



This document is one section from the EPA “Community-Based Watershed Management: Lessons from the National Estuary Program” handbook, published in February 2005. The reference number is EPA 842-B-05-003. You can find the entire document at <http://www.epa.gov/owow/estuaries/neprimer>.

# COMMUNITY-BASED WATERSHED MANAGEMENT

## LESSONS FROM THE NATIONAL ESTUARY PROGRAM

FEBRUARY, 2005

## Chapter 5: Implementing the Management Plan

### INTRODUCTION

The focus of this chapter is on how to move from studying problems plaguing our estuaries to implementing management measures to solve those problems. To ensure success, the NEPs work with their partners to see that they follow through with their commitments to support Management Plan implementation. The NEPs invigorate local involvement by addressing local problems and developing finance mechanisms to raise money to pay for implementation activities. Indicators of success are developed, tracked, and communicated by the NEPs to build additional support for implementation. The NEPs improve their implementation performance by sharing successes and lessons learned at events, such as national conferences and workshops, and by updating their Management Plans periodically. This chapter discusses how the NEPs organize effective institutional arrangements that ensure long-term oversight and accountability, obtain stable and diverse sources of funding, monitor results and communicate them to the public, and update the Management Plan periodically.

The NEPs have learned that the following actions can help lead to successful implementation:

- Organize effective institutional arrangements that ensure long-term oversight and accountability.
- Obtain stable and diverse sources of funding.
- Monitor results and communicate them to the public.
- Update the Management Plan periodically.

The following sections describe how the NEPs successfully implement their Management Plans.

### NEP PRINCIPLES IN CHAPTER 5

- To prevent conflicting agendas and individual interests from derailing the program, the NEPs adopt bylaws and other agreements that define participant roles and provide a mechanism for resolving conflicts.
- Several different institutional structures or arrangements have been effective for various NEPs as they move into implementation.
- A variety of funding sources are needed to avoid over-reliance on a single entity since implementation occurs over many years and is costly.
- A clear and realistic definition of success, including measurable indicators, should be developed and communicated to all stakeholders.
- Environmental results should be communicated in terms that are meaningful to all stakeholders.
- Citizens can play an important role in environmental monitoring and building public support for implementation.

## MAINTAINING MOMENTUM FROM PLANNING THROUGH IMPLEMENTATION

With the Management Plan complete, the NEPs increase their focus on implementation: obtaining funds, building partner support, and measuring and communicating results. To sustain the momentum gathered during plan development, the NEPs revisit their governance structure to ensure that it is appropriate to effectively implement the Management Plan. The NEP asks itself whether it should remain within its current institutional host, become a nonprofit, or establish a nonprofit arm. Each of these options has advantages and disadvantages in regards to fundraising, building partner support, and measuring and communicating results. The NEPs also intensify their efforts to involve stakeholders and build partner support. The NEPs engage stakeholders in applied activities, such as volunteer monitoring and implementing mini-grants, and create an environment that respects all voices, gives real power to participants, clearly states objectives and timetables, and makes clear progress on those objectives.

### REVISITING THE GOVERNANCE STRUCTURE

In deciding whether to remain in its original institutional location, an NEP investigates a variety of different alternatives and identifies the place that best suits its specific needs. The NEPs examine the community of the estuary: how decisions are reached, what perceptions are prevalent, and who or what institutions are influential. Several different institutional locations have been effective for different NEPs. Coastal Bend Bays and Estuaries (Texas) and Tillamook Bay (Oregon) moved from state and local government institutions to become independent nonprofit organizations. San Francisco and Delaware Bay NEPs remained in their state government institutions but created nonprofit arms to conduct outreach and fundraising activities. The San Juan Bay NEP established a trust fund to conduct fundraising and a board of directors with representatives from the public and private sectors to provide overall direction for the program. And, the New York-New Jersey Harbor NEP remained in the EPA Region II office. While locating the NEP within a government agency can allow the NEP to more easily coordinate with other government programs and have greater access to data and certain regulatory functions, locating the NEP outside a government agency, in a satellite office or nonprofit, has advantages including greater autonomy, visibility, and certain funding opportunities. **Appendix D** presents a one-page list of the advantages and disadvantages of becoming a nonprofit.

SUSTAINING STAKEHOLDER INVOLVEMENT AND PARTNER SUPPORT

The NEPs reinforce the partners' commitment by continuing to hold stakeholder meetings, managing the NEP committee process, and working to sustain the consensus and common vision reached among the partners during plan development. While the NEPs implement some actions independently, they oversee, coordinate, and in other ways influence many more partner actions. For example, the NEP may provide seed money or the initial organization for implementing partners that do have the legal authority or resources to implement actions.

The NEPs, however, are sometimes frustrated by a decline in stakeholder participation after the Management Plan is completed. Without the focus of plan development, stakeholders may lose interest in the program. "Lack of time" is everyone's first response to the question of why they don't remain involved. But research from the NEP experience suggests that it is more a matter of setting priorities than the availability of time itself.<sup>3</sup> People free up time for things that are most important to them. The challenge for NEPs and other community-based watershed efforts is to invigorate local support by addressing local problems, but doing so in a coordinated manner that enhances mutual benefits and makes progress on regional problems. The mechanisms for involving the public vary from NEP to NEP. Some programs hire staff to focus on

**LOCATING THE NEP  
WITHIN AN ACADEMIC  
INSTITUTION**



In 1997, the Casco Bay Estuary Project moved from the Maine Department of Environmental Protection to the University of Southern Maine. The Muskie School for Public Service, a graduate school at the University, and the Marine Law Institute act as hosts to the Project. The Casco Bay board of directors went through a request for proposals process to find a host site. The University's successful bid brought the Project to an academic institution that exemplifies environmental stewardship. With the University, the Project receives an office on campus and the use of the institutional infrastructure. Benefits the Project has received from being located at the University include:

- Convenient location for meetings and outreach efforts.
- Credibility as an academic institution that is viewed as neutral without associations with enforcement agencies or advocacy groups.
- Many opportunities for graduate and undergraduate assistantships/internships.
- Opportunities to guest lecture in courses at the University and to get students involved in projects that benefit the Estuary Project.

For additional information, see [www.cascobay.usm.maine.edu](http://www.cascobay.usm.maine.edu).

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3 Webler, Thomas. "Why Do (or Don't) Local Government Officials Participate in Watershed Planning Efforts." *Coastlines* 10.2 (2002). Washington: U.S. Environmental Protection Agency.

this activity, while others delegate this task to a separate entity, such as a local nonprofit. For example, the Morro Bay NEP has partnered with nonprofit organizations working in and near the estuary to create the Estero Conservation

Alliance. Through this Alliance, member organizations cooperatively work to meet common goals and complete joint projects to enhance Morro Bay and surrounding areas.

**A GUIDEBOOK TO HELP ENGAGE THE COMMUNITY**



Understanding community social systems is key to successful Management Plan implementation.

EPA's *Community Culture and the Environment: A Guide to Understanding a Sense of Place* is a toolbox for understanding the social dynamics involved in community-based efforts. Readers learn about a flexible, step-by-step process for building a picture of community cultural preferences and priorities by identifying local values, beliefs, and behaviors as they relate to community life and the surrounding natural environment. Easy-to-use worksheets and community assessment stories from around the country provide methods that can be used to:

- identify a community's vision and goals,
- engage volunteers and other stakeholders,
- enhance education and outreach efforts, and
- build and strengthen partnerships.

To order the *Guide* (EPA 842-B-01-003), contact the National Service Center for Environmental Publications, U.S. EPA Publication Clearinghouse, P.O. Box 42419, Cincinnati, OH 45242, 1-800-490-9198, [ncepiwo@one.net](mailto:ncepiwo@one.net).

How can coastal managers and watershed organizations like the NEP entice local government officials and other stakeholders to participate in the implementation process?

- First, focus attention on producing a working environment that respects all voices, builds a sense of camaraderie, gives real power to the participants, clearly states the objectives and timetable, and makes clear progress on these objectives. Stakeholders are more likely to participate if the watershed project stays abreast of local problems and incorporates these into the program's objectives. Going out into the communities, listening to concerns, and inviting local participation are much more productive ways to secure involvement than merely sending a form letter to the town clerk, mayor's office, or county commissioners. For example, Massachusetts Bays NEP

created five Local Governance Committees that function like mini-NEPs. Each covers a specific region of the coast and staff visit each community in order to secure its commitment to implement Management Plan actions.

- Second, recruit people who have a strong environmental ethic, enjoy working collaboratively with peers, are able to take a regional perspective, and who pursue goals linked to the project's objectives. Invitations to new participants should include announcements listing existing participants and provide opportunities for networking and learning.

- Third, use mini-grants, segmentation schemes, and other mechanisms that enable stakeholder groups to make progress on their local agenda while remaining connected to the watershed project. The Maryland Coastal Bays Program awards an average of \$100,000 per year for local stakeholders to conduct projects in the watershed. Recipients provided many times the amount of their grants in matching funds which attracted more money to the watershed. The Tampa Bay Estuary Program subdivides the bay into seven segments. The program established nitrogen load reduction goals and management actions to achieve them for each segment. Achieving the chlorophyll targets will provide sufficient water clarity to allow recolonization of 12,350 acres of seagrasses and tangible results for local stakeholders.
- Fourth, use volunteer programs to broaden public involvement throughout the implementation process. Some NEPs have developed volunteer water quality monitoring programs while others enlist volunteers to deliver education and outreach activities. These opportunities for active involvement allow the public to become engaged in tangible efforts, build stewardship for the resource, and create public and private interest in providing financial support for implementation.
- Finally, avoid approaching any stakeholder group as an homogenous body. Watershed managers need to approach local government organizations and other stakeholder groups as individuals with different experiences, needs, values, and beliefs. To maximize stakeholder participation, it may be wise to design a process that contains a variety of ways and levels for stakeholders to become involved.

**USE OF THE INTERNET TO  
STIMULATE PUBLIC  
INVOLVEMENT**



The Tampa Bay Estuary Program's Community Advisory Committee created the Bay Opinion Poll to stimulate continued public involvement and communication. This informal poll assesses perceptions of the bay and identifies major community concerns related to bay protection. The poll is available on the Tampa Bay Estuary Program Web site: [www.tbep.org](http://www.tbep.org).

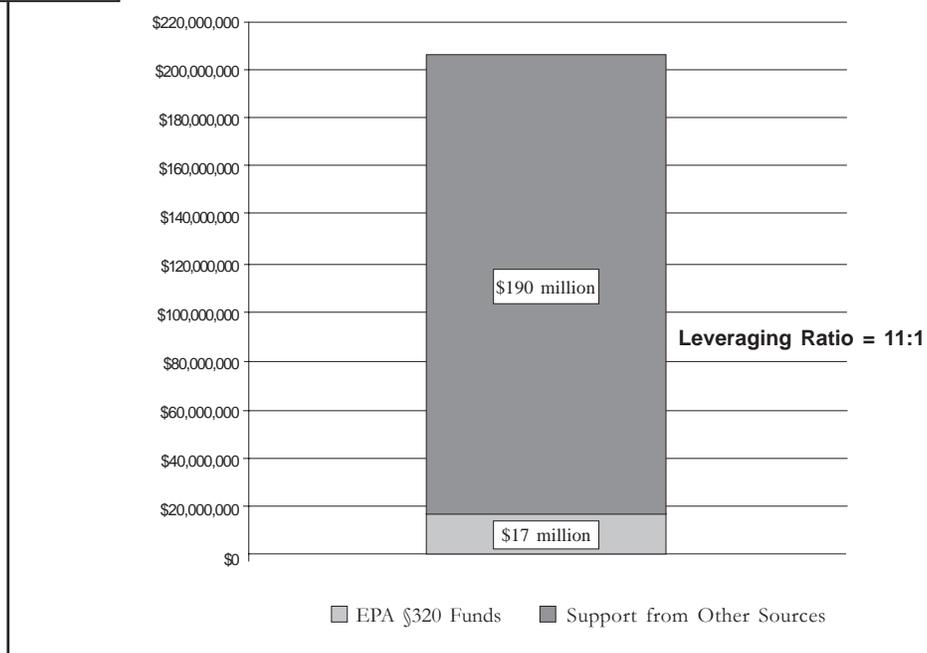
## OBTAINING FUNDS

NEPs attract funding and support to administer these funds from various sources and through strategic partnerships with other organizations. For example, the NEPs raised \$11 for every \$1 provided by EPA in 2003. This additional funding comes from a variety of federal, state, local, and private sources (see **Figures 5.1 and 5.2**). To help manage this additional funding, the NEPs obtained substantial support through partnerships with the public, private, and nonprofit sectors. For example, the Coastal Bend Bays and Estuaries Program (CBBEP) directly administered only about one-third of their leveraged funding, with the remaining two-thirds administered by local governments, universities, state agencies, and nonprofits. The CBBEP also created a land trust that has proved successful in acquiring and managing funds to protect habitat in the watershed.

How do the NEPs leverage these resources? First, the NEPs develop finance plans that identify and evaluate funding sources to implement their priority actions. The funding plans enable the NEPs to sift through potential sources and decide where to invest limited time and personnel. Rather than focus on a new grant each month, the



**Figure 5.1: Resources leveraged by the NEPs**

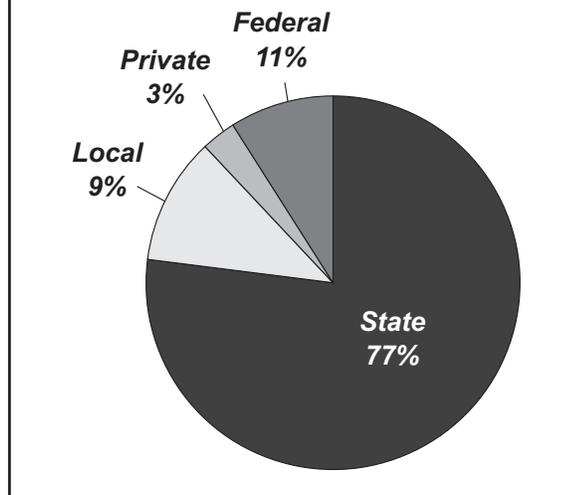


Source: NEP Annual Workplans, June, 2003.

NEPs pursue funding that supports their priorities. (See **Appendix E** for an excerpt from an NEP finance plan.)

Second, the NEPs develop strategic alliances with implementing partners to obtain their financial support. The NEPs reinforce the partners' commitment by continuing to hold stakeholder meetings, managing the NEP committee process, and working to sustain the consensus and common vision reached among their partners during plan development. While the NEPs implement some actions independently, they oversee, coordinate, and in other ways influence many more partner actions.

**Figure 5.2: Sources of NEP leveraged dollars (percent total)**



Source: NEP Annual Workplans, June, 2003.

Third, the NEPs demonstrate results that convince stakeholders that the NEPs are effective, can be trusted with their resources, and will give them credit for their contributions. The NEPs work closely with the media and produce independent newsletters, Web sites, and events that promote the achievements of the program and heighten the visibility of the NEP and its implementing partners.

Finally, the NEPs provide seed money or staff to initiate and develop new funding sources. For example, the NEP may lead meetings with local governments to develop stormwater utilities or obtain resources from the State Revolving Loan Fund.

The following sections provide examples of the types of funding NEPs have secured from federal, state, local, and private sources to finance their operations and projects. Most NEP activities are funded by more than one source and involve extensive partnering.

#### FUNDING OPERATING COSTS

Covering operating costs remains a perennial challenge for most NEPs. Nonetheless, the NEPs have developed several creative approaches to address this challenge.

*County general budget.* The Peconic Estuary Program Office is part of the Office of Ecology in the Suffolk County Department of Health Services and the county general budget covers most of the operating costs of the estuary program. Suffolk County has a long-standing commitment to environmental management. It pushed for Peconic

Estuary to be recognized as a National Estuary Program, and with the success of that effort, it has offered continued support. The Peconic Estuary Program presents its budgets as an investment with a greater return, not just as money to be expended.

*State line-item funding.* The Galveston Bay Program and the Coastal Bend Bays and Estuaries Program each receive state line-item funding of about \$1 million per year from the Texas legislature; the estuary programs use some of these funds for program operation. The Galveston Bay Program and the Coastal Bend Bays and Estuaries Program worked together to gain support for this state line-item funding. The estuary programs worked with local representatives to develop language for a bill in the state legislature, and the estuary programs enlisted local governments, nonprofit organizations, and individual citizens to support this measure. These NEPs also educated legislators statewide about the National Estuary Program and the estuary programs' role in Texas coastal protection. The bill received strong support and passed in 1999.

The Delaware Center for the Inland Bays used a series of breakfast presentations and individual meetings with state legislators to articulate current environmental problems such as *Pfiesteria*. Made aware of these problems, the Legislature provided specific monies for the NEP project to restore and preserve the Rehoboth, Indian River, and Little Assawoman Bays. The funding supports NEP outreach and research efforts and establishes local "tributary teams" to develop consensus-based plans to implement best management practices near the rivers and streams feeding into these bays. The Center for Inland Bays has successfully used the line-item funding to leverage additional funding sources.

**FUNDING NEEDED TO SUPPORT OPERATING EXPENSES**

The experience of several of the NEPs suggests that annual funding of \$600,000 to \$2.0 million is needed for initial program implementation. Basic staffing and program operations—to support outreach, monitoring, and other activities—account for approximately \$400,000 to \$600,000 of this total. Grant programs, contracts, and seed money—to implement other Management Plan actions—account for \$200,000 to \$1.4 million that are directly controlled by the Program itself.

*Annual giving program.* The Partnership for the Delaware Estuary (a nonprofit organization that was created to implement actions in the Delaware Estuary Plan) generates some of its operations funding with an annual giving program. Initially, the Partnership used a mail house to send out an appeal to the 25,000 people on the program's mailing list. Later, the Partnership sent out personalized appeals and an annual report to previous donors and a select group from the mailing list (less than 1,000 people) which resulted in a significant increase in the amount of donations.

*Technical assistance fees.* Buzzards Bay includes technical assistance fees on partner grant applications. The estuary program requests a 10 to 30 percent overhead charge for its grants to cover staff, printing, and outreach expenses. This charge, which generates \$20,000 to \$150,000 per year, requires a moderate amount of extra development and management. The Buzzards Bay Project communicates with grant makers to determine where staff expenditures and support costs are allowed under their grant programs. The estuary program thoroughly itemizes its expenses so that the grantor can see the specific needs and costs associated with completing tasks under the grant.

#### FUNDING IMPLEMENTATION PROJECTS

The NEPs use a variety of sources to fund implementation activities. The following examples show how the NEPs have used specialty license plate fees, foundation grants, capital giving campaigns, stormwater utility fees, state bond acts, tax credits, and low-interest loans to fund land acquisition, habitat protection, pathogen controls, and other activities.

*Affinity credit card.* The Long Island Sound Study NEP worked with the Connecticut Department of Environmental Protection (CTDEP), to develop a Long Island Sound affinity credit card. The CTDEP developed the proposal for the Long Island Sound affinity credit card and fronted the operating costs until the program started to generate revenues. People's Bank won the award and continues to donate \$5 to the Long Island Sound account of Connecticut's "Environmental Quality Fund" for every Long Island Sound credit card application it receives. The bank also donates half of one percent of the interest on all purchases made with the card. Revenues from the Long Island Sound affinity credit card program support grants for education, research, public access, and habitat restoration projects.

*Specialty license plate fees.* These fees generate \$400,000 per year for the Indian River Lagoon Estuary Program and at least 80 percent of these funds support habitat protection projects. The NEP proposed the idea to the state legislature with 12,000 signature petitions stating that registered vehicle owners intended to purchase the specialty plate. The NEP paid a \$15,000 administration fee to the state and developed

**COST OF  
MONITORING PLAN  
IMPLEMENTATION**



The costs of the Puget Sound Ambient Monitoring Program were calculated by a technical costing subcommittee of the monitoring management committee. The estimates provided by this subcommittee demonstrate that the costs of comprehensive monitoring programs can be substantial. In addition to the \$200,000 in staff and consultant time required to develop the monitoring program design, the calculated costs of full implementation of the monitoring program were estimated at \$3.2 million per year. The initial sampling program was reduced in scope due to resource constraints, and costs for the program were \$250,000 to \$350,000 over the first two years. For additional information, see [www.psat.wa.gov](http://www.psat.wa.gov).

a marketing strategy. The NEP is responsible for promotion of the license plate and management of the grant program supported by these revenues. The Anheuser-Busch Corporation donated \$15,000 to help pay for more than 70 billboard advertisements and the Florida Outdoor Advertising Association donated \$60,000 worth of billboard advertising space. For three months, a local car dealership provided all new car buyers with Indian River Lagoon license plates.

*Foundation grants.* The Narragansett Bay National Estuary Program partnered with a local nonprofit organization, Save The Bay, and received \$200,000 in foundation grants to support habitat restoration. Recognizing the overlap in their interests, the two organizations successfully applied to the Pew Charitable Trusts for grant funding that was available to partners in the Restore America's Estuaries coalition. The Narragansett Bay National Estuary Program leveraged these resources by using them as matching funds for a variety of other grant funding.

*Capital giving campaign.* In Casco Bay, a capital giving campaign raised more than \$56,000 from local businesses to relocate juvenile lobsters prior to a Portland Harbor dredging project. As the Portland Harbor dredging project was moving forward, local lobstermen raised concerns that dredging would disrupt lobster habitat. The Chair of the Board for the Casco Bay NEP, a city manager, wrote letters to harborfront property owners and businesses and the cities of Portland and South Portland asking for financial support to research the issue and to design and implement a plan to protect the lobsters. Before dredging began, a coalition of lobstermen, state regulators, and staff and volunteers from the Casco Bay Estuary Project and Friends of Casco Bay moved 34,012 small lobsters from the dredge area. This group also tagged 4,000 lobsters to help evaluate the project's success and keep the dredging project on schedule.

*Stormwater utility fee.* This fee funds a stormwater management program in Sarasota County, Florida that addresses priority actions in the Sarasota Bay NEP's Management Plan, such as encouraging property management that minimizes stormwater runoff. The Sarasota Stormwater Environmental Utility has generated more than \$100 million in revenue to fund planning, maintenance, and capital improvements, such as canal cleaning, mowing, and low-cost construction projects. The staff of the Sarasota Bay NEP served as an information source and members of the NEP's Citizen Advisory Committee provided public testimony during the utility development process.

*State bond act.* The Long Island Sound NEP Citizen Advisory Committee facilitated a memorandum of understanding signed by the governor and legislative leaders that committed over \$100 million of New York State Clean Air/Clean Water Bond Act funds to wastewater treatment, stormwater control, nonpoint source pollution control, and wetlands restoration projects in the watershed. New York State guidelines favor

projects that address the highest priorities identified in NEP Management Plans. New York State also forwards funding recommendations to the NEP Management Conferences for consultation regarding consistency with the NEP Management Plan priorities. Over \$200 million of this total has supported water quality improvement projects in the New York-New Jersey Harbor, Long Island Sound, and Peconic Bay NEPs.



*Taxes.* Ocean County, New Jersey voters approved a Natural Lands Trust financed by a new property tax of 1.2 cents per \$100 of valuation. The measure is expected to raise nearly \$4 million annually for the protection of the Barnegat Bay's watershed and agricultural lands. The new tax received broad support and was based on the results of public opinion surveys. Only natural lands or easements on natural lands will be purchased by the Trust, and public access will be guaranteed. No development will be allowed on the purchased properties.

*Tax credits and low-interest loans.* The Buzzards Bay Project and the Massachusetts Bays Program encourage citizens in their watersheds to take advantage of programs in Massachusetts that offer tax credits and low-interest loans to individuals that remediate failing septic systems. Under this program, the state's Clean Water State Revolving Fund makes interest-free loans to communities. The communities in turn lend money to homeowners that repair failing septic systems. Homeowners repay the loans with real estate taxes.

*Real estate transfer tax.* The Peconic Bay NEP worked with a nonprofit partner to implement a two percent real estate transfer tax, an assessment made by the county on land and deed transfers based on the sales price of property. Five towns surrounding the estuary have raised nearly \$70 million in less than three years with the tax.

## MONITORING AND COMMUNICATING RESULTS

The NEPs' Management Plans present goals, objectives, and actions designed to improve and protect estuaries and the quality of their waters. To evaluate how effective their actions have been in achieving Management Plan goals, the NEPs conduct environmental and programmatic monitoring. The NEPs develop and track environmental indicators to help communicate results to stakeholders and the general public that show how well management efforts are progressing and what changes in the estuary are taking place.

### ENVIRONMENTAL MONITORING

Environmental monitoring measures changes in the biophysical conditions of the estuary and answers questions such as:

- Is the ecological integrity of the estuary changing?
- Is water quality improving or getting worse?
- Is the area of wildlife habitat increasing or decreasing?

**Table 5.1** presents an excerpt from one of the Charlotte Harbor NEP's quarterly environmental reports. These reports are posted on their Internet Web site and present information on trends in water quality and the health of the surrounding habitat.

To supplement their own environmental monitoring programs, the NEPs often establish volunteer programs that can provide high-quality, reliable data. Volunteer monitoring programs provide the NEP with both a large, committed, and voluntary workforce, and a venue for public education and outreach. The direct involvement of individual citizens provides a strong base for continued support—from planning through implementation. Extensive information on how to develop volunteer monitoring programs and use volunteer data effectively can be found in EPA's *Volunteer Estuary Monitoring: A Methods Manual* ([www.epa.gov/owow/estuaries/monitor/](http://www.epa.gov/owow/estuaries/monitor/)).

For example, the Morro Bay NEP, in conjunction with Friends of the Estuary and the Regional Water Quality Control Board, administers a volunteer monitoring program. Volunteers collect samples and record flow, nitrates, coliforms, dissolved oxygen, water temperature, turbidity, phosphates, and macroinvertebrates. In addition, geomorphology, vegetation cover, and stormwater runoff are assessed yearly within the watershed. Over two hundred citizen monitors, ranging in age from school children to retirees, have participated in this very successful program. The Volunteer Monitoring Program increases public awareness and also assists the NEP in recording trends in environmental resources and water quality. The data are used to strengthen the mathematical models used by the NEP for management decisions.



**Table 5.1: Excerpt from one of the Charlotte Harbor NEP’s quarterly environmental reports**

Charlotte Harbor Proper/Lemon Bay			
Parameter	Assessment	Parameter	Assessment
Temperature	Slightly higher than normal	Phosphorous	Slightly higher than normal
Salinity	Slightly higher than normal	Dissolved Oxygen	Normal to very good
Color	Normal	Turbidity	Better than normal
Chlorophyll a	Normal	Secchi Depth	Normal to very good
Total Nitrogen	High in January	Near Bottom Dissolved Oxygen	Normal to very good
<p>Through the last quarter, water flows, water quality, and habitat were in generally good shape. Issues of particular concern this quarter included higher than normal water flows from the Myakka, higher than normal excess nutrients in Charlotte Harbor and Lemon Bay, a sewage spill in the Estero Bay basin, closed shell fishing in East Pine Island Sound, and chronic water quality impairments of water bodies identified within the study area.</p>			

For additional information, see [www.charlotteharbornep.com/ProgramReports/reports.htm](http://www.charlotteharbornep.com/ProgramReports/reports.htm).

**PROGRAMMATIC MONITORING**

Programmatic monitoring measures how well management efforts are progressing and answers questions such as:

- Are milestones being met?
- How much funding is being spent?
- Are partners following through on their commitments?

For example, the Charlotte Harbor NEP communicates their programmatic progress through monthly progress reports posted on their Internet Web site. These reports summarize the research, restoration, funding, and outreach activities completed during the month.

**COMMUNICATING RESULTS**

The NEPs use environmental indicators to track and communicate how well management efforts are progressing and what changes in the estuary are taking place. These indicators measure the estuary’s conditions over time and show the pressures on the estuary and the resulting effects on ecological and human health. These indicators help gauge how effective NEP management efforts have been in achieving measurable results. For example, several NEPs use the area in which shellfish can be safely harvested as an indicator. This indicator shows the extent to which contamination

restricts shellfish harvesting and can reflect problems related to how land is used and cared for in the nearby watersheds. NEPs use these indicators to help answer two key questions:

- Is the condition of the estuary changing?
- Are the goals and objectives of the Management Plan being met?

To communicate their monitoring results, the NEPs report their indicators on both an individual and aggregate level.

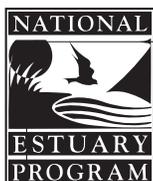
On an individual level, the NEPs report on a suite of indicators tailored to their estuary. For example, the Puget Sound NEP tracks and reports on 19 indicators to assess the successes and shortcomings of its efforts to protect and restore Puget Sound. The NEPs communicate these results through such means as State of the Bay reports, Web sites, and newspaper inserts. For example, the Long Island Sound Study developed their *Sound Health 2003—A Report on Status and Trends in the Health of Long Island Sound* report to communicate their results to a broad audience. This easy-to-read document (in newspaper format) required \$10,000 and four months of staff time to produce, and \$65,000 to print and distribute. It was inserted in the Sunday editions of more than 400,000 area newspapers and distributed to area libraries, nature centers, the state marine trades associations, and schools.

On a national scale, EPA uses a more limited number of indicators to assess the progress of the NEP as a whole. For example, the EPA tracks the number of acres and types of habitat restored and protected by the 28 NEPs. The EPA communicates these results through its Web site and other mechanisms. (See **Figure 5.3.**)

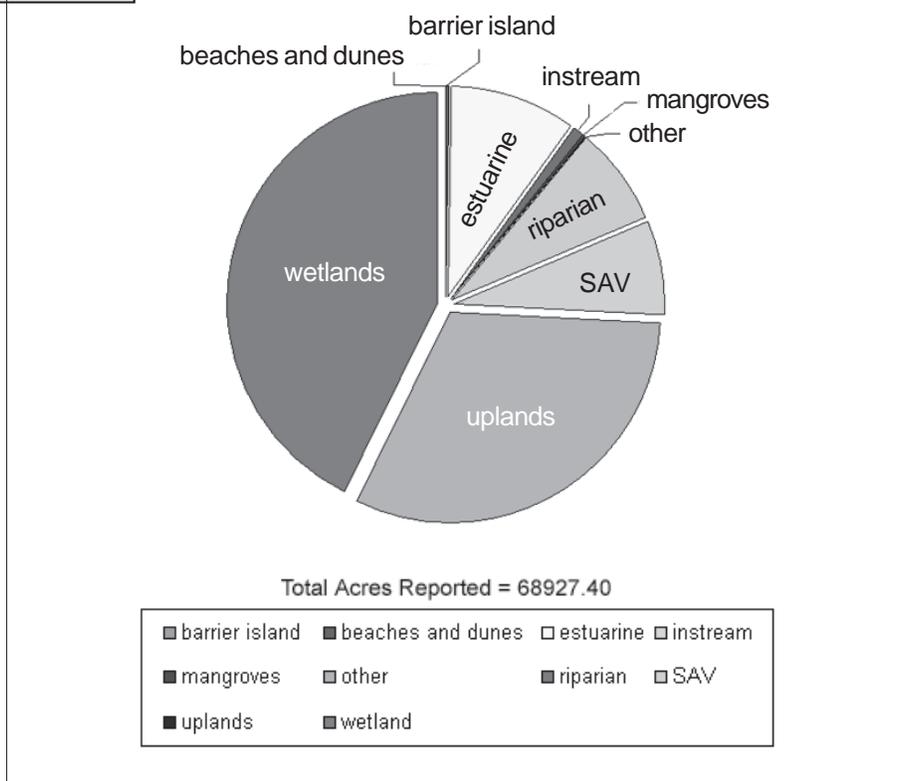
**ENVIRONMENTAL REPORT CARD**

The San Francisco Estuary Project produced the “Bay-Delta Environmental Report Card” to communicate the progress of the NEP to the public. The report card documented progress addressing the top 10 critical issues, such as invasive species, facing the Bay-Delta users, managers, watchdogs, and communities. The report card communicated the status of these issues, changes in public awareness of the issues over the three years, including ecosystem politics, funding, and effectiveness of efforts to address the issues. The report card also served to educate the public about emerging issues and new priorities for the future. For additional information, see [www.abag.ca.gov/bayarea/sfep/sfep.html](http://www.abag.ca.gov/bayarea/sfep/sfep.html).





**Figure 5.3: Habitat restored or protected by the NEPs**



Source: NEP Government Performance Results Act reports, October, 2001.

### UPDATING THE MANAGEMENT PLAN

Because the Management Plan is a flexible tool, it permits an estuary program to adapt to changing circumstances and to apply the lessons learned by experience. Some actions may be unsuccessful. New data may reveal unforeseen problems. Earlier assumptions may have been incorrect and technological advances may enhance cleanup capabilities. The resolution of some problems will free resources to tackle others. Furthermore, even though the Management Plan is a document reflecting consensus, conflicts among jurisdictions, agencies at various government levels, and the public are inevitable. These conflicts will need to be resolved, possibly by modifying the plan.

To help ensure the relevance of their Management Plans to ongoing project activity, many NEPs have provisions in their bylaws or operating plans that require periodic reviews of their plans. The updating of Management Plans has been used by estuary programs to celebrate progress and reaffirm commitments to their estuaries. The Coastal Bend Bays and Estuaries Program updates their Management Plan every five

years. The update includes measurable environmental goals and targets as well as timeframes for implementation over the next five to ten years. The Indian River Lagoon, Long Island Sound and New York-New Jersey Harbor estuary programs also periodically update their goals and implementation schedules. For example, to renew the commitment of stakeholders to the implementation of their Management Plan, the Long Island Sound Study developed a Long Island Sound 2003 Agreement. The 2003 Agreement was an update to the 1996 Agreement on implementing the Management Plan, and was approved by the Policy Committee. The 2003 Agreement was developed using a consensus-based process coordinated through the Management Conference and was subject to public review and comment.

## IMPLEMENTING THE MANAGEMENT PLAN: EXAMPLES

### ► *Example 1: Development and implementation of a bi-state total maximum daily load (TMDL)*

The Long Island Sound Study's (LISS) close partnership with the states of New York and Connecticut fostered an innovative TMDL approach that can serve as a model for how flexibility and market forces achieve efficient waste load allocations. The LISS Management Plan called for reductions in point and nonpoint source nitrogen loading to the Sound to improve water quality and reduce hypoxia. The LISS worked with the states and local governments to adopt aggressive nitrogen reduction targets in 1998 and then to adopt a nitrogen TMDL for the Sound in 2001. This TMDL, arguably the most comprehensive and complex one developed in the nation to date, establishes an enforceable schedule for point and nonpoint nitrogen reduction to the Sound over a 15-year period ending in 2014. The LISS helped Connecticut develop a general permit to incorporate nitrogen load limits for participating publicly-owned treatment works in the watershed. The LISS also fostered New York's bubble permit proposal for dischargers to the Sound. The Connecticut general permit scheme incorporates a nitrogen credit trading program that, in concert with the TMDL limits, sets a historic precedent in finding new ways of meeting water quality standards and protection, while keeping costs down for taxpayers. The TMDL is posted on the LISS Web site. For more information, see [www.longislandsoundstudy.net](http://www.longislandsoundstudy.net).



Photo: Steve Delaney

► **Example 2: Wetland construction to filter pathogens from stormwater runoff**

The Buzzards Bay Project assisted the Town of Marion, Massachusetts in developing a constructed wetlands system to abate pathogen contamination at Spragues Cove, a shellfish harvesting site regularly closed due to high concentrations of fecal coliforms. The discharge also adjoined a bathing area. A three-acre constructed wetland was designed to collect and treat stormwater runoff and associated nonpoint source pollutants from a 64-acre drainage area. Within the first year following construction, sampling indicated a reduction of fecal coliform bacteria in the cove. As additional plants become established in the wetlands, it is expected that fecal coliform counts will continue to decrease. For more information, see [www.buzzardsbay.org](http://www.buzzardsbay.org).

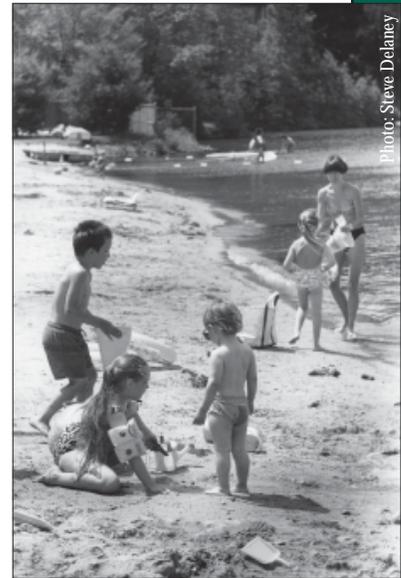


Photo: Steve Delaney

► **Example 3: Development of a technical assistance program to address toxic contamination**

The Narragansett Bay Estuary Program set up the Hazardous Waste Reduction Program as a partnership with the Rhode Island Department of Environmental Management and the University of Rhode Island. The Program focuses on both education and prevention. The Program provides technical assistance to businesses for pollution prevention through a waste information hotline and distributes information on source reduction, recycling, and chemical substitution-disposal alternatives. The Program also has developed a system for conducting onsite hazardous waste assessments for local businesses and industries. The Hazardous Waste Reduction Program has been so successful that it is now a state-funded, broad-based industrial pollution prevention program. The Program has been expanded to include information on, and a collection and treatment facility (the Eco-Depot) for, household toxic and hazardous wastes. For more information, see [www.nbep.org](http://www.nbep.org).

► **Example 4: Dam removal to allow fish to return to historic spawning areas**



Photo: Steve Delaney

The Management Plan for the Albemarle-Pamlico Sounds National Estuary Program calls for the restoration of vital fisheries habitats by means such as replanting vegetation, repairing hydrological systems, and improving water quality. The removal of the Quaker Neck Dam successfully restored 1,054 miles of anadromous fish spawning habitat along the Neuse River and its tributaries. This project was significant because it was the first dam ever removed specifically to benefit the environment. Biologists reported that

striped bass had returned to spawn in the lower half of the newly opened portion of the river. Other species expected to benefit include several major commercial and recreational fish species, such as American shad, hickory shad, and shortnose sturgeon. The success of the Quaker Neck Dam removal project resulted in the removal of two additional North Carolina dams for environmental purposes. For more information, see [www.apnep.org](http://www.apnep.org).

► **Example 5: Outreach to homeowners to combat an invasive plant**

The Tampa Bay Estuary Program provided seed money to a local homeowners association to develop a brochure on the Brazilian pepper plant. This plant threatens native species and poses health threats including skin irritation and respiratory problems. This educational leaflet provides homeowners with information on how to identify and eradicate the Brazilian pepper and where to obtain help. The brochure was distributed to citizens with shoreline homes and has been one of the Program's most popular public outreach tools. For more information, see [www.tbep.org](http://www.tbep.org).

► **Example 6: Development of best management practices to improve freshwater flows to the estuary**

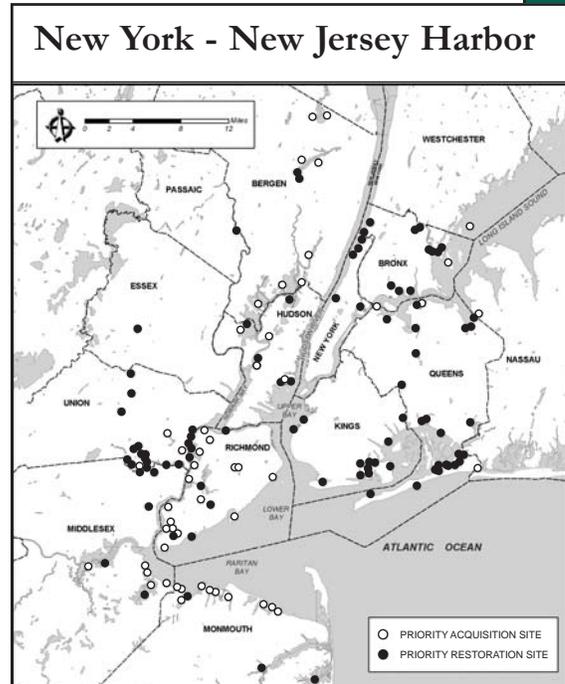
The Charlotte Harbor National Estuary Program's Management Plan ([www.charlotteharborneep.com/](http://www.charlotteharborneep.com/)) calls for a watershed approach to surface water management. Under this approach, a plan is created for each drainage basin that establishes minimum flows and water levels for each water body and determines the maximum cumulative withdrawals. One such plan is the Peace River Comprehensive Watershed Management Plan, developed by the Southwest Florida Water Management District and a team of stakeholders, which helps serve as a framework for future water use decisions. This plan seeks to provide a holistic method of protecting water quality in the basin and also ensuring adequate water supply for urban areas, agriculture, and the environment. Activities in the Comprehensive Watershed Management Plan and related efforts by the Charlotte Harbor National Estuary Program and the state include: additional research of surface and groundwater flow conditions within the study area; regulation of surface and groundwater withdrawals for water supply, agriculture, and industrial purposes; regulation and monitoring of flow rates of point source discharges from sewage treatment plants and industrial facilities; use of best management practices to decrease and retain stormwater runoff; issuance of water use permits; and public education programs. Two community education programs related to water use for landscaping are xeriscaping and the Florida Yards and Neighborhoods Program (<http://hort.ufl.edu/fyn/>).



Photo: Steve Delaney

► **Example 7: Development of a priority list and a GIS map of habitat sites for restoration and acquisition**

Through an ongoing process, the New York-New Jersey Harbor Estuary Program Habitat Work Group ([www.harborestuary.org/](http://www.harborestuary.org/)) developed a list and Geographic Information Systems (GIS) map (see figure to the right) of priority habitat sites for restoration and acquisition. This information is being used by the states, federal partners, and others to identify appropriate restoration and acquisition projects. The map and the tireless activity of the workgroup have resulted in the funding of millions of dollars worth of restoration projects. One of the major sources of funding has been the multimillion dollar New York State Clean Water/Clean Air Bond Act. The map has also been used by the Corps of Engineers to refine its list of sites to be included in the Hudson-Raritan Reconnaissance Study, an effort that may ultimately result in the restoration of hundreds of acres of habitat.



Source: New York-New Jersey Harbor Estuary Program Habitat Workgroup, July 31, 2002

► **Example 8: Replacement of failing septic tanks**

The Casco Bay Estuary Project and the Maine State Department of Environmental Protection entered into an innovative cooperative agreement to target the specific problem of overboard discharges (i.e., sand filter septic systems from homes on islands or other areas where conventional septic systems are difficult to install). The Department was understaffed, making statewide coordination of their Overboard Discharge Program and remediation of overboard discharges throughout the state difficult. The Estuary Project, working on a project to open closed clamflats to harvesting by removing known sources of pollution, arranged with the Department to manage the overboard discharge program in Casco Bay. With a clear understanding of the shared desire to accomplish this environmental goal, the Department agreed to provide the Estuary Project \$1,000 for every overboard discharge system that is replaced with an acceptable alternative system. This cooperative agreement is mutually beneficial to the stakeholders, effectively addresses a serious environmental threat, provides measurable results, and furnishes revenue to the Estuary Project. For more information, see [www.cascobay.usm.maine.edu](http://www.cascobay.usm.maine.edu).

► **Example 9: Clam beds reopened through water quality improvements due to increased municipal sewerage coverage**

In November 2000, the Seabrook Middle Ground was reopened to clamming for the first time in nearly 10 years. This reopening points to marked water quality improvements largely due to increased municipal sewerage coverage in the Town of Seabrook and other smaller scale pollution control measures. The pollution source identification and reduction work that made this possible was a cooperative effort by the New Hampshire Estuaries Project; New Hampshire Department of Health and Human Services; New Hampshire Fish and Game Department; New Hampshire Office of State Planning; New Hampshire Department of Environmental Services; the Towns of Seabrook, Hampton, and Hampton Falls; and a number of dedicated volunteers from Great Bay Watch and area towns. The reopening of the Seabrook Middle Ground represents a significant increase in the area and number of shellfish available for recreational harvest by New Hampshire residents. For additional information, see [www.state.nh.us/nhep](http://www.state.nh.us/nhep).



► **Example 10: Innovative partnerships to implement the Management Plan**

Innovative partnerships are being created for implementation of *The Galveston Bay Plan*, developed through the Galveston Bay Estuary Program. The goal of the Program's Natural Resource Uses Subcommittee was to implement a project that would address the highest priority actions in the *Plan*—restoring wetlands and using dredged material in wetlands restoration. The objectives of the Clear Creek Wetland Restoration Project are:

- Demonstrate a cost-effective way to use dredged material in a beneficial manner.
- Test innovative seeding techniques that allow planting in very loose sediment.
- Form a partnership of agencies, businesses, and interest groups to serve as a model for restoration efforts throughout the Bay and in other coastal areas.

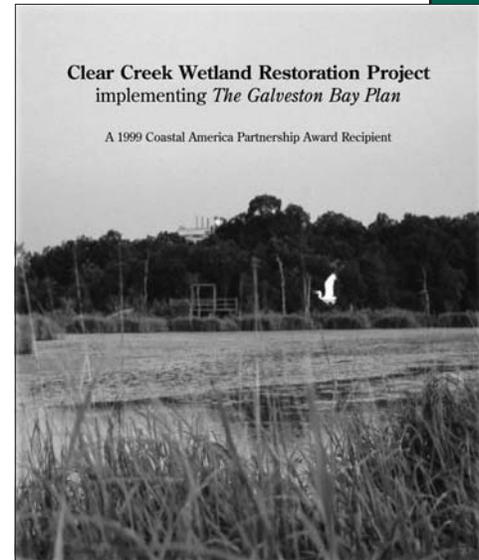
The project proved successful and demonstrated the benefits of agency-industry partnerships in leveraging resources and expertise including:

- Galveston Bay Estuary Program administered the grant and facilitated the project coordination.
- Reliant Energy, Inc. provided the site for the project, dredged the intake canal, and transported the material to the wetland site. Their expert staff provided project coordination.
- EPA Region VI provided a major source of funding, technical review, and facilitated the quality assurance process.
- Natural Resources Conservation Service tested the innovative treatment and distribution of seeds.
- U.S. Fish and Wildlife Service contributed the air boat for seed distribution.
- Padgett Shoreline Construction, Inc. built the levee and donated about half of its billable equipment time.
- Novus Systems, Inc., tested a variety of wave action barriers to protect the levee.

For more information, see [www.gbep.state.tx.us](http://www.gbep.state.tx.us).

► **Example 11: Environmental stewardship awards illustrate community involvement**

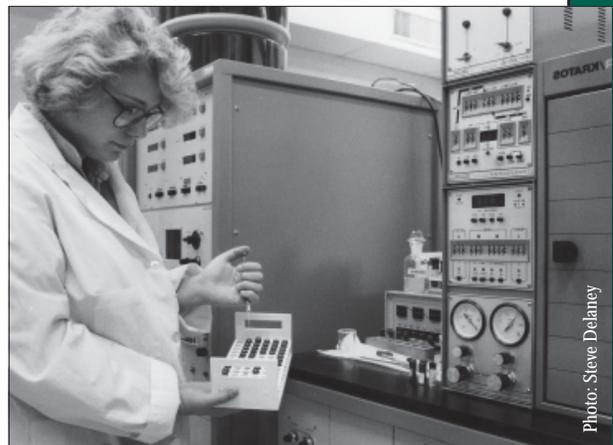
To sustain stakeholder involvement and partner support, the Mobile Bay NEP created annual Stewardship Awards to recognize individuals, businesses, and local governments that “maintain and promote the wise stewardship of the water quality and living resources of the Mobile Bay and Delta.” Presented at the Bay Area Earth Day celebration, a recent round of recipients included the City of Mobile Urban Planning Department for its smart growth work, a local ecotourism business for its commitment to protecting the Bay, and a man who led the effort to sponsor a specialty license plate issue that will raise money for land conservation in Alabama. Additional awards went to those who helped educate the public about the Mobile Bay ecosystem. The awards generate publicity for the program and strengthen ties with the recipients. For more information, see [www.mobilebaynep.com](http://www.mobilebaynep.com).



► **Example 12: Regional volunteer monitoring programs**

The Buzzards Bay Water Quality Monitoring Program and Massachusetts Bay Program have successfully built networks of citizen volunteers who contribute to key monitoring efforts. To document and evaluate nitrogen-related water quality and long-term ecological trends in Buzzards Bay's important embayments (more than one-quarter of the Massachusetts coast), the Coalition for Buzzards Bay recruited over 300 Baywatchers to monitor 180 stations. Baywatchers measure early morning oxygen levels, temperature, salinity, and water clarity on a set schedule once a week from May to September. The volunteers also collect samples on four dates in July and August for analysis of nutrients by a university laboratory. These basic parameters provide an immediate snapshot of the health of the Bay and are an excellent first warning system. The data are also being used to develop recommended limits and TMDLs for Buzzards Bay embayments and sewage treatment facilities. For more information, see [www.buzzardsbay.org](http://www.buzzardsbay.org).

Massachusetts Bays' volunteer program is similar, but focuses on wetlands. The Wetland Health Assessment Program was developed out of the need to better assess the overall quality of wetlands in order to enhance protection, preservation, and restoration efforts. Both programs have the dual benefit of collecting comprehensive water quality data while educating and empowering people to get involved and make a difference in the sound management and restoration of their estuarial watersheds. For more information, see [www.mass.gov/envir/massbays](http://www.mass.gov/envir/massbays).



► **Example 13: Developing environmental indicators: lessons learned**

The Long Island Sound Study (LISS) developed approximately 50 environmental indicators of the health of Long Island Sound and the progress being made in protecting and restoring it.

The LISS reported the following lessons learned from development of their environmental indicators:

- Many environmental databases are not designed to provide watershed or ecosystem-specific information. The authors required additional time and effort to organize the data for Long Island Sound.

- Even when relying on existing monitoring programs and data, developing environmental indicators is a significant undertaking. Achieving initial agreement from Management Conference partners requires persistence and patience, however the investment needed to maintain and revise the indicators is less than the investment needed to develop them. The indicators can then provide an ongoing tool for assessing and reporting on progress.
- Information sharing among NEPs undertaking development of environmental indicators and state-of-the-estuary reports would benefit these efforts.
- Environmental indicators used in state-of-the-estuary reports can provide a powerful communication tool. Specific products tailored to different audiences can make the overall effort more effective.

For more information, see [www.longislandsoundstudy.net](http://www.longislandsoundstudy.net).

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