water, can result in significant increases in levels of pollution. In particular, discharges of human waste from boats contribute to an increase in viral and bacterial contamination, which in turn results in beach closings or restricted commercial and recreational shellfish harvesting.

The Vessel Sewage Discharge Program¹ requires EPA to regulate the discharge of vessel sewage by requiring most vessels to use marine sanitation devices (MSDs), commonly referred to as boat toilets, when operating in U.S. navigable and territorial waters. EPA or states may request a 'No Discharge Zone' designation that prohibits the discharge of sewage (whether treated or not) from all vessels into specified waters. Currently, 14 states have 'No Discharge Zone' designations for some or all of their waters: California, Florida, Massachusetts, Michigan, Minnesota, Missouri, Nevada, New Hampshire, New Mexico, New York, Rhode Island, Texas, Vermont and Wisconsin.



EPA supports several efforts that focus on vessel sewage discharge. Fact sheets and brochures have been developed to increase public awareness about the proper use and maintenance of MSDs, the environmental threats incurred from vessel sewage discharges, and the availability of marina pumpout stations to allow boaters to dispose of sewage properly. Funding to States for the construction, renovation, operation and maintenance of pumpout stations and sanitary waste reception facilities at marinas and other vessel facilities is provided through the Clean Vessel Act. In addition, the NEPs have been instrumental in bringing boating issues to public attention by providing funding for marina pumpouts and garnering support for the "No Discharge Zone."

Through the following simple actions, you can help keep our waters healthy and pleasurable:

- Use on-shore sanitary facilities before boarding your vessel.
- Install a Coast Guard-certified MSD appropriate for your vessel and type of waterbody where the vessel will be operated.
- Learn how to use and maintain your MSD properly, including the use of marina pumpout stations when appropriate.
- Report violations to the nearest Coast Guard station (listed in the telephone book).

Marine Debris

Marine debris is the litter found floating in the ocean or washed up on a beach. It accounts for much of the visible pollution in the marine environment. Although some marine debris results from the illegal dumping of trash from ships, almost eighty percent of it can be traced to land-based sources such as inadequately treated municipal waste, storm water runoff, beach use, and littering. This trash is washed, blown or dumped on land, eventually ending up on our beaches or floating out to sea, where ocean currents may take it hundreds of miles from its launching point.

The effects of this trash on coastal and open ocean ecosystems can be devastating. Many people are familiar with pictures of, or have actually seen, wildlife ensnared by a piece of debris. Seagulls dragging a piece of fishing line, pelicans with six-pack rings around their necks, or sea lions struggling to remove a piece of discarded fishnet are some common examples of the problems marine debris causes wildlife. In addition, sea birds, sea turtles and whales have been known to mistake floating plastic pellets and plastic bags for natural prey, such as fish eggs, jellyfish, and squid. Ingesting plastic can cause internal injury, blockage of the digestive tract, and starvation in these animals. Other impacts of marine debris include navigation hazards, such as plastic rope or line that may entangle propellers, or plastic bags and sheeting that may clog vessel intakes, resulting in engine failure.



EPA participates in several efforts to help control aquatic debris. In a joint initiative with the Society of the Plastics Industry, EPA helped identify the

ways plastic pellets enter the environment and how to prevent their occurrence. As a result of the initiative, the plastics industry has developed plastics transport management plans, and changed its packaging practices to reduce the amount of pellets released into the environment.

In a cooperative effort among EPA, other federal agencies, and the Center for Marine Conservation, the National Marine Debris Monitoring Program documents the amounts and origins of marine debris along U.S. coasts, including the U.S. Virgin Islands and Puerto Rico. The program generates statistical data on marine debris that helps countries clean up debris and prevent pollution.

The Center for Marine Conservation's 1994 beach clean up involved 215,468 volunteers from 61 different countries who collected 4,010,532 pounds of marine debris.

Ocean Discharge

Point Source Discharge from Sewage Treatment Plants

Sewage may not be discharged into a waterway until the levels of pollutants have been reduced. Publicly owned treatment works (POTWs) are facilities that remove the pollutants from wastewater prior to releasing it into the environment. No water may be discharged from a treatment plant without a permit, and to obtain a permit, a POTW must demonstrate that the water to be discharged meets a specific level of treatment. There are three established levels of treatment for contaminated water: primary, secondary and tertiary. The treatment levels become more protective from primary to secondary to tertiary because each successive treatment method removes more pollutants. The Clean Water Act (CWA) originally required that all POTWs achieve a minimum of secondary treatment by 1977 to remove specific amounts of suspended solid waste and waste that depletes the oxygen in water.

After passage of the CWA in 1972, some large cities with POTWs discharging into marine waters maintained that the requirement for secondary treatment may be unnecessary since discharging into deep oceanic waters with strong currents allows for greater mixing and dispersion of pollutants than POTWs that discharge into shallow fresh waters. As a result, Congress amended the CWA in 1977 to allow for a case-by-case review of treatment requirements for marine dischargers². After the review, EPA may waive the requirements and allow a POTW that discharges into marine waters to do less than secondary treatment if it meets certain environmental criteria, such as showing that the discharge will not harm the habitat and community of marine life. Currently, 36 communities have waivers from EPA allowing them to operate at less than secondary treatment levels without harming the marine environment.



Point Source Discharge of Pollutants:

EPA regulates point source discharges of pollutants into marine waters by requiring discharging facilities to obtain a permit that ensures the removal of anything that would degrade the marine environment³. In addition, the program provides for an ecological assessment of the area around the discharge.

The program is designed to reduce the effects of point source discharges on human health, and preserve the quality of the ocean waters for swimming, fishing, and other recreational or commercial uses. It protects endangered or threatened animals and plants, and provides protection for the habitats in which these and other organisms live. These habitats include places where animals reproduce and where their young develop, and routes that migratory animals use during their life cycle from juvenile to adult. Marine refuges, parks, monuments, seashores, wilderness areas, and coral reefs are also protected. The program's flexibility has proven to be valuable in restoring and maintaining the quality of the ocean and coastal environment.

Protecting Our Coastal And Marine Resources

Coral Reefs

Coral reefs are among the world's richest ecosystems, second only to rainforests in the diversity of plants and animals they support. They are also fragile ecosystems, whose health can be affected by even slight natural or manmade changes in temperature, salinity, light, available oxygen and nutrients, or sediments flowing from the upstream parts of watersheds.

Marine sanctuaries and parks have been established in response to the continuing threats to coral reefs. This is an important first step, but because coral reefs are influenced by activities in areas beyond the protective boundaries of sanctuaries or parks, they are susceptible to activities occurring throughout the watershed, in many cases well beyond the park or sanctuary limits.



An integrated approach is needed, therefore, to gain control over pollutants from distant sources. It is only recently, however, that coral reefs have been regarded as part of a watershed. In this context, effective coral reef management must consider all waters and activities which influence the reef ecosystem. In addition to the coral reefs themselves, surrounding mangrove and sea grass bed communities, for example, should also be considered as major components of the reef ecosystem.

To help ensure the protection of coral ecosystems on a watershed basis, local communities have started to integrate and balance their needs and activities with protection of coral ecosystems. EPA has developed a

guidance document on protection of coral reefs through watershed management planning. This document presents a framework for coral reef management which can be used at the local level.

In the Florida Keys, a local conservation group has demonstrated how a small number of individuals can achieve significant gains in coral reef protection using a limited budget and volunteers. Reef Relief, a non-profit organization founded in Key West, has been instrumental in the development of community-based reef protection programs. Addressing the significant damage boat anchors can cause to corals, Reef Relief installed buoys for boats to tie up to instead of using their anchors in waters containing reefs. This effort has been supported by concerned citizens and the business community who realized the connection between a healthy coral ecosystem and the local economy. Reef Relief also launched a public education program that dissuades divers from making physical contact with corals.


Treasured Waters: Ocean Dumping

About 400 million cubic yards of sediment are dredged each year in the United States by federal, state and local governments, and private interests such as marinas, in order to keep the nation's waterways open to boat traffic for recreation, commerce, and defense. One method for disposing of this dredged material is dumping it in the ocean. Some of the material dredged from ports and harbors is contaminated by pollutants and does not meet the environmental criteria which allow it to be dumped into the ocean. If the material is determined to be acceptable, a permit must be issued to authorize the dumping.

EPA regulates both the conditions for obtaining a permit, and the designation of ocean dumping sites. The regulations are written to protect the marine environment by providing environmental criteria and other factors for evaluating dredged materials proposed for dumping. These factors include the potential effects of dumping on human health, economic concerns, and marine resources such as fisheries and recreational areas. The U.S. Army Corps of Engineers, which issues ocean dumping permits, is required to use EPA's environmental criteria when evaluating permit applications for the disposal of dredged material.



EPA encourages dredged material management planning on a watershed basis. Through comprehensive planning, all of the dredging needs of a region can be considered at once, a variety of dredged material disposal alternatives can be considered, and a long-term plan to meet future dredging needs and promote protection of the environment can be developed. Linking these efforts to watershed planning helps maximize the benefits of comprehensive dredged material management. Dredged material managers can work with watershed planners and pollution control managers to identify and address point and nonpoint sources of sediment



and sediment pollution within a watershed that may have an adverse impact on port and harbor sediments. This approach may also be used to identify beneficial uses of uncontaminated dredged material, such as replenishing beaches, or creating wetlands and islands.

Ocean Survey Vessel Peter W. Anderson

EPA's ocean survey vessel, the Peter W. Anderson, collects crucial marine information in support of coastal and marine protection programs. The Anderson sails year-round along the Atlantic and Gulf Coasts, collecting information from harbors, ports, and off-shore waters to identify and monitor the environmental problems affecting our oceans, bays, and estuaries.

The Anderson's operating crew works with a staff of up to 15 scientists from around the country to conduct various surveys. The ship is equipped with chemistry and microbiology laboratories, a wet lab for biological sample processing, an underwater video camera system, a sonar system to map the sea floor, and custom-made equipment designed to sample the ocean at all depths.

The Anderson conducts surveys to assist in the selection of new dump sites for dredged material, and monitors existing sites for any negative impacts the dredged material may have on the environment. It is also involved in efforts to track and identify sources of marine debris, and to determine the sources and impacts of pollutants deposited in coastal and marine waters through the air. In addition, the Anderson has been called upon to respond to emergencies resulting from accidental spills of pollutants.



For example, in June 1989, the Anderson aided in the location and quantification of an oil spill in the Delaware River. The Anderson was able to help determine how much oil spilled, how far it had reached beneath the

surface of the water, and the direction in which the slick was moving. This information helped clean-up crews move quickly to remediate the spill.

In January 1992, the Anderson located drums of arsenic in the Atlantic that had been swept off of a cargo ship in a storm. Using its underwater TV camera, the Anderson was able to locate the drums-something the Navy and Coast Guard could not do because they lacked the needed equipment.

Everyone Can Help

Protecting our coastal and marine waters also means protecting the smallest mountain streams, swiftly flowing rivers, dynamic estuaries, and the vast oceans. From nonpoint source protection measures far inland, to the National Estuary Program in estuarine and near coastal waters, to discharge permitting and coral reef protection in our oceans, EPA's programs to protect coastal and marine waters recognize and address problems throughout watersheds. Each of the programs described in this document make substantial contributions to protecting coastal and marine resources, and EPA is realizing even greater environmental gains by managing these programs within a watershed framework.

How can you help in ocean and coastal protection efforts? How about:

- Participating in your local National Estuary Program's Citizen Advisory Committee;
- Reducing the amount of fertilizers applied to your lawn;
- Becoming a responsible boater by following the suggestions on page 6 of this document;
- Getting involved in a local beach or stream clean-up;
- Using biodegradable products;
- Cutting six-pack rings;
- Reporting suspicious water pollution activities;
- Viewing but not touching or collecting live coral;
- Using designated boat buoys to anchor in coral reef areas; and
- Visiting the Anderson at a port near you.

Please call the Oceans and Coastal Protection Division for additional information at (202) 260-1952, or **visit the Office of Water Home Page at <http://www.epa.gov/ow/>**



References

1. Clean water Act §312 Program
2. Clean Water Act §(h)
3. Clean Water Act §403(c) Program

The documents and programs listed below offer more information on the topics discussed in Treasured Waters. Documents marked with an * can be requested from EPA's National center for Education and Public information(NCEPI) at 11029 Kenwood Road, Building 5, Cincinnati, OH 45242 (Phone: 513-489-8695). Please be sure to use the EPA reference number when ordering publications from NCEPI.

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(phone: 317-494-9555, fax: 317-494-5969).

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For more information on the case studies cited in this document, you may contact the following organizations:

1. Clean Water Act §312 Program
2. Clean Water Act §301(h)
3. Clean Water Act §403(c) Program

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Please be sure to use the EPA reference number when ordering publications from NCEPI.

National Estuary Program

Sarasota Bay National Estuary Program: (941) 359-5841

Massachusetts Bays Program Office: (617) 727-9530

Puget Sound Action Team: (360) 407-7300

Marine Debris

Society of the Plastics Industry

Center for Marine Conservation: (202) 429-5609

Coral Reefs

Reef Relief, P.O. Box 430, Key West, FL 33041. Contact: Dee Von Quirolo.
Phone: (305) 294-3000, fax: (305)293-9515,
email: www.arch.usf.edu/FICUS/conserve/groups/reefrel/contacts/contacts.html.

Florida Keys National Marine Sanctuary, P.O. Box 500368, Marathon, FL 33050

Contact: Billy Causey, Superintendent. Phone: (305) 743-2437
email: www.FKNMS.nos.noaa.gov

Ocean Dumping

National Dredging Team: US EPA (4504 F), Oceans and Coastal Protection Division, 401 M St., SW, Washington, DC 20460, or HQ, US Army Corps of Engineers, Policy Division, 20 Massachusetts Avenue, NW, Washington, DC