

# NATIONAL ESTUARY PROGRAM



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## THE NEP IS ADAPTABLE

The National Estuary Program (NEP) serves as a model for community-based watershed management—a non-regulatory, stakeholder-driven, collaborative approach that can easily be transferred and adapted to other programs across the country.

The NEP approach to problem solving continues to demonstrate effectiveness on a local level by helping towns and cities solve specific issues related to the wide range of environmental problems that are affecting the watershed.

The NEP approach integrates sound science with sound decision making and adaptive management—a process of continuous monitoring—and sometimes adjusting—if goals and objectives are not being met. This approach is also what makes NEPs successful in their ability to adapt to emerging issues facing our coasts and estuaries, such as invasive species, persistent organic pollutants, and climate change.

Here's a look at some of the successful efforts NEPs have made in the last decade to address common environmental challenges facing U.S. coastal watersheds.

### CLIMATE CHANGE

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The Puget Sound, home to already-imperiled salmon, recently listed orcas and declining marine birds, could be further jeopardized by rising sea-levels brought on by global warming, according to a July 2007 report from the National Wildlife Federation. Although the issue of adaptation to climate change is not new to Puget Sound, the potential consequences of climate change have become a reality that all NEPs must now address in order to protect coastal watersheds.

### NEP IN ACTION

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In 2005, the Puget Sound Action Team (now the Puget Sound Partnership (PSP)) invested \$25,000 of State funding in a report assessing the potential impact of climate change on the Pacific Northwest. They commissioned the Climate Impacts Group (CIG), a team of climate experts based at the University of Washington, to collect and analyze available scientific data and modeling projections relevant to Puget Sound.

PSP staff worked alongside CIG to write and design the report to ensure that findings were scientifically sound and that information would be accessible to a diverse regional audience, including policy-makers, resource managers, and the general public. A separate "Foundation Document" featuring the more technical and scientific aspects of the report was also made available on the PSP Web site. The report, "Uncertain Future," was released to the public in October 2005, asserting that Pacific Northwest

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temperatures are rising faster than the global average and that without a targeted plan, watershed and coastal areas could experience increased flooding, accelerated rates of sea level rise, loss of near-shore habitat and salt marshes, increased pressures on salmon, and greater incidences of low dissolved oxygen problems in some bays and estuaries related to increased algal blooms.

The report was delivered to legislators, political leaders, agency directors, environmental organizations, educational institutions, libraries, and all PSP agency contacts, moving one State senator to contact the PSP within one day of reading it to offer his support.

PSP is now developing strategies to adapt to sea level rise, increased flooding, reduced water quantity, and other projected outcomes as part of the forthcoming 2020 Action Agenda. As other Federal, State and local agencies address carbon emissions, the Puget Sound Partnership's long-term monitoring program (Puget Sound Assessment and Monitoring Program, or PSAMP) will also decide how best to modify monitoring activities to capture climate-driven changes, and work with climate models to predict likely changes in habitat, water quality and fish and wildlife distribution.

## INVASIVE SPECIES

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A variety of foreign microbes, plants, and animals enter the estuary waters where they face few, if any, native predators or diseases to prevent them from establishing themselves on the ocean floor where they can upset native habitat, marine life and water quality. Important pathways of introduction for invasive species include ballast water, aquaculture, marine recreational activities, and the sea chests of commercial and recreational fishing boats.

These intruders cling to the hulls of boats and other hard surfaces, including permanent floating docks and piers, ropes, buoys, chains—they even hitchhike on the backs of native shellfish and other organisms—where they can colonize and begin to smother native vegetation, killing off native populations by depriving them of food. Fouling communities of organisms can also damage piers and pilings and obstruct municipal water pipes while pathogen- or disease-carrying invaders have the potential to threaten public health.

Fortunately not every invader is harmful—some introduced species actually appear to be harmless—but among those that are, effective strategies are necessary to manage and control future invasions. But the first step is recognizing what species are present and identifying potential sources and vectors.



## NEP IN ACTION

Since 2000, the Massachusetts Bays Program (MBP) and other NEPs in the Northeast are addressing the problem in New England waters with an Invasive Species Rapid Assessment Survey (RAS), a quick, cost-effective approach similar to what NEPs in Washington and California have used. The MBP and its partners have conducted three RASs so far—a method that is less costly compared to other approaches but still provides high-quality data in a short period of time that can be shared and transferred to watershed regions across the country.

Every few years in mid- to late summer, when most marine organisms have matured and therefore are more easily identified, the MBP coordinates the weeklong RAS at designated floating dock communities along the coast. In July 2007, the MBP used local, State and Federal funding, including a Massachusetts Institute of Technology Sea Grant, individual NEP contributions and various State invasive working groups to seed the \$25,000 effort which stretched from Maine to Cape Cod.

From there, success rests entirely on the work of a team of volunteer taxonomic experts and researchers brought together by the MBP. Compensated with little more than a place to sleep and three squares a day, the team of scientists, educators and students dispersed across docks to gather samples, including seaweeds and fauna, tiny spindly crustaceans and other organisms. This year, the MBP had a diver and taxonomist from the Netherlands Natural History Museum on the team—a valuable addition that enabled them to capture species on the underside of docks in several places they would not have been able to observe and/or reach from the docks, especially species that are sensitive to fresh stormwater runoff and that seek habitat at greater depths.

After dropping the specimens into shallow pans of salty water for a quick examination, the scientists packed them in jars and plastic bags for an intensive study at the University of New Hampshire, another vital partner. Example specimens are preserved in ethanol to document species' occurrence and for possible use in future genetic studies. To complete the final RAS report, which takes about six months, scientists will continue the identifica-



The MBP is launching a year-round monitoring project this fall using plastic plates deployed in the water of various marinas so researchers can follow species settlement and development over time.



tion process back at their home labs across the U.S., Canada, Brazil and the Netherlands.

These baseline inventories are helping NEPs increase their knowledge about what species are present in time and place and to observe how things are changing. The information they collect can be shared and compared across estuary programs, putting researchers in a better position to publish trends about the presence and abundance of species—important factors that help State and local governments develop effective early detection and rapid response plans, State management initiatives, public education and increased volunteer interest in future monitoring efforts.

The MBP is currently working with State agencies, particularly the Massachusetts Coastal Zone Management (MCZM), to develop a coordinated Statewide approach involving all regulatory agencies and upper-level policy managers. To guide the effort, MCZM and the MBP completed a draft risk assessment process to evaluate the threat posed by new invaders and are now collaborating with the State working group on the implementation details. To facilitate cooperation and communication on a regional scale, the MBP sits on the regional U.S. Fish and Wildlife Services Panel for Aquatic Nuisance Species and has adopted some action items in its Comprehensive Conservation and Management Plan (CCMP) to serve as goals. To fund their programs, MBP partners pursue grants to support ongoing citizen volunteer monitoring efforts.

The MBP is launching a year-round monitoring project this fall using plastic plates deployed in the waters of various marinas so researchers can follow species settlement and development over time. MBP partners are securing grants for the plate materials, university students are expected to do the physical work and MBP's Netherlands partner will assist them in the identification process.

## EMERGING CONTAMINANTS

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Chemicals such as DDT and PCBs, known as legacy pollutants, have been banned for more than 20 years and was followed by successful efforts to eradicate them from San Francisco waterways. The fallout from these chemicals still poses health challenges for the San Francisco Bay estuary. Adding to the problem, in recent years a new set of chemical invaders called "emerging contaminants," compounds that are linked to everyday consumer products, are ushering in a whole new set of challenges for watershed managers.

What's now showing up in estuarine sediments and the blood and tissue samples of fish and sea mammals includes chemicals used in stain-resistant and non-stick coatings, flame retardants, plasticizers, triclosan in anti-bacterial soaps and a variety of other compounds used to manufacture pharmaceuticals and personal care products. Unfortunately, the toxicity of these goods—and their impacts on water quality, habitat and marine life—has not yet been established, an issue that calls for greater cooperation between scientists and policy makers.

## NEP IN ACTION

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In 2007, the San Francisco Estuary Project (SFEP) completed an 18-month process to update its Comprehensive Conservation and Management Plan, giving pollution prevention an extensive update that makes emerging contaminants a major target area for SFEP and its partners.

Working very closely with its partner, the San Francisco Estuary Institute (SFEI), steps are being made to enhance the San Francisco Estuary and its watershed in the face of chemical contamination. At a June 2007 Emerging Contaminant Workgroup meeting, the partners shared significant scientific findings on the scope of emerging contamination in the estuary enabling them to modify current strategies and design new ones.

Beginning with a very basic but important premise—that healthy streams and wetlands have inherent cleansing functions—the SFEP will embark on new programs designed to restore and enhance stream and wetland functions as another way to help mitigate the effects of pollu-

tion in the estuary and its watersheds. A loftier goal will be to engage local, State and Federal governments in an effort that targets makers of new and existing consumer products with a product stewardship program. This would require manufacturers to develop a Pollutant Release Minimization Strategy before new products hit the market along with a redesign, reformulation, or replacement of existing products that already are shown to be sources of pollution in the estuary.

Meanwhile, the inclusion of so many new and potentially harmful chemicals in consumer products is so widespread that attempts to control contamination using traditional pollution prevention efforts and conventional treatment systems make public education and awareness efforts a critical part of SFEP's plan.

To address pollution caused by flame retardants, the SFEP hopes to take advantage of a partnership the San Francisco Estuary Institute already has with Duke University, which conducts cutting edge research on flame retardants. This would enable an extensive monitoring program that offers flexibility in analysis and cost-saving benefits compared to that of commercial labs. Partnering with the university will also afford greater publishing opportunities and future collaboration on additional Regional Monitoring Program for Water Quality (RMP) studies.

Improving water quality and focusing on emerging pollutants will be a priority for SFEP in the next two years, along with maintaining freshwater flows into the estuary. This fall the SFEP's Implementation Committee will discuss the next steps for setting and funding priorities and forming partnerships necessary for carrying out the work.

## HABITAT RESTORATION

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The Port Aransas Nature Preserve, located along the western portion of Port Aransas, Texas, bordering the Ship Channel, features a diverse collection of habitats including freshwater and brackish marshes, estuarine areas, and wind tidal flats. Unfortunately, the Preserve is suffering from severe erosion, losing as much as 17 feet of land per year, according to reports commissioned by the Texas General Land Office (GLO).

If shoreline erosion continues at this pace, a breach of the uplands will quickly result in the permanent alteration of hundreds of acres of wetlands, destroying essential habitat for numerous species of finfish, shellfish, migratory and shorebirds, wading birds, waterfowl, and four species of sea turtles. Further destruction will also threaten coastal and nature tourism—a crucial element of the community's economy.



## NEP IN ACTION

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To ensure the long-term protection of the area, the Coastal Bend Bays & Estuaries Program (CBBEP) forged a partnership to take action. Together, the group has pooled funds and expertise to launch a \$6.35 million effort to protect more than 1,000 acres of wetlands.

To start, \$2.9 million was issued to the CBBEP by the National Oceanic & Atmospheric Administration (NOAA), which was used to leverage additional funding from the

Texas General Land Office's Coastal Erosion Planning and Response Act. The GLO matched the NOAA funding with \$2 million and management assistance.

With \$4.9 million in hand, the CBBEP employed an engineering firm to assess and develop a feasibility, assessment and design plan, but the project as proposed would require an additional \$1.5 million. They turned to the City of Port Aransas, which had already initiated its own project to preserve the eroding shoreline. The collaboration between the CBBEP and the City of Port Aransas resulted in a cost-effective, efficient and ecologically sound plan to install rocky barriers that would both preserve the shoreline and provide important housing for marine organisms along with places for algae and other food sources to grow.

Since much of the erosion in Port Aransas was attributable to ships moving in and out of the harbor, they called on Chenier Energy, an industrial shipping company that operates liquefied natural gas receiving terminals along the Gulf Coast. Chenier got on board with a donation of \$250,000. The Airport and Channel Corporation also had a stake in protecting the shoreline for its members who owned real estate bordering the preserve and contributed \$1.2 million to the project.

The project includes the installation of carefully selected erosion-control structures adjacent to the Corpus Christi Ship Channel near Piper Channel. It is well under way with construction crews installing a 6,000-foot rock revetment along the shoreline rock to maintain natural water flow to the wetlands and two 800-foot jetties, constructed of rock and steel sheet pile, at the east and west ends of the Piper Channel.

This unique project—expected to be completed in the fall of 2007—demonstrates how successful NEP efforts can be when local, State, and Federal organizations collaborate to achieve a common goal.

## NEPs SUCCESSFULLY MEET ENVIRONMENTAL CHALLENGES

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The US EPA National Estuary Program (NEP), a unique and voluntary community-based program established in 1987 under the Clean Water Act (CWA) Amendments, works to restore and maintain the water quality and ecological integrity of estuaries of national significance.

The NEPs have demonstrated an impressive ability to address new issues facing our coasts. Their success is made possible by applying sound science, sharing findings and developing solutions to take action.

There are 28 NEPs, located in 18 U.S. coastal states and Puerto Rico, which are designated estuaries of national significance for their distinct economic, ecological, recreational, and aesthetic values.

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*The NEP: Applying the Clean Water Act in ways that are Effective, Efficient, Adaptable, and Collaborative.*