



*A Partnership to Restore and Protect the Sound*

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**2003  
Comprehensive  
Conservation and  
Management Plan  
Implementation  
Tracking Report**

**January — December 2003**

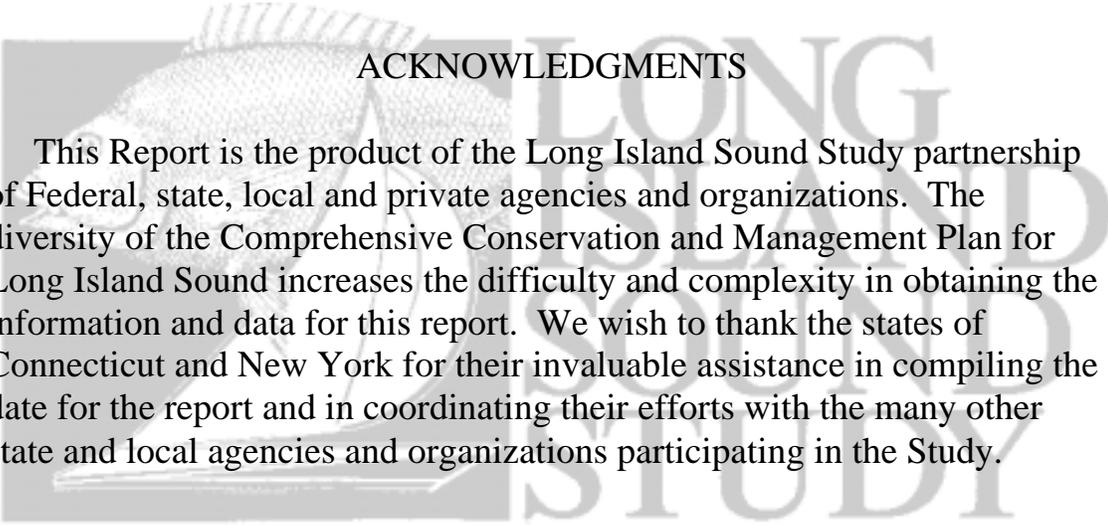
**THE  
LONG  
ISLAND  
SOUND  
STUDY**

*A Partnership to  
Restore and Protect  
the Sound*

**May 2004**

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## ACKNOWLEDGMENTS

This Report is the product of the Long Island Sound Study partnership of Federal, state, local and private agencies and organizations. The diversity of the Comprehensive Conservation and Management Plan for Long Island Sound increases the difficulty and complexity in obtaining the information and data for this report. We wish to thank the states of Connecticut and New York for their invaluable assistance in compiling the data for the report and in coordinating their efforts with the many other state and local agencies and organizations participating in the Study.

## FOREWORD

**T**his 2003 report documents the 10th year of implementation of the Long Island Sound Study (LISS) Comprehensive Conservation and Management Plan (CCMP) for Long Island Sound (LIS). This Report summarizes the continuing work of the LISS Management Conference partners in carrying out the CCMP.

**T**he LISS Management Conference is sponsored by the U.S. Environmental Protection Agency (EPA), the New York State Department of Environmental Conservation (NYSDEC), and the state of Connecticut Department of Environmental Protection (CTDEP). Additional partners include:

- Interstate Environmental Commission (IEC);
- U.S. Department of the Interior Fish and Wildlife Service (USFWS);
- U.S. National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS);
- New York City Department of Environmental Protection (NYCDEP);
- U.S. Department of Agriculture Natural Resource Conservation Service (NRCS);
- New York State Department of State (NYS DOS);
- New York and Connecticut Sea Grant College programs;
- U.S. Army Corps of Engineers (ACOE);

- LISS Science & Technical Advisory Committee (STAC); and
- LISS Citizens Advisory Committee (CAC).

**M**any other federal, state, municipal, academic, and local public and private organizations contribute to implementation of the CCMP. Among these are the:

- U.S. Geological Survey (USGS);
- U.S. Department of Agriculture's Cooperative Extension Service;
- Connecticut Department of Agriculture Bureau of Aquaculture (CTDOA/BA);
- New York and Connecticut state Departments of Health;
- New England Interstate Water Pollution Control Commission;
- University of Connecticut (UConn); and
- State University of New York (SUNY).

**T**ogether, these Federal, state, local, academic, and citizen partners combine their efforts to achieve the common CCMP vision for the long-term health, restoration, and economic well-being of Long Island Sound, its watersheds and tributaries, and living marine and marine-dependent resources.

## ABOUT THE 2003 REPORT

This 2003 CCMP Implementation Tracking Report continues the simplified model first piloted in 2000. The report is organized into seven sections, each corresponding to the seven priority management areas identified in the CCMP:

- 1) Continuing the Management Conference;
- 2) Hypoxia;
- 3) Pathogen Contamination;
- 4) Toxic Substances;
- 5) Floatable Debris;
- 6) Management and Conservation of Living Resources and Their Habitats; and
- 7) Public Involvement and Education.

Each of these sections contains a brief narrative *Overview* that highlights accomplishments of the Management Conference in that area in calendar year 2003.

The *Overviews* describe the environmental results, trends or indicators of progress for the CCMP priority area. A new section added to the *Overviews* in 2003 is the *Long Island Sound 2003 Agreement* commitments. This section attempts to relate CCMP actions to real and measurable environmental progress. The program is striving to improve its environmental indicators and refine the relationships to management actions over time.

This report provides information in the 36 CCMP subcategories outlined in the Index to the report. As in prior reports, the charts following each narrative section correspond to the

appropriate table in the CCMP for each priority area.

The charts describe accomplishments and actions planned for next year. Appendix A-1 contains the entire set of 232 CCMP actions indexed to the detailed charts in the report.

### **An Annual Snapshot of Progress**

Because of the inherent long-term nature of initiating and assessing the results of environmental restoration and improvement efforts, this report should be viewed as a one-year snapshot of accomplishments against the 36 action areas identified in the CCMP.

### **Environmental Indicators**

The LISS has developed a set of 43 environmental indicators for Long Island Sound, with an ultimate goal of linking progress on the CCMP to actual environmental improvements in the Long Island Sound ecosystem. In this way, environmental results may be used in the future to assess the effectiveness of CCMP actions, and the Management Conference will be in a better position to consider and adjust CCMP plans, actions, and resources according to the environmental results desired or achieved. The LISS environmental indicators are accessible on the new LISS website at:  
<http://www.longislandsoundstudy.net>

## EXECUTIVE SUMMARY

Summer 2003 was the second consecutive summer with a widespread hypoxic event in western Long Island Sound. Coastal managers and scientists around the country continue to observe moderate to severe hypoxia in coastal waters and embayments from the Sound to the Gulf of Mexico. This condition seriously impairs our Nation's water quality and threatens the health of aquatic life. Again and again, nutrient over-enrichment is cited as a primary factor responsible for this phenomenon.

In 1994 the states of Connecticut and New York, EPA, environmental and coastal managers, scientists and researchers, academics, and citizens had studied this phenomenon, and agreed on a plan of action to reduce the discharge of the nutrient nitrogen to improve oxygen levels in Long Island Sound. As of this writing, implementation of the plan has reduced end-of-pipe nitrogen discharges to the Sound by more than 50,000 pounds per day from early 1990 levels. The states of Connecticut and New York have invested in upgrading the treatment of sewage to reduce the nitrogen from the more than 100 plants that discharge more than a billion gallons of effluent annually into the Sound.

However, like the problem of atmospheric ozone pollution, hypoxia is a result of a synergy of highly variable natural and anthropogenic conditions, the right combination of which may result in lower dissolved oxygen levels in the Sound. These variables include the hydrology of the Sound, its physical geography, as well as seasonal air and water temperatures, salinity levels, rainfall levels, wind speed and storm events, and even exposure to sunlight.

Long Island Sound managers are studying these variables using a powerful new tool to model and predict results under differing conditions — the System-wide Eutrophication Model (SWEM). This hydrodynamic model will help managers in analyzing myriad data — compressing for real-time decision-making what otherwise would require years of empirical observations to confirm. Using the model, Long Island Sound scientists and managers can better understand how these variables affect the Sound

and influence hypoxia. This tool will be used along with other data to reassess the nitrogen TMDL approved in 2001.

What other observations can we report for 2003 in Long Island Sound? The American lobster, *Homarus americanus*, which was struck in 2002 by a second round of mortalities and the disease calcinosis, continued a slow recovery in 2003. One encouraging trawl survey, conducted by the Connecticut Department of Environmental Protection in November 2003 off the Bridgeport coast netted a record of more than 150 healthy lobsters of varying sizes in one haul. Several research studies on the 1999 lobster mortalities concluded in 2003, suggesting multiple stressors contributed to the massive die-off. Other ongoing lobster research was presented at an August public forum in Bridgeport, sponsored by the New York and Connecticut Sea Grant programs, which are coordinating the lobster research effort.

The unexplained LIS tidal wetlands losses, first noted in 2001 by Connecticut and New York environmental managers, was the subject of a June 2003 regional conference funded by the Long Island Sound Study through the New York State Department of Environmental Conservation. Scientists and researchers from the New England region and around the country assembled at Stony Brook University to discuss this emerging problem and develop recommendations for management action. The proceedings are available on the new LISS website, <http://www.longislandsoundstudy.net>.

Due to a near record rainfall during the 2003 spring and summer, there were more beach closures overall in the Sound, accounting for a 2 percent loss of available beach days from Memorial Day to Labor Day on the Sound's 240 monitored beaches. Rainy weather normally requires local health departments to preemptively close beaches as a precaution against bacteria infiltration from nonpoint source pollution runoff or combined sewer overflows. Summer 2003 had the added impact of the August East Coast electrical power blackout, which affected backup systems at several sewage plants

resulting in untreated discharges that closed beaches for an additional 36 beach days.

The Long Island Sound partners, CTDEP, IEC, and NYCDEP, continued ambient monitoring for dissolved oxygen, salinity, temperature, chlorophyll a, visibility, and several other priority parameters at a modified set of fixed stations to more accurately target hypoxic areas. This monitoring observed the widespread hypoxia in the Western Sound in 2003, which was estimated to be an area extending 345 square miles for a period of sixty days. The seventeen-year hypoxia averages for maximum area and duration in the Western Sound are 207 square miles and 57 days. Continued monitoring will be needed to discern long-term trends in response to nitrogen reductions.

At the same time, the total point source nitrogen load to the Sound continued a 14 year declining trend through 2003. The total 2003 load from New York and Connecticut point sources is estimated at 159,969 lbs/day, a decrease of more than 50,500 lbs/day from the 1990s baseline. This decrease is attributed to the states' progress in bringing facilities online with improved nitrogen controls, to the general nitrogen discharge permits issued, and to the new nitrogen credit exchange program.

With 60 percent of the 10 year goal elapsed, the LISS is somewhat behind schedule in achieving its coastal habitat restoration goal of 2000 acres by 2008. Since 1998, 510 acres of coastal habitat, or 25 percent of the acreage goal have been restored. However, 60 miles of river corridor, or 60 percent of the linear goal, have been reopened to anadromous fish passage.

Of the nine LISS-funded research projects from 2000 and 2001, five have been completed and four are ongoing. Projects that were completed included studies of: the causes and extent of lobster morbidity and mortality; isotope tracers of nitrates in the Sound to help distinguish sources of pollution; metal contaminant concentrations in LIS sediments over time; bottom water and sediments at critical sites in LIS; effects of trace metals, organic carbon and inorganic nutrients in surface waters on phytoplankton growth. Projects that are ongoing include studies of: phytoplankton dynamics to determine shifts in primary productivity; water column oxygen production and consumption; new approaches for assessing mutagenic risk of contaminants in LIS; and status and productivity of

salt marsh breeding sparrows. Final reports will be submitted or published by the principal investigators as the projects conclude.

The Management Committee continued to meet in January, April, July and October, approving formalization of the Nonpoint Source work group, co-chaired by the Natural Resource Conservation Service and the US Geological Service, CT. The work group will explore identification of sources of nonpoint source nitrogen loads to the Sound and recommend strategies to control them. The Science and Technical Advisory Committee sponsored a workshop on the LIS hydrodynamic model to better understand its form, structure and methodologies for application to the Sound.

The Citizens Advisory Committee (CAC) continued to meet in March, June, September, and December 2003 and welcomed five new members: the *Westchester County Planning Department*; the *Regional Plan Association*; *Audubon Connecticut*, *Save the River/Save the Hills*; and the *Bartlett Arboretum and Gardens*. In March 2003, the CAC hosted Connecticut Attorney General Richard Blumenthal, who discussed his views on underwater cable crossings in Long Island Sound. The CAC continued to actively advocate for federal funds for the restoration and protection of the Sound.

The Long Island Sound Study launched a new and revamped world wide website in September 2003, using its name to simplify recognition: [www.longislandsoundstudy.net](http://www.longislandsoundstudy.net). The LISS issued a new version of its biennial report, *Sound Health 2003*, which updated Long Island Sound's key environmental indicators. More than 475,000 copies of the report were distributed through the Sunday editions of seven coastal newspapers, and the full suite of indicators is posted on the new website.

As this report stated last year, nearly 400 years after Adriaen Block's exploration, Long Island Sound is, and remains a complex, intensely-used modern urban estuarine ecosystem. Global, regional and local weather patterns, combined with hydro- and geophysical characteristics of the Sound and anthropogenic inputs can challenge our best management efforts. The Sound continues to require our attention to address ongoing problems and identify emerging issues that may affect its ability to remain an ecologically productive, economically important, and aesthetically pleasing public treasure.

## CONTINUING THE MANAGEMENT CONFERENCE

**Implementing the CCMP is the combined responsibility of the Management Conference partners. Through their ongoing programs and day-to-day program operations, and through federal, state, local, and private LIS funding initiatives and activities, CCMP priorities are assessed, implemented, and reported.**

**CCMP Strategy:** An essential element of the Long Island Sound Study strategy to implement the CCMP was to continue the Management Conference partnership in carrying out the plan to restore and protect the Sound. The states and EPA signed LIS Agreements in 1994, 1996, and 2003, formally committing EPA and the states to the Management Conference partnership as the primary means of implementing the CCMP. Most of the original thirteen CCMP actions in this section continue to be key to the viability of the LISS partnership. Federal legislation in 1990 created the EPA Long Island Sound Office to bridge the bi-state, multi-agency, public/private efforts to restore and protect the Sound. In 2000 Congress reauthorized the LISS through 2005 and increased its authorization of appropriations to \$40 million annually for CCMP implementation through passage of the Long Island Sound Restoration Act, Title IV of Public Law 106-457.

**LIS 2003 Agreement Goal:** *Support the LISS Management Conference partnership in communicating and coordinating action to restore and protect the Sound among federal, state, interstate, and local governments, educational institutions, private nonprofit organizations, the regulated community, and the public.* This section contains several continuing goals, including continuing federal and state support in building partnerships to implement the CCMP, and to support the Science and Technical Advisory Committee, the Citizens Advisory Committee and Long Island Sound Office.

### **2003 Highlights:**

- Congress appropriated \$6.56 million for the LISS in 2003. Under CWA §119 EPA included \$477,400 in its 2003 budget for the LISS; and EPA's National Estuary Program allocated \$510,000 under CWA §320 for LIS. Congress added \$2.022 million in the Environmental Programs and Management appropriation, and \$3.6 million in EPA's State and Tribal Assistance Grants (STAG) program. A Congressionally mandated rescission of funds of .65 percent was applied across all 2003 appropriations.
- The states used STAG appropriations of \$1.78 million each to assist distressed communities in Connecticut in developing plans to upgrade STPs for nitrogen control and in New York for CCMP implementation projects and to assist communities in LIS project planning.
- The Management Committee met in January, April, July, and October 2003. The Committee approved formalization of a new Nonpoint Source work group led by the NRCS to address issues of identifying sources of nonpoint source nitrogen loads to the Sound and identifying strategies to control them.
- The Science and Technical Advisory Committee sponsored a workshop on the LIS hydrodynamic model, or SWEM, to better understand its form, structure and methodologies and its potential for application to Long Island Sound. The STAC added several new members in 2003, rounding out its representation among scientists, managers, researchers and academics.
- The LISS Citizens Advisory Committee (CAC) continued to meet in March, June, September, and December 2003. The CAC welcomed the Westchester County Planning Department, the Regional Plan Association, Save the River/Save the Hills, Bartlett Arboretum and Gardens, and Audubon Connecticut as new members in 2003.

## SUMMARY OF CCMP MANAGEMENT ACTIONS: CONTINUING THE MANAGEMENT CONFERENCE

<b>M-1. SUPPORTING IMPLEMENTATION (CCMP TABLE 50, P. 141)</b>	
<b>Key Elements: The CCMP committed the LISS to formally extend the Management Conference to guide CCMP implementation, and to continue its Citizens Advisory Committee as an integral part of the conference. The plan also called for the EPA LISO to continue and expand its efforts to coordinate among Management Conference participants in support of CCMP implementation by providing funding and staffing, conducting education, outreach, monitoring, and data management, and ensuring consistency with other federal and state goals and policies.</b>	
<b>2003 Description</b>	<b>2004 Planned Action</b>
<p>1. EPA and Congress continued to provide Federal funding for the LISS in FY2003 under Clean Water Act Sections 119 and 320. The LISS program budget in 2003 was \$6.56 million after a Congressionally mandated rescission of funds of .65 percent. \$3.57 million of that amount was in EPA's State and Tribal Assistance Grants appropriation to support LIS CCMP implementation projects in New York and Connecticut, including assistance to distressed communities in Connecticut for STP upgrade planning.</p>	<p>The FY2004 President's Budget for EPA included \$477,400 for the LISO, with Congress earmarking an additional \$1.8 million and \$5.0 million in EPA appropriations for LIS. LIS NEP funds totaled \$510,000.</p>
<p>2. LISS partner agencies began the task of implementing the goals and objectives contained in the Long Island Sound 2003 Agreement. Several goals had action items with target dates in 2003.</p>	<p>Continue implementation of the Agreement.</p>
<p>3. The LISS continued to provide funds for state program coordination and involvement and for the LISS public outreach and education, habitat restoration, and NY NEMO programs. In 2003, the LISS again provided funding for two Long Island Sound Fellows to assist the research and scientific mission of the program through the Science and Technical Advisory Committee.</p>	<p>Continue support as funding allows.</p>
<p>4. The Management Committee met in January, April, July, and October. A new Nonpoint Source and Watershed Management work group was organized with a number of interested partners volunteering to participate under NRCS leadership. The Management Committee directed its work groups and teams to develop 2 year work plans for their area of responsibility for use in the planning, budgeting and priority setting</p>	<p>The Committee will continue to meet in 2004 to address issues of concern to LIS.</p>
<p>5. The Science and Technical Advisory Committee met in April and October 2003. The STAC sponsored a workshop on the LIS hydrodynamic model, SWEM, in October 2003 to better understand the model and its application to and use for Long Island Sound management decisions.</p>	<p>Continue STAC meetings in 2004.</p>
<p>6. The Citizens Advisory Committee continued to meet in March, June, September, and December 2003. The CAC continued to advocate for development of a LIS stewardship system; continued research funding; continued state efforts to implement the nitrogen TMDL and habitat restoration strategy; and increased emphasis on toxics reductions. The CAC continued to advocate support for Federal appropriations for the LISS and for continued NEP funding for LISS under CWA Section 320. The CAC added several new organizational members in 2003: the Regional Plan Association, Save the River/Save the Hills, Bartlett Arboretum and Gardens, the Westchester County Planning Department and Audubon Connecticut.</p>	<p>The CAC will continue to increase its representation and advocate for the full \$40 million appropriation for the LISS.</p>
<p>7. The EPA LISO continued to coordinate the efforts of the Management and Citizens Advisory Committees, and the Science and Technical Advisory Committee. The LISO continued to support implementation efforts of LISS work groups, including the Nutrients Work Group, the Connecticut River Team, Habitat Restoration Team, Implementation Team, and Dredging EIS Work Group. A new Nonpoint Source Work Group was established with NRCS as chair. The LISO continued coordination of the management conference, development of the annual budget and work plan, the LISS research agenda and RFP.</p>	<p>The LISO will continue to support implementation of the CCMP and the Management Conference partners.</p>

## ELIMINATING ADVERSE IMPACTS OF LOW DISSOLVED OXYGEN IN THE SOUND

The CCMP identified low dissolved oxygen (hypoxia) as the most significant water quality problem in LIS affecting critical life cycles of living marine resources. Since 1990, EPA and the states of Connecticut and New York have implemented a phased program to reduce human-caused nitrogen loads to LIS and improve dissolved oxygen levels to meet water quality standards.

**CCMP Strategy:** The CCMP identifies a five-part strategy to address the elimination of adverse impacts of low dissolved oxygen on the aquatic habitat and living marine resources of the Sound by: 1) reducing nitrogen from sewage treatment plants (STPs) and other point sources; 2) reducing nitrogen loads from nonpoint sources; 3) continuing the management of hypoxia; 4) funding implementation of hypoxia management plans; and 5) monitoring and assessing hypoxic conditions in the Sound.

**LIS 2003 Agreement Goal:** *Eliminate the adverse impacts of hypoxia resulting from human activities.* There is one 2003 action item in this section: 1) by 2003, establish Phase IV nitrogen reduction agreements to address atmospheric deposition and watershed management for portions of the Long Island Sound watershed outside of New York and Connecticut. While the LISS is making good progress in reducing point source nitrogen loads to the Sound from Connecticut and New York sources, formal agreements with upland states have not yet been established. The LISS, through the Connecticut River work group, is proceeding to identify and validate sources of nitrogen from upland states as an antecedent to the development of such agreements.

**Environmental Indicators/Results/Trends:** Summer 2003 was another challenging year for hypoxia in Long Island Sound. While total point source nitrogen loads continue to decline (see Figure 2), a 10-year declining trend for end-of-pipe nitrogen discharge was interrupted with an increase both in CT & NY for 2003. This increase was attributed primarily to the cooler wetter summer experienced in the watershed during 2003 increasing STP influent/effluent flow and inhibiting (bacterial) biologic nutrient removal. The maximum area of hypoxia of less than 3.0 mg/l was the largest area recorded since 1994, covering an estimated 345 square miles at peak, and lasting sixty days (see Figures 3 & 4). Regional weather conditions, combined with the unique hydrology of the Sound may have set up ideal conditions for hypoxia. Winter 2003 was especially cold, promoting a strong thermocline, a condition conducive to hypoxia (see Figure 1).

### **2003 Highlights:**

- The estimated nitrogen load from STPs in the LIS drainage basin in 2003 is approximately 159,969 lbs/day, a decrease of more than 52,973 lbs/day from base levels. As of December 2003, New York's 2003 end-of-pipe point source nitrogen load was 120,067 lbs/day, compared with 106,481 lbs/day in 2002. As of December 2003, Connecticut's 2003 end-of-pipe point source nitrogen loading was 39,902 lbs/day compared with 38,722 lbs/day in 2002. Figure 2 shows the total point source nitrogen load and trends since 1990.
- In 2003, the maximum area and duration of dissolved oxygen (DO) levels less than 3 mg/l observed in LIS was 345 mi<sup>2</sup> and 60 days. The 17 year averages are 205 mi<sup>2</sup> and 57 days. Figure 1 shows the August 2003 hypoxic area map and Figures 3 and 4 show the areal extent and duration of hypoxia in LIS since 1987.
- Connecticut completed the first year of its Nitrogen Credit Exchange program. Forty-one of 79 participating STPs reduced nitrogen output below assigned permit limits, making them eligible to sell a total of \$2.76 million in

nitrogen credits. In August 2003 the state was required to purchase the excess credits generated in 2002 from the towns with approximately \$1.44 million from its Clean Water Fund (CWF).

- The states of Connecticut, Massachusetts, Vermont, and New Hampshire, along with NEIWPCC and EPA held discussions on the need to reduce nitrogen loading from the

Connecticut River watershed to Long Island Sound. At the recommendation of the Connecticut River work group, a 3-year nitrogen monitoring program was implemented for the Connecticut River watershed in order to identify sources and quantify loads of nitrogen from the upland states. The results of the first year of the monitoring program were analyzed and documented in a formal report.

Figure 1

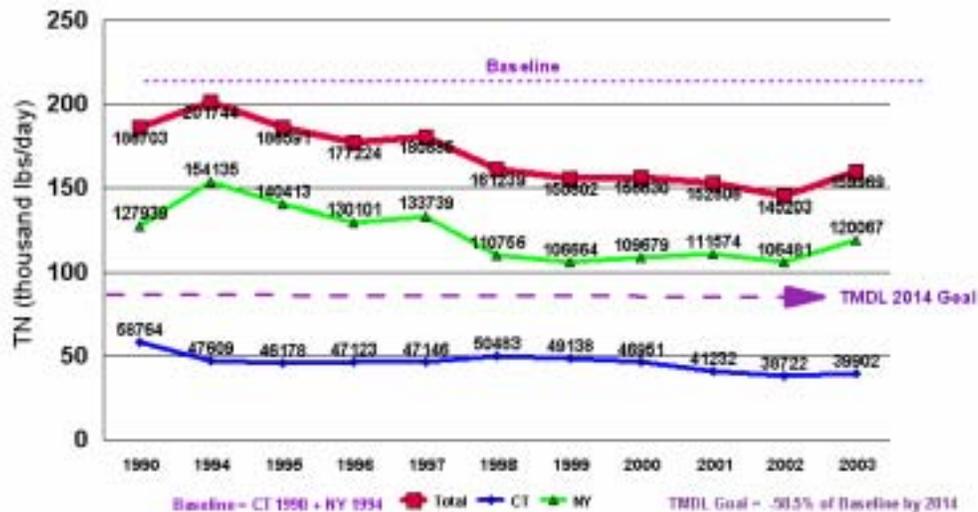
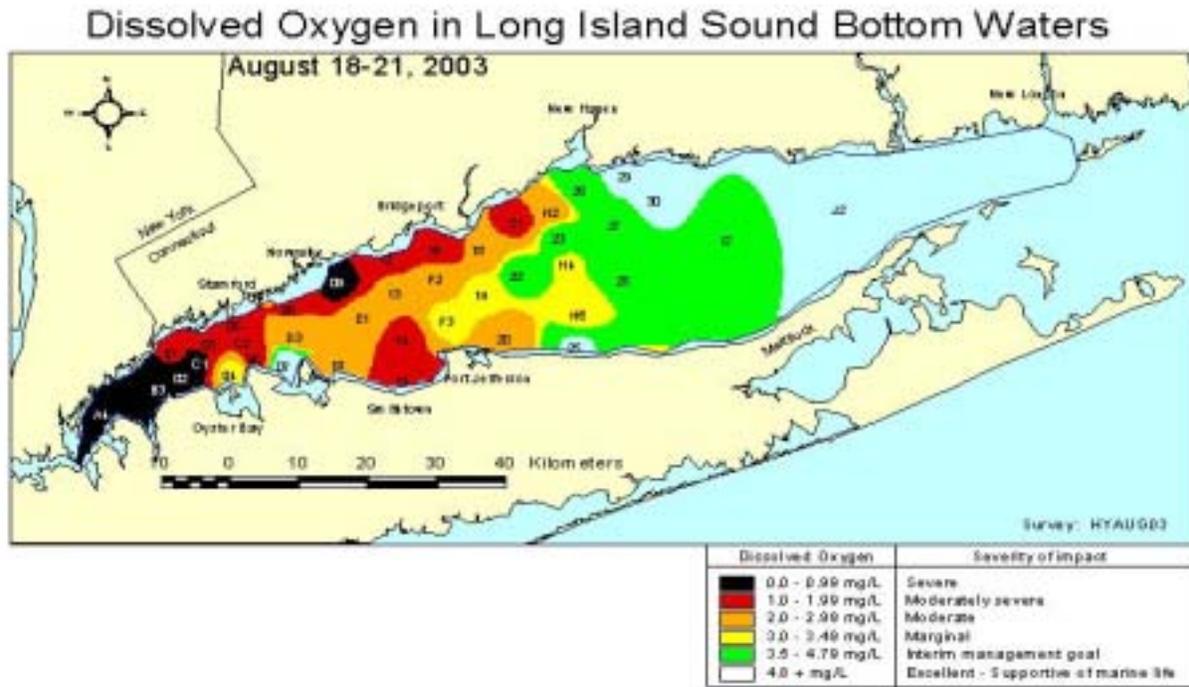
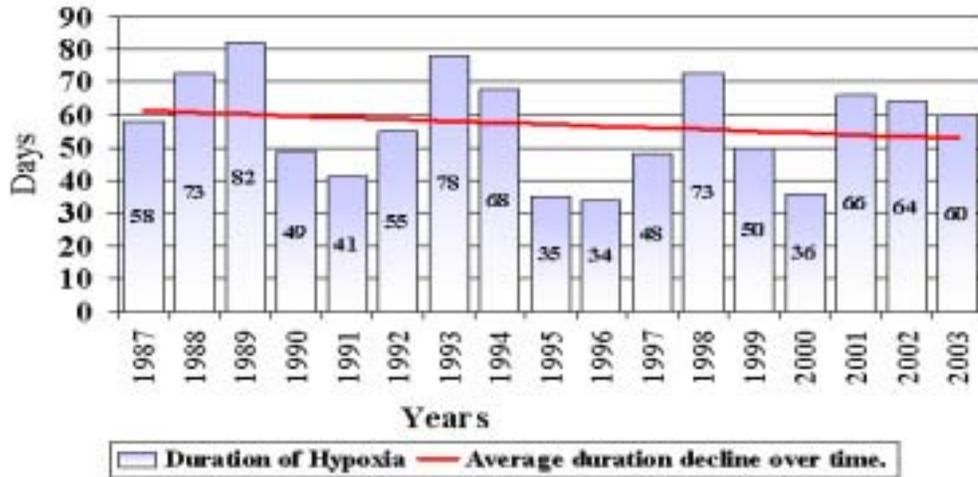


Figure 2

Figure 3

### Duration of Hypoxia 1987 - 2003

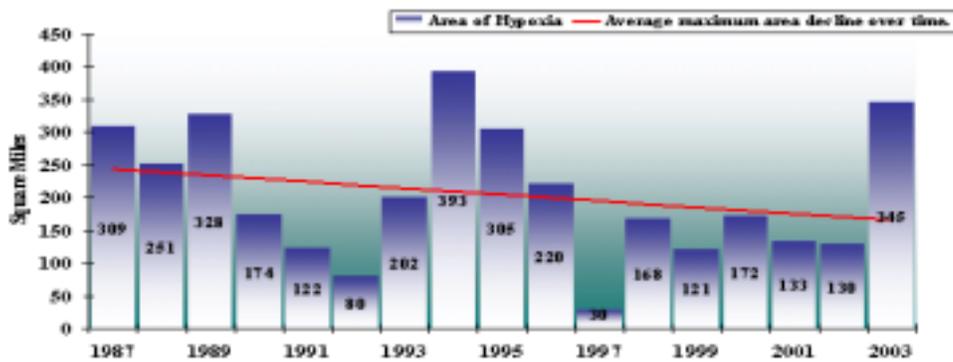


CT DEP LIS Water Quality Monitoring Program

Hypoxia = <3mg/L DO

Figure 4

### Maximum Area of Hypoxia\* in Long Island Sound 1987 - 2003



The red trend line indicates average area decline over time.

CT DEP LIS Water Quality Monitoring Program

\*Hypoxia = <3mg/L DO

## SUMMARY OF CCMP MANAGEMENT ACTIONS: HYPOXIA

### H-1. REDUCING NITROGEN FROM SEWAGE TREATMENT PLANTS AND OTHER POINT SOURCES (CCMP TABLE 4, P. 32)

**Key Elements:** The states of Connecticut and New York committed to reducing nitrogen loads in their portions of the Long Island Sound basin using a mixed approach of retrofits, pilot studies and upgrades under existing permitting authorities. With adoption of the TMDL, state requirements to remove nitrogen loads has been formalized and expanded well beyond the commitments specified in the CCMP. Prior to TMDL adoption in April 2001, the states had used a variety of legal, voluntary, and funding mechanisms to promote nitrogen removal from point sources, with considerable success.

2003 Description		2004 Planned Action
1.	The total estimated point source (end of pipe) nitrogen load to LIS in 2003 was 159,969 lbs/day, a decrease of more than 52,930 lbs/day from base levels. New York loads totaled 120,067 lbs/day compared with 106,481 lbs/day in 2002; Connecticut loads totaled 39,902 lbs/day compared with 38,722 lbs/day in 2002. The total reduction as of December 2003 was 25.1 percent below baseline levels and represents 47 percent of the total nitrogen reduction goal of 58.5 percent by 2014.	Continued emphasis on achieving TMDL point source nitrogen reduction targets.
2.	In Connecticut as of December 2003, 30 municipal sewage treatment plants have completed upgrades including nitrogen removal at a cost of more than \$340 million. Three STPs completed upgrades in 2003 - Fairfield, Branford, and Windsor Locks. Five municipal STPs currently have initiated more than \$118 million of upgrades including nitrogen removal — Bridgeport East and West; Bristol, Enfield & Litchfield, and Stamford all under construction in 2003. Five municipal STPs have begun designs for upgrades including nutrient removal at costs totaling over \$55 million — Bristol; Cheshire; Groton; North Haven; and Simsbury. [See Appendices B and C for complete lists of CT and NY 2003 nitrogen load by discharger.]	Continue to assist municipalities with upgrades to STPs.
3.	New York City continued its program for Advanced Wastewater Treatment Management Assistance to provide design and operational guidance for the on-going Step Feed BNR upgrades.	Continue program in 2004
4.	On April 22, 2002, the NYSDEC and NYCDEP entered into a consent order to require NYCDEP to design, construct and operate BNR facilities to comply with the Long Island Sound TMDL for nitrogen. The Consent Order also requires NYC to achieve secondary treatment at Newtown Creek by the end of 2007, instead of 2010. To date, NYCDEP has submitted the <i>Applied Research Summary Report</i> and the <i>BNR Facility Plan</i> in compliance with the order. New York City has commenced construction at two of its Upper East River Water Pollution Control Plants (WPCPs) and will begin construction at the remaining two plants in the near future, which will lead to the attainment of the 5-year nitrogen reduction targets associated with the TMDL in 2009. New York City received \$34.1M in Clean Water/Clean Air Bond Act grants for the upgrade of its Upper East River plants.	Continue construction

2003 Description	2004 Planned Action
<p>5. NYSDEC has modified the 14 SPDES permits for the Water Pollution Control Plants (WPCPs) in New York City as of April 2003. The six facilities that discharge to the East River have effluent permit limits consistent with the Long Island Sound TMDL for nitrogen. All 14 permits are now in hearing, having been challenged by NYCDEP. The twelve State Pollutant Discharge Elimination Systems (SPDES) permits for the Wastewater Treatment Plants on the north shore of Long Island that discharge into Long Island Sound have been modified to reduce discharge limits for nitrogen in accordance with the Long Island Sound Total Maximum Daily Load (TMDL) analysis. The discharge limits are consistent with the 5, 10, and 15 year waste load allocations that are specified in the Zone 10 and Zone 11 Nitrogen Management Plans. Treatment plants affected are:</p> <ul style="list-style-type: none"> <li>• Belgrave WPCD;</li> <li>• City of Glen Cove WTP;</li> <li>• Village of Great Neck WPCP; (hearing requested)</li> <li>• Great Neck WPCD; (hearing requested)</li> <li>• Village of Greenport WWTP;</li> <li>• Town of Huntington STP;</li> <li>• Village of Northport STP;</li> <li>• Oyster Bay WPCP;</li> <li>• Port Washington WPCD; (hearing requested)</li> <li>• Suffolk County Sewer District #1 Port Jefferson STP;</li> <li>• Suffolk County Sewer District #6 Kings Park STP; and</li> <li>• Suffolk County Sewer District #21 SUNY at Stony Brook.</li> </ul> <p>The SPDES permits for the four WPCPs in Westchester County were modified in 2003. The draft permits have permit limits consistent with the Long Island Sound TMDL for nitrogen.</p>	<p>The permittees will be required to develop a compliance schedule to identify the methods, operations, and/or facilities necessary to achieve compliance with the adjusted limits.</p> <p>The permittees will meet with NYSDEC to address their ability to meet the August 2004 limits in a Consent Order prior to issuance of the final permits.</p>
<p>6. In 2003, the Village of Northport and the Town of Hempstead received \$2,051,350 and \$3.3 million respectively of Clean Water State Revolving Funds for expansion and upgrade of the Village's wastewater treatment facility and for the Town's improvements to the Belgrave WPCD WWTP. The Village began construction to upgrade its STP and reduce nitrogen discharge levels to Northport Harbor.</p>	<p>The projects are scheduled to be completed in December and November 2004 respectively.</p>
<p>7. Nitrogen removal and facility improvements have been completed at the Glen Cove STP. The new system went online during 2003. The project was funded by two NYS Bond Act grants for a total of \$3,378,750.</p>	<p>Project complete.</p>
<p>8. The 2001 <i>Act Concerning Nitrogen Reduction in Long Island Sound</i> gives CTDEP authority to establish a General Permit for Nitrogen Discharges and set up a Nitrogen Credit Exchange Program. The General Permit was implemented in 2002 and the first year of data was collected from the 79 participating STPs and the price of a credit was set at \$1.65. The first year of the Nitrogen Credit Exchange program was considered a big success and in 2003 forty-one of the 79 participating STPs reduced nitrogen output below their assigned permit limits, making them eligible to sell a total of \$2.76 million in nitrogen credits. CTDEP held a public event on October 24, 2003 to celebrate the first year's success.</p>	<p>Continue the Nitrogen Credit Exchange program and Nitrogen General Permit.</p>

**H-2. REDUCING NITROGEN LOADS FROM NONPOINT SOURCES (CCMP TABLE 5, P.34)**

**Key Elements:** The states of Connecticut and New York have broad authorities to manage nonpoint sources of pollution and have agreed in the CCMP to emphasize control of nitrogen in ongoing state and federal programs. These include state nonpoint source programs (CWA §319), the coastal nonpoint source control program (CZARA §6217), and stormwater permitting programs. Most of the site specific studies and activities identified in the CCMP have been completed. The states have committed to using nonpoint source control programs to begin reducing nonpoint sources of nitrogen and anticipate continuing those efforts as the primary means to meet the reduction goal specified in the TMDL.

	2003 Description	2004 Planned Action
1.	Currently CTDEP is implementing 104 active §319 projects from FY99-2002 grants. Thirty-five new projects were funded under §319 in 2003 totaling \$2,642,613 including match, and 15 projects were closed out in 2003 totaling \$667,625 in §319 funds.	Continue to emphasize LIS nitrogen control in the §319 grant process.
2.	<p>New York State proposed a General Permit for Small Municipal Separate Storm Sewer Systems (MS4s) in January 2003. Localities needed to file Notice of Intent by March 2003 to be covered under the permit. A number of NPS projects are underway or were completed in 2003 as follows:</p> <ul style="list-style-type: none"> <li>• Village of Huntington: \$321,751 and \$237,038 to install 59 and 53 stormwater leaching basins in two different areas to reduce the pollutants carried to Huntington Bay and improve the water quality.</li> <li>• Village of Nissequague: \$115,000: Install 60 catch basins and leaching basins to contain stormwater and improve water quality in Story Brook Harbor. Completed.</li> <li>• Town of Brookhaven: \$90,000 to install at least 30 leaching basins along Lower Rocky Point Road, Gully Landing Road and side streets to reduce the volume and improve the quality of stormwater runoff entering LIS form these areas. In progress.</li> <li>• City of New York: \$850,000: to restore 1.5 acres of salt marsh and 0.75 acres of upland buffer on Pugsley Creek. This will reduce pollutants from runoff.</li> <li>• City of New York Economic Development: \$4,321,250: to construct and restore nearly 33 acres of freshwater/brackish water wetlands, adjacent floodplain and upland on the abandoned Flushing Airport. The project will provide stormwater filtration and treatment of pollutants.</li> <li>• City of Rye: \$1,615,150: will restore approximately 1.9 acres of wetlands at the Rye Nursery site. This will enhance water quality.</li> </ul>	
3.	<p>Following NYS Environmental Protection Funds were awarded in 2003:</p> <ul style="list-style-type: none"> <li>• Town of North Hempstead: \$18,000 for the Manhasset Bay Protection Committee to continue to implement the Manhasset Bay Water Quality Improvement Plan through water quality monitoring and stream-bank erosion control.</li> <li>• Town of Oyster Bay: \$25,000 to partner with the Friends of the Bay to prepare a Mill River Watershed Study.</li> <li>• Hempstead Harbor Protection Committee: \$37,500 to complete an EPA Phase II Stormwater Regulations Intermunicipal Compliance plan for Hempstead Harbor.</li> <li>• City of Glen Cove: \$140,000 to plan and design sanitary sewers and stormwater collection system infrastructure to support the redevelopment of approximately 800,000 square feet of proposed development along the north side of Glen Cove Creek.</li> </ul>	
4.	The City of Rye and the Village of Mamaroneck have enacted laws to end the most flagrant cases of huge houses being built on small lots throughout the municipalities. These laws were developed in response to rising housing costs that created an incentive for builders to buy modest homes, demolish them and build large luxury houses, dubbed "McMansions." The new laws are expected to prevent increases in the amount of impervious surfaces on land parcels.	The Rye City law contains a mandatory review after two years to determine if the new rules are working as planned.

2003 Description	2004 Planned Action
5. In the Town of Huntington, NY, a stormwater runoff mitigation project for Centerport Harbor is in the design phase. Also, in the Town of Huntington, the design phase for a stormwater mitigation project for Fleets Cove/Knollwood Beach has been completed.	Construction of both projects should start in 2004.
6. In the Village of Huntington Bay, NY, a stormwater control project was completed for the Wincoma Drainage area. The project consisted of installing 55 stormwater leaching basins to collect and dispose of one inch of the first flush stormwater runoff from 8,959 linear feet of roadways tributary to Huntington Harbor, and the nearby tidal wetland area. Also in the Village of Huntington Bay, stormwater control projects for the Bay Crest Willow Pond Drainage Basin and the Bay Hills Drainage Basin area are in the design phase.	
7. The Village of Laurel Hollow, NY has completed design for a water quality improvement project at Laurel Hollow Bathing Beach. The project will trap first flush contaminants through installation of catch basins and sediment traps. Filtration of organic matter and fertilizer will occur in construction wetland cells. A discharge pipe will be extended offshore to allow for restoration of a bathing beach.	
8. New York's Governor has asked the Governors from Maine to Maryland to join together in a regional strategy to reduce emissions from power plants, which will reduce pollutants from rainfall. The initiative would involve developing a regional market-based emissions trading system to require power generators to reduce emissions. Governors of nine northeast states have expressed an interest to join New York State in a regional strategy to reduce emissions from power plants.	
9. The Nassau County Department of Public Works completed the design for a stormwater treatment project at the County outfall at Glen Cove Marina.	
10. The Village of Northport, NY, has completed design for a network of catch basins and leaching pools to mitigate stormwater runoff from Main Street and improve shellfishing and contact recreation in Northport Harbor.	Construction will begin during 2004.
11. Westchester County, SUNY Purchase, and nine local municipalities are starting to use electric cars designed to save energy and curb pollution. DaimlerChrysler, in partnership with the New York Power Authority, has donated 300 zero-emission vehicles to government agencies, public parks, state colleges and nonprofit organizations. The cars will reduce emissions of hydrocarbons, carbon monoxide, carbon dioxide and other gases, including NOx "by thousands of pounds" on SUNY campuses and save more than 15,000 gallons of gas a year.	
12. New York State has started a program to retrofit school buses with new equipment to reduce harmful emissions, including NOx. The New York State Clean Air School Bus Program, administered by the New York State Energy Research and Development Authority, will retrofit 2,194 school buses across the State with advanced emission-reducing equipment. New York is the first state in the country to fund such a program.	
13. In the Thames River basin, water-quality sampling in the Quinebaug River and its tributaries in eastern Connecticut demonstrated a consistent and pervasive pattern of nutrient enrichment during water years 2000 and 2001. A final USGS Report- <i>Nutrient Enrichment, Phytoplankton Algal Growth and Estimated Rates of Stream Metabolism in the Quinebaug River Basin, Connecticut, 2000-2001</i> was submitted to CTDEP as part of a Clean Water Act Section 319-funded project. This report generated consensus for additional need of targeted water-quality sampling and analysis for the West Thompson Reservoir on the Quinebaug River in Thompson. That two-year USGS investigation began in 2003 and a final report to CTDEP is expected in early 2005.	
15. In March 2003, the Westchester County Department of Planning, along with 11 municipalities, under the auspices of Watershed Advisory Committee 7, began developing a watershed management plan to control polluted stormwater in the Bronx River and Grassy Sprain watersheds. The plan will recommend actions to control nonpoint source pollution via municipal ordinances and comprehensive plans, streams and wetlands, stormwater management practices, and outreach and education. Information on the County's LIS watershed efforts may be found on their web page at: <a href="http://www.westchestergov.com/planning">http://www.westchestergov.com/planning</a> .	The plan is tentatively scheduled to be completed in 2005

2003 Description		2004 Planned Action
16.	The states of Connecticut, Massachusetts, Vermont, and New Hampshire, along with NEIWPCC and EPA met several times to discuss the need for reduced nitrogen loading from the Connecticut River Watershed to Long Island Sound. Information on the workgroup's efforts may be found on the project web page at: <a href="http://www.neiwpcc.org/ctrivernitrogenproject.htm">http://www.neiwpcc.org/ctrivernitrogenproject.htm</a> .	The Connecticut River work group will continue to meet to discuss options for reducing nitrogen loading from upland states
17.	NEIWPCC coordinated the development, implementation and completion of the first year of a 3-year nitrogen monitoring program for the portion of the Connecticut River Watershed draining the upland states. The monitoring program, funded by the LISS, is identifying sources of nitrogen and quantifying nitrogen loads from the upland states. NEIWPCC analyzed and documented the results of the first year of the monitoring program in a formal report to the LISS under its grant. Nitrogen loading estimates for the Connecticut River Watershed were obtained from the New England SPARROW Model, which was developed with partial support from the LISS, as well as from other NPS models.	Complete year 2 of nitrogen monitoring program in Connecticut River Watershed and document results in a data report.

### H-3. CONTINUING MANAGEMENT OF HYPOXIA (CCMP TABLE 6, P. 39)

**Key Elements:** The actions specified in the CCMP primarily reference research, monitoring and modeling activities and the use of that information and those tools to improve understanding and management of hypoxia in the Sound. Much progress has been made in this area to provide the scientific basis for the TMDL and the TMDL specifies the implementation steps recommended in the CCMP to control hypoxia. Finally, the action to continue appropriate modeling and research and periodically review management plans is central to the adaptive management approach promoted in the TMDL.

2003 Description		2004 Planned Action
1.	The states of New York and Connecticut continued to implement the LIS nitrogen TMDL through a comprehensive adaptive management strategy to reduce nitrogen loads, assess effects and improve estimates of loading.	Continue implementation of the TMDL through the General Permit program and Nitrogen Credit Exchange program in Connecticut.
2.	The LISS Nutrient Workgroup, in cooperation with the NY/NJ Harbor Estuary Program, began applying SWEM to LIS scenarios. In 2003, various projection scenarios were analyzed by the model to forecast future water quality conditions for various management actions. A series of model runs was also initiated to develop an updated water quality response matrix to facilitate the watershed trading program.	Continue to apply the SWEM to analyze hypoxia and eutrophication in the Sound.
3.	In 2003, work was completed on LISS-funded research projects: <ul style="list-style-type: none"> <li>• <i>Isotope Tracers of Nitrogen in Western LIS</i>. PI: Dr. Fairbanks, Columbia U.;</li> <li>• <i>Environmental Change in Long Island Sound Over the Last 400 Years</i>, (Dr. Johan Varekamp, PI) [\$75,909]</li> </ul> In 2003, work continued on the following LISS-funded research projects: <ul style="list-style-type: none"> <li>• <i>Phytoplankton Dynamics in LIS</i>: (Dr. J.E. Ward, UCONN, PI) [\$157,360]</li> <li>• <i>Water Column Oxygen Production and Consumption</i>; (Dr. James Kremer, PI) [\$188,433]</li> </ul>	These projects have been completed and final reports submitted.  Final report due April 2005. Final report due October 2004.
4.	UCONN and Manhattan College sponsored a BNR workshop on <i>Inhibition of Biological Nitrogen Removal Processes</i> on February 3, 2003 at the UCONN Stamford campus. The workshop presented solutions to inhibition problems at wastewater treatment plants that are or will be removing nitrogen. The workshop was attended by nearly 100 treatment plant operators.	Project Complete.

2003 Description		2004 Planned Action
5.	<p>The 2003 Long Island Sound Study Research Request for Proposals identified research on the processes leading to the eutrophication of Long Island Sound as a priority. Three research projects that focused on this topic were selected for funding by the EPA-Long Island Sound Study, Connecticut Sea Grant, and New York Sea Grant partnership:</p> <ul style="list-style-type: none"> <li>• <i>A Biological-Physical Numerical Simulation Model For The Investigation, Prediction &amp; Management Of Oxygen Production &amp; Consumption In Long Island Sound: Data Analysis And Model Formulation.</i> PI: Dr. W. Frank Bohlen, UCONN.</li> <li>• <i>Natural Isotopic Tracers for Anthropogenic Nitrogen in Long Island Sound.</i> PIs: Dr. Mark Altabet, UMASS, and Dr. Johan Varekamp, Wesleyan University.</li> <li>• <i>Assessment Of The Effects Of Bottom Water Temperature &amp; Chemical Conditions, Sediment Temperature, Sedimentary Organic Matter (Type &amp; Amount) On Release Of Sulfide &amp; Ammonia From Sediments In Long Island Sound: A Laboratory Study.</i> PI: Dr. Carmela Cuomo, University of New Haven.</li> </ul>	Continue to fund research to improve the understanding and management of hypoxia in the Sound.
6.	EPA awarded a grant to CTDEP, one of only 10 projects selected nationally, for piloting its water quality trading program. The \$85,000 grant will evaluate the success of the trading program in Connecticut during its first two years in operation.	

#### H-4. FUNDING TO IMPLEMENT HYPOXIA MANAGEMENT PLANS (CCMP TABLE 7, P. 41)

**Key Elements:** The CCMP envisioned fully-funded nonpoint source (CWA §319 and CZARA §6217) programs, federal and state funding of state revolving fund programs, and appropriation of additional federal funds for management, emphasizing the Phase III management efforts incorporated in the TMDL.

2003 Description		2004 Planned Action
1.	In 2003 the Connecticut Bond Commission awarded an additional \$1.26 million CT Clean Water Fund (CWF) monies to Branford along with the eleven additional STP design and construction projects to be completed over the next three years. More than \$36 million of CWF financing was committed to these projects.	
2.	In 2003, New York committed \$83 million from the Clean Air/Clean Water Bond Act for LIS projects, a significant portion of which is for STP upgrades.	Obligations under the Bond Act for Long Island Sound have been completed.

**H-5. MONITORING AND ASSESSMENT OF HYPOXIA (CCMP TABLE 8, P. 4)**

**Key Elements:** The importance of continuing and expanding monitoring efforts to answer fundamental questions on the health of LIS and to identify trends and changes that may be related to management activities were recognized in the CCMP. Most of the recommended monitoring was to be directed towards oxygen and nutrients because of the hypoxia problem in LIS. In addition, several specific monitoring/research projects were listed, most of which were completed shortly after the CCMP was released. Lobsters were identified for special attention because of disease problems that pre-dated the 1999 lobster die-off in Western LIS.

	2003 Description	2004 Planned Action
1.	In Summer 2003, hypoxic conditions (<3mg/l DO) in LIS were estimated to have extended for a period of 60 days and covered a maximum area of 345 square miles compared to the 17 year averages of 57 days and 205 square miles.	Continue CTDEP ambient monitoring of LIS.
2.	<p>The LISS partners continued ambient monitoring of LIS in 2003:</p> <p>CTDEP continued its ambient monitoring of LIS stations in 2003. CTDEP expanded its scope of monitoring parameters to support the changing ecosystem perspective. CTDEP modified its summer sampling strategy. Currently, 17 stations are monitored on a monthly basis, year-round and 25-30 stations are added for bi-weekly hypoxia monitoring from June through September. Maps and summaries are available on the CTDEP website at: <a href="http://dep.state.ct.us/wtr/lis/monitoring/lis_page.htm">http://dep.state.ct.us/wtr/lis/monitoring/lis_page.htm</a>.</p> <p>NYCDEP performed ambient monitoring of NY waters in Western LIS.</p> <p>IEC continued its summer hypoxia monitoring in LIS by collection and weekly measurements of DO, temperature, salinity, chlorophyll a at 21 stations, and at a subset of stations, samples were collected for phytoplankton and Pfiesteria in 2003. IEC made weekly data transmissions to LISO, CTDEP, NYCDEP, NYSDEC, CSHH and HydroQual. The IEC Annual Report, released each year on January 24, details all monitoring activities. All IEC data are entered into the EPA database, STORET.</p>	Continue the ambient monitoring program.
3.	CTDEP and NYSDEC continued participation in EPA's National Coastal Assessment in 2003. In addition to standard water quality parameters, sediment samples were collected once from one-half of the number of fixed (sampling point) stations in LIS. As part of CT's sampling plan for NCA, phytoplankton and zooplankton identification projects are being conducted.	In Summer 2004 CT and NY will continue to participate in the National Coastal Assessment by recording water quality parameters and collect sediment samples from the other half of the fixed (sampling point) stations
4.	The UCONN Department of Marine Sciences at Avery Point, Connecticut, continued to operate and maintain a real-time water quality monitoring network, MYSound through a LISS grant in 2003. The MYSound stations monitor surface and bottom waters for dissolved oxygen, temperature, salinity and selected other parameters at five specific sites. The MYSound website address is: <a href="http://www.mysound.uconn.edu">http://www.mysound.uconn.edu</a> . EPA's technology transfer handbook presenting MYSound as a case study may be ordered from EPA's website, <a href="http://www.epa.gov/ttbnrmrl">http://www.epa.gov/ttbnrmrl</a> .	The Management Committee approved LISS funding to continue operation of the fixed monitoring stations through 2004.
5.	<p>The 2003 Long Island Sound Study Research RFP identified research on the processes leading to the eutrophication of Long Island Sound as a priority. The following project, which will investigate the effect that hypoxia has on lobsters, was selected for funding by the EPA-Long Island Sound Study, Connecticut Sea Grant, and New York Sea Grant partnership:</p> <ul style="list-style-type: none"> <li><i>Temporal And Spatial Changes in Copper Speciation and Toxic Metal Concentrations in Long Island Sound: Effect Of Changes in Water Temperature and Dissolved Oxygen Levels.</i> PI: Dr. Sergio Sañudo-Wilhelmy, Stony Brook University.</li> </ul>	Continue to fund research to improve the understanding and management of hypoxia in the Sound.
6.	In response to EPA's November 2000 revised DO standards for saltwater in the Virginian Province (Cape Cod to Cape Hatteras), NYSDEC is preparing a rulemaking (triennial review) that would include revised standards for dissolved oxygen in marine waters, as well as new standards for ammonia for marine waters, additional standards for human health protection, and other changes. The proposed rule must be reviewed by the state's Governor's Office of Regulatory Reform before release to public notice as a formal proposed rulemaking.	NYSDEC anticipates release for public notice by late 2004 or early 2005, with any formal adoption following in 9-12 months

## CONTROLLING MAJOR SOURCES OF PATHOGENS

**Pathogens can cause illness in people exposed through bathing in, or consuming fish or shellfish from contaminated waters. Pathogen contamination results in closed beaches, fisheries, or shellfish areas, hurting local economies and damaging public perception of the ecological health of the Sound.**

**Overall CCMP Strategy:** As sources of pathogens come under better control, ambient water conditions improve and human and environmental exposures lessen. The CCMP identifies a seven part strategy to control pathogen contamination to LIS from: 1) combined sewer overflows (CSOs); 2) nonpoint sources (NPS); 3) sewage treatment plants (STPs); 4) vessel discharges; and 5) individual on-site systems/discharges. The final two elements of the strategy are to control pathogen contamination through: 6) public education; and 7) monitoring and assessment. As the public becomes educated concerning the impact of personal behaviors on the environment, i.e., improper disposal of pet wastes, inappropriate feeding of wildlife, access to boat pumpouts, changes in such behaviors may benefit the Sound.

**LIS 2003 Agreement Goal:** *Increase the area for shellfish harvesting and eliminate bathing beach closures while maintaining protection of human health.* There is one 2003 action item under this goal: 1) by 2003, nominate vessel no-discharge areas for the Pawcatuck and Mystic Rivers in Connecticut and for all the Long Island Sound embayments in New York. EPA approved Connecticut's request for No Discharge Designation of the Stonington/Pawcatuck River area in 2003. EPA action on the Stonington/Mystic River area designation is pending, and no action has been taken on New York designations as of this writing. After more than three years of chronic closure due to pathogen contamination, Harbor Island Park in Westchester County' was reopened for swimming in June 2003.

**Environmental Indicators/Results/Trends:** Current LIS environmental indicators for pathogens include the number of beach closure days and number of vessel pumpout stations. There were 604 LIS beach closure days reported in 2003 in Connecticut (224) and New York (380), approximately 2 percent of the total beach days. Most closures are due to rainfall levels that require presumptive action by local health departments to close beaches. In New York, 192 closure days were attributable to system failures and 36 closure days were attributable to the August regional power blackout. The number of vessel pumpout stations in NY and CT has increased from 43 in 1995 to 142 in 2003.

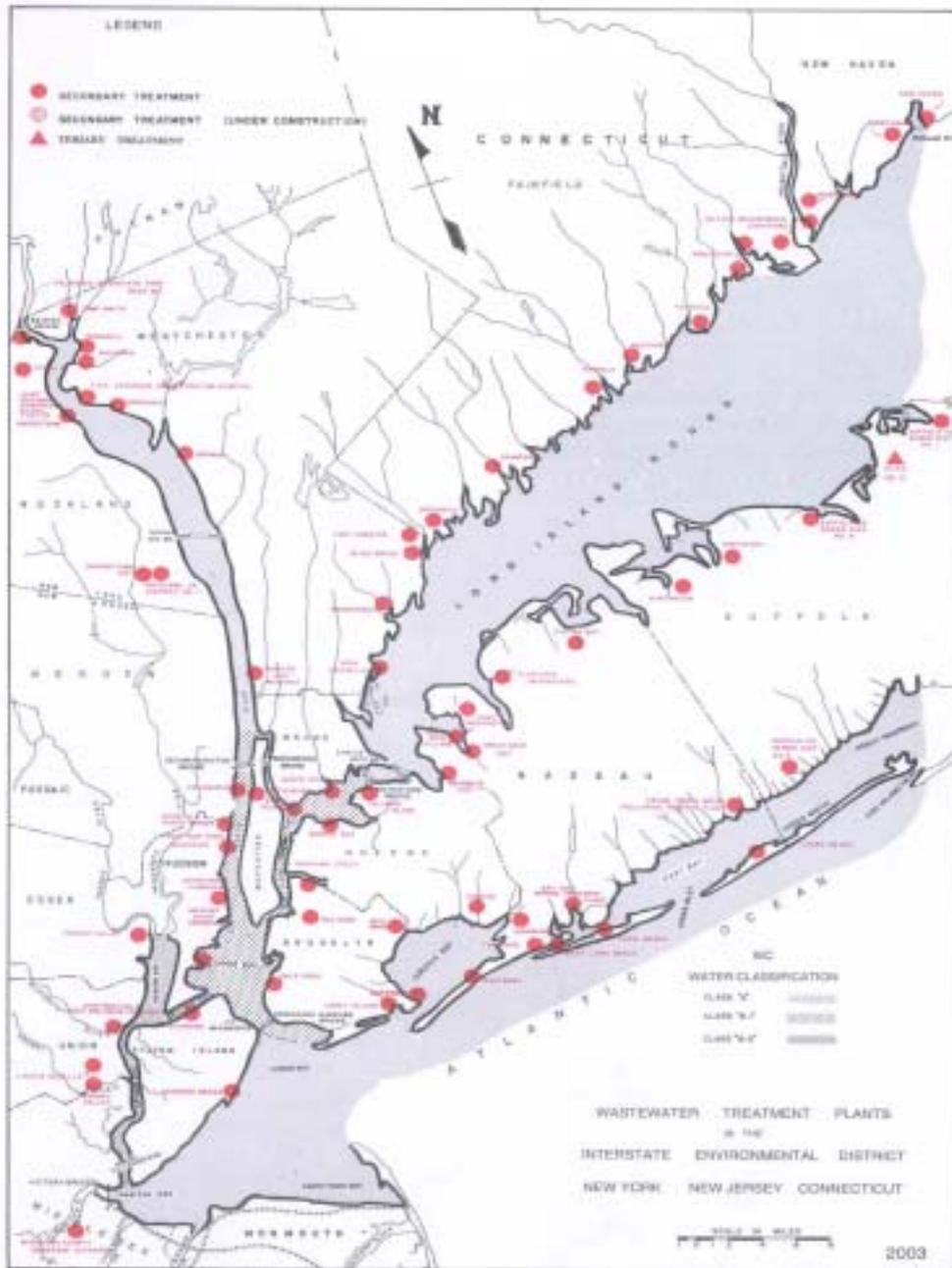
### **2003 Highlights:**

- CT and NY implemented new programs to address EPA's Phase II requirements for storm water from municipal separate storm sewer systems in urban areas and for construction sites disturbing one or more acres. In 2003 CTDEP issued modifications to its industrial permit and issued a public notice of intent to modify the construction permit.
- Connecticut anticipates spending \$480 million over the next 14 years to eliminate combined sewers that deliver high volumes of untreated water directly into rivers.
- New York City continued its \$1.5 billion comprehensive program to abate CSOs, scheduled for completion by 2006. Facility planning and preliminary design for CSO abatement of discharges to tributaries of the East River and Western Long Island Sound continued. Construction of one major CSO retention facility on Flushing Creek will reduce impacts to Flushing Creek, the East River, and western Long Island Sound and is scheduled for completion by 2004.
- As of 2003, Connecticut has 90 land-based vessel pumpout facilities and 11 pumpout boats; there are 19 dump stations. There are 52

pumpout stations in the New York LIS coastal area. This brings the total number of pumpout stations/boats available in LIS to 142, an increase of 8 from 2002.

- After more than three years of chronic closure due to pathogen contamination,

Harbor Island Park in Westchester County reopened for swimming in June 2003. An 800-foot boom to trap pathogens was installed in September 2002, and subsequent testing by the Westchester County Department of Health indicated that pathogen levels had fallen sufficiently to allow the beach to be re-opened.



*The network of wastewater treatment plants monitored by IEC during its ongoing effluent compliance surveys.*

## SUMMARY OF CCMP MANAGEMENT ACTIONS: PATHOGEN CONTAMINATION

### P-1. CONTROLLING PATHOGEN CONTAMINATION FROM COMBINED SEWER OVERFLOWS (CCMP TABLE 31, P. 83)

**Key Elements:** Many municipalities with older sewerage facilities have combined stormwater and sanitary systems. These systems overflow during rainfalls, causing untreated sewage to reach the Sound. Abatement of combined sewer overflows (CSOs) will reduce a major source of pathogens to the Sound. CSO abatement programs are underway in New York and Connecticut.

2003 Description	2004 Planned Action
<p>1. New York City continued:</p> <ul style="list-style-type: none"> <li>• to increase capture of runoff in CSO areas and is in compliance with EPA's minimum standards for CSO controls. NYCDEP continued planning for maximizing wet weather flow to its WPCPs through operation optimization. Wet weather operation plans were developed for the Hunts Point, Wards Island, Bowery Bay, Newtown Creek, Tallman Island and 26<sup>th</sup> Ward WPCPs to reduce CSO discharges to the Upper East River and Jamaica Bay. These plans were submitted to NYSDEC. A wet weather operating plan was also developed for the North River WPCP.</li> <li>• planning under its Comprehensive City-Wide Floatables Control Abatement Plan project that is evaluating needs for additional CSO abatement that are not part of the City's water quality based CSO control program. Planning is ongoing under the USA Project for the Hunts Point, Bowery Bay and Tallman Island WPCP service areas.</li> <li>• construction of its Flushing Creek CSO Retention Facility to provide storage capacity of 43 million gallons (28 MG in the tank and 15 MG in upstream sewers) that will abate CSO discharges to the head end of Flushing Creek. Phase I construction of the underground structural elements of the tank is complete. Phase 2 construction of the mechanical and above-ground portion of the facility is ongoing. Construction is progressing on schedule toward beneficial use of the storage facility.</li> <li>• planning for the Hutchinson River CSO abatement facility for constructing a storage conduit, which will provide 7 MG of additional storage capacity that will abate CSO discharges to the River. Field investigations and design work continued, although a relocation of a portion of the conduit has been required to gain public approval, thus necessitating redesign efforts. Efforts continued on ULURP and CEQR tasks. A modified facility plan was submitted to NYSDEC.</li> <li>• planning for its Alley Creek drainage area improvements. This comprehensive watershed improvement project has several components including drainage area improvements and CSO abatement facility construction. Construction of the drainage area improvement continued.</li> <li>• planning for its Westchester Creek CSO Retention Facility. The underground CSO storage tank will provide 12 MG underground storage capacity that will abate CSO discharges at Outfall HP-25 to Westchester Creek. Design work continued. A modified facility plan was submitted to NYSDEC. Site acquisition, ULURP and CEQR activities continued.</li> </ul>	<p>Submit North River WPCP WWOP to NYSDEC. Develop WWOPs for Red Hook, Owls Head, Coney Island, Jamaica and Port Richmond WPCPs. Continue to operate the facilities to increase flow to the maximum extent possible.</p> <p>Continue floatables control planning in areas not affected by CSO facility plans under USA Project. Draft Waterbody/Watershed Plans will be developed for Flushing Bay and Westchester Creek.</p> <p>Continue construction.</p> <p>Continue ULURP and CEQR activities.</p> <p>Continue drainage area improvements and initiate construction of CSO facilities.</p> <p>Continue design activities and site acquisition. Complete ULURP and CEQR activities.</p>

	2003 Description	2004 Planned Action
	<ul style="list-style-type: none"> <li>review of existing and attainable recreation water uses affected by pathogen bacteria for the City's CSO facility and watershed-based planning projects for the Upper East River, its tributaries, and the City's waters of western Long Island Sound through its Use and Standards Attainment (USA) Project. This effort specifically addresses pathogen controls for the City's current CSO abatement plans and evaluating opportunities for improvements in the plans - a preliminary water body/watershed plan has been developed for the Bronx River that addresses primary and secondary contact recreation water uses in the Bronx River. NYC submitted a modified facility plan to NYSDEC for the Bronx River area, which indicated that the CSO retention facility as being reviewed under the USA Project produced limited water quality benefits.</li> </ul>	Continue USA evaluations on the upper East River and its tributaries. Continue review of recreational use attainability and finalize the Bronx River Waterbody/Watershed Plan under the USA Project.
2.	The Connecticut State Bond Commission awarded more than \$15.4M toward CSO projects statewide in 2003.	Connecticut anticipates spending \$450 million over the next 14 years to eliminate combined sewers.
3.	The Hartford MDC began work on its revised Long Term Control Plan (LTCP) in 2003.	It is expected that Hartford's LTCP will be submitted by the end of 2004.
4.	The City of New Haven is continuing to implement its approved (2002) LTCP for the containment of a 10-year storm and elimination of the City's 22 CSOs by separating the City's stormwater and sanitary sewer systems.	The City proposes to eliminate remaining CSOs over the next 14 years at a cost of \$180 million.
5.	The City of Bridgeport LTCP is still under review by CT DEP. The project is divided into several geographical areas. In 2003, area F-4 construction was completed for separating the combined sewer overflows. The contract for area G-1 was approved by the DEP on July 14, 2003 and advertised for bids in the Fall of 2003. Contract G-2 is currently under DEP review.	CT DEP expects to act on the LTCP in 2004. Construction for area "G" is expected to start in 2004 and complete in 2005. A Clean Water Fund grant application for \$3.9M is awaiting Bond Commission approval.

**P-2. CONTROLLING PATHOGEN CONTAMINATION FROM NONPOINT SOURCES (CCMP TABLE 32, P. 84R)**

**Key Elements:** Nonpoint source runoff, including urban stormwater runoff, is one of the most significant sources of pathogen contamination in Long Island Sound. Pathogens in urban stormwater runoff can originate from many sources, presenting a management challenge. Methods of controlling pathogens from nonpoint sources include best management practices; permitting activities; changes in building codes; consent agreements; and technical assistance and education.

	2003 Description	2004 Planned Action
1.	In 2003 the New York Nonpoint Source Education for Municipal Officials (NEMO) program received a LISS grant of \$87,281. The program is described further below under P-6, <i>Controlling Pathogen Contamination Through Public Education</i> , #2, and under E-2, <i>Public Information and Education</i> .	NY NEMO will continue operating with other funding sources in 2004.
2.	Watershed Advisory Committee (WAC) 7 has been organized by Westchester County as part of its efforts to help the health of Long Island Sound. WAC 7 will cover the Westchester portion of the Bronx River watershed, 48 square miles, from the southern tip of New Castle south to the Bronx line. The WAC includes representatives of the 13 Westchester towns, villages and cities that are part of the watershed, as well as three environmental groups: the Bronx River Conservancy, the Kensico Environmental Enhancement Program, and the Bronx River Alliance.	The WAC is scheduled to write a plan by the end of 2005, but interim projects are expected to begin prior to the completion of the plan.

2003 Description		2004 Planned Action
3.	The NYSDEC Phase II storm water implementation plan involves permitting many storm sewer systems that discharge to Long Island Sound. NYSDEC issued the new storm water Phase II general permits on January 8, 2003. Regulated storm water dischargers submitted a Notice of Intent by March 10, 2003. Information on the Phase II program in New York is posted on the NYSDEC website: <a href="http://www.dec.state.ny.us/website/dow/PhaseII.html">http://www.dec.state.ny.us/website/dow/PhaseII.html</a> .	Continued oversight and implementation of the program.
4.	On July 15, 2003 CTDEP issued modifications to its industrial permit and CT is the only state in the nation with a Stormwater Permit for Commercial sites with more than 5 acres of impervious surface, such as shopping malls. On November 1, 2003 CTDEP issued a public notice of intent to modify the construction permit.  On January 9, 2004 the CT approved and implemented its new Phase II MS4 storm water permit program.	The MS4 Permit will be issued in 2004. Once the MS4 permit is issued, CTDEP will hold workshops to train municipal officials in the requirements of the permit.
5.	The Hempstead Harbor Protection Committee has completed its GIS Storm Drain Mapping project. The project was funded by a grant from the NYS Department of State (NYS DOS). NYS DOS approved the final product on September 15, 2003.	

**P-3. CONTROLLING PATHOGEN CONTAMINATION FROM SEWAGE TREATMENT PLANTS (CCMP TABLE 33, P. 85)**

**Key Elements:** If operating properly, sewage treatment plants contribute a relatively small percentage of pathogens to the Sound. However, malfunctions, illegal sewer hookups, and wet weather overflows can cause problems at STPs.

2003 Description		2004 Planned Action
1.	The City of Stamford, Connecticut's STP is operating under a State Consent Order to upgrade, expand and implement nitrogen removal capabilities, to be substantially complete by 2005. By an additional Consent Order, the plant converted from chlorine disinfection to UV disinfection, which came on-line in May 2003.	
2.	The Town of Litchfield, Connecticut completed installation of its UV disinfection system in 2003.	
3.	In 2003, IEC: <ul style="list-style-type: none"> <li>conducted 49 unannounced effluent surveys at CT and NYS WPCPs that discharge into the LIS portion of the Interstate Environmental District. These surveys are conducted to check compliance with SPDES permits and IEC Water Quality Regulations. Pathogens monitored include fecal and total coliforms. IEC found nearly 100 percent compliance with the existing discharge permits. Additional samples were analyzed for fecal streptococcus and enterococcus in support of TMDL development.</li> </ul>	Continue to conduct effluent surveys at CT and NY WPCPs; additional pathogens for monitoring during 2004 include fecal streptococcus and enterococcus.
	<ul style="list-style-type: none"> <li>chaired the Regional Bypass Work Group (RBWG) to address unplanned bypasses of raw and partially treated sewage, i.e., treatment plant upsets, broken pipes due to age, or construction mishaps. The RBWG developed a model to predict which areas may be affected by a particular bypass. From 1998-2003, the number of events has been consistent, ranging from 94 in 1998 to a peak of 115 in 2001 and 99 in 2003. During 2003, 10 percent of the events occurred in Long Island Sound and its embayments; 20 percent occurred in the East River.</li> </ul>	Continue to chair the RBWG.
4.	The Village of Mamaroneck sought bids for two major projects valued between \$500,000 and \$750,000 to fix leaking sewer lines that have caused widespread water contamination. The first project will replace several hundred feet of sewer pipes on local streets, and the second project will repair 132 sites of sewer inflow and infiltration that were identified in a Westchester County report seven years earlier. Mamaroneck's underground sewer system connects sewage pipes to the county sewage treatment plant.	It is anticipated that the project will be completed during 2004.

	2003 Description	2004 Planned Action
5.	The City of Glen Cove, New York has begun construction of an ultraviolet treatment system for its STP under a 2003 Clean Air/Clean Water Bond Act award of \$1.02 M. On October 21, 2003 the BNR portion of the project came on-line. The Act also provided \$100,000 for creation of retention basins and plantings to reduce stormwater runoff effects to Cedar Swamp Creek, which drains to Hempstead Harbor and to LIS.	The UV disinfection system is currently being designed and construction will likely begin in 2004.
6.	In December 2002 New York announced \$4.4M in state funding for four wastewater treatment projects to assist the Town of Huntington, the Village of Northport, the City of Glen Cove and the Belgrave Water Pollution Control District in protecting and improving water quality in Long Island Sound through construction of ultraviolet disinfection systems at the first three facilities. The Belgrave UV system is under design in 2003. The UV system for Huntington is scheduled for construction during 2004. Construction is underway to install UV disinfection at the Northport STP. The construction completion date is scheduled for December 2004.	
7.	The Village of Sea Cliff, NY completed construction of a sanitary sewer for Shore Road. Residents, as well as a beach pavilion have hooked up to the sewer.	

**P-4. CONTROLLING PATHOGEN CONTAMINATION FROM VESSEL DISCHARGES (CCMP TABLE 34, P. 86)**

**Key Elements:** Although not a primary source of pathogens in the Sound, vessel discharges can be a cause of local water quality problems in poorly-flushed embayments. Creation of vessel No-Discharge Zones, use of best management practices, and increasing the number of vessel pumpout stations are major actions to manage pathogen contamination from vessel discharges.

	2003 Description	2004 Planned Action
1.	CTDEP received \$874,000 from the USFWS Clean Vessel Act (CVA) Pumpout grants program in 2003. By the end of the 2003 boating season there were 90 total pumpout stations (eleven boats) and 19 dump stations, (including one floating rest room) at 89 boating facilities. A directory and map of pumpout stations and boats can be found on the CTDEP website at: <a href="http://www.dep.state.ct.us/olisp/cva/cva.html">www.dep.state.ct.us/olisp/cva/cva.html</a> , along with a variety of information about Connecticut's Clean Vessel Act program.	A decision on Federal FY 2004 funding for CT is anticipated in April 2004. CT proposes to construct two stationary pumpouts, one additional pumpout boat and provide further O&M funding.
2.	<p>A goal of the Long Island Sound 2003 Agreement was: <i>By 2003, nominate vessel no-discharge areas for the Pawcatuck and Mystic Rivers in Connecticut and for all the Long Island Sound embayments in New York.</i></p> <p>EPA approved CTDEP's designation of the Pawcatuck River/Little Narragansett Bay complex and Stonington Harbor as a No Discharge Zone (NDZ) in 2003. An application was submitted to EPA for approval of NDZ designation of the remaining waters of Fishers Island Sound to Avery Point, Groton.</p> <p>A survey of vessel pump-out stations in harbors in the NYS portion of Long Island Sound was initiated in 2003, and is almost completed. The pump-out station survey is a prerequisite to nominating an area as a No-Discharge Zone. When/if it is determined that an adequate number of pump-out stations are present to handle boat traffic in an embayment, then it may be nominated.</p>	Work continues on development of applications for federal approval of the designation of the remaining coastal waters of Connecticut as a No Discharge Zone.
3.	New York State has received a \$450,900 grant from the U.S. FWS's CVA Pumpout Program to support programs that construct, renovate and maintain marine pumpout facilities for recreational boaters. Pumpout station locations are posted on the NY Sea Grant website at: <a href="http://www.cce.cornell.edu/seagrants/pumpouts/lipumpouts.html">http://www.cce.cornell.edu/seagrants/pumpouts/lipumpouts.html</a> .	Implementation of the grant program in 2004.
4.	<i>EarthPlace</i> in Westport, CT received LISS Small Grant funding to study indicator bacteria in the Silvermine River. <i>EarthPlace</i> established eight monitoring sites and determined that a small tributary is responsible for the elevated inputs of bacteria.	The project will receive continued funding in 2004

**P-5. CONTROLLING PATHOGEN CONTAMINATION FROM INDIVIDUAL ON-SITE SYSTEMS/DISCHARGES (CCMP TABLE 35, P. 87)**

**Key Elements:** When appropriately sited, functioning properly, and well-maintained, septic systems should not be a source of pathogens to the Sound. When not properly sited or maintained, they may fail and become a source of pathogens. Both state and local governments must play a role in managing pathogen contamination from individual on-site systems.

2003 Description	2004 Planned Action
No activity reported.	

**P-6. CONTROLLING PATHOGEN CONTAMINATION THROUGH PUBLIC EDUCATION (CCMP TABLE 36, P. 88)**

**Key Elements:** In many cases, simple lifestyle changes can reduce or eliminate a source of pathogen contamination in the Sound. Upon available funding, the CCMP called for development and implementation of a public education plan, targeting specific audiences, in cooperation with federal, state and local public outreach experts and environmental educators.

2003 Description	2004 Planned Action
1. Boater education continued to be a focus of the CTDEP CVA program. CTDEP staff attended boat shows with displays and contacted individual boaters. CTDEP staff attended the annual meeting of the Connecticut Harbor Management Association and displayed outreach materials.	Implement base work plan in 2004. In addition an interactive computer/video kiosk is under development.
2. The LISS revised and reprinted 4,000 copies of a four-part poster series highlighting nonpoint source pollution problems. The posters humorously illustrate four common nonpoint pollution problems, including runoff from car washing, lawn fertilization, leaking automotive oil, and pet waste. The posters may be seen at: <a href="http://longislandsoundstudy.net/publications.htm#posters">http://longislandsoundstudy.net/publications.htm#posters</a>	Continue to reprint and distribute materials as appropriate.
3. In 2003 the New York Sea Grant NEMO Program (NYSG NEMO) supported Long Island local governments' stormwater management programs. NYSG NEMO responded to municipal requests for support by providing presentations, producing reference materials, conducting meetings and by developing recommendations to promote municipal tie-ins to LISS CCMP objectives concurrent with PH II compliance.	Continue workshops, technical support and development of educational materials for Suffolk County Priority LIS watershed municipalities.
4. In July 2003 NYCDEP released its annual <i>New York Harbor Water Quality Report</i> for the year 2002. Among other water quality parameters measured, summer-averaged <i>fecal coliform</i> concentrations have fallen throughout much of this region over the past 16 years. However, slight increases were identified in 2001-2002. The report also highlights other monitoring and pollution control activities conducted by the City and other agencies, and is available at: <a href="http://www.nyc.gov/dep">http://www.nyc.gov/dep</a>	New York City will release its new and updated Water Quality Report based on the 2003 monitoring program.

**P-7. MONITORING AND ASSESSMENT OF PATHOGENS (CCMP TABLE 37, P. 89)**

**Key Elements: Monitoring of indicator bacteria helps assess the success of the pathogen reduction activities called for in the CCMP. Monitoring and assessment are essential to improved understanding of pathogen contamination in the Sound.**

	2003 Description	2004 Planned Action
1.	<p>During 2003 there were 604 beach day closures out of a total of 25,440 beach days at the 240 monitored beaches on Long Island Sound from Memorial Day to Labor Day.</p> <p>Connecticut: 216 beach-day closures at private and three municipal beaches; of four state beaches on LIS, two had beach closures totaling eight days, for a total of 224 lost beach days in Connecticut.</p> <p>New York: 380 beach-closure days in the New York portion of Long Island Sound. All of the closures occurred in Westchester and Suffolk Counties; of these, 129 beach-days were at two beaches in Mamaroneck Harbor. Administrative (rain) closures accounted for 152 beach-closure days, while all other closures were caused by a sewer line break (28 beach days) and the August 2003 major electrical blackout (36 beach days).</p>	<p>CT municipalities, regional health districts, and CTDEP will continue to monitor for bacteria. NY state, city, town and county monitoring for pathogens will continue in 2004.</p>
2.	<p>After more than three years of chronic closure due to pathogen contamination, Harbor Island Park in Westchester County' was reopened for swimming in June 2003. An 800-foot floating boom to trap pathogens was installed in September 2002. Subsequent testing by the County Dept. of Health indicated that pathogen levels had fallen sufficiently to allow the beach to be re-opened.</p>	<p>Swimming beaches along the shore of Westchester County are continuously monitored by the Westchester County Health Dept.</p>
3.	<p>Connecticut's Department of Public Health received \$223,921 in EPA FY2003 Beach Act funding for implementing elements of the program in Connecticut.</p> <p>New York's Department of Health received \$359,215 in EPA FY2003 Beach Act funding to support program implementation state-wide; a portion of these funds will benefit LIS beaches.</p>	<p>In FY2004, if funds are appropriated, EPA expects to make grants to support implementation of monitoring and notification programs.</p>
4.	<p>CTDOA/DA continued its annual monitoring of shellfish beds for pathogens, providing invaluable information to the shellfish industry and the public on the classification and condition of shellfish beds.</p>	<p>Continue to monitor shellfish beds for health and viability.</p>
5.	<p>IEC:</p> <ul style="list-style-type: none"> <li>• continued to conduct its tri-state water quality monitoring program and summarized its results in its 2003 Annual Report. The Report describes the status of plant upgrades and construction in the tri-state environmental district. IEC conducted its annual inspection trip of Commission waters in August 2003 for environmental district members. IEC continued to improve its new website at <a href="http://www.iec-nynjct.org">www.iec-nynjct.org</a>.</li> <li>• conducted dry weather inspections of MS4s. For the period January 1 through September 30, 2003, 42 inspections were completed in Nassau County, NY. Three flowing MS4s under dry weather conditions were reported to NYS DEC, Region 1 for remediation.</li> <li>• continued pathogen monitoring in the NY-NJ Harbor Complex. A subset of the 61 station network is located within the LISS core area. Pathogens monitored include <i>fecal</i> and <i>total coliforms</i>, <i>fecal streptococcus</i>, and <i>enterococcus</i>.</li> <li>• coordinated development of a monitoring plan for pathogen track down in the Byram River. The QA/QC monitoring plan was approved by EPA, Region 1. Monthly ambient water quality monitoring began in May 2003; dry weather discharges were discovered on both the New York and Connecticut sides of the river. Track down and remediation is under way.</li> </ul>	<p>Continue preparation of the annual report and conduct the annual boat inspection trip in 2004.</p> <p>IEC will continue dry weather MS4 inspections in 2004.</p> <p>IEC will continue pathogen monitoring, laboratory analysis and data sharing during 2004 under dry weather conditions only in the Byram River.</p>
6.	<p>NYCDEP continued its Harbor Survey program by monitoring <i>fecal coliform</i> and <i>enterococcus</i> in the City's waters of the Upper East River and Western Long Island Sound. Monitoring continued at several East River tributary stations that were added to the program in 2001.</p>	<p>Continue Harbor Survey program and enhance <i>enterococcus</i> sampling.</p>

## PROTECTING THE SOUND FROM THE ADVERSE EFFECTS OF TOXIC SUBSTANCES

Toxic substances can cause adverse human and ecosystem health effects, and can result in significant negative economic impacts on the value of the natural resources of the Sound.

**CCMP Strategy:** The CCMP strategy to address toxic contamination in LIS has five principal elements: 1) controlling and preventing toxic contamination from all sources; 2) addressing sediment contamination; 3) improving human health risk management; 4) monitoring and assessing toxic contaminants; and 5) conducting research to investigate toxic contamination.

**LIS 2003 Agreement Goal:** *Eliminate toxicity or bioaccumulation impacts on living resources by reducing contaminant inputs and cleaning up contaminated sites, and manage risk to humans from seafood consumption.* There are two action items with 2003 target dates in this section: 1) *update the Long Island Sound 'Contaminants of Concern' list considering National Coastal Assessment monitoring results and other sources of data;* and 2) *New York and Connecticut will meet to jointly review their approaches for Long Island Sound fish consumption advisories and to discuss a process to achieve the goal of consistent fish consumption advisories for Long Island Sound.* Updating the *Contaminants of Concern* list is ongoing. The LIS Fellows who support the STAC are researching information to update the list. The state departments of health have not yet met to discuss common fish advisories.

**Environmental Indicators/Results/Trends:** The Long Island Sound Study report, *SoundHealth 2003* reported that toxic emissions in the region and to the Sound have been declining over the last 25 years due to increasingly stringent environmental regulation. Historical contaminant levels as measured in sediments and in living marine resources show a downward trend, which is particularly evident for banned or controlled chemicals such as DDT and chlordane. Today, the remaining sources of toxic chemicals to the Sound come from sewage treatment plants and industrial discharges, which are regulated; and from urban stormwater and atmospheric deposition, which are more difficult to control. Regulatory programs strive to reduce chemical discharges and minimize toxicity of effluents. However, the contaminants released in the past remain in the sediments of Long Island Sound long after the discharges cease.

### **2003 Highlights:**

- EPA and ACOE issued the draft Environmental Impact Statement (EIS) for the designation of open water dredged material disposal sites in Western and Central Long Island Sound. Public hearings were held and public comments received on the draft EIS in 2003.
- Westchester County recycled nearly 800,000 tons or 42 percent of the solid waste generated in the county in the year 2002. This exceeded the New York State mandated goal of 40 percent recycling which it has done so for the sixth consecutive year since the state recycling goal went into effect in 1997. In addition, Westchester County government together with participating municipalities instituted and expanded upon an Organic Waste Transfer Station program whose success has contributed to the nearly 150,000 tons of yard waste that has been diverted from the garbage.
- In 2003, 80 of the 84 Connecticut STPs discharging into the Sound or its tributaries passed toxicity testing. This represented no change but different plants from 2002 and is a decrease from 2001 of facilities that discharge treated waste water that is safe for most aquatic life. In New York, facilities that are currently required to conduct toxicity testing per their NYSPDES permit are Glen Cove

Creek and all the NYC WPCPs. In 2003, Glen Cove and all NYC WPCPs affecting LIS were in compliance.

- The LISS publication, *Sound Health 2003* noted decreasing toxic substance levels in the LIS watershed over the last decade. This may

be due to stronger emission controls, increased recycling, reuse and treatment, declining manufacturing industries, and natural dispersion and degradation cycles. The EPA Toxic Release Inventory (TRI) website is: <http://www.epa.gov/tri>.

## SUMMARY OF CCMP MANAGEMENT ACTIONS: TOXIC SUBSTANCES

T-1. TOXIC CONTAMINANT SOURCE CONTROLS AND POLLUTION PREVENTION (CCMP TABLE 21, P. 65)		
<b>Key Elements:</b> Permit programs and enforcement activity for both direct and indirect discharges, including toxicity testing of those discharges, are responsible for greatly reducing toxic substance loads over the past 25 years. The LISS's priority management recommendation for toxic substances is to continue these successful activities, all of which are funded under current programs. Other programs that are designed to prevent pollution and reduce pollutant loads must also be supported as part of a comprehensive program to manage toxic contamination in the Sound.		
	2003 Description	2004 Planned Action
1.	CTDEP completed development of the Geographic Information System (GIS) project for the Sediment Quality Information Data (SQUID) system for Long Island Sound in 2001. A User Manual was developed in 2002 and Technical Manual in 2003.	Distribution of the Long Island Sound SQUID upon development and completion of Electronic Deliverables (ED) updating.
2.	A TMDL for ammonia was approved in January 2003 for Limekiln Brook. Other work that has been ongoing for toxic contamination source controls are investigations of aquatic life impairments where the cause is unknown in 2003 for the Willimantic River, Naugatuck River and Hockanum River.	Follow-up monitoring will be conducted to measure progress of TMDL implementation.
3.	In 2003, 80 of 84 Connecticut STPs passed toxicity testing, the same number as last year but different plants; in 2001 82 of 84 facilities passed this testing requirement.	As more STPs upgrade their facilities, the expected goal of 100% discharge passing the toxicity test will be achieved.
4.	<p>Connecticut's efforts to reduce the introduction of hazardous substances into the environment from non-point sources are seen in its state-wide household hazardous waste collection program. In 2002, more than 31,000 residents took part in household hazardous waste collections in Connecticut. This represents ~3.6 percent of all single-family homes in Connecticut. While this participation rate is slightly down from the past two years, it is still indicative of a strong commitment from Connecticut residents to properly dispose of their hazardous waste. This commitment extends to Connecticut's municipalities. Of the 169 municipalities, 155 had access to at least one household hazardous waste collection. Few, if any, states have a higher percentage of towns that offer household hazardous waste collections.</p> <p>In 2002, the Connecticut legislature passed one of the most comprehensive mercury laws in the country; many of its provisions became effective in 2003, including a requirement that dentists follow best management practices for the management of mercury. The Connecticut Dental Association (CDA) and CTDEP have been working cooperatively to implement this provision of the law. One of the best management practices for dentists includes the installation of dental amalgam separators. Amalgam separators remove mercury from water through the discharge pipes. A typical unit can remove 98% of the mercury that goes down the drain. Amalgam separators will help remove mercury from sewage treatment plant sludge or prevent contamination of septic systems.</p>	CT DEP will continue working with citizens and businesses to reduce the amount of toxic substances released to the environment. CTDEP will continue to work with regional and national associations to reduce waste toxicity, including efforts to implement the New England Governors/Eastern Canadian Premiers <i>Mercury Action Plan</i> . CTDEP will develop programs for the separation and recycling or proper disposal of wastes that contribute to toxicity, such as consumer electronics and appliances, household batteries, mercury-containing lamps (including fluorescent light bulbs), and thermostats.
5.	In New York, facilities that are currently required to conduct toxicity testing per their NYSPDES permit are Glen Cove Creek and all the NYC WPCPs. In 2003, Glen Cove and all NYC WPCPs affecting LIS were in compliance.	Continued testing in 2004.

2003 Description		2004 Planned Action
6.	Westchester County recycled nearly 800,000 tons or 42 percent of the solid waste generated in the county in the year 2002. This exceeded the New York State mandated goal of 40 percent recycling which it has done so for the sixth consecutive year since the state recycling goal went into effect in 1997. In addition, Westchester County government together with participating municipalities instituted and expanded upon an Organic Waste Transfer Station program whose success has contributed to the nearly 150,000 tons of yard waste that has been diverted from the garbage.	Results for 2003 will be reported when available.
7.	The City of Glen Cove, the US Departments of Treasury, Commerce, Defense and the General Services Administration agreed to contribute \$20 million to EPA's Superfund to remove and transport about 60,000 cubic yards of contaminated soil from the 26-acre former LI Tungsten Corporation site. Through New York State's Clean Water State Revolving Fund, the City of Glen Cove received a \$3 million long term loan for the remediation of the Li Tungsten Low Level Radioactive Waste Site.	It is anticipated that federal agencies will pay another \$7.5 million for future cleanups at the site, based on the current estimated cleanup cost of \$54 million.

## T-2. ADDRESSING SEDIMENT CONTAMINATION (CCMP TABLE 22, P. 67)

**Key Elements:** To begin the process of remediating sediments, LISS will conduct further assessments of toxic contaminant distribution in sediments of western Long Island Sound and embayments identified as having elevated toxic contaminant burdens. Based on these assessments, it will be possible to determine the feasibility, value, and cost of remediating contaminated sediments, where remediation may be necessary.

2003 Description		2004 Planned Action
1.	The Long Island Sound 2003 Agreement action item for this area is: <i>By 2004, EPA, in conjunction with the Army Corps of Engineers, will complete the Environmental Impact Statement for the designation of dredged material disposal sites in central and western Long Island Sound and, by 2008, will complete the EIS for designation of dredged material disposal sites in eastern Long Island Sound.</i> Under the EIS process for designation of dredged material disposal sites in LIS under MPRSA, in 2003 the ACOE and EPA issued the draft EIS for Central and Western LIS. The draft EIS and other reports are available on the EPA New England Region website: <a href="http://www.epa.gov/region01/eco/lisdreg/rpfs.html">http://www.epa.gov/region01/eco/lisdreg/rpfs.html</a> .	By early Spring 2004, EPA, in conjunction with the ACOE, will complete the EIS for the designation of dredged material disposal sites in Central and Western LIS.

**T-3. IMPROVING HUMAN HEALTH RISK MANAGEMENT (CCMP TABLE 23, P. 68)**

**Key Elements:** The objective of human health risk management is to determine the likelihood that exposure to a toxic substance will have adverse impacts on human health and to estimate the degree of the effects. In the case of Long Island Sound, the states of Connecticut and New York have issued advisories on consumption of selected seafood taken from the Sound. By improving communication of consumer advisories, it is anticipated that public health risk will be improved.

2003 Description		2004 Planned Action
1.	<p>The Long Island Sound 2003 Agreement action item for this area is: <i>By 2003, New York and Connecticut will meet to jointly review their approaches for Long Island Sound fish consumption advisories and to discuss a process to achieve the goal of consistent fish consumption advisories for Long Island Sound.</i> The state departments of health did not meet in 2003.</p> <p>Connecticut's current LIS fish consumption advisory is for PCBs in striped bass, bluefish, and lobster hepatopancreas; the CT fish advisory is posted on the CTDOH website: <a href="http://www.dph.state.ct.us/Publications/BCH/EEOH/fishweb02.pdf">http://www.dph.state.ct.us/Publications/BCH/EEOH/fishweb02.pdf</a>.</p> <p>New York's current LIS fish consumption advisory is for PCBs in bluefish and American eels from LIS, for PCBs in striped bass from LIS west of the Wading River; and for PCBs, cadmium, and dioxin in crab and lobster hepatopancreas. The New York fish consumption advisory is posted on the NYSDOH website: <a href="http://www.health.state.ny.us/nysdoh/environ/02fish.pdf">http://www.health.state.ny.us/nysdoh/environ/02fish.pdf</a>.</p>	Project will continue in 2004.
2.	<p>The New York State Environmental Board (a 16-member group of state agency heads and representatives of the environmental community, citizen groups, business and industry) approved a revision to a state regulation that will help protect public health and the environment by enhancing notification requirements for commercial pesticide lawn applications. Commercial pesticide applicators will be required to use consistent contract features when entering into a lawn care contract, and provide notification language and visuals when treating an area with pesticides.</p>	The regulation takes effect on January 1, 2004. The notification requirements for marker features will take effect on January 1, 2005, to provide certified pesticide applicators with time to change current signage.
3.	<p>Suffolk County has adopted a new law creating a "no-spray" registry for people who do not want their property subject to adult mosquito control (aerosol and fog applications).</p>	

**T-4. MONITORING AND ASSESSMENT OF TOXIC CONTAMINANTS (CCMP TABLE 24, P. 71)**

**Key Elements:** The LISS toxic contaminant monitoring program will focus on water, sediment and tissue media. The data collected from the monitoring program will be used to answer questions about resource and human health risks and sources of toxic contaminants.

2003 Description		2004 Planned Action
1.	<p>The Long Island Sound 2003 Agreement goal for this area is: <i>By 2003, update the Long Island Sound Contaminants of Concern list after considering National Coastal Assessment monitoring results and other sources of data.</i></p>	This item has been assigned to the new Long Island Sound Fellows for action in 2004.
2.	<p>NYSDEC, through the Waste Management and Reduction Institute of Stony Brook University, and CTDEP continued participation in the EPA-sponsored National Coastal Assessment monitoring program in 2003. Elements of the existing NYCDEP harbor water quality survey, the LIS ambient water quality monitoring program, Suffolk County DOHS and the Town of Hempstead water quality monitoring programs have been integrated with the National Coastal Assessment. The program is monitoring and assessing water and sediment quality parameters and biota in LIS.</p>	Continued participation in 2004 is planned.

**T-5. RESEARCH TO INVESTIGATE TOXIC CONTAMINATION (CCMP TABLE 25, P. 73)**

**Key Elements:** Toxic contaminants identified in Long Island Sound are numerous; their pathways to the Sound are varied, and their effects on the environment, marine life and human health are not fully understood. These factors must be understood if effective management is to be accomplished. The CCMP identified these needs are identified as recommendations, though continuation of work begun by LISS through the EPA Long Island Sound Office and other parties should recognize these recommendations as priority research topics.

2003 Description		2004 Planned Action
1.	<p>Under the LISS Research Grant Program, the following 2000 and 2001 research grant was completed in 2003:</p> <ul style="list-style-type: none"> <li><i>Effects Of Trace Metals, Organic Carbon And Inorganic Nutrients In Surface Waters Of LIS On Phytoplankton Growth</i>, Marine Science Research Center, Stony Brook University (Dr. Sañudo-Wilhelmy, PI) [\$116,622] The results are being published in a scientific journal.</li> </ul> <p>The following LISS research grant is ongoing:</p> <ul style="list-style-type: none"> <li><i>New Approaches For Assessing Mutagenic Risk of Contaminants in LIS</i>, Stony Brook University, (Dr. Ann McElroy, PI) [\$99,561]</li> </ul>	<p>Final report submitted and being published in a scientific journal.</p> <p>Final report due November 2004.</p>
2.	<p>In 2003, CTDEP continued to support UCONN researchers conducting research on toxins that may have contributed to the crash of the LIS lobster fishery in late summer of 1999. In 2003, researchers at UCONN completed a study on air deposition of mercury in LIS. The final report was submitted to DEP and accepted.</p>	<p>Continue to support this research; review final reports.</p>
3.	<p>In 2003, researchers at UCONN completed a study on air deposition of mercury in LIS. The final report was submitted to DEP and accepted.</p>	<p>Project completed.</p>
4.	<p>Through the 2003 Long Island Sound Study Research Grant Program, the following project was selected for funding by the EPA-Long Island Sound Study, Connecticut Sea Grant, and New York Sea Grant partnership:</p> <ul style="list-style-type: none"> <li><i>Temporal And Spatial Changes In Copper Speciation And Toxic Metal Concentrations In Long Island Sound: Effect Of Changes In Water Temperature And Dissolved Oxygen Levels</i>. (Dr. Sergio Sañudo-Wilhelmy, PI) Stony Brook University.</li> </ul>	<p>Continue to fund research on toxic contaminants in order to accomplish effective management.</p>

## REDUCING FLOATABLE DEBRIS IN THE SOUND

Litter, debris, and trash floating in LIS coastal waters and washing up on LIS shorelines is unsightly and can be a nuisance to, or hazard for boaters, beach-goers, bathers, fishermen, and other recreational or commercial LIS users. Floatable debris can harm wildlife and living marine resources.

**CCMP Strategy:** Floatable debris contributes to unsightly, unsanitary, or unhealthy beach and shoreline conditions, and can adversely affect environmental quality and the health of living marine resources, water-dependent birds, and other aquatic life. This type of pollution can reduce the market value of shoreline property, affecting the regional economy, and can also adversely affect public perception of the health of the Sound. This CCMP priority area identifies two principal management actions: 1) controlling floatable debris from combined sewer overflows (CSOs) and storm sewers; and 2) increasing floatable debris cleanup efforts.

**LIS 2003 Agreement Goal:** *Assure a viable Long Island Sound watershed that supports vibrant and healthy aquatic life, and minimizes the negative effects of erosion, sedimentation, and flooding on the Sound and its tributaries and embayments.* There is one 2003 action item in this section: *Connecticut and New York will identify the amount of impervious surface in their respective portions of the watershed, based on available land use/land cover data. Through watershed planning efforts the states will encourage municipalities to adopt limitations on impervious surfaces, with an overall goal of minimizing increases in impervious cover to a rate consistent with population change.* LISS funding was awarded in 2003 to the University of Connecticut to begin impervious surface mapping.

**Environmental Indicators/Results/Trends:** Programs in place to control sources of debris to the Sound include regional/statewide anti-litter campaigns, beach cleanup and adopt-a-spot programs, municipal Clean Marinas and Clean Vessel Act activities, street sweeping, refuse pick-up and recycling programs, solid waste facility management practices, public awareness campaigns, and enforcement of local ordinances.

### **2003 Highlights:**

- As a result of National Beach Clean Up Day in September 2003, 2,632 volunteers from New York removed 107,903 pounds of debris from 56 sites. Connecticut data was not available.
- The amount of litter entering area waters from New York City has continued to decrease from 1995 baseline levels through the City's street sweeping efforts. The percentage of streets rated Acceptably Clean was 86 percent in 2003, compared to 77 percent in 1995. The percentage of streets rated Filthy in 2003 was 1.7 percent, down from a 1995 level of 4.9 percent.
- A floatable debris collection system was installed in 2003 by the City of New Rochelle at the mouth of Stephenson Brook. The County of Westchester assessed the installation of collection system(s) on county-owned lands, and received funding under the Clean Air/Clean Water Bond Act fund for two floatable debris collection systems on the Bronx River, a tributary to LIS.
- In May, 2003, CTDEP, the Town of Stonington, and student volunteers from Pine Point School in Stonington, installed educational storm drain markers at Pine Point School and in nearby Birdland Neighborhood to help protect Long Island Sound.
- The LISS Small Grants Program funded the Connecticut River Estuary Regional Planning Agency (CRERPA) to reprint 5,000 "boater waste wheels" and 50 two-hour *Connecticut Waterways - Masterpieces Worth Preserving* videos. CRERPA is partnering with CTDEP's Clean Boater Program to distribute this outreach material to state boaters.

## SUMMARY OF CCMP MANAGEMENT ACTIONS: FLOATABLE DEBRIS

F-1. CONTROLLING FLOATABLE DEBRIS FROM CSOs AND STORMWATER SEWERS (CCMP TABLE 38, P. 96)	
<b>Key Elements:</b> Ongoing programs conducted by state and municipal governments to reduce floatable debris; and long-term CSO abatement and NPDES stormwater permitting programs are key to controlling debris.	
2003 Description	2004 Planned Action
<p>1. Connecticut's <i>Clean Marina</i> program includes a recreational boater outreach and education component, part of which addresses control of solid waste on boats. Seasonal Boating Education Assistants distributed "Clean Boating Packets" to CT's boaters at marinas and boat launch ramps. Laminated <i>Clean Boating Tips</i> cards detail methods to minimize the environmental impacts of common boating practices are part of the program. Old Saybrook Marina was the first (and only) marina certified under the Clean Marina Program in 2003.</p> <p>CWA 319 grant funds are used to provide Clean Marina Cost-Share Assistance Grants. Five grants were awarded in 2003. Funded projects include: two dustless vacuum sanders, one high-volume, low-pressure spray gun, two used oil furnaces, and one pressure wash water filtration system.</p>	<p>A series of informational meetings and two compliance open houses are planned for 2004 in addition to continued implementation of a "Clean Marina Small Grants" program. CTDEP will continue to distribute "Clean Boating Packets".</p> <p>CTDEP will continue to award grants on a first-come, first-served basis until CWA 319 funds are depleted.</p>
<p>2. New York City continues to implement actions for reducing floatables in its harbor waters and neighboring water bodies, including Western Long Island Sound. In 2003 New York City:</p> <ul style="list-style-type: none"> <li>• continued to improve the effectiveness of its catch basins to prevent street litter from entering harbor waters through its ongoing re-inspection and re-hooding program;</li> <li>• continued to increase the number of hooded catch basins through re-construction of un-hoodable basins;</li> <li>• progressed with planning, design and construction of CSO retention facilities for the East River and Western Long Island Sound that will include discharge volume reductions and screening to reduce floatables discharges to these waters. NYCDEP's comprehensive floatables planning is also continuing for reducing floatables discharges to non-tributary waters of the East River and the City's waters in Western Long Island Sound;</li> <li>• evaluated its current <i>Interim Floatables Containment Program</i> to identify methods of improvement to maximize CSO floatables capture throughout the City including the upper East River and several of its tributaries. Made improvements in the existing program in 2003. Ongoing facility improvements and maintenance activities continued throughout 2003 to improve the efficiency of collection; and</li> <li>• continued to retrieve debris from local waters from CSO and non-CSO sources. The Interim Floatables Containment Program features CSO containment booming and skimming in the City's tributaries and open waters of the East River and Western Long Island Sound.</li> </ul>	<p>Continue re-inspections.</p> <p>Continue construction of new basins.</p> <p>Continue to develop waterbody/watershed plans during which the need for additional floatable controls will be evaluated.</p> <p>Assess the effects of the improvements made in the Interim Program and evaluate potential changes to the program.</p> <p>Continue to operate control program.</p>
<p>3. In 2003 New York City completed construction of an additional floatables containment system in Little Bay near the Throggs Neck Bridge as part of its Interim Floatables Containment Program. The system is located on Tallman Island WPCP CSO outfall TI-013 and includes an outfall extension channel and an end-of-pipe netting system.</p>	<p>Continue to collect debris from this new facility.</p>
<p>4. Wet Weather Operating Plans were prepared for the Upper East River WPCPs, 26<sup>th</sup> Ward and five existing or planned CSO facilities. These plans provide operating protocols for maximizing capture and treatment of wet weather flows.</p>	<p>WWOPs will be prepared for the remaining WPCPs.</p>

2003 Description		2004 Planned Action
5.	As part of its continuing long-term CSO planning efforts, New York City is progressing with development of a long-term plan to increase the amount of wastewater flow conveyed to and treated at the Tallman Island WPCP during wet weather. More detailed facility planning, design and construction will be required before this action will be affected.	Develop a contract to provide for detailed facility planning, design and construction bidding.
6.	As part of the Use and Standards Attainment Project, New York City developed a preliminary waterbody/watershed plan for the Bronx River. Among other things this plan recommends additional actions to control CSO and non-CSO floatables in the Bronx River. The City intends to initiate additional facility planning studies to further develop those actions.	Initiate design activities for floatables control facilities for Hunts Point CSO Outfalls #004, #007 and #009 on the Bronx River in accordance with the Bronx River waterbody/watershed plan. New York City will develop a contract to conduct additional facility planning activities.
7.	A floatable debris collection system was installed by the City of New Rochelle at the mouth of Stephenson Brook in 2003.	
8.	The Westchester County departments of Planning and Parks, Recreation and Conservation, using a grant under the New York State Clean Water/Clean Air Bond Act, installed two floatable debris collection systems on the Bronx River in Bronx River Parkway Reservation in 2003, a tributary to Long Island Sound.	

## F-2. INCREASING FLOATABLE DEBRIS CLEANUP EFFORTS (CCMP TABLE 39, P. 99)

**Key Elements:** Anti-litter educational campaigns, annual beach clean-ups, litter control demonstration projects and storm drain stenciling programs are part of effective debris prevention and control programs.

2003 Description		2004 Planned Action
1.	<i>National Beach Clean Up Day</i> in September 2003 resulted in 2,632 volunteers from New York picking up 107,903 pounds of debris at 56 sites on LIS. Data from Connecticut was not available.	Save the Sound, Inc., in cooperation with the CT Sea Grant program and the American Littoral Society in New York will promote National Clean Up Day in 2004.
2.	The LISS Small Grants program awarded a \$5,000 grant to the Northeast Chapter of the American Littoral Society in New York to assist in conducting its annual beach cleanup program on Long Island Sound beaches in 2003.	
3.	The amount of litter entering area waters from New York City has continued to decrease from 1995 baseline levels through the City's street sweeping efforts. The amount of streets rated <i>Acceptably Clean</i> was 86 percent in 2003, compared to 85 percent in 2002 and 77 percent in 1995. The number of streets rated <i>Filthy</i> in 2003 was 1.7 percent, an increase from 1.5 percent reported in 2002, but down from a 1995 level of 4.9 percent.	Continue street sweeping programs.
4.	In May, 2003, CTDEP, the Town of Stonington, and student volunteers from Pine Point School in Stonington, installed educational storm drain markers Drains to Waterways and Long Island Sound, No Dumping at Pine Point School and in nearby Birdland Neighborhood to help protect Long Island Sound.  The CT DEP Storm Drain Marker Program has distributed more than 67,600 English and 900 Spanish storm drain marker kits, most of them in 2003. Matching financial assistance for this program was provided by a grant from the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration (NOAA).	

2003 Description		2004 Planned Action
5.	Recycling has been mandatory in Connecticut since 1991. CT recycled over 867,300 tons or 25% of solid waste generated in the state in 2002. Another 60% of solid waste is burned for energy recovery at six resource recovery facilities (RRFs). Connecticut has a 40% recycling goal.	CT DEP is committed to assisting municipalities in meeting the state goal of recycling 40% of the solid wastes generated in the state.
6.	In 2003 Westchester County adopted its recycling law, known as the <i>Source Separation Law</i> . It requires various recyclable materials to be separated from garbage, by each and every waste generator, as each individual is the source of the generation of waste.	Report on progress in 2004.
7.	The LISS Small Grants Program awarded the Connecticut River Estuary Regional Planning Agency (CRERPA) funds in 2003 to reprint 5,000 "boater waste wheels" and 50 two-hour <i>Connecticut Waterways - Masterpieces Worth Preserving</i> videos. As of July 2003, 460 packets were distributed to area boaters, and area marinas are viewing the video.	CRERPA will partner with CTDEP's Clean Boater Program to distribute this outreach material to state boaters.

## MANAGING AND CONSERVING LIVING RESOURCES AND THEIR HABITATS

The overall abundance and diversity of habitats and living marine resources in the Sound is a strong indicator of the health of the ecosystem. Years of neglect, mismanagement, and damaging actions had diminished these resources and habitats. The LISS partners promote actions to improve water quality and protect and restore critical habitats, and to reduce economic and environmental impacts from flooding, erosion, and runoff pollution.

**CCMP Strategy:** The CCMP identifies the following elements to preserve, protect and enhance LIS living marine resources and their habitats: 1) restoring and enhancing aquatic and terrestrial habitats; 2) protecting and acquiring habitat; 3) developing inventories and management strategies for aquatic and terrestrial habitats; 4) managing endangered and threatened species; 5) managing harvested species; 6) managing exotic and nuisance species; 7) educating the public; 8) developing databases; 9) conducting Sound-wide and site-specific research and monitoring; and 10) conducting living resources and habitat research.

**LIS 2003 Agreement Goal:** *Assure a healthy ecosystem with balanced and diverse populations of indigenous plants and animals, maintain or increase the abundance and distribution of harvestable species, and restore the ecological functions of degraded and lost habitats.* There are three actions with 2003 target dates in this section: 1) *complete the mapping of eelgrass in the Long Island Sound area to determine trends;* 2) *identify critical issues related to the management and conservation of living resources (such as fish and birds) and their habitats, and develop strategies to improve conditions, as appropriate;* and 3) *produce a list of the invasive species of concern in Long Island Sound.* Also, a continuing goal is to report on progress against the LISS habitat restoration goals (see below). The mapping of eelgrass was completed by the LISS, with assessment of trends under consideration. The LISS Science & Technical Advisory Committee annually considers priority topics for funding, including living resources, and the Stewardship Initiative is assisting in identification of priority areas for conservation and preservation as well as protection strategies. In 2003, a coordinated list of invasive species of concern in LIS was compiled by the US Fish & Wildlife Service, with assistance from EPA, CTDEP, NYSDEC, and researchers at UCONN and Williams College.

**Environmental Indicators/Results/Trends:** The primary measurable Long Island Sound environmental indicators for this priority area are the number of acres of coastal habitat restored and linear miles of river corridor reopened to anadromous fish passage. Of its goal of 2000 acres to be restored by 2008, the LISS has restored 510 acres as of December 2003. Of the 2008 goal to reopen 100 river miles to fish passage, 48 miles have been restored as of December 2003. In 2002, LISS partners noted several disturbing environmental events, including a new, smaller scale lobster die-off in the Central and Eastern basins; a new lobster disease observed in western LIS; and, as yet unexplained tidal wetlands losses in both Connecticut and New York LIS embayments. In response to these events, New York and Connecticut Sea Grant College Programs sponsored the third LIS Lobster Symposium in March 2003 to review research progress in several critical areas; and the LISS funded a conference conducted by NYSDEC in June 2003 to review tidal wetlands losses in the region and to develop recommendations and propose management actions.

### 2003 Highlights:

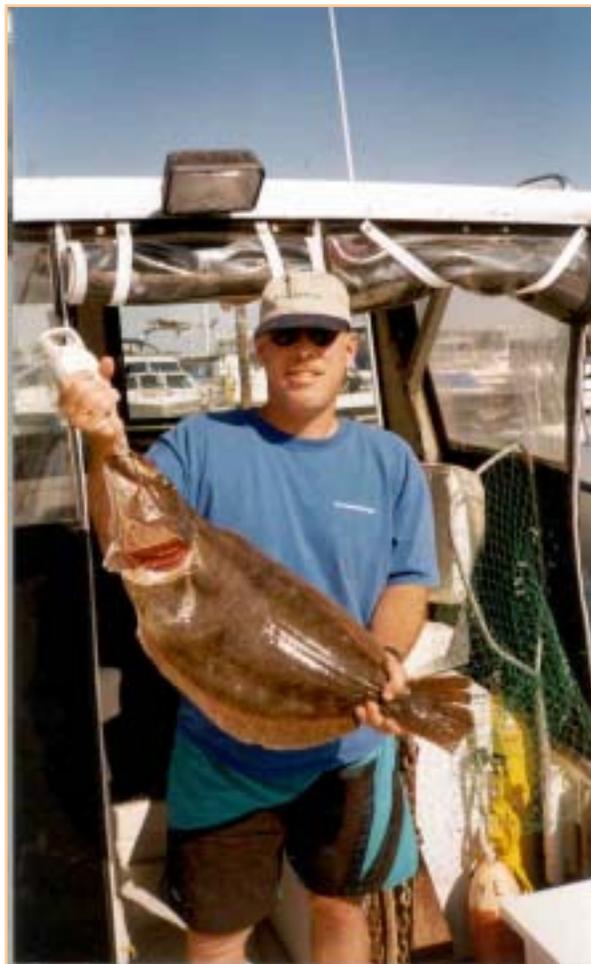
■ CT & NY implemented new rules to comply with the provisions and deadlines contained in fishery management plans of the Atlantic

States Marine Fisheries Commission. In NYS, the 2003 fishing season for summer flounder (fluke), scup (porgy), and striped bass was

expanded due to effective fishery management programs in NY, CT, and neighboring states.

- In 2003 the LISS Stewardship System Work Group, composed of federal, state, and local agencies and organizations, developed an inventory of places along the Sound's coast with significant ecological, scientific or recreational value. The Stewardship Initiative will identify priorities for land acquisition and protection, for increasing and improving public access, and for managing use conflicts. Save the Sound, Inc. (STS), Audubon New York (ANY), and the Regional Plan Association (RPA) continued to coordinate and support the work group, with technical assistance from the US Fish and Wildlife Service's Coastal program.

- The Management Committee approved a 2003 LISS research fund of \$300,000 to address several key areas of research on LIS, including living marine and marine-dependent resources. Research has concluded on five of nine projects that were selected for funding in 2000 and 2001, and four research projects are ongoing.
- The New York and Connecticut Sea Grant College Programs, with the National Marine Fisheries Service, CTDEP, and NYSDEC, continued to coordinate and manage the LIS lobster research initiative. Twenty research teams in eight states will be completing their research by mid-2004. A fourth and last symposium will be held in October 2004. More than \$7.5 million of federal and state dollars support the on-going research, extension, and resource monitoring and assessment work.



**SUMMER FLOUNDER IN LONG ISLAND SOUND, SUMMER 2003**

*Photo Courtesy of Peter Sattler, IEC*

**SUMMARY OF CCMP MANAGEMENT ACTIONS:  
MANAGING AND CONSERVING LIVING RESOURCES AND THEIR HABITATS**

<b>L-1. RESTORATION AND ENHANCEMENT OF AQUATIC AND TERRESTRIAL HABITATS (CCMP TABLE 40, P.107)</b>		
<b>Key Elements: Continue and enhance programs to restore tidal wetlands and other habitats. Develop a coordinated strategy to inventory and prioritize habitat restoration and enhancement needs.</b>		
	<b>2003 Description</b>	<b>2004 Planned Action</b>
1.	The LISS continued to support the New York and Connecticut habitat restoration coordinators and programs in 2003. The state coordinators provide technical assistance to municipal and local landowners and other partners in implementing the LISS habitat restoration plan.	The LISS habitat restoration program coordinator positions have been assigned to the LIS base program for continued support.
2.	In 2003 the Management Committee approved funding three habitat projects: 1) to perform an aerial infrared survey of NY tidal wetlands; 2) to create benthic infaunal community profiles for sediment types in selected LIS embayments in NY; and 3) to install eleven sediment erosion tables to study marsh losses in NY.	The projects will continue in 2004.
3.	The LISS Habitat Restoration Initiative - made up of representatives from CTDEP, NYSDEC, EPA, NOAA, NY Sea Grant, Save the Sound, USDA, and USFWS - continued working toward the LISS goal of 2000 acres of coastal habitat restored and 100 river miles reopened to anadromous fish passage by 2008. In 2003, 39.5 acres of coastal habitat were restored and 4.55 river miles were reopened for fish passage. As of December 2003, the LISS has restored 510 acres and reopened 48 miles of riverine migratory corridor toward its restoration goals.	Continue work in 2004.
4.	<p>CTDEP continues to award grants and participate in restoration of riverine migratory corridors (RMC) for anadromous fish in the streams and rivers of the state. In 2003, LIS Fund grants were awarded as follows:</p> <ul style="list-style-type: none"> <li>• \$25,000 for construction of a fishway at Queach Brook at the Supply Dam in Branford to restore anadromous fish passage to upstream spawning habitats for alewife and other migratory fish species, partnering with the Branford Land Trust</li> <li>• \$25,000 for construction of a fishway at the Gorham's Pond, or Upper Pond Dam in the Goodwives River in Darien to restore anadromous fish passage to upstream spawning habitats for alewife, blueback herring and other migratory fish species, partnering with Friends of Goodwives River, Inc.</li> </ul> <p>Other CT projects include:</p> <ul style="list-style-type: none"> <li>• completion of a fish ladder at Perry Bog on an unnamed tributary of the Mill River, Fairfield, CT, which opened 0.5 miles of RMC. The Town of Fairfield sponsored this project and CTDEP provided technical assistance. The fishway is a pool-and-weir design.</li> <li>• installation of a fishway at Lower Guilford Dam on the East River in Guilford, which opened 0.75 miles of RMC. The Guilford Lakes Improvement Association was the sponsor with help from American Rivers and CTDEP. The fishway is a hybrid design incorporating features of a rocky ramp and steepass designs.</li> </ul> <p>Not all migratory barriers within RMCs are dams. A poorly installed culvert on the Shunock River in North Stonington had blocked anadromous fish runs under all but the highest flow levels. In 2003, the property owner, Mashatucket Tribal Indian Nation removed the faulty culvert and replaced it with a fish-friendly culvert that opened 3.3 miles of RMC. CTDEP provided technical assistance.</p> <p>A total of 4.55 RMC miles in CT were opened up in 2003.</p>	<p>Continue to work with partners to open up additional fish passages and provide funding for design and construction of fish bypasses and ladders..</p> <p>Continue work toward the LISS goal to restore 100 RMC miles by 2008.</p>

	2003 Description	2004 Planned Action
5.	<p>Connecticut continued to restore degraded tidal wetlands through its existing programs and in collaboration with the Long Island Sound Study Habitat Restoration initiative. CTDEP has established a Tidal Wetland Restoration Team (i.e., USFWS, NMFS, NRCS, and Save the Sound) which identifies annual work priorities. Tidal flow was returned to a 0.4 acre marsh in East Haven on Morris Creek and 30 acres of <i>Phragmites</i> control was conducted at Great Meadows in Essex. Restoration plans were developed for Coastal Barriers, i.e., Ocean Beach in New London and Waterford Town Beach in Waterford. Restoration grants for these two beaches were received through the NRCS Wildlife Habitat Incentive Program (WHIP). Eradication of the highly invasive European dune grass, <i>Leymus arenarius</i> has occurred at Ocean Beach. Water chestnut harvesting continued on the Connecticut River in the greater Hartford area in attempts to prevent its spread downstream into Ramsar wetlands and embayments. With funding from the USFWS Silvio O. Conte Fish &amp; Wildlife Refuge, a seasonal staff person was hired to search lakes and ponds in the CT River drainage basin for new sites of infestation (none were found).</p> <p>Connecticut continued to use the Coves and Embayments Program to fund preliminary engineering, design and construction for the restoration of degraded coves especially those dominated by tidal wetlands.</p>	<p><i>Phragmites</i> control work will continue in 2004 at several sites.</p>
6.	<p>In the last several years, CTDEP has implemented a series of experimental restoration projects on the Connecticut River including herbicide treatments and a variety of ditch plugging strategies (to restore tidal hydrology and elevate salinity and sulfide concentrations). CTDEP is monitoring the effects of these experimental restoration techniques upon brackish marsh restoration. In 2003, LISS provided CTDEP with a grant to continue and expand that monitoring into 2004, which will be conducted by scientists at Connecticut College.</p>	<p>On-going</p>
7.	<p>In 2003, CTDEP used the following funding sources to implement habitat restoration projects: National Wetland Conservation Grant and Stewart B. McKinney funds (USFWS), Transportation Efficiency Act (FHWA), NOAA – Ducks Unlimited Funds, NRCS, CT Corporate Wetland Restoration, CT LIS Cleanup Account Funds, Lynde Point Land Trust, The Nature Conservancy, Borough of Fenwick, Partners for Fish and Wildlife (USFWS).</p>	<p>On-going</p>
8.	<p>The Westchester County Department of Planning and Soil and Water Conservation District continued to restore degraded natural resources in the Long Island Sound watershed using county appropriations and state and federal grants. Since 1999, the Department and District have completed 15 natural resources restoration projects. Six additional projects are funded and are in the design process. One of these projects has multiple components involving several sites along the Sheldrake River. The projects completed to date include freshwater and tidal wetland restoration, creation of vernal pools and coastal dunes, stream bank stabilization, stream channel restoration, and pond and meadow restoration. The objective of each project is to improve water quality and/or fish and wildlife habitat. In 2003, the Department and District stabilized the Sheldrake River banks in Columbus Park, Mamaroneck, NY, using bioengineering methods; curbed the spread of common reeds and restored part of the salt marsh at Rye Golf Club, Rye City, NY; created a wet meadow at Edith G. Read Natural Park and Wildlife Sanctuary, Rye City, NY; installed a stormwater management structure and restored part of a swamp at Nature Study Woods, New Rochelle, NY; and began work to eradicate burning bush and Japanese knotweed and replace them with native shrubs and trees at Nature Study Woods, New Rochelle, NY.</p>	
9.	<p>NYC Dept. of Parks and Recreation received a NYS Environmental Protection Fund (EPF) grant of \$100,000 to continue to implement the partially-funded Bronx River Waterfront Enhancement Project to remove invasive species, reduce river bank erosion, provide educational programming, and establish canoe/kayak launch sites. This will further work developed under a 2001 EPF award.</p>	
10.	<p>The USFWS Coastal Program worked with NYSDEC and other partners to study fish passage opportunities in the Oyster Bay area of Long Island.</p>	<p>Design should be complete and resources collected to implement passage that would return anadromous fish to the area.</p>
11.	<p>The USFWS Coastal Program assisted CTDEP, Coastal America, and corporations in exploring restoration opportunities and incentives to increase corporate participation in the Corporate Wetland Restoration Partnership (CWRP). Northeast Utilities chairs the group, and hosts monthly calls to discuss candidate restoration sites, progress on</p>	<p>Continue to work with the states, Coastal America and the corporate partners to expand the CWRP and implement</p>

2003 Description	2004 Planned Action
existing CWRP-sponsored projects, expansion of corporate sponsorship, and partnership improvements. The Coastal Program co-coordinated an event to celebrate and gain visibility for the Lynde Point marsh restoration in Old Saybrook, a project to which the CWRP contributed important funding. The Coastal Program also facilitated CWRP involvement (educational signage) for the Barn Island Wildlife Management Area.	priority restoration projects. The Coastal Program will help the CWRP as they plan an upcoming event to gain additional visibility for the CWRP.

**L-2. HABITAT PROTECTION AND ACQUISITION (CCMP TABLE 41, P.110)**

**Key Elements:** Maintain the effectiveness of permit programs (e.g. for wetlands, stormwater, dredging) to regulate use and development affecting aquatic resources and critical habitats. Expand acquisition programs and efforts to protect habitats from development and establish a reserve system of areas of land and water of outstanding or exemplary scientific, educational, or biological value. Manage Federal wildlife refuges.

2003 Description	2004 Planned Action
1. New York City's CSO facility planning projects for the Hutchinson River, Westchester Creek, the Bronx River, Flushing Creek and Bay, and Alley Creek are continuing at various levels of planning, design, and construction. Once completed, the facilities will minimize CSOs and protect habitats in these tributaries to the East River and Western Long Island Sound.	
2. NYS Environmental Conservation Law allows state agencies to designate Natural Heritage Areas on state properties they manage, providing state land managers with a tool to highlight and ensure the protection of rare animals, rare plants, rare natural communities, and the state's best examples of common natural communities. At this time, more than 2,400 rare species and significant natural community occurrences are on record on state lands. As designations are voluntary and are made by the agency responsible for each property, they continue to give state land managers the flexibility they need to balance myriad land uses and objectives. To begin this process, NY Natural Heritage needs to assess its database of more than 10,400 records to identify the subset of state lands that are known to support truly exceptional biodiversity concentrations. These areas can then be used by state agencies such as NYSDEC and the Office of Parks, Recreation, and Historic Preservation to establish a process for determining when Natural Heritage Area designations are appropriate on their properties. The cost of this project is \$24,000.	The project is scheduled for completion on or by March 31, 2004.
3. NYSDEC acquired four new state-of-the-art watercraft that will help Division of Law Enforcement personnel in marine and freshwater enforcement operations. The new 31-foot patrol boats are being added to NYSDEC's fleet to conduct marine and freshwater fisheries enforcement operations and to enforce the Navigation Law. The new boats were obtained through state funds and grants from the National Oceanic Atmospheric Administration, the National Marine Fisheries Service and the US Department of Commerce.	
4. The NYS legislature established the Long Island North Shore Heritage Area Planning Commission. The Commission's purpose is to preserve, protect, and enhance the cultural, historical and natural resources along the north shore of Long Island.	A management plan will be created. A consulting firm has been selected for the project.
5. The Westchester Community Foundation awarded a \$30,000 grant to the Teatown Lake Reservation, in Westchester County, to fund the design and implementation of a series of workshops for local municipalities regarding conservation easements. A consortium of nonprofit agencies including the Westchester Land Trust, the Hudson Highlands Land Trust, the Mianus River Gorge Preserve, and Teatown Lake Reservation have joined together to conduct a series of conservation easement workshops for municipalities. Elected and appointed officials, including zoning, planning and conservation boards, and wetlands commissions, professional staff, and <i>ad hoc</i> volunteer committee members will be invited from 24 targeted municipalities.	

2003 Description	2004 Planned Action
<p>6. Connecticut's open space acquisition program goals are to acquire 10 percent of the state's land area as open space held by the state, and not less than 11 percent of the state's land area held by municipalities, water companies, or nonprofit land conservation organizations as open space. The state currently owns 230,930 acres in its system of state park, forest, wildlife, fishery, and natural resource management areas. The Nature Conservancy has purchased a 144 acre parcel that abuts the Barn Island Wildlife Management Area. CTDEP is purchasing this property from TNC to expand the wildlife management area with the bulk of the funding, \$1.0 million from a USFWS grant under the National Wetlands Conservation Grant Program. The Barn Island marshes are one of the most significant wetland research areas on the entire eastern seaboard of the US, with over 50 years of continuous ecological investigations.</p>	
<p>7. In 2003, the USFWS National Wildlife Refuge System acquired Calf Island, a 28-acre island in Long Island Sound, as a unit of the Stewart B. McKinney Wildlife Refuge and a part of the National Wildlife Refuge system. Environmental education, research and recreation are among the activities that will be encouraged on Calf Island. The US Fish &amp; Wildlife Service is working to develop a Friends Group and is meeting with organizations interested in taking advantage of this facility.</p>	<p>The Stewart B. McKinney Refuge will continue its management and conservation of migratory birds and their habitats.</p>
<p>8. The USFWS Coastal Program continued work on the ecological component for the LIS Stewardship System in 2003. The FWS held meetings with resource experts from NYS and CT and developed criteria for identifying important habitat areas throughout the Sound. Data gathered through the resource inventory have been illustrated on maps, which will be presented to the public during a series of public meetings to be held early in 2004.</p>	<p>The FWS will participate in Stewardship Initiative Public Meetings and will complete the identification of the important habitat areas throughout Long Island Sound.</p>
<p>9. The USFWS Coastal Program coordinated with CTDEP in developing a grant proposal for \$1,000,000 for acquisition of 144 acres at Barn Island Wildlife Management Area. The team was successful, and the State of Connecticut received the full \$1,000,000 from the Service's Coastal Wetlands Conservation Grant program.</p>	<p>Continue to work with CTDEP to determine potential new proposals that can be developed for acquisition or restoration in 2004.</p>
<p>10. The USFWS Coastal Program assisted CTDEP and other partners in identifying important criteria for coastal area protection. The request for this assistance was based on CTDEP's pursuit of funding through NOAA's Coastal and Estuarine Land Conservation Program.</p>	<p>Continue assisting CTDEP in this grant program, as requested, by sharing expertise in ecological, GIS, or grant-writing realms.</p>

**L-3. INVENTORIES AND MANAGEMENT STRATEGIES FOR AQUATIC AND TERRESTRIAL HABITATS (CCMP TABLE 42, P.112)**

**Key Elements: Develop habitat management strategies for specific complexes or regions using a watershed perspective.**

2003 Description		2004 Planned Action
1.	NOAA's Office of Response and Restoration completed the production of Environmental Sensitivity Index (ESI) maps, printed in December 2001. CTDEP obtained hard copy ESI atlases and electronic data in 2002, and has reformatted the electronic data into a form that is compatible with CT GIS data. This mapping also includes Westchester County and portions of Queens County in New York.	Project complete.
2.	CTDEP continues to assist the CT Corporate Wetland Restoration Program (CWRP). In 2003 the CWRP provided funds for the Lynde Point marsh restoration, the Jordan Millpond riverine migratory corridor and for signage for the recent Barn Island Wildlife Management Area acquisition.	Work will be ongoing in 2004.
3.	The Town of Brookhaven received a \$50,000 Environmental Protection Fund Grant to prepare a water body management plan for Mount Sinai Harbor. The 455-acre embayment includes a designated Significant Coastal Fish and Wildlife Habitat with extensive tidal wetlands and shellfish beds, which accommodates 1,000 boats, and provides water dependent recreational opportunities. The water body management plan will integrate human uses with natural resource needs and identify specific actions to address ecological impairments.	
4.	NY Natural Heritage will determine and map the natural communities within selected lands administered by the National Park Service in New York to enable and enhance future inventories, monitoring, and management of the natural resources found within these areas. The project will utilize recent aerial photos and digital imagery to locate, identify, and map the natural communities of these areas, gather and analyze natural community data to develop a community classification for each of these areas, create maps of the natural communities present, provide attribute data (including plant species, cover, soil types, etc.) of the natural communities present, and assess the accuracy of the original mapping using Accuracy Assessment Protocols and refining the maps as necessary. The cost of the project is \$84,418 from the National Park Service.	The project is scheduled for completion on or by February 28, 2005.
5.	The Town of Southold, NY, has produced a Local Waterfront Revitalization Plan (LWRP). The LWRP includes a detailed explanation of the intent of the program (what it is designed to achieve) and the standards by which proposed actions will be measured. It contains detailed information about an existing Harbor Management plan as well as a blueprint for future Harbor Management Plans that will be adopted within the Town of Southold.	
6.	NYSDEC, ACOE New York District, NOAA/Fisheries Northeast Regional Office, and Northeast Fisheries Science Center are exploring the concept of performing mitigation in advance of certain in-water construction activities. For the present effort, these agencies are using American lobster habitat as a trial effort. Known lobster congregation areas have been identified and characterized, and suitable habitat enhancement materials located and evaluated. In this situation, beneficial use of rock is being considered to create cryptic habitat for lobsters.	
7.	2003 was the sixth year of a comprehensive assessment of state parks in New York. Findings from the five-year inventory effort have clearly demonstrated the presence of sensitive and diverse biological resources throughout the park system. They have also shown the importance of protecting these resources to the maintenance of biodiversity in the state as a whole. In this sixth year, NY Natural Heritage will (a) inventory properties acquired by the Office of Parks, Recreation and Historic Preservation in the last five years and (b) conduct additional targeted surveys on selected species and ecological communities throughout the state park system. Products will include seamless natural community maps for new properties at a scale of 1:12,000, maps and fact sheets on rare species and significant natural communities found, and detailed reports for each property. The cost of the project is \$200,000.	The project is scheduled for completion on or by March 31, 2004.

2003 Description		2004 Planned Action
8.	The Westchester County Department of Planning, in partnership with 14 Westchester County municipalities and three environmental organizations, began a 30-month study of the Bronx River watershed, which includes Grassy Sprain Brook and Kensico Reservoir. The river, which drains into the East River, is a tributary of Long Island Sound. The study will include recommendations to improve water quality and fish and wildlife habitat, largely by controlling polluted stormwater. Control methods will include the implementation of best management practices, improving land use regulations and plans, natural resources restoration, and public education and outreach. The intermunicipal committee overseeing the study, Watershed Advisory Committee 7 (WAC 7), is the fourth such committee to be formed for similar purposes. Previously, WACs 3, 4 and 5 developed and adopted watershed management plans of their own in 1998, 2001 and 1997, respectively. Each committee focuses on a subwatershed of the Long Island Sound watershed in Westchester.	
9.	Save the Sound, Great Eastern Ecology, and the Westchester County Departments of Planning, and Parks, Recreation and Conservation completed a study, funded with a NOAA grant, of current and potential tidal regimes at Manursing Lake (a.k.a., Playland Lake) in Rye City, NY. The purpose of the study was to determine how best to restore daily tidal fluctuations within the lake, a man-made coastal embayment, in order to promote the re-introduction and development of salt marshes and submerged aquatic vegetation.	Westchester County and the U.S. Army Corps of Engineers are evaluating implementation of the recommendations contained in the study.
10.	In 2003 the LISS Habitat Restoration Team completed five of the 12 planned habitat restoration modules. The subject habitats of the completed modules are tidal wetlands, freshwater wetlands, submerged aquatic vegetation, coastal grasslands, and coastal barriers, beaches and dunes. The report <i>Technical Support for Coastal Habitat Restoration</i> was printed in November 2003.	Continue work on seven remaining modules. In 2004, three habitat modules – riverine migratory corridors, shellfish reefs and estuarine embayments – will be prepared.
11.	The USFWS Coastal Program was asked to participate on the Steering Committee of the Waterbird Working Group. This effort extends far beyond the watershed of the LIS, but data and material produced by the workgroup will be applicable throughout the LISS.	Continue supporting the working group via participation on the Steering Committee.
12.	The USFWS Coastal Program, as part of the LISS Stewardship Initiative, has begun mapping the Sound's physical and benthic environment. Features being mapped include surf clam areas, mud flats, coastal bays, sand shoals, and sediment texture. Benthic mapping is useful for describing the conditions and characteristics of the Sound's bottom. This information supports efforts to describe and evaluate habitat types and locations in the Sound that are important to fish, shellfish and other sea life.	The USFWS Coastal Program will continue gathering data and mapping the Sound's physical and benthic environment and, with the Stewardship Initiative work group, will identify data gaps regarding the Sound's underwater resources.

#### L-4. MANAGING ENDANGERED AND THREATENED SPECIES (CCMP TABLE 43, P.116)

**Key Elements:** Continue endangered species programs and develop lists of Long Island Sound endangered species to aid management programs

2003 Description		2004 Planned Action
1.	NYSDEC's Natural Heritage Program's May 2003 <i>Rare Plant List</i> is posted on the agency's website at: <a href="http://www.dec.state.ny.us/website/dfwmr/heritage/plants.htm">http://www.dec.state.ny.us/website/dfwmr/heritage/plants.htm</a> .	NYSDEC NHP will re-evaluate the list in 2004.
2.	In 2003, CTDEP used funding from the "Endangered Species, Natural Area Preserves and Watchable Wildlife" account to expand Dr. Chris Elphick's project on salt-marsh sharp-tailed sparrows in coastal marsh habitats. Habitat work within many coastal areas such as Bluff Point for the endangered species New England Cottontail rabbit was also funded. The <i>Endangered Species/Wildlife Income Tax Check-Off Fund</i> , authorized under P.A. 93-233, allows Connecticut state income tax payers to donate a portion of their tax refund to support Connecticut's endangered species, natural area preserves and watchable wildlife.	Continue the program as funding allows.

	2003 Description	2004 Planned Action
3.	In 2003 CTDEP prohibited the taking of alewives and blueback herring from inland and marine waters of Connecticut. This action was initially taken in April 2002, which prohibition expired on March 31, 2003. The latest action by the DEP extends the prohibition from April 1, 2003 until March 31, 2004. CTDEP has also been removing obsolete dams, opening many miles of river habitat to re-colonization by river herring. When dam removal is not possible, the DEP builds fishways that allow fish to migrate past dams.	CTDEP will continue its other efforts to enhance river herring stocks by transplanting adult herring from streams with healthy runs into streams where runs have been eliminated or greatly depleted.
4.	In 2002 the LISS Small Grants program approved funding for Long Island University to continue the diamondback terrapin study (Dr. Draud, PI). The small grants project for 2003 included expanding the research to Mill Neck Creek. Seine netting and baited traps were used to capture 94 terrapins which included 39 recaptures. There was 100% retention of the PIT tags used. All the recaptures were from the same location as the initial capture. A total of 118 nesting females were observed. A nesting survey also began at Mt. Sinai Harbor but not a single nesting female was observed.	
5.	Five towns on eastern Long Island and the Nature Conservancy received a grant from the U.S. Department of the Interior for \$82,500 to protect piping plovers and their beach habitats, as well as other local threatened species.	

**L-5. MANAGING HARVESTED SPECIES (CCMP TABLE 44, P.117)**

**Key Elements:** Ensure safe consumption and enhanced production of harvested species through fishery management plans, improved fish passage and habitat improvements. Support related programs such as oyster cultch placement, artificial reef development, dredging windows, and incidental take of nontarget species or entrainment/impingement at industrial facilities

	2003 Description	2004 Planned Action
1.	In CT, several changes in the 2003 fishing season and minimum length sizes of several marine fish were implemented. The scup (porgy) season was expanded; striped bass length limits were lessened (down to 28") and a 2 fish creel limit, replaced the slot limit strategy in effect since 2000; for tautog an additional closed season was established from November 24th through December 31; for black sea bass there is a new minimum length of 12 inches and the implementation of two closed seasons; and for atlantic cod and haddock minimum length limits were set to 23 inches to match federal waters	CTDEP will continue to change and incorporate new fishing regulations as needed to manage harvested species.
2.	<p>In NYS, the 2003 fishing season for summer flounder (fluke), scup (porgy) and striped bass has been expanded due to highly effective fishery management programs in New York, Connecticut, and neighboring states.</p> <p>Recreational harvest of summer flounder (fluke) will be allowed all year, as opposed to former regulations which had an open season from May 2 through October 31. The minimum size limit of 17 inches total length and the seven fish possession remain unchanged.</p> <p>Recreational harvest of scup (porgy) will also be allowed all year. The previous regulations had an open season of June 25 through November 30 for all persons fishing aboard boats that hold a Party/Charter Boat license. For all other persons, the previous regulations allowed for harvest from June 25 through September 15 and October 1 through November 30. The minimum size limit of 10 inches total length and the 50 fish possession limit remain unchanged.</p> <p>An extension of the striped bass season has been put into effect in the waters around Long Island and New York City, and Hudson River waters south of the George Washington Bridge. Recreational harvest of striped bass will be allowed from April 15 through December 15. Previous regulations had an open season of May 8 through December 15. The minimum size limit of 28 inches total length and the one fish possession limit, two for persons fishing aboard boats that hold a Party/Charter Boat license holding a special striped bass permit, remain unchanged.</p>	

**L-6. MANAGING EXOTIC AND NUISANCE SPECIES (CCMP TABLE 45, P.120)**

**Key Elements: Develop measures to prevent the introduction of undesirable species and implement a program to reduce the abundance of mute swans.**

2003 Description		2004 Planned Action
1.	In 2003, a coordinated list of invasive species of concern in LIS was compiled by the US Fish & Wildlife Service, with assistance from the EPA-Long Island Sound Office, CTDEP, NYSDEC, and researchers at Williams College and UCONN.	Narrow list to priority species on which management activities should focus.
2.	CT Sea Grant and CTDEP received a grant from NOAA National Sea Grant in 2003 to support the development of a state management plan for aquatic nuisance species, following the guidance of the federal ANS Task Force.	A workshop will be convened in February 2004. Sub-committee work will continue throughout the spring, with an anticipated final draft by Fall 2004.
3.	In 2003 the CT legislature enacted Public Act 03-136, <i>An Act Concerning Invasive Plants</i> , which created a council that will publish a list of invasive plants, make recommendations to the legislature regarding plants that should be banned from sale and identify control measures and research for particular species. CTDEP staff also members of the CT Invasive Plant Working Group and last fall recommended that nursery grass <i>Leymus arenarius</i> from Europe be added to the invasive plant list as this species is highly invasive in sand dunes. This species was mistaken for American beach grass and was planted at Ocean Beach in New London.	The Council is required to submit a report to the legislature in 2004 including proposed revisions to the list of invasive plants.
4.	The CTDEP LIS License Plate program funded <i>A Research Study to Test the Hypothesis that Loss of Shallow Water Eelgrass Beds Can Be Attributed to Persistent Grazing by Resident Mute Swans and Canada Geese</i> . Studies in other New England states have demonstrated that mute swans can cause significant adverse impacts to eelgrass beds. This research will document the impacts to eelgrass in Long and Fishers Island Sounds.	
5.	New York State passed legislation that will help protect New York State's natural resources from invasive, non-native species of plants, insects and fish. The law will create a New York State Invasive Species Task Force charged with examining the factors surrounding the introduction of invasive species and the impacts they have on the State. The Task Force will be charged with assessing the nature, scope and magnitude of the environmental, ecological, agricultural, economic, recreational, and social impacts caused by invasive species in the State. The Task Force will identify actions that can be taken to: <ul style="list-style-type: none"> <li>• Prevent the introduction of invasive species;</li> <li>• Detect and respond rapidly to populations of invasive species in a cost-effective and environmentally sound manner;</li> <li>• Monitor invasive species populations accurately and reliably;</li> <li>• Provide for restoration of native species and habitat conditions in ecosystems that have been invaded;</li> <li>• Conduct research on invasive species and develop technologies to prevent introduction; and</li> <li>• Promote public education on invasive species and the means to address invasive species.</li> </ul>	
6.	The Westchester County Department of Parks, Recreation, and Conservation along with the Federated Conservationists of Westchester, have developed a program to replace invasive plants with native species in its 16,000 acres of parkland. For the past two years, the Department has planted only native shrubs, flowers and grasses while removing invasive plants. Called the "Go Native" program, it also encourages residents to replace non-native plants with those that evolved in the county.	

2003 Description		2004 Planned Action
7.	The Westchester County Department of Planning, using a \$140,000 grant from the USEPA, completed a project to prevent the spread of common reeds into a 35-acre salt marsh at Rye Golf Club, Rye City, NY. The Department, using a NYS Clean Water/Clean Air Bond Act grant, also began a two-year project to eradicate burning bush and Japanese knotweed from Nature Study Woods, New Rochelle, NY. Using a similar grant, it also completed a project to restore a former meadow by eradicating porcelain berry at Edith G. Read Natural Park and Wildlife Sanctuary, Rye City, NY. All projects replaced invasive and exotic species with native species.	
8.	Through a Cooperative Agreement with The Nature Conservancy, the US Fish and Wildlife Service Coastal Program is contributing to a program to monitor the efficacy of various Phragmites control techniques and their impacts on plant and animal diversity. In FY03 the Coastal Program put \$10,000 towards support of the monitoring of treated areas and dissemination of the 2002 findings. In addition to two publications, two poster sessions were presented at the New England Estuarine Research Society meeting in May.	The next year of field study will proceed with financial assistance from the USFWS Coastal Program.
9.	The CTDEP LISS habitat restoration coordinator is the lead for removal of the invasive aquatic plant water chestnut from waters of the Connecticut River and its tributaries. Three years of control efforts have resulted in near-eradication of the infestations in the CT and Hockanum Rivers.	Continue removal efforts with use of volunteers and hire an intern to coordinate volunteers and survey for new infestations.
10.	In August 2003, the LISS participated in a rapid assessment survey of aquatic invasive species from Casco Bay to the New York Harbor. This survey was coordinated by the Massachusetts Bays National Estuary Program and MIT Sea Grant, with support from EPA. In the Sound, the sampling was conducted off of permanent docks and piers located in Mystic, Milford, and Stamford, CT.	Upon completion of species identification by taxonomic experts, a final report summarizing the findings of the field sampling and detailing the species found will be published in 2004.

L-7. EDUCATING THE PUBLIC ABOUT THE PLANTS AND ANIMALS OF LONG ISLAND SOUND (CCMP TABLE 46,.120)		
<b>Key Elements:</b> Educate the public about the plants and animals of Long Island Sound and elicit volunteers to assist with plants and animals monitoring programs.		
2003 Description		2004 Planned Action
1.	The CTDEP Long Island Sound Fund gave an award to Sea Research Foundation to develop and distribute a <i>Marine Animal Response Guide</i> and to conduct workshops to educate municipalities, law enforcement agencies, educators and the general public about the proper response when a stranded marine animal is sighted. The Long Island Sound License Plate Fund will continue awards for habitat restoration and education projects benefiting LIS wildlife. Nineteen projects were funded in 2003 for a total of \$354,542. The complete project list is on: <a href="http://dep.state.ct.us/whatshap/press/2003/cr0522a.htm">http://dep.state.ct.us/whatshap/press/2003/cr0522a.htm</a>	
2.	CTDEP staff presented an overview of CT's wetland restoration program at the "Inaugural Estuarine Habitat Restoration" conference organized by Restore America Estuaries. CTDEP also gave an oral presentation on the role of permitting in assuring quality estuarine restoration projects. CTDEP staff was also invited to a Gulf of Maine restoration initiative to share its experience (technology transfer) regarding a variety of tidal wetland restoration techniques. The NOAA Coastal Services Center published an article regarding CT's wetland restoration program ( <a href="http://www.csc.noaa.gov/magazine/2003/02/conn.html">http://www.csc.noaa.gov/magazine/2003/02/conn.html</a> ).	Continue to educate the public on issues related to habitat restoration.

2003 Description		2004 Planned Action
3.	<p>The LISS Small Grant program funded:</p> <ul style="list-style-type: none"> <li>Southern Connecticut State University to produce a video tour of Outer Island in 2003.</li> <li>Suffolk County Cornell Cooperative Extension to produce a planetarium show on the LIS lobster fishery. The premiere, <i>Long Island Sound Lobster, A Fishery on the Brink</i>, was shown on September 19, 2003 at the Vanderbilt Museum &amp; Planetarium, Centerport, NY.</li> <li>CT Sea Grant to develop a website on invasive species in Long Island Sound and to develop informational cards to help marina operators cope with invasive species that biofoul their floating docks. The website will be hosted by CT Sea Grant and linked to the LISS website.</li> </ul>	The website and the cards will be completed by September 2004.
4.	<p>The Connecticut Sea Grant College Program, with support from the LISS, continued to distribute the booklet, <i>Living Treasures: The Plants and Animals of Long Island Sound</i>. More than 25,000 copies of the booklet were printed, and about 12,000 have been distributed to teachers, schools, environmental organizations, aquariums, and to the public free of charge. Copies may be obtained by contacting CT Sea Grant College Program, <a href="http://www.seagrant.uconn.edu/publ.html">http://www.seagrant.uconn.edu/publ.html</a>.</p>	Distribution will continue in 2004 as quantities are available.
5.	<p>Alley Pond Environmental Center received a \$10,450 New York City Environmental Fund Grant for development of a new curriculum, <i>Plants of Alley Pond Park</i>, continuation of programs in environmental science, and hosting of a volunteer day.</p>	
6.	<p>The Long Island Sound Watershed Alliance (LISWA) held its annual conference on <i>Marine Animals in LIS – Status and Trends</i> on March 29, 2003 at the New York Botanical Garden. The conference was attended by more than 150 participants.</p>	A May 2004 LISWA conference is planned.
7.	<p>The CT Sea Grant College Program sponsored a conference on <i>Marine Protected Areas as They Relate to Fisheries Management: An Educational Seminar</i>, on March 8, 2003 at the UCONN Avery Point Campus. The conference presented a number of views on MPAs, including theoretical impacts to fisheries, an assessment of no-take zones and several case studies.</p>	
8.	<p>In 2003 the LISS Habitat Restoration Team distributed the report <i>Technical Support for Coastal Habitat Restoration</i> to municipalities, towns and other interested parties. The restoration manual is also available on the LISS website at: <a href="http://www.longislandsoundstudy.net/habitat/index.htm">http://www.longislandsoundstudy.net/habitat/index.htm</a></p>	Continue distributing the restoration manual.

**L-8. DEVELOPING AN INFORMATIONAL DATABASE ABOUT LIVING RESOURCES AND THEIR HABITATS (CCMP TABLE 47, P.122)**

**Key Elements:** Develop and expand informational databases on living resources and their habitats with an emphasis on GIS data for resource management

2003 Description		2004 Planned Action
1.	<p>CTDEP reformatted many of its coastal data layers for incorporation into its intranet browser-based GIS project called ECO. CTDEP continues to work with the CT Dept. of Information Technology to make these data available to the public over the internet.</p>	Ongoing.
2.	<p>The UCONN Marine Sciences Center (Dr. Kremer, PI) is conducting preliminary studies of southeastern (CT) coves to evaluate and model the impacts of nitrogen upon biological communities. CTDEP provided Dr. Kremer with a CWA Section 319 nonpoint source grant to further his nitrogen loading and modeling studies for shallow water systems.</p>	The final report was due in Fall 2003.
3.	<p>Cornell Cooperative Extension, Suffolk County, NY, completed and published a report, <i>A Comparison of Small Mesh Traps for Sampling Juvenile Lobster (<i>Homarus americanus</i>) in Western Long Island Sound</i>, on sampling methodology for juvenile lobsters.</p>	

**L-9. SOUND-WIDE AND SITE-SPECIFIC RESEARCH AND MONITORING (CCMP TABLE 48, P.123)**

**Key Elements:** Continue and enhance monitoring of living resource populations with an emphasis on fishery surveys, colonial water birds, submerged aquatic vegetation, and lobsters.

2003 Description		2004 Planned Action
1.	New York City's <i>Use and Standards Attainment Project</i> conducted extensive biological sampling programs in the East River and its tributaries for ichthyoplankton, benthic and epibenthic biota, and fish. Sediment and water column sampling was conducted simultaneously. These programs are developing data for characterizing existing biotic abundance and diversity, and habitat. Use attainability is being evaluated and areas of opportunity are being identified for restoring, enhancing and protecting habitats in the East River, its tributaries, the Hutchinson River, Eastchester Bay, Alley Creek and Little Neck Bay in Western Long Island Sound.	Project is continuing.
2.	The LISS provided funding for CTDEP and NYSDEC to map eelgrass beds in eastern LIS. An MOA was developed with the National Wetlands Inventory Section of the USFWS. The photographic flight took place in Spring 2002. The FWS Coastal Program conducted field verification of suspected eelgrass beds based upon the aerial photography. In addition, the Coastal Program completed final eelgrass maps for the final report that was published in April 2003.	Pending approval of funding, the Coastal Program will update the survey in '05.
3.	The CTDEP marine fisheries program continued its fish trawl survey of Long Island Sound in 2003, funded with a 'Federal Aid in Sport Fish Restoration' grant from the USFWS.	CTDEP will continue to conduct trawl and estuarine seine surveys.
4.	In 2003 research concluded on the following LISS-funded project: <ul style="list-style-type: none"> <li>• <i>Assessment of the Causes and Extent of Morbidity and Mortality of American Lobsters (Homarus americanus) in Long Island Sound, UCONN Avery Point, Dept. of Pathobiology; (Dr. Richard French, PI) [\$170,643].</i></li> </ul>	Final report submitted

**L-10. LIVING RESOURCES AND HABITAT RESEARCH (CCMP TABLE 49, P.124)**

**Key Elements:** Identify priorities for research to fill gaps in our understanding of the Long Island Sound ecosystem and to assist management of living resources.

2003 Description		2004 Planned Action
1.	In 2003, research continued on the following research grant that was awarded by the LISS in 2001: <ul style="list-style-type: none"> <li>• <i>Salt Marsh Breeding Sparrows; (Dr. Chris Elphick, PI) [\$102,874].</i> Preliminary results may be obtained at: <a href="http://www.eeb.uconn.edu/faculty/Elphick/sparrows/saltmarsh_sparrows.htm">http://www.eeb.uconn.edu/faculty/Elphick/sparrows/saltmarsh_sparrows.htm</a></li> </ul>	Final report due September 2005
2.	The Long Island Sound Lobster Initiative held the third annual Lobster Symposium in Bridgeport, Connecticut in March 2003. Researchers presented preliminary findings in a number of key areas. The proceedings are available on the Lobster Initiative website: <a href="http://www.seagrant.sunysb.edu/LILobsters">http://www.seagrant.sunysb.edu/LILobsters</a> .	The research projects will be completed by mid-June 2004. A final LIS lobster health symposium will be held in October 2004.

2003 Description	2004 Planned Action
<p>3. Through the 2003 LIS Research Grant Program, the following three projects were selected for funding by the EPA-Long Island Sound Study, Connecticut Sea Grant, and New York Sea Grant partnership:</p> <ul style="list-style-type: none"> <li>• <i>Application of Remote Sensing Technologies for the Delineation &amp; Assessment of Coastal Marshes &amp; Their Constituent Species.</i> PIs: Dr. Daniel Civco, UCONN, and Dr. Martha Gilmore, Wesleyan University</li> <li>• <i>Food Webs In Long Island Sound: Review, Synthesis &amp; Potential Applications.</i> PI: Dr. Roman Zajac, University of New Haven</li> <li>• <i>Understanding the Role of Nutrient Enrichment in Tidal Marsh Loss in Long Island Sound.</i> PI: Dr. Shimon Anisfeld, Yale University</li> </ul>	<p>Continue to fund research on the Sound's living resources as funding allows.</p>
<p>4. CTDEP funded five research projects totaling \$96,184 through the LIS License Plate Program in 2003:</p> <ul style="list-style-type: none"> <li>• <i>Assessing the Impact of Mute Swan Grazing on Long Island Sound Eelgrass Beds - A research study to test the hypothesis that loss of shallow water eelgrass beds can be attributed to persistent grazing by resident mute swans and Canadian geese.</i></li> <li>• <i>Quantification Of Marsh Bank Erosional Processes Responsible For Loss Of High Marsh Habitat At The Charles E. Wheeler Wildlife Management Area.</i> A research study to quantify processes responsible for loss of high marsh habitat at Knells Island.</li> <li>• <i>Determining Winter Flounder Spawning Sites In Two Connecticut Estuaries.</i> A research study to determine winter flounder spawning habitat requirements and essential fish habitat of the winter flounder egg in New Haven Harbor and Milford Harbor.</li> <li>• <i>Invertebrates of Connecticut Coastal Strand Communities.</i> A research study to collect preliminary invertebrate inventory data for beach, sand dune and grasslands communities of the Connecticut shoreline as a first step in protecting these habitats and organisms.</li> <li>• <i>Identification Guide to the Larvae and Early Stages of LIS Ascidians and Bryozoans.</i> Creation of an identification guide to the early life stages of Long Island Sound ascidians (tunicates) and bryozoans (true moss animals), including drawings, descriptions and taxonomic keys.</li> </ul>	<p>Continue to fund and coordinate priority LIS research projects through the LIS License Plate program.</p>
<p>5. NYSDEC conducted a regional workshop on tidal wetlands losses observed in Long Island Sound at Stony Brook University in June 2003. The invitational workshop was attended by 50 federal, state and local scientists and managers. The goal of the workshop was to create a strategy to address the issue of unexplained tidal wetland loss in the Sound that included:</p> <ul style="list-style-type: none"> <li>• An assessment of current understanding of wetland loss processes;</li> <li>• A research agenda for Long Island Sound marshes;</li> <li>• Monitoring recommendations;</li> <li>• Management recommendations; and</li> <li>• Restoration recommendations.</li> </ul> <p>The workshop proceedings are available on the LISS website:  <a href="http://longislandsoundstudy.net/habitat/habitat_rest_wkshp_rpt03.pdf">http://longislandsoundstudy.net/habitat/habitat_rest_wkshp_rpt03.pdf</a></p>	

## RAISING PUBLIC AWARENESS AND PARTICIPATION THROUGH EDUCATION AND OUTREACH

A significant factor toward long-term CCMP effectiveness is the ability to increase public awareness of and participation in day-to-day activities designed to protect LIS. Educating LIS watershed residents and increasing the number of people that take an active interest in protecting and restoring the Sound helps to nurture long-term stewardship ideals in local communities. As the Sound is restored to a healthier state, public support based on these ideals will help ensure continued progress.

**CCMP Strategy:** The CCMP public awareness and outreach strategy identifies six major elements: 1) increasing community awareness and stewardship; 2) promoting understanding; 3) facilitating public participation; 4) increasing communication and cooperation; 5) enhancing education at all levels; and 6) securing funding.

**LIS 2003 Agreement Goal:** *Assure continued public access to Long Island Sound for aesthetic, recreational, cultural, and historical purposes and continue to identify and acquire open spaces that are essential for the ecological health and balance of the Sound.* There is one 2003 action item in this section: *1) identify a coordinated strategy for developing a Long Island Sound Stewardship System that: a) promotes conservation of open space, landscapes, and ecosystems; b) improves access to the Sound; c) establishes a listing of existing open space properties and prioritizes property types for natural resource conservation and natural resource-based outdoor recreation; d) incorporates the sites of outstanding and exemplary scientific, educational, or biological value identified by Action IV. 7; and e) promotes federal, state, local, and private funding for open space projects.* The LISS, through the Stewardship work group, developed information on the ecological, recreational and public access resources of the Sound and presented recommendations for public presentations on the Stewardship Initiative to the Management Committee in 2003. The Committee approved a series of public forums in 2004 to present options for the Stewardship Initiative.

**Environmental Indicators/Results/Trends:** Changing human behavior to improve the environment is an inherent goal of any environmental education and public outreach program. While it is difficult, at best, to estimate the direct effects of these programs on the population, several indirect indicators can be used. Demand for information on the health of the Sound from students, educators, researchers, managers, and the public continues to increase. The LISS world wide website has grown in the number of site visits over the last several years to more than 160,000 in 2003. The LISS Small Grants public participation program continues to receive more applications for projects than it can fund; these education and outreach projects continue to complete important environmental work valued far in excess of their cost.

### **2003 Highlights:**

- In 2003, LISS outreach and education program staff responded to more than 300 information requests, developed and staffed displays at 15 public events that reached more than 8,000 people; and conducted 13 presentations to combined audiences of 365 attendees. CTDEP produced three issues of the LISS-funded publication, *Sound Outlook*.
- The LISS inaugurated a new World Wide Website and address in 2003. Electronic "visits" to LISS websites web page continued in popularity, with more than 160,000 requests for web pages to the former website address. In addition, the LISS created a new website, [www.longislandsoundstudy.net](http://www.longislandsoundstudy.net), in mid-September that received an additional 25,000 page requests from 10,400 visitors. The LISS website includes fact sheets, slide shows,

newsletters, LIS links, and key federal and state LIS personnel contact information. The new website, with its interactive e-mail form, has helped to increase electronic requests for LISS products from about one per month to about 20 per month.

- The LISS published Sound Health 2003, a report on environmental trends in Long Island Sound. The report was sent to about 460,000 households as a Sunday newspaper insert in seven coastal papers in New York and Connecticut, with an additional 15,000 copies distributed to schools and community groups. Interest by schools using the report as an educational resource resulted in an additional printing of 20,000 copies.
- In 2003, the LIS Mentor Teacher Program was launched by CT Sea Grant. Three teams (9 certified teachers) of “mentor” teachers (grades K-4, 5-8, and high school) with experience in using LIS in their classroom curricula were established through an application process. After attending a planning session, the teachers were asked to prepare and offer a one-day workshop for their peers to demonstrate effective “tried and true” ways to incorporate age-appropriate information on the Sound into the classrooms.
- LISS outreach and education staff conducted or supported many workshops, seminars, symposia, and conferences on LIS issues in various locations throughout the LIS area during 2003.
- Through 2003, the LISS public information and education Small Grants Program has funded 120 educational, informational, and habitat restoration projects totaling over \$475,000. These projects assisted hundreds of teachers and thousands of school children, and produced more than 20,000 pieces of LIS literature. In 2003, LISS funded 15 small grants projects totaling nearly \$65,000.
- The CTDEP Long Island Sound License Plate Research Fund distributed more than \$354,000 for projects that benefit Long Island Sound in the following four categories: Education and Outreach; Habitat Restoration; Public Access; and Research.
- In May 2003, CTDEP, the Town of Stonington, and student volunteers from Pine Point School in Stonington, installed educational storm drain markers at Pine Point School and in nearby Birdland Neighborhood to help protect Long Island Sound.

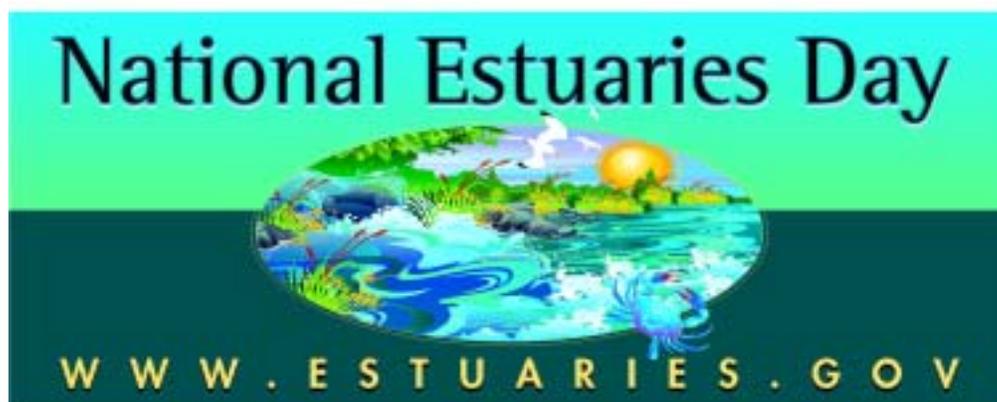


Figure 1

## SUMMARY OF MANAGEMENT ACTIONS: PUBLIC INVOLVEMENT AND EDUCATION

<b>E-1. COMMUNITY AWARENESS AND STEWARDSHIP (CCMP TABLE 51, P.146)</b>		
<b>Key Elements: The CCMP emphasized existing, and enhanced public involvement and education programs at local, regional and national levels to promote understanding and management of LIS. The development of informational materials for specific audiences including printed materials, public exhibits, educational curricula, and research programs were identified as primary outreach and education mechanisms.</b>		
	<b>2003 Description</b>	<b>2004 Planned Action</b>
<b>1.</b>	<p>The LISS Outreach Program:</p> <ul style="list-style-type: none"> <li>• responded to more than 300 information requests, developed and staffed displays at 15 events that reached more than 8,000 people; and conducted 13 presentations to a combined audience of more than 250;</li> <li>• gave LIS presentations to 5 Connecticut high schools informing more than 100 students about the LIS ecosystem and human impact issues;</li> <li>• produced and distributed more than 4,200 copies of the LISS <i>UPDATE</i> newsletter; the two issues covered the LIS Agreement and the Citizens Advisory Committee;</li> <li>• assisted in producing and distributing three issues of the CTDEP LIS newsletter <i>Sound Outlook</i> to a circulation of 2,759 in addition to making it available on the CTDEP website. The Sound Outlook page averages 130 hits per month.</li> </ul>	Staff will continue to respond to requests for information, provide presentations, staff displays at events, and publish the newsletter and other pertinent materials.
<b>2.</b>	<p>In 2003, LISS distributed 475,000 copies of Sound Health 2003, an environmental indicators report, in Sunday newspaper inserts as well as to community groups and schools. The high demand from schools led to a decision to publish 20,000 additional copies.</p> <p>In November, LISS published a Habitat Restoration technical manual for municipalities, and habitat restoration specialists for the Long Island Sound community. Habitat restoration specialists from around the country have also been requesting the manual.</p> <p>LISS reprinted 4,000 nonpoint source posters, educating the public about the pollution threat to the Sound from leaking motor oil, soap and oil residue from car washing, animal waste, and lawn fertilizer.</p> <p>CTDEP updated fact sheets and a FAQ (Frequently Asked Questions) on the TMDL and proposed Nitrogen Credit Exchange Program. The fact sheets have been posted on the CTDEP web site, <a href="http://dep.state.ct.us/wtr/index.htm">http://dep.state.ct.us/wtr/index.htm</a>.</p>	<p>Publish a biennial report that tracks the progress of LISS in the past two years, and provides the public with an understanding of the LISS program.</p> <p>Continue to distribute publications and posters and explore other venues for LISS messages.</p> <p>Update fact sheets to reflect activity of the first year of the Nitrogen Credit Exchange program.</p>
<b>3.</b>	<p>CTDEP continued to provide technical assistance and outreach to municipalities regarding coastal management and coastal nonpoint source pollution. A regional coastal management workshop was conducted in Old Saybrook, using the <i>Connecticut Coastal Management Manual</i> produced by CTDEP. The workshop included a review of mock site plans to help officials apply coastal management concepts learned during the workshop. A regional coastal nonpoint source workshop was also held in Middletown, geared toward municipal land use decision makers in non-coastal communities along the Connecticut River. Several fact sheets from the <i>Connecticut Coastal Management Manual</i> were made available to participants. The <i>Manual</i> is available on CTDEP's website <a href="http://dep.state.ct.us/olisp/manual/manual.htm">http://dep.state.ct.us/olisp/manual/manual.htm</a>. The "Focus on the Coast" workshop for coastal municipalities was being finalized in conjunction with the University of Connecticut's NEMO program, Sea Grant, and The Nature Conservancy, to highlight the need to protect submerged aquatic vegetation, tidal wetlands, and migratory fish.</p>	<p>Additional coastal management and coastal nonpoint source program workshops are planned in both coastal and non-coastal towns. "Focus on the Coast" workshops and materials will also be finalized and made available. A coastal nonpoint source website will be developed by CTDEP, as well as pamphlets explaining the various components of the state's coastal nonpoint source program.</p>
<b>4.</b>	<p>The New England Estuarine Research Society (NEERS), in cooperation with the Connecticut Sea Grant College Program, the LIS Foundation, the LIS Councils and Assembly, UCONN, CTDEP, and the New York Sea Grant Institute and EPA, continued planning for the 2004 biennial LIS research conference. LISS outreach staff supported conference planning in 2003.</p>	<p>The 2004 research conference will be held in Fall.</p>

	2003 Description	2004 Planned Action
5.	Working with the Waterfront Center, a LISS Small Grant program recipient on Long Island, LISS outreach staff provided a LIS presentation to 23 Realtors. The goal of the program was to provide realtors with information on LIS to share with new waterfront homeowners.	The Realtors requested future programs like this be provided to them. The Waterfront Center will follow up on this.
6.	The Marine Science Research Center at Stony Brook, with funding from New York Sea Grant, placed monitoring equipment on the Bridgeport Port Jefferson Ferry the PT Barnum. The project web site, <a href="http://www.stonybrook.edu/soundscience">www.stonybrook.edu/soundscience</a> displays the monitoring data. There is also a video monitor kiosk on the ferry for passengers to learn more about LIS.	This project is ongoing. The Management Committee approved funding in 2004 to continue the project for one year.
7.	Cornell Cooperative Extension produced a planetarium show on lobsters that is available for viewing at the Vanderbilt Planetarium in Centerport, NY on weekends. The project was funded by the Small Grants program. The Planetarium website is: <a href="http://www.vanderbiltmuseum.org/home.php?section=planetarium&amp;sub=programs">http://www.vanderbiltmuseum.org/home.php?section=planetarium&amp;sub=programs</a>	The show is available for viewing on weekends at the Vanderbilt Planetarium in Centerport, NY
8.	With LISS funding, CT Sea Grant purchased a table top display and graphics to utilize at various public venues to draw the public's attention to Long Island Sound. In 2003, the display was set up at four conferences, workshops, and events, including National Estuaries Day at Mystic Aquarium, and the Southern new England Marine Educators annual conference. At the Aquarium, it was paired with an interactive watershed model, introducing several hundred people to the concepts of runoff, nonpoint source pollution, and their impacts on Long Island Sound. Various LISS materials were made available to interested families.	The display will be set up at selected workshops and conferences during the year. More graphics will be purchased to provide more information about Long Island Sound.
9.	To promote water quality awareness around the globe, IEC took part in World Water Monitoring Day, October 18, 2003. Water quality parameters were measured in situ at 9 LISS stations. All data were input to the World Water Monitoring Day website, <a href="http://www.worldwatermonitoringday.org">www.worldwatermonitoringday.org</a> .	
10.	CT Sea Grant, under the auspices of the CT NEMO program and in collaboration with UCONN Cooperative Extension, was invited to give numerous presentations on environmental stewardship, reduction in nonpoint source pollution, and behaviour changes to protect water local water quality to homeowners, land trusts, garden clubs, and other groups. The workshops, including "Clean Waters" and "Rain Gardens" reached hundreds of people in CT during 2003. Handouts included the <i>Clean Waters</i> fact sheet series, 11 topics ranging from maintenance of septic systems, to proper use and disposal of household chemicals, to landscaping to reduce runoff and water use. Thousands of the fact sheets have been distributed, and they are currently in their third printing.	These presentations will continue to be given by CT Sea Grant and UCONN Cooperative Extension staff.
11.	The New York City Environmental Fund awarded \$10,000 to Neighborhood Initiatives Development Corporation to recruit, organize and train community youth and adults to reclaim a sector of the Bronx River through volunteer activities. New York City Environmental Fund projects foster restoration, care and public enjoyment of natural resources in New York City and designated parts of Westchester County. The New York City Environmental Fund was created in 1994 as part of an environmental enforcement settlement between the DEC and the Consolidated Edison Company (ConEd). Under the terms of the settlement, ConEd provided \$5 million to establish the fund for support of environmental stewardship and educational programs.	
12.	Coastal America, a long-term public-private alliance for coastal stewardship, has selected <i>The Partners to Revitalize Glen Cove's Waterfront</i> to receive a 2003 Coastal America Partnership Award for their outstanding endeavor to restore and protect the coastal environment.	
13.	The LISS procured six National Estuaries Day banners [see Figure 1, page 50] for use by staff for LIS displays around the Sound. The LISS set up a tabletop display in the lobby of the Stamford Government Center during CoastWeeks 2003.	Set up similar displays in 2004 for CoastWeeks and National Estuaries Day events.

2003 Description		2004 Planned Action
14.	The NY Sea Grant Program annually coordinates the review of the LISS Small Grants program, assembling a team of federal, state, and citizen partners to review proposals and make funding recommendations. In 2003, the US Fish and Wildlife Service, CTDEP, NYSDEC, EPA, and CAC participated on the Small Grants Program review team, helping to determine the most effective projects to fund as it they relate to programs, projects, and products that educate and involve the public in the protection and restoration of Long Island Sound and its watershed.	Continue the Small Grants Program review team.

E-2. PROMOTING UNDERSTANDING (CCMP TABLE 52, P.147)		
<b>Key Elements: An important component of the Public Involvement and Education priority of the CCMP is keeping the partner agencies and municipalities informed and abreast of LIS issues. It was the intent of the CCMP to have the states of Connecticut and New York incorporate LIS information into all related programs wherever possible. All coastal municipalities are to be provided with information on CCMP implementation and how it would affect their cities and towns. Additionally, the partners are to provide briefings to user groups and assess and support opportunities for training and educating the environmental decision making community and regulated community on LISS CCMP actions.</b>		
2003 Description		2004 Planned Action
1.	<p>The LISS issued a number of press releases to publicize important events affecting LIS:</p> <ul style="list-style-type: none"> <li>• <i>Attorney General Richard Blumenthal To Discuss Transmission Lines Crossing Long Island Sound At March CAC Meeting</i>, March 12, 2003.</li> <li>• <i>Long Island Sound Summit to Highlight Latest Research to Protect Marine Animals of the Sound</i>, March 26, 2003.</li> <li>• <i>\$90,000 in Small Grants Available for Work on Long Island Sound: Program Targeting Invasive Species Education, National Estuary Day Activities</i>, July 28, 2003.</li> <li>• <i>EPA, CT Sea Grant and NY Sea Grant Announce Grant Opportunities, Fellowship Program for Long Island Sound Research</i>, Aug. 15, 2003.</li> <li>• <i>Report on Long Island Sound Highlights Improvement in Water Quality; Cites Additional Needs</i>, Sept. 24, 2003.</li> <li>• <i>LISS Announces NEW CT and NY Fellows</i>, Oct. 20, 2003.</li> <li>• <i>LISS Announces Small Grants Winners</i>, Oct. 27, 2003.</li> </ul>	Continue to issue press releases as needed.
2.	The former LISS website was one of the most visited sites on the EPA Region I server in 2003, with visitors requesting more than 160,000 web pages. In September 2003 the LISS launched a new website, <a href="http://www.longislandsoundstudy.net">www.longislandsoundstudy.net</a> in which visitors requested an additional 25,000 pages, attracting 10,400 visitors. From September to December 2003 an average of 20 people per month contacted staff using the "LISS Feedback" e-mail address compared to an average of two per month generated by the former website. Many of these website visitors were requesting LISS public information and education products.	The LISS communications team will continue to work to update the new website in 2004, and further encourage the use of the internet to communicate with the public.
3.	CTDEP LISS Outreach staff continued as contributing editor of <i>Sound Outlook</i> , the CTDEP Long Island Sound newsletter. This newsletter is a cooperative effort between the Coastal Zone Management and National Estuary Programs at the state level. <i>Sound Outlook</i> has a circulation of 2,759 and is available on the CTDEP web site: <a href="http://dep.state.ct.us/olisp/soundout/soundout.htm">http://dep.state.ct.us/olisp/soundout/soundout.htm</a> . The Sound Outlook web page receives an average of 130 hits per month. Staff contributed seven articles and assisted in editing other articles.	Continue to publish <i>Sound Outlook</i> and cooperate with the LISS newsletter <b>UPDATE</b> .

2003 Description		2004 Planned Action
4.	In May 2003, IEC and its interstate counterparts with New York membership co-sponsored the New York Water Environment Association's Legislative Forum in Albany. Meeting in New York's capitol gave the six interstate Commissions the opportunity to emphasize to New York Legislature the scope of the combined agencies' efforts being undertaken to promote water pollution control and carry out water pollution abatement activities. On August 6, 2003, the Commission's annual Boat Inspection Trip toured a section of the Interstate Environmental District. Specifically, a 6-hour tour of the southern extent of the District, giving public officials, government agencies, the press and the public an opportunity to view the waterways and discuss water quality issues.	IEC and its interstate counterparts will co-sponsor the NYWEA Legislative Forum in Albany, NY on April 20, 2004. IEC is planning to conduct its annual boat inspection trip on August 4, 2004.
5.	Educational materials created in 2003 to complement the NEMO GIS products include a fact sheet entitled, <i>The Nissequogue River: A River of Special Significance</i> , and a NYSG NEMO presentation, <i>Linking Land Use to Water Quality: Protecting and Restoring the Resources of the Nissequogue River Basin</i> .	

### E-3. FACILITATING PUBLIC PARTICIPATION (CCMP TABLE 53, P.148)

**Key Elements:** The intent of the CCMP in terms of public participation is that "the public must be involved in setting policy for the Sound . . . as well as participating in the cleanup of the Sound through hands-on activities." The LISS partners are to provide financial and technical support for such activities as beach cleanups, habitat restoration projects, and storm drain stenciling. The EPA and states of Connecticut and New York are to promote citizen involvement in educational and volunteer monitoring activities in and around the Sound and providing technical assistance as needed.

2003 Description		2004 Planned Action
1.	The LISS funded 15 small grants projects totaling nearly \$65,000 in 2003. The American Littoral Society, Discovery Museum, Suffolk County Cornell Cooperative Extension, The Maritime Aquarium, Save the Sound, Inc, and Yale University's Peabody Museum received small grants funding for environmental education and implementation projects and programs for teachers and students.	LISS Small Grants funded 20 projects for 2004. The New York Sea Grant program will continue to manage the small grants program for the LISS.
2.	The New York Sea Grant program distributed 15 Long Island Sound stencils with the message, <i>Don't Dump, Drains to Long Island Sound</i> , to one group. The LISS reprinted one thousand copies of the LIS stenciling brochure in 2002.	Continue to distribute brochures and stencils to interested groups.
3.	The CTDEP Long Island Sound License Plate Fund provided more than \$89,500 in 2003 for education grants.	
4.	The CTDEP provided 68,000 free storm drain marker kits as part of a joint effort between the LIS Fund and NOAA to provide more source pollution education for towns (especially Phase II) and other environmental education institutions.	CT DEP plans to continue to provide free storm drain marker kits in 2004, available in English or Spanish.

	2003 Description	2004 Planned Action
5.	<p>The LIS Citizens Advisory Committee (CAC) met in January, March, June, September and December 2003 to identify and address issues concerning LIS and CCMP implementation. The CAC:</p> <ul style="list-style-type: none"> <li>• increased its membership base by adding the <i>Connecticut Harbor Management Association</i>, the <i>Westchester County Planning Department</i>, the <i>Regional Plan Association</i>, <i>Bartlett Arboretum and Gardens</i>, and <i>Save the River Save the Hills</i> as new members in 2003;</li> <li>• hosted Connecticut Attorney General Richard Blumenthal who discussed the state's position on underwater conduits;</li> <li>• approved a motion in December 2003 to advise the NYCDEP Commissioner that it is opposed to changing the BNR program as reflected in the April 2002 Consent Order without proof of ability to achieve existing reduction targets;</li> <li>• approved 2003 budget and work plans and recommended budget and work plan priorities to the Management Committee for 2004.;</li> <li>• briefed members of Congress on LIS priorities and problems in October 2003 as part of the Clean Water/Jobs coalition.</li> </ul>	<p>Quarterly meetings are planned for 2004.</p>
6.	<p>New York City Environmental Fund grants were awarded to:</p> <ul style="list-style-type: none"> <li>• The American Littoral Society, \$7,000 to support participation in the International Coastal Cleanup in New York City and Westchester County;</li> <li>• The Federated Conservationists of Westchester County, \$15,000 to support Westchester Environment Student Council, a high school student council fostering stewardship through education and field activities;</li> <li>• The Neighborhood Initiatives Development Corporation, \$10,000 to recruit, organize and train community youth and adults to reclaim a sector of the Bronx River through volunteer activities;</li> <li>• Rocking the Boat, \$15,000 for development and initiation of two projects designed to increase community access to and understanding of the Bronx River;</li> <li>• Project SPLASH, \$20,000 to develop a program for second graders from two different communities designed to nurture an awareness of the stewardship of natural areas through trips to the Hudson River and Long Island Sound; and</li> <li>• Alley Pond Environmental Center, \$10,450 for development of a new curriculum, "Plants of Alley Pond Park," continuation of programs in environmental science, and hosting of a volunteer day.</li> </ul>	

**E-4. INCREASE COMMUNICATION AND COOPERATION (CCMP TABLE 54, P.150)**

**Key Elements:** The CCMP commissioned the EPA and the states of Connecticut and New York, in combination with a Management Conference public outreach workgroup, to help coordinate ongoing governmental and non-governmental public outreach efforts. During the CCMP implementation phase, and thereafter, the partners are to encourage private and non-profit groups to continue to develop and implement LIS educational and outreach programs.

2003 Description		2004 Planned Action
1.	CTDEP LISS outreach staff continued to provide technical information and resources (about LIS and LISS CCMP actions) to CTDEP agency staff and to other state and federal agency partners to facilitate cooperation and outreach with each other and the public at large.	Continue to provide information and resources to state and federal agency staff.
2.	LISS outreach staff participated on the planning committee for the Atlantic Northeast Coastal Indicators Workshop.	Staff will attend Atlantic Northeast Coastal Indicators Workshop meetings in January 2004 and assist with follow-up outreach products.
3.	Acting on a bill passed by the Suffolk County Legislature, the county's Department of Health Services designed the three-hour course to cover a wide range of alternatives to pesticide use. The course, taught by Cornell Cooperative Extension, is open to pesticide applicators certified by the New York State Department of Environmental Conservation, people working under certified applicators and landscapers licensed through the Home Improvement Division of Suffolk County Office of Consumer Affairs.	

**E-5. ENHANCE EDUCATION AT ALL LEVELS (CCMP TABLE 55, P.151)**

**Key Elements:** A key objective for the LISS involvement and education program is to develop, among the citizens of CT and NY, a long-term sense of environmental appreciation for and understanding of the Sound by enhancing educational opportunities at all age levels. The States of Connecticut and New York are to work with appropriate school districts in their respective states to develop Long Island Sound educational materials to integrate into existing primary and secondary school curricula. The partners are to encourage natural history museums and nature centers to promote LIS issues within their programs and provide support for teacher training and workshops integrating LIS issues.

2003 Description		2004 Planned Action
1.	In May 2003, CTDEP, the Town of Stonington, and student volunteers from Pine Point School in Stonington installed educational storm drain markers at Pine Point School and in nearby Birdland Neighborhood to help protect Long Island Sound.	More Connecticut schools will be encouraged to participate in storm drain education and marking projects for 2004.
2.	The LIS Mentor Teacher Program was launched by CT Sea Grant. Three teams (9 certified teachers) of "mentor" teachers (grades K-4, 5-8, and high school) with experience in using LIS in their classroom curricula were established through an application process. After attending a planning session, the teachers were asked to prepare and offer a one-day workshop for their peers to demonstrate effective "tried and true" ways to incorporate age-appropriate information on the Sound into the classrooms.	Continue in 2004.
3.	NY Sea Grant, as a member of the Executive board of the NYS Marine Education Association (NYSMEA), distributed new LISS materials to members and kept them informed of LISS activities. Staff assisted with planning the NYSMEA annual conference.	Staff will continue on the Board and distribute information. Staff will also assist with the organization of the yearly conference to be held at Southampton College, June 4 - June 6, 2004.
4.	Yale University sponsored a series of public meetings under the auspices of the Curtis and Edith Munson Distinguished Lecture Series, <i>The Science and Policy of Coastal Eutrophication and Restoration</i> . Four lectures were conducted on November 4, November 11, November 18 and December 2 covering Chesapeake Bay, Long Island Sound, Gulf of Mexico, and National Policy respectively. Dr. Walter Boynton presented <i>Eutrophication of Chesapeake Bay: Historical Origins, Ecological Impacts, and Probable Future Trends</i> ; Dr. James Kremer presented <i>General Model of Eutrophication in Shallow Embayments</i> ; Dr. Quay Dortch presented <i>Troubles in the Gulf of Mexico: Dead Zones, Toxic Algae, and Diversions</i> ; and Dr. Robert Howarth presented <i>Nitrogen Pollution in the U.S.—Trends in Sources, Fluxes, and Steps Toward Solution</i> .	

**E-6. SECURE FUNDING (CCMP TABLE 56, P.152)**

**Key Elements: Connecticut, New York and the EPA are to publicize grant opportunities whenever possible and to encourage all organizations associated with the public involvement and education effort, both governmental and non-governmental, to take advantage of the various grant programs available that provide funding for educational activities and products. Private sector funding should also be sought when and wherever possible and identify other grant programs for which LIS projects would be eligible.**

	<b>2003 Description</b>	<b>2004 Planned Action</b>
1.	The LISS released a Request for Proposals (RFP) in 2003 for the 2004 CCMP Enhancements Projects programs, which included an element for public information and education projects. The EPA LISO developed a new Catalog of Federal Domestic Assistance description for the LISS grant program, which will be included in a 2004 edition of the Catalog published biannually by the Office of Management and Budget. The CFDA listing will publicize the availability of LISS funds to interested parties in the central federal repository for such information.	CCMP Enhancement projects will be selected and implemented as funds allow in 2004.
2.	EPA announced its annual Environmental Education Grants program in 2003.	Selected projects will commence in 2004.
3.	The CTDEP Long Island Sound License Plate Fund distributed nearly \$354,000 for projects that benefit LIS in the following four categories: Education and Outreach, Habitat Restoration, Public Access, and Research. A list of past awards is available on the CTDEP web site at <a href="http://dep.state.ct.us/olisp/index.htm">http://dep.state.ct.us/olisp/index.htm</a> .	CTDEP has issued its Request for Proposals for 2004 with an application deadline of March 17, 2004. Grants of up to \$25,000 will be awarded in May.
4.	Since the inception of the LISS Small Grants Program, the LISS has provided funds for 120 projects totaling more than \$475,000. These projects assisted hundreds of teachers and thousands of school children, and produced over 20,000 pieces of literature. In 2003, the LISS provided grant funds totaling \$65,000 for 15 projects.	20 projects will be underway in 2004. The 2005 small grants RFP will be issued in Summer 2004.
5.	The CTDEP announced \$249,229 in grants awarded to coastal municipalities and regional planning agencies in Connecticut. Through DEP's Office of Long Island Sound Programs, eleven projects received grants to address coastal planning issues such as waterfront redevelopment, residential docks, and storm water management. The funding for the grants to the municipalities and planning agencies for purposes of developing new Harbor Management Plans or updating coastal Conservation and Development plans was made possible through an increased federal grant allocation from the NOAA Office of Ocean and Coastal Resource Management. These eleven grants will provide the recipients with an opportunity to improve their existing coastal planning programs, as well as to provide for more public education and outreach opportunities about various emerging issues along the coast.	These grants will help address a number of significant planning challenges that are critical to balancing development with the preservation and protection of our natural coastal resources.
6.	LISS staff continued to make available information and announcements from a number of grant programs sponsored by Federal or state agencies, including NOAA, USFWS, EPA research and regional or special educational grant programs, NYS Clean Air/Clean Water Bond Act, and CT License Plate/Clean Water Fund programs.	Coordination and distribution of information will continue in 2004.

CONTINUING THE MANAGEMENT CONFERENCE**Long Island Sound Study  
Comprehensive Conservation and Management Plan  
Actions**

- M1-1.** Formally extend the Management Conference for a minimum of five years to continue coordination and oversee implementation of the management plan. The Citizens Advisory Committee will remain part of the Management Conference structure.
- M1-2.** Continue and expand the role of the EPA Long Island Sound Office, consistent with the requirements of the LIS Improvement Act of 1990. Funding is available in FY 1994, but will be required in future years.
- M1-3.** Continue state program coordination and involvement in the Management Conference. Funding is available in FY 1994, but will be required in future years.
- M1-4.** Maintain public involvement and education efforts with an added focus on local government involvement. Funding is available in FY 1994, but will be required in future years.
- M1-5.** Establish delegation of authority to allow the EPA Long Island Sound Office to support projects of studies as authorized by the Long Island Sound Improvement Act.
- M1-6.** Advocate modification to Clean Water Act § 320(g)(2) to allow the EPA to provide base funding through cooperative agreements to National Estuary Programs that complete their management plans.
- M1-7.** Develop a coordinated monitoring plan to assess the effectiveness of implementation, considering innovative approaches and building upon existing programs.
- M1-8.** Coordinate data management efforts between Long Island Sound and New York-New Jersey Harbor Estuary Program (HEP), including support for a system wide data manager.
- M1-9.** Modify the current structure of the LISS as needed to oversee implementation of the plan.
- M1-10.** Ensure that the LISS is consistent with existing state coastal zone management (CZM) policies.
- M1-11.** Incorporate relevant elements of the plan into the state CZM program for federal consistency review.
- M1-12.** Continue to support and enhance data management, analysis and reporting.
- M1-13.** Prepare an annual progress report on implementation including recommendations to redirect efforts.
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HYPOXIA

**H1-1.** The states of New York and Connecticut will continue their point and non-point source permitting and enforcement programs as a primary mechanism of pollutant load reduction. Fundamental to the direction of these programs are the states' water quality standards and classifications that provide the basis for management policies and decisions.

**H1-2.** The state of New York will ensure compliance with the consent order to upgrade the Newtown Creek plant to provide secondary treatment with biological nutrient removal retrofit modifications.

**H1-3.** The state of Connecticut will freeze nitrogen discharges and, if appropriate, explore opportunities to reduce nitrogen discharges at three industrial facilities with significant nitrogen discharges.

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**H1-4.** The municipalities in the states of Connecticut and New York will implement biological nutrient removal retrofits to reduce the load of nitrogen to the Sound on an interim basis.

**H1-5.** Conduct feasibility studies and pilot demonstrations for nitrogen removal at 13 of its [NYC] 14 sewage treatment plants, with actual design for Newtown Creek.

**H1-6.** Westchester County will investigate sludge re-handling at their four facilities to determine if opportunities exist for nitrogen load reduction.

**H1-7.** The state of New York will continue to seek to reach agreement with Belgrave, Great Neck East Shore, Huntington, Oyster Bay, Port Washington, and Kings Park on permit modifications for implementing the no net increase in nitrogen policy.

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**H2-1.** The states of Connecticut and New York will continue to use their existing authority to manage non-point source pollution and appropriate federal grants such as CWA§ 319, 604(b), and 104(b) to carry out projects that will help prevent increases and, to the extent practicable, achieve reductions in the non-point source loads from high priority drainage identified in the CT and NY portions of the watershed.

**H2-2.** The states of CT and NY are developing their coastal non-point source control programs, as required by §6217 of the Coastal Zone Management Act.

**H2-3.** The states of CT and NY will continue to implement general storm water permit programs to control the discharge of storm water from industrial, construction, and municipal activities, in accordance with EPA's national program regulations. These permits will regulate discharges from construction activity greater than five acres and from eleven industrial categories.

**H2-4.** The states of CT and NY will continue to implement their existing permitting programs, such as the inland and tidal wetland programs, to address non-point nutrient control with respect to LIS management needs, as appropriate.

**H2-5.** The states of CT and NY will implement the requirements of the reauthorized Clean Air Act to achieve additional nitrogen emission controls. Major actions include reduction of nitrous oxide emissions through adoption of statewide enhanced vehicle inspection and maintenance programs and stricter emission controls for stationary sources such as power plants.

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**H2-6.** The EPA will make non-point source management of nitrogen and other pollutants identified by the LISS, through wetlands and riparian zone protection as well as best management practices implementation, high priorities for funding under §319, 104(b), and 604(b) of the Clean Water Act.

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**H2-7.** Investigate expansion of storm water permitting programs to regulate communities with populations fewer than 100,000 that border Long Island Sound within high priority management zones.

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**H2-8.** In cooperation with the state of New York, Westchester County is developing a non-point source management plan that will include implementing best management practices for non-point source nitrogen control, monitoring their effectiveness and establishing a Westchester County management zone (or bubble) for assessing compliance with the nitrogen load freeze.

The LISS will explore extending the bubble concept to other management zones throughout Connecticut and New York state portions of the Long Island Sound drainage.

**H2-9.** Westchester County will implement the recommendations of the County Executive's Citizens Committee on Non-point Source Pollution in Long Island Sound.

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**H2-10.** Point and non-point nitrogen load estimates will be made in the City of Stamford to assess feasibility of a point/non-point source *trading*

program. A cost-effective mix of management options will be proposed that may be used to help decide how nitrogen reduction targets can be met once they are established.

**H2-11.** New York state will pursue the expansion of the State Building Code to include provisions for erosion and sediment control and storm water practices for all construction activities in order to prevent increases in non-point nitrogen runoff.

**H2-12.** Provide technical assistance to coastal municipalities to address impacts of hypoxia in their municipal regulations and plans of development, as required by law.

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**H2-13.** Advocate the use of the June nitrate test on agricultural lands to ensure that fertilizer applications to crops do not exceed crop needs.

**H2-14.** In addition to continuing general storm water permitting programs, the state of New York should determine if the general permit adequately regulates nitrogen from activities subject to national storm water regulations.

**H2-15.** Explore the expansion of current requirements for federally licensed or permitted projects to obtain a water quality certification in New York to protect water quality from sources of pollution to include all projects adjacent to wetlands and other sensitive areas (e.g., adjacent to wetlands) or those that exceed a minimum size (e.g., greater than one acre).

**H2-16.** The states of Connecticut and New York should develop a habitat restoration plan that includes a list of potential project sites and priorities. Wetland projects that are in close proximity to priority nitrogen management areas should be highlighted.

**H2-17.** Evaluate Maryland's *Critical Areas* regulations and the reported nutrient reduction benefits and make recommendations of the potential value of a similar program for Long Island Sound.

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**H3-1.** The LISS will complete work on the LIS 3.0 model and the necessary management scenario projection runs.

**H3-2.** Develop LIS 3.0-based dissolved oxygen targets and nitrogen load reduction targets for each management zone.

**H3-3.** Establish a firm timetable for achieving, within 15 years, the load reduction targets by zone, with progress measured in five year increments.

**H3-4.** Develop zone-by-zone plans to achieve the nitrogen load reduction targets.

**H3-5.** Encourage and support development of innovative, cost-effective technologies to reduce point and non-point sources of nitrogen.

**H3-6.** Periodically recalibrate LIS 3.0 to reflect the changing conditions of the Sound and use it to explain these changing conditions and to evaluate proposals to modify the management plan, as necessary.

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**H4-1.** Increase funding of the Connecticut and New York State Revolving Fund Programs to meet statewide wastewater control needs, including Long Island Sound nitrogen control needs.

**H4-2.** Appropriate \$50 M to fund a *Long Island Sound Challenge Grant Program*, a significant portion of which would be used to ensure that the Phase III nitrogen control efforts get off to a fast start with full local government cooperation.

**H4-3.** Fully fund the non-point source control programs under §319 of the Clean Water Act and §6217 of the Coastal Zone Act Reauthorization Amendments to support additional non-point source management activities.

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**H5-1.** The states of Connecticut and New York, New York City, and the Interstate Sanitation Commission will monitor dissolved oxygen and nutrients in Long Island Sound, its major tributaries, and key sewage treatment plants.

**H5-2.** Develop a coordinated monitoring plan to assess the effectiveness of implementation, considering innovative approaches and building upon

existing programs.

**H5-3.** As part of a combined National Estuary Program Action Plan Demonstration Project and a CTDEP Long Island Sound Research Fund project, the EPA and the state of Connecticut will complete a demonstration project designed to evaluate and quantify the benefits of a riparian zone in the denitrification process.

**H5-4.** The state of Connecticut, through its Long Island Sound Research Program, has solicited proposals to identify the role of riverine transport in attenuating the load of nitrogen delivered to the Sound in the Housatonic or Naugatuck Rivers. If an acceptable proposal is identified, it will be a priority for funding in 1994.

**H5-5.** The state of Connecticut, through its Long Island Sound Research Program, will continue to fund atmospheric deposition monitoring of nitrogen at two coastal locations through May, 1994.

**H5-6.** The EPA Office of Research and Development will continue to develop regional dissolved oxygen criteria for marine and estuarine waters.

**H5-7.** The NYSDEC will complete its initial study on the effects of hypoxia and disease on Long Island Sound lobsters.

**H5-8.** Continue long-term dissolved oxygen and nutrient monitoring of the Sound, its major tributaries, and key sewage treatment plants.

**H5-9.** Continue to monitor finfish and crustaceans of the Sound with emphasis on determining population response to low dissolved oxygen.

**H5-10.** Continue to monitor the effects of hypoxia on disease of lobsters.

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### **PATHOGEN CONTAMINATION**

**P1-1.** Continue CSO implementation and update overall management plans to assure implementation addresses bathing beach and shellfish closures and is consistent with water quality standards.

**P2-1.** Implement the state nonpoint source management initiatives supported from Section 319 funding

**P2-2.** Develop state coastal nonpoint source control programs, as per Section 6217 of the Coastal Zone Management Act to address the nonpoint source pathogen load from the LIS coastal zone.

**P2-3.** Implement general storm water permit programs to control the discharge of storm water from industrial, construction, and municipal activities, as per EPA regulations.

**P2-4.** Provide technical assistance to coastal municipalities to address impacts of pathogens in their municipal regulations and plans of development, as required by state law.

**P2-5.** Pursue changes of the State Building Code to include provisions for storm water management.

**P2-6.** Initiate a pilot program to control storm water discharges using enforceable instruments (i.e., permits or consent agreements). Connecticut and New York will evaluate the effectiveness of the pilot program for more widespread implementation.

**P2-7.** Expand current requirements for federally licensed or permitted projects to obtain a water quality certification to include all projects in sensitive areas or where a contaminant or parameter is found to exist at or exceeding a threshold value.

**P3-1.** Minimize malfunctions of treatment systems and eliminate dry weather overflows and illegal hookups to storm sewers through aggressive management programs. Ensure prompt notification and response and take quick enforcement action.

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**P3-2.** Identify and take priority enforcement actions to control wet weather overflows from sewers caused by excessive infiltration and inflow.

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**P3-3.** Implement a beach and shellfish closure action plan to take immediate corrective and priority enforcement actions addressing improperly treated municipal discharges. Preventable incidents involving beaches and shellfish areas will be emphasized.

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**P4-1.** During the permitting process, minimize the impacts of boat dockage facilities and temporary live-aboard anchorages by considering their proximity to productive and certified shellfish waters, existing boat channels, wetlands, and critical habitat areas, and tidal flushing.

**P4-2.** Consider the impacts of vessel discharges through appropriate resource management and recovery programs and limit or condition the siting or operation of boating facilities as necessary to minimize such impacts.

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**P4-3.** New York and Connecticut will apply to the EPA to create vessel *No Discharge* areas in specific embayments and harbors after ensuring the sufficient availability of pump-out stations and treatment facilities.

**P4-4.** New York state has identified Huntington and Lloyd Harbors as areas requiring additional protection and the EPA has Public Noticed its tentative determination that there are adequate pump-out facilities in these areas.

**P4-5.** Connecticut, through a 319 grant, will ensure completion of a marina and mooring area water quality assessment guidance document. Connecticut has also completed a marinas *best management practices* project report for nonpoint sources of pollution, which may be used to develop requirements for use of certain best management practices at marinas. New York state will review these documents for potential incorporation into state management programs.

**P4-6.** Complete regulations to require pump-out facilities as required by, and in accordance with, state law.

**P4-7.** The states of Connecticut and New York have received funding from the Federal Clean Vessel Act to conduct a pump-out needs survey, determine the effectiveness of existing facilities, develop and implement plans for construction of additional pump-out stations by marinas and prepare education/information plans.

**P4-8.** Collect information on sewage discharge controls in Long Island Sound, disinfection chemicals used, boater education and sewage treatment plant acceptance of pump-out wastes. Evaluate availability of treatment capacity for pump-out wastes and secure commitments from municipalities to accept these wastes.

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**P5-1.** Connecticut and New York are coordinating management actions with local governments when on-site septic systems are found to be failing and impacting shellfish growing areas and bathing beaches.

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**P5-2.** Continue and enhance management actions with local governments when on-site septic systems are found to be failing and impacting shellfish growing areas and bathing beaches.

**P5-3.** Evaluate existing septic system controls (including system monitoring, required maintenance and repair and replacement of failing systems) to determine if they are sufficient to protect coastal ecosystems and recommend changes to local governments.

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**P6-1.** Develop and implement a public education plan, targeting specific audiences, in cooperation with federal, state and local public outreach experts and environmental education.

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**P7-1.** Review existing data and reports and the recommendations of the Monitoring Workshop to identify shell fishing or bathing area in need of further assessment.

**P7-2.** Perform bacterial surveys of harbors and embayments to identify contaminated shellfish areas and potential sources of pathogens as required by the National Shellfish Sanitation Program.

**P7-3.** Use seasonal or conditional certification of shellfish harvest areas, as may be warranted by water quality variations, under guidelines provided by the National Shellfish Sanitation Program.

**P7-4.** Meet annually with health directors of coastal municipalities to refine monitoring and bathing beach closure protocols and share information

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**P7-5.** Evaluate existing monitoring programs and, as necessary, make recommendations for enhancements.

**P7-6.** Conduct a workshop to determine appropriate and consistent methods for bathing beach monitoring and laboratory analysis and work to adopt, if feasible, common methods.

**P7-7.** Implement the recommendations of the LISS Monitoring Plan to enhance pathogen monitoring.

**P7-8.** Develop and conduct a dry and wet weather sampling program for specific drainage basins. Both states will evaluate this pilot program for possible expansion.

**P7-9.** Assess the impacts of identified point and nonpoint sources and assign priorities to areas where management actions are most likely to be beneficial. Priority criteria will include viability of the resource, feasibility and cost-effectiveness of management. Enhance state bacterial surveys of harbors and embayments to identify contaminated shellfish areas and potential sources of pathogens.

**P7-10.** Support the efforts to develop a better understanding of the relationship between pathogen indicators and the risk to public health such as the National Indicator Study.

**P7-11.** Along with supporting the National Indicator Study, investigate funding for a regional epidemiological survey to determine the relationship between waters of varying indicator quality and public health.

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### TOXICS CONTAMINATION

**T1-1.** The states of Connecticut and New York and the Army Corps of Engineers will continue to regulate dredging and the disposal of dredged sediments through the existing permit programs.

**T1-2.** The states of Connecticut and New York and the EPA will continue their pretreatment programs to ensure that toxic discharges to sewage treatment plants are controlled. The states of Connecticut and New York, through their Pollution Discharge Elimination System Programs, will continue to ensure that facilities comply with their permit limits.

**T1-3.** The states of Connecticut and New York and the EPA will apply pollution-prevention techniques, as appropriate, to both direct and indirect discharges of toxic substances by emphasizing wastewater minimization, recycling of wastewater, and alternative processes and chemicals to reduce toxicity and toxics loads and to minimize effects on all environmental media.

**T1-4.** The states of Connecticut and New York will review municipal and industrial discharge permits to surface waters to reduce the allowable concentrations of toxic pollutants from the previous permitted values.

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**T1-5.** The LISS will encourage adequate funding to continue and expand pollution prevention site visit programs targeting industrial dischargers to the Sound and its tributaries.

**T1-6.** As part of the NY-NJ Harbor Estuary Program, total maximum daily loads, wasteload allocations for point sources, and load allocations for nonpoint sources will be developed to ensure that water quality standards for mercury are met in the Harbor, the East River, and Long Island Sound.

**T1-7.** As part of the New York - New Jersey Harbor Estuary Program, the states of New York and New Jersey will establish water quality-based effluent limits for copper, mercury, and six other toxic metals, as necessary. Permits will be subsequently modified.

**T1-8.** Support education on the environmental impact of using home, garden, and commercial hazardous chemicals and pesticides and continue to provide guidance on how to minimize use of these chemicals and properly dispose of them through household hazardous waste collection.

**T1-9.** Evaluate mass loadings of toxic contaminants and determine their relationship to ambient water and sediment quality.

**T1-10.** Identify and assign priorities to toxic substances which should be banned from use and for which *virtual elimination of discharge* should be the goal.

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**T2-1.** The LISS will review the National Oceanic and Atmospheric Administration (NOAA) 1991 sediment chemistry and toxicity survey results of harbors and embayments, when available in the Spring 1994.

**T2-2.** The LISS will provide a preliminary review of the data on sediment contamination on a site-by-site basis. State and federal experts will evaluate the problem at each site and recommend additional assessments needed to fully characterize the problem, ascertain the need for and feasibility of remediation and prepare a remediation plan.

**T2-3.** The City of Glen Cove plus their Review Committee will evaluate the contamination of Glen Cove Creek.

**T2-4.** The LISS will review and evaluate sediment remediation approaches developed in the Great Lakes ARCS Program and HEP.

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**T2-5.** Conduct further assessments and develop site plans addressing the feasibility, technical approach, cost and value of conducting remediation activities for Black Rock Harbor and Glen Cove Creek, where data may be sufficient to conduct case study analyses. Recommend other harbors for characterization and feasibility studies to be conducted at a rate of two harbors per year.

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**T3-1.** The LISS will advocate the coordination between the states of Connecticut and New York to review health risk and advisory recommendations and formulate plans to ensure consistency.

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**T3-2.** Develop strategies for controlling loadings of contaminants for which seafood consumption advisories have been issued.

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**T3-3.** Develop a strategy for identifying toxic substances of human health risk concern in Long Island Sound seafood species and tolerance levels for those substances.

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**T4-1.** The mussel watch and benthic surveillance components of NOAA's Status and Trends Program and the EPA's Environmental Monitoring and Assessment Program provide regular and systematic sampling of contaminant levels in the Sound.

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**T4-2.** A monitoring workshop was held to integrate findings of the LISS and develop a comprehensive, Soundwide monitoring plan for toxic substances.

**T4-3.** Under the auspices of the New York- New Jersey Harbor Estuary Program (HEP), the U.S. Army Corps of Engineers has agreed to develop a work plan and budget to develop system wide models for PCBs, mercury, and other toxic pollutants that will provide the technical foundation for comprehensive efforts to eliminate these contamination problems in the Sound-Harbor-Bight system. The Corps of Engineers and other participants have agreed to seek the funding necessary to complete these models. Special attention will be directed to fully account for nonpoint sources of mercury.

**T4-4.** Monitoring initiatives will be coordinated with the EPA Regional - Environmental Monitoring and Assessment Program (EMAP) to further the understanding of sediment toxicity and benthic community structure gradients in western Long Island Sound.

**T4-5.** Conduct site-specific characterization surveys of water, sediment and biota in harbors where active sources of toxic substances are believed to persist at a rate of two harbors per year.

**T4-6.** Identify sources and sites of PCB loadings to the Sound ecosystem from in-Sound and NY-NJ Harbor Estuary sources. Focus on reducing and eliminating PCB loadings on a priority basis, concentrating on areas of known contamination such as Black Rock Harbor.

**T4-7.** Monitor contaminant levels in selected estuarine organisms to ascertain their effects on the biology of the species and their effects on the edibility of the species.

**T4-8.** Implement the recommendations from the LISS Monitoring Plan to improve contaminant monitoring.

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**T5-1.** The relationship between organism body burdens and their toxic response needs to be investigated as an important mechanism of toxic impact.

**T5-2.** Trophic level transfer and bioaccumulation effects of contaminants up the food chain need to be quantified to better manage both the aquatic community and human health risk.

**T5-3.** While toxicity testing of sediments and waters is an efficient means of identifying toxicity problems, the relationship between toxicity and specific causative agents needs to be determined.

**T5-4.** Evaluate the use of an ecological risk assessment approach, demonstrated in the LISS Black Rock Harbor Action Plan Demonstration Project, for more widespread application to identify toxicity and its sources in embayments and harbors of the Sound.

**T5-5.** Continue to monitor finfish and crustaceans of the Sound with emphasis on determining population response to low dissolved oxygen.

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### **FLOATABLE DEBRIS**

**F1-1.** Continue implementation of long-term CSO abatement programs to manage or eliminate all CSO areas remaining in the Long Island Sound region.

**F1-2.** Control discharge of stormwater from industrial, construction, and municipal activities in accordance with EPA's national program regulations.

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**F2-1.** Continue to implement the *Pack It In/Pack It Out* anti-litter campaign.

**F2-2.** The New York-New Jersey Harbor Estuary Program has developed detailed short- and long-term floatable debris action plans for the New York-New Jersey Harbor.

**F2-3.** National Beach Cleanup Program. As part of this program, annual cleanups of Long Island Sound shorelines have taken place since 1988. This program costs \$10,000 per year per state to coordinate and support volunteer efforts.

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**F2-4.** Continue to implement *Clean Streets/Clean Beaches* anti-litter campaign.

**F2-5.** Conduct a demonstration project to encourage proper solid waste handling and recycling at five marinas.

**F2-6.** Expand involvement in *Coastweeks* program to include a second beach cleanup in the spring, prior to the beach season.

**F2-7.** Continue to coordinate volunteers to paint stenciled messages on storm drains, such as *Don't Dump - Drains to Long Island Sound*.

**F2-8.** Maintain clean beaches and minimize resuspension of debris back into Long Island Sound waters by: -Cleaning beaches in the evening to prevent resuspension overnight; -Using solid waste receptacles with lids instead of the open mesh type; -Providing recycling containers in convenient locations; -Using environmentally responsible containers for food and beverages at concession stands.

**F2-9.** Distribute a directory of volunteer groups in the Long Island Sound watershed that work on projects and activities to reduce marine debris.

**F2-10.** Encourage the public and manufacturers to promote recycling, use less packaging, and substitute products made from degradable material whenever possible.

**F2-11.** Encourage marina operators to accept responsibility for litter control and recycling.

**F2-12.** Require floatation materials that are resistant to decomposition and fragmentation.

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### **LIVING RESOURCES AND THEIR HABITATS**

**L1-1.** Connecticut, New York, and federal agencies will continue to pursue restoration of degraded habitat.

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**L1-2.** Through Connecticut's coastal permit programs and consistency with the CT Coastal Management Act, applicants may be required to protect, restore or enhance aquatic resources.

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**L1-3.** Connecticut preparing a tidal wetland management plan that includes an identification of potential wetland restoration sites.

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**L1-4.** Connecticut will continue the Coves and Embayments Restoration program to restore degraded tidal and coastal embayments and coves.

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**L1-5.** Connecticut, New York, and federal agencies currently administer programs for the restoration of habitats other than tidal wetlands such as dunes, submerged aquatic vegetation, and coastal woodlands.

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**L1-6.** New York is phasing out, and Connecticut prohibits, maintenance ditching of mosquito ditches in favor of selective use of open marsh water management techniques to control mosquitos and restore pools and ponds on tidal wetlands.

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**L1-7.** Coastal America, a cooperative effort of several federal agencies, is conducting a study in Connecticut to evaluate the impacts of transportation facilities upon ten tidal wetland sites. This study is sponsored by the CTDEP and undertaken by the USACE. When the study is completed, restoration plans will be developed for those sites where a transportation facility is shown to be the cause of degradation. Restoration is expected to be implemented through a combination of ISTEA, Water Resources Development Act, Long Island Sound Cleanup Account funds, New York's Environmental Protection Fund, and, where appropriate, natural resources damages recovered under CERCLA or OPA90.

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**L1-8.** Connecticut's Coves & Embayments Program will complete nine restoration projects in progress and commitments to begin three new projects.

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**L1-9.** Connecticut and New York should continue to pursue the use of funds from the following programs, and explore additional funding sources, to support restoration and enhancement activities described in the previous recommendation: The Land and Water Conservation Fund, the Intermodal Surface Transportation Efficiency Act (ISTEA) Enhancement Program, the Partners in Wildlife Program, § 319 of the Clean Water Act, Army Corps of Engineers Section 22 Planning Funds, the Water Resources Development Act, National Coastal Wetlands Conservation Grants, the North American Waterfowl Management Plan, Connecticut's Long Island Sound Cleanup Funds, and the Coastal Zone Management Act.

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**L1-10.** The rapid displacement of native brackish and fresh tidal plant communities on the Connecticut River has been identified as the single most significant habitat problem in this estuary. A specific restoration program for the control of common reed in these tidal wetlands needs to be implemented to check and reverse the spread of common reed and develop the most efficient means of effecting this restoration. Control techniques need to be evaluated for the full range of wetland habitat types on the river. Baseline surveys will be established and post-control monitoring over multiple years will be conducted.

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**L1-11.** New York should continue to phase out maintenance ditching for mosquito control. These programs should receive additional support for selective use of open marsh water management techniques to control mosquitos and restore pools and ponds on tidal wetlands.

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**L1-12.** Obtain long-term funding for Connecticut wetland restoration staff.

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**L1-13.** Connecticut and New York should develop a restoration plan for the full range of coastal terrestrial and estuarine aquatic habitats adjacent to and in Long Island Sound. The restoration plan will include a list of potential restoration projects and a priority listing of projects to be implemented. Preliminary sites identified for future restoration in New York include: City Island (\$300,000); Pelham Bay Park (\$400,000); Wading River (\$50,000); Sunken Meadow Creek (\$50,000); Crab Meadow (\$50,000); and Mattituck Creek (\$100,000). Other sites in New York where costs have not been estimated include Pugsley Creek, Udall's Cove, Oak Neck Creek, Frost Creek, and East Creek. Connecticut has estimated that ten priority sites

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could be restored for \$750,000, or approximately \$75,000 per site.

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**L1-14.** New York should strengthen their capabilities for implementing programs that restore degraded habitats. This should be undertaken in cooperation with the implementation of the Long Island Sound Regional Coastal Management Plan.

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**L2-1.** The states of Connecticut and New York and the USACE will continue to implement their permit programs and coastal consistency provisions of states' Coastal Management Programs to regulate use and development of aquatic resources and critical habitats such as tidal and freshwater wetlands, intertidal flats, submerged aquatic vegetation beds, beaches, and dunes.

These programs also regulate dredging and the disposal of dredged sediments at designated sites in Long Island Sound. Open water disposal is only permitted at the designated open water sites and may only occur if the disposal will not cause adverse impacts to estuarine organisms.

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**L2-2.** Connecticut will continue to reduce habitat degradation caused by storm water runoff projects (e.g. chronic dilution effects and sedimentation) through the goal of retaining the first one-inch of runoff.

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**L2-3.** Connecticut and New York have programs to acquire by easement, fee simple acquisition, or other means habitats important for populations of plants and animals. These programs include the development of priority listings for acquisition and protection.

Connecticut and New York have land acquisition and management programs that use state funds and federal fund programs such as the Land and Water Conservation Fund, the National Coastal Wetland Conservation Program, and the North American Waterfowl Management Plan to protect and acquire coastal lands and wetlands.

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**L2-4.** The USFWS maintains a national system of refuges, which includes the Stewart B. McKinney National Wildlife Refuge in Connecticut (i.e., Salt Meadow, Chimon Island, Sheffield Island, Goose Island, Milford Point and Falkner Island Units) and Long Island National Wildlife Refuge Complex in New York (i.e., Oyster Bay and Target Rock units).

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**L2-5.** Congress has authorized the creation of the Silvio Conte Connecticut River National Fish and Wildlife Refuge within the Connecticut River Watershed for the purpose of conserving, protecting and enhancing the Connecticut River Valley populations of plants, fish, and wildlife; preserving natural diversity and water quality; fulfilling international treaty obligations relating to fish and wildlife; and providing opportunities for scientific research and education.

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**L2-6.** Connecticut has established a Migratory Bird Conservation Stamp Program, the proceeds of which can be used for acquisition and management. The newly created state income tax form check off for endangered species, natural areas preserves, and watchable wildlife creates a fund that can be used for the identification, protection, conservation, management, and education activities related to the above listed wildlife and habitats.

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**L2-7.** Create a Long Island Sound Reserve System consisting of areas of land and water of outstanding or exemplary scientific, educational, or biological value to reflect regional differentiation and variety of ecosystems and to include representatives of all of the significant natural habitats found in the Sound. Where appropriate, sites will be selected from existing lands and wetlands held for conservation purposes so that acquisition funds will be directed towards those lands in private ownership that are needed to complete the reserve system.

The primary activities in the recommendation include site identification (2 years) and site protection through the development of management plans, acquisition where necessary, and site management.

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**L2-8.** Connecticut and New York should continue to acquire or protect through less than fee simple means, significant coastal habitats through funding sources such as the Land and Water Conservation Fund, the National Coastal Wetland Conservation Program, the North American Waterfowl Management Plan, Connecticut's Recreation and Natural Heritage Trust Program, Connecticut's Migratory Bird Conservation Stamp Program, New York's Environmental Protection Fund, and, where appropriate, natural resource damages recovered under CERCLA or OPA90.

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**L2-9.** Acquire and protect those sites that are considered for acquisition in the New York State Open Space Conservation Plan. Sites include Oyster Bay Harbor (\$5 million); Porpoise Channel (\$2 million); Plum Point (\$1 million); Udall's Cove (\$8 million). Other sites on Long Island Sound that are among the state's highest priority acquisition sites include: Bronx River Trailway, Udall's Ravine, Alley Creek (\$750,000); Long Creek and Mattituck Creek (\$340,000); Premium River (\$750,000); and Cedar Beach Creek (\$186,000).

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**L2-10.** Acquire and protect those sites that are considered priorities for acquisition in Connecticut. The Great Meadows site is the highest priority. (See also Ongoing Programs portion of this table in the CCMP.)

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**L2-11.** Encourage activities of existing Long Island Sound-specific land trusts and encourage formation of new trusts, to seek donations and easements of localized habitat areas for the plants and animals of Long Island Sound.

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**L3-1.** Connecticut, New York and The Nature Conservancy will continue the Natural Diversity Database in Connecticut and the Natural Heritage Program in New York. These programs collect, maintain, and update information pertaining to significant terrestrial and aquatic habitats.

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**L3-2.** The USFWS will continue the Southern New England-New York Bight Coastal and Estuary Project. The project focuses on assessing and monitoring the regional geographic distribution and population status of a large number of key species called *Species of Special Emphasis* and their habitats including evaluating the threats to physical integrity of these habitats and the viability of species populations. Primary objectives are to determine and delineate those regionally important habitats and species populations requiring both immediate and long term protection, conservation, enhancement, and restoration.

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**L3-3.** The NYSDEC will, on a pilot basis, develop a site-specific habitat management strategy for the Oyster Bay/Cold Spring Harbor complex. Phase II will entail implementation of the identified strategy.

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**L3-4.** Connecticut is identifying wetland complexes of statewide significance and general wetland protection strategies for areas located in Long Island Sound and the Connecticut River. This project has been funded by the EPA under §104(b) of the Clean Water Act.

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**L3-5.** Develop a nomination document to recommend the designation of the Connecticut River estuary as a *Wetland of International Importance* for the purpose of establishing a formal designation of this area to recognize the ecological significance of this ecosystem and to foster increased protection of its significant habitat complex and living resources.

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**L3-6.** Develop a strategic plan for the estuarine portion of the Connecticut River that will identify habitat and species issues/problems, monitoring, and research needs and recommendations to foster increased protection of this nationally significant ecosystem.

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**L3-7.** Develop and periodically update a list of significant habitats, habitat complexes, and sensitive areas for protection and management. When completed, habitat management plans will be developed for these areas. In New York this should be undertaken in cooperation with the implementation of the NYSDOS Long Island Sound Regional Coastal Management Plan.

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**L3-8.** Expand the Southern New England-New York Bight Coastal and Estuary Project to: 1) include the watersheds of Long Island Sound; and 2) reexamine the habitat complexes previously identified in Long Island Sound based upon the most current listing of Species of Special Emphasis. Examine the complexes more carefully to fine tune the management recommendations and implement these recommendations through state, county and municipal agencies.

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**L3-9.** Federal habitat programs should develop a watershed approach to protection of living resources of Long Island Sound and their habitats, such as development of a Connecticut River/Long Island Sound Management Unit by the USFWS.

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**L3-10.** Designate portions of the Connecticut River estuary as a National Estuarine Research Reserve. A reserve designation will result in promoting research that is directed towards resource management issues and provide facilities and programs for public education and interpretation.

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**L4-1.** Connecticut, New York, and federal agencies will continue to implement their Endangered Species Programs in order to protect endangered and threatened species that live in and adjacent to Long Island Sound.

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**L4-2.** Develop a list of endangered and threatened invertebrates. Maintain and update the diversity database. Periodically revise the list of threatened and endangered species. Expand the monitoring program, identify essential habitats, and develop recovery plans.

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**L4-3.** Develop legislation or regulations in New York state that will minimize disturbance to the essential habitats of rare plants and animals.

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**L4-4.** Revise and publish a list of rare and sensitive species associated with the coastal lands and waters of Long Island Sound.

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**L5-1.** Development and implementation of fishery management plans, including research, monitoring, and conservation law enforcement activities.

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**L5-2.** Management of shellfish aquaculture activities including resource monitoring.

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**L5-3.** Improvement of anadromous fish passage opportunities including associated research and monitoring activities.

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**L5-4.** Wildlife management, including research and monitoring activities in support of management programs.

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**L5-5.** Activities that minimize mortality due to entrainment and impingement of eggs, larvae, and juvenile and adult aquatic organisms at industrial facilities.

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**L5-6.** Define, revise, and coordinate the establishment of seasonal restrictions for dredging that minimize adverse effects on aquatic organisms, especially finfish and shellfish and their habitats.

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**L5-7.** Enhance implementation of interstate fishery management plans for Long Island Sound fishery resources.

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**L5-8.** Expand efforts to bypass obstructions to anadromous finfish migrations on Connecticut tributaries to Long Island Sound and the Connecticut River by constructing or installing fishways or fishlifts.

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**L5-9.** Enhance municipal shellfish restoration programs.

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**L5-10.** Enhance the Connecticut Oyster Restoration Program on public beds in state waters by stocking settling habitat (cultch) and conducting related activities (e.g., resource sampling).

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**L5-11.** Develop a marine biotoxin assessment program for shellfish.

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**L5-12.** Develop artificial reefs in appropriate areas of New York waters to increase fishing opportunities, consistent with the New York State Artificial Reef Development Plan. Plans have been developed to construct reefs in New York waters of Long Island Sound off Matinecock Point, Eatons Neck, Miller Place/ Mt. Sinai, and Mattituck Inlet.

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**L5-13.** Develop methods to reduce the incidental take of nontarget species and undersized individuals in fishing activities.

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**L6-1.** Develop measures to prohibit or prevent the induction or release to Long Island Sound and its watershed of known or potentially undesirable species.

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**L6-2.** Implement a management program to reduce abundance of mute swans that are causing losses of certain aquatic habitat types such as submerged aquatic vegetation and certain types of emergent tidal wetland vegetation.

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**L7-1.** Develop an outreach program to inform and educate the public about the plants and animals in Long Island Sound.

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**L7-2.** Develop a citizens monitoring program specific to the plants and animals of Long Island Sound sufficient to aid managers in identifying problems and assessing the effects of management efforts.

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**L8-1.** Connecticut will continue its statewide Geographic Information System (GIS) Program to digitize spatial information and data for resource management purposes.

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**L8-2.** Connecticut has created a Long Island Sound Resources Center for the purpose of : 1) developing the full potential of estuarine related GIS applications; 2) computerizing pertinent literature and data for rapid access through standard word search and spatial basis; and 3) completion of the estuarine geology of Long Island Sound. Additionally, this Center is taking a leadership role in the development of side scan sonar mapping of Long Island Sound that is now being overlaid with benthic community information. This will become the foundation of future living species and habitat management programs.

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**L8-3.** Identify spatial data for living resources and habitat on a Sound wide basis and digitize priority data sets for incorporating into a Sound wide

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Geographical Information System.

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**L8-4.** Expand the data layers for living resources and their habitats on a Sound wide basis.

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**L8-5.** Develop and maintain state databases and an integrated Long Island Sound database describing the living resources of Long Island Sound and their habitats.

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**L8-6.** Expand the side scan sonar/benthic habitat mapping program in order to create baseline information for management and conservation purposes.

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**L8-7.** Maintain and enhance the Long Island Sound literature, indexing and GIS capabilities of the Marine Sciences Research Center at SUNY, Stony Brook.

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**L9-1.** Connecticut conducts a Sound wide open water fishery survey that has become an integral component of the LISS monitoring and Management programs. In addition, Connecticut conducts a nearshore finfish survey, and surveys of lobster, shad, anadromous herrings, Atlantic sturgeon, and shortnose sturgeon (the latter is listed by the federal government as an endangered species). Other marine surveys include a survey of oyster recruitment (Connecticut Department of Agriculture, Aquiculture Division) and recreational and commercial fishery statistics activities.

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**L9-2.** Connecticut conducts nesting surveys of colonial water birds, Least Tern and Piping Plover, Osprey, waterfowl, a mid-winter eagle survey, and surveys of diamond-backed terrapin, threatened and endangered terrestrial species, and other species of special concern.

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**L9-3.** New York conducts an American lobster mortality project funded by the LISS. In addition, New York conducts the NMFS's Recreational Fishery Statistics Survey, surveys of commercial fishery landings, seabird surveys, (e.g., ospreys, piping plovers, least terns), surveys of threatened and endangered species and species of special concern, and other surveys as needed.

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**L9-4.** Connecticut should pursue the construction and staffing of a marine science technology center at Avery Point with a research focus on Long Island Sound.

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**L9-5.** Enhance wildlife monitoring activities (e.g., seabirds, waterfowl, and marine turtles).

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**L9-6.** Monitor the status and trends of eelgrass in the Sound and all species of submerged aquatic vegetation in the Connecticut River using remote sensing and ground surveys.

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**L9-7.** New York should initiate a nearshore fishery independent survey of Long Island Sound.

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**L9-8.** Continue the lobster mortality and disease monitoring project in Long Island Sound.

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**L10-1.** Connecticut will continue the Long Island Sound Research fund. This fund is used to foster research that addresses priority management issues in Long Island Sound including living species and their habitats.

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**L10-2.** Connecticut has funded the following living resources and habitat research: evaluation of the causes of declines of eelgrass; assessment of contaminant levels in the greater scaup; changes in the phytoplankton community resulting from nitrogen enrichment; effects of hypoxia on bottom feeding fish; vegetation changes in a restoring tidal wetland; and mapping of benthic communities.

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**L10-3.** Identify priorities for management-oriented research about the living resources of Long Island Sound and their habitats.

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**PUBLIC INFORMATION & EDUCATION**

**E1-1.** The LISS and state public involvement and education programs are: developing printed and other educational materials for specific

audiences; exhibiting LIS materials at regional and local fairs and events; encouraging education and information on the Sound for urban populations; promoting the importance of the Sound's resources to children in the region; and, using public educational material of non-profit organizations.

**E1-2.** Support research conferences such as: the CTDEP conference to highlight its LIS Research Grant Program; the LIS Watershed Alliance *Citizens' Summit* annual conference on the Sound; and the bi-state LIS research conference sponsored by local universities, Sea Grant programs, and the states.

**E1-3.** *Coastweeks*, an annual three week celebration of marine and coastal environments is supported by both states.

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**E1-4.** Enhance the LISS and state public involvement and education programs to provide additional funding to build upon the current outreach and education activities with a new focus on interpretation and implementation of the management plan.

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**E2-1.** Incorporate LIS information into all related programs conducted by state staff wherever possible.

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**E2-2.** Provide information to all municipalities on the LISS and the importance of protecting and restoring the Sound. Special attention will be given to coastal municipalities in the form of briefings by state officials to explain exactly how implementation of the plan will affect that particular city or town and how to work cooperatively together to implement the management plan. Briefings will also be held for specific user groups, local officials, and elected representatives.

**E2-3.** Assess opportunities for training and educating the environmental decision-making community and provide technical information and assistance on implementation of the plan to the regulated community.

**E2-4.** Utilize the Bi-state Marine Resources Committee to ensure Long Island Sound related legislation moves on a parallel track in both Connecticut and New York and to help educate local governments and the public about the importance of the Sound and the successful implementation of the LISS recommendations.

**E2-5.** Pursue reestablishment of funding for the Long Island Sound Resource Center at Avery Point and further development of a similar resource center in New York to serve as clearinghouses and depositories for information about the Sound and investigate ways to improve funding for these centers.

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**E3-1.** Encourage public participation in activities relating to the cleanup and protection of the Sound and provide support for activities including storm drain stenciling, beach grass planting, and beach cleanups.

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**E3-2.** The LISS Citizens Advisory Committee will continue to provide guidance to the Management and Policy Committee and serve as a link between the public and LISS management agencies. The CAC has been instrumental in providing guidance to the Study and serving as a conduit between the Management Conference and the public.

**E3-3.** Enhance funding for hands-on activities such as storm drain stenciling, beach grass planting and beach cleanups to allow the public to actively participate in the cleanup and restoration of the Sound and learn more about its ecosystem.

**E3-4.** Promote citizen involvement in educational and monitoring activities in and around the Sound and consider:

- Providing technical assistance to citizen monitoring groups;
- Developing a reward system for citizens participating in Long Island Sound protection and restoration programs;
- Developing environmental habitat kits and guide maps;
- Production and distribution of videos of Long Island Sound research cruises.

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**E4-1.** Increase efforts to coordinate ongoing governmental and non-governmental public outreach efforts as the plan becomes implemented and encourage private and nonprofit groups to continue to develop and implement Long Island Sound educational and outreach programs.

**E4-2.** Establish a public outreach work group to guide the implementation of the public involvement and education commitments and recommendations. The work group will work closely with and serve to complement the ongoing public outreach and education efforts of the Citizens Advisory Committee. The group will also be charged with determining funding resources for implementation of public involvement and education recommendations, consulting with staff on tactics, working to provide coordination of public outreach efforts from both an internal and external basis,

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and assessing program effectiveness.

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**E5-1.** Support ongoing actions that assist teachers in their efforts to integrate LIS issues into existing curricula.

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**E5-2.** Continue Connecticut's Long Island Sound High School Research Grant Program, initiated in 1990. This program provides funding for students to conduct research on the Sound and its watershed.

**E5-3.** Encourage natural history museums and nature centers to promote Long Island Sound issues within their programs.

**E5-4.** Work with school districts and, where appropriate, the Department of Education, in Connecticut and New York to develop Long Island Sound educational materials and outreach programs for primary and secondary schools. Help teachers integrate Long Island Sound information into their curricula and provide materials wherever possible. This should include hiring a Long Island Sound education coordinator.

**E5-5.** Enhance ongoing actions to assist teachers in their efforts to integrate Long Island Sound issues into their existing curricula including the development and support of teacher workshops.

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**E5-6.** Consider a Long Island Sound High School Research Grant Program to provide resources to allow a variety of high schools to conduct research on the Sound and its watershed.

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**E6-1.** The LISS will continue to encourage all organizations involved in the public involvement and education effort, both governmental and non-governmental, to take advantage of the various grant programs for which they are eligible, that provide funding for educational activities. These include Connecticut's Long Island Sound Fund, Long Island Sound High School Research Grant Program and EPA's Education Grants. Private sector funding should also be sought when and where possible and other private grant programs identified.

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**E6-2.** Seek to create a public involvement and education (PIE) fund that could be supported by a variety of funding sources, including federal appropriations through the Long Island Sound Improvement Act. The PIE fund would be administered by the LISS Management Conference. A PIE fund and interest generated from its endowment would provide support for projects fulfilling plan involvement and education actions and recommendations as proposed by both non-governmental and governmental organizations. Current state and private Long Island Sound public education programs are underfunded. State and private funding sources must be directed toward meeting the needs of existing programs before being sought for a PIE fund.

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## Wasteload Allocation and Upgrade Progress Point Source Dischargers by Management Zone – Connecticut 2003

<b>Total Nitrogen Wasteload Allocation for Connecticut Point Source Discharges.</b>							
<b>Facility</b>	<b>Baseline End-of- Pipe (lbs/day)</b>	<b>WLA End- of-Pipe (lbs/day) 2014</b>	<b>2003 Nitrogen Discharge (lbs/day)</b>	<b>BNR Upgrade Planned (Yes/No) *</b>	<b>Year Upgrade To Be/or Completed</b>	<b>Cost Estimate \$\$ (M) **</b>	<b>Design Capability (Mg/l) ****</b>
<b>Zone 1</b>							
Groton City	272	99	162	*	-	-	Phase II
Groton Town	420	153	464	*	-	-	Phase II
Jewett City	42	15	39	Yes	2005	1.5	Phase III
Killingly	359	131	147	*	-	-	Monitoring
Ledyard	20	7	3	Yes	1997	0.35	Phase III
Montville	323	118	151	*	-	-	Phase II
New London	1057	386	405	Yes	2002	2.67	Phase II
Norwich	550	201	983	*	-	-	Monitoring
Plainfield North	94	34	87	*	-	-	Monitoring
Plainfield Village	65	24	44	*	-	-	Monitoring
Putnam	145	53	170	*	-	-	Monitoring
Sprague	20	7	7	*	-	-	Monitoring
Stafford Springs	164	60	130	*	-	-	Monitoring
Stonington Borough	37	14	54	*	-	-	Monitoring
Stonington Mystic	74	27	43	*	-	-	Monitoring
Stonington Pawcatuck	66	24	34	*	-	-	Monitoring
Thompson	28	10	35	*	-	-	Monitoring
UConn	120	44	71	Yes	1996	1.058	Phase II
Windham	344	125	242	*	-	-	Monitoring
Pfizer (Industrial)	2900	1059		N/A	-	-	-
<b>Subtotal</b>	7100	2591					

<b>Total Nitrogen Wasteload Allocation for Connecticut Point Source Discharges.</b>							
<b>Facility</b>	<b>Baseline End-of-Pipe (lbs/day)</b>	<b>WLA End-of-Pipe (lbs/day) 2014</b>	<b>2003 Nitrogen Discharge (lbs/day)</b>	<b>BNR Upgrade Planned (Yes/No)</b>	<b>Year Upgrade To Be/or Completed</b>	<b>Cost Estimate \$\$ (M)**</b>	<b>Design Capability (Mg/l)</b>
<b>Zone 2</b>							
Bristol	1091	398	1122	Yes	2004	0.584	Phase II
Canton	66	24	87	*	-	-	Monitoring
Mattabassett	2285	834	1767	*	-	-	Monitoring
East Hampton	148	54	119	Yes	2001	0.69	Phase II
East Hartford	801	292	748	*	-	-	Phase II
East Windsor	163	59	34	Yes	1996	1.0	Phase III
Enfield	763	278	835	Yes	2004	1.76	Phase II
Farmington	486	178	354	*	-	-	Monitoring
Glastonbury	268	98	305	*	-	-	Monitoring
Hartford	6512	2377	5882	*	-	-	Monitoring
Manchester	855	312	761	*	-	-	Monitoring
Middletown	569	208	385	*	-	-	Monitoring
Plainville	277	101	304	*	-	-	Monitoring
Plymouth	114	42	70	*	-	-	Phase II
Portland	86	31	28	Yes	2002	1.05	Phase III
Rocky Hill	789	288	764	*	-	-	Monitoring
Simsbury	293	107	315	*	-	-	Phase III
South Windsor	289	106	324	*	-	-	Monitoring
Suffield	122	45	37	*	-	-	Phase III
Vernon	504	184	670	*	-	-	Monitoring
Windsor Locks	180	66	115	Yes	2003	1.84	Phase III
Windsor Poquonock	268	98	420	*	-	-	Monitoring
Winsted	175	64	188	*	-	-	Monitoring
<b>Subtotal</b>	17104	6244					

<b>Total Nitrogen Wasteload Allocation for Connecticut Point Source Discharges.</b>							
<b>Facility</b>	<b>Baseline End-of-Pipe (lbs/day)</b>	<b>WLA End-of-Pipe (lbs/day) 2014</b>	<b>2003 Nitrogen Discharge (lbs/day)</b>	<b>BNR Upgrade Planned (Yes/No)</b>	<b>Year Upgrade To Be/or Completed</b>	<b>Cost Estimate \$\$ (M)</b>	<b>Design Capability (Mg/l)</b>
<b>Zone 3</b>							
Branford	526	192	80	Yes	2003	3.158	Phase III
Cheshire	281	103	492	*	-	-	Phase III
Meriden	1230	449	920	*	-	-	Monitoring
New Haven East	4294	1568	1641	Yes	1997	8.2	Phase III
North Haven	433	158	502	*	-	-	Phase II
Southington	557	204	796	*	-	-	Monitoring
Wallingford	737	269	613	*	-	-	Phase II
West Haven	967	353	666	Yes	1996	0.75	Phase II
Cytec (Industrial)	2543	928		N/A	-	-	
Upjohn (Industrial)	309	113		N/A	-	-	
<b>Subtotal</b>	11877	4337					

<b>Total Nitrogen Wasteload Allocation for Connecticut Point Source Discharges.</b>							
<b>Facility</b>	<b>Baseline End-of-Pipe (lbs/day)</b>	<b>WLA End-of-Pipe (lbs/day) 2014</b>	<b>2003 Nitrogen Discharge (lbs/day)</b>	<b>BNR Upgrade Planned (Yes/No)</b>	<b>Year Upgrade To Be/or Completed</b>	<b>Cost Estimate \$\$ (M)</b>	<b>Design Capability (Mg/l)</b>
<b>Zone 4</b>							
Ansonia	314	115	306	*	-	-	Monitoring
Beacon Falls	33	12	45	*	-	-	Monitoring
Danbury WPC	1211	442	1882	*	-	-	Monitoring
Derby	195	71	64	Yes	2000	0.677	Phase II
Heritage Village	54	20		<b>This is a private Plant.</b>	<b>Plant.</b>	<b>No data</b>	<b>Available.</b>
Litchfield	64	24	54	Yes	2004	1.0	Phase II
Milford Beaver Brook	258	94	179	Yes	1996	1.0	Phase II
Milford Housatonic	844	307	432	Yes	1996	0.65	Phase II
Naugatuck Treatment Co.	675	246	435	*	-	-	Phase II

<b>Total Nitrogen Wasteload Allocation for Connecticut Point Source Discharges.</b>								
<b>Facility</b>	<b>Baseline End-of-Pipe (lbs/day)</b>	<b>WLA End-of-Pipe (lbs/day) 2014</b>	<b>2003 Nitrogen Discharge (lbs/day)</b>	<b>BNR Upgrade Planned (Yes/No)</b>	<b>Year Upgrade To Be/or Completed</b>	<b>Cost Estimate \$\$ (M)</b>	<b>Design Capability (Mg/l)</b>	
<b>Zone 4</b>								
New Milford	66	24	52	*	-	-	Monitoring	
Newtown	115	42	50	Yes	1997	1.06	Phase II	
Norfolk	30	11	13	*	-	-	Monitoring	
North Canaan	36	13	22	*	-	-	Monitoring	
Salisbury	58	21	27	*	-	-	Monitoring	
Seymour	167	61	56	Yes	1993	0.25	Phase II	
Shelton	290	106	543	*	-	-	Monitoring	
Southbury T.S.	41	15	18	*	-	-	Monitoring	
Stratford	974	356	645	Yes	1996	0.8	Phase II	
Thomaston	114	42	52	Yes	2001	1.16	Phase III	
Torrington	680	248	300	*	-	-	Phase II	
Waterbury	2766	1010	1335	Yes	2000	17.36	Phase III	
Watertown ***	106	39	NA	<b>This Plant is Closed.</b>				
Unknown Industrial	1152	420	<b>N/A</b>					
<b>Subtotal</b>	10243	3739						

<b>Total Nitrogen Wasteload Allocation for Connecticut Point Source Discharges.</b>							
<b>Facility</b>	<b>Baseline End-of-Pipe (lbs/day)</b>	<b>WLA End-of-Pipe (lbs/day) 2014</b>	<b>2003 Nitrogen Discharge (lbs/day)</b>	<b>BNR Upgrade Planned (Yes/No)</b>	<b>Year Upgrade To Be/or Completed</b>	<b>Cost Estimate \$\$ (M)</b>	<b>Design Capability (Mg/l)</b>
<b>Zone 5</b>							
Bridgeport East	991	362	609	Yes	2004	2.09	Phase II
Bridgeport West	2852	1041	2307	Yes	2004	2.37	Phase II
Fairfield	1113	406	457	Yes	2003	15.96	Phase III
Westport	238	87	132	Yes	1996	0.4	Phase II
<b>Subtotal</b>	5194	1896					

<b>Total Nitrogen Wasteload Allocation for Connecticut Point Source Discharges.</b>							
<b>Facility</b>	<b>Baseline End-of-Pipe (lbs/day)</b>	<b>WLA End-of-Pipe (lbs/day) 2014</b>	<b>2003 Nitrogen Discharge (lbs/day)</b>	<b>BNR Upgrade Planned (Yes/No)</b>	<b>Year Upgrade To Be/or Completed</b>	<b>Cost Estimate \$\$ (M)</b>	<b>Design Capability (Mg/l)</b>
<b>Zone 6</b>							
Greenwich	1313	479	463	Yes	1996	0.5	Phase II
New Canaan	175	64	24	Yes	2000	1.235	Phase III
Norwalk	1967	718	897	Yes	2000	6.64	Phase II
Ridgefield South St.	80	29	28	Yes	1996	0.2	Phase III
Stamford	2536	926	1650	Yes	2005	63.0	Phase III
<b>Subtotal</b>	6071	2216					
<b>Total Zones 1-6</b>	57589	21023					

- **\* -- All plants have the potential to be upgrade. Some may upgrade and others may choose to purchase credits.**
- **\*\* -- Nitrogen cost portion only.**
- **\*\*\*-- The Watertown plant shut down and the flow now goes to the Waterbury STP for treatment.**
- **\*\*\*\* Phase II compliant = meets goal of 8 ppm total nitrogen  
Phase III compliant = meets goal of 5.6 ppm total nitrogen  
Monitoring Plants = greater than 8 ppm total nitrogen in effluent**

**Wasteload Allocation and Upgrade Progress  
Point Source Dischargers by  
Management Zone - New York  
2003**

<b>Total Nitrogen Wasteload Allocation for New York Point Source Discharges.</b>							
<b>Facility (Capacity, MGD)</b>	<b>Baseline End-of- Pipe (lbs/day)</b>	<b>TMDL WLA End- of-Pipe (lbs/day)</b>	<b>2003 Nitrogen Discharge (lbs/day)</b>	<b>BNR Upgrade Planned (Yes/No)</b>	<b>Year Upgrade To Be/or Completed</b>	<b>Cost Estimate \$\$ (M)</b>	<b>2014 Design Capability (Mg/l)</b>
<b>Zone 7</b>							
Mamaroneck (20.6)	2135	829	1597	yes	unknown	unknown	unknown
Port Chester (6.0)	563	219	784	yes	unknown	unknown	unknown
Blind Brook (5.0)	338	131	385	yes	unknown	unknown	unknown
New Rochelle (13.6)	1516	589	1747	yes	unknown	unknown	unknown
North Castle ( ? )	33	13	33				
<b>Subtotal</b>	4585	1780	4546				
<b>Zone 8</b>							
Wards Island (250)	43140	17903	28500	yes	2009	\$776	
Hunts Point (200)	28630	11881	18400	yes	2007	\$497	
Bowery Bay (150)	17270	7167	17900	yes	2010	\$486	
Tallman Island (80)	6860	2847	8700	yes	2009	\$308	
<b>Subtotal</b>	95900	39798	73500				
<b>Zone 9</b>							
Newtown Creek (310)	45270	18787	35000	no			
Red Hook (60)	4610	1913	4500	no			

<b>Total Nitrogen Wasteload Allocation for New York Point Source Discharges.</b>							
<b>Facility (Capacity, MGD)</b>	<b>Baseline End-of-Pipe (lbs/day)</b>	<b>TMDL WLA End-of-Pipe (lbs/day)</b>	<b>2003 Nitrogen Discharge (lbs/day)</b>	<b>BNR Upgrade Planned (Yes/No)</b>	<b>Year Upgrade To Be/or Completed</b>	<b>Cost Estimate \$\$ (M)</b>	<b>2014 Design Capability (Mg/l)</b>
<b>Subtotal</b>	49880	20700	39500				
<b>Zone 10</b>							
Belgrave (2.0)	213	77	295	yes	2006	\$3.5	5-6
Glen Cove (8.0)	893	323	284	yes	2003	\$3.4	4-5
Great Neck SD (3.8)	457	165	454	yes	2006	\$18	0
Great Neck (Village) (1.5)	212	77	242	yes	2006	inc.above	0
Oyster Bay (1.8)	220	80	171	yes	2006	\$9.1	4-5
Port Washington (4.0)	655	237	444	yes	2008	\$22.7	6
<b>Subtotal</b>	2650	958	1890				
<b>Zone 11 West</b>							
SUNY (SCSD #21) (2.5)	208	40	54	**	2006	\$14.2	4-5
Port Jefferson (SCSD1) (.85)	202	39	121	yes	2006	\$14.2	4-5
Huntington (2.5)	448	87	281	yes	2005	\$10.5	4-5
Kings Park (SCSD #6) (2.0)	134	26	47	yes	2004	\$9.3	4-5
Northport (Village) (.34)	52	10	52	yes	2004	\$1.5	5-6
<b>Subtotal</b>	1044	202	555				
<b>Zone 11 East</b>							
Greenport (Village) (?)	76	11	76	yes	2005	\$1.5	7
<b>Total Zones 7-11</b>	154135	65479	120067				

\*\*currently denitrifying, considering recharge

# Glossary of Acronyms

## A

ACOE Army Corps of Engineers

## B

B Billion

BAT Best Available Technology

BMP(s) Best Management Practice(s)

BNR Biological Nutrient Reduction (Removal)

BOD Biological Oxygen Demand

## C

CAC Citizens Advisory Committee

CCMP Comprehensive Conservation and Management Plan

CD Compact Disc

CD-ROM Compact Disc - Read-Only Memory

CERCLA Comprehensive Environmental Response, Compensation and Liability Act (Superfund)

CES Cooperative Extension Service

CSO(s) Combined Sewer Overflow(s)

CT Connecticut

CTDEP Connecticut Department of Environmental Protection

CTDOA Connecticut Department of Agriculture

CTDOA/BA Connecticut Department of Agriculture Bureau of Aquaculture

CTDOHS Connecticut Department of Health Services

CTDOT Connecticut Department of Transportation

CVA Clean Vessel Act

CWA Clean Water Act

CZM Coastal Zone Management

CZMA Coastal Zone Management Act

## D

DO Dissolved Oxygen (expressed in milligrams per liter [mg/l])

## E

EIS Environmental Impact Statement

EMPACT Environmental Monitoring for Public Access and Community Tracking (EPA)

EPF Environmental Protection Fund (New York State)

## F

FY Fiscal Year

FFY Federal Fiscal Year

## G

GIS Geographic Information System

<u>H</u>	
HEP	Harbor Estuary Program (New York/New Jersey)
Hg	Mercury
<u>I</u>	
ICM	Integrated Crop Management
IEC	Interstate Environmental Commission
IPM	Integrated Pest Management
ISTEA	Intermodal Surface Transportation Efficiency Act
<u>K</u>	
K	thousand
k	kilogram
km	Kilometer
Km <sup>2</sup>	Square kilometer
<u>L</u>	
l	liter
LA	Load Allocation
lbs	pounds
LIS	Long Island Sound
LISO	Long Island Sound Office (EPA)
LISS	Long Island Sound Study
LISWA	Long Island Sound Watershed Alliance
<u>M</u>	
M	Million
MC	Management Committee
MEG	Model Evaluation Group
mg	milligrams
mgd	million gallons per day
mg/l	milligrams per liter
MPRSA	Marine Protection, Research and Sanctuaries Act
MSD(s)	Marine Sanitation Device(s)
MSRC	Marine Science Research Center (SUNY)
<u>N</u>	
N	Nitrogen
NDD	National Diversity Database
NDZ	No Discharge Zone
NEIWPC	New England Interstate Water Pollution Control Commission
NEMO	Nonpoint Education for Municipal Officials
NJDEP	New Jersey Department of Environmental Protection
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NO <sub>x</sub>	Nitrous Oxide
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source(s)
NRCS	Natural Resource Conservation Service

N (Cont'd)

NRWI	Norwalk River Watershed Initiative
NY	New York
NYC	New York City
NYCDEP	New York City Department of Environmental Protection
NYDOT	New York Department of Transportation
NY/NJHEP	New York/New Jersey Harbor Estuary Program
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOS	New York State Department of State
NYSOPRHP	New York State Office of Parks, Recreation and Historic Preservation

O

$O_2$	Oxygen
ODA	Ocean Dumping Act
O&M	Operations and Maintenance
OLISP	Office of Long Island Sound Programs (State of Connecticut)

P

P.A.	Public Act
PCB(s)	Polychlorinated Biphenyl(s)
PIE	Public Information and Education
PS	Point Source

R

RFP(s)	Request for Proposal(s)
RNHT	Recreation and Natural Heritage Trust (State of Connecticut)

S

SAV	Submerged Aquatic Vegetation
SEP	State Environmental Protection (fund, CT)
SFY	State Fiscal Year
SIP	State Implementation Plan
sq. mi.	Square Miles
SUNY	State University of New York
SPDES	State Pollution Discharge Elimination System
SRF	State Revolving Fund
STORET	STORage and RETrieval System (EPA Data System)
STP(s)	Sewage Treatment Plant(s)
SWEM	System-Wide Eutrophication Model

T

TAC	Technical Advisory Committee
TMDL	Total Maximum Daily Load

U

UCONN	University of Connecticut
USACOE	United States Army Corps of Engineers

U (Cont'd)

USCG United States Coast Guard  
USDA United States Department of Agriculture  
USDOJ United States Department of the Interior  
USEPA United States Environmental Protection Agency  
USFWS United States Fish and Wildlife Service  
USGS United States Geological Survey

W

WAC(s) Watershed Advisory Committee(s)  
WLA(s) Waste Load Allocation(s)  
WMA Wildlife Management Area  
WPCP Water Pollution Control Plant  
WWW World Wide Web

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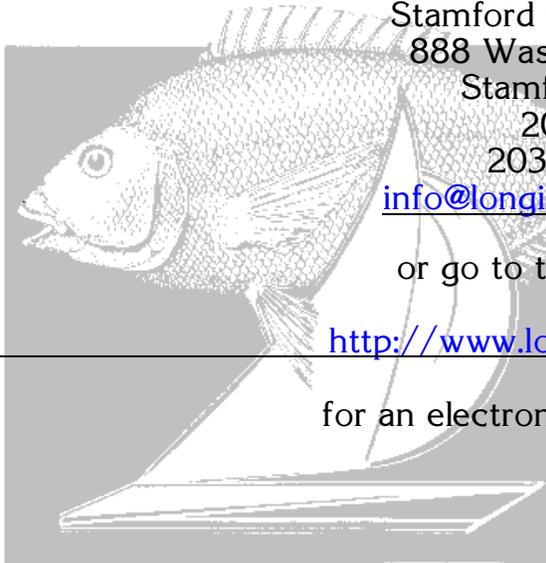
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