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Information About Estuaries and Near Coastal Waters August 1999 - Issue 9.4

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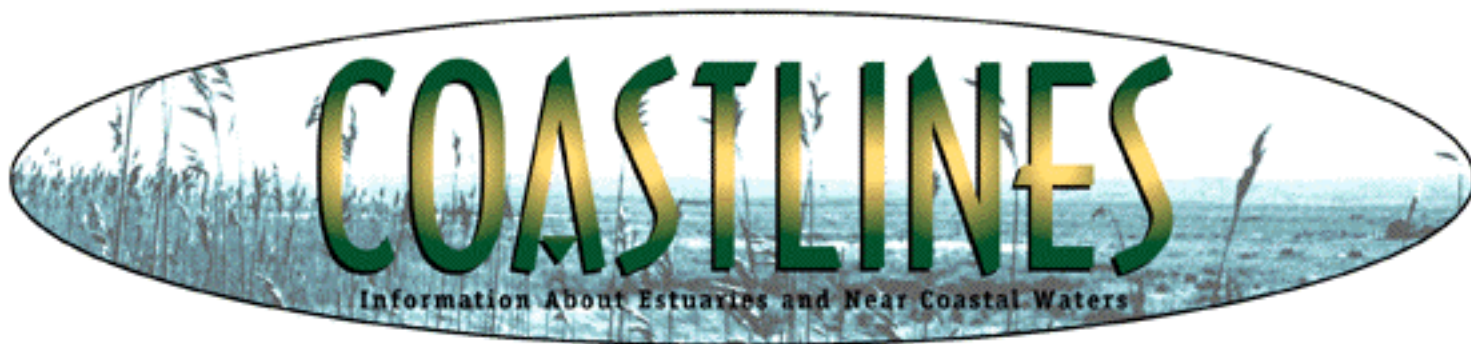
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Green Ports Report



The earliest settlements in the world were established primarily around port areas, forming an integral and vital sector of a region's economy—most often the driving force. Over time, urbanization, enhanced development, and commercialization have shifted the nature of port activity, changing the face of today's modern port. In the past, port development and operations often resulted in considerable alteration of and damage to the natural environment. Today, ports are increasingly more streamlined and conscious of the stewardship role they play over natural resources in coastal areas. At the same time, the economic benefits they afford continue to uphold modern ports as essential components of many urban harbor environments.

US ports, in particular, are experiencing an extensive shift in activity that is gradually changing the way ports are operated, what they are used for, and the way they are perceived. The nature of the changeover is readily observable. Smaller ports, for example, have been forced to concede that because of technological changes in the way cargo is transported and increased costs associated with port operations, they can no longer compete with larger ports situated in more geographically advantageous regions. Declining fish stocks, in addition, have greatly reduced the number and size of fishing fleets, in turn reducing the demand for support services. While inevitably, some small ports will not survive this period of change, others are experiencing a shift away from marine industrial activity toward more

commercial water-dependent activities such as whale watching, sport fishing, and increased recreational boating and waterborne transportation. Larger ports, on the other hand, are finding it necessary to consolidate and expand to meet the demands placed upon them by this dynamic shift. Both small and large port operations have also experienced significant deleterious environmental impacts as a result of past shipping, industrial, and military activities.

Public perception, environmental considerations, and economic factors have altered the definition of what a port can and should be. It is not surprising that during this time of reevaluation, consolidation, expansion, and more stringent environmental regulations, ports are facing up to their responsibility to cleanup the environment for ecological reasons, to improve the aesthetics of the waterfront for landside recreational activity and increased safety, and to take further advantage of the waterfront for proprietary commercial gain-often at a great expense. Many ports and port authorities have begun taking aggressive steps to remediate toxic areas in ports and prevent future incidences of pollution by adopting environmentally sound technologies and best management practices that allow for continued economic development of the port while minimizing the negative impacts to the environment and surrounding communities.

The Green Ports report-a compendium of research on ports conducted by the Urban Harbors Institute at the University of Massachusetts Boston under a grant from the US EPA-is a first attempt at tracking the various types of innovative and cost effective management, technical measures, and activities US ports are practicing to meet changing demands. The main goal of the study is to evaluate and compile environmental management efforts that have been employed with proven results in US ports, highlighting those that extend beyond compliance with regulatory requirements or legal injunctions.

Initially, over 120 sea ports, river ports and inland ports were surveyed. Those projects that passed the preliminary screening criteria were explored further. The common problems confronting ports were classified into thirteen issue areas, reflecting a wide range of environmental impacts: air quality, brownfields redevelopment, community impact, comprehensive environmental management, contaminated sediments, dredge disposal, endangered species, landscaping, wetland and other habitat restoration, oil spill response, regulatory compliance, solid waste management, and water quality. The case studies appearing in the report were selected based on (1) innovation and the use of uncommon technology or operational procedure, (2) dependence on response to legal or regulatory standards, (3) range of transferability and applicability to other ports, (4) the size of the port and its institutional capacity, (5) the gravity and ubiquitousness of the problem addressed, (6) the significance and breadth of benefits realized, (7) its effectiveness and if they produced any measurable results, and (8) the port's willingness to participate in this study.

The Green Ports report is a testament that significant advances in environmental port management have been made. However, complications continue to persist as each port struggles to find the most cost effective and appropriate strategies for dealing with the environmental impacts of its operations. By facilitating and maximizing the exchange of information on environmental issues successfully addressed by a US port, the Green Ports report is intended to provide guidance as ports endeavor simultaneously to boost business and improve the environment.

For further information, or to obtain a copy of the report, contact Chantal Levebre at the Urban Harbors Institute, at (617) 287-5570.

Air Quality Case Study: Bromosorb System, Port of San Diego, CA

The Port of San Diego imports a large amount of fruit from foreign countries, which as required by law must be quarantined and fumigated at the port with methyl bromide prior to distribution. Methyl bromide is effective at eliminating insects, rodents, bacteria, fungi, weeds, and parasitic microorganisms that might accompany fruit cargo during importation. While there are apparent human and environmental health benefits in the application of methyl bromide, there are also detriments. First, methyl bromide is believed to be a health risk to children living in neighborhoods adjacent to the port's cold storage facility. Second, it is a halon substance that adversely affects stratospheric ozone by converting it to oxygen and diminishing the layer's ability to shield the earth's surface from harmful ultraviolet radiation.

Methyl bromide is an ozone-depleting pesticide according to the Montreal Protocol (1987), and the Clean Air Act classifies methyl bromide as a Class I ozone-depleting hazardous air pollutant (HAP) and mandates a complete phase-out of its production and application by the year 2005. Currently no other chemical has been approved for use as a fruit fumigant by USDA. With this reality in mind, the port managers set-out to modify their fumigation practices and devise a system that would (1) capture 95 percent of the methyl bromide released during fumigation, (2) capture it in such a way that it remains 100 percent pure and can be reused in future fumigations, (3) eliminate hazardous waste, and (4) would not require extensive time periods to receive regulatory approvals.

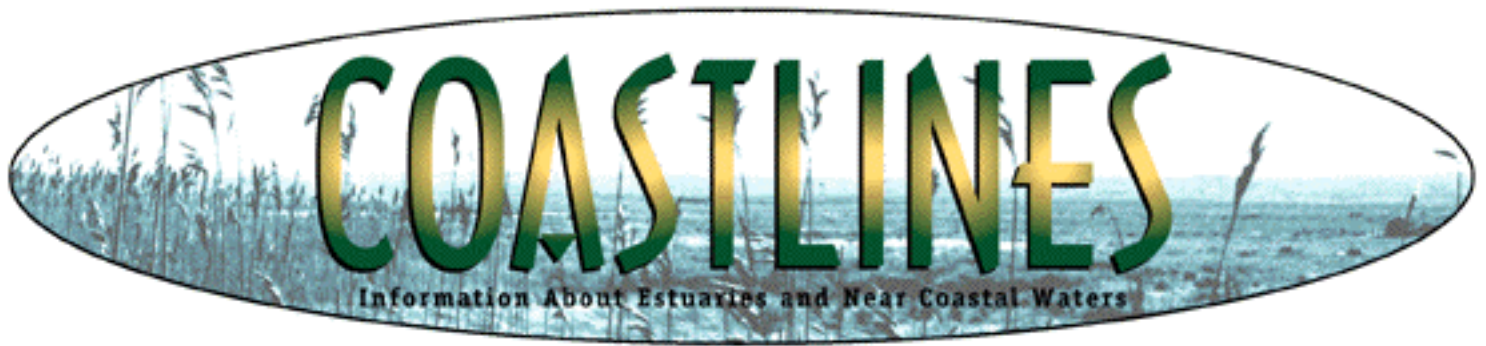
After considering a wide array of alternative technologies such as irradiation, nitrogen and carbon dioxide controlled atmospheres, ozone disinfection, carbon adsorption/desorption systems, and wet and dry destructive methods, the port managers selected the Bromosorb, an emissions capture system, that uses zeolite as the substrate for recapture. Zeolite is a unique mineral that is available in both naturally occurring and man-made synthetic forms. The crystalline structure of zeolite is defined by large cavities and channels that can hold cations (positively charged ions), water, and other molecules—behaving almost like a sponge. Zeolites can capture these substances either through adsorption or cation exchange, and can be easily regenerated and the sorbed materials easily removed through heating or through ion exchange with sodium. This property of Zeolites makes them ideal for removing harmful and polluting



elements from water, air, or soil. Zeolites are also federally classified as GRAS (Generally Recognized As Safe) in most applications, USDA-approved as an absorbent in food processing, and compliant with EPA regulations.

While the properties of zeolite enable clean and effective capture of methyl bromide, the economic benefits are also readily visible. USDA estimates that the economic loss in the agriculture industry resulting from the discontinued use of methyl bromide, mandated by EPA, could amount to as much as \$1.5 billion per year. However, with this new technology, ozone-depleting emissions from methyl bromide could be reduced from 20 tons to one ton per year, perhaps eliminating the need for the removal of methyl bromide in all agriculture applications.





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Streamlining the Aquatic/Wetland Permitting Process in the San Francisco Bay Area - JARPA



As is common throughout the country, in the San Francisco Bay area many governmental agencies are mandated to safeguard our aquatic environment. Each has their own permitting process, with their own time lines and requirements. Many people have been frustrated by the complicated, lengthy, and sometimes contradictory permits required in order to get work done on or near a waterbody. The Joint Aquatic Resource Permit Application (JARPA) has been developed to

streamline permitting for work in or near wetlands or water in the San Francisco Bay area.

The San Francisco Estuary Project and the Association of Bay Area Governments have been working with federal and state agencies since August, 1998, to develop a single permit application that will serve the needs of the regulatory agencies and simplify the process for applicants. Benefits of permit streamlining include:

- Reduction in paperwork and processing time - multiple applications are combined into a single form, resulting in reduced costs, frustration, confusion and delays for project applicants;
- Improvement in information received by government agencies - every agency reviews the same project description, site plans, maps, etc., with consistent details provided from the beginning;
- Reduction in revisions and increased coordination among agencies - because all

permitting agencies receive consistent information at the same time, early and ongoing coordination on projects is possible, reducing the need for permit revisions;

- Reduction in the number of violations - JARPA's single set of instructions advise applicants on which permits are needed for their particular project, resulting in fewer omissions and violations; and
- Improved environmental protection. Relevant permitting agencies can better coordinate protection of natural resources and oversight of projects.

Nearly everyone involved in aquatic permitting in the San Francisco Bay area agrees that the system now in use is clumsy and inadequate. Even with all the stringent rules and regulations, there are still gaps and overlaps in jurisdiction, which cause frustration among applicants; as a result, some projects may be undertaken without obtaining all the necessary permits. For example, during an especially heavy rainy season, a road failed near a creek. During the emergency road repair, proper permits were not obtained due to lack of information and a breakdown in communication among agencies. The creek was badly damaged during the critical migration time for an endangered species of fish, and the public's opinion of government agencies protecting the environment was greatly diminished. With a streamlined permit application, the local public works agency would have been referred automatically to all involved agencies at the beginning, before the start of repair work. Issues such as critical habitat would have been brought to the applicants' attention early. The prospect for successful road repair with minimal impact to the aquatic habitat would have been greatly increased.

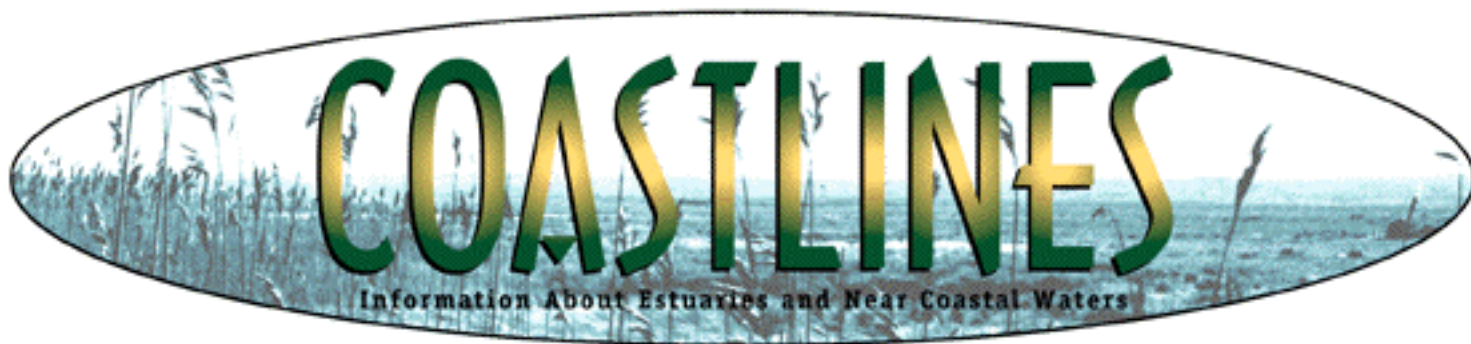
Applicants, (those proposing work along streams, wetlands and other waterbodies), will fill out only one application form for all necessary permits. An instruction sheet will provide information on the permits covered by JARPA, with a checklist for applicants to apply for the permits needed, and other instructions. In addition, we are working with local agencies to include information on Best Management Practices (BMPs) for work in and around aquatic environments.

An important part of our effort is working with the permitting agencies to agree on the application itself. Given the different areas of jurisdiction of the many agencies and their various permitting and information requirements, it has been challenging to develop a document that will be acceptable to all the agencies, and serve the public as well. For example, the California Department of Fish and Game oversees aquatic habitat and endangered species, the Coastal Commission is concerned with public access issues, the State Water Resources Control Board is charged with protecting water quality, and the Army Corps of Engineers regulates work on navigable waters and dredging of wetlands. Combining the mandated permit requirements into a single, easily read document requires many hours of work. However, the agencies have been supportive of the process and have been working closely on specific language that will address all needs.

The next steps include fine-tuning the application itself, testing it on pilot projects, surveying project applicants and agencies to judge the success of the document, and readying it for general use. The San Francisco Estuary Project will hold workshops to train local agencies on the use of the application and the instruction sheet, and suggestions for improvement of the form will be sought. Providing educational outreach is important in order to gain widespread support for this streamlined permit application.

The San Francisco Bay Area's JARPA project is modeled on a similar project in Washington State, developed by the Washington Department of Ecology. Their project has been in operation for the past four years and has been highly successful. Hundreds of small projects, single family docks, bulkheads, wetland alterations, and several larger projects, such as an airport runway, gold mining project, and a large bridge crossing--have used the State of Washington's JARPA process. The San Francisco Estuary Project is confident that similar success will occur as the JARPA process is implemented in the San Francisco region.

For further information, contact Carol Thornton, San Francisco Estuary Project, 1515 Clay Street, Suite 140, Oakland, CA 94612-1413; Phone: (510) 622-2419 or E-mail: ct@rb2.swrcb.ca.gov



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Local Government and the Takings Issue: How Far Can Government Go in Regulating Private Property?

Public officials face tough issues with respect to their ability to regulate private property. Topping the list is confusion over the circumstances under which government can regulate private property and the extent to which private property can thus be controlled.

This article presents a brief summary of the facts concerning regulation of private property. A few notes of caution, however. First, local government power is derived from individual states and their own constitutions and statutes. Thus, a local government in Texas is likely to have very different powers and limitations than does a city in California. Despite these differences, however, generalizations can be made, based on federal law, as to the limits to local government power.

Second, court interpretation of "takings law" as discussed in this article is ever evolving, thus making it impossible to present absolute and concrete rules for local officials. However, as discussed below, there are a sufficient number of so-called "bright-line" tests for determining whether a local government has exceeded permissible authority

Please note that this article is for general information purposes only. Local officials are encouraged to request specific advice on the takings issue from their local counsel.

Physical and Regulatory Takings of Private Property

Citizens own land with the understanding that laws and regulations made for the common good may restrict its use and diminish its market value. If, however, a land use regulation "goes too far," its effect may be equivalent to a physical taking, and the government must compensate the landowner. The underlying issue in any regulatory takings case is, whether the regulations are so burdensome that the cost should be paid by society instead of imposed on the landowner.

It is important to differentiate between a "physical taking" and a "regulatory taking," although both acts require governments to justly compensate the landowner. A physical taking occurs when an authorized government agency uses its eminent domain powers to take-possession of--private property for a public use. The authority to take private property for public use is derived from the federal and most state constitutions. Government is limited to takings for public uses and is required to pay compensation to the landowner.

A regulatory taking is distinguished from a physical taking in that a regulatory taking occurs when government uses its ability to regulate private property but "goes too far." While the regulation may be reasonable in its purpose, as applied to an individual's land, the regulation, in effect, serves the same purpose as if government had taken the property. In other words, although not intended, the application of the regulation so reduces the landowner's property value, that the net result is akin to a physical taking. As with a physical taking, when government renders private property essentially valueless through the enforcement of regulations, compensation is due to the landowner.

Rational Relationship to Legitimate Government Purpose

Underlying all land use control regulations is the requirement that the regulation be designed to protect public health, public safety and/or public welfare.

In order to meet this highly deferential, "fuzzy" standard, local officials need to convince a court that "it could rationally conclude" that the regulation would achieve its purpose. The standard is one of reasonableness. Included within the standard is the requirement that the government conduct a study or analysis prior to enacting regulations. The burden on local government is to ensure that its regulations are reasonable in both their adoption (e.g. procedural due process) and application.

Mandated Public Access: Equivalent to Physical Takings

Although "physical invasion" may be a *per se* taking, governments may still bargain for physical access as part of the permitting process. Courts will scrutinize the relationship between the exaction and the impact(s) created by the permitted activity. For example, a permit condition requiring physical access across a landowner's beach was found to have insufficient connection with the loss of visual access caused by their expanded beach house. Local governments should focus on the following two questions:

- what are the impacts of the permitted activity, and

- how will the permit condition serve to prevent or minimize the impact?

This analysis must consider quantity as well as quality. For example, an access exaction must be "roughly proportional" to the impacts of the permitted activity. Thus, where a city sought to condition permission for a business expansion on the dedication of a bike path, the city must show what increase in traffic would be expected.

The Nuisance Exception to a Government Taking

There is one narrow, but potentially very important, exception to the rule that takings must be compensated. If the activity being prohibited would be a nuisance, under established principles of state law, then no compensation will be required. All landowners own their land subject to the condition that they not use it in a way which will harm other landowners or the public. The law of the various states provides a procedure by which damaged neighbors, or a representative of the state, may seek a court order to "abate a nuisance." Because a landowner has no right to misuse his or her property in this way, nothing is taken when the misuse is forbidden.

Note that this test looks to established law and is a very narrow exception to the requirement that physical invasions require compensation. A local government cannot simply redefine what constitutes a nuisance simply to avoid liability for a taking. If, however, a local government is faced with a genuinely serious health and safety issue, such as a direct threat to their groundwater, surface waters, or coastal waters the concept of nuisance remains available.

Conclusion:

The rapidly developing law of regulatory takings poses a major challenge to local governments. The risk of liability can be reduced if governments can:

- identify and purchase extraordinarily sensitive land;
- avoid sudden changes or hasty re-zonings which defeat legitimate investment backed expectations;
- use flexible planning and zoning techniques to enable landowners to make the best use of their parcels consistent with environmental protection;
- clearly identify the impacts of proposed development, and the reasons why proposed regulation, dedications or exactions will serve to mitigate the problem; and
- identify hard-core health and safety risks of the kind which come within the existing definition of nuisance.

For further information, contact Jon Witten, AICP, Esq., Horsley & Witten, Inc. 90 Rt. 6A, Sandwich, MA 02563; Phone: (508)833-6600 or E-mail: jwitten@horsleywitten.com



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Environmental Economics in Estuary Management: The Peconic Estuary Program

Coastal environments provide many amenities that make them popular places to live, work, and play. Yet development can lead to degradation of the very same natural assets that attract people to coastal areas in the first place. Located on the east end of Long Island, the Peconic estuary system comprises more than 100,000 acres, with over 100 distinct bays, harbors, rivers and tributaries (see map). The



The Peconic estuary system is a natural asset, with generally high water quality that provides the public with many important benefits. However, rapid development of the surrounding area threatens water quality and other important resources.

The Peconic Estuary Program, part of the National Estuary Program, is an alliance of federal, state and

local interests working to develop a Comprehensive Conservation and Management Plan (CCMP) to restore, protect and maintain the natural resources in the Peconic estuary system. Because limited budgets do not allow all environmental problems to be addressed, priorities must be established that are based, at least in part, upon obtaining the greatest public benefit for a given budget. Applying environmental economic principles to natural resource assessment can help to prioritize management issues.

Project Description

Members of the Department of Environmental and Natural Resource Economics at the University of Rhode Island have completed an assessment of the economic value of the Peconic estuary in order to assist coastal managers in prioritizing work. The project consisted of three phases: 1) identifying estuarine-dependent economic sectors and their impacts on the local economy; 2) evaluating non-market values of natural amenities; and 3) prioritization of policy options for the CCMP.

Phase I

A total of 29 estuarine-dependent sectors were identified in Phase I. Estuarine-dependent sectors are those areas of the economy that are supported by services or products attributed to the estuary. For Peconic bay, these included over 1,010 establishments which employ more than 7,000 people, pay wages in excess of \$117 million and have total annual revenues of over \$400 million. Overall, estuarine-dependent economic activity conservatively accounted for a minimum of 20% of the local economy. As a group, tourism and recreation establishments dominate and comprise over 80% of the identified estuarine-dependent economic activity.

Phase II

Phase II studies focussed on assessing non-market values of natural amenities, and recreational services. Included were a recreation study, a resource valuation analysis, a property value study and a wetland productivity analysis. The term non-market value refers to those services or products that do not readily have a dollar value associated with them. They are based upon the value society places upon them, but are somewhat more intangible than bought and sold on the markets.

The recreation study was based on a survey which asked respondents about their recreational activities on the east end of Long Island, the area surrounding the estuary. From the survey it was estimated that a total of 8.4 million recreation days occur each year on the east end. Swimming was the single largest activity, with an estimated 2.4 million recreation days, followed closely by bird and wildlife viewing (2.3 million). In dollar terms, preliminary estimates of these recreational uses are \$12.1 million for swimming, \$18.0 million for boating, \$23.4 million for fishing and \$27.3 million for bird watching.

How recreational values are affected by environmental quality can provide important information to coastal managers for prioritizing policy initiatives. Changes in water quality due to a policy initiative, such as upgrading a sewage treatment plant, can lead to an increase in value of recreational activities. The results of this study indicated that \$1.3 million in annual benefits to recreational swimming could result

from a 10% improvement throughout the estuary in all water quality parameters considered (nitrogen concentrations, coliform counts, brown tide cell counts and water clarity).

The resource survey identified public priorities for preserving or enhancing local natural resources (farmland, open space, salt marsh, eelgrass and unpolluted shellfish areas). Two factors were considered, public values for general levels of amenities provided for the Peconic area as a whole and values of resources to people living immediately adjacent to natural resources. For example, the public has high values for farmland as an amenity for the Peconic region as a whole. However, living immediately adjacent to a farm was found to be undesirable, perhaps due to odors from fertilizers or threats of contaminating wells with agricultural chemicals. In contrast, parks or conservation areas provide open space amenities to the region as a whole, and also provide additional benefit to those living in the immediate vicinity.

A property value model was used to quantify benefits to residents living in the immediate vicinity of amenities. The idea is that the premium paid for houses in the immediate vicinity of an amenity indicates a willingness to pay to live near the amenity, and is a measure of benefits received by those living nearby. Results indicated that adjacent parkland adds to the value of a house, while adjacent farmland detracts from the value of houses.

Finally, a wetland productivity study was conducted, which views wetlands as assets that provide various benefits valued by society, such as providing habitat for fish, birds and other biota. Wetland productivity values ranged from \$600 per acre for mud flats and \$3,300 per acre for salt marsh to \$9,800 per acre for eelgrass.

Phase III

The goal of the last phase of the project is to use the estimates of uses and values to analyze policies for the CCMP. Integration of the economic analysis into policy actions involves several steps, including identifying resource preservation and restoration actions, determining the costs of programs to implement these actions, using the results from the first two portions of the study to identify benefits of the programs, and identifying and evaluating alternatives for financing programs. It is anticipated that this final phase of the project will be completed by the end of the year.

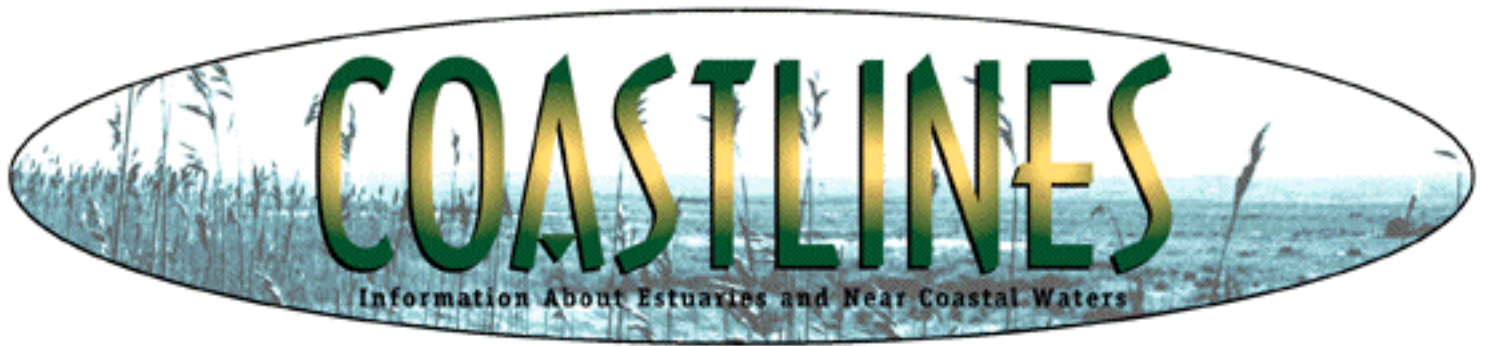
Conclusion



Financing is an especially challenging task, as the public increasingly rejects the notion of raising taxes as a quick fix to fund programs. More creative ways of financing management actions must be developed. Possible examples include charging those who create problems, using the "polluter pays principle," or charging those who benefit from a policy action through user fees. Spending of public funds for research and management is under increased scrutiny. Agencies must demonstrate that expenditures of public funds achieve goals that benefit the public. Applying resource economic analysis methods is one way to demonstrate benefits and

costs of managing the resource.

For further information, contact James J. Opaluch, University of Rhode Island, Narragansett, RI; Phone: (401) 874-4590 or E-mail: jimo@uri.edu



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Clear Creek Wetland Restoration Project

Galveston Bay Estuary Program

Characteristics

Galveston Bay covers 600 square miles of water surface and averages six to twelve feet in depth. The watershed covers 39,337 square miles, incorporating the Houston-Galveston area and the Dallas-Fort Worth metroplex. Half the population of the state of Texas lives in the watershed and has a potential impact on the bay! The lower watershed, the study area for the Galveston Bay Estuary Program, is defined as the 4,238 square mile area downstream of two major impoundments: Lake Houston on the San Jacinto River and Lake Livingston on the Trinity River. The sprawling city of Houston, with its associated urban communities, occupies the western side of the bay, while the eastern side remains largely agricultural and undeveloped.



Galveston Bay has been a critical resource throughout history for food supply transportation, oil and gas production, and recreation. The surrounding watershed contains urban development, petroleum and petrochemical production, and agricultural uses. Galveston Bay shares many problems with other estuaries of a similar stature, chiefly in the increasing demands placed on its resources because of an expanding population and its associated development.

The Problem



Vital Galveston Bay habitats have been lost or reduced over time, threatening the bay's future sustained productivity. Over the past 50 years, Galveston Bay has lost some 35,000 acres of vegetated wetlands. The five main causes for wetland losses have been identified as: subsidence and associated sea level rise; erosion; direct conversion of land for agricultural, urban, industrial, and transportation uses; dredge and fill activities; and isolation projects, in which shoreline areas have been artificially cut off from the bay system.

The Project

A successful partnership between the Galveston Bay Estuary Program, Reliant Energy, the Natural Resource Conservation Service, U.S. Fish & Wildlife Service, Novus Systems, Inc., and Padgett Shoreline, Inc., has produced one of the most innovative wetland restoration projects in the country. Some twelve acres of intertidal wetlands were restored along Clear Creek in Galveston Bay, Texas. Salt

marsh was restored by using dredged material to fill a subsided area to the necessary elevation for emergent marsh grasses to grow and thrive. Smooth cordgrass (*Spartina alterniflora*) seeds were distributed by airboat, and within six months the project had resulted in one of the most successful restorations of its kind.

Introduction to Galveston Bay

Galveston Bay is situated on the Texas Gulf Coast in the Houston-Galveston Metropolitan complex. It is home to a variety of human activities:

- The Houston-Gulf Coast Region accounts for almost half of the nation's basic petrochemicals manufacturing capacity and over one-third of the nation's petroleum refining.
- Ten thousand recreational vessels are registered in the Galveston Bay area, the third largest concentration of pleasure boats in the U.S.
- The Port of Houston is the second largest in the U.S. and eighth largest in the world in tonnage, generating \$5.5 billion in annual revenues.
- Four million people live in the immediate watershed.

Coupled with all of this human activity, Galveston Bay continues to be a productive ecosystem that provides many economic benefits to the state, including:

- Habitat for seventy-five percent of North America's bird species;
- Two-thirds of the state's oysters, one-third of the state's shrimp, and one-fourth of the state's blue crabs;
- \$5 billion dollars per year in tourist dollars spent in the immediate watershed;
- \$1 billion annually from recreational fishing; and
- Nursery grounds, critical to some 90% of the commercially harvested seafood species in the Gulf of Mexico.

The value of Galveston Bay is unquestionable, as is the need for developing innovative projects to serve as models for bay protection and restoration.

Overview of the Project



The goal of this project was to develop a partnership that could provide an example of how to use dredged material and innovative seeding techniques to restore wetlands around Galveston Bay. The wetland restoration site is located along Clear Creek, in the Galveston Bay watershed south of Houston. A utility company, local businesses, agencies and conservation groups working together sought to restore approximately twelve acres of intertidal vegetated wetlands in Galveston Bay. The joint project benefited all involved: the utility company realized benefits

from lower dredge material disposal costs; the agencies tested innovative seeding techniques; and the conservation groups realized the increased habitat for birds. Many areas in the Galveston Bay have experienced wetland losses, but it is hoped that these successful innovative partnerships and techniques will serve as a model for restoration elsewhere in the watershed, as well as in other coastal areas nationally.

Project Objectives

The primary goal for the year 1998 was to develop a project to demonstrate the beneficial uses of dredged material in wetland restoration in Galveston Bay. The following objectives were outlined:

- Restore a wetland area using dredged material;
- Test innovative seeding procedures that allow seeding in a very loose substrate;
- Provide a model for other dredging projects needing to dispose of dredged material in a cost effective way, that also benefits the environment;
- Form a partnership of agencies, industries and environmental interest groups to serve as a model for similar efforts throughout the bay.



Implementing the Project

Site selection was key to a successful project. Fortunately, the site was adjacent to a willing project partner--Reliant Energy. The company provided a biologist for project coordination and was already planning maintenance dredging at their intake canal. The site chosen was a deep water embayment where subsidence had taken its toll years ago. A healthy marsh had once filled the now open water area. Additionally, the embayment site was optimized, with the construction of a levee that separated the site from the main flow of the creek, allowing for the fill material to be contained.

The first step was construction of a 2,600 foot long containment levee, along Clear Creek. Following

completion of the levee, one gallon containers of smooth cordgrass (*Spartina alterniflora*) were planted on the outside of the levee to help control erosion. A brush fence was also built to protect the levee from wave action. Two water control structures were installed (one at each end of the containment levee) to facilitate dewatering of the dredged material.

Once the site had been prepared, dredged material from the Webster Generating Station's intake canal was pumped over land, through a pipe, and into the contained subsided area. A total of 25,000 cubic yards of material was removed from the canal to fill the project site. For eight weeks, the sediment was allowed to consolidate. The sediment raised the elevation of the submerged land to a level where wetland plants could once again thrive.



Following dewatering, seeding took place in February of 1998 by an airboat provided by the U.S. Fish & Wildlife Service. A total of 30 pounds of seed was dispersed in transects within the containment area. After just seven months, a healthy stand had been established.

Success was attributed in large part to the pre-treatment of the seeds prior to planting. Seeds were collected in the fall of 1997 and held in saltwater throughout the winter under refrigeration in order to acclimate them to natural conditions. In the spring, the seeds were examined microscopically to determine the best time to plant, based upon their condition and weather.

Success Stories

- Partners came together to illustrate the potential for wetland restoration in coastal estuaries;
- Government agencies were able to test innovative seeding techniques for use with the loose dredged materials;
- The restored wetland has become a showcase for wetland restoration; representatives from six states have come to tour the wetland over the past 6 months;
- Aerial sowing of cordgrass seed proved to be an excellent method to quickly plant in soft sediment in a contained area, avoiding intensive labor required by hand planting;
- The project has been recognized at the local, state and national level. Reliant Energy received the Houston Corporate Recycling Council's 1999 Award; The 1999 Governor's Award for Environmental Excellence; and the Coastal America Partnership Award;
- As an example for other industrial landowners, this project demonstrated that wetlands construction can be a cost effective alternative to upland disposal of dredge material and can serve the bay by restoring valuable wetland habitats for fish and wildlife!

Lessons Learned

- Obtaining permits for wetland habitat enhancement is still not easy. Difficulties may be minimized if regulatory agencies are advised of proposed activities; well before completion of a work plan and by involving them in the planning process.
- Contingency plans are needed whenever earthmoving activities are being done to minimize costs, assure safety and minimize environmental impacts due to temporary construction activities.
- Similar projects should be implemented to offset wetland losses in coastal estuaries and beneficially use dredged material.

For further information, contact:

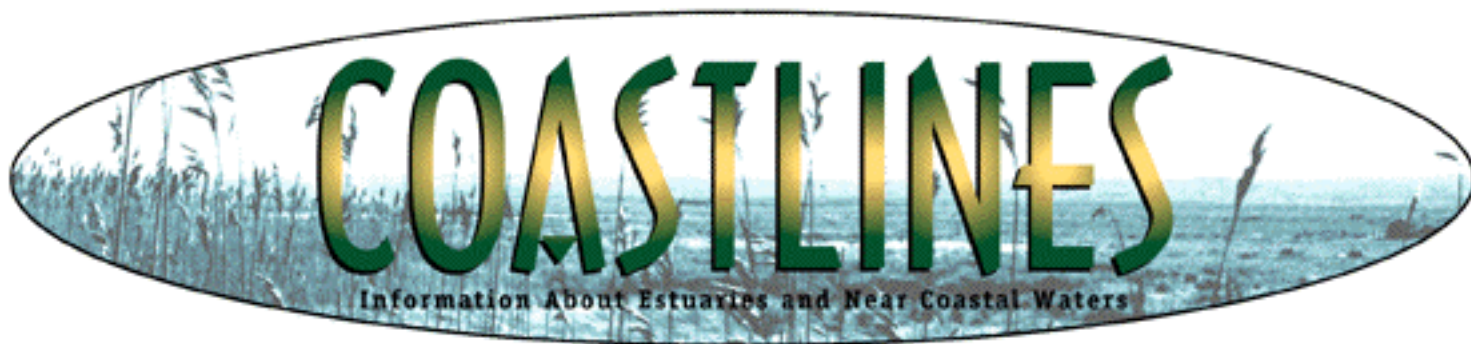
Helen Drummond
Galveston Bay Estuary Program
711 W. Bay Area Blvd., Suite 210
Webster, Texas 77598,
Phone: (281) 332-9937
hdrummond@tnrcc.state.tx.us



Or visit the GBEP's Galveston Bay Information Network at
<http://gbep.tamug.tamu.edu>. [EXIT disclaimer >](#)

<http://www.epa.gov/owow/estuaries/programs/gb.htm>





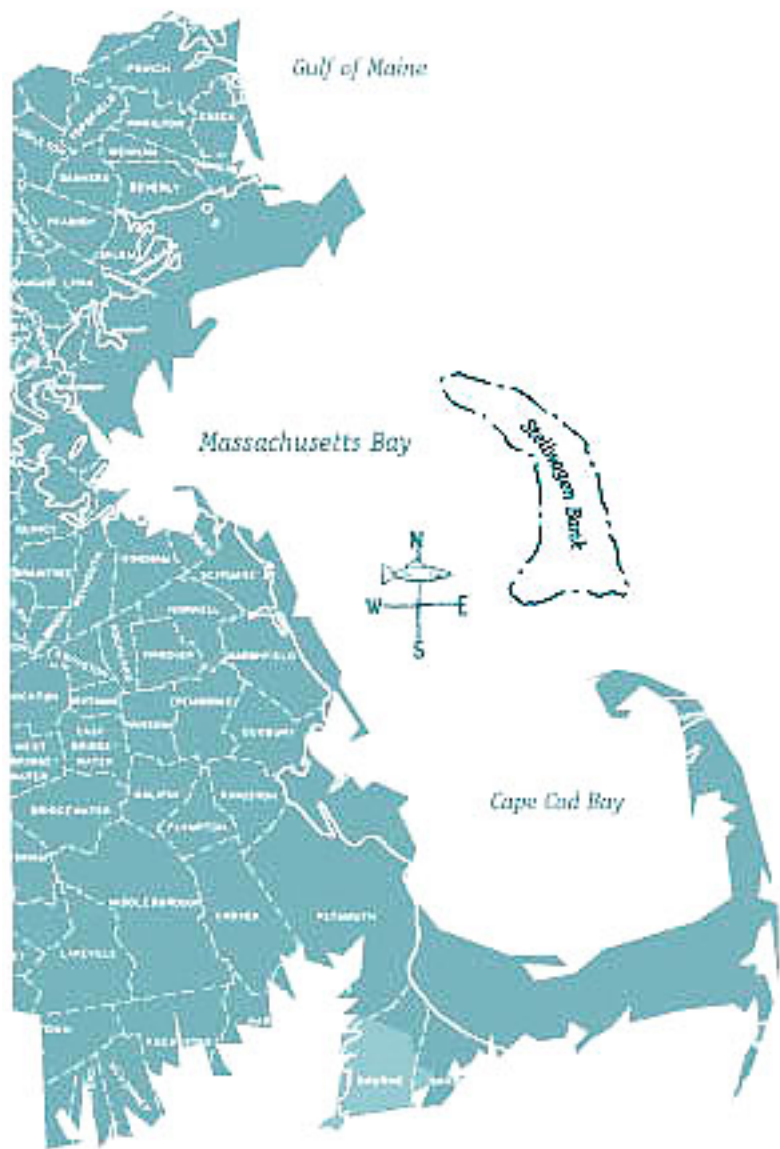
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Planning for the Future of the Ocean

Stellwagen Bank Sanctuary Sets the Stage with its Management Plan Review

What does it mean to have a part of the ocean designated as a national marine sanctuary? At this time, for each of the twelve sites in the national marine sanctuary system, the answers are as different as the sanctuary sites themselves. The one-square-mile Monitor National Marine Sanctuary off the coast of North Carolina prohibits any activities, such as fishing, that may harm the wreck of the Civil War ironclad warship and restricts the numbers of divers to the site. In contrast, the 5,300-square-miles of open water in Monterey Bay are open to a plethora of commercial and recreational activities, with some limits (e.g., jet skis are limited to a small portion of the sanctuary).



The Gerry E. Studds/Stellwagen Bank National Marine Sanctuary off the Massachusetts coast is wrestling with the issue of how to appropriately manage this site as it undergoes a two-year-long Management Plan Review (MPR) process that will guide the sanctuary into the next millennium. Stellwagen Bank is the first of the national marine sanctuaries to undertake this regular review process which is mandated by Congress for all of the sanctuaries. The management plan review process is being initiated at a site where many of today's pressing issues concerning the marine environment are being played out daily in the water and on the news. Whalewatching and vessel traffic concerns, endangered species protection, overfishing and the current National Marine Fisheries Service fishery closures, jurisdiction limitations, interagency regulatory overlap and water quality issues have become matters of shared concern between user groups, government authorities and the public in the Gulf of Maine. The sanctuary serves as an illustrative example of efforts to manage these complex concerns.

Stellwagen Bank's original management plan was released in 1993, one year after the designation of the sanctuary. Since that time, the public and

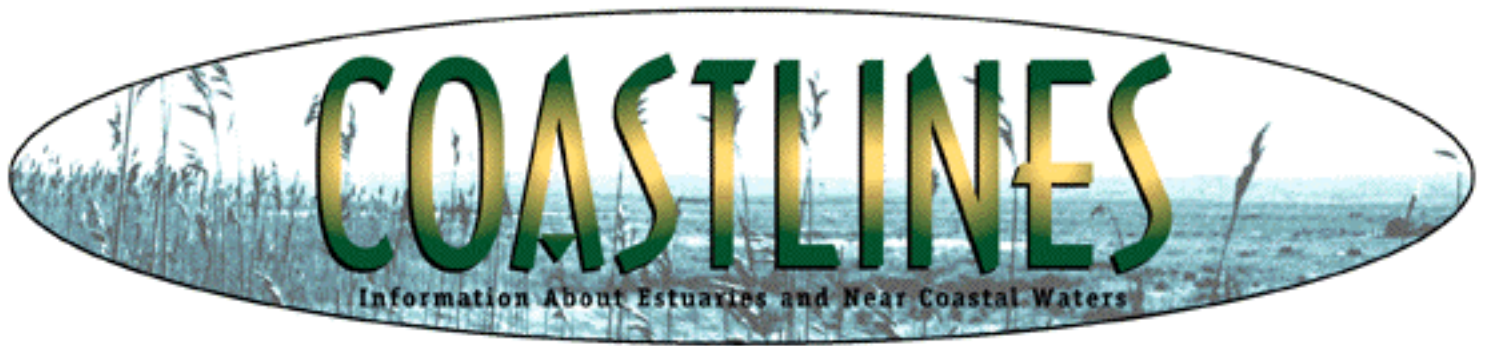
policymakers have been confronted by a wide range of issues that were not addressed in the earlier plan. Concomitantly, scientists have been actively working in the sanctuary to better understand the geological and biological nature of the site. Management plan reviews offer the public and the National Oceanic and Atmospheric Administration (NOAA), which administers the sanctuary program, a chance to update the way business is done in the sanctuaries. By revisiting the plans every five years, the sanctuaries are better able to adapt to changes in local conditions while incorporating the latest scientific data and ocean management practices.

The initial phase of the Stellwagen Bank MPR consisted of a series of scoping sessions, held this past December. The scoping sessions provided the public with an opportunity to voice their concerns, which will now guide sanctuary management in fine-tuning the Stellwagen Bank Sanctuary management plan to best meet resource protection goals. These meetings highlighted great public concern about the effects of a regional sewage outfall on water quality in the region, ship collisions with endangered whales and potential pressures of increased whalewatching traffic on feeding whales. Also of great concern were impacts of fishing gear on the seafloor, which may diminish regional biodiversity, overfishing and marine mammal entanglement in fishing gear.

The review process will continue to gather more information about the concerns expressed. A draft document will be created that will serve as the draft environmental impact statement and management plan. The revised draft management plan is likely to contain a series of action plans to address both specific issues and general management needs. The National Marine Sanctuary Program will make the draft plan available for public review during the winter of 2000 and at that time will once again take formal written comments on the draft, as well as host public hearings for people to provide oral comments. After the close of the public comment period, comments will be considered and necessary changes made, prior to issuing the final management plan the following fall.

The public is encouraged to participate in the management plan revision process. You can help by identifying issues and potential solutions, reviewing the draft management plan, and providing comments and recommendations for the final plan. Ample notice of all public meetings will be given through various media outlets, including notices in local papers and on web pages. The deadline for formal written comments was the end of April; however, anyone with concerns should feel free to submit a letter at any time. Production of the final management plan is scheduled for the winter 2001.

For more information or to submit written comments, contact Katrina Van Dine, Coordinator - Management Plan Review, Stellwagen Bank National Marine Sanctuary, 175 Edward Foster Road, Scituate, MA 02066; E-mail sbnms@ocean.nos.noaa.gov; or download our scoping session questionnaire at our website at <http://vineyard.er.usgs.gov>.



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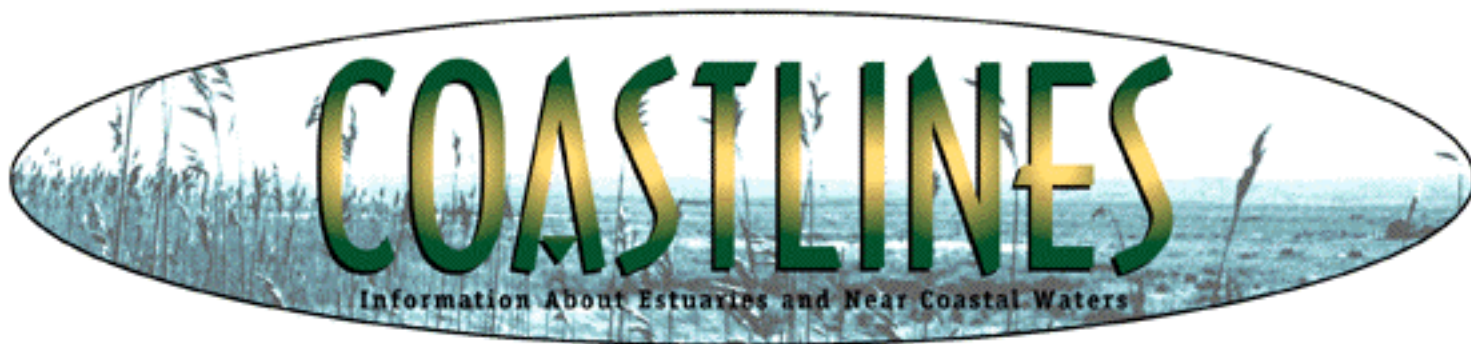
Flags Help Restore Connecticut Eelgrass Beds, Scallop Populations

Connecticut's Niantic River was once renowned for its legendary harvests of bay scallops, earning the name "The Scallop Estuary." Eelgrass beds, used by juvenile scallops as refuge from crab predators, were healthy and abundant. By 1988, however, most of the eelgrass beds in the river were gone. As a result, bay scallop populations declined drastically and for many years the river was closed to scalloping.

Volunteers in two Connecticut towns are helping to restore the Niantic River to its former glory. In an effort to protect eelgrass beds from boat traffic, the volunteers have placed flags stating "Protect Eelgrass Beds" atop buoys in the river. The flags help alert boaters to stay within the channels since boat propellers can cut off eelgrass blades and stir up sediments, reducing the amount of sunlight that can reach the eelgrass. Plastic signs and brochures that describe the locations of the eelgrass beds and provide information about the eelgrass/bay scallop restoration project are being produced with the assistance of the Connecticut Sea Grant and the local Shellfish Commission.

While scallops cannot return to their former abundance overnight, these restoration activities are already helping existing populations to thrive.

For further information, contact Nancy Balcom, Connecticut Sea Grant Associate Extension Educator, Groton, CT; Phone: (860) 405-9127; E-mail: balcom@uconnvm.uconn.edu



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Educational Video on Processing Fecal Coliform Samples

Training volunteers how to take samples properly can be time consuming and difficult. To assist volunteer organizations, a short educational video is now available that describes and demonstrates the analysis of fecal coliform sampling. It includes vital information for the lay person on everything from sterilization techniques to QA/QC (quality assessment/quality control) procedures. The video costs \$14 and can be ordered through the New Hampshire Sea Grant Communications Office, Kingman Farm House, UNH, Durham, NH, Phone: (603) 743-3997



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Community "Visioning" Sets Course for Maryland's Coastal Bays

How and where growth occurs represents the most important, yet potentially most derisive step in managing coastal ecosystems. So last year, the Maryland Coastal Bays Program let watershed residents decide how they wanted their community to look in the future.

This year, the not-so-surprising results are being incorporated into the comprehensive conservation and management plans for the Maryland estuary where managers hope the resident-driven plans will give teeth to resource conservation initiatives and sprawl control in the 175-square-mile watershed.

During two workshops, entitled "Your Community, Your Choice: Picturing Tomorrow," some 300 residents representing the development, farming, tourism and business industries took a visual preference survey which let them pinpoint which land uses, development patterns, building types, and streetscapes they preferred over others. Each person rated slides from the watershed on a +/- scale. A questionnaire and zoning preference workshop followed the survey.

Workshop organizers were betting on local residents' ability to make connections between water quality and land usage. The results revealed that although the connection was not always made, the participants overwhelmingly wanted to protect natural lands, replace lawns with trees and shrubs, and create road and streamside buffers. Residents' visual preferences were consistent with water quality and wildlife protection goals even though aesthetics drove their choices.

Visual Preference

The survey had a visual preference component where participants rated slides depicting different land use types throughout the watershed on a scale of -10 to +10. Here, farms, forests and beaches consistently scored between 8 and 9, the highest of all slides.

In addition to natural areas, downtown areas received high scores along with developments or structures that emulated the old civic, industrial, and commercial architectural styles.

The prevailing theme in the slide show was that trees and landscaping dictate how people feel about their communities. Areas landscaped with trees and shrubs received the best reactions from watershed residents, whether these areas were roadside borders, parking lots, sidewalks, or commercial or residential developments. Narrower roads also received high marks. Large areas of asphalt and particularly treeless places consistently received negative scores.

Answers to Important Questions

Results from a questionnaire were consistent with the visual preference survey. Across the watershed, the preservation of forestland received the highest marks of any questionnaire category, with 92.5% of respondents calling for more forest preservation. More protection for tidal marsh, stream corridors and wetlands, wildlife and wildlife habitats, fishing and crabbing, and agricultural land followed closely, with 85% or more calling the areas "important to the development and economic success of the watershed."

Questionnaire responses also called for limits on sprawl, better public transportation, and more walking and biking opportunities.

Three quarters of respondents called for growth in the watershed to take place in and around already developed areas, but there was little agreement regarding the type of residences or size of lots which should be encouraged in eastern Worcester County where the coastal bay's watershed lies.

In the business portion of the questionnaire, survey-takers voted against commercial strip development with 85% saying such development should not be encouraged in Worcester. Seventy-five percent said tourism and recreation should dominate land usage and 70% believed rehabilitation of downtowns should be a priority.

Where Should We Grow?

At the end of the surveys, locals used dimes to trace areas of the watershed where they believed growth should occur over the next 20 and 50 years. Residents prescribed growth adjacent to town centers, accommodating three times the current population while consuming less than 10 percent of the land. Restored neighborhoods and urban infill also allowed for large greenways free of development.

Sponsored by the Maryland Coastal Bays Program, the State Mass Transit Administration, and

Worcester County, the workshops showed that residents from all walks of life have consistent visions for their community- visions that protect natural areas and water quality.

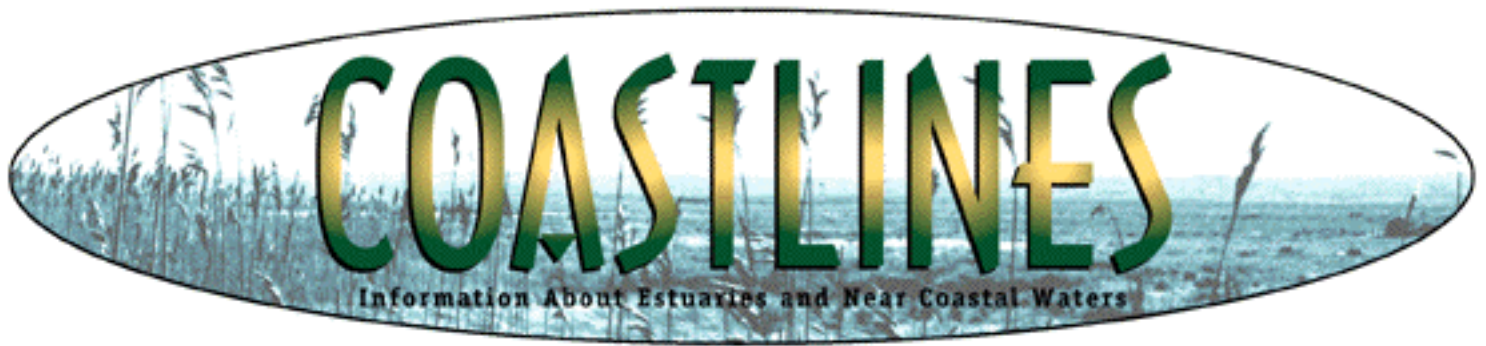
Control of sprawl, downtown revitalization, and narrower roads serve to limit impervious surfaces and conserve open space. Likewise, preservation of natural land, plant buffers and landscaping provide wildlife habitat and increase the land's nutrient and chemical uptake capacity.

Because survey-takers were evenly split between those in the business, service, government, education and agricultural sectors, the Coastal Bays Program has used the results to convince policy makers that their land use decisions involve complex financial and social links. The management plan for the coastal bays incorporates these links which will determine the economic and ecological health of this estuary in the next century.

Copies of the 30-page Visioning Workshop results booklet can be obtained by writing to the Coastal Bays Program Office at 9609 Stephen Decatur Highway, Berlin, Maryland, 21811; Phone: (410) 213-2297.

For further information, contact Dave Wilson, Jr., Public Outreach Coordinator, Maryland Coastal Bays Program;

E-mail: DWILSON@dnr.state.md.us



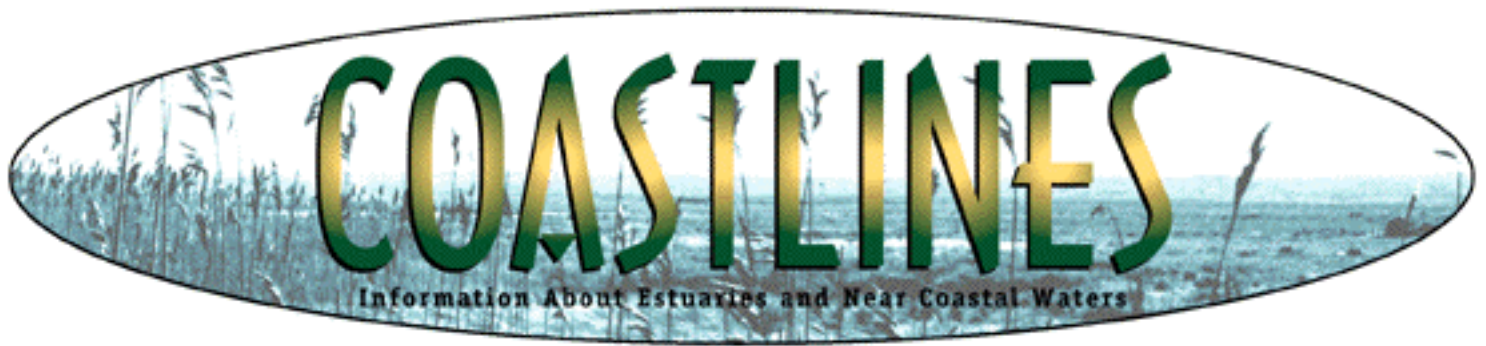
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Video Available on Constructed Wetlands for Managing Stormwater

A new video entitled "Use of Constructed Wetlands for Stormwater Runoff" is available from the Cornell Cooperative Extension (\$19.95). The video for the use of developers, natural resource managers, community planners, educators and the general public on how properly constructed wetlands moderate flow extremes and improve water quality. Added benefits include enhanced groundwater recharge, aesthetic appeal, and the creation of wildlife habitat. The 20-minute program shows how wetlands function to reduce pollution, explains appropriate design elements, highlights success stories, and suggests sources of assistance for planning and constructing a wetland. Funding for the video was provided by the US EPA Section 319 Nonpoint Source Program, administered by the New York State Department of Environmental Conservation and the USDA Renewable Resources Extension Act.

For further information contact, Gary Goff, Department of Natural Resources, the Cornell Cooperative Extension, 104 Fernow Hall, Cornell University, Ithaca, 14853; Phone: (607) 255-2824 or E-mail: grg3@cornell.edu



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Innovative Coral Reef Restoration in the Florida Keys

The Accidental Tourist

Vessel groundings have assaulted south Florida's coral reef resources for centuries. In the fall of 1989, three large vessels ran aground on the Florida reef tract, prompting Congress to establish a Florida Keys National Marine Sanctuary. With sanctuary designation, a number of new authorities were created to ensure long-term protection of the natural resources that rely upon the waters surrounding south Florida.

The Contship Houston, a 613-foot container ship, went aground on a living coral reef off the lower Florida Keys in February of 1997. The hull of the Houston cut a swath through the reef, crushing and breaking corals for approximately 400 meters. Under Federal and state statutes, the parties that injure resources in the Florida Keys National Marine Sanctuary are responsible for restoring the injured resources and the services they provide.

Emergency Restoration Efforts

Restoration of the coral reef subsequent to the vessel's grounding was the result of unprecedented cooperation between the Houston's owner, the insurer, the National Oceanic and Atmospheric Administration (NOAA), and the state of Florida. From the start, the vessel owner and insurer assisted with damage assessment and emergency restoration of the injured coral reef habitat. As a result, restoration activities were completed within ten months of the vessel grounding.

Immediately after the grounding, dislodged coral heads were uprighted to elevate them above the sea floor and prevent smothering. Soon after, more than 3,000 injured pieces of coral were reattached to the reef substrate at about 75 locations throughout the grounding site, and pieces of reef debris were removed or stabilized with epoxy to prevent ongoing injury to the reef and marine life. These emergency restoration efforts were designed to enhance the survival rate of these corals.

The vessel owners paid for two restoration projects to address the remaining injury to the reef. The first involved using pourable epoxy to stabilize reef rubble that had been formed into large berms on the ship's inbound track. The second project entailed stabilizing the loose debris at the ship's final resting place by deploying flexible concrete mats to stabilize more than 7,650 square feet of reef substrate. In addition, large boulders were placed on the concrete mats to provide three-dimensional habitat for resident organisms.

Creative Compensation

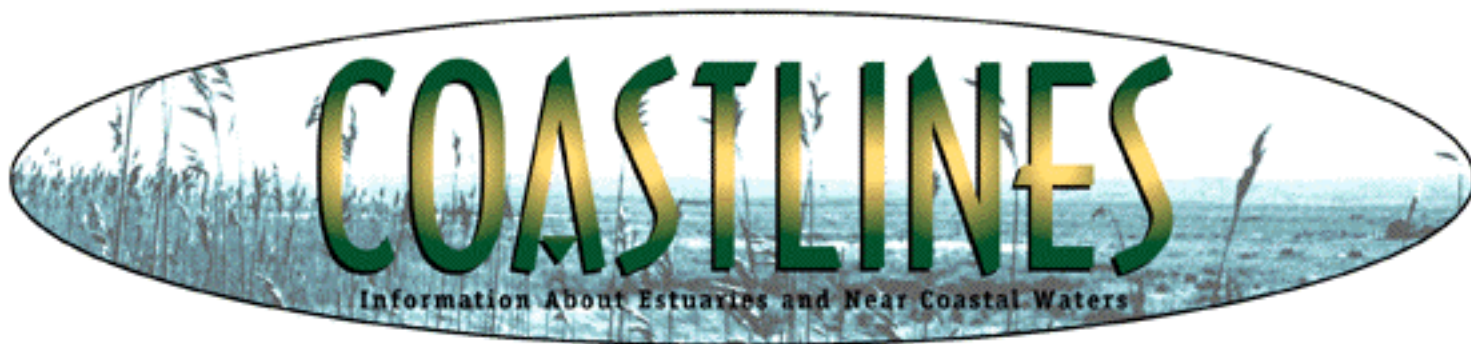
Coral reefs grow very slowly and there is a limit to the amount of restoration that can be undertaken. To compensate for the public's losses as a result of the reef's impairment until it recovers, the vessel owner agreed to purchase one of the most advanced technologies in navigational aids to help prevent future vessel groundings. This is a truly creative and innovative way of using the federal governments damage assessment authorities to bolster protection of the public's resources.

In early March, 1999, state-of-the-art navigational aids were installed in the Florida Keys National Marine Sanctuary. Reducing the detrimental impact of vessel groundings has been an important objective for the federal government and managers of the Florida Keys National Marine Sanctuary. By allowing mariners to precisely identify their location, this new Racon navigation system will decrease future vessel groundings by reducing the likelihood of navigational mishaps.

The installation of the Racon navigation system represents a creative solution to compensating the public for the injury that was done to the reef. The beacons are mounted on navigational structures along the Florida reef tract, stretching from Miami to Loggerhead Key in the Dry Tortugas, 70 nautical miles west of Key West. The devices emit unique signals that appear on ship radar, allowing mariners to precisely identify the location of navigational aids and warn ships when they are nearing a reef. Each signal has a range of 15-20 nautical miles. The US Coast Guard installed the system and has agreed to maintain the beacons.

As America's coastal steward, NOAA has expansive capabilities for understanding, protecting, managing and restoring the nation's coastal resources. The installation of the Racon navigation system represents the fruition of a cooperative effort by NOAA, the US Coast Guard and the state of Florida to restore the world's third largest barrier reef.

For further information, contact Brian Julius, Acting Branch Chief at NOAA's Damage Assessment Center's; Phone: (301) 713-3038 ext. 199 or E-mail: Brian.Julius@noaa.gov.

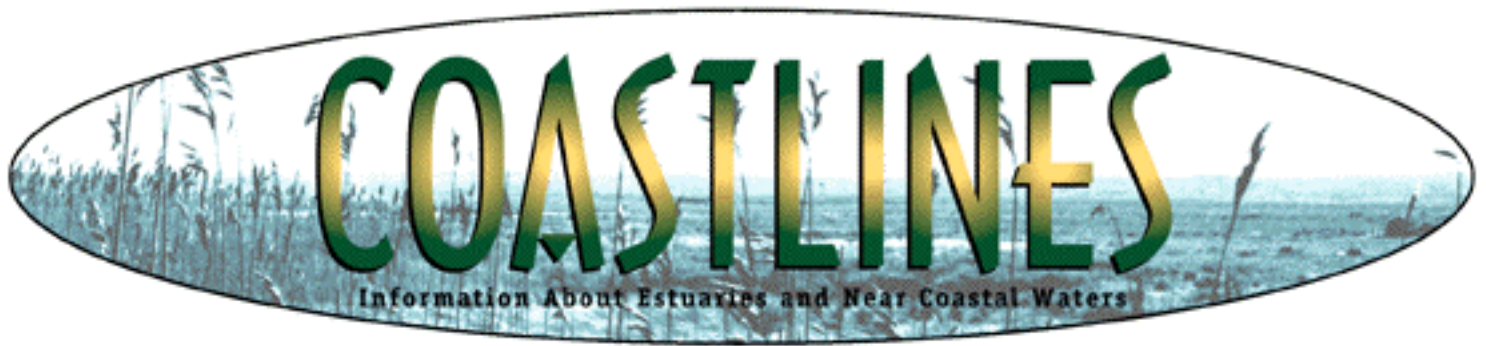


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Results of the EPA Beach Survey Announced

Results from the second annual National Health Protections Survey of Beaches is available. Information was gathered on water quality at approximately 1,400 beaches nationwide, an increase of approximately 400 beaches since last year. The review of coastal beaches indicated that of the 1,062 coastal beaches, more than 350 beaches had an advisory or closure last year. The EPA has established BEACH Watch web site where the public can view maps of beaches and obtain information on water quality monitoring efforts in their communities. Only the beaches whose monitoring officials responded to EPA's survey are included. The survey will be conducted each year and as new information becomes available it will be added to the BEACH Watch Web site. The 1999 survey results are available at www.epa.gov/ost/beaches



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Red Lobster Seeding Narragansett Bay with Future Dinners

A new private/public partnership between the Red Lobster restaurant chain and several federal and university departments in Rhode Island is under way to restore damaged marine habitat and increase lobster populations in Rhode Island's Narragansett Bay. Artificial reefs, built with settlement money from the 1989 World Prodigy oil spill, are being used to create a protective habitat for lobsters in a small area of the West Passage. The World Prodigy spill killed hundreds of adult lobsters and crabs and affected future lobster and shellfish catches through destruction of eggs and larvae when about 290,000 gallons of home heating oil spilled into Narragansett Bay.

The program involves seeding of the artificial reefs with juvenile lobsters and producing educational materials. The juvenile lobsters will be tagged with microscopic tags to allow biologists to monitor the reefs. Tracking will determine how well the hatchery lobsters survive and grow, and if stocking larval lobsters will increase local populations. With a little cooperation from nature, it is hoped that lobstermen will be able to start setting their traps on the reefs in about five years.

For further information, contact: Stephanie Dorezas, National Marine Fisheries Service; Phone: (301) 713-2370; E-mail: Stephanie.Dorezas@noaa.gov or Kathleen Castro, Rhode Island Sea Grant; Phone: (401) 874-5063; E-mail: kcastro@uriacc.uri.edu.