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## **Information About Estuaries and Near Coastal Waters April 2001 - Issue 11.2**

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## **Microscopic Stowaways in Ballast Water**

Ever since the earliest civilizations began to sail the Mediterranean Sea, aquatic organisms have had opportunities to "stowaway" on boats and ships. In the past, plants and animals were transported attached to the hulls of vessels. Today, the evolution of ship design has allowed such stowaways to be transported in ship ballast. While ships formerly used "hard" ballast, usually stones, to assure their stability and trim in the open ocean, for the past hundred years water has been used as ballast, making it easier to make the many adjustments needed for stability at sea or to correct the ship's waterline in port as cargo is loaded on and off.

During the past twenty years, scientists, the shipping industry, and the public have become increasingly aware that ships ballast water unintentionally transports a myriad of aquatic species and delivers them in a viable state to ports of arrival. Organisms small and large, from bacteria to fish, have been documented in ballast water samples. Should these organisms be nonindigenous, that is, not native to the area in which they are released, then the stage is set for a possible biological invasion that may have ecological and/or economical significance.



The issues posed by nonindigenous invertebrate species, such as the zebra mussel, are much better understood, documented and publicized than concerns raised by the potential introduction of microorganisms, some of which may be pathogenic to humans, plants, and animals. Indeed, quantification of the abundant viruses, bacteria, and protozoans transported around the world in ships' ballast water has only just begun. Recently, researchers have measured an average of about two million bacteria and twenty million viruses per milliliter of ballast water in ships entering the Chesapeake Bay. Considering that the annual discharge of ballast water in U.S. ports exceeds 79 million metric tonnes, then the number of imported bacteria and viruses can be truly astronomical! Most of these microorganisms are naturally occurring denizens of aquatic ecosystems and are not pathogenic; however, whether their rapid global translocation is cause for environmental concern has yet to be determined.

There are instances in which ballast water microbes clearly are not benign. Perhaps most well known among these are unicellular algae called dinoflagellates, some of which are responsible for red tides and shellfish poisoning. For example, such a dinoflagellate species was introduced from Japan to Australia, where it proliferated and greatly impacted aquaculture operations. The invasion success of dinoflagellates is related to their ability to lie dormant as cysts for months and even years in ships' tanks. Following their discharge at a port of arrival, the dormant cysts can be stimulated by nutrients and light and begin to grow. Often these cysts are found in sediment that sometimes accumulates in ships' tanks.



A microorganism equally notable for its potential impact is *Vibrio cholerae*, the bacterial agent of human cholera. In one case, oysters in the Gulf of Mexico were discovered to contain a novel strain of *V. cholerae*. This novel strain proved identical to one collected from ballast water of ships having recently arrived from ports in Latin America where cholera was epidemic. In another case, researchers determined that pathogenic *V. cholerae* are ubiquitous in ballast water of ships arriving in the Chesapeake Bay. The concentration of these bacteria was low, about 10 to 100 cells per ml of ballast water, and they are natural components of the Bay's estuarine flora. Nonetheless, their presence in ballast water imported from thousands of kilometers away raises the possibility that they represent novel genetic strains. More importantly, these findings suggest that other pathogens may be transported and distributed worldwide by ships.

What preventative measures can be taken to reduce the risk of ballast-mediated invasions, whether by organisms in general or microorganisms in particular? Existing management strategies intended to minimize the rate of new invasions rely on ballast water exchange in the open ocean, as recommended by the International Maritime Organization and the U.S. Nonindigenous Aquatic Nuisance Protection and Control Act. In this procedure, coastal water and its accompanying suite of organisms are removed from tanks and replaced by oceanic water. Oceanic organisms entrained in the process are unlikely to survive in coastal water when they are discharged at the port of arrival.



The U.S. National Invasive Species Act of 1996 made ballast water treatment mandatory, either by exchange or another method, for ships entering the Great Lakes after operating beyond the U.S. Exclusive Economic Zone. However, ballast water exchange is not 100% effective; sediment may not be exchanged or tanks may be only partly emptied, allowing harmful species to remain in the tank or hold. Furthermore, ballast water exchange cannot be safely performed in rough seas.

Other than exchange at sea, ballast water treatment strategies include filtration, heating, dosing with biocides, and irradiation with ultraviolet light. While all of these methods may effectively eliminate larger organisms, some have significant limitations with respect to the control of microorganisms. The industrial-strength filters necessary to treat ballast water, those capable of handling on order of 6,000 liters per minute, can only remove particles that are 25 to 1,000 times larger than bacteria and viruses. Except for microorganisms that may be attached to large particles, viruses and bacteria will pass through such filters.

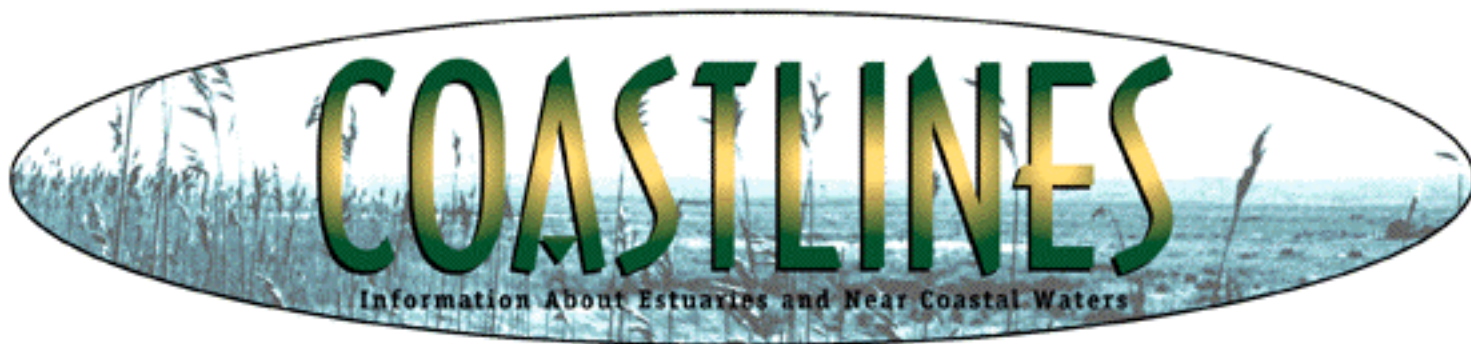
Heat treatment may have the unintended consequence of promoting the growth of certain microorganisms, including human pathogens, which grow optimally at 37\_C (human body temperature). Treatment of ballast water with oxidizing and non-oxidizing biocides has limited effectiveness since some microorganisms can form resting stages extremely resistant to harsh chemical treatments. Even if the biocides were effective, discharging the biocide-laden ballast presents another potential environmental threat.



Some researchers of ballast-water treatment have focused on ultraviolet (UV) light as a tool to kill bacteria and protozoans and inactivate viruses in ballast water. The germicidal effects of UV light have long been known and used in a multitude of industrial and medical applications. UV light damages an organism's DNA, thus rendering it incapable of reproducing. At higher doses, UV light can destroy molecular bonds, causing microorganisms literally to fall apart. Because UV treatment is environmentally benign, it has been considered by many as a means to treat ballast water; in fact, commercial units already are on the market. Experimentation has begun with a new, very efficient lamp that inexpensively delivers UV doses sufficient to kill not only vegetative cells of bacteria and dinoflagellates, but spores and cysts, their highly resistant resting stages, as well. Incorporating such a lamp into commercial UV treatment units may be one means of greatly reducing the transport of viruses and bacteria from one port to another.

For further information, contact Fred C. Dobbs, Ph.D., Associate Professor of Oceanography, Department of Ocean, Earth And Atmospheric Sciences,

Old Dominion University, 4600 Elkhorn Ave, Norfolk, VA 23529; E-mail: [fdobbs@odu.edu](mailto:fdobbs@odu.edu)



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## **Innovative Funding of CCMP Actions**

The San Francisco Bay Estuary Project (Estuary Project), in conjunction with the San Francisco Bay Regional Water Quality Control Board (Regional Board), has developed an innovative way to fund projects to implement Comprehensive Conservation Management Plan (CCMP) actions in the Bay. The Regional Board is one of nine throughout the State of California that regulate water quality issues. Supplemental Environmental Projects (SEPs) are the result of Administrative Civil Liabilities imposed by the Regional Board against noncompliant dischargers, as part of their enforcement authorities. In lieu of paying a portion of the fine, a discharger in noncompliance may opt to fund a local environmental project. These projects range from small environmental education events to major on-going restoration and land acquisition projects.

The program was initiated in 1990 by the Executive Officer of the Regional Board, the Regional Board's attorney and local environmental activists. Originally, the program was managed entirely by Regional Board staff. In 1998, an audit of the program recommended improving project oversight by hiring a project manager. The Regional Board contracted the Estuary Project to provide oversight and improve tracking and overall performance of these projects. The Estuary Project ensures that environmental projects conform to guidelines set by the State Water Resources Control Board, each Regional Board, and the CCMP. At this point, the program is voluntary and dischargers may opt not to use the services of the Estuary Project for project oversight. However, because dischargers are usually unfamiliar with environmental projects, the new program has been a welcome one, saving the discharger a great deal of time and effort.



A percentage of the SEP funding covers Estuary Project staff time to oversee each project, to maintain current lists of potential projects in the Bay Area, and to conduct outreach efforts to increase participation by the local environmental community.

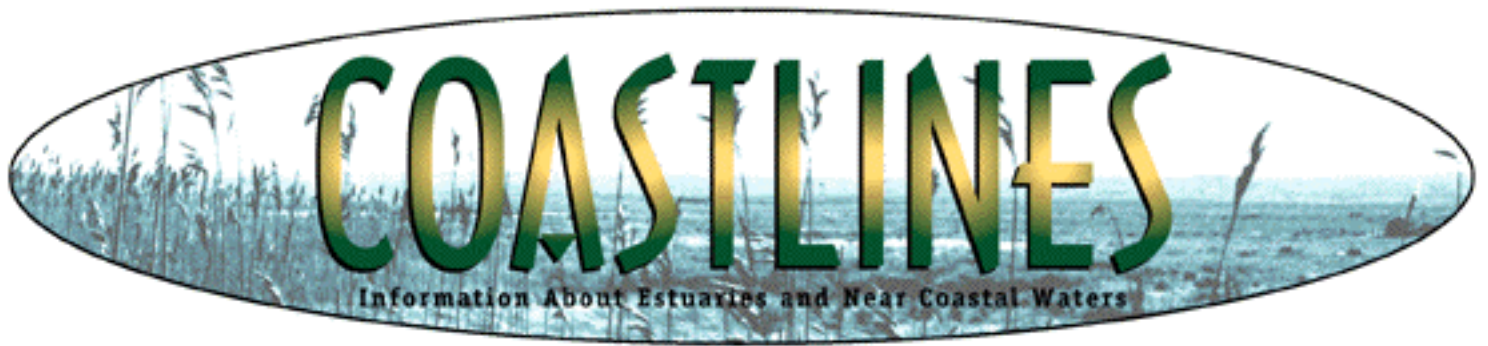
# an *Francisco Estuary Project*

Oversight entails ensuring that the projects are viable and address the goals of the program, that project reports are submitted on time, that funds are spent appropriately and that monitoring plans are in place. The Estuary Project works with the discharger (who is ultimately responsible for the success of the project), Regional Board staff, and the local non-profit organization to set up an appropriate project, and then follows the project to completion.

From 1991 to 1997, eighty-two projects were funded through SEP, with individual projects ranging in cost from \$1,400 to \$3,715,000. SEP projects fall into one of three categories: environmental restoration and enhancement, pollution prevention and reduction and environmental education. Education projects include publication and dissemination of brochures and other materials on various topics (pollution prevention, restoration issues, creek and wetland signage, school curricula, etc.). Some examples of restoration projects that have been completed under the program include a demonstration creek restoration project which educated county public works staff in soil bioengineering techniques, a clearing house and referral system to assist/advise landowners and public agencies regarding creek problems, web page development to publicize restoration activities, and wetland acquisition and restoration projects. Recently, funding through this program allowed for the acquisition of 3.5 acres of wetlands, adjacent to a city park, to be used as an environmental education area for the city. In addition, pollution prevention projects have included the study of failed sewage pump stations, the establishment of a pollution prevention center, and development of an NPDES Electronic Reporting System.

Besides the obvious environmental benefits the program offers, outreach efforts to the many environmental groups in the Bay Area that qualify for funding, while daunting, have provided the Estuary Project with an opportunity to build working relationships with these groups. Overall, the program has been lauded as an excellent example for funding environmental projects but there has been some criticism that non-compliant dischargers have received positive publicity for their mistakes through participating in this program. While this may be true in the short term, hopefully the positive long-term environmental benefits will outweigh these concerns.

For further information, please contact Carol Thornton, San Francisco Estuary Project, Phone: (510) 622-2419 or E-mail: [ct@rb2.swrcb.ca.gov](mailto:ct@rb2.swrcb.ca.gov)



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## **BMPs for Construction Site Chemical Control**

The New Hampshire (NH) Coastal Program, in cooperation with NH Department of Environmental Services and the NH Department of Agriculture, Markets and Food, has recently published a new BMP manual entitled, "Best Management Practices for Construction Site Chemical Control." The purpose of the handbook is to assist in preventing or controlling pollution from construction sites due to improper handling and usage of chemicals. Potential pollutants related to construction activities include pesticides, nutrients (fertilizers), petroleum products, construction chemicals, and solid waste.

For a copy of the manual, contact Joanne McLaughlin; Phone:(603) 271-2155



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## **SOUND HEALTH 2001 - Status and Trends in the Health of Long Island Sound**

In 1994, the Long Island Sound Study (LISS) produced its Comprehensive Conservation and Management Plan (CCMP), a roadmap to improving coastal resource areas. Six years have passed and it is time to ask how we are doing. How do we measure our success and failures? Where should we focus our future efforts? The LISS has been working to develop indicators of the health of the Sound to assess the effectiveness of programs targeting nitrogen pollution, sediment contamination, habitat degradation and loss, and the health and abundance of living resources. A new report, "Sound Health 2001, Status and Trends in the Health of Long Island Sound," highlights water quality, the status of living resources, land use and development trends, and other indicators of environmental health. The report provides a snapshot of current conditions and trends, linking actions taken and identifying gaps in CCMP implementation efforts.

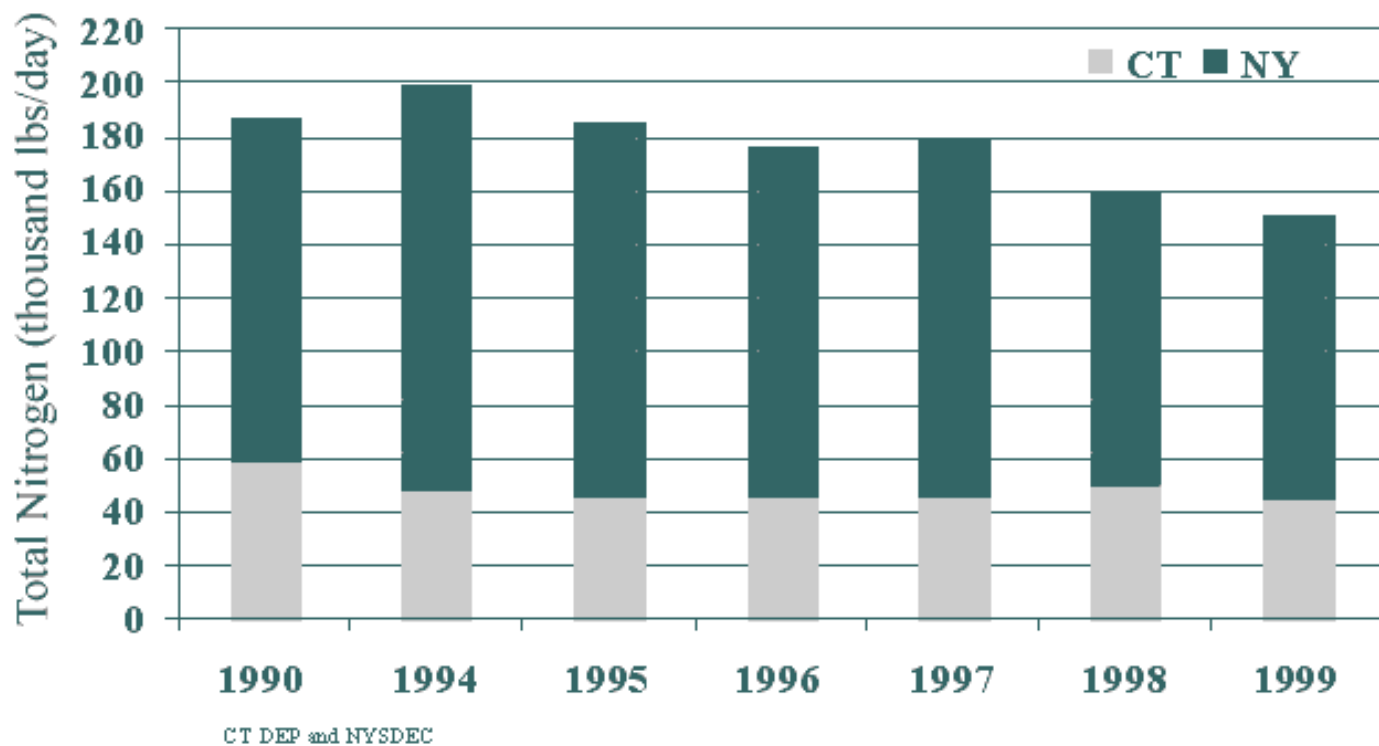
Environmental indicators are specific, measurable markers used to assess the condition of the environment and how it changes over time. Sharp changes and general trends in the values of those markers can reveal improving or worsening environmental health. The LISS partners, the Connecticut Department of Environmental Protection, New York Department of Environmental Conservation, and U.S. Environmental Protection Agency have spent more than a year collecting and reviewing data provided by several federal and state agencies, universities, and municipal programs for the 19 indicators that are described in Sound Health 2001. A more comprehensive report, featuring some 40 indicators, will appear on the Long Island Sound website later this year.

### **Measuring Success**

#### **Nitrogen Pollution**

Since 1990, the LISS has been implementing a phased plan to improve oxygen levels in the Sound by reducing nitrogen loads. In 1998, LISS adopted a 58.5 percent reduction target for nitrogen loads from human sources to the Sound over 15 years, with five and ten-year interim targets to assure steady progress.

# Point Source Nitrogen Load

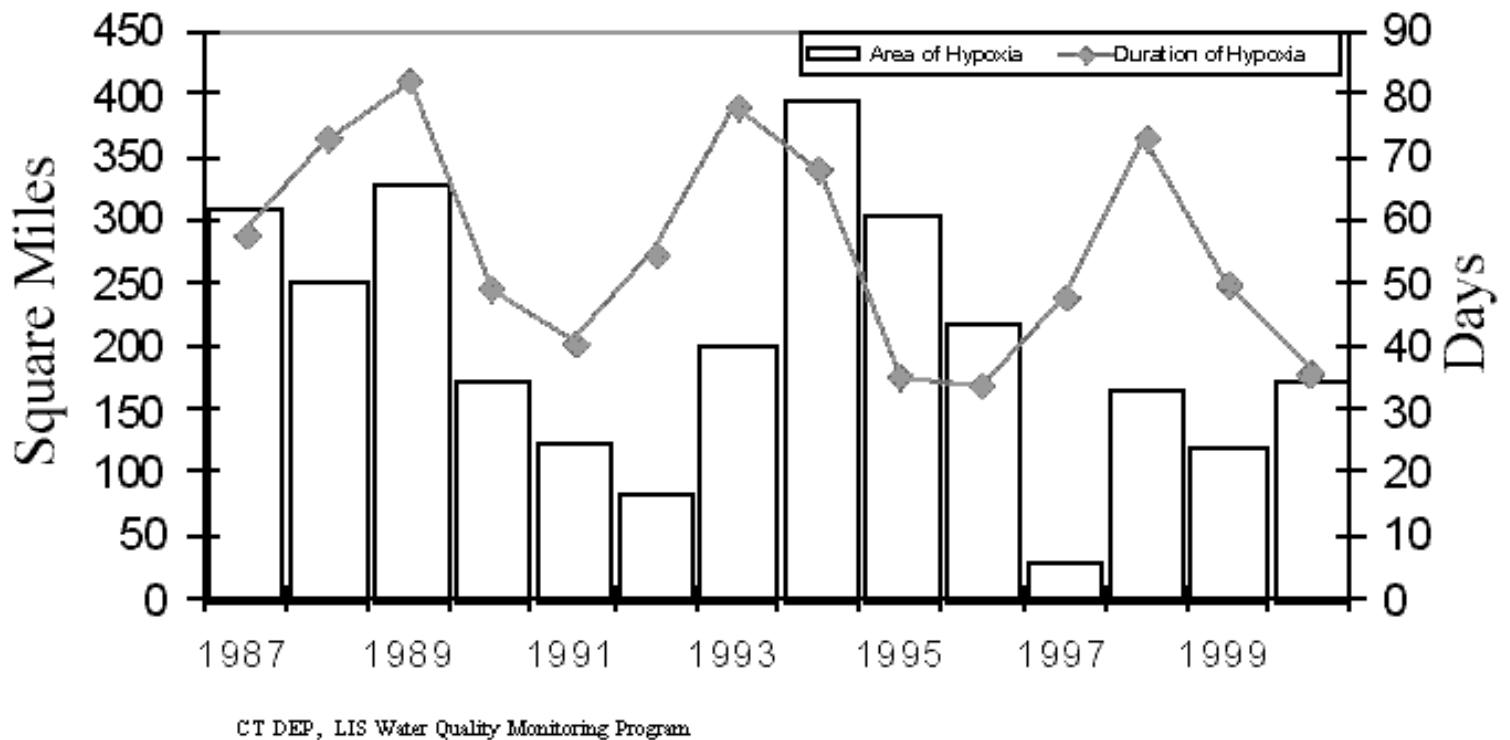


The states of Connecticut and New York are working to achieve the target through upgrades to sewage treatment plants, watershed protection to control nitrogen runoff, and reductions in nitrogen oxide emissions to the air.



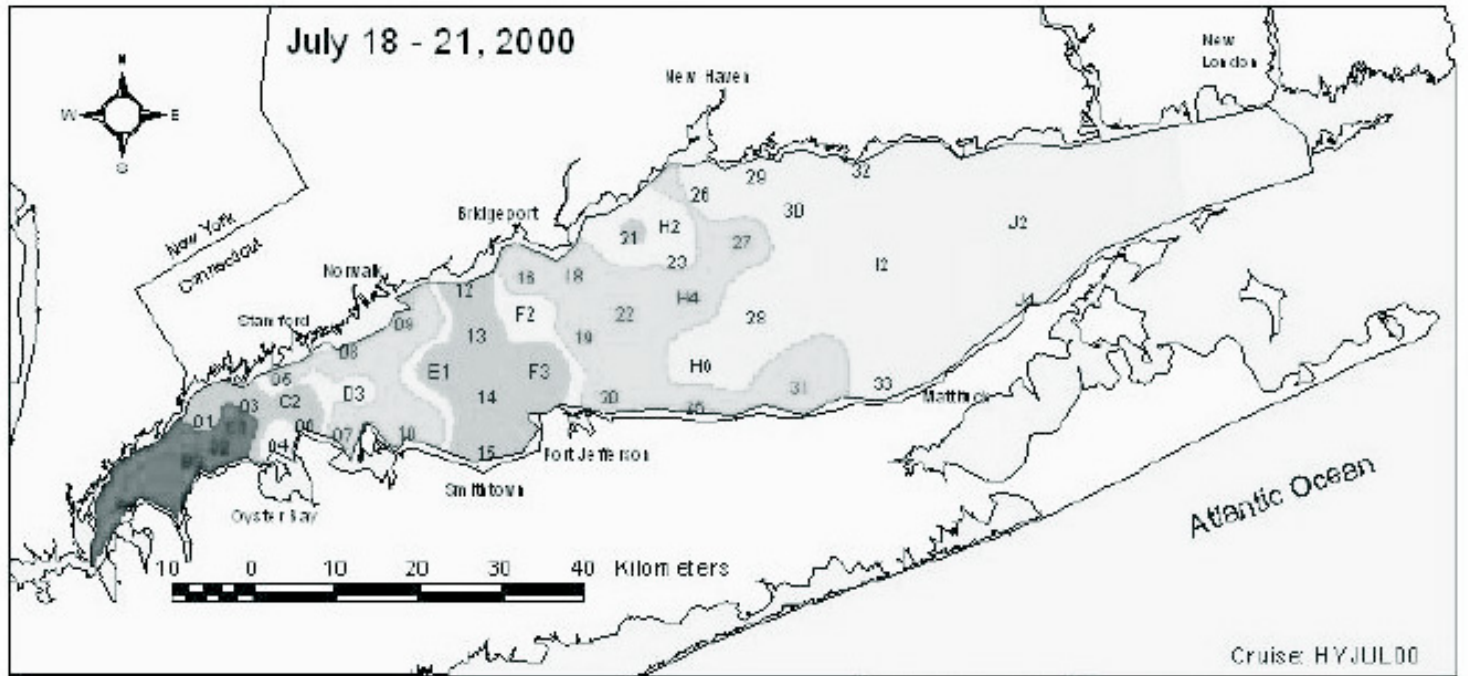
# Maximum Area and Duration of Hypoxia\*

\* Hypoxia is defined as less than 3.0 mg/l



As a result, 25 percent of the sewage treatment plants have been upgraded to include biological nutrient removal. Nitrogen discharges to Long Island Sound have decreased by 19 percent, reducing algal growth and improving oxygen levels. In terms of area, duration, and intensity, the severity of hypoxia in the Sound has decreased since the late 1980s.

## Dissolved Oxygen in Long Island Sound Bottom Waters



CT DEP, LIS Water Quality Monitoring Program

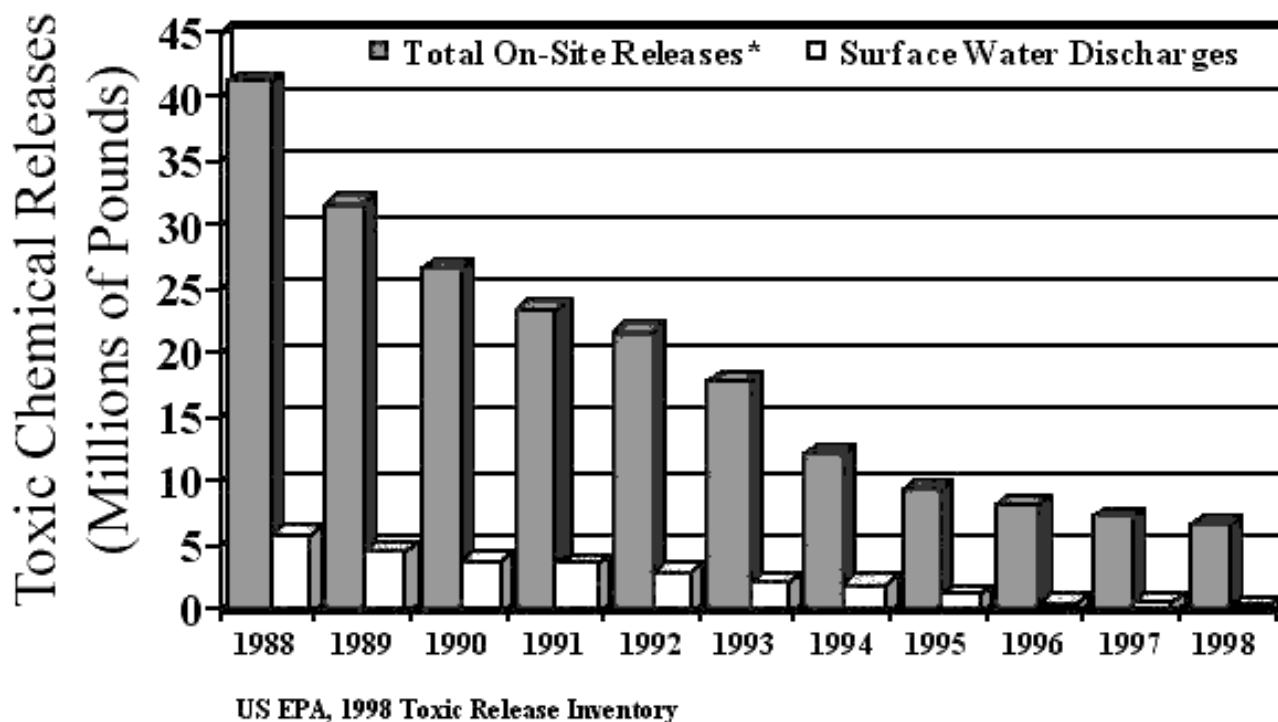
Dissolved oxygen levels in bottom waters in July 2000. The western portion of Long Island Sound exhibited hypoxic levels during this period.

### Sediment Contamination

Toxic contaminant releases in the Long Island Sound watershed have also declined relative to the late 1980s, consistent with trends in toxic releases throughout the country.

# TRI Data

## CT/NY Industries in LIS Watershed



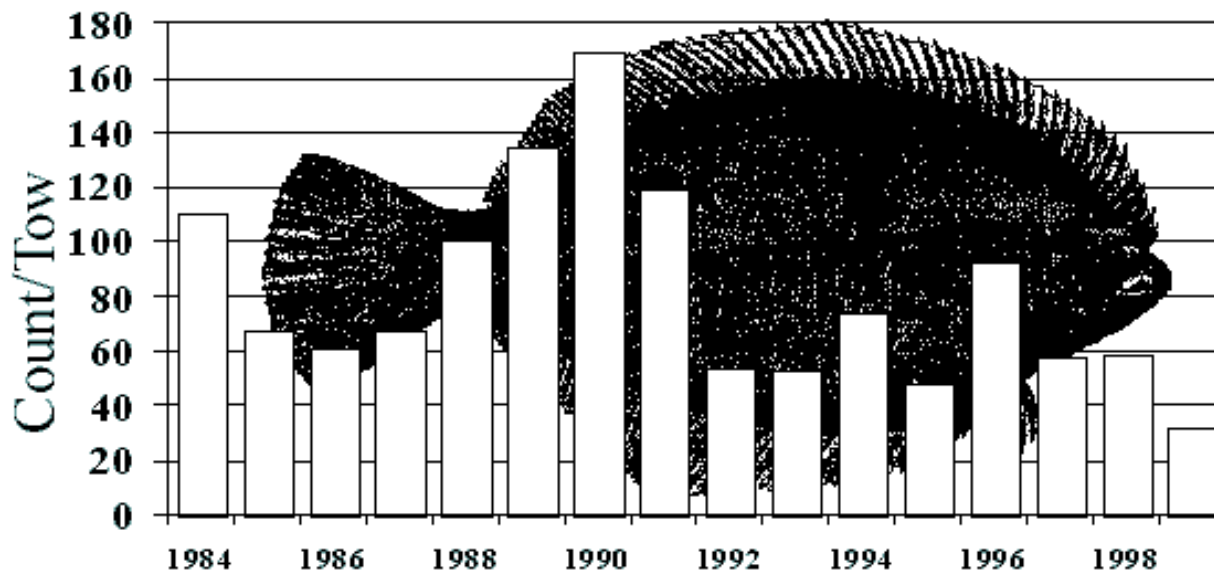
\*Total On-Site Releases include-total air emissions, other on-site land releases, and surface water discharges.

Pollution controls and changes in manufacturing trends have decreased the amount of contaminants discharged in the Sound and have resulted in decreased concentrations of contaminants in the surface sediments.

### Health and Abundance of Living Resources

The coastal environs of Long Island Sound represent a unique and highly productive ecosystem. The diverse array of living resources ranges from microscopic plants and animals that drift with the currents, to seaweeds and economically important finfish, shellfish, and crustaceans. Many other types of wildlife, such as birds, sea turtles, and marine mammals, spend all or part of their lives in the Sound, on its shores, or in its watershed. But environmental conditions, habitat availability, and disease has had major impacts on recreational and commercial fisheries as well as colonial bird populations.

## Winter Flounder Abundance



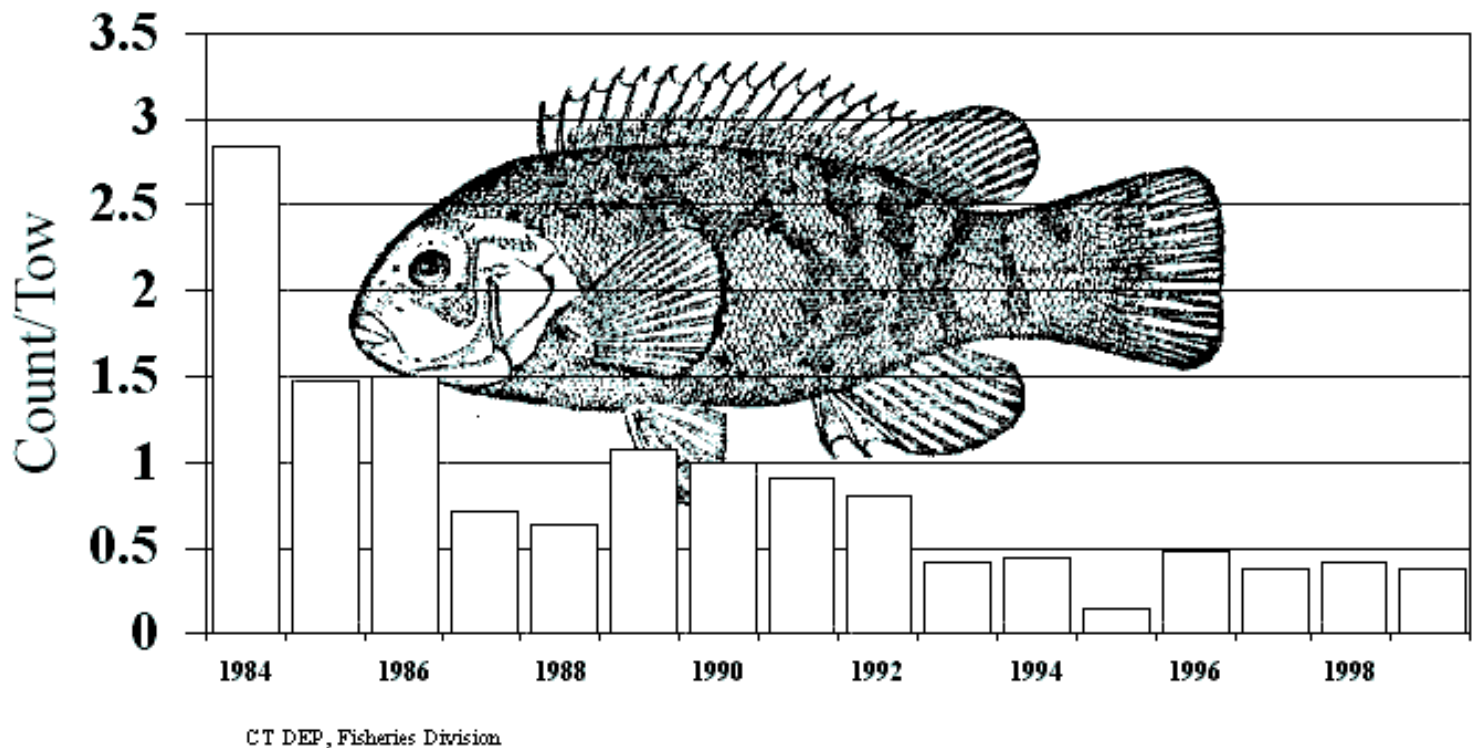
CT DEP, Fisheries Division

In the late 1980s and early 1990s, marine fish stocks plummeted in Long Island Sound. All of the principal species supporting the recreational and commercial fisheries of the Sound were considered overfished. Today, a combination of environmental conditions leading to improved recruitment (the number of young produced per year) and fishery management measures to limit exploitation and rebuild stock has helped to stabilize the productivity of the Long Island Sound fishery. However, there still remains a great deal of work to be done to improve fish stocks.

Colonial bird populations, although making modest gains in adult numbers, have not yet shown statistically significant trends.



# Tautog Abundance



## Habitat

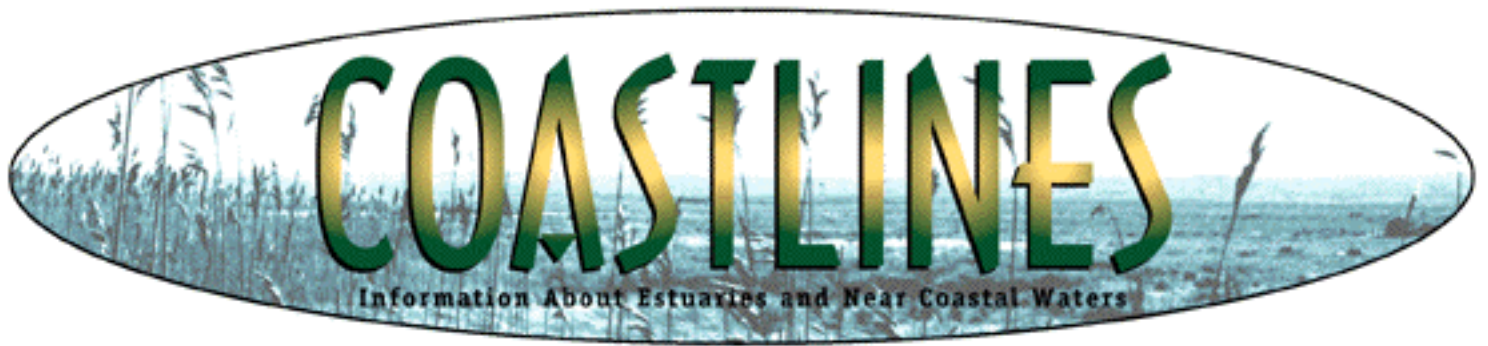
In 1998, the LISS Habitat Restoration Initiative adopted a goal to restore 2,000 acres of coastal habitat (e.g. dunes, inland wetlands, tidal wetlands, forests, submerged aquatic vegetation) and 100 miles of riverine migratory corridors for anadromous fish by the year 2008. In the past two years, 33.4 miles of river have been opened to anadromous fish and 593 acres of coastal habitat have been restored indicating both Connecticut and New York's steady pace to meet these restoration goals.

## Looking to the Future

While progress is being made toward achieving the CCMP goals of clean water and sediments, abundant and diverse fisheries and wildlife, sustainable ecosystems, and multiple commercial and recreational use of Long Island Sound, much remains to be accomplished. The program has used the environmental indicators in this report to identify successes and point out areas for further study.

As the LISS continues to implement the CCMP, it is expected that continued responses will be seen in many of these indicators, pointing out the need to monitor for long-term trends. The report also shows the necessity for continued research to interpret these trends and patterns. These interpretations will hopefully be revealed in future State of the Sound reports, tentatively scheduled for release every two to three years.

For further information or a free copy of Sound Health 2001, Status and Trends in the Health of Long Island Sound, contact Rosemary Pastor, Communications Coordinator, EPA-Long Island Sound Office, 888 Washington Boulevard, Stamford, CT 06904; Phone: (203) 363-7897; Fax: (203) 977-1546; or E-mail: [pastor.rosemary@snet.net](mailto:pastor.rosemary@snet.net) or visit the LISS website at [www.epa.gov/region01/eco/lis/](http://www.epa.gov/region01/eco/lis/).



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## **The South Boston Seaport District - Planning Urban Waterfronts**

Boston is poised to ride a new wave of waterfront revitalization with the massive redevelopment of its South Boston waterfront. Three decades ago, Boston helped pioneer the redevelopment of underutilized or abandoned industrial waterfronts with its Fanueil Hall Marketplace development project. In those early years, attempts to reclaim urban waterfronts were often solitary missions. However, today the economic advantages and versatility of waterfront property are widely understood, as are the public interests and community benefits associated with waterfront redevelopment.



The portion of the South Boston waterfront known today as the Boston Seaport District consists of approximately 1,025 acres of land bordering Boston's Inner Harbor just east of the downtown financial district. The area was created during the 19th century through extensive filling of tidelands to create new wharves, piers, and rail facilities to support the growing mercantile trade and industry. By the mid 20th century, however, changes in the regional economy and technological improvements in transportation had lessened the functional advantages of waterfronts for many industries, and the properties slowly reverted to parking lots and warehouses.

The Seaport District's proximity to downtown Boston, together with recent public investments in transportation infrastructure and improvement of Boston Harbor's water quality, generated intense interest in new private sector development. The build-out potential of the district is projected to be



between 17 and 24 million square feet (sq ft) of new mixed-use development (in addition to the 14 million sq ft of existing development).

Planning for the future of the Seaport District began over three years ago, when the Boston Redevelopment Authority (BRA), the city agency primarily responsible for planning and development review, recognized the tremendous potential, scale and complexity of redeveloping this area and prepared a Seaport Public Realm Plan. The goal of the plan? To establish an overall vision for the district and serve as a guide for all subsequent planning and development proposals. The plan's broadly endorsed objectives included linking land and water uses, establishing the area as a major economic center, and creating a vital, 24-hour, mixed-use neighborhood. This latter objective emphasized substantial residential and civic uses to ensure around-the-clock activity and to address housing demands.

The Commonwealth of Massachusetts, through its Executive Office of Environmental Affairs (EOEA), also played a key role in shaping the future of this waterfront, based on its duty to protect the public interest in tidelands in accordance with the Public Trust Doctrine. The principles of the Public Trust Doctrine have been a part of Massachusetts' law since 1641, and codified as Chapter 91 of the Massachusetts General Laws since 1866. Under Chapter 91, all activities proposed on tidelands (including historically-filled tidelands) must be for water-dependent uses or otherwise serve a proper public purpose, such as public access. Waterways Regulations, adopted in 1990, contain guidance and standards for licensing of development under Chapter 91. For proposed nonwater-dependent use projects, the regulations include specific standards establishing minimum waterfront setbacks and limitations on building height, lot coverages, and ground floor uses, all of which are meant to ensure that the public rights in tidelands are not unduly compromised.

In the early 1990s, the state's Coastal Zone Management Program issued a complementary set of regulations that enabled communities to prepare Municipal Harbor Plans to guide waterfront development. Municipalities can use these plans, with state approval, to modify certain standards of the Waterways Regulations to reflect local conditions and objectives. Municipal Harbor Plans thus provide a means to coordinate the waterfront policies, objectives and regulatory requirements of the state and municipality.

The City of Boston prepared a Municipal Harbor Plan for the South Boston waterfront in order to fully implement the vision set forth in the Seaport Public Realm Plan. Approximately 128 acres of the Seaport District lies on filled tidelands within the jurisdiction of Chapter 91, and creation of the new mixed-use neighborhood envisioned by the city required some modifications of the state's waterways standards.

As the Municipal Harbor Plan was being prepared, the prospective developers of Fan Pier (a 14-acre site within the Seaport District) submitted a proposal to build nine blocks of hotel, office, and residences on Fan Pier. This would be the largest waterfront project in Boston's history, with a value of over one billion dollars! This proposal sharpened the public debate over the appropriate use of the waterfront and how the public's interests and rights could be balanced with the desire for economic development.



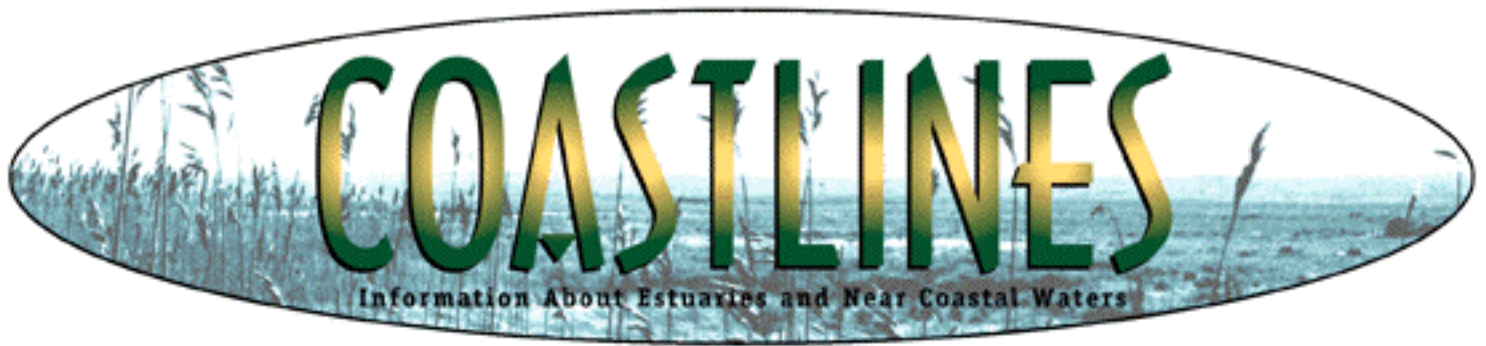
Key issues to be settled in the Municipal Harbor Plan were:

- Amount of public open space and access to the waterfront.
- Level and types of water-dependent uses to occur along the waterfront.
- Potential density of development, particularly design elements such as height, setbacks and coverage to minimize wind and shadow impacts.
- Inclusion of civic and cultural uses to attract the public and activate the waterfront throughout the year.
- Adequacy of transportation to support the proposed development.

The public debate over these issues intensified throughout the planning process and carried over into the "consultation" process for state approval of the plan conducted by the Secretary of Environmental Affairs. The Municipal Harbor Plan needed to strike the appropriate balance between the state's responsibility to protect the public interest in tidelands, the city's prerogative to determine its patterns of land use and economic growth, and the private landowners' property rights. To achieve this balance, the Secretary designed and mediated a public process whereby all parties progressively worked toward acceptable resolution of each issue. The final decision on the harbor plan reduces building heights, increases setbacks from the water, and preserves 56 percent of the total area as open space (11 acres), while embracing the original vision and framework for redevelopment put forth by the city in its Seaport Public Realm Plan.

The stage is now set for landowners to come forward with development plans for the district. While certain issues such as the demand for transportation need further attention, city planners, state regulators, and the public are now looking forward to the creation of a new waterfront neighborhood where the advantages and benefits of a Boston Harbor-front location are properly and equitably realized.

For further information contact, Jack Wiggin, Assistant Director, Urban Harbors Institute, University of Massachusetts Boston, 100 Morrissey Boulevard, Boston MA 02111, Phone: 617-287-5570, E-mail: [jwiggin@umb.edu](mailto:jwiggin@umb.edu).



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## **Fostering Collaboration The Corporate Wetlands Restoration Partnership**

Environmental restoration has found a significant new partner in the business of restoring wetlands. A collaborative initiative, the Corporate Wetlands Restoration Partnership program (CWRP), was recently established nationally under the auspices of Coastal America. Coastal America is an action-oriented, results-driven collaboration of federal government agency partners with the goal of restoring and preserving vital coastal ecosystems. The CRWP establishes private-public collaborations and pools resources to restore highly impacted, priority coastal wetland sites. Although it is still in its infancy, there has been tremendous interest in the program as indicated by the number of corporations that have joined the partnership. In fact, enthusiasm for the partnership has already led to plans for expansion of the program from coastal states to inland states. The new program aspires to assist the national goal of restoring 100,000 acres of wetlands and coastal regions annually by raising \$1 million for restoration in every state in the nation. This money can then be leveraged with Federal funding at a 3 to 1 ratio, potentially providing \$4 million in restoration funds for each state per year.

### **Background**

The partnership began in Massachusetts when the Gillette Company, working with the Massachusetts Executive Office of Environmental Affairs, Environmental Protection Agency Regional Office, and the head of the Army Corps New England Region, identified a common goal and a mutual problem. Many Federal programs require a 25 to 35 percent non-Federal contribution for every environmental restoration

project. As a result, many projects languished, because there was insufficient non-Federal matching funds. At the same time many companies like Gillette, who wish to improve and restore wetlands and coastal habitats near their facilities, have been ill-equipped to identify, prioritize, and adequately remediate potential projects. To that end, the Corporate Wetlands Restoration Partnership (CWRP) was officially launched in the fall of 1999 in Massachusetts and has quickly demonstrated its effectiveness. Under the leadership of The Gillette Company, an additional 20 companies and 25 Non-Government Organizations (NGOs; including academia) were recruited, and more than \$1 million in cash and in-kind services was raised within the first six months for restoration projects in Massachusetts. In addition, dozens of state environmental groups and local watershed associations contributed in-kind services, including technical support. In April 2000, work began to restore 50 acres of the Sagamore salt marsh on Cape Cod. Of the \$1.6 million estimated cost, the Massachusetts Executive Office of Environmental Affairs and the CWRP contributed \$500,000, and the Federal government contributed the remaining balance. Based on the success of the Massachusetts program, last year the CWRP expanded to the New England region in January and nationally in May.

## **Objectives & Involvement**

The objective of the CWRP is to pool private and public resources to effectively and efficiently stop and reverse the degradation of America's fresh and saltwater wetlands and other aquatic habitats. The CWRP is a voluntary public-private partnership in which corporations join forces with Federal and state agencies to restore wetlands and other aquatic habitats. The partnership also includes local communities, academia, and nonprofit organizations, including Ducks Unlimited and Restore America's Estuaries. The NGO partners have committed to help identify and prioritize projects, improve community buy-in and add volunteers to the process. The National Association of Manufacturers has enthusiastically signed on as a national sponsor, leading the drive to bring corporations around the country into the new partnership. The Gillette Company continues to take the lead in formulating the strategy and policy at the national level, and serves with Battelle, Ducks Unlimited, Duke Energy, ENSR, and Restore America's Estuaries on the CWRP National Advisory Council.

## **The Process**

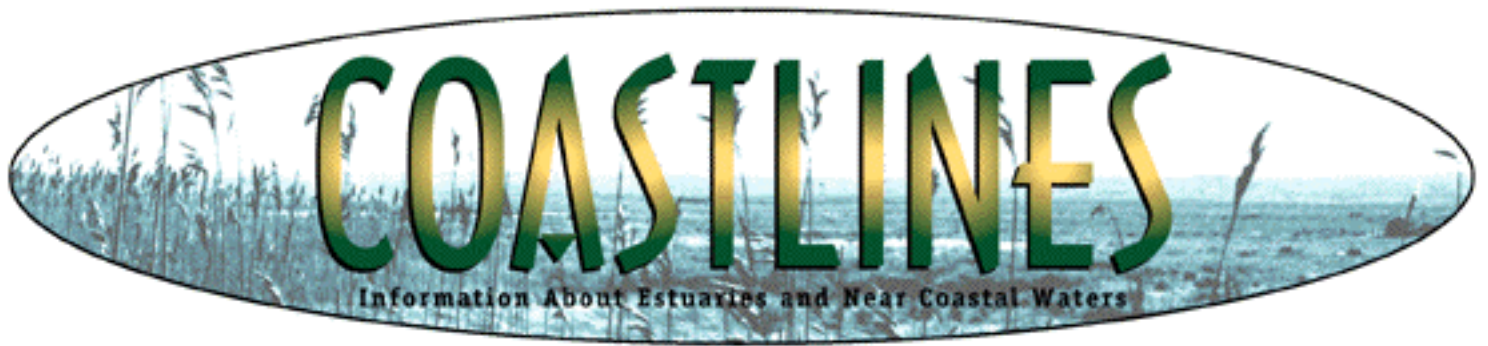
Under the CWRP, corporations contribute to a participating private foundation or state trust fund. These funds are used to support site-specific wetland or other aquatic habitat restoration projects and will usually be matched by federal dollars. The match will vary by project, but generally every CWRP dollar invested will result in up to four federal dollars of habitat improvement. Projects that receive funds from CWRP will be endorsed by Coastal America as priority habitat restoration projects, making them eligible for federal funding. These projects may include, but are not restricted to, wetland, estuary or salt marsh restoration; sea grass revegetation; beach, dune or reef restoration; or the removal of obsolete and unsafe dams.

The key aspect of this partnership is its flexibility. Corporate commitment to the CWRP may be in the form of financial or in-kind services. Financial contributions may be in any amount, thereby including

both large and small companies. In-kind services may include the donation of equipment, or the manpower associated with volunteering of a company's employees for a day. Companies may also choose to join the CWRP advisory council at a local, regional, or national level. The advantages of joining the advisory council include the ability to help prioritize projects of interest to the company and its community, as well as the potential to improve communication with Federal and state regulatory agencies to meet regulatory requirements. For the NGO community, the CWRP process is a chance to accelerate important restoration projects and to interact with senior government officials and with corporate decision makers.

## **Expansion of the CWRP**

The CWRP is currently concentrating on wetlands and coastal projects in need of restoration, or obsolete dams in need of removal, along the Atlantic Ocean, Pacific Ocean, Gulf of Mexico, and the Great Lakes. However, the CWRP could be extended inland to include all 50 states; initial strategy sessions are currently being held to accomplish this goal. There has also been interest among several corporate partners to expand the CWRP to Canada and Mexico, Europe, and Australia. Discussions on how to replicate the CWRP model abroad are underway. For further information, please contact the Coastal America, Coastal America Reporters Building, 300 7th Street, SW Suite 680, Washington, DC 20250; Phone: (202) 401-9928 or visit the Coastal America website at [www.coastalamerica.gov](http://www.coastalamerica.gov). [EXIT disclaimer ►](#)



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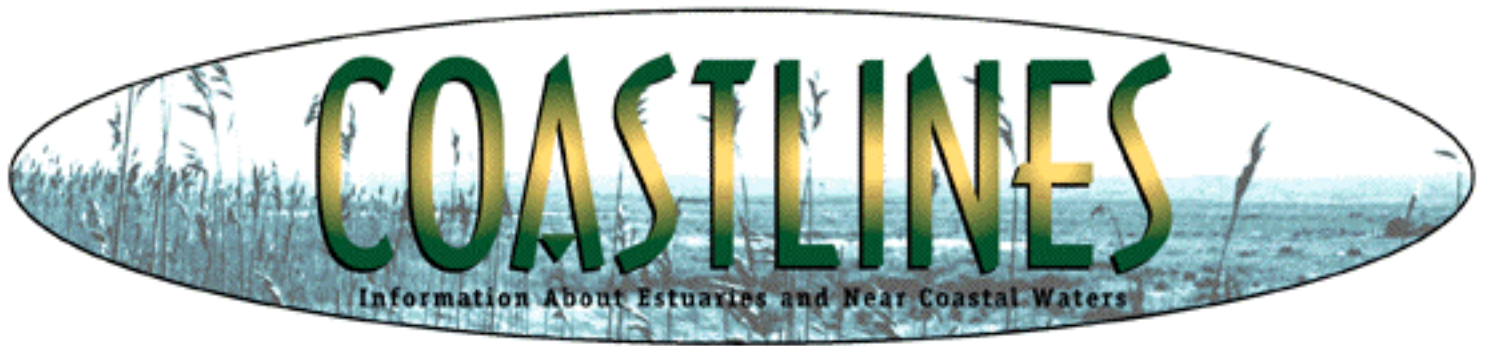
## **National Coastal Workshop Held at Rookery Bay**

Staff at Rookery Bay National Estuarine Research Reserve hosted the first gathering of stewardship coordinators from the National Estuarine Research Reserve system. Workshop attendees included a representative from the National Oceanic and Atmospheric Administration and representatives from 10 of the 25 reserves within the system, including Alabama, Florida, Maryland, Mississippi, New Hampshire, North Carolina, Oregon, Virginia and Washington. The goal of the workshop was to develop a nationally recognized plan for continued research and education that will address long-term management of coastal lands.

Another primary goal of the workshop was to establish a defined role for stewardship coordinators. Basic position descriptions for stewardship coordinators were developed, with emphasis on consistency throughout the Reserve system. Eventually a national stewardship coordinator position within NOAA's Estuarine Reserve division may be established. By addressing common goals at the national level, the participants hope to secure funds for stewardship activities at each reserve.

For further information, contact Renee Wilson, Rookery Bay National Estuarine Research Reserve, 300 Tower Road, Naples, Florida 34113-8059; Phone: (941) 417-6310.





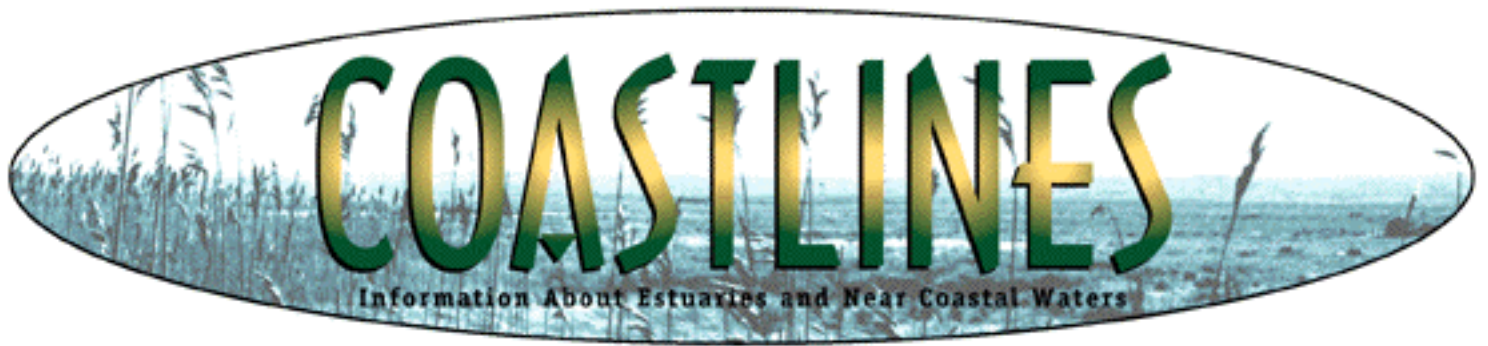
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## **NRDC Issues New Report on Stormwater Strategies**

The report entitled "Stormwater Strategies: Community Responses to Runoff Pollution" was recently released by the Natural Resource Defense Council (NRDC). This report identifies numerous tools and approaches already in use to control or prevent polluted stormwater runoff. The report highlights more than 150 examples of environmentally effective and economically advantageous stormwater strategies being employed by municipalities, developers, and community organizations across the nation. NRDC is working with local and regional organizations to bring this information to community leaders and interested citizens, and is available to provide presentations at meetings, workshops, or other events.

For further information, contact George Aponte Clarke, Phone: (212) 727-4413; E-mail: [gaclarke@nrdc.org](mailto:gaclarke@nrdc.org). Stormwater Strategies is available through NRDC's publications department; Phone: (212) 727-4486 for \$14.00 plus shipping and handling, or on the web at [www.nrdc.org](http://www.nrdc.org). [EXIT disclaimer ►](#)



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## **Excellent Websites!**

### **Best Nonpoint Source Documents from the U.S. Environmental Protection Agency**

This website will lead you to some of the best nonpoint source materials for both professionals and the public. The following major categories are highlighted on the site: agriculture, forestry, marinas, urban, stream restoration, nonpoint source monitoring, and funding. Visit the website at <http://www.epa.gov/owow/nps/bestnpsdocs.html>

### **The Clean Water Action Plan Coastal Research and Monitoring Strategy is Available Online!**

The Strategy presents a basic assessment of the Nation's coastal research and monitoring needs, and recommends an integrated framework to address the needs of the Nation and the coastal States and Tribes in order to protect vital coastal resources. <http://cleanwater.gov/coastalresearch/index.html>

### **Draft National Management Measures to Control Nonpoint Source Pollution from Marinas and Recreational Boating Online!**

This a draft technical guidance and reference document for use by State, local, and tribal managers in implementing nonpoint source pollution management programs. It contains information on the best available, economically achievable ways of reducing pollution of surface water runoff from marinas and recreational boating. <http://www.epa.gov/owow/nps/mmsp/index.html>

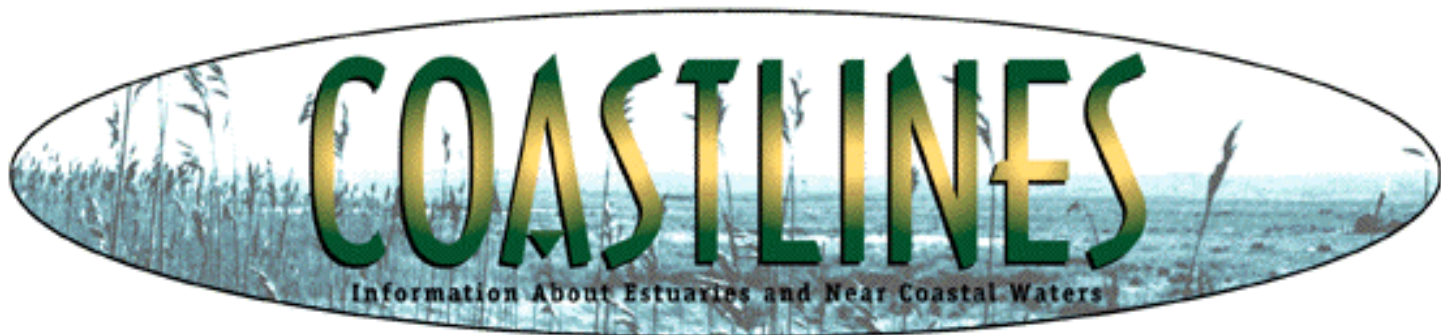
## **New Stormwater Resource Website!**

Visit the new Stormwater Manager's Resource Center website at [www.stormwatercenter.net](http://www.stormwatercenter.net). This new website, developed by the Center for Watershed Protection through a grant from the US EPA Office of Wastewater Management, includes a searchable stormwater library, 10 browsable slide shows, a manual builder, an ordinance selector, more than 50 different facts sheets on virtually every topic necessary for a community to implement Phase 1 or 2 stormwater requirements, and fully downloadable articles from The Practice of Watershed Protection.

## **New EPA Website for Asian Americans and Pacific Islanders**

EPA's new website on the Asian American and Pacific Islander (AAPI) Initiative is located at <http://www.epa.gov/aapi/>. The AAPI website was developed to increase the community's awareness of:

- Potential environmental and public health risks
- Ways for individuals and communities to get involved in protecting their local environment
- Economic opportunities, such as grants and contracts
- Educational opportunities such as internships and research fellowships
- Employment opportunities



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## **Restoring Seattle's Hometown River... The Duwamish**





One hundred fifty years ago, the White, Black (Cedar), and Green Rivers flowed together to form the Duwamish River. Tides flooded 5,300 acres of lush wetlands, and millions of salmon swam past Native



American longhouses near the mouth of the river.

Zoom ahead to the turn of the 21st century - the river has been dredged, straightened and diked, and at least 97 percent of the wetlands have been filled. In an effort to bring some of the biological vitality back to the river, numerous agencies and organizations have collaborated on nine small estuarine restoration projects.

Each of these restoration projects involved removing fill in salt marsh areas allowing tidal waters to return and encourage the growth of salt-tolerant vegetation. Some of the projects have been ongoing for as long as eight to ten years, while others are only a few years old. Measuring the long-term success of restoration projects is determined by monitoring the health of the vegetation, colonization of new species and whether non-native species have invaded.

Volunteers for the People for Puget Sound are attempting to assess restoration success through the Volunteer Salmon Habitat Restoration and Monitoring Project. The project is partly funded through the Puget Sound Water Quality Action Team's Public Involvement and Education (PIE) contract. The monitoring system was developed in cooperation with the Elliott Bay/Duwamish Restoration Program and is designed to provide one of the tools for their "Inter-tidal Habitat Projects Monitoring Program." People for Puget Sound has established a rigorous training program (with the help of the Native Plant Society) to ensure that the data collected by volunteers is of the highest quality.

Through this project, steadfast and well-trained volunteers monitor the health of these restored wetlands every month, and gather detailed vegetation data three times during the year. Surveys completed last summer have provided baselines for four of the projects, and People for Puget Sound plans to train more volunteers to cover the other five sites in 2001.


People for Puget Sound determines the sampling points randomly (using a Geographic Information System) in the project area. Volunteers take mobile equipment into the field to gather data on the vegetation including invasive species. Using the data, volunteers try to determine to what extent inter-tidal and riparian habitat is developing on the site. Plant vitality and diversity are used as indicators of the level of habitat function.

The data are displayed on the World Wide Web for students, teachers and citizens to access and is also sent to various project managers each year, along with recommendations for maintenance and enhancement projects. In this way, the program provides information feedback that allows for adaptive management of these projects.

Dedicated volunteer stewards have much to do with the success of restoring these marshes. In addition to monitoring, volunteers help to maintain the plantings and remove the debris and trash that may accumulate. Volunteers are making a difference in restoring Seattle's hometown river.

As for the salmon, in 1999, more than 600 juvenile chum salmon were counted in a restored saltmarsh near the mouth of the Duwamish. On Earth Day 2000, People for Puget Sound volunteers paused from their planting project at the mouth of Hamm Creek to watch juvenile salmon swim into the newly restored

estuary.

For more information, contact Rachel Schofield, People for Puget Sound, 1402 Third Avenue, Suite 1200, Seattle, WA 98101, Phone: (206) 382-7007, Fax: (206) 382-7006, Email: [rschofield@pugetsound.org](mailto:rschofield@pugetsound.org), or go to the website at [www.pugetsound.org](http://www.pugetsound.org) 

Last summer, People for Puget Sound made some dramatic revisions to the Shoreline Inventory, a process that gathers detailed data on key stretches of Puget Sound shoreline. The new system brings volunteers together for an intense day of data gathering at low tide; the result is a complete data set for a specific stretch of beach. The data provide a baseline for resource managers and can be used to target conservation or restoration efforts or to help guide management decisions. For information on training sessions, contact Rachel Schofield at (206) 382-7007 or [rschofield@pugetsound.org](mailto:rschofield@pugetsound.org).

[Article appeared in the Winter 2001 issue of "Sound Waves," a quarterly newsletter of the Puget Sound Water Quality Action Team.]

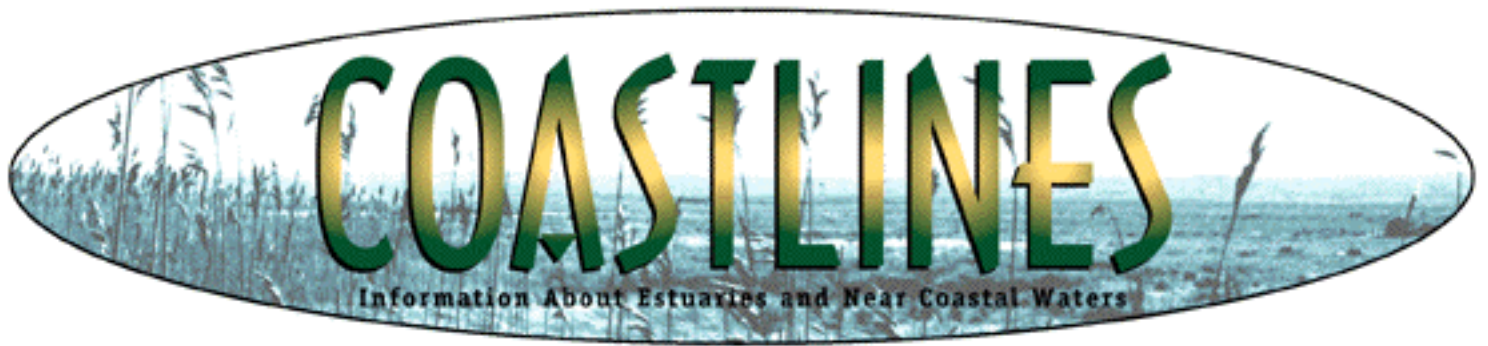


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## **Center for Marine Conservation's Report on the Health of America's Oceans**

The Center for Marine Conservation (CMC) has issued its first report to the nation on the health of America's oceans. The comprehensive report is intended to provide baseline information on the condition of our oceans. It also provides a set of health indicators, one in each of the four key areas covered in the report -- Clean Oceans, Marine Wildlife, Fish and Fisheries, and Ocean Ecosystems. Each chapter outlines steps that federal, state and local governments can take to improve the ocean's health. The report is available at <http://www.cmc-ocean.org> [EXIT disclaimer ►](#)



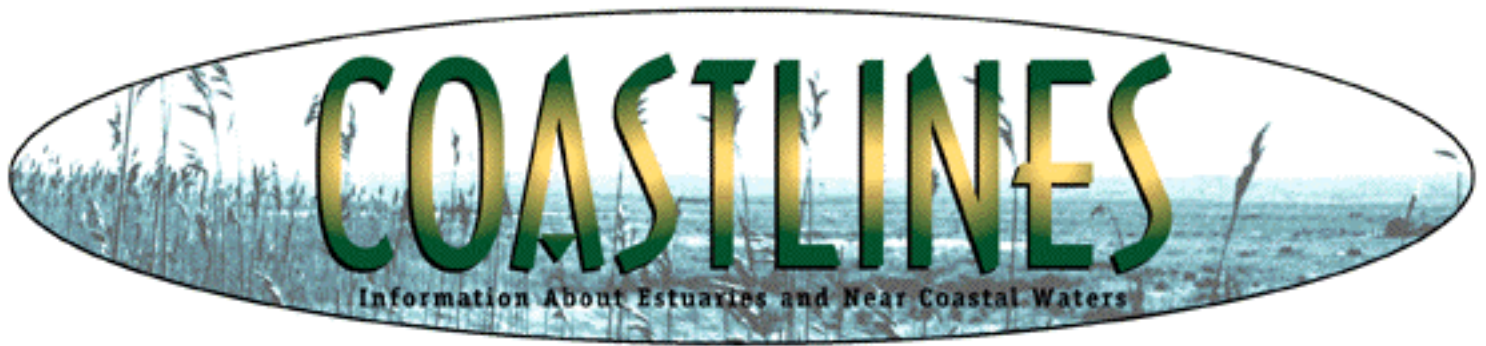
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## **National Water Quality Report Available**

On June 28, 2000, EPA released the 1998 305(b) Water Quality Inventory Report. The report shows that 40% of the nation's assessed waterways remain too polluted for fishing and swimming. Runoff from agricultural lands and urban areas remains the primary source of the leading pollutants: sediment, bacteria, phosphorus, nitrogen, and metals. The report is available at

<http://www.epa.gov/305b/98report/index.html>



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## **Estuary Bill Passes**

What began as a bill of marginal importance to National Estuary Programs became the major vehicle for addressing issues of NEP funding and reauthorization. S. 835, The Estuaries and Clean Waters Act of 2000, was introduced in early 1999 and was originally sponsored by the late Senator John H. Chaffee of Rhode Island and co-sponsored by John Kerry of Massachusetts. This bill became the vehicle for the passage of elements in 5 other estuary-related bills, including a bill to reauthorize the National Estuary Program. The primary purpose of this bill is "to encourage the restoration of estuary habitat through more efficient project financing and enhanced coordination of Federal and non-Federal restoration programs, and for other purposes."

Among those "other purposes" included in amendments in the fall of 1999 are the reauthorization of the National Estuary Program and the authorization of additional funding for implementation. The legislation is relevant to the National Estuary Program in several ways. It increases the authorization for the NEP program through 2005, allows federal funds to be used to help implement management plans, and increases the non-federal match requirement for receiving federal funds. The legislation will also restore one million acres of estuary habitat over the next 13 years, effectively leveraging limited federal resources by matching them with local funding.

Reprinted from the Buzzard's Bay and Save the Bay Legislative Updates