Note: This information is provided for reference purposes only. Although the information provided here was accurate and current when first created, it is now outdated.

Disclaimer: The information in this website is entirely drawn from issues of newsletters published between 1994 and 2002 and these issues will not been updated since the original publication date. Users are cautioned that information reported at the time of original publication may have become outdated.

Information About Estuaries and Near Coastal Waters
Febuary 1999 - Issue 9.1

Table of Contents

Center Insert

COASTLINES
Information About Estuaries and Near Coastal Waters

Note: This information is provided for reference purposes only. Although the information provided here was accurate and current when first created, it is now outdated.

Disclaimer: The information in this website is entirely drawn from issues of newsletters published between 1994 and 2002 and these issues will not been updated since the original publication date. Users are cautioned that information reported at the time of original publication may have become outdated.

Landmark Court Decision on Jet Ski Ban

Tiny San Juan County in Washington state is the first local government in the country to ban the use of personal watercraft (PWC) in its waters. And it has a lot of waters. San Juan County is comprised entirely of islands in the straits between the northwest Washington mainland and Vancouver Island in British Columbia, Canada.

The county includes some 400 islands; 172 are named and 60 are inhabited by people, though only four have ferry service to the mainland. There are approximately 375 miles of shoreline and about 440 square miles of marine waters within the county boundaries. Sitting offshore of the growing Seattle-Vancouver, B.C. metropolitan area, the islands' resident population - now about 12,500 - is increasing, as is the number of visitors who come to enjoy the natural beauty, tranquility, wildlife, and marine recreational activities. Kayaking, sailing,

boating in general, whale watching, and wildlife viewing, are all popular in the islands.

In January, 1996, after extensive public involvement, the Board of County Commissioners passed an ordinance to place a two-year ban on the operation of PWC and called for a study to determine if and where PWC use could possibly be accommodated. As anticipated, several PWC businesses and an industry lobbying organization sued shortly thereafter. In September, 1996, the Superior Court found the ordinance to be unconstitutional, based on one issue alone: a distinction made between PWCs and other vessels while no such distinction is made in the state's boat licensing rules. At the time, the focus of argument by the industry was: "you can't treat us differently than other boats!"

The county appealed, and almost two years later the Washington Supreme Court made a sweeping ruling that reversed the trial court and upheld the county's authority to ban the use of PWCs as a proper use of its police power. This 7 to 2 decision is a major victory for local government control over the impacts of PWCs on its waters.

The Washington Supreme Court dismissed the trial court's allegation of conflicts with a vessel registration statute. The decision noted that this law did not extend unlimited rights to operate any registered boat anywhere in the state, comparing the argument to concluding that a hunting license authorized hunting in downtown Seattle as long as the hunter has a license.

The court found no conflicts with other state laws dealing with marine waters and the rights of the public to use and enjoy navigable public waters, saying that "it would be an odd use of the public trust doctrine to sanction an activity that actually harms the waters and wildlife of this state."

Finally, the court found the state constitution allows counties to enact laws to protect the public welfare if it bears "a reasonable and substantial relation to" or is "reasonably necessary" to protect the public health, safety or general welfare. On the whole, the court found that PWCs are different from other vessels, and that counties do have the authority to treat them differently. The fact that the state didn't make the distinction didn't mean that counties couldn't, and further, San Juan County did have facts to justify just saying no to PWCs.

The study called for in the 1996 ordinance appears to be the first comprehensive compilation of information that characterizes the nature and use of PWCs. Extensive material had been produced by many communities around the country and around the world on the subject of PWCs and concerns about water quality, safety, noise, harm to wildlife, and other impacts. Material about efforts toward, and debate about, PWC regulation was included in the study.

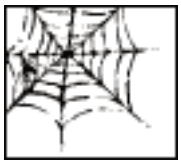
To analyze the impacts of PWC use in the San Juan Islands, PWCs as vessels were catalogued in the study, both in general and in contrast to other types of vessels. The study examined how PWCs are designed, marketed and used, the demographics of their use, and their safety record compared with that of other vessels. Then, to put this into a local context, the county's marine environmental features were catalogued, examining the general setting and the various types of marine habitats (intertidal, nearshore

and offshore), and marine mammal, bird and fish species of regional and national concern.

Approaches to PWC regulation in other areas were also examined and the differences noted. Looking at the differences, even in the definitions used, types of enforcement issues, and other practical considerations was informative - while the county may have been the first in the nation to go so far, it didn't have to reinvent the wheel to do it.

In the San Juan Islands, the quality of the natural environment, marine habitat issues, and the potential for irreconcilable conflicts between these and PWC use have been recognized by the highest court in the state as warranting use of local government authority to "just say no."

For further information, contact: Laura Arnold, AICP Planning Director, San Juan County, PO Box 947, Friday Harbor, WA 98250; Phone: 360-378-2393; E-mail: Laura Arnold. The case is reported as Weden v. San Juan County and can be found at 135 Wash.2d 678 (1998).



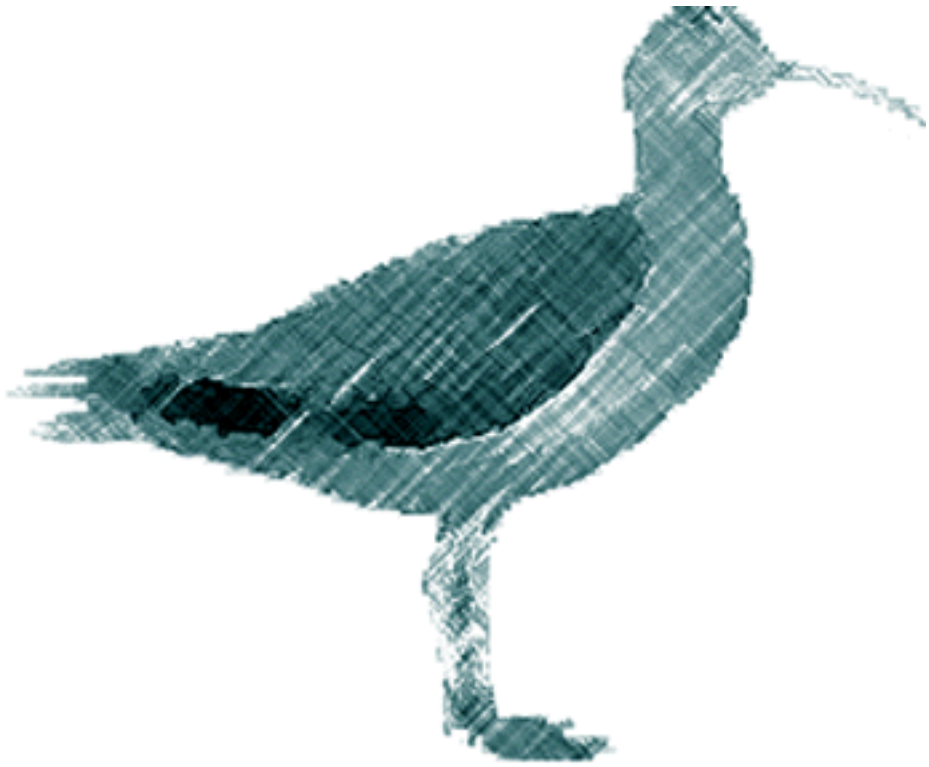
Note: This information is provided for reference purposes only. Although the information provided here was accurate and current when first created, it is now outdated.

Disclaimer: The information in this website is entirely drawn from issues of newsletters published between 1994 and 2002 and these issues will not been updated since the original publication date. Users are cautioned that information reported at the time of original publication may have become outdated.

Partners In Flight: The Coastal Connection

What kind of birds come to mind when you think of a coastal area? You probably think of familiar coastal residents such as gulls and herons. But for vast numbers of birds, the coasts of the U.S. are not a year-round home, rather a critical leg on a round-trip seasonal journey. Terns, ducks, geese, sandpipers, plovers, warblers, hawks, orioles, swallows, and many other birds fall into the category of "neotropical migrants." Migrants head north each spring to breed in favorable locations, then turn around each fall and fly south to warmer winter homes. Some migration routes are thousands of miles, others just a few hundred miles.

Importance of the Coast to Migratory Birds



- At least three-fourths (500+ species) of migratory birds incorporate the coastline or the coastal plain into their migration routes.
- Some species may use coastal migration routes to assist young birds in navigating their first trip south.
- Many migrants feed on insects during the summer and switch to a high-fruit diet during fall migration. Shrubs like bayberry and waxmyrtle along the dunes of the east coast are important food sources for many of these species.

Numerous seabirds, ducks, and shorebirds are completely dependent on coastal habitats for both breeding and wintering grounds. Many land birds also use the coast as rest stops during their long journey between Central and South American wintering areas and forested breeding grounds in the U.S. and Canada. For many species, American coasts are key places for these birds to rest and refuel before or after an exhausting non-stop flight. Protecting migratory birds is tricky; conserving one kind of habitat in one place or even one country is not enough. Migratory birds need quality habitat in wintering areas, breeding grounds, and at critical stop-over locations along their migration routes.

The Coasts are Critical Stop-over Areas

- Each spring many songbirds enroute from Latin America to U.S. and Canadian breeding grounds make the 400-mile,18-hour flight across the Gulf of Mexico. Coastal woodlands and barrier islands on the Gulf coast are critical places for these birds to rest and refuel. High Island, Texas, and Horn Island, Mississippi, are two important rest stops for many spring migrants.
- Huge numbers of birds are funneled down the Cape May and Delmarva peninsulas, making these key stops on the fall migration route for many spring migrants.
- Shorebirds are particularly dependent on just a few critical stop-over locations. For one sandpiper, the Red knot, 50-80% of the adult population congregates each spring along the Delaware Bay during their long trip from South America to the Arctic. Other critical shorebird stop-over sites include the Copper River Delta in Alaska, Gray's Harbor in Washington, and the Bay of Fundy in Canada.

In recent decades, concern has grown as annual bird counts reveal sharp declines in the numbers of once

common birds. Fragmentation, degradation and loss of habitat in both Latin and North America is thought to be the single most important factor contributing to the decline. Other problems confronting neotropical migrants include pollution, competition with exotic species, collisions with buildings and automobiles, hunting and control as agricultural pests, and increased rates of predation and parasitism caused by feral animals, exotic species, and degraded habitat.

Annual surveys show that the populations of some migratory species began to decline around 1980 at alarming rates, an average of 1 to 2 percent per year.

In response to troubling population trends, Partners In Flight/Compañeros en Vuelo/Partenaires d'Envol was launched in 1990. The central premise of Partners In Flight (PIF) is that the resources of public and private organizations in North and South America must be combined, coordinated, and increased in order to achieve success in conserving bird populations in this hemisphere. Currently, partners include 17 federal agencies, 48 non-government organizations (NGOs), over 60 state and provincial fish and wildlife agencies, numerous universities, and 14 corporations, primarily from the forest industry -- and the list continues to grow.

Partners in Flight has approached bird conservation on several major fronts:

- *Coordinate efforts, share information, establish research and monitoring priorities, develop standard protocols and procedures*. For example, PIF has developed a species priority -setting scheme that has been applied to rank all North American land bird species at the physiographic area level -- a popular version called the "Watch List" appears on the web site of the National Audubon Society.

- *Further education and awareness about the need for bird conservation*. PIF publishes several periodicals in English and Spanish, and sponsors the popular International Migratory Bird Day each May. Migratory Bird Citizens Manuals are also under development. The manuals will serve as practical guides for use by local groups and citizens in developing strategies for bird conservation. A prototype Citizens Manual for Maryland is already complete.

- *Conservation Planning*. Bird Conservation Plans are being developed for each physiographic area or state across the country. Slated for completion during the spring of 1999, the plans will include priority species lists, priority habitat descriptions, bird population objectives, and habitat objectives.

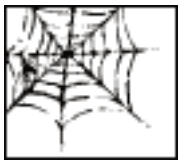
Coastal protection and management have many areas of overlap and mutual interest with bird conservation. Working with PIF can help coordinate wildlife and habitat research, monitoring, planning, and conservation activities.

All Partners In Flight meetings are open to anyone interested in bird conservation. National Estuary Program Comprehensive Conservation and Management Plans -- and other coastal management efforts -- contain strong elements of research, monitoring, and action to protect coastal habitats and wildlife. Coastal governments, resource managers, NGOs, and citizens can work with PIF to ensure that these wildlife and habitat protection efforts are coordinated with PIF activities for the mutual benefit of bird conservation and coastal management.

Here are some ways to get involved with Partners in Flight:

- Visit the PIF web site to learn more about activities, resources, and contacts.
- Contact your state or regional PIF coordinator (listed on the web site) and explore opportunities for coordination or collaboration.
- Check out upcoming International Migratory Bird Day events -- consider sponsoring an event or coordinating a related activity.
- Review the priority species list for your physiographic area and explore opportunities for incorporating it into your planning, restoration, out-reach, and research activities. Priority species lists are available on the web from the Colorado Bird Observatory at: http://members.aol.com/cbopifdb/ EXIT disclaimer
- When the Bird Conservation Plan for your state or physiographic area becomes available this spring, explore opportunities to incorporate its conservation objectives into coastal planning and other activities.

For further information about Partners in Flight, contact David Pashley, National PIF Coordinator, American Bird Conservancy, P.O. Box 249, The Plains, VA 20198; Phone: 540-253-5780; Fax: 540-253-5782, E-mail: dpashley@abcbirds.org or visit the Partners In Flight home page (including a list of regional and state contacts) at www.partnersinflight.org. EXIT disclaimer



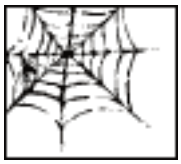
Note: This information is provided for reference purposes only. Although the information provided here was accurate and current when first created, it is now outdated.

Disclaimer: The information in this website is entirely drawn from issues of newsletters published between 1994 and 2002 and these issues will not been updated since the original publication date. Users are cautioned that information reported at the time of original publication may have become outdated.

New Watershed Assistance Grants Available

EPA's Office of Wetlands, Oceans, and Watersheds recently awarded River Network $300,000 to distribute grants to local watershed partnerships to support organizational development. River Network, a national organization based in Portland, Oregon, supports river and watershed advocates at the local, state, and regional levels to build effective partnerships and organizations. The Watershed Assistance Grants program will distribute grants ranging from $2,000 to $30,000 in 1999 to support watershed partnerships working to protect and restore watersheds. The deadline for application is February 18, 1999.

To request an application, please write to River Network, Watershed Assistance Grants Program, PO Box 8787, Portland, OR 97207, or E-mail River Network . For additional information on funding opportunities, visit River Network's web site at www.rivernetwork.org .



Note: This information is provided for reference purposes only. Although the information provided here was accurate and current when first created, it is now outdated.

Disclaimer: The information in this website is entirely drawn from issues of newsletters published between 1994 and 2002 and these issues will not been updated since the original publication date. Users are cautioned that information reported at the time of original publication may have become outdated.

Kachemak Bay National Estuarine Research Reserve Dedicated by State of Alaska

The Alaska Department of Fish and Game, federal, state, and local officials celebrated the state's effort to designate Kachemak Bay as the nation's 23rd National Estuarine Research Reserve. The ceremony, held on National Estuaries Day, October 3, 1998 in Homer, Alaska, recognized a nearly four-year effort by the State of Alaska to establish the reserve and join NOAA's National Estuarine Research Reserve System. NOAA administers the National Estuarine Research Reserve System, while state agencies operate each reserve to provide opportunities for estuarine science and education.

Kachemak Bay will be the largest National Estuarine Research Reserve, at 365,000 acres. The bay is a productive estuary with extensive tidal flats, deep-water fjords, clear water and glacial rivers, and diverse fish and wildlife habitats. The reserve boundary starts at the bay's mouth near Anchor Point and includes all of its waters, as well as the Fox River Flats State Critical Habitat Area, Kachemak Bay State Park, and smaller parcels near the City of Homer. The bay is situated at the southern terminus of the road system in South Central Alaska.

The bay plays a prominent role in its surrounding communities and the South Central region. Community members participating in the designation process for the Reserve emphasized the need to synthesize available scientific and ecological information and define information gaps. Knowledge of the Kachemak Bay area is scattered and often inaccessible (Alaska's state resource library is located in Anchorage, and the state's School of Fisheries and Oceans Sciences is located at the University of Alaska in Fairbanks), and few people have a clear understanding of past or ongoing research.

Designation as a research reserve opens up new federal-state supported research and education programs focusing on the complex estuarine environment. The Reserve's first project, an ecological characterization supported by NOAA's Office of Coastal Resource Management and Coastal Services Center, is already underway. The project will compile all existing data on Kachemak Bay on CD-ROM and make it available via the Internet by April, 2000.

Alaska Department of Fish and Game began this project to increase understanding of the ecosystem, improve access to information, assist in Exxon Valdez Oil Spill restoration efforts, and define missing information that benefits researchers, resource managers, local governments, and the public. Better information will support better resource use decisions, promote resource stewardship, and help meet the goals of the new reserve.

The first step to increasing the knowledge base lies in the "ecological characterization," a synthesis of regional information emphasizing research, management, and educational needs. It presents a site-specific picture of the region's ecosystem, including its human elements. The Kachemak Bay Ecological Characterization will synthesize the available biological, physical, and human use information on the Kachemak Bay watershed. It will be published in an interactive digital format on a compact computer disk, suitable for both novice and technically sophisticated audiences. Unlike a paper document, the CD format will utilize hypertext markup language (HTML, the language used on the Internet) enabling easy

updates, and allowing the user to query and manipulate data. Information needing constant updates, such as descriptions of ongoing research, will be housed on the projects Internet site as well. For those who cannot access these formats, the executive summary will be provided as a paper document. The project will also develop a centralized Geographic Information System or "GIS" for the Kachemak Bay watershed. The GIS will include both spatial and tabular data, much of which will be published on the Characterization CD.

For further information on the Reserve, contact Glenn Seaman, Manager; Kachemak Bay National Estuarine Reserve, Alaska Department of Fish and Game, 333 Raspberry Road, Anchorage, AK 99518-1599.

For further information on ecological characterization, contact Bridgit Callahan; Kachemak Bay National Estuarine Reserve, Alaska Department of Fish and Game, 202 West Pioneer Avenue, Suite B, Homer, AK 99603; or visit the website at: Kachemak Bay Ecological Characterization Project

COASTLINES
Information About Estuaries and Near Coastal Waters

Note: This information is provided for reference purposes only. Although the information provided here was accurate and current when first created, it is now outdated.

Disclaimer: The information in this website is entirely drawn from issues of newsletters published between 1994 and 2002 and these issues will not been updated since the original publication date. Users are cautioned that information reported at the time of original publication may have become outdated.

The Louisiana Coast 2050 PlanThe Need for Action

The Problem

Every year Louisiana loses 25-35 square miles of premier coastal wetlands. The words "bayou country" usually conjure up visions of moss-draped live oaks along scenic waterways teaming with egrets and alligators. It is a place where tables are laden with shrimp "po boys," oysters on the half-shell, stuffed flounder and seafood gumbo. However, this unique American treasure is under siege. As a result of well-intentioned efforts to tame the Mississippi River and settle this delta plain, the delicate balance of delta-building and coastal land loss has been upset. Land building processes have been greatly hindered, while loss processes have been accelerated.

During the past 100 years, over one million acres of estuarine wetlands have been lost in coastal Louisiana. The causes are varied and complex, but the underlying theme is altered hydrology resulting from flood control, navigation, and other developmental activities.

Finding a Solution

Numerous efforts have been launched over the years to address this dire situation. However, none has

been comprehensive enough, nor received a broad enough base of support, to address an environmental disaster of such magnitude. In early 1997, a partnership was forged among federal, state and parish participants that would embark on the "Coast 2050" planning effort. Among the first accomplishments of this diverse group was the establishment of a mission statement:

In partnership with the public, develop, by December 22, 1998, a technically sound strategic plan to sustain coastal resources and provide an integrated multiple use approach to ecosystem management.

Planning was done in an interactive fashion and was aimed at finding strategies that would be both technically feasible and publicly acceptable. Public participation was greatly facilitated by dividing the coast into four regional teams (see map). Regional teams were comprised of members of the public, parish governments, Coastal Zone Management committees, state and federal agency personnel, academic and consulting scientists, and special interest groups, such as the Coalition to Restore Coastal Louisiana, the Lake Pontchartrain Basin Foundation, and the Acadiana Bay Association.

The overall planning structure included a group of coastal scientists and experts, referred to as the Planning Management Team, which focused on the "technically sound" part of the interactive planning process, and authored the final Coast 2050 Plan document. The Objective Development Team was responsible for the "partnership with the public" part of the mission statement, and developed specific habitat objectives in conjunction with the local governments and CZM committees across the coast. In all, 64 meetings were held in which public participation was involved.

The Coast 2050 Plan

As the name implies, Coast 2050 is directed at future conditions projected for coastal Louisiana in the year 2050. The process examined the status quo scenario (i.e., existing restoration efforts in place, but no additional ones), and contrasted that with what the participants would prefer the coast to be like in the future. These 2050 objectives were the basis for developing strategies.

The strategies were developed at two scales. One scale addressed problems of local concern, such as site-specific opportunities for marsh creation using dedicated dredged material, specific shoreline integrity needs, or local opportunities for marsh enhancement through vegetative plantings. A watershed-level or hydrologic basin-level scale was used to develop "regional strategies." Regional strategies include large-scale river diversions, maintenance of the integrity of major shorelines, barrier island restoration and maintenance, and restoration of natural watershed drainage patterns.

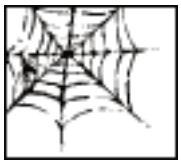
As most of the problems underlying coastal land loss are hydrological, it is no surprise that the solutions are also. For example, river diversions are proposed in areas where this is needed to restore wetland sustaining processes; and structural features of the landscape that affect hydrology, such as ridges and barrier islands, are slated for repair and maintenance in areas where their effectiveness has been compromised.

The end product of this planning process was a set of habitat objectives and strategies that had an extensive and well-defined public review and input process. A total of twenty written resolutions of support were obtained from the parish governments for the strategies pertinent to their area, as well as the process used in developing them. Additionally, the state's Wetlands Conservation and Restoration Authority and the federal Coastal Wetlands Planning, Protection and Restoration Act Task Force unanimously endorsed the strategies and objectives at a joint meeting on October 20, 1998. The Coast 2050 plan document was completed in December of 1998.

It is predicted that the proposed Coast 2050 large-scale strategies alone, even considered without the benefit of the local strategies, would prevent 97% of the net marsh loss expected by 2050. Thus, the plan addresses the land loss problem at an appropriate scale and will result in sustainable systems. The strategies were selected to address not only wetland needs, but were chosen with an eye towards their long-term benefits to other coastal concerns such as communities, transportation and navigation infrastructure, and fisheries production. With the level of marsh loss prevention envisioned, Louisiana's contribution to the nation by virtue of continued oil and gas supply, fisheries production, navigation, agriculture, and prime wildlife habitat will also be sustainable.

The Coast 2050 Plan was a challenge to complete in such a short time frame, and it will be an even greater challenge to implement in a timely fashion. However, the lessons learned and the organizational network developed during this planning process will be valuable assets in our efforts to save coastal Louisiana.

For more information about the Coast 2050 plan, contact Dr. Bill Good, Coastal Restoration Division, Louisiana Department of Natural Resources, P.O. Box 94396, Baton Rouge, LA 70804-9396; phone (225) 342-7308; or check these websites www.savelawetlands.org EXIT disclaimer or www.lacoast.gov EXIT disclaimer



Note: This information is provided for reference purposes only. Although the information provided here was accurate and current when first created, it is now outdated.

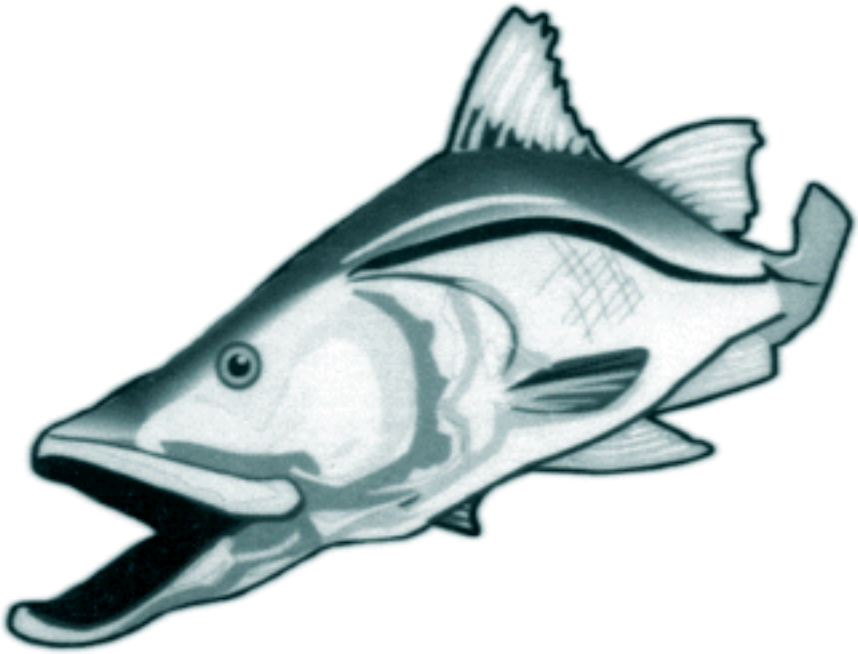
Disclaimer: The information in this website is entirely drawn from issues of newsletters published between 1994 and 2002 and these issues will not been updated since the original publication date. Users are cautioned that information reported at the time of original publication may have become outdated.

Partnering to Help Restore Coastal Habitat

Communities interested in restoring coastal habitats now have new funding sources available. A three-year agreement between NOAA Fisheries and the American Sportfishing Associations (ASA) Fish America Foundation will help local communities put their marine habitat restoration ideas into action. To launch the new partnership, this year NOAA and ASA each invested $50,000 to initiate eight restoration projects. The projects will revitalize fish habitat and accelerate the repopulation of fish species that once were abundant in our rivers and estuaries. From New Jersey to Alaska, planned restoration projects range from freshwater anadromous fish runs to ocean kelp resources. A total of nearly one-half million dollars in habitat restoration funding is expected after contributions from local, public, and private sources are leveraged.

The model project that paved the way for the eight new restorations is Adobe Creek in the Pacific Southwest. A tributary of the Petaluma River in California, Adobe Creek was once considered a "dead" river system for salmon spawning. A project was developed for the community-based restoration program when a local science teacher, who was working with the community to clean up and restore the urban creek, asked NOAA for help. NOAA Fisheries and the ASA, along with high school volunteers and local businesses, helped design and construct a step-pool fish ladder which allowed migrating salmon to bypass a culvert and reach their natural spawning ground for the first time in over one-hundred years. High school students remain the stewards of the creek and continue to monitor its success.

Technical experts from the NOAA Restoration Center and regional offices, along with the large volunteer base of the ASA's Fish America Foundation, will jointly undertake community-based habitat restorations. The projects contribute directly to restoring estuaries and marine habitats, especially salt marshes, seagrass beds, coral reefs, mangrove forests, and freshwater habitat important to marine species. These community-based projects have the added benefit of promoting stewardship and a conservation ethic among coastal communities.

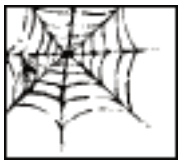


An oyster reef restoration project sponsored by NOAA, Fish America Foundation, Virginia Marine Resources Commission and the Rotary Club of Norfolk in the Lafayette River in Norfolk, Virginia, will be one of the eight proposed for this year. After years of harvesting, habitat destruction, pollution, and disease-induced mortalities oysters, which were once abundant in the Chesapeake Bay, have been reduced to less than one percent of historic levels. The project hopes to restore oyster beds by purchasing oyster shells and transporting and deploying these shells into a reef structure. Hatchery-produced seed oysters will be grown by middle and high school students in floating cages throughout the river. The oyster growing will take place over an academic year, at the end of which the oysters will be planted on the reconstructed reef.

In Santa Monica Bay, California, a partnership with the Santa Monica Baykeeper kelp reforestation project is proposed to restore kelp forest habitat within the bay to historic acreage. Coastal kelp beds in the Santa Monica Bay provide critical habitat for over 800 marine species that live upon, hide among, or feed on the kelp plants or drifting kelp. The project began in 1996 in conjunction with the California Department of Fish and Game, marine biologists from UCLA and volunteer community divers. The first year of the project focused on kelp growth cycles and plans for the restoration work, and the second year focused on documenting the state of the existing kelp forests and establishing trial restoration sites to identify the most effective restoration techniques. Now that the background research and testing have been completed, the actual kelp restoration is ready to begin.

Baykeeper, with assistance from NOAA and Fish America volunteers, will coordinate community involvement in preparation, planting and maintenance of the kelp sites, as well as documentation of growth patterns and changes in marine life attracted to the area. Community dive groups will be trained and assigned 10,000 square foot kelp sites, while students from area schools will participate by growing juvenile kelp plants in classroom aquariums and assisting with the transfer of these plants to the dive sites.

For further information on the partnership and the eight community-based restoration projects, contact: Chris Doley, NOAA/NMFS Restoration Center, 1315 East-West Highway, Silver Spring, MD 20910; Phone: 301-713-0174; Fax: 301-713-0184; E-mail: Chris Doley , or visit the NOAA Fisheries Restoration Center website: http://www.nmfs.gov/



Note: This information is provided for reference purposes only. Although the information provided here was accurate and current when first created, it is now outdated.

Disclaimer: The information in this website is entirely drawn from issues of newsletters published between 1994 and 2002 and these issues will not been updated since the original publication date. Users are cautioned that information reported at the time of original publication may have become outdated.

Delaware Inland Bays Nitrogen Overload

The Delaware Inland Bays are receiving nitrogen inputs at twice the rate considered to be their carrying capacity. This conclusion is the result of a detailed land use and nutrient loading analysis commissioned by the Center for the Inland Bays in Lewes, Delaware. The majority of nitrogen is contributed by manure and agricultural fertilizers applied to crops supporting the region's poultry industry. The second leading source is residential development relying upon on-site wastewater disposal systems. Management of these land uses to minimize future loadings presents a serious challenge to local and state officials charged with protecting the bays' water quality.

The Delaware Inland Bays are located along the Atlantic shore of Delaware. The bays consist of three adjoining embayments, with only limited connection to the Atlantic Ocean. The average flushing time is infrequent; water exchanges with the Atlantic every 80 to 100 days. The main source of freshwater to the system is from groundwater discharging either directly to the bays, or to drainage channels which, in turn, flow into the bays. The groundwater drainage area to the entire system encompasses 163,960 acres.

A model was developed to quantify the loadings of nitrogen from each land use within the groundwater drainage area. GIS analysis of land use information for the drainage area was provided by the Delaware Department of Natural Resources. Loading rates for each land use were based on monitored data where available, and on literature values for similar land uses where no actual data were available. Local measurements of nitrogen concentrations in groundwater below agricultural areas were used to refine the

loading estimates for fertilizer applications.

The carrying capacity is the ability of a waterbody to assimilate nitrogen before there are adverse impacts. Each of the Inland Bay's carrying capacities was assessed, using standards developed by the Buzzards Bay Project in Massachusetts that are based on eel grass health.

Embayment	Capacity lbs-N/yr	Load lbs-N/yr	Difference(+/-) lbs-N/yr
Rehoboth	909,000	720,000	-189,000 below capacity
Indian River Bay	920,000	2,248,000	+1,328,000 above capacity
Little Assawoman	312,000	825,000	+513,000 above capacity
Entire System	1,232,000	3,793,000	+2,561,000 above capacity

Table 1. Nitrogen Carrying Capacity Results - Current Conditions *does not include the Maryland portion of the watershed

Results of the nitrogen modeling indicate that the loadings to the entire system are twice the overall carrying capacity (see Table 1). While the loadings to Rehoboth Bay currently are below its carrying capacity, the loadings to Indian River Bay and Little Assawoman Bay are significantly above their carrying capacity. Both systems are receiving loads that are approximately two and a half times the amount calculated to be their carrying capacity.

Comparisons of different land uses and their nitrogen contributions reveal that the largest land use, agriculture, contributes approximately 70% of the total nitrogen load to the Inland Bays (Figure 2). Unsewered residential land use constitutes the second largest source of nitrogen. While residential land uses have a higher loading rate than cropland, there is less acreage. If there was a conversion of agricultural lands to residential land use, the current nutrient problem would not be reduced. The problem lies in the large watershed or contributing areas and the relatively small receiving water bodies with low flushing rates.

Future nitrogen contributions from development within the watersheds to the bays were also estimated. In the Rehoboth Bay basin, additional development would result in a nitrogen load that is greater than the estimated carrying capacity. Given that the other two bays are already over their estimated carrying capacities, any additional loadings from the development of these areas causes a greater exceedance of the carrying capacity and, therefore, further degradation of water quality.

The report concludes that the Delaware Inland Bays are seriously threatened from nutrient loadings within their watersheds. With the exception of Rehoboth Bay, the loadings of nitrogen to each of the Inland Bays, under current conditions, are significantly above their projected carrying capacity. Under projected buildout conditions, the amount of excess nitrogen increases further, such that even Rehoboth Bay exceeds its carrying capacity.

This type of analysis has been extremely effective in various parts of the country in instituting policy changes at the local level. The Buzzards Bay NEP employed this approach in

Buttermilk Bay to evaluate nitrogen loadings to embayments and utilized the findings to implement local bylaws that were protective of estuarine water quality. A nitrogen loading and carrying capacity analysis allows managers to prioritize land uses that contribute nitrogen to an embayment and quantifies the amount of nitrogen loading an embayment can absorb without degrading water quality.

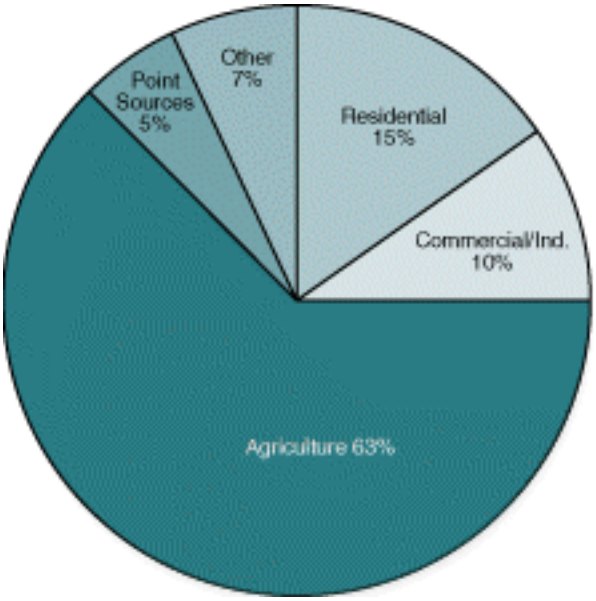


Figure 2. Nitrogen Load By Land Use for Delaware Inland Bays

The managers of the Delaware Inland Bays face a serious and difficult task in deciding how to protect the water quality in the bays. A significant reduction in current loadings is needed, and any future loadings must be prevented. To have any affect, these reductions must come from the two largest nitrogen sources: agriculture and residential development. However, these land uses are also the driving force in the local economy. Bay managers are working now to develop techniques to reduce nitrogen inputs, recognizing that any proposed solutions must have the support of all parties living and working in the watershed.

For further information, contact: Bruce Richards, Executive Director, Center for the Inland Bays, P.O. Box 279 Nassau, DE 19969, Phone: 302-645-7325; E-mail: Bruce Richards or visit the web site at http://www.epa.gov/owow/estuaries/programs/dib.htm

COASTLINES
Information About Estuaries and Near Coastal Waters

Note: This information is provided for reference purposes only. Although the information provided here was accurate and current when first created, it is now outdated.

Disclaimer: The information in this website is entirely drawn from issues of newsletters published between 1994 and 2002 and these issues will not been updated since the original publication date. Users are cautioned that information reported at the time of original publication may have become outdated.

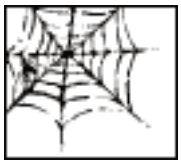
Tools to Manage and Protect Coral Reefs Available on CD-ROM

The Special Projects Office of NOAA and the Florida Department of Environmental Protection, Florida Marine Research Institute announce the availability of a set of tools to assist in monitoring, managing, and protecting the Florida Keys coral reef ecosystem. These tools consist of the Benthic Habitats of the Florida Keys CD-ROM, and a web page. They represent a new model for the types of tools needed to study, manage, and protect these resources, not only in the Florida Keys, but wherever coral reefs exist.

Researchers, resource managers, and concerned citizens can map Florida Keys coral reefs and seagrass beds, overlay other digital data, and perform spatial analysis using Geographic Information Systems (GIS). Thematic data, such as bathymetry, aids to navigation, land, and protected area boundaries are included on the CD-ROM. As a result, GIS analysis associated with marine reserve management, monitoring and research, ship groundings, restoration, and other activities, can be conducted. Most importantly, the CD-ROM includes all necessary software.

The World Wide Web page provides an introduction to the Florida Keys benthic habitats mapping project, example maps and summary statistics, and internet access to the digital data. Once downloaded, the data can be used in ArcView and MapInfo. The internet address for the Benthic Habitats of the Florida Keys web page is: www-orca.nos.noaa.gov/projects/benthic_habitats .

To learn more about the Benthic Habitats of the Florida Keys mapping project or to receive a free CD-ROM, contact either: Steve Rohmann, NOAA, Room 9650, 1305 East-West Highway, Silver Spring, MD 20910; Phone: (301)713-3000x137; E-mail: Steve Rohmann , or Christopher Friel, Florida Marine Research Institute, Florida Department of Environmental Protection, 100 Eighth Avenue, S.E., St. Petersburg, FL 33701; Phone: (813)896-8626; E-mail: Christopher Friel.



Note: This information is provided for reference purposes only. Although the information provided here was accurate and current when first created, it is now outdated.

Disclaimer: The information in this website is entirely drawn from issues of newsletters published between 1994 and 2002 and these issues will not been updated since the original publication date. Users are cautioned that information reported at the time of original publication may have become outdated.

Massachusetts Facility Tests New Technologies to Protect Coastal Ecosystems

Cape Cod, Buzzards Bay, Nantucket, and Martha's Vineyard are some of the jewels of the southeastern Massachusetts coast and the area is one of New England's most desirable places to live and visit. Consequently, the popularity of the area has increased summer and year-round populations and placed the ecosystems of coastal waters under stress. Specifically, the increased release of nutrients, primarily nitrogen, has over-fertilized many coastal water bodies and has caused consequent declines in water quality, loss of species diversity, loss of valuable fisheries and aesthetic qualities.

With few large cities, limited centralized wastewater treatment in the region, and sandy soils, one of the largest sources of nitrogen to area waters is through onsite wastewater treatment system (OWTS) or septic system contamination of groundwater. Alternative, innovative septic systems which remove substantially larger amounts of organics, solids and nitrogen exist, but have been slow to reach the market in significant numbers for many reasons, including lack of verified performance data, higher initial cost and cost of operation, slow regulatory response, and unfamiliarity with advanced systems by system designers, installers and the public.

In 1994, the Buzzards Bay Project, Barnstable County, and the Center for Marine Sciences and Technology at the University of Massachusetts-Dartmouth sought to better coordinate efforts and

develop a more rigorous approach to identify alternative systems that are suited to the region's soils, climate and occupancy patterns. Comparing data gathered from alternative technologies installed in residences was limiting because water usage and wastewater strength vary widely from family to family. For this reason, it was decided that a centralized test facility which would test alternative OWTS alongside a conventional OWTS, using a common sewage source for a two-year testing period, would provide the best comparative, verified performance data to speed the approvals and thus the availability of technologies in the region.

A grant, through the US EPA's Environmental Technologies Initiative, enabled the Buzzards Bay Project to move forward with the project. In November, 1998, the Massachusetts Alternative Septic System Test Center was completed on the selected site at the Air National Guard Base and began testing five alternative onsite technologies.(This Massachusetts facility joins two other recently constructed testing and research facilities for onsite technologies in Texas and Florida).

The Test Center will serve as a test bed for vendors of advanced OWTS who are seeking to speed approvals by agencies in the region. The facility is able to test concurrently, triplicates of six alternative and one conventional OWTS for a period of two years. Standard testing will measure removals of organic matter and pathogens, with an additional focus on nitrogen and phosphorus removal performance. In addition to speeding regulatory permits and providing a data set for potential approvals elsewhere in the US, the data generated will be an important marketing tool with local permitting boards, system installers and consumers.

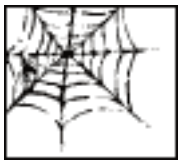
The Test Center will go a long way to address the needs of municipal Boards of Health in having adequate performance data and operation and maintenance information for approval of use. For example, in seasonal communities, like some villages on Cape Cod, Boards of Health have been reluctant to approve alternative systems for residences which are used primarily during the summer, and which may comprise a large proportion of new construction in some areas. These boards are skeptical that alternative systems, many of which rely on biological processes to remove nitrogen and other contaminants, will provide the same level of performance that they do in year-round operation. The Test Center will provide the opportunity for vendors of alternative systems to evaluate their systems under simulated seasonal use conditions.

Since alternative technologies have been generally more expensive to purchase, install and operate than a conventional system, a vendor's ability to make sales is tied to savings which may accrue from the use of their systems. First, in nitrogen sensitive watersheds, systems which remove more nitrogen than a conventional technology may obtain nitrogen credits which allow for larger houses or higher housing density. Second, alternative treatment systems which reduce the suspended solids and organic load in their effluent by about 90% or more may obtain reduced area requirements for leaching fields or in the separation distance to the water table.

Beyond the benefits noted above to onsite system vendors, the Test Center will benefit the public in several ways. By speeding approvals of new technologies there should be an increase in the variety of

systems available to the public. More technologies on the market should lead to price competition. The results of testing each technology are to be released as public documents which will be available to homeowners and Boards of Health.

For further information, contact: Tony Millham; Buzzard's Bay Project phone: 508-291-3625; E-mail: Tony Millham , or visit www.buzzardsbay.org EXIT disclaimer



Note: This information is provided for reference purposes only. Although the information provided here was accurate and current when first created, it is now outdated.

Disclaimer: The information in this website is entirely drawn from issues of newsletters published between 1994 and 2002 and these issues will not been updated since the original publication date. Users are cautioned that information reported at the time of original publication may have become outdated.

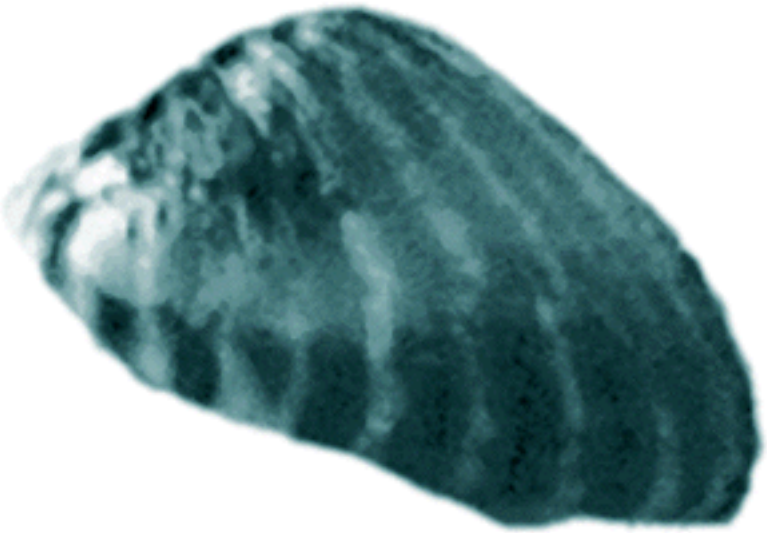
Connecticut Becomes the 19th State Invaded By Zebra Mussels

Zebra mussels, thumbnail-sized freshwater mollusks which arrived in the United States through ship ballast water in 1986, have invaded their 19th state with the confirmation of their presence in East Twin Lake in Salisbury, Connecticut, according to an announcement from the Connecticut Sea Grant College Program.

The discovery of the mussels is the first confirmed sighting in Connecticut, and only the second discovery of the mussels in New England. The mussels have been thriving in New York lakes and the Hudson River, as well as Lake Champlain for a number of years, but had not been found in Connecticut until now. The mussels were up to 15 millimeters in length, indicating that they may have been introduced to the lake in late 1997, or early 1998.

Since their discovery in Lake St. Clair in June, 1988, zebra mussels have spread throughout the Great Lakes; the Arkansas, Hudson, Illinois, Mississippi, Mohawk, Ohio, St. Lawrence, and Tennessee Rivers; and other waters of southern Canada and the eastern United States. They have also been intercepted on boat trailers at four points in California.

A study by the National Sea Grant Zebra Mussel Clearing House in Brockport, NY estimated that costs of the zebra mussel infestation to raw-water-dependent users, such as utility companies, to be approximately $69 million, between 1989 and 1995.

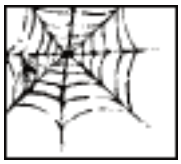


Zebra mussels are part of an increasing environmental threat of non-indigenous species invasions brought on, in part, by the increasing level of global commerce. New England waters, such as Long Island Sound, are being invaded by a new species on the average of one species every 36 months.

The most common method of transport is via ballast water in ocean-going ships, although the organisms can also travel between lakes and rivers on boat hulls, on aquatic weeds caught in propellers, or on boat trailers, and invisibly in bait buckets in their larval planktonic form.

Boaters and anglers can take some simple precautions to avoid spreading zebra mussels and aquatic weeds from lake to lake by removing all aquatic weeds from the propeller, boat trailer and other gear before leaving a launch area, washing their boat, and drying it thoroughly in the sun for several days before using it again.

For further information, contact: James T. Carleton, Connecticut Sea Grant Director, Williams College / Mystic Seaport Maritime Studies Program; phone: (860)572-5359; E-mail: James T. Carleton or Charles O'Neill, Director, Sea Grant National Zebra Mussel Information Clearinghouse; phone: (716)395-2638; E-mail: Charles O'Neill



Note: This information is provided for reference purposes only. Although the information provided here was accurate and current when first created, it is now outdated.

Disclaimer: The information in this website is entirely drawn from issues of newsletters published between 1994 and 2002 and these issues will not been updated since the original publication date. Users are cautioned that information reported at the time of original publication may have become outdated.

HazNet Site Debuts

In a year when El Niño has spawned violent weather around the globe, and when many scientists anticipate continuing weather extremes, the national Sea Grant network has created HazNet, a web site devoted to coastal hazards awareness and mitigation. The HazNet web site gathers information and resources from Sea Grant programs, the National Oceanographic and Atmospheric Administration, and other public and private sector sources. It is designed to help people meet the challenges presented by natural hazards such as riverine flooding, storm surge, coastal erosion, seismic events and hurricanes.

The site includes consumer fact sheets, including one from South Carolina with tips on how to purchase storm shutters; an example of a community hazard mitigation plan from Rhode Island; a report on changes in building codes and practices in South Florida since Hurricane Andrew; a bibliography of Sea Grant coastal hazards research; and an on-line hazards bulletin board and discussion group.

The site can be found on the worldwide web at www.haznet.org. EXIT disclaimer For further information on the Sea Grant HazNet project, contact Bob Bacon; Phone: (843) 727-2075; E-mail: haznet@haznet.org

COASTLINES
Information About Estuaries and Near Coastal Waters

Note: This information is provided for reference purposes only. Although the information provided here was accurate and current when first created, it is now outdated.

Disclaimer: The information in this website is entirely drawn from issues of newsletters published between 1994 and 2002 and these issues will not been updated since the original publication date. Users are cautioned that information reported at the time of original publication may have become outdated.

Evaluating Simple, Cost Effective Solutions for Reducing Stormwater and Urban Runoff Pollution

Santa Monica Bay Restoration Project

Characteristics

Santa Monica Bay's 414-square mile watershed includes a large part of the Los Angeles metropolitan area and is home to approximately three million people.

The bay is vital to the economic health of Los Angeles. Tourism ranks as the second largest industry in the region. Many of these visitors flock to the region's primary recreational resource -- Santa Monica Bay. The 22 public beaches along the bay's 50 miles of shoreline attract over 45 million visitors each year and some are world renowned for providing spectacular surfing opportunities.

In addition, the bay supports a diversity of habitats and some 5,000 species, including biologically rich kelp forests the southern-most run of the endangered steelhead trout, submarine canyons and an extensive soft-bottom benthic community.

The Problem

Despite notable environmental improvements, the bay continues to face the challenges of health risks to recreational users and habitat degradation resulting from urban runoff pollution during both dry and wet weather.

Los Angeles County and the 21 cities in the watershed are grappling with implementing stormwater pollution reduction technologies, given limited financial resources and the lack of research on appropriate technologies for the climate and weather regime found in Southern California.

The Project

The purpose of this project was to demonstrate and evaluate the effectiveness of catchbasin retrofit devices in reducing pollutant loads to the bay. The focus was on devices requiring only minor structural modifications to existing catchbasins, costing no more than $500 to $1,000 per catchbasin and needing maintenance, on average, only once per year. Commercially available and easily constructed devices were evaluated in both wet and dry weather.

Introduction to Santa Monica Bay

Santa Monica Bay is a priceless resource, as vital to its marine life, birds, and other forms of resident and transient wildlife as it is to the nine million people who live within an hour's drive of its shores. However, it has long been adversely affected by the ills associated with its proximity to the heavily urbanized Los Angeles basin. While tremendous improvements have been made, stormwater and urban runoff remain significant uncontrolled sources of pollution to the bay. Reducing pollution from these sources is one of the highest priorities in the Bay Restoration Plan.

Indicative of the problems associated with stormwater and urban runoff are the findings of the landmark epidemiological study conducted by the Santa Monica Bay Restoration Project (SMBRP), linking increased illness rates to swimming near flowing storm drain outlets and at beaches with high bacterial indicator densities. Stormwater also carries massive trash loads to the bay, costing Los Angeles County taxpayers roughly $4 million in beach clean-up costs in 1997. Sediment contaminants (e.g., metals) are

elevated near stormwater discharges and urban runoff has been found to be toxic to portions of the bay's benthic community.

Click on above image for larger picture.

Overview of the Project

The Municipal Stormwater/Urban Runoff Pilot Project was initiated by the SMBRP, which awarded a $100,000 challenge grant to the City of Santa Monica. With this money, Santa Monica led the effort to organize a consortium of agencies, including Los Angeles County, 13 municipalities, one industry partner and the SMBRP, to collectively undertake a study to evaluate the feasibility and effectiveness of retrofitting catchbasins to reduce pollutant loads to the bay. Catchbasins in Southern California typically are not designed to allow the solids to fall out, allowing sediments and their associated contaminants to wash down the drain. The consortium hired two consulting firms and two researchers from the University of California at Los Angeles to conduct a series of applied research studies to meet the project's goal.

Project Objectives

The goal of this project was to evaluate the feasibility and benefits of using catchbasin retrofit devices as one element in local stormwater management programs. Three main objectives (or tasks) were undertaken to achieve this goal:

- characterizing local runoff and selecting target pollutants;
- evaluating catchbasin retrofits, and
- assessing the feasibility and potential environmental benefits of various inter-city catchbasin retrofit scenarios.

Implementing the Project

Characterize Local Runoff and Select Target Pollutants

Limited sampling was conducted at four sites to confirm the types and concentrations of pollutants in local urban runoff and differences between land uses. Target pollutants met the following criteria:

- present in local receiving waters in concentrations that threaten beneficial uses,

- discharged via municipal storm drains in significant quantities, and
- can be removed or reduced by some type of catchbasin insert.

Based on these criteria and the results of sampling conducted both prior to and as part of this project, the pollutants selected for study were total suspended solids, oil and grease, and trash and debris.

Evaluate Catchbasin Retrofits

Before conducting field and laboratory tests, a set of objectives for evaluating retrofits was established. The objectives addressed the cost of the devices and their ability to control the designated target pollutants, function as operationally practical components of the municipal stormwater collection system, and be used in certain municipal applications (i.e., with specific types of catchbasins and/or for specific types of land use).

Based on previous research and limited modeling, a variety of catchbasin "inserts" was selected for further evaluation. Inserts are devices that attach to the catchbasin entrance or mount inside and thus are relatively easy and inexpensive to install. Inserts are designed to improve stormwater quality by either preventing debris and pollutants from entering the basin or by detaining and treating the water in the basin. Field-testing was conducted in two areas -- one having residential land use and the other commercial. Laboratory testing included shake tests, bench-scale column tests, and a full-scale simulation in a fabricated, aboveground catchbasin. Table 1 summarizes the results of the field and full-scale laboratory tests for the candidate devices.

	Dry Weather			Wet Weather		
Retrofit Device	TSS	Oil & Grease	Debris	TSS	Oil & Grease	Debris
Commercial Device**	none	mod.	high	none	low	high
Boardover	none	none	high	NR***	NR	NR
Debris Basket	none	none	high	none	none	high
Inlet Screen	none	none	high	NR	NR	NR
Sedimentation Baffle	high	low	high	mod.	low	mod. - high

Table 1: Comparative Pollutant Removal Effectiveness*
*Full report includes a similar comparison for all evaluation objectives.
**Commercial device consisting of an inlet screen panel, debris basket and oil sorbing columns.
***"NR" indicates that the device is not recommended.

Assess Inter-city Implementation Scenarios

Several inter-city implementation scenarios were considered, including citywide implementation, implementation at high opportunity sites, land-use specific implementation, and implementation in

catchments discharging to sensitive or targeted receiving waters.

For example, for the land-use specific scenarios, the expected reduction in the target pollutant load was estimated using data on the number of catchbasins associated with the particular land use(s): the predicted pollutant removal efficiency for retrofitted catchbasins and the estimated pollutant load for the area under that land use. These calculations are illustrated for free oil and grease removal in Table 2. Calculations were also made for removal of trash and debris and total suspended solids under various scenarios.

Based on this pilot project, a decision framework for evaluating retrofit options was developed to help municipalities select catchbasin retrofit devices taking into account local conditions and priorities. The first "decision tree" includes four steps:

Land Use-Based Retrofit Alternative	% of Catchbasins Retrofitted (approx. number)	Estimated Removal for Sedimentation Baffle	Total Watershed Reduction	Reduction in Actual Pollutant Load (in metric tons)
Baywide	80%(12,320)	80%	64%	434
Commercial, Multi-Family Industrial	80%(6,966)	80%	43.2%	293

Table 2: Estimated Results of Sedimentation Baffle Retrofit for Free Oil and Grease Removal

1. Determine which pollutants are of concern (e.g., which impair or threaten beneficial uses),
2. Identify the catchbasins to be controlled (e.g., those discharging to sensitive water bodies),
3. Decide whether to focus on dry-weather or wet-weather discharges or both, and
4. Select appropriate devices (e.g., boardovers or screens to control dry-weather pollutants).

Another decision tree with supporting information helps planners evaluate different devices based on their technical feasibility, pollutant removal effectiveness, cost, and operation and maintenance considerations.

Success Stories

- This pilot project is the first to systematically test stormwater treatment devices under the climate and weather regime found in Southern California (i.e., arid climate, clearly defined wet and dry seasons, and high-intensity winter storms).
- The project's findings are transferable to coastal Southern California and other arid regions of the U.S. and, in addition, the implementation scenarios can be easily updated with new information.
- The project's findings are providing a timely impact on disbursement of county bond funds for

capital improvements to reduce stormwater pollution -- and should prove valuable to municipalities as they formulate capital project proposals.

- Inlet screen panels and boardovers are a very effective and inexpensive way to prevent nearly all debris from entering catchbasins during dry weather. In addition, they do not interfere with street sweeping; in fact, tests showed that the street sweeper picked up 95% of the accumulated debris in front of the catchbasin.
- Debris baskets are equally effective in both dry and wet weather; they did not impede flow in field tests, require no catchbasin modifications and can be easily cleaned out. Furthermore, they can hold oil sorbents to control oil and grease. These are probably used most effectively in commercial areas, which typically generate about three times the trash as other areas.

Lessons Learned

Prototype box-shaped debris basket

When evaluating stormwater treatment devices, planners should make sure that devices have been tested based on pollutant concentrations typically found in urban runoff. Many sorbers, for example, had been tested based on oil and grease concentrations in the thousands of milligrams per liter rather than the more appropriate 10 to 35 mg/l range typical of urban runoff.

Catchbasins should be evaluated in the context of all of the elements of a watershed-based stormwater management program. When considering the use of catchbasin inserts, it is important to recognize that there are practical limits on which pollutants can be controlled, what degree of control is possible, and what is truly "practicable" given that catchbasins must still perform their function of flood control.

For oil and grease removal, the most cost-effective land use-based approach is to target commercial, multi-family and industrial areas. Reducing the number of retrofits by 44%, but focusing on the land uses that generate more oil and grease, still affords a pollutant load reduction of 67% of the baywide scenario (see Table 2).

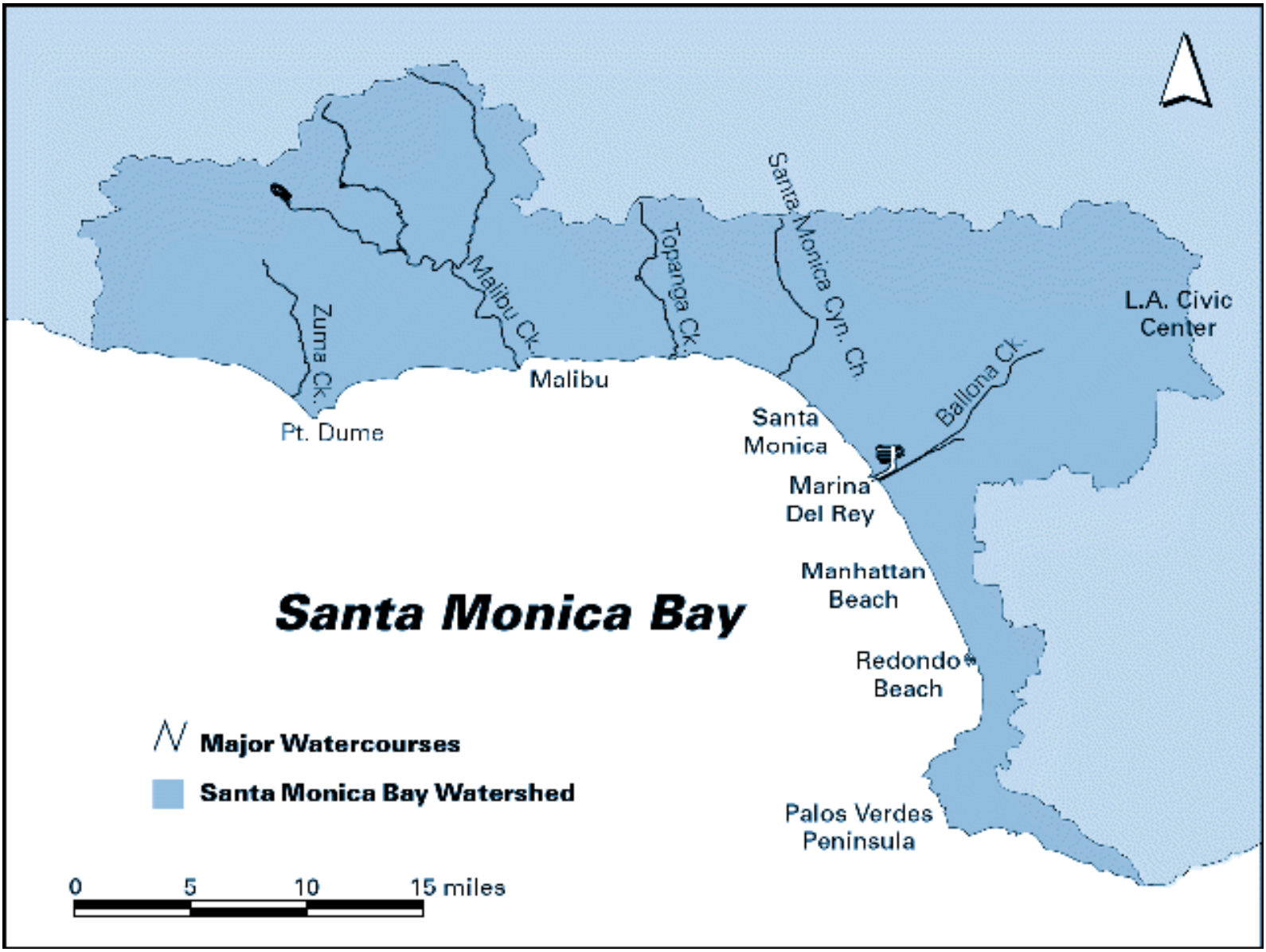
The volume of most Southern California catchbasins is large enough to allow significant capture of total suspended solids and fine particulate-related pollutants. The most cost-effective scenario for controlling total suspended solids is to focus on catchbasins where pollutant removal would be highest (e.g., those with larger volume to tributary area and imperviousness ratios).

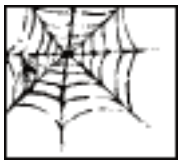
For Further Information

Renee Purdy DeShazo
Santa Monica Bay Restoration Project
101 Centre Plaza Dr.
Monterey Park, CA 91754
Phone: (323) 266-6958
E-mail: rdeshazo@rb4.swrcb.ca.gov

A "boardover" used to physically block the curb inlet of the catchbasin

| Back to Index Page |


Zuma Ck.
Malibu Ck.
Topanga Ck.
Santa Monica Cyn. Ch
Ballona Ck.
L.A. Civic Center
Malibu
Pt. Dume
Santa Monica
Marina Del Rey
Manhattan Beach
Redondo Beach
Palos Verdes Peninsula
Santa Monica Bay
Major Watercourses
Santa Monica Bay Watershed
0 5 10 15 miles



Note: This information is provided for reference purposes only. Although the information provided here was accurate and current when first created, it is now outdated.

Disclaimer: The information in this website is entirely drawn from issues of newsletters published between 1994 and 2002 and these issues will not been updated since the original publication date. Users are cautioned that information reported at the time of original publication may have become outdated.

The National Estuary Program

Estuaries and other coastal and marine waters are national resources that are increasingly threatened by pollution, habitat loss, coastal development, and resource conflicts. Congress established the National Estuary Program (NEP) in 1987 to provide a greater focus for coastal protection and to demonstrate practical, innovative approaches for protecting estuaries and their living resources.

As part of the demonstration role, the NEP offers funding for member estuaries to design and implement Action Plan Demonstration Projects that demonstrate innovative approaches to address priority problem areas, show improvements that can be achieved on a small scale, and help determine the time and resources needed to apply similar approaches basin-wide.

The NEP is managed by the U.S. Environmental Protection Agency (EPA). It currently includes 28 estuaries: Albemarle-Pamlico Sounds, NC; Barataria-Terrebonne Estuarine Complex, LA; Barnegat Bay, NJ; Buzzards Bay, MA; Casco Bay, ME; Charlotte Harbor, FL; Columbia River, OR and WA; Corpus Christi Bay, TX; Delaware Estuary, DE, NJ, and PA; Delaware Inland Bays, DE; Galveston Bay, TX; Indian River Lagoon, FL; Long Island Sound, CT and NY; Maryland Coastal Bays, MD; Massachusetts Bays, MA; Mobile Bay, AL; Morro Bay, CA; Narragansett Bay, RI; New Hampshire Estuaries, NH; New York-New Jersey Harbor, NY and NJ; Peconic Bay, NY; Puget Sound, WA; San Francisco Bay-Delta Estuary, CA; San Juan Bay, PR; Santa Monica Bay, CA; Sarasota Bay, FL; Tampa Bay, FL; and Tillamook Bay, OR.

| Back to Index Page |

EPA HOMEPAGE | **WATER HOME** | **HOTLINES** | **SEARCH** | **COMMENTS**
Environmental Protection Agency's Office of Wetlands, Oceans, & Watersheds

URL:
http://www.epa.gov/owow/estuaries/coastlines/janfeb99/center/natestuaryprog.html
Revised March 1, 1999