



Peconic Estuary Program

comprehensive conservation & management plan



Public Summary Document

If you would like information on the Peconic Estuary Program please contact the following:

Program Office

Vito Minei, Program Manager
Walter Dawydiak, Deputy Program Manager
Laura Bavaro, Suffolk County Coordinator
Office of Ecology, Department of Health Services
County Center, Riverhead, NY 11901
(631) 852-2077

vito.minei@co.suffolk.ny.us • walter.dawydiak@co.suffolk.ny.us • laura.bavaro@co.suffolk.ny.us

Citizen's Advisory Committee

Kevin McDonald, Chair
P.O. Box 569
Bridgehampton, NY 11932
(631) 537-1400
kmcdonald@hamptons.com



Public Participation Office

Gayle Marriner-Smith, Coordinator
EcoVision, Inc.
1775 Point Pleasant
Mattituck, NY 11952
(631) 765-1766
gm-s@ecovisioninc.com



The Peconic Estuary Program is funded in part by the United States Environmental Protection Agency under assistance agreements #CE992002 to the Suffolk County Department of Health Services and # CE992066 to the New York State Department of Environmental Conservation. The mention of trade names or commercial products does not in any way constitute an endorsement or recommendation for use.

websites of interest

Save the Peconic Bays: <http://www.savethepeconicchays.org/>
Association of National Estuary Programs: <http://www.anep-usa.org/>
EPA – National Estuary Programs: <http://www.epa.gov/owow/estuaries/>
Sea Grant – Brown Tide: <http://www.seagrants.sunysb.edu/>
Suffolk County: <http://www.co.suffolk.ny.us/webtemp3.cfm?dept=6&id=980>



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Dear East Ender,

Imagine it's 1985. The sun is just rising over the calm waters of the Peconic Bay. Baymen are busily harvesting it's bounty for as far as the eye can see. One feels vibrantly alive in the presence of such a rich and productive bay. Water quality and habitat are as you've always remembered them — pristine. After all, this is the East End. Then, without warning, these waters turn the color of coffee. The 1,200 baymen whose families have worked the waters of the East End for 300 years have an ominous sense that something has gone very wrong.

We know today, more than 15 years later, that their premonition was right. The Brown Tide, as it became known, served as a rallying cry for us to examine what we were doing to our waters and how we could restore them.

Two remarkable women, Jeanne Marriner of Mattituck and Jean Lane of Sag Harbor, mobilized the East End community and brought together all levels of government to work in a coordinated fashion in response to this new Brown Tide phenomenon. The level of commitment demonstrated by members of the Peconic Estuary Citizens Advisory Committee (CAC), elected officials and public servants was simply outstanding. Debate, while sometimes spirited, was in all cases conducted by members who were solely motivated by the well-being of the bay. The CAC adopted a simple philosophy: Everyone must do their part to protect and restore the Peconic Bay. If we all do a little, together we can accomplish a lot.

Now, after years of robust citizen involvement and study by federal, state, county and local levels of government, we have a blueprint to restore and protect the waters of the Peconic Bays — the Peconic Estuary Program's Comprehensive Conservation and Management Plan (PEP CCMP). We're asking every person and family on the East End to take a pledge to lighten their impact on the Peconics.

If you join us in this pledge, you'll be in good company. A remarkable agreement with local farmers for a nitrogen reduction goal of 25% will be initiated this year. Homeowners will be asked to reduce their nitrogen and pesticide loads by the same amounts. Local

governments and schools are instituting organic landscape practices. Boaters can now radio pump-out boats across the Peconics to empty their holding tanks as part of the no-discharge-zone agreement crafted with the help of the local Association of Marine Industries (AMI). Other successes, such as sewage treatment upgrades, stormwater runoff abatement and habitat restoration projects attest to real improvements being made in the watershed. While significant, these were easy compared to the challenges that lie ahead.

Land protection and improved land-use practices in the region will determine whether or not we succeed. Recent passage of the Peconic Bay Region Community Preservation Fund (CPF) has protected 2300 acres of farmland and open space since 1999. This program, in partnership with state and county land protection efforts, must remain robust and unwavering. The CCMP identifies more than 85 actions that we must implement together as a region. The greatest challenge to restoring the Peconic Bay isn't pollution — it's the willingness to take action.

So, when you are asked to do your part — whether it's in your backyard or boatyard, the school hall or town hall — you may wonder whether it's worth the bother. It is. Clean water and healthy bays are part of our heritage. We owe it to our children and grandchildren to protect it.

This will be an experiment in enlightened democracy. Can a citizenry rally its government and its community to act together to restore and protect an extraordinary natural resource? With your help, history will show that the East End answered this question with a resounding YES!

Look for what you can do and please commit to one action today. Thank you!

Sincerely,

Kevin McDonald
Chairman, Citizens Advisory Committee



Peconic Estuary Program Study Area

The Peconic Estuary Program study area includes a watershed of more than 110,000 acres of land and 121,000 acres of surface water.



What is an Estuary?

An estuary is a semi-enclosed coastal body of water that connects to the open sea. It is a transition zone where saltwater from the ocean mixes with freshwater from rivers and land. The Peconic Bays (Flanders, Great Peconic, Little Peconic, and Gardiners) together make up the Peconic Estuary.

Why are Estuaries Important?

Estuaries are among the most important of the earth's ecosystems. More than 80 percent of all fish and shellfish use estuaries as a primary habitat or as spawning and nursery grounds. Estuaries also support abundant plant life and provide feeding, nesting, breeding and nursery areas for a wide variety of animals.

Peconic Estuary Program

About the Peconic Estuary Program

The Peconic Estuary is one of 28 "Estuaries of National Significance" under the federal government's National Estuary Program (NEP). The purpose of the NEP is to develop watershed-based comprehensive management plans for estuaries of national significance threatened by pollution, development, or overuse. Formally established in 1993, the Peconic Estuary Program (PEP) "Management Conference" includes numerous stakeholders, representing citizen and environmental groups, businesses and industries, academic institutions, and local, state, and federal governments. The PEP Comprehensive Conservation and Management Plan (CCMP) was formally approved on November 15, 2001 by U.S. Environmental Protection Agency Administrator Whitman, with the concurrence of New York State Governor Pataki.

The CCMP

The Peconic Estuary Program's CCMP promotes a holistic approach to improving and maintaining the estuary and its watershed. Priority management topics in the CCMP include Brown Tide, nutrients, habitat and living resources, pathogens, toxic pollutants, and critical lands protection. These six priority topics, together with the need for public education and outreach, form the basis for the CCMP action plans.

PEP CCMP Actions

Each of the 85 actions in the CCMP is broken down into one or more discrete steps. The full CCMP document provides detailed information on who is responsible for carrying out the steps, the time frame, and the cost of completing the step.



acronym key

- CAC** – Citizens Advisory Committee
- CCMP** – Comprehensive Conservation and Management Plan
- CNRA** – Critical Natural Resource Area
- EPA** – United States Environmental Protection Agency
- NEP** – National Estuary Program
- NYSDEC** – New York State Department of Environmental Conservation
- PEP** – Peconic Estuary Program
- SCDHS** – Suffolk County Department of Health Services
- USFWS** – United States Fish and Wildlife Service

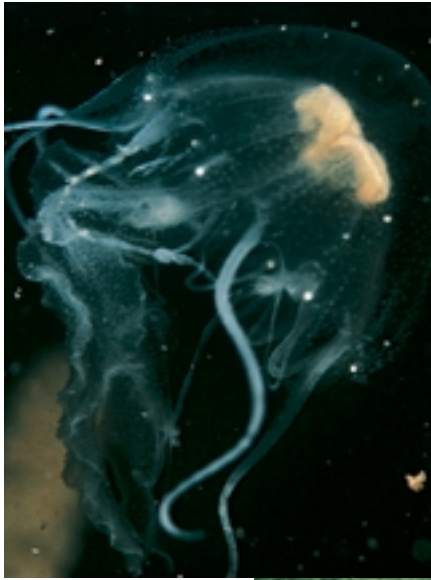
Coordinator/Editor: Gayle Marriner-Smith, Ecovision, Inc.

Text: Rick Balla (USEPA), Laura Bavaro (SCDHS), Marci Bortman (TNC), Walter Dawydiak (SCDHS), Michael DeLuca (NYSDEC)

Graphic Design: Diane C. Hewett, DCH Graphics

Photographer: Scott W. T. Hughes

All photographs in this Public Summary were taken within the Peconic Estuary watershed.



our estuary,

The East End of Long Island is a place of unparalleled beauty. Indeed, the combination of undisturbed habitats and productive bays prompted The Nature Conservancy (TNC) to call the Peconic Estuary “one of the Last Great Places in the Western Hemisphere.” With 5,680 acres of tidal wetlands and 111 rare species, nearly everyone can agree that the Peconic Estuary is worth protecting — moving ahead to protect it remains a great challenge.

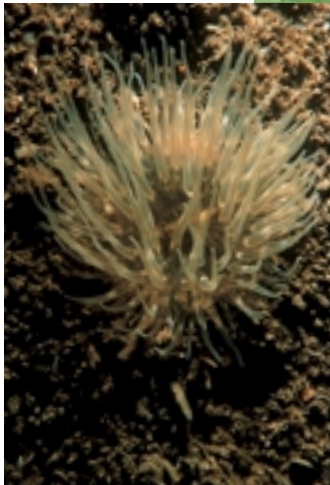
A Vision of the Peconic Estuary in the 21st Century

Most of the Peconic Estuary’s surface waters are of high quality. The Peconic Estuary does not exhibit some of the widespread problems found in many highly urbanized and industrial areas. However, changes in land use and increasing pressure on natural resources have taken their toll. These stresses have created areas of degraded water quality, disturbed habitat, harmed wildlife, and may have stimulated Brown Tide blooms. Therefore, the PEP vision for the Peconic Estuary is to protect and restore habitat diversity, water quality, and ecological communities.

While the actions and measurable goals of the CCMP are numerous and complex, they are necessary to achieve a simple vision:

- An estuary in which marine life can exist free from the stresses of low dissolved oxygen, at all places, and at all times.
- An understanding of Brown Tide, so that its occurrence and impacts can be minimized.
- Rebounding scallop and clam populations, and waters that remain clean enough for our children to harvest the shellfish.
- Lush eelgrass meadows, teeming with life.
- Pristine wetlands and extensive natural areas supporting abundant wildlife and diverse ecological communities.

This is an estuary in which preservation is as important as restoration. We will need a lot of time — at least 10 years. The good news is that we are well on our way.



our future...

The PEP is distinguished for its depth and breadth of technical studies. These studies have already been used to support major actions. For example, a cap has been set on the amount of nitrogen that sewage treatment plants can discharge into the Peconic River and Flanders Bay (“no net increase”), and a “water quality preservation policy” has been adopted for all high quality waters. Numerous regional initiatives and partnerships

Early Implementation

have been spearheaded by the PEP, including the Brown Tide Steering Committee, the Habitat Restoration Workgroup, the Critical Natural Resource Area process, and the Agricultural Environmental Management Strategy.

Using over \$13.8 million in federal and state funds, 97 demonstration and implementation projects have been conducted. Projects include upgrades of the sewage treatment plants in Riverhead and Sag Harbor, an enhanced wastewater treatment system at the Corwin Duck Farm, a pilot agricultural environmental management project, numerous stormwater mitigation projects, bay scallop seeding, wetland and eelgrass restoration, and demonstrations of numerous best management practices.

Perhaps most noteworthy is the tremendous local support expressed by the region’s towns and villages, Suffolk County and New York State. Tens of millions of dollars have been committed to open space and farmland preservation by the East End Towns and Suffolk County. Also, the NYS Clean Air/Clean Water Bond Act allocated a minimum of \$30 million to the Peconic and the South Shore Estuary Reserve. Over the next several years, well over \$100 million is expected to become available for open space acquisition, pollution control and resource restoration and enhancement through local programs such as the Community Preservation Fund, the Community Greenways Fund and the Suffolk County Quarter-Percent Sales Tax Program.

Studies have demonstrated that the economic and environmental conditions on the East End of Long Island are deeply intertwined. Clearly, businesses that rely on the estuary’s natural resources have not only a responsibility, but also a vested interest, in preserving these valuable assets in the 21st century.



brown tide management plan



- Determine environmental factors responsible for Brown Tide blooms
- Develop and implement strategies to prevent or mitigate Brown Tide, and its effects on estuarine resources
- Restore the natural resources affected by Brown Tide

Brown Tide's Early Warning—Proceed with Caution

Brown Tide is a bloom (excessive growth) of small marine algae (*Aureococcus anophagefferens*). Although algae of many types are found in all natural freshwater and marine ecosystems, blooms of the Brown Tide organism literally turn the water deep brown, making it unappealing to swimmers and fishermen alike. While not harmful to humans, the presence of the Brown Tide is a problem for bay scallops and eelgrass, and to a lesser degree other finfish and shellfish. Brown Tide is unlike most other algal blooms because of its unusually high concentrations, the extent of area it covers and the length of time it persists.

Soon after Brown Tide blooms began in 1985, the population of bay scallops declined significantly, leading to a near collapse of the commercial shellfishing industry in the Peconics. Many people considered this to be a "warning shot across the bow" for the estuary and its watershed.

As more is learned about Brown Tide, it becomes clear that both the estuary's problems and their solutions are characterized by the interrelationship among habitat, living resources, water quality and humans. Understanding and resolving what causes the Brown Tide problem will likely require small steps on many fronts, sustained over a long period of time by many stakeholders, from homeowners to farmers to sewage treatment plant operators.

strategies

Since 1985, researchers have been working to understand what causes Brown Tide blooms. The Brown Tide Steering Committee (BTSC), led by the PEP and Suffolk County, is coordinating the regional effort to collect and analyze data, conduct experiments, and integrate the results. The BTSC is made up of various agencies, scientists and other interested parties. The New York Sea Grant Institute oversees the Brown Tide Research Initiative, which has funded many studies. Numerous theories have been investigated, but scientists still do not have a clear explanation of what causes Brown Tide blooms. These studies have, however, yielded discoveries that will aid in unlocking the Brown Tide mystery. The new information gathered includes:

- An identification procedure that allows accurate, reliable, and rapid analysis of Brown Tide cell concentrations.
- A hypothesis that nitrogen may play a role in Brown Tide blooms. The theory holds that increased nitrogen in groundwater from septic systems and fertilizers may play a role in triggering or sustaining Brown Tide blooms.
- Experiments which suggest that microzooplankton (small animals that would typically eat organisms like Brown Tide) avoid Brown Tide, while hard clams, when present in high enough numbers, can prevent Brown Tide cells from increasing to bloom conditions.
- Compared to other types of algae, Brown Tide can grow well under low light conditions. The organism usually acts like an autotroph (plant), producing its own food through photosynthesis. However, in low light conditions, Brown Tide may behave like a heterotroph (animal), metabolizing organic carbon and nitrogen.

actions

The CCMP emphasizes a continued effort to coordinate research, monitoring, and information sharing. The CCMP's Brown Tide Management Plan lists actions that can be taken to prevent, or at least mitigate, the effects of Brown Tide and restore the resources affected by Brown Tide.

brown tide management actions

- Ensure continued coordination and information sharing on Brown Tide research.
- Support continued funding for Brown Tide research.
- Ensure that the Suffolk County Department of Health Services (SCDHS) water quality monitoring program continues to include Brown Tide monitoring and provide information needed for Brown Tide research.
- Periodically update the Brown Tide Workplan with new ideas for research and management projects.
- Restore resources impacted by Brown Tide, such as bay scallops and eelgrass. (See the Habitat and Living Resources Chapter of the CCMP)

Brown Tide Facts & Findings:

In 1982, the harvest of 500,000 lbs of bay scallops from the Peconic Estuary accounted for 28% of all U.S. commercial landings and had a dockside value of \$1.8 million. After the appearance of the Brown Tide in 1985, the bay scallop population was virtually eliminated. Although the population rebounded in 1994, another Brown Tide bloom in 1995 reduced the 1996 scallop landing to 53 lbs valued at \$400.

Since 1997, Suffolk County has provided more than \$680,000 in funding for Brown Tide research projects. The New York Sea Grant Institute funded over \$750,000 in Brown Tide research projects from 1991-1997. The National Oceanic and Atmospheric Administration, through the New York Sea Grant Institute, dedicated \$3.0 million for Brown Tide research from 1996-2001, as part of the Brown Tide Research Initiative.

nutrient management plan



- Reduce nutrient loads to the western estuary
- Preserve water quality in eastern estuary waters
- Develop and implement a total nitrogen load allocation strategy for the entire estuary
- Maintain or improve dissolved oxygen concentrations
- Optimize conditions for eelgrass

Nutrients—All Things in Moderation

Nutrients are essential for sustaining the marine ecosystem. However, when nutrients are present at excessive levels (“eutrophication”) due to human activities — they can be harmful to an estuary. When nutrients, especially nitrogen, are introduced to the estuary at higher than normal rates, they stimulate aquatic plant growth, including algae and “seaweed”. Under certain conditions, algal blooms can kill or harm fish and other aquatic animals by using up the dissolved oxygen in the water they need in order to breathe.

When sunlight is available, algae and plants release oxygen through photosynthesis, increasing the level of dissolved oxygen (DO) in the water. However, because algae use dissolved oxygen at night when photosynthesis does not occur (“water column respiration”), DO levels can become quite low by the early morning hours. Excess aquatic plant growth can also create problems as it settles to the bottom and is decomposed by bacteria. Not only do the bacteria use oxygen to break down the plant material (“sediment oxygen demand”), but they once again release the plants’ nitrogen back into the water column (“sediment nutrient flux”). If there is not enough dissolved oxygen in the water to sustain all of these processes, fish and other aquatic life will be forced to leave the area, become stressed or die. This condition of low dissolved oxygen is known as hypoxia.

strategies

Although high levels of nutrients can lead to low dissolved oxygen conditions, other impacts from nutrients are also a concern. Excessive algae also cloud the water, effectively blocking sunlight from submerged aquatic vegetation (SAV). SAV, particularly eelgrass, provides prime nursery and spawning habitat for juvenile finfish and shellfish. The loss of SAV can affect the entire estuarine food web. The long-term impacts of high nutrient levels are difficult to measure, but probably include changes to the numbers and kinds of aquatic life present in the estuary.

Fortunately, about 97 percent of the Peconic Estuary's surface waters are classified as high quality when measured against New York State's dissolved oxygen standards. These waters also meet the criteria for nitrogen set by the Long Island Sound Study and the Chesapeake Bay Program, which are based on the protection of eelgrass. However, due to poor tidal flushing and pollutant inputs, the environmentally sensitive western estuary is critically stressed (more specifically, the tidal Peconic River, Meetinghouse Creek and East Creek in Riverhead). These areas have elevated nitrogen levels and frequently do not meet dissolved oxygen standards. As a measurable goal, the PEP strives to reduce total nitrogen concentrations in the western estuary to meet the water quality standard established by the PEP.

While mitigation is a priority in the tidal Peconic River and Flanders Bay, the Peconic Estuary Program has adopted a "water quality preservation priority" for the waters east of Flanders Bay. The PEP's goal is to ensure that the existing total nitrogen and dissolved oxygen levels are maintained or improved in these waters. This is especially critical because studies show that nitrogen stresses may exist in Great Peconic Bay and Little Peconic Bay, even though the dissolved oxygen standard has not been routinely violated.

Finally, the PEP has a strong focus on the subwatersheds of the creeks and shallow embayments where eelgrass concerns are paramount.

Too Much of a Good Thing

Sources of nitrogen include agricultural and residential fertilizers, on-site disposal systems (septic systems or cesspools), atmospheric deposition, in-place nutrient enriched bay bottom sediments, sewage treatment plants, and stormwater runoff. Most of the nutrients enter the bays from the atmosphere (rainfall) and groundwater, although sewage treatment plants are an important factor in localized areas. Nitrogen loadings (inputs) to the entire estuary appear to be at an all-time high, with increases in loadings that come from the atmosphere and groundwater more than offsetting reductions that have occurred due to the closing of duck farms.

Over 80 percent of the total controllable land-based nitrogen comes from private homes and farmland. Considering that an estimated 40 percent of the study area is still subject to development, the challenge of reducing nutrient loads over time becomes formidable. While most new development is expected to be residential, the western estuary's commercial and industrial growth potential is great as well.

For these reasons, development is a major environmental concern, especially in its potential to increase nutrient loadings and lower dissolved oxygen levels in the bays. In response, the PEP has conducted numerous studies and developed a computer model to explore management alternatives and build-out scenarios. The computer model can be used to predict what will happen if we continue with current practices or make changes in how things are done, for both the system as a whole and for particular

embayments. The PEP will develop a nitrogen load allocation strategy for the entire estuary to ensure that water quality standards are met now and in the future.

actions

Several regulatory and non-regulatory programs, such as the Agricultural Environmental Management Strategy, have been developed. Also, the NYSDEC has implemented a point source total nitrogen freeze policy for the western estuary (Peconic River and Flanders Bay) by modifying discharge permits. All major sewage treatment plants discharging to the Peconic Estuary have been upgraded as well.

Continuation of aggressive open space acquisition programs is critical, not only for the control of nitrogen inputs, but for habitat and living resource concerns. Programs such as the Pine Barrens Land Use Plan have already resulted in tremendous open space benefits. More than 25% of the watershed (over 31,900 acres) is now preserved open space. Other land use programs will need to focus on local issues such as zoning density, setbacks from wetlands and surface waters, clustering development, minimizing clearing, and reducing turf grass areas. Review of septic system management, including the use of innovative and alternative systems, is also an ongoing priority.

actions (continued)

Residents will play perhaps the most important role in controlling nitrogen loads. They will be called upon to eliminate or significantly reduce their use of fertilizers (or to use slow-release nitrogen fertilizers if they choose to fertilize), limit clearing of vegetation, and use native plants for landscaping. Better maintenance of septic systems is also an important component of the plan.

The PEP has categorized the estuary's surface waters as "high quality", "stressed", or "threatened" with respect to dissolved oxygen. The PEP will be developing a total nitrogen loading goal for the entire watershed, based in large part on the results of modeling various management and land use scenarios. Guiding the process are "nitrogen management work groups" addressing agriculture, non-agricultural issues (mainly residential), and the specific issue of establishing a load allocation for the stressed western estuary.

nutrient management actions

- Use the best science available to continue to set water quality standards and guidelines for nitrogen and dissolved oxygen.
- Develop and implement a quantitative nitrogen load allocation strategy for the entire estuary, which accomplishes the following goals:
 - a) Reduce the nitrogen levels in the western bays to attain the dissolved oxygen standard.
 - b) Preserve water quality east of Flanders Bay.
 - c) Target the most stringent nitrogen management efforts in the subwatersheds of creeks and shallow embayments to optimize conditions for eelgrass.
- Implement plans to address nonpoint sources of nutrients from existing development, aging septic systems, and fertilizer applications (residential and agricultural).
 - a) Implement the Agricultural Environmental Management Strategy to reduce agricultural nitrogen loads by 25%.
 - b) Develop and implement a non-agricultural nitrogen policy.
- Use land use planning to control nitrogen loading associated with new development.
- Implement both preservation and mitigation projects, with presumptively equal priority.
- Coordinate management efforts with other programs (such as the Pine Barrens Program).

Nutrient Facts & Findings:

Low levels of dissolved oxygen can inhibit the feeding growth and survival of the Peconic Estuary's living marine resources. Dissolved oxygen levels tend to be lowest during the summer, which is also the time when populations of many finfish and shellfish species, including eggs, larvae and juveniles, are at their greatest.

Bay bottom sediments are an internal nitrogen source, which reflects current and historic human inputs. The amount of nitrogen already present in the sediment is greater than any other individual source of point or nonpoint source pollution. This source of nitrogen, however, is one that will decrease over time if pollution inputs to the bays are reduced.

In the Peconic Estuary, excessive levels of nutrients can harm eelgrass, a critical habitat, by stimulating the growth of epiphytes (very small plants that live on eelgrass), preventing light from reaching seagrasses due to increased algal growth, and, possibly, by causing eelgrass to grow weak and spindly.

Under the worst-case scenario, (i.e., houses are built on all land that is not set aside as open space while preserving existing agricultural uses), nitrogen loads could increase by about 40% across the entire estuary study area. In the eastern estuary, building on the South Fork would have the most profound effect (over 60% increase in nitrogen loads).

habitat & living resources management plan



- Protect ecosystem health
- Support sustainable recreational and commercial fisheries
- Protect critical natural resource areas
- Protect rare, threatened, and endangered animal and plant species
- Restore degraded habitats
- Promote a coordinated approach to research and monitoring of habitat and living resources

Ecosystem at a Crossroads

The PEP study area encompasses a variety of habitats — from dwarf pitch pine forests to salt marshes to soft bay-bottom communities — all of which are important to the ecology and productivity of the Peconic Estuary ecosystem. Some of these habitats are found nowhere else in New York State, and rarely found elsewhere in the United States. Some habitats are in danger of becoming fragmented, degraded, overused or completely lost. The Peconic Estuary region supports 111 documented species that are endangered, threatened, rare, or a “species of concern.” Also, many economically important species, like the bay scallop, weakfish, and winter flounder, spend all or part of their life in the estuary.

Natural resources and ecosystems need to be conserved and enhanced for future generations to enjoy and experience. Due to human encroachment, overuse, exploitation, excess nutrient inputs, and pollution, the Peconic Estuary ecosystem is beginning to show signs of stress. These signs have not gone unnoticed.

Physical alterations to the environment such as navigational channel dredging, filling of low-lying areas including wetlands, hardening of the shoreline (i.e., bulkheads and

strategies

other erosion control structures) and clearing of land for human uses all directly impact habitat and living resources. Additionally, residential and commercial development and farming have led indirectly to degraded terrestrial and aquatic habitats. For example, road construction and culverts have modified the flow of surface water, causing changes to wetlands, fragmentation of habitats, and the decline of species diversity and reproductive success. Dredging and shoreline hardening structures change currents, wave energy and sedimentation patterns, which in turn lead to wetland loss, beach erosion, and altered species composition. The PEP will strive to implement a 'No Net Increase' policy for shoreline hardening structures by first working to ensure that there is no overall increase in the current linear feet of hardened shoreline, then seeking to decrease overall shoreline hardening by 5% over the next 15 years.

By implementing the CCMP, we can halt, mitigate and reverse the direct and indirect negative impacts to estuarine habitats and living resources. This goal can be achieved using both high-tech and low-tech solutions. An example of a low-tech approach is the replacement of an undersized culvert with a larger one to increase salinity behind a dike in Orient by Long Beach Bay. Multiple restoration projects, such as those occurring at Cassidy Preserve, Three Mile Harbor and Paynes Creek, have been accomplished by excavating soil, removing invasive vegetation (common reed, also known as *Phragmites*) and re-grading the site to allow natural tidal flooding and the return of native wetland plants. Also, land acquisitions and environmental easements are preserving open spaces and natural resources before they are fragmented or lost entirely.

According to the U.S. Fish and Wildlife Service (USFWS), there are approximately 5,680 acres of tidal wetlands in the Peconic Estuary. In addition, the USFWS reports that 256 acres of all types of wetlands were lost between 1972 and 1994. The most significant factors in the loss of wetlands were erosion by marine processes, dredging, and filling for home and lawn construction. At least as important with respect to wetland acreage loss are human disturbances that have degraded buffer areas around wetlands. Most wetland losses occurred historically, prior to the passage of strict State tidal wetland laws and the Clean Water Act.

One species that has suffered is the bay scallop. Although re-seeding efforts are taking place, the once abundant bay scallop population was virtually eradicated by the onset of Brown Tide in 1985 (see the Brown Tide section of this summary). Because of the lower abundances of bay scallops, East End shellfishers have turned toward harvesting hard clams in greater numbers.

Shallow water areas make up only 6.6 percent of the estuary, yet they supply a majority of the commercial shellfish harvest. While there is no evidence that hard clams have ever been especially abundant in the Peconic Estuary, recent surveys and anecdotal evidence suggest that there may be a decline with respect to historic levels. This may be the result of overfishing, low recruitment (insufficient addition of new clams to an area), and/or high mortality. Six spawning sanctuaries for hard clams have been established in the Peconic Estuary, with the expectation that they will enhance shellfish resources. Scientists will attempt to measure their impacts on future shellfish abundance and landings.

Eelgrass beds, an important estuarine nursery habitat for both finfish and shellfish (especially bay scallops), have declined recently. Once abundant throughout the estuary, eelgrass beds are now limited to waters near Shelter Island and other easternmost waters. Although the cause of the decline is uncertain, light attenuation resulting from Brown Tide blooms, excessive nutrients, low levels of pesticides, competition from non-native species (such as codium), plant diseases, and suspended sediments are possible reasons for the losses. With this knowledge, marine scientists from Cornell Cooperative Extension have conducted several pilot projects to restore eelgrass beds within the estuary. In the past year, new methods of seeding and transplanting have been highly successful at Jessup Neck and show potential for larger restoration projects in the future.

Evidence suggests that finfish declines may be attributed to over-harvesting, but habitat degradation cannot be ruled out as an important implicating factor. It is suspected that shoreline hardening, fertilizer and pesticide use, commercial trawling, historic oyster culturing, recreational boating, and dredging have all impacted feeding and spawning habitats.

habitat &
living
resources
management
actions

actions

The management of habitats and living resources in the Peconic Estuary will require a combination of protecting existing natural areas and restoring or enhancing others to achieve the most natural, sustainable ecosystem possible. One approach is the establishment of Critical Natural Resource Areas, specific locations with significant biodiversity in need of extra protection to preserve their unique characteristics, and to develop management plans to protect them. Rough boundaries of these areas already have been drawn. Another approach has been through the preparation of a Habitat Restoration Plan to 1) prioritize significant habitat types; 2) develop restoration goals for those habitat types; and 3) identify locations for implementation of restoration projects. To date, seventy-two restoration sites have been nominated, encompassing 836 acres with an estimated restoration cost of over \$42 million.

The actions in the CCMP seek to foster sustainable recreational and commercial uses of the Peconic Estuary that are compatible with biodiversity protection and habitat improvement. It is anticipated that implementing these actions will result in the enhancement of economically and ecologically important species. The implementation of these CCMP actions will be crucial in the management of the entire system.

- Protect Critical Natural Resource Areas (CNRAs) throughout the Peconic Estuary by means such as local management overlay districts, ordinances, and land protection efforts (see the Critical Lands Protection Section).
- Prevent overall increases in shore stabilization structures (i.e., bulkheads, docks, and piers).
- Protect wetlands through stewardship and regulatory programs.
- Protect existing eelgrass beds.
- Foster sustainable recreational and commercial finfish and shellfish resources in a way that is compatible with biodiversity protection (protection of the variety of species in a given area, as well as the number of species).
- Implement an estuary-wide habitat restoration plan.
- Protect sea turtles, marine mammals, shorebirds and their habitats.
- Ensure that aquaculture, dredging, and artificial reef programs and activities are done in an environmentally sensitive way.
- Develop and implement a Habitat and Living Resources Research, Monitoring and Assessment Plan so we can better understand and manage the estuary.

Habitat & Living Resources Facts & Findings:

There are 111 endangered, threatened, rare, or special concern terrestrial and freshwater species documented in the Peconic Estuary and its watershed—
13 insects, 1 freshwater fish, 2 amphibians, 1 reptile, 12 birds, and 82 plants.

Wetlands provide more than just habitat for birds, fishes, and invertebrates. They also provide a buffer zone that acts in two ways. First, wetlands are capable of absorbing surface runoff from land, buffering the estuarine waters from excess nutrients and contaminants in stormwater. Second, they absorb floodwater from the estuary during storm surges, adding protection against erosion.

critical lands protection



- Accelerate land protection, including acquisition, in the watershed
- Develop and implement a process whereby lands are identified as priorities for protection, including acquisition
- Estimate funding needed for land protection, quantify benefits, evaluate funding sources, and seek funding
- Help to resolve issues regarding underwater land ownership and management

The Need for Land Protection

Ever-increasing development is consuming open space and natural habitat, and stressing watersheds and natural communities. The region's growing population and the significant increase in the rate of development in the last five years underscores the need for immediate action to protect the estimated 40% of acreage in the Peconic Estuary study area that still could be developed.

There are many benefits to land protection, including preserving unique species and natural communities, controlling nitrogen loads to optimize dissolved oxygen in the water for fish and shellfish, and protecting surface water quality and groundwater recharge areas from other adverse effects. In addition, the public has a strong attachment to the natural and amenity resources of the Peconic Estuary region, even if they do not use them directly or frequently.

The Critical Lands Protection Plan

The CCMP presents a detailed strategy for preparing a Critical Lands Protection Plan. The Critical Lands Protection Plan ultimately will evaluate the land available for development in the Peconic Estuary study area and

strategies

identify priorities for protection with respect to estuarine management concerns. It is the intent of the Critical Lands Protection Plan to prioritize the land available for development “through the lens” of habitat and water quality protection by integrating what is known about the Peconic’s habitat and living resources and sources of nutrients, pathogens, and toxics. The Critical Lands Protection Plan is not designed to be the sole reference for land protection in the Peconic Region. However, it will serve as a useful tool for agencies that make land protection decisions based in part on estuarine considerations.

Already, the Critical Lands Protection Work Group has developed draft maps depicting the land still available for development that also meet the criteria chosen by the work group to determine land protection priorities. These criteria include: proximity to shorelines, wetlands, other preserved areas, Critical Natural Resource Areas, and subwatersheds that have already been stressed from too much nitrogen. These maps also identify preserved lands and the parcels in the watershed recommended for acquisition under the Community Preservation Fund. The work group is currently meeting with the towns for additional input and clarification.

actions

The actions in the Critical Lands Protection chapter of the CCMP outline a strategy for developing a Critical Lands Protection Plan. The Critical Lands Protection Plan ultimately will evaluate the land available in the Peconic Estuary study area and identify priorities for protection with respect to estuarine management concerns.

critical lands management actions

- Develop a “Critical Lands” map and list of parcels recommended for protection.
- Estimate the funds needed for land protection, evaluate the funding sources available, and quantify the benefits of land protection.
- Develop a Critical Lands Protection Plan report.
- Accelerate land protection in the Peconic Estuary.
- Develop a strategy for the management of underwater lands, which conserves and enhances the Peconic region’s natural resources.

Critical Lands Protection Facts & Findings:

Public benefits of land protection include: aesthetic values that contribute to our quality of life; limiting development costs related to infrastructure investments; protection from erosion and flooding-related damages; drinking water protection; increased public access and recreational opportunities; enhanced economic values to the community; and protection of productive finfish and shellfish habitats for recreational and commercial purposes.

Many land acquisition programs exist at the Federal, State, County, and town levels, including the New York State Open Space Conservation Plan, the Suffolk County Quarter-Percent Sales Tax Program, and each individual town’s Community Preservation Fund.

pathogens management plan

- Minimize health risks due to human consumption of contaminated shellfish
- Minimize closure of beaches and shellfish beds due to pathogens
- Develop and implement plans to reopen closed shellfish beds



Pathogens—Reducing the Risks

Pathogens are viruses, bacteria, algae, and protozoans that cause diseases in humans, other animals or plants. Pathogens that may be found in marine waters include those causing gastroenteritis, salmonellosis, and hepatitis A. Pathogens can enter marine waters via untreated or partially treated human sewage and possibly by way of wild or domestic animal waste. Humans may encounter pathogens through direct contact with contaminated water, ingestion of contaminated water, or consumption of raw or partially cooked shellfish harvested from contaminated waters. Pathogen inputs to the Peconic Estuary are a concern because of the potential human health risks and the economic losses associated with the closure of shellfish beds and beaches.

Because measuring concentrations of specific pathogens in seawater is so difficult, scientists use indicators as a proxy for pathogens commonly found in the intestines of warm-blooded animals. The most common indicators are fecal and total coliform bacteria.

Excessive levels of coliform bacteria are generally found in areas where the water exchange or tidal flushing is limited and runoff from the surrounding land is high. To date, only one public bathing beach of twenty-eight in the Peconic Estuary has been closed due to excessive coliform bacteria values — the East Hampton town beach on the south end of Lake Montauk.

Shellfish bed closures due to coliform contaminants represent an economic loss and a potential human health problem. Fourteen percent of the region's productive shellfish growing areas are closed due to pathogen contamina-

strategies

tion. Shellfish bed closures have decelerated in recent years, most likely because many of the shallow, relatively enclosed creeks and embayments, which tend to be poorly flushed and contaminated by pathogens, have already been restricted for shellfish harvesting. Unless further actions are implemented to reduce pathogen loading to the estuary, additional shellfish beds may be closed in the future.

Stormwater runoff carries a multitude of nonpoint source pollutants and is the largest contributor of pathogens to the estuary. Coliform bacteria from undeveloped land are most likely from wildlife (including waterfowl) while those from developed areas may be from domestic animals and/or poorly functioning septic systems or cesspools. More than 28 stormwater runoff abatement projects were implemented between 1993 and 2001. In addition to stormwater runoff, another small but possibly significant contributor of pathogens is sanitary wastewater from boats, particularly in the enclosed waters around marinas and mooring areas. To remedy this problem more sanitary pump-out stations have been installed at marinas over the past several years. Also, the Peconic Estuary Program has secured a 'Vessel Waste No Discharge Area' designation for the entire Peconic Estuary.

Pathogens can also originate from point source discharges. Point sources in the Peconic Estuary include effluent from sewage treatment plants and the Corwin Duck Farm on Meetinghouse Creek.

pathogens management actions

- Continue to develop and implement stormwater management plans to control runoff and pathogen loading from existing development.
- For new developments, apply land use regulations and construction site guidelines that eliminate or minimize new sources of stormwater runoff.
- Investigate and demonstrate new low-tech and high-tech approaches to remediate stormwater runoff.
- Enhance existing and implement new best management practices for septic systems.
- Control pathogen loadings from marinas and boatyards by providing additional pumpout facilities and encouraging their use.
- Establish a Vessel Waste No Discharge Area for the entire Peconic system.
- Ensure adequate disinfection of wastewater at sewage treatment plants.
- Make improvements at the Corwin Duck Farm to reduce pathogen loadings to Meetinghouse Creek.
- Continue monitoring water quality to determine where additional controls are necessary.

actions

The approach for nonpoint source loads, the predominant source of pathogen inputs to the estuary, relies on the implementation of guidelines, regulations, and best management practices to address stormwater runoff, failing or poorly functioning septic systems, wastewater from boats, and wild and domestic animal wastes. Stormwater mitigation efforts have been implemented locally, but much more needs to be done. The management strategy for point source discharges focuses on new and alternative technologies to provide effective disinfection of wastewater. Point source discharges (sewage treatment plants and the Corwin Duck Farm) will continue to be monitored. Studies to identify pathogen loading and monitor water quality will also be continued. Finally, a concerted effort will be undertaken to educate the public with regard to boater waste, septic system operation and maintenance, eliminating or reducing stormwater runoff, and the proper disposal of animal waste. Ultimately, the PEP goal is to prevent any additional closures of shellfish beds, and to reopen beds locally, where cost effective. To achieve this goal, the PEP has initiated a "Regional Stormwater Management Strategy" to identify and prioritize stormwater inputs to creeks and embayments, evaluate management alternatives, and develop detailed recommendations to be used in implementing mitigation plans.

Pathogens Facts & Findings:

There are approximately 20,880 acres of highly productive shellfish beds in the Peconics, of which fourteen percent (2,952 acres) are closed to harvesting year-round or seasonally. These areas are closed because the water quality fails to meet the criteria established for certified shellfish growing areas by New York State Environmental Conservation Law and the National Shellfish Sanitation Program. [Subsequent to the writing of the CCMP, the NYSDEC has reclassified 340 acres of closed shellfish growing areas as opened seasonally or year round.]

To reduce coliform contamination to Meetinghouse Creek, a freshwater wetland was constructed at the Corwin Duck Farm to remove contaminants from the Farm's wastewater discharge. The system acts as a natural filter that captures and retains pathogens.

To remediate the pathogen input of stormwater runoff into the Peconic Estuary, stormwater abatement projects have included the use of native plants, the construction and restoration of wetlands, and the redirection of stormwater runoff into wetlands to naturally filter out pathogens.

Wastewater effluent from the Riverhead and Sag Harbor Sewage Treatment Plants are now disinfected using reliable and highly effective ultraviolet light. The small, privately-owned Shelter Island

Heights Sewage Treatment Plant is finalizing an environmental impact statement for a potential upgrade, including new disinfection technologies, in 2002.

toxics management plan



- Reduce the risks people face from eating toxic contaminated fish and shellfish
- Protect and improve bay and creek waters and bottom sediments for all living things
- Keep toxic substances from entering groundwater and the bays through voluntary and regulatory programs
- Where there is contamination, clean it up quickly
- Monitor toxic concentrations in water, sediments and living things to determine whether the environment is getting cleaner

Toxics—Prevention is Key

Toxic pollutants include both human-made and natural substances that can be harmful to people and other living things. Toxics can be present in bay and creek waters and bottom sediments, groundwater, soils, and in plants and animals. Toxics can affect the ability of fish, shellfish, and wildlife to survive or reproduce. Some toxics can accumulate in the edible parts of fish, shellfish, and wildlife, making them an unsafe food source for either people or wildlife. Toxic contamination can also impact dredging and dredged material placement operations because limited placement options are available for contaminated sediments.

The toxic contaminants that may be present in the estuary are as diverse as the land uses and activities from which they can originate. Potential sources include: stormwater runoff from private homes and businesses, construction sites, roads and parking lots; sewage treatment plants; individual septic systems; farms, golf courses, mosquito control measures; marinas and recreational boating; Federal and State Superfund sites; treated lumber used for bulkheading, docks and piers; leaking underground storage tanks; and atmospheric deposits from sources near and far.

Relative to other estuaries nationally, toxic contamination is not currently a significant problem in the Peconic

strategies

Estuary. However, toxic substances have been found in the estuary, and impacts from toxic substances have been documented. The PEP has completed a number of studies to better assess the effect that toxic substances have on the system, both individually and cumulatively. At some locations, detailed investigations and clean-ups are occurring under Federal and State hazardous waste clean-up laws. Limiting the inputs of toxic substances to the system, particularly pesticides, is an important management strategy to prevent problems from occurring in the future, particularly as the population in the watershed increases. The focus of the CCMP is targeting those land uses and activities that contribute toxics to the system and taking steps to prevent them from getting into the ecosystem.

Pesticides, an emerging concern, may enter the Peconic system from suburban areas such as homes, golf courses, and public and private lawns and landscaped areas, as well as from agricultural operations and mosquito control measures. Though no causal link has been identified, low levels of pesticides (and other toxics) may be affecting living creatures in the Peconic Estuary, especially during the sensitive early life stages of commercially and recreationally important finfish and shellfish. Other plants and animals in the food web may also be affected. Even pesticides that are banned or not being applied can cause or contribute to environmental problems if they are disposed of or stored improperly.

Because the clean-up of toxic contamination is an expensive proposition, preventing toxic contamination is the preferred management approach. Clean-ups of known problem areas, such as sites identified under Federal and State hazardous waste clean-up laws, address pollution that occurred in the past and return these areas to environmentally sound conditions and productive uses.

actions

The actions in the Toxics Management Plan of the CCMP address both point sources (i.e., direct discharges through a pipe) and non-point sources (from many diffuse sources and typically carried to the bays in groundwater or surface runoff). The actions call for clean-ups at some contaminated sites, enforcement of existing and new regulations, pollution prevention programs, research, and monitoring. Additional actions to reduce toxics can be found in the Public Education and Outreach Chapter of the CCMP.

toxics management actions

- Continue to assist in ensuring that the remedial investigations and cleanups currently underway at contaminated sites, especially the Superfund sites at Brookhaven National Laboratory and Rowe Industries, adequately address human health and ecological impacts.
- Eliminate or reduce pesticide use.
- Continue to use alternatives to chlorine disinfection at sewage treatment plants, where possible.
- Ensure proper storage and disposal of chemicals at construction and road building/repair sites.
- Keep toxics substances from getting into runoff and groundwater.
- Create and carry-out pollution prevention programs, including local household hazardous waste disposal programs.
- Make sure that dredging and the placement of dredged material does not negatively affect the Peconic Estuary study area.
- Compile existing information and gather new information on toxics in the Peconic Estuary and the effects they may be causing.

Toxics Management Facts & Findings:

Chlorine disinfection of sewage treatment plant discharges recently has been eliminated at two of the three largest facilities discharging to the Peconic Bays. Ultraviolet light treatment is now used to disinfect the effluent. The elimination of chlorine at the small privately-owned Shelter Island Heights plant is being investigated.

There are three Federal Superfund sites in the Peconic Estuary study area: the North Sea Municipal Landfill, Rowe Industries (Sag Harbor), and a portion of Brookhaven National Laboratory (Upton).

Toxics can come from various places and activities, including homes (septic systems; lawn care and landscaping, leaking underground storage tanks for heating oil), businesses, farms, road runoff, boating (engine exhausts, maintenance, bottom paints), sewage treatment plants, mosquito control operations, construction and road building/maintenance, and bulkheads (treated lumber). The amount of toxics that get into the bays and creeks from any one home, business, boat, road or bulkhead may be small, but when countless small amounts are added together, we can start to detect their presence in the environment. Toxics, especially metals, pesticides, and PAHs (chemicals from the burning of fossil fuels), are present in bay bottom sediments. The best way to keep toxics out of the bay is for everyone to comply with existing laws and follow the three "Rs" of pollution prevention: **REDUCE, REUSE, RECYCLE.**

public education and outreach management plan



- Help people understand how their actions individually and cumulatively affect the Peconic Estuary
- Promote hands-on and action-orientated stewardship of the Peconic ecosystem
- Foster communication and cooperation among the diverse stakeholders in the Peconic Estuary region
- Increase the awareness of the value of the Peconic Estuary as a regional and national resource
- Support implementation of the Peconic Estuary Program CCMP

Citizen involvement has been an important part of the Peconic Estuary Program since it began in 1993. The Citizens Advisory Committee (CAC) helped to guarantee broad-based public input during preparation of the CCMP. Marine-related industries, environmental and civic organizations, baymen, boaters, recreational fishermen, and other interested citizens participate on the CAC. In addition to producing printed materials, the CAC has hosted events and sponsored television and radio broadcasts in its public education and outreach efforts.

Continuing to educate, involve and gain the support of the public is vital to the future success of the PEP. All of Eastern Long Island's residents and visitors need to understand their role as users of the system and the effect that their actions and inaction have on the quality and sustainability of the area's resources. Various education and outreach methods will be used to engage the public.

strategies

The strategy for public participation during CCMP implementation stresses how important it is to: bring together the stakeholders in the watershed; participate in decision-making; be actively involved in programs to protect, enhance and restore the estuary and its watershed; and carry out education and outreach efforts on priority topics. A hallmark of the Peconic Estuary Program has been, and will continue to be, the preparation and use of innovative and high quality participation, education and outreach methods.

public education and outreach management actions

- Develop and carry out new programs while expanding successful education and outreach programs addressing:
 - reduction of fertilizer and other nutrient inputs;
 - protection of habitats and living resources;
 - elimination of or reduction of pesticides and other toxic inputs; and
 - reduction of sources of bacteria and other pathogens.
- Promote action-oriented stewardship of the Peconic Estuary ecosystem.
- Increase the public's awareness of the social and economic value of the Peconic Estuary as well as its value as a regional and national resource.
- Foster communication and cooperation among stakeholders.
- Develop public support for implementation of the actions in the CCMP.

actions

The actions below reflect the need for continued public outreach and support on CCMP management topics including nutrients, toxics, pathogens, habitat and living resources, as well as for overall stewardship of the Peconic Estuary system.

Public Education and Outreach Facts & Findings:

A public opinion poll in 1994 showed that 78 percent of those polled understood the connection of the bays to the local economy and documented that there was a high level of willingness to pay taxes and take actions for the good of the bays, especially among the users of the bay system. The ongoing PEP public outreach and education program started by saturating the already popular local newspapers with press releases and ads, and bringing information on estuarine conservation and protection to television, radio, schools and the business community, where there had previously been little or no information.

financing management plan

strategies

A wide variety of funding sources must be secured to ensure full implementation of the CCMP. The ability of the PEP to achieve its goals and objectives, and the pace at which progress is made, clearly will be a function of the availability of funding. Securing this funding is a responsibility of the Peconic Estuary Program as a whole and the agencies, organizations, and individuals that make up the Management Conference. The funding of many actions will continue through ongoing activities of existing governmental and non-governmental stakeholders. However, because there are limitations on the types of activities that may be funded under these programs, additional sources of funding must be secured.

Numerous existing and new funding sources and mechanisms are described in the Plan at the Federal, State and County level, including the State's Revolving Loan fund, municipal bonds, fines and settlements, tax abatements and incentives, the establishment of municipal improvement districts, and selective sales fees. In addition, not-for-profit organizations and other private entities are encouraged to participate in CCMP implementation.

- At a minimum, continue to fund Federal, State, County, and local environmental protection funds at their current levels
- Aggressively seek additional public and private funds
- Use innovative financial sources and incentives to fully implement the CCMP

actions

The actions below address the wide range of possible funding mechanisms for CCMP implementation.

Financing Facts & Findings:

In 1993, more than 1,100 establishments were identified as estuarine dependent; gross revenues for those establishments exceeded \$450 million per year. More than 7,300 people are employed in those businesses, with a combined annual income of more than \$127 million.

Costs of Management Actions: The total cost of all new actions in the CCMP is approximately \$20 million in new one-time costs and \$10 million per year in new annual costs. These estimates do not include costs for actions that are already underway or for which governmental or non-governmental commitments have been secured. In addition to those costs, an estimate for implementing a comprehensive habitat restoration program is \$60 million. Other estimates of new needs beyond existing commitments include: \$100 million for implementing agricultural best management practices; \$100 million for land protection/acquisition; and \$50 million for stormwater remediation activities. The total of all these costs (including estimates) is \$330 million in one-time costs and \$10 million in annual costs.

Implementation funding is already substantial. With Federal, State and local funding sources, including the New York State Clean Water/Clean Air Bond Act, the Suffolk County Quarter-Percent Sales Tax and local Community Preservation Fund initiatives, over 100 million dollars have been committed to the Peconic Estuary.

financing management actions

- Convene a Finance Work Group to oversee financing of CCMP implementation.
- Effectively use governmental funds, staff and programs already dedicated to CCMP implementation.
- Determine whether additional funds are available for CCMP implementation at all levels of government.
- Involve non-profit organizations and the private sector in implementing the CCMP.
- Use the State Clean Water Revolving Fund loans and municipal bonds to finance eligible CCMP projects.
- Use funds from fines and settlements for eligible CCMP projects.
- Use tax abatements and other tax incentives to encourage conservation projects and environmental improvements.
- Create municipal improvement districts to pay for qualified projects.
- Encourage citizen initiated environmental legislation to secure funding for CCMP implementation.
- Investigate the feasibility of establishing a selective sales fee on certain products (such as fertilizers and pesticides) to fund environmental improvement projects.

post ccmp management & plan implementation

strategies

The Peconic Estuary Program has long recognized the need for establishing a long-term framework for the management of the Peconic Estuary study area and implementation of the CCMP. The PEP will continue to use the management structure that existed during preparation of the CCMP. The effectiveness of this structure will be evaluated every three years.

The Program Office will continue to be located in the Suffolk County Department of Health Services Office of Ecology, with oversight from a Management Committee consisting of voting representatives from the U.S. Environmental Protection Agency (EPA), New York State Department of Environmental Conservation (NYSDEC), Suffolk County, Local Government, and chairs of the Technical Advisory Committee and Citizens Advisory Committee. A four member Policy Committee, made up of representatives from the EPA, NYSDEC, Suffolk County and local government, oversees the entire program.

The Post-CCMP section of the Plan also includes actions on reporting progress in implementing the CCMP and measuring environmental quality. The CCMP highlights the need to work with local governments and to develop and carry out plans for one waterbody (subwatershed) per year in each town. The first subwatershed plans are underway.

- Ensure a stable and effective management structure to oversee CCMP implementation
- Work to involve all public agencies in implementing the CCMP and rely on existing programs and laws whenever possible
- Develop and implement an effective long-term monitoring program, and use and share the data that are collected
- Track environmental indicators and report progress in implementing the Plan

actions

The management actions below address topics that are cross-cutting, affecting many of the management topics in the plan including: oversight of the entire program; monitoring the environment; reporting on plan implementation; and involving local government.

post ccmp management & plan implementation actions

- Ensure that an effective organization oversees the implementation of the CCMP
- Conduct and coordinate environmental monitoring
- Track and regularly report on environmental indicators and progress in implementing the CCMP
- Make sure local governments and elected officials are aware of the CCMP and involved in its implementation
- Develop and implement specific plans for subwatersheds within the Peconic System
- Comply with Federal, State, and local laws, including the National and State historic preservation laws and the Federal Endangered Species Act, when implementing the CCMP

