

*A Partnership to Restore and Protect the Sound*

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**2008  
Comprehensive  
Conservation and  
Management Plan  
Implementation  
Tracking Report**

**January — December 2008**

**THE  
LONG  
ISLAND  
SOUND  
STUDY**

*A Partnership to  
Restore and Protect  
the Sound*

**July 2009**



## ACKNOWLEDGMENTS

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## FOREWORD

This 2008 report documents the 14th 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.

The 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);
- New England Interstate Water Pollution Control Commission;
- U.S. Department of the Interior Fish and Wildlife Service (USFWS);
- U.S. National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS);
- U.S. Geological Survey (USGS);
- New York City Department of Environmental Protection (NYCDEP);
- U.S. Department of Agriculture Natural Resource Conservation Service (NRCS);
- New York State Department of State (NYSDOS);
- 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).

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

- 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;
- University of Connecticut (UConn); and
- State University of New York (SUNY).

Together, 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 2008 REPORT

This 2008 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 2008.

The *Overviews* describe the environmental results, trends or indicators of progress for the CCMP priority area. *Long Island Sound 2003 Agreement* commitments are highlighted in the Overview sections, with more detailed reports on progress following. 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 B 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 40+ 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

**HYPOXIA.** The total 2008 nitrogen load from the 106 New York and Connecticut sewage treatment plants (STPs) that discharge into Long Island Sound is estimated at 40,440 Trade-equalized pounds per day. Under the Long Island Sound Total Maximum Daily Load (TMDL) for nitrogen, each STP is assigned a numerical factor that provides a mathematical means of calculating the relative impact of nitrogen its discharges to the Sound, depending on the STPs' distance and other factors, from the Sound. The 2008 discharge represents a decrease of more than 18,700 TE lbs/day from the TMDL baseline of 59,146 TE lbs/day.

The maximum area of low dissolved oxygen less than 3 milligrams per liter in the Sound in Summer 2008 covered an estimated 180 square miles at peak lasting for 79 days. The 22 year averages are 200 square miles and 58 days.

**LIVING RESOURCES and HABITATS.** The LISS did not meet its goal to restore 2000 acres of coastal habitat 2008. The program restored 656 acres during the 1998-2008 goal period. The LISS met its goal to reopen 100 miles of river corridor to diadromous fish passage, with 146 miles reopened in the 10 year period. The habitat restoration goal continues to be hampered by the inherent complexity of coordinating and managing on-the-ground construction projects with the various levels of state and local governments and public and private property owners. Obtaining adequate funding for restoration projects remains problematic. Often funding sources need to be 'cobbled' together and coordinated with on-the-ground work, adding to the complexity of accomplishing projects.

**TOXICS, PATHOGENS and FLOATABLES.** Toxic pollutants continue to decrease in the Sound as sources are better identified and controlled and legacy levels are naturally cleansed or degraded in the environment. State and federal permit and reporting programs, such as the National Pollutant Discharge Elimination System and the Toxics Release Inventory program, and

other public information and education programs have helped to control and require reporting of toxic releases to the environment. Long Island Sound still suffers from hundreds of years of deposition of toxic pollutants that take many years to disperse. Pathogens and floatable debris are continuing management concerns and the LISS CCMP includes state and local program to address sources of pathogen contamination to our waterways and deposition of floatable debris.

**PUBLIC INVOLVEMENT and EDUCATION.** The Citizens Advisory Committee met in March, June, September, and December 2008. The CAC continued to provide advice to the LISS on program implementation. The Long Island Sound Study's world wide website, [www.longislandsoundstudy.net](http://www.longislandsoundstudy.net) continues to resonate with the public as new features and information are added. Website page visits are on the increase, showing a steady public interest in the Sound and its ecosystems. The Small Grants program continued to provide opportunities for citizen involvement and citizen education by funding projects at the local level.

**SCIENCE and RESEARCH.** The LISS Science and Technical Advisory Committee (STAC) met in February, June and November 2008. The STAC added several new members in 2008, including The Nature Conservancy and a new representative from CTDEP from marine fisheries. Ongoing LISS-funded research projects include the development and publication of a synthesis of the scientific research and data on the Sound; development of a water quality index using cluster analysis; a synthesis of water quality monitoring and planktonic data; analysis of the SWEM model; Projects completed in 2008 include an analysis of the vectors that introduce aquatic nuisance species into the Sound from fish bait; analysis of coastal riparian buffers in the LIS watershed; and understanding of the role of nutrient enrichment in tidal marsh losses.

**M**ANAGEMENT and FUNDING. The Management Committee met in January, April, July and October 2008. The 2008 federal budget for the Study totaled \$5.5 million, which funds key base program functions and staff positions for the Management Conference. The Long Island Sound base program consists of the water quality monitoring program conducted by the Connecticut Department of Environmental Protection; the public information, education and outreach program conducted by the New York and

Connecticut Sea Grant programs; the Long Island Sound Futures Fund large and small grants program administered by the National Fish and Wildlife Foundation; the CCMP Enhancements Projects grant program, administered by the New England Interstate Water Pollution Control Commission; and the Long Island Sound Research grant program jointly administered by the New York Sea Grant program and the Connecticut Sea Grant program.

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## CONTINUING THE MANAGEMENT CONFERENCE

IMPLEMENTING THE CCMP IS THE COMBINED RESPONSIBILITY OF THE MANAGEMENT CONFERENCE PARTNERS. THROUGH THEIR ONGOING PROGRAMS AND DAY-TO-DAY 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 actions in this section of the CCMP 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.

**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 ongoing 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. The Agreement commits the LISS to convene within a five-year window to update progress and refine its goals through the Management Conference process.

### **2008 Highlights:**

- Long Island Sound is included in EPA's Strategic Plan for 2006-2011 under Goal 4, *Healthy Communities and Ecosystems*. The Plan includes four key sub-objectives and may be viewed, ordered or downloaded at EPA's website: [www.epa.gov/ocfopage/plan/plan.htm](http://www.epa.gov/ocfopage/plan/plan.htm).
- Congress appropriated \$5.73 million for the LISS in 2008. Under CWA §119 EPA included \$467,000 in its 2008 President's Budget request for the LISS; and EPA's National Estuary Program allocated \$316,660 under CWA §320 for LIS. Congress added \$1.7 million in the *Environmental Programs and Management* appropriation for LISS and \$175,940 in the NEP program.
- The LISS developed a draft Long Island Sound Agreement in 2008. The Agreement updates the 2003 Agreement, focusing on priority areas identified by the LISS partners. As of this writing it is expected that a new Long Island Sound Agreement will be signed by the EPA Policy Committee and Governors before the end of 2009.
- The Management Committee met in January, April, July, and October 2008. The Committee added the Massachusetts Department of Environmental Protection as a member in 2008 and created a local government subcommittee to address concerns of local CCMP implementers.
- The STAC met in April, July and November 2008. Progress continued on developing the Long Island Sound synthesis document, which will provide a sweeping overview of scientific research in the Sound.
- The CAC met in March, June, and September, 2008. After many years of service as Connecticut CAC co-chair, John Atkin stepped aside and Curt Johnson of Connecticut Fund for the Environment/Save the Sound was elected as the new Connecticut co-chair. Dr. Martin Garrell of Adelphi University's physics department was elected CAC secretary.



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

### M-1. SUPPORTING IMPLEMENTATION (CCMP TABLE 50, P. 141)

**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.

2008 Description		2009 Planned Action
1.	Congress continued to fund the LISS in FY2008 under Clean Water Act Sections 119 and 320. The LISS budget in 2008 was \$5.73 million.	The FY2009 budget for LIS is \$3,000,000. In addition, LIS will receive \$600,000 as an Estuary of National Significance.
2.	EPA included Long Island Sound in its revised Strategic Plan for 2006-2011 under Goal 4, Healthy Communities and Ecosystems, Objective 4.3 Restore and Protect Critical; Ecosystems, Sub-objective 4.3.6: Restore and Protect Long Island Sound. Four strategic targets for Long Island Sound include: 1) reduction of point source nitrogen loads to the Sound; 2) reduction in the size and duration of the hypoxic zone in the Sound; 3) protection and restoration of coastal habitat; and 4) reopening of river corridors to anadromous fish passage. Each of these targets has baseline, interim and 2011 goals. EPA's Strategic Plan is available at: <a href="http://www.epa.gov/ocfopage/plan/plan.htm">www.epa.gov/ocfopage/plan/plan.htm</a>	EPA will work with the Management Conference to achieve targets and goals as resources allow.
3.	The Management Committee met in January, April, July, and October. The Committee held its third annual two-day session in October to review progress in CCMP implementation and to consider ways and means of better coordinating and implementing actions. The Committee established priorities for 2009 and agreed to actions for a new Long Island Sound 2009 Agreement.	The Committee will continue to meet in 2009 to address issues of concern to LIS.
4.	The Science and Technical Advisory Committee (STAC) met in April, July, and November 2008. The STAC elected its CT co-chair for a third term, and welcomed two new LIS Fellows, the CT Fellow from UConn, and the NY Fellow from Stony Brook University. The Fellows initiated projects to study salt marsh response to sea level rise and fish population response to disturbances. The STAC had briefings from the outgoing Fellows from Yale and SBU. The STAC continued work on the LIS ecosystem data synthesis project to summarize scientific work in several disciplines and produce a volume dedicated to LIS scientific research.	Continue STAC meetings in 2009 and continue to develop and refine LIS research needs based on extant scientific research.
5.	The Citizens Advisory Committee met in March, June, September, and December 2008. The CAC set a letter to the Long Island Sound Congressional Caucus supporting funding under the American Reinvestment and Recovery Act for Long Island Sound projects that would create jobs and improve environmental stewardship. The CAC invited NYSDEC Deputy Commissioner James Tierney and CTDEP Commissioner Gina McCarthy to discuss their views of Long Island Sound as a priority in their agency. The CAC had presentations from several LIS partners. The director of the Norwalk Public Works Department presented that city's project on storm water filtering. NYCDEP presented its work to upgrade its STPs for nitrogen removal. The CAC also invited its sister CAC leaders from the Peconic Estuary Program and the New York/New Jersey Harbor Estuary Program to present their work to restore and protect those important ecosystems. The CAC reorganized itself in 2008 forming new legislative, tracking and local government subcommittees, while increasing its participation on LISS teams and work groups. As of December 2008 CAC membership stood at thirty-seven, with twenty members from NY and seventeen from CT.	The CAC will continue to increase its representation and advocate for the full \$40 million appropriation for the LISS and \$25 million for the LIS Stewardship initiative.
6.	The EPA LISO continued to coordinate the work of the Management Committee, the STAC, and CAC and continued to support implementation efforts of LISS work groups -- the Nutrients Work Group, Nonpoint Source Work Group, the Connecticut River Work Group, the Habitat Restoration Team, Implementation Team, and the Stewardship Work Group. Each of these groups developed and implemented annual work plans linked to the LISS budget request, and are reported elsewhere in this report. The LISO continued coordination of the Management Conference, development of the annual budget and NEP work plan, and the LISS scientific research agenda. In 2008 the LISO assisted NOAA in funding a NOAA ecologist to work on living marine resources and scientific research in support of the LISS.	The LISO will continue to support implementation of the CCMP and the Management Conference partners.

# 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 coordinated management of hypoxia; 4) funding implementation of hypoxia management plans; and 5) monitoring and assessing hypoxic conditions and impacts.

**LIS 2003 Agreement Goal:** *Eliminate the adverse impacts of hypoxia resulting from human activities.* The management goals are to achieve the nitrogen reduction targets in Connecticut and New York and to 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. Connecticut and New York are continuing to make progress in reducing nitrogen loads to the Sound by 58.5 percent. The LISS, through its Connecticut River Work Group, continues work to identify and validate sources of nitrogen from upland states as an antecedent to developing formal agreements with these jurisdictions.

**Environmental Indicators/Results/Trends:** Total point source nitrogen loads delivered to Long Island Sound in 2008 decreased by 18,706 Trade-equalized (TE) lbs/day from the baseline (see Figure 1). There has been relatively flat progress in reducing point source nitrogen to the Sound over the last four years due to several factors. Several New York City STPs have been under construction for nitrogen removal upgrades and storage and processing capacity has been reduced as a result. This 'bulge' in the nitrogen reduction curve will last for several more years until STP upgrades are completed. Weather and rainfall also affect STPs' ability to effectively remove nitrogen, and the environmental response of the ecosystem is unpredictable. The maximum area of hypoxia (less than 3.0 mg/l dissolved oxygen (DO)) covered an estimated 181 square miles at peak, and lasted 79 days compared to the 22 year averages of 200 square miles and 58 days. The maximum area affected by hypoxia in 2008 represents approximately 14 percent of the total surface area (1,218 mi<sup>2</sup>) of the Sound and the duration of the hypoxic event represents 21 percent of the calendar year.

## **2008 Highlights:**

- The estimated nitrogen load from STPs in the LIS drainage basin in 2008 is approximately 40,440 TE lbs/day, a decrease of 18,706 TE lbs/day from the baseline. Figure 1 shows point source nitrogen load reductions since 1994. Appendix C shows the plant-by plant loads in CT and NY.
- In 2008, the maximum area and duration of dissolved oxygen less than 3 mg/l observed in LIS was 181 mi<sup>2</sup> and 79 days. The 22 year averages are 200 mi<sup>2</sup> and 58 days. Figure 2 shows the area and duration of hypoxia over time.
- In 2008, Connecticut completed the sixth year of its Nitrogen Credit Exchange program. As of 2007, 52 facilities were required to purchase credits in order to remain in compliance with the General Permit. Municipalities purchasing credits contributed a total of \$5,159,019. Twenty-seven facilities received payments totaling \$2,072,001 from the sale of nitrogen credits, netting \$3,087,018 from credit purchases and sales in 2007, the latest date available for this data.

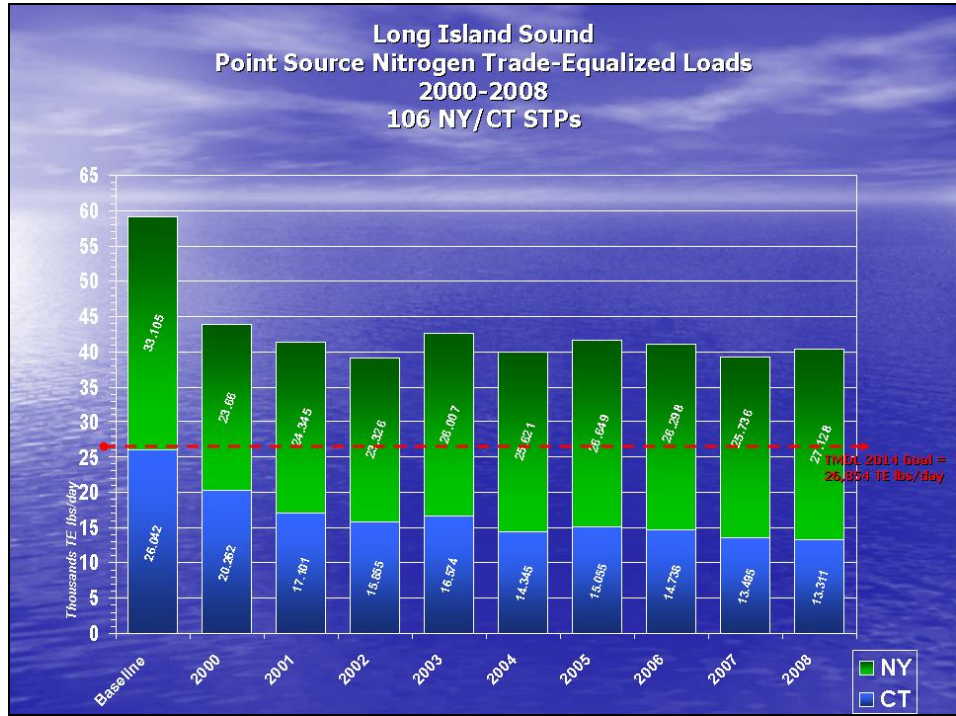


Figure 1

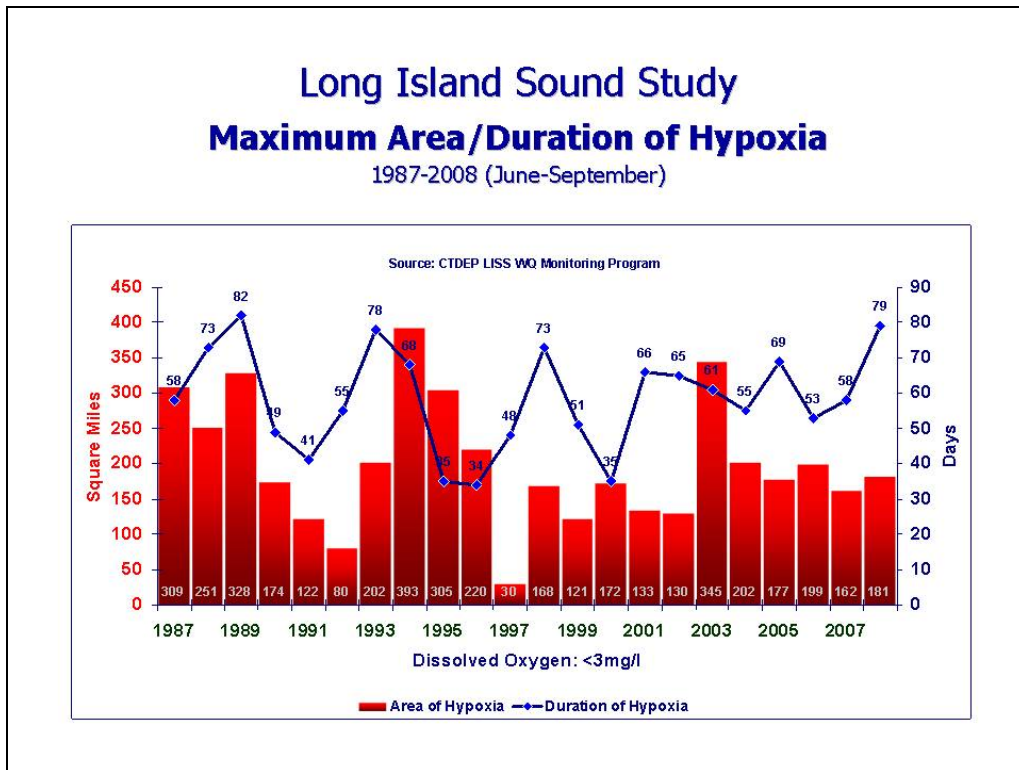


Figure 2

## SUMMARY OF CCMP MANAGEMENT ACTIONS: HYPOXIA

<b>H-1. REDUCING NITROGEN FROM SEWAGE TREATMENT PLANTS AND OTHER POINT SOURCES (CCMP TABLE 4, P. 32)</b>		
<b>KEY ELEMENTS: THE STATES OF CONNECTICUT AND NEW YORK COMMITTED TO REDUCE NITROGEN LOADS IN THEIR PORTIONS OF THE LONG ISLAND SOUND BASIN USING A MIXED APPROACH OF STP RETROFITS, PILOT STUDIES AND UPGRADES UNDER EXISTING PERMITTING AUTHORITIES. WITH ADOPTION OF THE TMDL, STATE REQUIREMENTS TO REMOVE NITROGEN LOADS HAVE BEEN FORMALIZED AND EXPANDED BEYOND THE ORIGINAL COMMITMENTS IN THE CCMP.</b>		
	<b>2008 Description</b>	<b>2009 Planned Action</b>
<b>1.</b>	<p>The total estimated point source (end of pipe) nitrogen load to LIS in 2008 was 40,440 Trade-Equalized lbs/day, a decrease of more than 18,500 TE lbs/day from the base TMDL level of 59,146 TE lbs/day. Trade-Equalized (TE) pounds consider the transport efficiency factor of each Management Zone established in the TMDL. Factors vary from 1.0 to 0.13 depending on calculated efficiency of nitrogen transport to the Sound. For example, a pound of nitrogen from the Stratford, CT STP would be equivalent to 0.62 pounds of nitrogen from Glen Cove, NY STP.</p> <p>New York loads totaled 27,128 TE lbs/day compared with 25,736 TE lbs/day in 2007. This increase is due to the construction work at New York City STPs to upgrade facilities for nitrogen control. The City has taken much holding and processing capacity off-line during construction work, which temporarily increases nitrogen loads to the Sound.</p> <p>All of the Upper East River WPCPs (Tallman Island, Bowery Bay, Hunts Point, and Wards Island) which represent Management Zone 8 are currently being upgraded for Step Feed BNR in addition to a 1.85 MGD SHARON Process being constructed at WI to treat the high strength ammonia stream from the dewatering facility. As a result of the ongoing construction, the nitrogen removal performance is expected to decrease while tanks are out of service but this will ultimately enable the WPCPs to meet the TMDL limits. These upgrades will occur in two phases; the first phase will consist of all the major infrastructure upgrades and is expected to be completed by the end of 2011 at a cost of about \$502M strictly for the BNR portion of the ongoing work. The second phase will consist of implementing cost effective supplemental carbon addition in conjunction with minor process enhancements. These facilities are expected to meet the 2014 WLA by 2017.</p> <p>Connecticut loads totaled 13,311 TE lbs/day compared with 13,495 TE lbs/day in 2007. The decrease in CT loadings is attributed to several plants removing nitrogen beyond waste load allocations. The Westport, CT STP completed its nitrogen upgrades in 2008 and came on line in Spring 2008.</p> <p>The total reduction as of December 2008 is nearly 52 percent of the total TMDL reduction and is 31.6 percent below baseline levels. There are 106 STPs that collectively discharge more than one billion gallons of treated effluent per day to the Sound. (See Appendix C for TMDL targets and 2008 plant-by-plant loadings.)</p>	Continue emphasis on achieving TMDL point source nitrogen reduction targets.
<b>2.</b>	<p>On December 30, 2008, NYSDEC executed a Consent Order against Westchester County which supersedes the Consent Order executed December 24, 2004 for the Blind Brook, Mamaroneck, New Rochelle, and Port Chester WPCPs. It also supersedes The July 3, 2006 Consent Order issued for the Town of North Castle WPCP. This new order addresses five WPCPs in Westchester County (Blind Brook, Mamaroneck, New Rochelle, Port Chester and North Castle). This Order implemented a SPDES requirement for a 12-month rolling average (12-MRA) for each facility but also included a "4 WWTP Aggregate 12-MRA" for the Blind Brook, Mamaroneck, New Rochelle, and Port Chester WPCPs. This CO requires the County to be in compliance with the 2014 WLA no later than 2017.</p>	Demolition of the New Rochelle plant is required to begin in 2009. By December 31, 2009 the County must submit the Design Report for the Phase I work at the Mamaroneck WWTP.
<b>3.</b>	<p>NYCDEP's Long Term CSO Control Program "Waterbody/Watershed Plan" for the 11 watersheds was submitted in 2007 and is currently under review. This plan has evaluated the impact of CSO discharges throughout all of New York City including the East River tributaries of Alley Creek, the Hutchinson River, Westchester Creek, the Bronx River, Flushing Bay and Creek, and Newtown Creek. The sewer system and outfall improvements in Alley Creek are also nearing completion which will reduce CSO flow and nitrogen loading to the waterways in the LIS basin. A CSO Retention Tank is also</p>	

	2008 Description	2009 Planned Action
	planned for Alley Creek. It is likely that CSO controls in the planning stage for the other waterways will also result in a reduction of nitrogen discharges.	
4.	<p>The following presents activities and progress by Management Zone in New York (please note that costs presented include disinfection upgrades as needed; all funding for LIS from the NYS Clean Air/Clean Water Bond Act has been committed). Disinfection projects are identified in the "Controlling of Pathogens" section of this report:</p> <p><u>Zone 7</u> – Has achieved an 11% reduction in nitrogen discharges from baseline. The costs for this Zone are currently being determined.</p> <ul style="list-style-type: none"> <li>• New Rochelle WWTP - Phase 1 is required to be completed by June 30, 2014, and be meeting the 12-MRA for New Rochelle and Mamaroneck WWTP by December 31, 2014.</li> <li>• Mamaroneck WWTP – Phase 1 is required to be completed by December 31, 2012, meeting their individual 12-MRA by June 30, 2013.</li> <li>• Any additional construction identified as being required to meet the Final/4 WWTP 12-MRA must be completed by December 31, 2016. Compliance with the Final/4 WWTP Aggregate 12-MRA must be demonstrated by August 1, 2017.</li> </ul> <p><u>Zone 8</u> – Has achieved a 15% reduction in nitrogen discharges from baseline. The costs to upgrade this Zone are estimated at \$502,000,000.</p> <ul style="list-style-type: none"> <li>• Bowery Bay - Phase I Construction of the BNR upgrade began in 2006, with the expected completion by 12/31/12. Phase 2 (carbon addition) of the nitrogen upgrade is expected to be completed by 7/1/16. This is a \$77 million project.</li> <li>• Hunts Point – Phase I BNR construction began in April 2003 and is expected to be complete by 6/30/09. Phase 2 (carbon addition) is expected to be complete by 8/1/15. This is a \$203 million project.</li> <li>• Tallman Island – Began construction of the nitrogen upgrade May 2006 with an expected completion date of 12/31/11. Phase 2 will be completed by 2017. This is an \$80 million project.</li> <li>• Wards Island – Began construction of the nitrogen upgrade April 2006. This is the full build-out for nitrogen treatment which will be used as a pilot for determining what is needed (Phase 2) at the other three plants. This project is due for completion by 12/31/11. The SHARON construction is expected to be completed by 7/31/09. This is a \$142 million project.</li> </ul> <p><u>Zone 9</u> – Are the NYC WPCPs Red Hook and Newtown Creek. In a 2006 Consent Order, NYC negotiated the ability to trade between the two NYC zones. As such, all of the required reductions in nitrogen loading from the NYC zones will come from Zone 8.</p> <p><u>Zone 10</u> – Has achieved a 36% reduction in nitrogen discharges from baseline. The costs to upgrade this Zone are currently estimated at \$64,000,000. Two of the six facilities in this Zone are meeting the 2014 WLA.</p> <ul style="list-style-type: none"> <li>• Great Neck Sewage District and Great Neck Village – The Great Necks have entered into an Intermunicipal Agreement to upgrade and build one combined plant at the Great Neck Water Pollution Control District's site to treat the flow from both sewer districts. The engineering report and the Design report are currently being reviewed by NYSDEC. The combined plant is sized for both plants' current design flow.</li> <li>• City of Glen Cove – This Facility has been meeting its 2014 WLA since 2003.</li> <li>• Oyster Bay SD – This Facility has been meeting its 2014 WLA since 2006.</li> <li>• Port Washington – This plant's BNR upgrade is underway with an expected completion date of 10/15/10. The project cost is approximately \$11 million.</li> <li>• Belgrave – This Facility was awarded \$2.9 million in 2003 to upgrade their biological filters to add methanol feed. The construction schedule has been extended for completion by August 2009 due to problems with the contractor.</li> </ul> <p><u>Zone 11</u> – Has achieved a 69% reduction in nitrogen discharges from baseline. The costs to upgrade this Zone are approximately \$43,100,000. Two of the six facilities in this Zone are meeting the 2014 WLA.</p> <ul style="list-style-type: none"> <li>• Greenport (V) - The Village of Greenport has submitted an engineering design report for BNR and UV upgrades. The BNR upgrade will meet the 2012 limit.</li> </ul>	

2008 Description	2009 Planned Action
<p>Construction is scheduled to begin during 2009. This Facility's WLA will be re-evaluated as part of the TMDL reassessment.</p> <ul style="list-style-type: none"> <li>Huntington SD – This Facility completed its nitrogen removal upgrade in April 2008 and is meeting the 2014 WLA.</li> <li>Port Jefferson (Suffolk Co SD#1) – The nitrogen upgrade at this Facility has been completed and the Facility has been meeting the 2014 WLA since September 2008.</li> <li>Kings Park (Suffolk Co SD#6) – Construction is underway for upgrading this Facility to meet the 2014 WLA. Construction for Phase 1 is expected to be complete by July 31, 2009.</li> <li>SUNY (Suffolk Co SD#21) – This Facility is currently under a Consent Order, effective 9/3/08 requiring The Phase 1 Design Plan and Specifications for an interim recharge facility to meet the 2009 nitrogen limit has been submitted.</li> <li>Northport (V) – The BNR upgrade was completed in 2005; however the facility is not yet meeting the 2014 WLA and is required to submit an Engineering Report by 8/1/09 detailing how the 2014 limit will be met.</li> </ul>	

**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 STORM WATER 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.**

2008 Description	2009 Planned Action
<p>1. In 2008 CTDEP and USGS completed a LISS-funded project to develop water quality thresholds that are protective and will help restore LIS eelgrass beds. The program's goal is to include eelgrass bed losses on Connecticut's Section 303(d) list once management criteria are available to address the problem. Sources are primarily nonpoint in the eastern LIS embayments where eelgrass is still extant.</p>	<p>Steering Committee is set up and a student will be hired to provide technical support to the project</p>
<p>2. The 2008 Consent Order between the NYSDEC and Westchester County (described above in H-1, #2, on page 9) requires the County to propose a Scope of Work for a non-point source study.</p>	<p>The scope of work is required to be submitted February 28, 2009.</p>
<p>3. NYS Issued the SPDES General Permit for Storm Water Discharges from Municipal Separate Storm Sewer Systems (MS4s) Permit No GP-0-08-002, effective May 1, 2008 and expiring April 30, 2010. If the TMDL reassessment is completed before the issuance of the next permit, Part IX will become applicable to all MS4s in the LIS watershed. This Part requires "Watershed Improvement Strategies" that include retrofits for controlling nitrogen.</p>	<p>Once the Reassessed LIS TMDL is adopted, affected MS4s will need to modify their SWMP to ensure reduction of the POC specified in the TMDL.</p>
<p>4. CAA/Air Regulations – NYS has adopted revisions to 6NYCRR Parts 200 (General Provisions), 201 (Permits and Registrations) and 231 (New Source Review for New and Modified Facilities). These changes will help monitor and reduce NOx emissions from affected sources. If the vacatur of CAIR is left in tact, 6 NYCRR Parts 237 &amp; 238 will be amended to include emission reductions (in NOx) expected from the CAIR program.</p>	<p>6 NYCRR Part 204 – NOx Budget Trading Program may be repealed in 2009 if the federal court of appeals leaves CAIR in place pending remand to EPA to develop a revised rule.</p>
<p>5. Nassau County provided funding through the Nassau County Environmental Bond Act to municipalities to improve storm water quality. A number of municipalities will be installing Catch Basin Inserts and are initiating projects at the following locations:</p>	<p>Complete Catch Basin installation.</p>

2008 Description	2009 Planned Action
<ul style="list-style-type: none"> <li>▫ Mill Pond Park - Town of North Hempstead</li> <li>▫ Roslyn Pond Park - Town of North Hempstead</li> <li>▫ North Sheets Creek - Town of North Hempstead</li> <li>▫ Hempstead Harbor Shoreline - Town of North Hempstead</li> <li>▫ Roosevelt Marina - Town of Oyster Bay</li> <li>▫ Scudders Pond - Village of Sea Cliff</li> <li>▫ Lumber Road/Skillman Street - Village of Roslyn-</li> <li>▫ Mill Pond - Glen Cove</li> <li>▫ Leeds Pond - Village of Plandome Manor</li> <li>▫ Dogwood Lake - Town of Oyster Bay</li> </ul>	
<p>6. Nassau County Four Ponds Project- Two of the four ponds involved in the project fall within the Long Island Sound watershed: Twin Ponds in Plandome, which drains to Manhasset Bay; and Udall's Mill Pond, which drains to Little Neck Bay. The ponds are being evaluated and technical Design Reports will be presented to the County that include recommendations to remediate the ponds through various storm water BMPs.</p>	<p>Implement BMPs for storm water remediation.</p>
<p>7. In May 2008, the Town of North Hempstead began an extensive NPS remediation project in Mill Pond that drains into Manhasset Bay. Plans call for dredging of sediments, wetland restoration, and swirl separators to treat water before it enters Manhasset Bay. The goal of the project is to increase retention time to allow for sediment deposition, increased nutrient uptake by the wetlands, and to create a juvenile fish nursery; juvenile American eel and pumpkin seeds have already been found in the pond. Funding for the approximately \$5.1M project was from multiple sources including different New York State agencies and the USEPA storm water infrastructure improvement fund. In 2008, the subcontractor was selected and construction activities commenced. A feasibility study and final construction designs and specifications for constructing storm water treatment systems are underway. The existing storm water drainage infrastructure will be retrofitted and, to the extent possible, ecological function (i.e., watershed function and riparian habitat) will be restored. When implemented, water quality and aquatic habitat in Mill Pond Park will be substantially improved through pollutant loading reductions to the Manhasset Bay Significant Coastal Fish and Wildlife Habitat. Up to three alternative schematic designs will be prepared and evaluated. Each alternative design will include measures and practices selected to function together as a whole to achieve measurable results. In addition to construction designs and specifications, cost estimates, a strategy and schedule, and permit applications will be prepared to implement the preferred alternative. A monitoring and maintenance plan was developed during 2008 to monitor and maintain the newly constructed storm water treatment systems and the surrounding riparian habitat.</p>	<p>Project is ongoing with expected completion in 2009.</p>
<p>8. <u>Glenwood Road/Powerhouse Drain Storm Water Pollution Abatement Plan and Development of Coordinated Ordinances and Enforcement Measures for Surface Water Uses:</u> Under sponsorship of the Village of Sea Cliff, NY, the Hempstead Harbor Protection Committee is in the process of implementing strategies identified in the Hempstead Harbor Water Quality Improvement Plan. In 2008, site reconnaissance work was begun to implement storm water management practices. The project includes a storm water pollution abatement plan for Glenwood Road/Powerhouse Drain and coordination of local ordinances and enforcement for Hempstead Harbor water uses. The project builds on work completed under previous NYS EPF awards by the nine-member inter-municipal watershed planning coalition.</p>	<p>Project is ongoing.</p>
<p>9. <u>Construction of Scudder's Pond Improvements, Phase One:</u> The Village of Sea Cliff is in the process of implementing elements of the Phase I improvements identified in its Scudder's Pond Sub-watershed Plan. In 2008, the project advisory committee was established, and site reconnaissance work begun to implement storm water management practices. The pond is located on property owned by the North Shore Country Club with public access provided through a long-term easement to the Village. Work will include installation of a swirl separator to intercept sediment, redirection of flow to a treatment wetland, and replacement of the discharge weir with a two-stage spillway. This will further work developed under a previous NYS EPF award.</p> <p><u>Construction of Scudder's Pond Improvements, Phase Two:</u> Additionally, the Village of Sea Cliff is implementing elements of the Phase Two improvements identified in its Scudder's Pond Sub-watershed Plan. Specifically, the Village will install a second swirl separator, remove a portion of the accumulated sediment in the pond, and replace invasive species along the pond's western edge with native species.</p>	<p>Project is ongoing.</p>

2008 Description	2009 Planned Action
<p>10. <u>Planning for Storm Water Management in Town of Southold Creeks:</u> With the assistance of Cornell Cooperative Extension, the Town of Southold developed a Waterbody Management Plan for creeks connecting to Long Island Sound and the Peconic Estuary. The Town completed the majority of the work for this project in 2007 and the project was completed in 2008. Specific tasks conducted in 2008 included the development of a storm water infrastructure database. The overall project included an inventory and assessment of all Town storm water infrastructure. This furthered work developed under previous EPF awards.</p>	<p>Project is ongoing.</p>
<p>11. IEC conducted MS4 outfall inspections during dry weather conditions on the north shore of Nassau County, New York. During 2008, 10 outfalls were inspected of which 4 were flowing. These observations were reported to NYS DEC, Region 1, for remediation.</p>	<p>Continue and expand dry weather inspections in other New York counties, as well as in Connecticut and New Jersey.</p>
<p>12. The Westchester County Department of Planning is designing and constructing a 3.2 acre stormwater wetland to absorb and filter runoff discharging from a pipe into the Bronx River and stabilize an adjacent eroding river bank. The project is one of 24 high priority sites identified by the Bronx River Watershed Coalition in its <i>Comprehensive Stormwater Pollution Control Plan</i>. The group is comprised of municipalities, nonprofits and county and state agencies who work together to improve water quality in the Bronx River by controlling stormwater pollution. It is designed in accordance with the standards of the <i>New York State Stormwater Management Design Manual</i>. The project was funded in 2008 as part of the Long Island Sound Futures Fund with \$250,00 in funds from a \$7 million settlement generated by the New York State Attorney General's Office (OAG) and Department of Environmental Conservation.</p>	<p>The Bronx River Watershed Initiative (BRWI) is a new source of support for stormwater retrofit projects along the Bronx River</p>
<p>13. The New York City Department of Parks and Recreation is developing a 360-square foot swale to capture 14,937 gallons of stormwater annually at Shoelace Park along the Bronx River. The project was funded in 2008 as part of the Long Island Sound Futures Fund with \$250,000 in funds from a \$7 million settlement generated by the New York State Attorney General's Office (OAG) and Department of Environmental Conservation.</p>	<p>The project is a visible stormwater retrofit that illustrates the connection between rainwater runoff and water pollution. It is also part of comprehensive effort involving community organizations and federal, state and local government working in close collaboration called the Bronx River Greenway Team. This multi-entity collaboration aims to develop the Bronx River Greenway a linear park and multi-use path.</p>
<p>14. The Bronx River Alliance is developing and implementing a rainwater harvesting program at key sites capturing roof runoff in tanks and encouraging its reuse to prevent polluted stormwater from entering the sewers which discharge into the waterway. The project will be implemented at sites identified in a targeted analysis conducted by the Bronx River Alliance and its municipal and nonprofit partners in 2007. The analysis focused on three parts of the Borough "sewersheds" that contribute the most polluted stormwater into the Bronx River. Sewersheds are areas of neighborhoods comprised of systems of pipes, manholes, pumps and drains that transport wastewater into sewers. The project was funded in 2008 as part of the Long Island Sound Futures Fund with \$117,500 in funds from a \$7 million settlement generated by the New York State Attorney General's Office (OAG) and Department of Environmental Conservation.</p>	



### 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.

2008 Description		2009 Planned Action
1.	The LISS TMDL Writing Team worked with the Connecticut River Work Group to plan and execute the System-Wide Eutrophication Model (SWEM) nutrient reduction scenarios. The combined group is evaluating the current TMDL to support a revision in the TMDL based on new data.	Continue to apply SWEM to analyze hypoxia and eutrophication in the Sound to support TMDL revision.
2.	<p>Principal Investigators are continuing work in 2008 on the following LISS or Dissolved Oxygen Benefit Fund projects to investigate, model or document hypoxia:</p> <p><b>Development of a Long Island Sound-Specific Water Quality Index Using Cluster Analysis and Discriminant Analysis</b> (City College of New York; PI: Zhang; LI-97263606; LIS 2006 Research Funding; \$119,217; ENDS: 8/31/09): The objective of this project is to develop a Long Island Sound-specific water quality index. The water quality index will be computed using multivariate cluster analysis and discriminant analysis of a set of individual water quality indicators. A numerical water quality index (around -1 to 1) will result, with a value close to 1 indicating good water quality (oligotrophic), a value close to -1 indicating poor water quality (eutrophic), and a slight negative value representing mesotrophic conditions (intermediate water quality). The new method will be applied to the Long Island Sound water quality data (past 15 years at ~20 stations) collected by CTDEP. Monthly water quality indices will be computed for every station, and seasonal and annual trends in the water quality indices will be examined. The outputs of this project include a new LIS-specific water quality index and an automated procedure for computing the index. The numerical water quality index will give clear indications of the trophic status of LIS waters for routine water quality assessments.</p> <p><b>Simulation of Long Island Sound with the System-wide Eutrophication Model (SWEM): Inter-annual Variability and Sensitivity</b> (UConn/DMS; PI: Dam/O'Donnell; LI-97127101; LIS 2005 Enhancement Fund; \$251,164; ENDS: 3/30/09): The objectives of this project are to evaluate the effectiveness of SWEM and to identify additional studies that will improve our ability to predict the impact of management strategies on the water quality of Long Island Sound. The researchers will establish the sensitivity of SWEM to model parameters, model formulation, and inter-annual variations in weather and river discharge and will provide an independent, quantitative evaluation of the model and its utility as a management tool.</p> <p><b>Cost-effective Strategies to Reduce Nitrogen Discharges into the Long Island Sound: Optimization of Partial Nitrification and External COD Based Denitrification at Stamford WPCA</b> (The Trustees of Columbia University in the City of New York, DO Fund 2007, \$204,000) The project will develop and implement state of the art biological tools to remove nitrogen that enters the Long Island Sound's bays and harbors from sewage treatment plants. A high level of nitrogen reduces the amount of oxygen in water available to sustain fish and other aquatic animals. This condition of low "dissolved" oxygen is known as hypoxia. Too much nitrogen also leads to excessive algae growth which clouds the water and blocks sunlight to marine plants that provide prime nursery and spawning habitat for juvenile finfish and shellfish. The tools piloted at the Stamford Water Pollution Control Authority will be useful to publicly owned treatment works in Connecticut and New York major point sources of nitrogen loads into local watersheds affecting water quality and the recreational, ecological and economic values of the estuary.</p> <p><b>Assessing Nitrogen Loading to Western Long Island Sound from Submarine Groundwater Discharge.</b> (USGS - Woods Hole Science Center, DO Fund 2007, \$579,104) The project will quantify the significance of groundwater's contribution to nitrogen into the Long Island Sound. The project results will provide useful technical information to the current public dialogue about nitrogen loading from sewered and unsewered watersheds. It will compare groundwater discharge from those types of watersheds as well as other types of pollution found in groundwater (fertilizer, pesticides, and air). The</p>	LISS will continue to support research related to management decisions.

2008 Description	2009 Planned Action
<p>information generated from the study will help resource managers determine circumstances where sewers and/or other tools (e.g. filtration beds etc.) reduce nitrogen loads into local watersheds.</p> <p><b>Numerical Evaluation of Larval Survival in Long Island Sound as Influenced by Exposure to Varying Levels of Dissolved Oxygen.</b> (Manhattan College, DO Fund 2007, \$74,654) This project will develop a tool that will improve the long-term survival of fish, shellfish and crabs by allowing resource managers to better determine and manage the amount of nutrients allowed in the open waters of the Long Island Sound. The project will look at the different amounts of dissolved oxygen required to sustain juvenile and adult fish and shellfish. Among other benefits, the project will improve our ability to pinpoint and protect important spawning habitat and to tailor nutrient reduction goals to improve propagation of fish and shellfish.</p> <p><b>Tools to Monitor the Effects of Management Actions on DO and its Interactive Effects with Sewage-derived Endocrine Disrupting Chemicals in Wastewater Affected Coastal Environments.</b> (The Research Foundation of SUNY, DO Fund 2007, \$181,253) The project will develop an innovative approach to evaluate the effect of chemicals (including common pharmaceuticals) that increase the amount of natural and synthetic estrogens found in sediments in Jamaica Bay and Long Island Sound fish. Estrogens are now strongly believed to result in hormonal changes that increase the ratio of female to male fish and lower reproduction in fish both findings of great significance to the humans, plants and animals along the coast.</p> <p><b>Characterization and Minimization of Nitrogen Greenhouse Gas Emission from Wastewater Treatment Operations.</b> (Columbia University, DO Fund 2008, \$194,247) The project will characterize nitrogenous greenhouse gas (N-GHG) emissions from wastewater treatment plants, and develop reactor configurations and strategies to reduce N-GHG fluxes from an advanced nutrient removal facility in Stamford, CT. A mechanistic model will be refined to support development of a tool to predict NO<sub>x</sub> and N<sub>2</sub>O emissions from wastewater treatment plants using a range of wastewater treatment processes.</p> <p><b>Measurement of Mixing Rates in Western Long Island Sound.</b> (University of Connecticut, DO fund 2008, \$199,192) This project will measure the rate of production of turbulent kinetic energy and the evolution of the stratification near Execution Rock and to use these to estimate the vertical eddy viscosity and diffusivity. The estimates will be compared to those used in the SWEM water quality model and the consequence of using the estimates on SWEM predictions will be evaluated.</p> <p><b>Smithtown Bay: A Hypoxic Hot Spot – Why?</b> (University of New Haven, \$199,150) This project investigates the role that certain factors (e.g. circulation, water temperature, wind, sediment oxygen demand, bioturbation) may play in the establishment of hypoxic conditions in Smithtown Bay and the role that Smithtown Bay (and other coastal embayments) have on the evolution of hypoxia in Long Island Sound.</p>	

**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.**

2008 Description	2009 Planned Action
<p>1. Using funds from the consent judgment settlement with New York City, a Dissolved Oxygen Environmental Benefit Fund (DOEBF) for western Long Island Sound and Jamaica Bay was established in 2006. The DOEBF is administered by the National Fish and Wildlife Foundation. In 2008 research and restoration projects selected for funding totaled \$833,000. See Appendix A for 2008 project descriptions.</p>	<p>All funds were committed for western Long Island Sound projects, making 2008 the last funding year for the DOEBF. Projects will be tracked and reported upon completion.</p>

2008 Description	2009 Planned Action
<p>2. The Bronx River Watershed Initiative (BRWI) is a new source of support for storm water retrofit projects along the Bronx River. The funds come from a \$7 million settlement generated by the New York State Attorney General's Office (OAG) and Department of Environmental Conservation (DEC) resulting from violations associated with discharges of raw sewage into the Bronx River from storm sewers. In 2008, the BRWI awarded \$617,500 to three projects for storm water mitigation in NY:</p> <ul style="list-style-type: none"> <li>• The Westchester County Department of Planning will design and construct a 3.2 acre storm water wetland to absorb and filter runoff discharging from a pipe into the Bronx River and stabilize an adjacent eroding river bank. The project is one of 24 high priority sites identified by the Bronx River Watershed Coalition in its <i>Comprehensive Storm water Pollution Control Plan</i>. The group is comprised of municipalities, nonprofits and county and state agencies who work together to improve water quality in the Bronx River by controlling storm water pollution. It is designed in accordance with the standards of the <i>New York State Storm water Management Design Manual</i>.</li> <li>• The Bronx River Alliance will develop and implement a rainwater harvesting program at sites capturing roof runoff in tanks and encouraging its reuse to prevent polluted storm water from entering the sewers which discharge into the waterway. The project will be implemented at sites identified in a targeted analysis conducted by the Bronx River Alliance and its municipal and nonprofit partners.</li> <li>• The New York City Department of Parks and Recreation will develop a 360-square foot swale to capture 14,937 gallons of storm water annually at Shoelace Park along the Bronx River. <i>The Bronx River Ecological and Watershed Management Plan</i> recommends implementation of storm water retrofits of this type to reduce the volume and peak flow of storm water into the River; and to implement storm water retrofit projects which demonstrate the capacity of state and local government and citizens groups to implement such projects. At the 211<sup>th</sup> Street site water flows overland from surrounding streets, sidewalks and rooftops into the park where it forms channels that erode parkland and river bank before flowing directly into the river. Additional flows are currently diverted to a storm drain catch basin that pipes polluted water into the river under Gun Hill Road.</li> </ul>	<p>The next RFP is currently on the web at <a href="http://www.nfwf.org/brwi">www.nfwf.org/brwi</a> Proposals were due March 13, 2009.</p>

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

**KEY ELEMENTS:** THE CCMP RECOGNIZED 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 ACTIONS. 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.

2008 Description	2009 Planned Action
<p>1. In Summer 2008, hypoxic conditions (&lt;3mg/l DO) in LIS were estimated to have extended for a period of 79 days and covered a maximum area of 181 square miles compared to the 20 year averages of 58 days and 203 square miles. Hypoxic conditions began on July 3, 2008 and lasted through September 19, 2008. LIS monitoring information is posted on the CTDEP website: <a href="http://dep.state.ct.us/wtr/lis/monitoring/summer2008.htm">http://dep.state.ct.us/wtr/lis/monitoring/summer2008.htm</a>. EPA has included this area as an environmental indicator in its Strategic Plan for 2006-2011 under Goal 4, Healthy Communities and Ecosystems.</p>	<p>The LISS is continuing to fund the CTDEP ambient monitoring of LIS in 2009.</p>
<p>2. The UConn Department of Marine Sciences at Avery Point, Connecticut, continued to operate and maintain a real-time water quality monitoring network, MYSound, in 2008 under LISICOS, the Long Island Sound Integrated Coastal Observing System, an expanded regional monitoring initiative. MYSound stations monitor surface and bottom waters for dissolved oxygen, temperature, salinity and other selected parameters, such as wind speed, at eight sites. The MYSound website address is:</p>	<p>Continue to operate and maintain the MYSound stations and website as funding allows.</p>

2008 Description	2009 Planned Action
<a href="http://www.mysound.uconn.edu">http://www.mysound.uconn.edu</a> .	
<p>3. The LISS partners continued ambient monitoring of LIS in 2008:</p> <p>CTDEP continued its ambient monitoring of LIS stations. CTDEP's scope of monitoring parameters supports the changing ecosystem perspective. Currently 17 stations are monitored on a monthly basis, year-round and 25-30 stations are added for bi-weekly hypoxia monitoring from June-September. Maps and summaries are available on the at: <a href="http://www.ct.gov/dep/cwp/view.asp?a=2719&amp;q=325532&amp;depNav_GID=1654">http://www.ct.gov/dep/cwp/view.asp?a=2719&amp;q=325532&amp;depNav_GID=1654</a></p> <p>NYCDEP performed ambient monitoring of NY waters in Western LIS. Its findings are summarized in the NYCDEP Harbor Water Quality Monitoring Report produced annually.</p> <p>IEC continued summer hypoxia monitoring in LIS by weekly measurements of DO, pH, temperature, salinity and Secchi depth at 21 stations; and bimonthly, samples were collected for chlorophyll a. Two unique events occurred during 2008: one fish kill (menhaden) on September 13, 2008, was observed in Mamaroneck Harbor. The second was that the summer hypoxic event extended into mid-September, representing the longest summer monitoring survey since its inception in 1991. IEC made weekly data transmissions to LISO, CTDEP, NYCDEP, NYSDEC, CSHH and HydroQual. The IEC Annual Report details all monitoring activities which can be viewed on the IEC website at: <a href="http://www.iec-nynjct.org">www.iec-nynjct.org</a>. All IEC data are entered into the EPA database, STORET.</p>	<p>Continue the ambient monitoring program.</p>
<p>4. In 2008, NYSDEC Crustacean Unit staff, with the aid of a contracted commercial fisherman, deployed and sampled NYSDEC lobster traps at 75 sites per week in WLIS from June through November. The sites were located in WLIS from the NY side to the CT side and from Lloyd Neck to Hempstead Harbor. Trap sampling was also in concert with environmental variable recording. In approximately 8000 trap hauls, staff sampled 1,354 lobsters. Catch decreased noticeably during periods of low DO and/or high bottom water temperature. The number of lobsters seen in 2008 was the lowest yet and continues the pattern of fewer lobsters every year since the survey began in 2003 (no sampling in 2005). The purpose of this survey is to monitor lobster populations and determine how populations respond to environmental variables. Funding for this work was provided by Federal Disaster Relief funding through NOAA for the lobster die-off in the late 1990s.</p> <p>Reports are prepared twice a year and submitted to NOAA for this project. In the spring report, NYSDEC staff describe the upcoming sampling, any changes to past sampling techniques, and results for any additional sampling conducted during the off-season from December to May. The December report is larger and contains the year's results. A copy of either report is available upon request.</p>	<p>Funding to continue the work in 2009 is uncertain. NYSDEC crustaceans staff prepare two reports per year to NOAA. The spring report covers the upcoming sampling plans and the December report provides the year-end results. Reports are available from NYSDEC.</p>
<p>5. Westchester County completed the 12th season of water quality sampling in Manursing (aka, Playland) Lake, annual surveys began in 1997. Staff collected data on dissolved oxygen, salinity, temperature, and conductivity from May through September. The data collected from the lake is compared with data collected at the end of Playland Park Pier and is used in county management decisions. Funding for this project is through the Westchester County Parks operating budget for staff time and equipment. The YSI meter used for sampling was donated as a gift from the Friends of Read Sanctuary in 1997.</p>	<p>Sampling will continue in 2009.</p>
<p>6. NYS had developed and promulgated in February 2008 new marine dissolved oxygen (DO) standards. In general, the new standards establish an acute criteria limit of "never less than 3.0 mg/l DO." The chronic criteria established through a formula determining how long a concentration of DO in the range <math>3.0 \text{ mg/l} &lt; x &lt; 4.8 \text{ mg/l}</math> may exist. These criteria were developed to be protective of juvenile species survival and larval population survival.</p>	
<p>7. Friends of the Bay in Oyster Bay, NY completed their 11th ambient water quality sampling season in 2008. Sampling took place once a week from the first Monday in April to the last Monday in October; reports are available on the FOB website at <a href="http://www.friendsofthebay.org">www.friendsofthebay.org</a>. Funding for the 2008 sampling season was provided by the National Fish and Wildlife Foundation and Arrow Electronics. In-kind contributions were provided by the Oyster Bay Marine Center, Joe Shaulys, and Frank M. Flower and Sons.</p>	<p>Water quality monitoring activities are planned to continue in 2009.</p>
<p>8. In 2008, 100 volunteers participated in the Westchester County Citizens Volunteer Monitoring Program (April to October sampling season) comprising a total 20 teams that monitored sites in the four major watersheds in Westchester County. Volunteers consisted of residents, students and teachers in Westchester County. There were three sites in tributaries of Long Island Sound and two in the Bronx River (a tributary of Long Island Sound via the East River). Data has been entered into a web-based database for viewing and comparison using statistics and computer-aided mapping at</p>	<p>This program will be continued in 2009.</p>

2008 Description	2009 Planned Action
<a href="http://cvmp.westchestergov.com/cvmp">http://cvmp.westchestergov.com/cvmp</a> .	
<p>9. The Coalition to Save Hempstead Harbor (CSHH) completed its 17th season of water-quality monitoring. Sampling takes place once a week from May to November. Nine stations have been selected for full surveys, weekly to monthly, depending on tidal cycle, although there are a total of 13 stations at which samples are also collected for bacteria analysis that is conducted at the Nassau County Department of Health lab. If unusual conditions or discharges are visible, additional samples are collected for bacteria analysis. Reports are published on the web at: <a href="http://www.hempsteadharbor.org/documents.asp">http://www.hempsteadharbor.org/documents.asp</a>. The Hempstead Harbor Protection Committee (HHPC), a consortium of municipalities that have jurisdiction over Hempstead Harbor and CSHH continue to work in partnership to monitor the Harbor's water quality and produce data on the website.</p>	<p>Monitoring will continue in 2009.</p>
<p>10. The Manhasset Bay Protection Committee monitored five sites in 2008 in conjunction with the Town of North Hempstead's Bay Constable. Current monitoring entails collecting bacteria samples for analysis by the Nassau County Department of Health. Additional testing is also performed by the three local sewer districts and the DOH also monitors the local beaches. This is a volunteer project with the Town of North Hempstead donating boat and Bay Constable time as a part of the annual budget. Nassau County DOH has also made sample analysis a part of their annual budget, but with budget constraints, MBPC may have to look for another laboratory or offer compensation to DOH.</p> <p>The collected data is used to determine trends in Manhasset Bay water quality and whether conditions are improving or not. In the future, MBPC wants to analyze long term trends in Bay water quality. To do this, MBPC received a NYS EPF grant to have existing data, mostly on paper, put into one software program. MBPC hired LabLite as a consultant who had a proprietary program used mostly by sewer districts until recently. They completed the data sets for DOH and MBPC and MBPC is now wrapping up that portion of the project. The final report from Lablite was submitted in 2008.</p>	<p>Continue the coordinated monitoring effort. Additionally, pursue the possibility of hiring a summer intern to do more enhanced testing and to put the results of the 2008 monitoring into the software program. Intern could also mine for other data sets and input those as well.</p>
<p>11. The Manhasset Bay Protection Committee, on behalf of the Town of North Hempstead is implementing recommendations of the Manhasset Bay Water Quality Improvement Plan, prepared under previous LWRP grants from the Environmental Protection Fund (EPF). The project will focus on water quality monitoring and an adopt-a-watershed program. Work in 2008 included the compilation of historical data and the development of monitoring protocols for future use.</p>	<p>Project is ongoing.</p>

## 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 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, e.g., improper disposal of pet wastes, inappropriate feeding of wildlife, changes in such behaviors may benefit the Sound. There are many ongoing federal, state and local programs to control and prevent pathogen contamination and to educate the public on best practices to avoid infection.

**LIS 2003 Agreement Goal:** *Increase the area for shellfish harvesting and eliminate bathing beach closures while maintaining protection of human health.* There are several goals in this section of the Agreement, including nomination of No Discharge Areas (NDAs) in Connecticut and No Discharge Zones (NDZs) in New York, decreasing the acreage of shellfish beds closed due to pathogen contamination, and minimizing and eliminating chronic beach closures due to pathogen contamination.

**Environmental Indicators/Results/Trends:** LISS environmental indicators for pathogens include the number of beach closure days and number of vessel pumpout stations. There were 927 LIS beach closure days reported in 2008, with Connecticut reporting 135 and New York reporting 635 closure days at LIS beaches in Nassau (237), Suffolk (253), Westchester (110), and NYC (35) LIS beaches. There are 240 LIS beaches that are monitored for pathogen contamination by local health departments, counties or state agencies. Most closures are due to rainfall levels exceeding a range of ½-1 inch in a 24-hour period, which requires local officials to close beaches as a health precaution.

### **2008 Highlights:**

- Seven Connecticut STPs installed Ultraviolet (UV) disinfection equipment to reduce pathogens and eliminate the use of chlorine in their discharges.
- The City of Shelton, Connecticut, EPA, and CTDEP reached a settlement on Shelton's violation of raw sewage discharge from its sanitary sewer overflow (SSO). The city also agreed to pay a fine of \$142,000 split between EPA and CT and certified to sealing up the by-pass outfall to the Housatonic River. The CT portion will be used to pay for environmental projects in the LIS watershed.
- The Town of North Hempstead began an extensive NPS remediation project in Mill Pond which drains into Manhasset Bay to increase retention time to allow for sediment deposition, increase nutrient uptake by the wetlands, and to create a juvenile fish nursery.
- A restoration project in Dickermans Pond, New Rochelle created sumps and sediment basins to remove sediment from storm water flowing into the site and established wetland to further treat the storm water in addition to the project's habitat benefits. The Hempstead Harbor Complex and the Oyster Bay/Cold Spring Harbor Complex in NYS were both designated as vessel waste no discharge zones (NDZs).

## 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 STORM WATER 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.

2008 Description	2009 Planned Action
1. The Greater New Haven Water Pollution Control Authority (WPCA) completed the CSO sewer separation project for the Lombard area.	The Greater New Haven WPCA plans to install a monitoring system at several large CSO discharge points in New Haven to quantify the volume of CSO discharged at that location during a storm event. Other plans include: Perform a CSO sewer separation project in the vicinity of the Yale University campus and Prepare a Modified Facility Plan that summarizes all planning studies recently conducted (CSO and treatment plant upgrade projects), perform an affordability analysis, and establish a plan and schedule for implementing those projects.
2. In August 2008 the City of Bridgeport, was Issued an Administrative Order to revise its LTCP with report due by 9/30/2010. Contract G-2 was completed in early 2008 and contract G-4 was nearly complete by the end of 2008. (completed early 2009)	The revised LTCP will be developed with final plans and specifications for the River Street pump station and interconnecting sewer in areas G3 & G5 submitted by May 2009. Area "H" will be designed during 2009-2010, with construction beginning 2009-2012.
3. The City of Shelton, EPA, and the CTDEP reached a settlement on Shelton's violation of raw sewage discharge from its sanitary sewer overflow (SSO). Under the agreement, the city eliminated its "waste water treatment by-pass" and agreed to implement a comprehensive, system-wide plan to ensure that overflows of raw sewage associated with insufficient wastewater collection system capacity are eliminated by July 30, 2010. The city also agreed to pay a fine of \$142,000 split between EPA and CT and certified to sealing up the by-pass outfall to the Housatonic river. The CT portion will be used to pay for environmental projects in the LIS watershed. Historically, the city's collection system was combined, handling both sanitary sewage and storm water during periods of wet weather. During the 1980's, the city separated much of the collection system and eliminated designated combined sewer overflow outfalls (CSOs). However, the city maintained a wastewater treatment by-pass to the Housatonic River prior to the headworks of the city's STP.	Shelton will continue to monitor its STP system and outfall.
4. The NYCDEP has proposed and the NYSDEC has accepted that the wastewater treatment plants that are undergoing construction to upgrade to BNR will achieve nitrogen reduction levels that include reductions equivalent to the nitrogen load from the CSO's in Zones 8 & 9.	Ally Creek retrofit is contained in the Tallman Island Permit and is under construction. Paedegat Basin CSO retrofit is under construction, with construction expected to be completed in 2009.

2008 Description	2009 Planned Action
<p>5. The Retrofit of Flushing Creek/Bay CSO was operational in May 2007 with major completion in November 2008 at a cost of \$330M. The 43 million gallon (MG) Flushing Bay Combined Sewer Overflow (CSO) Retention Facility will capture CSOs through a CSO Outfall which previously contributed 60% of the CSO discharges to Flushing Creek and Bay, and 50% of the pollutant load. The facility was designed to capture 100% of CSO discharges for up to a 0.5 inch rainstorm (6-weeks). The annual amount of CSO capture will be approximately 800 MG. Pumped combined sewage will flow to the Tallman Island Water Pollution Control Plant where it will be treated. The facility will improve water quality and increase dissolved oxygen in Flushing Creek and Flushing Bay</p>	
<p>6. The Alley Creek drainage area improvements and CSO abatement facilities project is currently under way within the Tallman Island WPCP drainage area. The project includes construction of additional combined and storm sewers to increase the hydraulic capacity of the existing sewer system to eliminate sewer surcharging and street flooding. The project also includes a CSO storage facility within Alley Park to capture 5 million gallons (MG) of combined sewage to improve the water quality of Alley Creek and Little Neck Bay by abating CSO discharges into Alley Creek. Combined sewage stored in the storage facility will be drained to the Old Douglaston Pumping Station and pumped to the existing sewer system. The pumped combined sewage will flow to the Tallman Island WPCP for treatment. The overall volume of CSOs discharged to Alley Creek will be reduced from approximately 246 MG per year to 112 MG per year.</p> <p>Water quality in Alley Creek and Little Neck Bay will be improved by increasing the dissolved oxygen concentrations, decreasing the coliform levels, and decreasing the floatables and settleable solids within the Creek and Bay.</p> <p>The project is currently in Stage 2 (2006-2011), which involves activation of CSO storage facility constructed under Stage 1 and a major upgrade of Old Douglaston Pumping Station. This stage of the upgrade is estimated at \$30 million.</p>	

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

**KEY ELEMENTS: NONPOINT SOURCE RUNOFF, INCLUDING URBAN STORM WATER RUNOFF, IS ONE OF THE MOST SIGNIFICANT SOURCES OF PATHOGEN CONTAMINATION IN LONG ISLAND SOUND. PATHOGENS IN URBAN STORM WATER 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.**

2008 Description	2009 Planned Action
<p>1. CTDEP continued to implement its Phase II MS4 Permit program. In 2008 CTDEP received MS4 General Permit Annual Reports from 30 municipalities. Approximately 113 municipalities have submitted their Part B registrations. All towns are developing their Storm water Management Plans. Four workshops were conducted for towns. CTDEP negotiated three consent orders with towns to be addressed by a joint supplemental environmental project (SEP) to fund development of television and radio public service announcements (PSAs) addressing storm water pollution prevention.</p>	<p>The fifth year annual reports are due to the DEP by January 2009. CTDEP will collect reports and do follow-up for Part B registrations and late Reports.</p>



2008 Description	2009 Planned Action
<p>2. In 2007-2008, the following CT water bodies had approved TMDLs for waters around Long Island Sound. These water bodies include embayments or tributaries to Long Island Sound:</p> <ul style="list-style-type: none"> <li>• Southport Harbor – TMDL for indicator bacteria</li> <li>• Quinnipiac River Regional Basin - TMDL for indicator bacteria</li> <li>• Naugatuck River Regional Basin - TMDL for indicator bacteria</li> <li>• Eagleville Brook - TMDL for impervious cover</li> </ul>	<p>The towns in the Naugatuck and Quinnipiac River basins have been notified to update their Stormwater Management Plans to address the TMDL requirements.</p> <p>Continue to pursue TMDLs for other water bodies through implementation of the MS4 permit program, as well as work with local stakeholders to improve watershed conditions.</p>
<p>3. On October 16, 2008, staff from NYSDEC Bureau of Marine Resources and Division of Water met with representatives of Hempstead Harbor (Towns of Hempstead and Oyster Bay) to discuss the 27-water body pathogen TMDL, released in 2007, and concerns the towns had with the development of the TMDL. The towns felt it failed to give credit to the progress that had been made in Hempstead Harbor, among other issues. NYSDEC cited that the representatives could use the TMDL as evidence that they are ahead of the game in water quality improvements. The following water bodies were included in a 27 water body pathogen TMDL for waters around Long Island. These water bodies are all embayments or tributaries to Long Island Sound:</p> <ul style="list-style-type: none"> <li>• Hempstead Harbor</li> <li>• Cold Spring Harbor – Inner</li> <li>• Cold Spring Harbor – Eel Creek</li> <li>• Huntington Harbor</li> <li>• Centerport Harbor</li> <li>• Northport Harbor</li> <li>• Stony Brook Harbor</li> <li>• Port Jefferson Harbor</li> <li>• Conscience Bay</li> <li>• Setauket Harbor</li> <li>• Mt. Sinai Harbor</li> <li>• Mattituck Creek</li> <li>• Goldsmith Inlet</li> <li>• West Harbor, Fishers Island</li> </ul> <p>The NYSDEC is currently reviewing and considering revisions to the MS4 Stormwater General Permit. When re-issued, it will include provisions for implementing watershed improvement strategies for these water bodies.</p>	
<p>4. The MS4 SPDES General Permit issued May 1, 2008 includes the implementation for a watershed improvement strategy for Oyster Bay and Mill Neck Creek, which has a Pathogen TMDL completed in 2003.</p>	
<p>5. In May 2008, the Town of North Hempstead began an extensive NPS remediation project in Mill Pond which drains into Manhasset Bay. Plans call for dredging of sediments, wetland restoration, and swirl separators to treat water before it enters Manhasset Bay. The goal of the project is to increase retention time to allow for sediment deposition, increased nutrient uptake by the wetlands, and to create a juvenile fish nursery. Funding for the approximately \$5.1M project was from multiple sources including different New York State agencies and the USEPA's stormwater infrastructure improvement fund. ( This project is also included under Hypoxia, #2, on page 12).</p>	<p>Project is ongoing with expected completion in 2009.</p>
<p>6. Westchester County is conducting six non-point source/aquatic habitat restoration projects along the Sheldrake River corridor within the City of New Rochelle and Town of Mamaroneck. All work undertaken through this project will result in improvements to the water quality and fish and wildlife habitat values of the Sheldrake River. 2008 activities included site analyses, including topographical and bathymetric surveys conducted for Gardens Lake, in the Town of Mamaroneck; a monitoring and maintenance plan was developed for Carpenters Pond, in New Rochelle; and construction and planting was completed for Dickerman's Pond in New Rochelle. (Also reported in L-1, page 39).</p>	<p>Work in progress</p>

2008 Description		2009 Planned Action
7.	The Westchester County SWCD completed a pond restoration in Dickermans Pond, New Rochelle in fall 2008 as part of the Sheldrake River corridor restoration. The project was primarily aimed at restoring the ecological and water quality protection benefits once provided by the pond. The project created sumps and sediment basins to remove sediment from stormwater flowing into the site and established wetland to further treat the stormwater in addition to the project's habitat benefits. The project was funded by a state Clean Water/Clean Air Bond Act grant from the Department of State, as well as matching funds from the County of Westchester, City of New Rochelle, and Town of Mamaroneck. More information can be found at: <a href="http://www.westchestergov.com/waterquality">www.westchestergov.com/waterquality</a> (Also reported in L-1, page 39).	
8.	The Town of Brookhaven completed a restoration master plan for West Meadow Beach, located in the hamlet of Stony Brook, NY on Long Island Sound. To comply with Chapter 594 of the Laws of New York, 1996, the Town must remove 93 cottages from this site. The plan delineates, assesses and synthesizes a series of strategies to simultaneously achieve the goals of ecological restoration, public use and access, and environmental education. (Also reported in L-1, page 39).	Work in progress

**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.**

2008 Description		2009 Planned Action
1.	The Greenwich, CT STP installed and came on line with a UV disinfection system December 2008.	Operate equipment at capacity.
2.	The Stratford, CT STP completed and installed an UV disinfection project replacing existing chlorine disinfection system.	Operate the equipment at capacity.
3.	The Plainville, CT STP completed a new UV disinfection system to replace an old UV system.	Operate the equipment at capacity.
4.	The Milford Beaver Brook and Milford Housatonic STPs installed UV disinfection units and came on line in 2008.	Operate the equipment at capacity.
5.	The Glastonbury, CT STP is installing a UV disinfection unit to replace its chlorine disinfection system.	Plans to put the UV disinfection unit online in 2009.
6.	The Southbury Training School STP is being shut down and design modifications to remove the discharge.	Remove STP discharge in 2009.
7.	Of the 12 WWTP's discharging into Long Island Sound from Long Island, 9 will be upgrading their disinfection systems to Ultra Violet (UV). The Oyster Bay SD has added a de-chlorination system. It is unclear at this time as to what the Village of Great neck or the Great Neck SD facilities will choose for compliance with the disinfection requirements.	
8.	In 2008 the Interstate Environmental Commission (IEC): <ul style="list-style-type: none"> <li>conducted 59 unannounced effluent surveys at CT and NYS WPCPs that discharge into the LIS portion of the IEC. 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.</li> <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</li> </ul>	Continue to conduct effluent surveys at CT and NY WPCPs.  Continue to chair the RBWG. Seek funding for model updates.

2008 Description	2009 Planned Action
1998-2008, the number of events has been consistent. During 2009, 281 bypass events were reported to the Commission; 3 percent of the events occurred in Long Island Sound and its embayments; 60 percent occurred in the East River and its tributaries. A new bypass model 2.0 was released to the agencies for the bathing season.	

**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 CAUSE LOCAL WATER QUALITY PROBLEMS. CREATION OF VESSEL NO-DISCHARGE ZONES AREAS, USE OF BEST MANAGEMENT PRACTICES, AND INCREASING THE NUMBER OF VESSEL PUMPOUT FACILITIES ARE MAJOR ACTIONS TO MANAGE PATHOGEN CONTAMINATION FROM VESSEL DISCHARGES.**

2008 Description	2009 Planned Action
<p>1. CTDEP received \$952,868 from the USFWS Clean Vessel Act (CVA) Pumpout grants program in 2008 for coastal projects. By the end of the 2008 boating season there were 92 total pumpout facilities (including fifteen boats) and 22 dump stations, (including one floating rest room) at 90 boating locations. The pumpout directory is posted on the CTDEP website: <a href="http://www.ct.gov/dep/cva">www.ct.gov/dep/cva</a>, along with a variety of information about Connecticut's CVA program. Pumpouts are also listed in the annual Connecticut Boater's Guide.</p>	Upgrades and repairs of existing pumpouts are slated for 2009.
<p>2. <b>A goal of the Long Island Sound 2003 Agreement is:</b> <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>In July 2008 Connecticut completed designation of all of its LIS waters as NDAs, with EPA's approval of its vessel pumpout plan.</p> <p>New York state is committed to completing NDA designation of New York waters of Long Island Sound by the end of 2009.</p>	
<p>3. Two additional harbor complexes within NYS were designated as no discharge zones in October 2008; these were the Hempstead Harbor Complex and the Oyster Bay/Cold Spring Harbor Complex. This works towards the 2003 Agreement to have all LIS waters within NYS designated as NDZ. Additionally, a group of government and non-government personnel has formed and is holding monthly conference calls to prepare a petition for all the remaining NY LIS waters and Fishers Island waters to get these areas designated as NDZ.</p>	The group will continue holding conference calls and working on drafting a NDZ petition in the hopes of having a completed petition submitted to EPA Region 2 by late 2009, early 2010.
<p>4. Since 1994 New York State Environmental Facilities Corporation (EFC) has administered the NYS Clean Vessel Assistance Program (CVAP). In 2008, EFC awarded over \$114,900 for seven construction projects, over \$13,200 in Operation &amp; Maintenance grants for 15 projects, and over \$9,800 in Information and Education grants for two such projects in Long Island Sound.</p> <p><u>New or replacement pumpout projects in 2008 included:</u></p> <ul style="list-style-type: none"> <li>• Woodbine Marina, Huntington (631-351-3192)</li> <li>• Pt. Jefferson Harbor Barge (631-473-3052)</li> <li>• Municipal Marina, New Rochelle (914-235-6930)</li> <li>• Port Washington Dock, North Hempstead (516-869-7841)</li> <li>• Port Jefferson Boat (631-473-3052)</li> <li>• Mt. Sinai Boat (631-473-3052)</li> </ul>	Continue implementation of the CVA program in 2009.

**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.

2008 Description	2009 Planned Action
<p>1. In 2008, the Town of Old Saybrook began the process of public education on their proposed decentralized wastewater district. The goal of the decentralized wastewater management district is to reduce the impact of wastewater discharges from existing high density development (typical lot size is 5,000 sf) on the surrounding environment. This proposed district would require roughly 1,900 properties in identified areas of town to upgrade their existing onsite treatment systems to meet specific minimum criteria. These criteria are codified in the proposed Upgrade Program Standards. Each property will have its current onsite system compared to the standards; if the system does not meet those standards, either a conventional upgrade (septic tank and leaching system) or alternative technology will be installed which meets those standards. The determination of which approach is required will be made during a detailed evaluation of each property, and is based on existing site conditions (soils, depth to groundwater, proximity to sensitive resources, etc.). Alternative technologies will be required to meet a performance goal of 50% reduction of total nitrogen in the effluent (approx 19 ppm). The project, if approved by voters, will be implemented over a period of seven years, at an estimated total cost of \$45 million.</p>	<p>Public education meetings will continue into the early summer. A public hearing will be held on June 17, 2009 to elicit formal public comment. On July 29, 2009, a public meeting to consider the adoption of ordinances establishing the decentralized wastewater management district and authorizing the expenditure of funds to implement the recommendations will be held. That meeting will be followed on August 11, 2009 by a referendum. If approved, the town will contract with one or more consultants to begin the detailed evaluation of properties that fall, with construction beginning in the spring of 2010.</p>

**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.

2008 Description	2009 Planned Action
<p>1. Boater education and the Clean Marina program continued to be a focus of the CTDEP CVA program in 2008. CTDEP staff attended several boat shows and other events to distribute information regarding clean marina and boating practices, marine sanitation devices and pumpouts. CTDEP staff displayed outreach materials at the Connecticut Harbor Management Association meeting. Two interactive kiosks were developed for use at boat shows and other various locations throughout the state to educate the public about the Clean Vessel Act, pumpouts, and other clean boating practices. An Action Guide for Boaters was distributed at events such as boat shows and other informational events. CT DEP maintains its "Clean Boater Program" that includes a segment on pathogens.</p>	<p>Continue to promote the clean marina and boating initiative by increasing media usage via radio. Incorporate clean boating practices into the DEP-Boating AquaSmart program, which teaches children about water and boat safety.</p>
<p>2. In 2008 the LISS public information and education program continued to distribute its 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. See posters and download at: <a href="http://longislandsoundstudy.net/publications.htm#posters">http://longislandsoundstudy.net/publications.htm#posters</a></p>	<p>Continue to reprint and distribute materials as appropriate.</p>

2008 Description	2009 Planned Action
<p>3. NY Environmental Facilities Corporation (EFC) published boating education advertisements in the Long Island Edition of <i>Boating World</i>. The half page ads urged boaters to use pumpouts and directed them to the EFC website for more info. (Also Reported in E-1, page 53)</p>	<p>EFC will continue to publish educational materials in <i>Boating World</i>.</p>
<p>4. The New York Sea Grant Nonpoint Education for Municipal Officials Program extended its reach throughout Long Island and advanced Long Island local governments' implementation of effective Phase II storm water management programs. Support of municipal Phase II measures to meet the Oyster Bay/Mill Neck Creek pathogens TMDL was provided to nearly a dozen municipalities through comments on their Phase II annual reports. Additionally, a storm water management workshop with a focus on pathogen control was provided to Town of Oyster Bay and neighboring municipal officials.</p>	<p>Continue to deliver outreach and support designed to ensure integration of municipal PH II storm water management with advancement of LIS CMP objectives. Provide targeted workshops, consultations, and materials to strengthen municipal efforts to meet pathogens TMDL storm water allocations.</p>

**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.**

2008 Description	2009 Planned Action
<p>1. During 2008 there were 927 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. Connecticut: 135 beach-day closures at private and municipal beaches. New York: 792 beach-closure days reported in the New York portion of Long Island Sound; Nassau Co., 169 days; Suffolk Co, 484 days; Westchester Co., 84 days; NYC 55 days. EPA's Beach Watch website is: <a href="http://www.epa.gov/beaches">http://www.epa.gov/beaches</a>.</p>	<p>Municipalities, regional health districts, and departments will continue to monitor for bacteria. State, city, town and county monitoring for pathogens will continue in 2009.</p>
<p>2. The CT Dept. of Public Health (CTDPH) received \$224,000 from EPA for FY2008 Beach Act funding for implementing elements of the Beach Monitoring program in Connecticut. CTDEP, in partnership with the CTDPH, samples state beaches and CTDPH analyzes the samples. The NYSDOH received \$347,300 from EPA for FY2008 Beach Act funding in New York state.</p>	<p>Expect continued EPA funding for Beach Act monitoring in 2009. Beach Act 2009 funding for CT is a projected at \$223,000. Expected Beach Act funding for New York in 2009 is \$348,000.</p>
<p>3. NYSDEC Shellfisheries staff completed enough water quality sampling in outer Hempstead Harbor (HH) to determine that the area meets water quality criteria for certified shellfish lands. In 2008, working with the Town of Oyster Bay (OB) and a contractor working for the Towns of OB and North Hempstead, the group collected hard clam samples from two locations in outer HH for analyses for chemical contaminants. The samples were examined by commercial labs under contract to NYSDEC. The samples were examined for metals; PCBs and organo-chlorine pesticides; dioxins and furans; and, PAHs. The analyses were paid for (~\$7700) by NYSDEC Bureau of Marine Resources. The results were received in December 2008 and January 2009 and forwarded to the NYSDOH for review to determine if the levels of those contaminants are of public health concern.  NYSDEC is in the process of conducting the shoreline survey/pollution source inventory component of the sanitary survey that is required before the area can be upgraded from uncertified to seasonally certified or certified.  Finally, NYSDEC has a request in to the USFDA to assist with a hydrographic dye study of the Glen Cove STP outfall to determine the appropriate size of the prohibited (closed safety) zone around that outfall in Glen Cove Creek. The dye study is tentatively scheduled for fall 2009. The reclassification of outer HH cannot be done</p>	<p>Complete the sanitary survey and dye study and DOH review of chemical contaminants in shellfish samples for eventual reopening of outer Hempstead Harbor to shellfishing.</p>

2008 Description	2009 Planned Action
<p>until the sanitary survey and dye study and DOH review of chemical contaminants in shellfish samples are all completed. Funding for the chemical analyses was from the Conservation Fund - Marine Account, shellfish sanitation program cost center, and \$2000 from the NYC Nitrogen Settlement Fund.</p>	
<p>4. The Town of North Hempstead will implement recommendations outlined in the Manhasset Bay Water Quality Improvement Plan and will result in improved stormwater monitoring and a decrease in pollutant loads into the Bay through stream bank restoration at Stannards Brook and community education via storm drain stenciling. The results of the monitoring will be used to identify which discharges have the greatest need for retrofits. The establishment of indigenous terrestrial plants will stabilize eroding stream banks, resulting in decreased sedimentation thus improving water quality. The surrounding communities will be educated through participating in plantings as well as the storm drain stenciling project. The project addresses pollutants in stormwater runoff including pathogens which contribute to shellfish bed closures, a priority concern for the Long Island Sound Coastal Management Program. In 2008, rain event samples were collected and analyzed, and a final report was completed for Stannards Brook.</p>	<p>Work in progress</p>
<p>5. In 2008, the Interstate Environmental Commission:</p> <ul style="list-style-type: none"> <li>• continued to conduct its tri-state water quality monitoring program and summarized its results in its 2008 Annual Report. The Report describes the status of wastewater plant upgrades and construction in the tri-state environmental District. IEC conducted its annual Boat Inspection Trip in a portion of the Interstate Environmental District in August 2008. Attendees representing all levels of government and citizen groups viewed the upper East River and Long Island Sound, Long Island north shore bays, Connecticut and Westchester County harbors. The report can be viewed 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 December 31, 2008, 10 inspections were completed on the north shore of Nassau County, NY, and four 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. Completed in August 2008, pathogen sampling was conducted during dry and wet weather conditions at 9 stations on the Hudson River from Yonkers to Bear Mountain to characterize concentrations in regards to bathing beach criteria, as well as to add to the 2001-2005, inclusive, database.</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. Upstream and inland track down for dry weather flow and illegal hook-ups was conducted during 2008. From 2002 to 2008, 22 violations were discovered and as of November 2008, 21 have been remediated.</li> <li>• completed a temperature and pathogen monitoring project at the Silver Sands State Park beach, Milford, CT. This project was funded by a Connecticut License Plate grant.</li> </ul>	<p>Continue preparation of the Annual Report, which is a statutory requirement due annually on January 24; continue the municipal WPCP monitoring; conduct the annual boat inspection trip in August 2009.</p> <p>IEC will continue and expand dry weather MS4 inspections in other New York counties, as well as Connecticut and New Jersey.</p> <p>IEC will continue pathogen monitoring in support of TMDL development and beach siting.</p> <p>IEC will continue pathogen monitoring, laboratory analysis and data sharing during 2009, under dry weather conditions only in the Byram River.</p>

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# 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 several actions in this section of the Agreement: 1) update the Long Island Sound Contaminants of Concern list; 2) evaluate current contaminant monitoring/control programs; and 3) develop an approach for a joint NY/CT fish consumption advisory for LIS. In 2005 and 2006 the LISS awarded funds to New York State to work with Connecticut in collecting and testing new specimens for toxic contamination. This work will potentially lead to revision of state fish consumption advisories, or issuance of joint NY/CT advisories for certain species. Work is still ongoing on this project in 2008.

**Environmental Indicators/Results/Trends:** Preliminary data on fish tissues analyzed for toxics show a significant decline in polychlorinated bi-phenyls (PCBs) and mercury in fish species sampled. Toxic emissions in the region and to the Sound have declined due to increased environmental regulation and relocation or closing of manufacturing facilities in the watershed. Historical contaminant levels, as measured in sediments and in living marine resources, continue to 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 storm water 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. Emerging contaminants such as the unregulated discharge of chemicals from pharmaceuticals and personal care products represent a potential but as yet undefined risk.

## **2008 Highlights:**

- In 2008, 86 of 89 Connecticut STPs passed toxicity testing. Facilities are reported as not passing toxicity test when there are two consecutive failures or three failures during a one-year period for the past year. The three facilities that did not pass testing were: Greenwich American Centre STP, Vernon STP, and Wallingford STP.
- New York State promulgated a new salt water ammonia standard. All permittees discharging ammonia into salt water will have their permits modified to address the new ammonia water quality standard.
- New York adopted the Mercury Utility Rule: 6 NYCRR Part 246, Mercury Reduction Program for Coal-Fired Electric Utility Steam Generating Units. This imposes an annual facility wide mercury emission limit based on the state mercury budget distributed to NYS by EPA.
- New York began requiring the installation of 99.9% removal efficient mercury amalgam separators in all dentist offices.



**SUMMARY OF CCMP MANAGEMENT ACTIONS:  
TOXIC SUBSTANCES**

**T-1. TOXIC CONTAMINANT SOURCE CONTROLS AND POLLUTION  
PREVENTION  
(CCMP TABLE 21, P. 65)**

**KEY ELEMENTS:** 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 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.

	2008 Description	2009 Planned Action
1.	<p>NYSDEC revised its Technical Guidance Document Series (TOGS) 1.3.2 in 2007, which governed whole effluent toxicity (WET) testing. There are 11 New York State facilities discharging into LIS that may require WET. For the period 2006 – 2008 seven of the 11 facilities were not required to conduct WET testing. The following outlines the results of the 4 facilities that did perform WET testing:</p> <ul style="list-style-type: none"> <li>• Wards Island – passed all quarterly acute and chronic tests required in 2006</li> <li>• Tallman Island – passed all quarterly acute and chronic tests required in 2008</li> <li>• Newtown Creek – is required to continuously WET test. The Facility failed an 8/08 acute test marginally, but because they are required to conduct simultaneous chronic testing, and are continuous quarterly tester, no action was required.</li> <li>• Glen Cove – Failed a 1/06 chronic test, which, in addition to a failure on 7/05, was sufficient evidence to require an increase in testing frequency from bi-annually to quarterly. Overdosing of a Water Treatment Chemical (WTC), specifically a de-foamer, was suspected and, upon decreasing the dosage, reduced toxicity to acceptable levels. Four quarters of testing were completed satisfactorily and the facility was allowed to return to the bi-annual test regime with no additional test failures reported.</li> </ul>	
2.	<p>All New York SPDES Permits have chlorine limits to ensure the applicable water quality standard will be met.</p>	
3.	<p>Nassau County Storm water run-off impact analysis is a program whereby storm water pollutant loadings are evaluated on a watershed by watershed basis. Watersheds already completed include (In the LIS Watershed) Tiffany Brook, Francis Pond, White's Creek, Bailey Arboretum and Mill River watersheds.</p>	<p>Continue assessing on a watershed-by-watershed basis.</p>
4.	<p>In 2008, 86 of 89 Connecticut STPs (or 97%) passed toxicity testing, the same as in 2007 but with a total of 92 facilities testing. Facilities are reported as not passing toxicity test when there are two consecutive failures or three failures during a one-year period for the past year. The three facilities that did not pass testing were: Greenwich American Centre WPCF, Vernon WPCF, and Wallingford WPCF.</p>	<p>CTDEP will continue working with STPs to stay in compliance with toxicity tests.</p>
5.	<p>In Connecticut, facilities registered under the Industrial Storm Water General Permit are required to test their storm water discharges annually for oil &amp; grease, pH, chemical oxygen demand, total suspended solids, total phosphorous, Total Kjeldahl Nitrogen, Nitrate as Nitrogen, Copper, Zinc, Lead, hardness, conductivity and aquatic toxicity. Over 1500 facilities are registered under the Industrial Storm Water General Permit.</p> <p>86.2 percent of facilities that monitored in 2008 met the target goal for aquatic toxicity (LC50&gt;50%) compared to 83.4 percent of facilities that met the goal in 2007. Facilities that fail to submit monitoring under this permit receive Notices of Violation and facilities that discharge high levels of monitored pollutants in their storm water receive correspondence from CTDEP and are targeted for inspection.</p>	<p>Continue to work with permittees to improve compliance with the program and to improve monitoring results. Renewal of the Industrial Storm Water General Permit is slated for next year. The General Permit for Storm Water Associated with Industrial Activities will be reissued April 14, 2009.</p>

	2008 Description	2009 Planned Action
6.	6 NYCRR Part 374-4 required the installation of 99.9% removal efficient mercury amalgam separators in all dentist offices in New York by March 12, 2008.	
7.	In February 2008, New York State promulgated a new salt water ammonia standard. The adoption of the new water quality standard increased the Environmental Benefit Permit Review program for wastewater discharges to salt water, thus facilitating the permit renewal process. All permittees discharging ammonia into salt water will have their permits modified to address the new ammonia water quality standard.	
8.	New York has adopted the Mercury Utility Rule: 6 NYCRR Part 246, Mercury Reduction Program for Coal-Fired Electric Utility Steam Generating Units. This regulation incorporates the Phase I emission cap established in the federal Clean Air Mercury Rule (CAMR) for the years 2010 - 2014. This imposes an annual facility wide mercury emission limit based on the state mercury budget distributed to NYS by EPA. Starting in 2015, Phase II, in conjunction with other electric sector regulations such as the Regional Greenhouse Gas Initiative (RGGI) and the second phase of the Clean Air Interstate Rule (CAIR), the State mercury regulation will establish a facility wide emission limit for each applicable facility.	
9.	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 2008 residents took part in household hazardous waste collections in Connecticut. This participation is 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, 156 had access to at least one household hazardous waste collection. Information on Connecticut household hazardous waste centers and events is posted on the web at: <a href="http://www.ct.gov/dep/cwp/view.asp?a=2718&amp;q=325448&amp;depNav_GID=1646">http://www.ct.gov/dep/cwp/view.asp?a=2718&amp;q=325448&amp;depNav_GID=1646</a> Prescription medicine collection days are held by individual towns.	CTDEP will continue working 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. CTDEP will encourage the development of programs for the separation and recycling or proper disposal of wastes that contribute to toxicity, such as consumer electronics, paint, and, mercury-containing lamps (including fluorescent light bulbs), and thermostats.
10.	The Norwalk (CT) Public Works Department presented the results of its project to retrofit storm water catch basins with filter technology to the CAC in June 2008. The Water Street Demonstration project was very successful in reducing sediment, oils, fecal materials and toxic substances to the demonstration area affecting Norwalk Harbor. The filters were effective in removing 75-95% of bacterial material, 70% of oils, some heavy metals, e.g., copper, titanium, zinc. In addition 19 tons of sediment and debris were prevented from entering the Harbor.	The project ended in June 2007 and was funded by a \$400,000 Congressional earmark.
11.	New York Sea Grant organized a committee to conduct a pharmaceutical collection event on Long Island. This event is a collaboration of New York Sea Grant and the Long Island Sound Study, Stony Brook University and Stony Brook University Medical Center, Suffolk County Department of Health Services, the Suffolk County Legislature, and Triumvirate Environmental Inc.	Pharmaceuticals will be collected from Suffolk County residents during a one-time event scheduled for April 18 <sup>th</sup> , 2009.

## 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.

2008 Description		2009 Planned Action
1.	The National Marine Fisheries Service (NMFS), the New England District Army Corps of Engineers (ACOE) and CTDEP are developing guidelines for siting and operating contained aquatic disposal sites (CADS). The guidance will be used to address the growing interest in use of the CADS technology for non-federal dredging projects where sediments are deemed unsuitable for unrestricted open water disposal. The ACOE is leading the effort to establish criteria and provide site guidance for the general public, and reduce the uncertainty associated with such proposals. The effort will cover site identification, characterization of sub-bottom geology, resource impacts, and mitigation measures as well as scheduling and operation. In 2008 ACOE produced a draft set of guidelines that were reviewed by EPA and CTDEP.	Finalize guidelines.
2.	The U.S. Army Corps of Engineers is developing a Dredged Material Management Plan (DMMP) for Long Island Sound, in cooperation with EPA, NOAA, and the states of Connecticut and New York. The estimated cost of the DMMP is \$10 million. EPA designated the Western and Central Long Island Sound Dredged Material Disposal Sites for long-term use in June 2005, conditioned on the completion of the DMMP by 2013. The New London Disposal Site, which serves the eastern LIS region, is scheduled to close in October 2011. An Environmental Impact Statement to evaluate a potential replacement for this site has not yet begun due to a lack of funding.	The Corps received \$3.525 million in FY08 to start the DMMP, and \$980,000 in FY09 to continue the work. The Corps needs about \$6 million over the next three years to complete the project.

## 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.

2008 Description		2009 Planned Action
1.	<p><b>A Long Island Sound 2003 Agreement action item for this area is:</b> <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></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/environmental/outdoors/fish/docs/specific_advisory_table.pdf">http://www.health.state.ny.us/environmental/outdoors/fish/docs/specific_advisory_table.pdf</a></p> <p>NYS Department of Health published its 2008—2009 <i>Chemicals in Sportfish and Game Health Advisories</i>. The report can be found on-line at:  <a href="http://www.nyhealth.gov/environmental/outdoors/fish/fish.htm">http://www.nyhealth.gov/environmental/outdoors/fish/fish.htm</a> There were no health advisory changes for recreational fishing in LIS from the 2006—2007 report.</p> <p>Connecticut's current LIS fish consumption advisory is posted on the CTDOH website:</p>	Continue project through 2010.

2008 Description	2009 Planned Action
<a href="http://www.ct.gov/dph/lib/dph/environmental_health/eoha/pdf/ificatchit.pdf">http://www.ct.gov/dph/lib/dph/environmental_health/eoha/pdf/ificatchit.pdf</a> New York's current LIS fish consumption advisory is posted on the NYSDOH website: <a href="http://www.health.state.ny.us/environmental/outdoors/fish/docs/specific_advisory_table.pdf">http://www.health.state.ny.us/environmental/outdoors/fish/docs/specific_advisory_table.pdf</a>	

<b>T-4. MONITORING AND ASSESSMENT OF TOXIC CONTAMINANTS (CCMP TABLE 24, P. 71)</b>  <b>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.</b>	
2008 Description	2009 Planned Action
<b>1. A Long Island Sound 2003 Agreement goal for this area is:</b> <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>  A technical characterization of toxic contaminants in LIS, which was reviewed by the LISS STAC has been updated. The contaminants of concern will be considered in the context of the LIS ecosystem data synthesis project. One chapter of that document will address pollutant sources, magnitudes and trends.	Continue work on the LIS synthesis document through 2010.

<b>T-5. RESEARCH TO INVESTIGATE TOXIC CONTAMINATION (CCMP TABLE 25, P. 73)</b>  <b>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 AS RECOMMENDATIONS, THOUGH CONTINUATION OF WORK BEGUN BY LISS THROUGH THE LISS RESEARCH PROGRAM AND OTHER PARTIES RECOGNIZES THESE RECOMMENDATIONS AS PRIORITY LISS RESEARCH TOPICS.</b>	
2008 Description	2009 Planned Action
<b>1.</b> In September 2008 Southern Connecticut State University (SCSU) Center for Coastal and Marine Studies received a \$287,000 grant from the U.S. Department of Agriculture that will help pay for research on the environmental habitat of the Eastern oyster ( <i>Crassostrea virginica</i> ) and the contamination levels of oyster tissues. The research will take place in Long Island Sound and some of the harbors and rivers connected to it. The research project is a joint effort that includes various institutions across Connecticut: Central Connecticut State University, Western Connecticut State University, Wesleyan University, The Sound School and the Maritime Aquarium at Norwalk. Each organization will contribute in different ways, such as with faculty, students, staff, equipment and facilities.	SCSU will complete a report within a year as to the health of oysters along the Connecticut shoreline and the status and future of the oyster industry in the state.

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## 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 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.* While the former work to identify impervious surfaces was completed through a LISS-funded project in 2006, the latter work is now being conducted as part of ongoing programs in the states based on that work.

**Environmental Indicators/Results/Trends:** Ongoing programs to control sources of debris to the Sound include regional/statewide anti-litter campaigns, beach cleanup and adopt-a-spot programs, state and 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.

### **2008 Highlights:**

- As a result of International Beach Clean Up Day in September 2008, volunteers from Connecticut and New York removed thousands of pounds of debris from many LIS beaches and recreational sites. In New York, 2,341 volunteers removed more than 69,000 pounds of debris from 55 sites and more than 100 miles of shoreline. In Connecticut, more than 1,700 volunteers collected 13,687 pounds of debris on 61 miles of shoreline at 50 sites.
- The City of Norwalk is proposing the first in a two phase project to upgrade its existing WPCF to remove more nitrogen and to treat all combined sewage flows. This first phase will enable the WPCF to better handle the debris, grit and high flows coming into the facility.
- The Retrofit of Flushing Creek/Bay CSO was operational in May 2007 with major completion in November 2008 at a cost of \$330M. Pumped combined sewage will flow to the Tallman Island Water Pollution Control Plant where it will be treated. The facility will improve water quality and increase dissolved oxygen in Flushing Creek and Flushing Bay.

## SUMMARY OF CCMP MANAGEMENT ACTIONS: FLOATABLE DEBRIS

### F-1. CONTROLLING FLOATABLE DEBRIS FROM CSOs AND STORMWATER SEWERS (CCMP TABLE 38, P. 96)

**KEY ELEMENTS:** 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.

2008 Description	2009 Planned Action
<p>1. New York City continues to implement actions for reducing floatables in its harbor waters and neighboring water bodies, including Western Long Island Sound. In 2008 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>• continued 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 2008. Ongoing facility improvements and maintenance activities continued throughout 2008 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 booms and skimming in the City's tributaries and open waters of the East River and Western Long Island Sound.</li> <li>• Used its skimmer vessel in its skimming operations.</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>2. The Retrofit of Flushing Creek/Bay CSO was operational in May 2007 with major completion in November 2008 at a cost of \$330M. Pumped combined sewage will flow to the Tallman Island Water Pollution Control Plant where it will be treated. The facility will improve water quality and increase dissolved oxygen in Flushing Creek and Flushing Bay. See Pathogens section of this report for more information.</p>	
<p>3. The City of New Rochelle operated floatable debris collection systems that were installed using a combination of state Environmental Protection Funds and local funds.</p>	
<p>4. 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 continue additional facility planning studies to further develop those actions.</p>	<p>Continue 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. NYC will develop a contract to conduct additional facility planning activities.</p>

2008 Description	2009 Planned Action
<p>5. The Connecticut Clean Water Fund (CWF) is the state's environmental infrastructure assistance program. The fund was established in 1986 to provide financial assistance to municipalities for planning, design and construction of wastewater collection and treatment projects. This program was developed to replace state and federal grant programs that had existed since the 1950s. The 1987 amendments to the Federal Clean Water Act required that states establish a revolving loan program by 1989. The fund was modified in 1996 to include the Drinking Water State Revolving Fund (DWSRF) to assist water companies in complying with the Safe Drinking Water Act by providing low cost financing. The fund consists of five accounts:</p> <ul style="list-style-type: none"> <li>• the Water Pollution Control State account;</li> <li>• the Federal Revolving Loan account;</li> <li>• the Long Island Sound Clean-up account;</li> <li>• the River Restoration account; and,</li> <li>• the Drinking Water Revolving Fund account.</li> </ul> <p>The federal account is designated as the qualifying State Revolving Fund (SRF) under Title VI of the federal Clean Water Act amendments of 1987 and is subject to EPA regulation. Federal assistance is deposited into the SRF.</p>	<p>In 1985, the State's estimated sewerage needs totaled \$1.077 billion. Today, with inflation and a refined estimate for Long Island Sound project needs, total costs are estimated at \$1.7 billion. Of this, \$400 million is associated with combined sewer overflow projects and more than \$700 million is associated with removing nitrogen to restore Long Island Sound.</p>
<p>6. Combined sewer overflow (CSO) projects are being undertaken to separate storm and sanitary flows from combined sewers to minimize the number and volume of overflows in Connecticut. The following projects are eligible for maximum grants of 50% with the remainder being covered by 20-year loans at 2% per year:</p> <ul style="list-style-type: none"> <li>• <b>Bridgeport</b> is continuing separation work in the southern part of the city. This work will enable the City to reduce CSOs to the Pequonnock River. Bridgeport CSO \$14,000,000 Bridgeport CSO design \$5,175,900</li> <li>▪ <b>The Greater New Haven WPCA</b> is working to separate sewers in the vicinity of Yale University. This project will reduce the frequency and volume of downstream CSOs. GNHWPCA CSO Construction \$19,200,000 GNHWPCA CSO Design \$3,000,000</li> <li>▪ This <b>Metropolitan District Commission (MDC)</b> separation effort is in the north end of Hartford. The project will reduce the frequency and volume of CSO discharges to Gully Brook. MDC CSO Construction \$60,000,000 MDC CSO Design \$6,000,000</li> <li>▪ <b>Middletown</b> is proposing to separate sewers in the Old Mill Road area. This will reduce excessive flows to the WPCF thereby minimizing bypasses. Middletown CSO Construction \$2,000,000</li> </ul> <p>The City of <b>Norwalk</b> is proposing the first in a two phase project to upgrade their existing WPCF to remove more nitrogen and to treat all combined sewage flows at the WPCF. This first phase will enable the WPCF to better handle the debris, grit and high flows coming into the facility. Portions of this proposed project are eligible for maximum grants of 50% with some portions at a maximum 20% grant. The remaining costs are eligible for a twenty year loan at 2% per annum. Norwalk WPCF Denitrification/CSO \$40,000,000.</p>	<p>Continue work on projects in out-years.</p>



## 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.

2008 Description	2009 Planned Action
<p>1. <i>National Beach Clean Up Day</i> in September 2008 resulted in thousands of volunteers from New York and Connecticut picking up thousands of pounds of debris at many beaches and recreation area sites on LIS.</p> <p>The New York Chapter of the American Littoral Society coordinated a massive Coastal Cleanup Day effort. In total for NY LIS locations in 2008, 2,341 volunteers removed over 69,700 pounds of debris from 55 sites (including an underwater cleanup) which covered 111 miles of shoreline. In total, 1,333 bags of garbage were removed for proper disposal.</p> <p>In Connecticut, 1,708 volunteers collected 13,687 pounds of debris on 61 miles of coast at 50 sites. Beach cleanup data is available on the Ocean Conservancy website at:  <a href="http://www.oceanconservancy.org/site/PageServer?pagename=press_icc">http://www.oceanconservancy.org/site/PageServer?pagename=press_icc</a>.</p>	<p>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 on September 19, 2009.</p>
<p>2. The LISS Futures Fund Small Grants program awarded a \$5,000 grant to the Northeast Chapter of the American Littoral Society (ALS) in New York to assist in conducting its annual beach cleanup program on Long Island Sound beaches in 2008; and a \$5,000 grant to Connecticut Fund for the Environment to assist beach cleanups in Connecticut in 2008. See the Atlantic chapter of the ALS website for more information on beach cleanups: <a href="http://www.alsnyc.org">http://www.alsnyc.org</a></p>	<p>The 2009 beach cleanup is scheduled for September 19, 2009.</p>
<p>3. Coastal Steward had 18 beach cleanups in 2008 that removed 32.37 tons of debris (the dumpsters were weighed at the landfill) from 37 miles of local beaches along the north shore of Long Island within the Long Island Sound watershed with the help of 371 volunteers. Funding was provided, in part, by the Long Island Sound Futures Fund.</p>	<p>Coastal Steward will continue its cleanup and restoration work in 2009.</p>
<p>4. The Connecticut Legislature passed <i>An Act Concerning The Removal Of Abandoned Sunken Vessels</i>, clarifying and streamlining the process for removal of derelict vessels that may become a hazard or produce floating debris. Under the Act, once a duly authorized harbormaster determines that a boat is a "derelict vessel" the state transportation commissioner or a duly authorized representative of a municipality may order the boat removed at the expense of the owner, agent, or operator. The bill makes the last owner of record responsible for the boat, and establishes procedures regarding storage and, if deemed necessary, sale of the boat.</p>	
<p>5. Proper control of debris and refuse is a component of the Connecticut Clean Marina program. Proper containers and recycling programs are required for corrugated cardboard, glass and metal food and beverage containers, leaves, newspaper, white office paper, scrap metal, waste oil, spent lead acid storage batteries, nickel-cadmium rechargeable batteries. Other refuse must be disposed in covered dumpsters or other suitable containers.</p>	<p>Additional marinas will pledge to become certified Clean Marinas and additional certifications will occur.</p>
<p>6. CT's Clean Boater Program encourages boaters to learn about and use clean boating techniques. The Clean Boaters pledge is: <i>I pledge to be a Clean Boater and to make the sound choice to keep Connecticut's waterways clean. I pledge to keep fuel, sewage, plastics, trash, spent fishing line, and invasive species out of the water, to clean my boat responsibly, and to dispose of all wastes properly.</i></p>	<p>Seasonal "boating education assistants" will visit marinas and boat launches in Summer 2009 to answer questions, distribute Clean Boater Packets, and encourage boaters to sign the Clean Boaters Pledge.</p>

# 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 HAVE 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 nine actions in this section of the Agreement. As of December 2008, four are ongoing, one has been modified to an ongoing biennial task, and four have been completed. A continuing goal is to report progress against the LISS habitat restoration goals (see below).

**Environmental Indicators/Results/Trends:** The primary environmental indicators for this priority area are the number of acres of coastal habitat restored, protected or enhanced, and the linear miles of river corridor reopened to diadromous fish passage. Of the goal to restore 2000 acres by 2008, the LISS has restored 656 acres as of September 2008. Of the 2008 goal to reopen 100 river miles to fish passage, 146 miles had been reopened as of September 2008, accomplishing this goal. In 2006, the Policy Committee agreed to restore or protect an additional 300 acres of coastal habitat and reopen an additional 50 river miles to anadromous fish passage by 2011 -- as of March 2009 the LISS has restored or protected 1,376 acres and reopened 146 river miles.

## **2008 Highlights:**

- The Long Island Sound Futures Fund large grant program selected two habitat restoration projects, one stewardship project, one green roof project, and two species conservation projects in 2008. These projects are part of a total award fund of \$830,000 with more than \$5 million in local match provided by grantees.
- The 2008 biennial Long Island Sound Research Conference was held October 30-31, 2008 at Connecticut College in New London, Connecticut. More than 30 researchers presented the results of their investigations, many relative to living resources of the Sound, including such topics as invasives, shellfish, estuarine fauna, and salt marsh ecology. The Conference is jointly sponsored by the Long Island Sound Foundation and the New England Estuarine Research Society.
- The Management Committee approved the use of \$1.3 million in Long Island Sound 2008 funding for land acquisitions in support of the Stewardship Initiative. A 48 acre parcel in the Connecticut Barn Island Wildlife Management Area was selected for purchase and LISS funding assisted in that acquisition. In New York, a parcel was selected for purchase and LISS funding will be applied to this acquisition in 2009. The Management Committee approved \$300,000 in 2009 for additional acquisitions.

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

**L-1. RESTORATION AND ENHANCEMENT OF AQUATIC AND TERRESTRIAL  
HABITATS  
(CCMP TABLE 40, P.107)**

**KEY ELEMENTS: CONTINUE AND ENHANCE PROGRAMS TO RESTORE TIDAL WETLANDS AND OTHER HABITATS. DEVELOP A STRATEGY TO INVENTORY AND PRIORITIZE HABITAT RESTORATION AND ENHANCEMENT NEEDS.**

	2008 Description	2009 Planned Action
1.	A 750 foot stretch of dunes bordering Long Island Sound (Fenwick, Old Saybrook, CT) was covered with the potentially invasive plant, rugosa rose ( <i>Rosa rugosa</i> ). The dunes are owned by The Lynde Point Land Trust (LPLT). This project began as invasive species management in the fall of 2006 with plans to replant the dunes with native grasses in the spring of 2007. Due to two major Nor'easters that hit the Connecticut coast during the spring of 2007, the dune system was severely eroded. LPLT decided to rebuild the dunes – both to protect the adjacent tidal marsh and for nostalgic reasons. Therefore, with funding raised by the LPLT and from Natural Resources Conservation Service (NRCS), the LPLT, Connecticut Sea Grant and NRCS undertook the restoration of this dune system in 2007. Working with several companies, a plan was developed to restore the dunes using Filtrex® tubing - an erosion control material which had not previously been used in a coastal environment. Photo-monitoring was used to monitor both the progress of the project and the results in 2008.	Ongoing monitoring of the health of the restored dune.
2.	Connecticut Sea Grant provided \$1,000 for a UCONN graduate student from the College of Agriculture & Natural Resources (CANR, Plant Science) to create a master plan for coastal land use for the Borough of Fenwick.	
3.	The LISS continued to provide funding to support the New York and Connecticut habitat restoration coordinator positions in 2008. The state coordinators provide technical assistance to municipal and local landowners and other partners in implementing the LISS habitat restoration plan. There are currently 20 active Tidal Wetland (TW) projects and 32 active Riverine Migratory Corridor projects in the workplans.	The Management Committee approved base program funding for the LISS habitat restoration program coordinator positions in 2009.
4.	The LISS Habitat Restoration Initiative - made up of representatives from CTDEP, NYSDEC, EPA, NOAA, ACOE, NY Sea Grant, CT Sea Grant, 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 September 2006, the Policy Committee committed to restoring, protecting or enhancing an additional 300 acres of habitat and reopening an additional 50 miles of riverine corridor to diadromous fish passage by 2011.  In 2008, 16.1 acres of coastal habitat were restored and 2.92 river miles were reopened for fish passage. As of December 2008, the LISS has restored 656 acres and reopened more than 146 miles of riverine migratory corridor, accomplishing this latter restoration goal.	Continue habitat restoration work in 2009.
5.	NYSDEC has a draft shellfish restoration strategy that will serve as a framework for further plan development.	Internal review pending until staffing levels are sufficient.
6.	In October 2008, the Town of North Hempstead completed follow-up native wetland restorations that were started in 2004 and 2006. The town partnered with the Nassau County Soil and Water Conservation District, which gave the town \$19,000 and staff time for the project. Using a consultant to design the restoration, the town applied herbicide in the uplands as well as hand-pulling to remove invasive plant species such as phragmites, black locust, and Norway maples. They then replanted using native species such as <i>Spartina</i> .	Upon contract approval by NYSDEC, the Town will begin the next phase of the restoration.
7.	The Westchester County SWCD completed a pond restoration and exotic and/or invasive plant species removal in Dickermans Pond, New Rochelle in fall 2008. The project was primarily aimed at restoring the ecological and water quality protection benefits once provided by the pond. The project was funded by a state Clean Water/Clean Air Bond Act grant from the Department of State, as well as matching funds from the County of Westchester, City of	

	2008 Description	2009 Planned Action
	New Rochelle, and Town of Mamaroneck. More information can be found at: <a href="http://www.westchestergov.com/waterquality">www.westchestergov.com/waterquality</a>	
8.	The above Dickermans Pond restoration is part of a larger Sheldrake River and Lake Habitat Improvement Project in which the County of Westchester will conduct six non-point source/aquatic habitat restoration projects along the Sheldrake River corridor within the City of New Rochelle and Town of Mamaroneck. All work undertaken through this project will result in improvements to the water quality and fish and wildlife habitat values of the Sheldrake River. This project is based on recommendations of the inter-municipal Watershed Advisory Committee Four from 2001. All projects lie along the 8.6-mile NYS Priority Waterbody List segment (#1702-0069) of the Sheldrake River. 2008 activities included site analyses, including topographical and bathymetric surveys conducted for Gardens Lake, in the Town of Mamaroneck; a monitoring and maintenance plan was developed for Carpenters Pond, in New Rochelle; and construction and planting was completed for Dickermans Pond in New Rochelle.	Work in progress
9.	The Westchester County SWCD also began planning and design for the following aquatic restoration projects within LIS: <ul style="list-style-type: none"> <li>▫ Pond Restoration, Gardens Lake, Mamaroneck Town</li> <li>▫ Pond Restoration, Carpenters Pond, New Rochelle</li> <li>▫ Tidal Pond Restoration, Manursing Lake, Edith G. Read Natural Park and Wildlife Sanctuary, Rye</li> </ul>	Complete planning and design and begin project implementation.
10.	Native plants were installed at a restored tidal salt marsh next to Harbor Island Park in Mamaroneck Village. Westchester County employed a contractor, who installed nearly 700 native herbaceous and woody plants as well as mulch within and next to the salt marsh. Native plants species that were installed included shore juniper ( <i>Juniperus conferta</i> ), bayberry ( <i>Myrica pennsylvanica</i> ), aromatic sumac ( <i>Rhus aromatica</i> ), common saltmarsh grass ( <i>Puccinella maritima</i> ), and switchgrass ( <i>Panicum virgatum</i> ). This project was funded by \$6,000 from conservation project financial assistance pursuant to the provisions of Section 11-a (1) (b) of the New York State Soil and Water Conservation Districts Law.	
11.	Cornell Cooperative Extension of Suffolk County is continuing their ongoing eelgrass restoration work along the North Shore of Long Island and in eastern Long Island Sound. This work includes plantings running from Caumsett State Park in the west to Great Gull Island in the east. Most of the restored sites are monitored on a monthly basis. Funding for these projects comes from LISFF, Suffolk County and a grant through the NYS Seagrass Task Force.	Continue to monitor restoration sites and proceed with additional plantings.
12.	<u>Planning for West Meadow Beach Restoration and Access:</u> The Town of Brookhaven is preparing a restoration plan for West Meadow Beach, located in the hamlet of Stony Brook, NY on Long Island Sound. To comply with Chapter 594 of the Laws of New York, 1996, the Town must remove 93 cottages from this site. The West Meadow Beach Restoration Plan will investigate post-removal opportunities for ecological restoration, environmental education, museum development, and expansion of recreation. This will further work developed under a previous EPF award. The restoration master plan was completed in 2008 which delineates, assesses and synthesizes a series of strategies to simultaneously achieve the goals of ecological restoration, public use and access, and environmental education.	Work in progress.
13.	<u>Soundview/Bronx River Estuary Salt Marsh Restoration:</u> The New York City Department of Parks and Recreation Natural Resources Group, in conjunction with work being performed by the United States Army Corps of Engineers, will restore five acres of salt marsh in Soundview Park, on the east bank of the Bronx River. The project will restore tidal flow by excavating 87,120 cubic yards of fill and creating low marsh, high marsh, and maritime upland habitats, and planting native vegetation in place of the invasive vegetative monocultures currently overrunning the site. Site reconnaissance and restoration schematic designs were 90% completed during 2008. Salt marsh restoration and upland forest buffer areas were retrained in the master plan.	Work in progress.
14.	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.	Continue to work with partners to open additional fish passages and provide funding for design and construction of fish bypasses and ladders toward the LISS goal to restore 150 RMC

2008 Description		2009 Planned Action
		miles by 2011.
15.	Connecticut continued to participate in the LISS Habitat Restoration Initiative and to restore degraded tidal wetlands through its existing programs. CTDEP has also established a Tidal Wetland Restoration Team that identifies annual work priorities. 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.	Habitat restoration and invasive species control efforts will continue in 2009.
16.	In 2008 CTDEP was awarded \$804,000 from the US Natural Resources Conservation Service (NRCS) Wetland Reserve Program for tidal wetland restoration. The funds were used by CTDEP to restore 726 acres of tidal wetlands degraded by the invasive plant "Phragmites" at three Wildlife Management Areas along the lower Connecticut River (Plum Bank, Back River, and Upper Island WMA) and Sherwood Island and Silver Sands State Parks along Connecticut's coast. CTDEP's Wildlife Division, Wetland Habitat and Mosquito Management program (WHAMM) has been conducting Phragmites control at over sixty-six sites.	On-going.
17.	CTSG partnered with the Lynde Point Land Trust, Natural Resources Conservation Service, and All Habitat, Inc. to restore 750 feet of an active dune system bordering Long Island Sound that was severely eroded by storms in 2007. The restoration successfully used Filtrexx® tubing - an erosion control material which had not previously been used in a coastal environment. Several species of native grasses were planted on the reconstructed dune in 2008. The dune provides partial protection for the recently-restored 10-acre Lynde Point tidal marsh in the lower Connecticut River tidelands that have been designated Wetlands of International Significance, and is part of 4+ acres donated by the late Katharine Hepburn to the land trust for open space protection.	Monitor restoration project, work with partners on several new projects in 2009

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

**KEY ELEMENTS: THE LISS STATE PARTNERS MAINTAIN THE EFFECTIVENESS OF PERMIT PROGRAMS (E.G. FOR WETLANDS, STORMWATER, DREDGING) TO REGULATE USE AND DEVELOPMENT AFFECTING AQUATIC RESOURCES AND CRITICAL HABITATS. THE LISS PARTNERS WILL MANAGE ACQUISITION PROGRAMS AND EFFORTS TO PROTECT HABITATS FROM DEVELOPMENT AND ESTABLISH STEWARDSHIP OF AREAS OF LAND AND WATER OF OUTSTANDING OR EXEMPLARY SCIENTIFIC, EDUCATIONAL, OR BIOLOGICAL VALUE.**

2008 Description		2009 Planned Action
1.	The LISS provided \$1.3 million in 2008 to Connecticut and New York to support acquisition of key habitat areas under the LIS Stewardship Initiative. CTDEP completed acquisition of a parcel at its Barn Island Wildlife Management Area. TNC contributed approximately \$920,000 toward the acquisition of 48 acres to be added to the state Barn Island Wildlife Management Area under a cooperative agreement with CTDEP. New York has committed its portion of 2008 funding to acquire parcels in Westchester and Suffolk Counties.	Complete acquisitions in New York. In 2009 the LISS provided \$300k for an additional CT acquisition.
2.	In May 2008, NYSDEC used the State Environmental Protection Fund (EPF) to purchase 1.5 acres of land on Mattituck Creek (also called the Lizza property) for \$1.25M. This acquisition adds to a bordering 3.5 acres purchased previously.	State EPF has been frozen due to the state budget crisis. Other projects on the property, such as a pumpout station installation and public access projects, are also on hold for budget purposes.

	2008 Description	2009 Planned Action
3.	<p>The Town of Southold and the County of Suffolk acquired the Bittner Property, a more than 57 acre Sound front property, located in Peconic, NY in April 2008. The total purchase price was \$13,123,110 and was a partnership between the Town of Southold and the County of Suffolk. The County contributed \$6,561,555 from the County Environmental Legacy Fund. The Town contributed \$5,096,820 from the Community Preservation Fund, in addition to a \$1,464,735 federal grant the Town received for the purchase from the US National Oceanic and Atmospheric Administration, Coastal Estuarine Land Conservation Program. The property includes over 1300 feet of road frontage on Soundview Avenue and over 1400 feet of shoreline along Long Island Sound between Goldsmith Inlet and Peconic Dunes County Park. The property also has a great diversity of habitat and wildlife including regionally rare primary and secondary dunes, freshwater wetlands, wooded areas, cranberries, beach plums, and many other environmentally significant features. The Town and County will be developing a Management Plan, designed in accordance with the environmentally significant nature of the property, to allow for passive open space uses of the property.</p>	<p>Through a NYSDOS Local Waterfront Revitalization Grant, the Town of Southold will remove existing structures, mitigate contamination, re-vegetate dunes, and construct a parking area and nature trail. The project will provide new public access to 1,400 linear feet of waterfront, in part, through the bulkhead removal portion of the project.</p>
4.	<p>The Nature Conservancy's (TNC) Long Island Chapter contributed \$6,800 to the above mentioned Bittner Property land acquisition project in the Town of Southold that is now in public ownership. This project includes an "undevelopment" component that would eventually remove a house, bulkhead and pool that have disrupted natural shoreline processes.</p>	
5.	<p>The Town of North Hempstead purchased approximately one acre of open space in October 2008. This was the final piece of property necessary to complete the harbor trail from what used to be called "Bar Beach" south to the Roslyn viaduct.</p>	
6.	<p>The US Department of Homeland Security announced plans to close federal facilities on Plum Island (an 840-acre island) in eastern Long Island Sound. Plum Island, a biosafety level 3 facility, has been the only lab in the country able to study foreign animal diseases such as foot and mouth disease. But the Department has said it is too small, too outdated and isn't appropriate for biosafety level 4 research. The Department will evaluate options in the coming months for transitioning [the Plum Island] facility and land for future sale or use. Once a new facility is constructed in Kansas, the Plum Island unit will close.</p>	<p>TNC is leading efforts to have significant portions of the island transferred to the USFWS. TNC is also exploring land protection through policy and land use changes.</p>
7.	<p>CTDEP and other partners have worked with the U.S. Fish and Wildlife Service in identifying important criteria for coastal area protection and pursuing funds through NOAA's Coastal and Estuarine Land Conservation Program (CELCP). CTDEP has identified several important parcels located along the Connecticut River in Lyme, as well as an isolated island located in the CT River that would be an ideal candidate for a CELCP grant.</p>	<p>On-going</p>
8.	<p>During the 2005 Connecticut Legislative Session, an act was passed which creates a mechanism to fund affordable housing, farmland acquisitions, open space purchases, and historic preservation. <i>The Community Investment Act</i> (CIA) requires Town Clerks to collect an additional \$30 fee for each document they record in the towns land records. The state receives \$26 of each recorded document fee and the Town keeps \$4. Of the monies collected, CTDEP will receive 25 % for municipal open space grants. As of December 2008 the CIA has provided to the DEP over \$11 million to purchase open space land totaling 2,631 acres.</p>	<p>CTDEP will continue to evaluate and acquire land for open space.</p>
9.	<p>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. As of December 2008, the state owns 253,187 acres in its system of state park, forest, wildlife, fishery, and natural resource management areas. During this past year, an additional 1,301 acres were acquired in the through the Recreation and Natural Heritage Trust program. Thus CTDEP currently holds 79 percent of the 320,576 acres targeted for state open space acquisition. In 2008 more than \$10 million was awarded to purchase 2,440 acres of permanently protected open space land. Connecticut has set a goal to preserve 21% of the state's land as open space by 2023. Currently 486,504 acres have been preserved. This is 72.2% of the goal.</p>	<p>CTDEP's Land Acquisition &amp; Management division will continue to provide grant funding to municipalities and purchase additional lands.</p>

**L-3. INVENTORIES AND MANAGEMENT STRATEGIES FOR AQUATIC AND TERRESTRIAL HABITATS  
(CCMP TABLE 42, PP.112-113)**

**KEY ELEMENTS:** THE LISS PARTNERS DEVELOP HABITAT MANAGEMENT STRATEGIES FOR SPECIFIC COMPLEXES OR REGIONS USING A WATERSHED PERSPECTIVE. THESE INCLUDE THE NATURAL DIVERSITY DATABASE IN CONNECTICUT AND THE NATURAL HERITAGE PROGRAM IN NEW YORK.

	2008 Description	2009 Planned Action
1.	Connecticut Sea Grant is supporting the development of a benthic index (or set of indices, if necessary) specific to Long Island Sound (LIS), based on a multi-metric approach, and effective in discriminating between degraded and non-degraded sites in LIS (Whitlatch et al, UCONN/UNH; 2008-2010). The methods and metrics used in the index will be validated using comparisons to examine effects of seasonal and inter-annual ecological variation as well as geographic differences in physical/chemical characteristics (e.g., salinity, seafloor types) on the metrics' effectiveness.	Research project is expected to be completed in early 2010
2.	The LISS has completed work to develop a habitat restoration database to track and report progress in achieving restoration and protection goals. The database will be populated and maintained by the LISS habitat restoration coordinators and will support on-line access on the LISS website.	Migrate the database to on-line status in 2009.
3.	NYS established a Sea Level Rise Task Force in 2007. The task force held its first meeting in June 2008 and has begun working toward identifying the anticipated impacts of sea level rise on NY's coastal areas in the marine district as well as recommendations for protection, adaptation, and regulation changes directed at the marine coastline. Several smaller work groups were organized to study specific issue areas which include natural resources, infrastructure, human health and water supply.	The task force will continue work on its draft report to the Legislature and Governor.
4.	The NYS Seagrass Task Force has been working on a draft management strategy for NYS marine district seagrass (mainly <i>Zostera marina</i> , eelgrass) including those in LIS. More information can be found at <a href="http://www.SeagrassLI.org">www.SeagrassLI.org</a>	Final management strategy is expected mid-2009.
5.	NYSDEC participates in the Atlantic Coastal Fish Habitat Partnership (ACFHP) which was first organized in May 2006. The partnership's mission is to "accelerate the conservation, protection, restoration, and enhancement of habitat for native Atlantic coastal, estuarine-dependent, and diadromous fishes through partnerships between federal, tribal, state, local, and other entities."	ACFHP will apply for full partnership status through the National Fish Habitat Action Plan in 2009. NYSDEC will continue to be involved in the effort.
6.	The Village of Port Jefferson is developing a watershed management plan for the Mill Creek drainage basin and a habitat restoration plan for Mill Creek to implement recommendations of the inter-municipal Port Jefferson Harbor Complex Harbor Management Plan. These efforts are intended to enhance the environmental quality and recreational value of Mill Creek. Work in 2008 included preliminary project planning, the formation of a watershed advisory committee, and the development and advertisement of an RFP.	Work in progress
7.	CTSG developed a habitat-based management plan outline for use by land stewards. The outline was tested by a Yale University Masters candidate who used it to write a plan for the Branford Land Trust and the Guilford Land Conservation Trust. Draft management plans for Essex Land Conservation Trust and Westbrook Conservation Commission incorporate aspects of the habitat-based management plan outline; the Essex Land Conservation Trust applied for and received NRCS WHIP cost share funds to manage habitat on the Cross Lots Preserve in 2008.	Expand training opportunities on use of habitat-based management plan outline in 2009

**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**

	<b>2009 Planned Action</b>
<p><b>1.</b> NYSDEC's Natural Heritage Program's <i>New York Rare Plant Status List</i>, updated June 2008, is posted at: <a href="http://www.dec.ny.gov/animals/29396.html">http://www.dec.ny.gov/animals/29396.html</a>. The website contains links to other related sites, such as protective regulations. The List changes include six new additions, four renamed species, and four species that were removed. This work also identifies gaps in knowledge of rare plant species. There is a current total of 570 rare or extirpated plant species in New York.</p>	<p>NYSDEC NHP will re-evaluate the list in 2009 using previous growing season data.</p>
<p><b>2.</b> The NY State Wildlife Grant Animal Data Entry project completed in October 2008 with a total of 1,310 animal records processed.</p>	<p>The NYSDEC will develop Conservation Focus Maps for Species of Greatest Conservation Need based on four habitat variables, Tidal Wetlands, SAV, Shoreline, &amp; Benthic Environments with the Sound. The maps will identify areas for restoration, preservation, acquisition and commercial development.</p>
<p><b>3.</b> The NYSDEC began inventories for the swamp darter (<i>Etheostoma fusiforme</i>) and banded sunfish (<i>Enneacanthus obesus</i>) both of which are threatened species under NYS law.</p>	<p>The inventories will continue and species recovery plans will be developed for each species.</p>
<p><b>4.</b> In 2008 CTDEP prohibited the taking of alewives and blueback herring from inland and marine waters of the State of Connecticut. This action was initially taken in April 2002 and then extended each successive year through 2007 with an expiration date of March 31, 2008. The current action by the CTDEP Commissioner extends the prohibition through March 31, 2009. Monitoring conducted during 2002, 2003 and 2004 indicated that the river herring stocks remain depressed, noting that the number of blueback herring counted at the fishway at the first dam on the Connecticut River reached an all-time low of 151 fish in 2004. The number was up slightly in 2005 at 534; however, the numbers are still drastically below acceptable levels for population restoration. Monitoring conducted during 2008 indicated that the river herring stocks remain depressed and DEP found no signs of an imminent recovery of river herring populations</p>	<p>The DEP indicates that the prohibition on the taking of river herring could likely extend well into the future.</p>



**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 AND 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

	<b>2009 Planned Action</b>
<p><b>1.</b> NYSDEC's marine recreational fishing regulations for 2008:</p> <p><b>Summer Flounder (fluke)</b> - Minimum size limit: 20.5" Total Length Possession Limit: 4 Open Season: May 15 – September 1</p> <p><b>Scup</b> - Minimum size limit: 10.5" Total Length Possession Limit: 10 Open Season: May 24 – September 26 Exception: passengers fishing aboard licensed Party/Charter boats may each possess up to 45 scup during the period of September 1 -- October 15 with an original dated receipt from the licensed vessel.</p> <p><b>Black Sea Bass</b> - Minimum size limit: 12" Total Length Possession limit: 25 Open Season: All year</p> <p><b>Striped Bass</b> - Possession Limit: 1 fish between 28" and 40" Total Length and 1 fish greater than 40" Total Length. Exception: passengers fishing aboard Party/Charter boats possessing a striped bass permit may possess 2 fish with a minimum length of 28" Total Length with an original dated receipt from a licensed vessel. Open season (unchanged): April 15 -- December 15</p> <p><b>Bluefish</b> - Possession Limit: 15 fish, no more than 10 of which may be less than 12 inches in Total Length. Open season: All year</p> <p><b>American Lobster</b> – Minimum size limit: 3 5/16" Carapace Length Possession limit:: 6 Open Season: All year Lobsters in spawn (eggs visible thereon) may not be taken or possessed.</p> <p><b>Tautog</b> - Minimum size limit: 14" Total Length Possession limit:: 4 Open Season: October 1 – December 20, January 17 – April 30</p> <p><b>Horseshoe Crabs</b> – No size limit. Possession limit:: 5 Open Season: All year</p> <p>More information can be found at: <a href="http://www.dec.ny.gov/outdoor/7894.html">http://www.dec.ny.gov/outdoor/7894.html</a></p>	<p>There will likely be new recreational measures for summer flounder, scup, black sea bass and probably for winter flounder, but no specific decision has been made on any of these to date.</p>
<p><b>2.</b> In 2008, to protect public health, NYSDEC designated over 5,000 acres of shellfish harvesting areas in the Town of Huntington as temporarily closed on an emergency basis after its biotoxin monitoring program detected elevated levels of saxitoxin in shellfish in Northport Harbor, Northport Bay and Huntington Bay. <i>Alexandrium fundyense</i> (Af) is a naturally occurring marine dinoflagellate (phytoplankton) that produces the biotoxin responsible for paralytic shellfish poisoning (PSP), a saxitoxin which can be potentially fatal to humans.</p> <p>NYSDEC began monitoring for PSP in shellfish in 2004 using samples collected at shellfish dealers (wholesalers) and processors. In 2006, NYSDEC began deploying and testing mussels in bays and harbors, as well as samples of natural-set shellfish (mussels, hard-shell and soft-shell clams) that were harvested from local bays and harbors.</p>	<p>NYSDEC will continue its monitoring of shellfish in these and other waters for PSP toxins.</p>
<p><b>3.</b> Research was conducted by SUNY Stony Brook University's School of Marine and Atmospheric Sciences during 2007 and 2008 into <i>Alexandrium fundyense</i> (Af) levels in the water column and sediment in the bays and harbors in the Town of Huntington, in northwest Suffolk County, and other tributaries of Long Island Sound. Preliminary results show that Af bloomed in Northport Harbor and adjacent bays in response to certain forms of nitrogen</p>	<p>Final report from SBU SoMAS is expected.</p>

2008 Description		2009 Planned Action
	introduced to the water by a nearby sewage treatment plant and storm water runoff. Additionally, <i>Af</i> cysts in the sediment in late 2008 were three times (3x) higher than they were in late 2007. The 2007 cysts were the "seeds" for the 2008 bloom, which produced the highest saxitoxin levels that have ever been detected in New York. Funding was provided by NYSDEC through the New York City Nitrogen Settlement Agreement for Long Island Sound.	
4.	After the 2008 PSP-producing <i>Alexandrium fundyense</i> bloom in the Huntington Harbor complex on Long Island, NYSDEC food inspectors collected shellfish specimens from local wholesalers for testing to ensure the safe consumption of shellfish that may have been exposed to the toxin. No product had to be pulled related to this investigation.	NYSDEC food inspectors will respond in a similar matter in the case of another bloom of <i>Af</i> .
5.	The NYC Parks Department continued to monitor its eastern oyster pilot reef located at the junction of the Bronx and East Rivers. <a href="http://www.nycgovparks.org">http://www.nycgovparks.org</a>	Continuation of the monitoring of the reef.
6.	In CT, changes in the 2008-2009 fishing seasons were made. The open seasons for recreational fishing for black sea bass have been changed to year round. Summer flounder regulations for recreational fishers includes a season of June 15 to August 19 with a size limit of 19 ½ inches at 3 fish per angler. CT also adopted new fishery management measures for the recreational fishery for scup. The recreational creel limit and minimum length for scup will be: 25 fish at a 10-1/2 inch minimum length and a season from May 24 to September 26. But Party/Charter boat anglers will be able to keep 10 fish when fishing from June 12 to August 31 <sup>st</sup> and 45 fish per angler from September 1- October 15. Scup caught from a Party/Charter boat must be a minimum of 11 inches. These measures will become effective January 1, 2009.	Regulations for other species may change in 2009 depending on monitoring data results.
7.	In 2005 CT passed Public Act 05-281, An Act Implementing a Lobster Restoration Program. This act requires DEP to establish a lobster restoration program involving the V-notching of the tails of mature female lobsters caught by commercial fishermen and releasing them in order to increase lobster egg production. It requires, if funds become available, DEP to compensate commercial fishermen who: 1) lands, has marked, and releases lobsters and 2) reports it as required by law. The compensation must equal the average market value, which the commissioner determines. In July 2008 DEP announced the program successful in delaying the increasing of minimum sizes limits by the Atlantic States marine Fisheries Commission. The program has returned the equivalent of more than 58,000 mature female lobsters to the Sound between December 2007 and July 2008 and represents more than 100% of the goal established for the first year.	Students will continue to collect and notch female lobsters until funding is exhausted.

## 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.**

2008 Description		2009 Planned Action
1.	The Connecticut Aquatic Nuisance Species (ANS) Management Plan has undergone formal review by CTDEP in 2006 and was signed by Governor Rell in early 2007. It was approved by the federal ANS Task Force in June 2007. Federal funds to support partial implementation were received by DEP from the USFWS in 2008.	Seek ongoing funding; hire coordinator in 2009
2.	Westchester County Soil and Water Conservation District staff developed an educational brochure in the summer of 2008 about Westchester County's most invasive plants. The brochure, entitled "A Growing Concern: Westchester's Most Invasive Plants," features the invasive trees, shrubs, vines, herbs, and grasses that are most prominent in Westchester County. The brochure describes and includes a color photograph of each of these species in an effort to promote the identification and management of them. It provides information that will aid parks and public works managers as well as landowners and others involved in managing and maintaining natural resources and landscaped areas. Nearly 2,500 copies of the brochure were distributed to libraries, colleges and universities, County parks, nature centers, and municipalities in Westchester County. It complements another brochure titled "Go Native," which is focused on native plants, produced by the Westchester County	Additional copies of the invasive plants brochure are being produced and distributed by non-County entities.

2008 Description	2009 Planned Action
<p>Department of Parks, Recreation and Conservation. The brochure is available online through the District's webpage and Department of Planning website. The printing of the brochure was funded with monies received by The Westchester County Soil and Water Conservation District.</p>	
<p>3. As part of Westchester County's ongoing Aquatic Restoration Program, invasive and/or nonnative plant species were removed at several restoration sites where these plants began to dominate and became a problem. The County hired a contractor to perform the manual removal of invasive and/or non-native plants at three aquatic restoration sites in 2008: Nature Study Woods in New Rochelle, Crestwood Maintenance Facility in the Bronx River Parkway Reservation in Tuckahoe, and Edith G. Read Nature Park and Wildlife Sanctuary in Rye (where they cleared a 0.9 acre parcel of Knotweed, Phragmites, and Porcelain Berry, among others, and replanted with 108 native trees and a native meadow mix). In addition, Bonnie Briar Country Club hired the same contractor to maintain the stream restoration site that bisects its golf course. The contractor provided labor, services, materials, tools, and equipment necessary to complete the work at all of the sites. Maintenance promotes the long-term success of the project benefits and site values resulting from the restoration work. This project was funded by \$6,000 from conservation project financial assistance pursuant to the provisions of Section 11-a (1) (b) of the New York State Soil and Water Conservation Districts Law.</p>	
<p>4. Within the Greater Pipe's Cove Study Area within the Town of Southold (roughly 615 acres of protected land in total), straddling the Long Island Sound and Peconic Estuary watersheds, a team of TNC biologists mapped invasive, non-native plant infestations including autumn olive, oriental bittersweet, garlic mustard, multiflora rose, Norway maple, and wineberry.</p>	<p>Efforts are underway to eradicate the infestations in the more pristine areas of these protected lands.</p>
<p>5. TNC CT Chapter completed its eighth season of chemical application to Phragmites in tidally influenced marshes of the lower Connecticut River. TNC and the CT DEP manage Phragmites on marshes on the lower CT River. TNC manages Phragmites on 189 acres on the Lieutenant River and 138 acres at Lord Cove, with CT DEP managing another 136 acres at Lord Cove. TNC Phragmites management in 2008 covered 327 acres.</p>	<p>Herbicide application will continue in 2009 based on 2008 success and funding availability.</p>
<p>6. Connecticut Sea Grant, in collaboration with the other Northeast Sea Grant programs, distributed multi-lingual signs throughout the Northeast (bait dealers, boat ramps) to alert anglers of the potential for introducing new species through the disposal of the seaweed used to pack live marine baitworms in the water. "Don't Dump Bait" stickers to be applied to baitworm boxes at point-of-sale were piloted at five bait shops in Connecticut. The outreach program was initiated as a regional SG program. With the completion of the LISS-supported baitworm research project (Yarish et al) in 2008, CTSG and NYSG worked with the researchers to host an informational meeting in each state with baitworm retailers and other interested parties to discuss the results. The research results support the need for ongoing outreach to address this potential vector for introduced species.</p>	<p>Outreach program will be continued.</p>
<p>7. Connecticut Sea Grant initiated a project to manage invasive plant species along the Avery Point campus shoreline. Starting with the area near the Avery Point Light House, the majority of invasive plants were cleared from the area near the lighthouse, and planted with native Virginia rose (<i>Rosa virginianum</i>), little bluestem (<i>Schizachyrium scoparium</i>), butterfly weed (<i>Asclepias tuberosa</i>), and prickly pear cactus (<i>Opuntia humifusa</i>). Two high school interns helped to remove invasive plants. Advanced Master Gardeners received training on Coastal Habitats and Invasive Plants, and Aquatic Invasive Species of Long Island Sound. UConn CES geospatial faculty taught the use of Geographical Positioning Systems (GPS) to an undergraduate Geography class, which then mapped locations of invasive plants along the campus shoreline. These data formed the pre-removal base map.</p>	<p>Invasive plant removal will continue, Geography classes will continue mapping the invasive plant locations, to illustrate changes over time.</p>
<p>8. Connecticut Sea Grant was awarded a 2006 LISS Enhancement Grant, administered by NEIWPPCC, to oversee development of an interstate ANS Management Plan for Long Island Sound. A working group was developed preliminary goals and objectives, strategies and tasks. The draft plan was submitted to EPA in late 2007 and received preliminary review by the ANS Task Force in early 2009.</p>	<p>Review comments and revise draft plan; work towards adoption in 2009</p>
<p>9. CTSG worked with UConn maintenance staff, interns, and volunteers to develop a management plan to control and manage invasive plants, such as Asiatic bittersweet (<i>Celastrus orbiculatus</i>) and Japanese knotweed (<i>Polygonum cuspidatum</i>), along the Avery Point campus shoreline. An undergraduate geography class maps the locations of the invasive plants using GPS each spring. Control efforts began in late spring 2008 and continued through the summer, concentrated in the area near the lighthouse. In fall 2008, several native species were planted in the cleared area.</p>	<p>Continue control efforts in 2009.</p>

## L-7. EDUCATING THE PUBLIC ABOUT THE PLANTS AND ANIMALS OF LONG ISLAND SOUND (CCMP TABLE 46,.120)

**KEY ELEMENTS: EDUCATE THE PUBLIC ABOUT THE PLANTS AND ANIMALS OF LONG ISLAND SOUND AND ELICIT VOLUNTEERS TO ASSIST WITH PLANTS AND ANIMALS MONITORING PROGRAMS.**

2008 Description	2009 Planned Action
1. Connecticut Sea Grant produced the book, <i>Seaweeds of Long Island Sound</i> , with support from EPA LISS and Connecticut College in 2006; 3,000 copies were printed. Nearly 3,000 copies were distributed to educators in Connecticut and New York free of charge, through CTSG, NYSG, and EPA LISS; copies are also available through several nature center book stores and the Connecticut College Arboretum. This publication raises awareness and better understanding of the seaweeds of the Sound and their ecological importance.	Reprint book in 2009
2. Connecticut Sea Grant produced the laminated card, "Guide to Common Seaweeds of Long Island Sound's Rocky Shore," which complements the book, and helps educators and their students identify some of the more common species of seaweeds found in the rocky intertidal zone. 3,000 were printed and all have been distributed.	Seek ways to reprint in 2009.
3. Connecticut Sea Grant produced a PowerPoint® presentation, <i>Living Treasures: The Plants and Animals of Long Island Sound</i> in 2006. The presentation, geared to middle and high school, focused on key habitats of the Sound and the plants and animals found within them, and contains 120 slides and 166 images, resources and key contacts. The PowerPoint® is packaged on a CD along with a stand-alone image library and the PDF of <i>SoundFacts: Fun Facts about Long Island Sound</i> . More than 2,500 copies have been distributed in CT and NY.	Include material on combined CD with other LIS educational resources in 2009
4. An interactive map of Long Island Sound Study Habitat Restoration Sites was completed by NYSDEC and NY Sea Grant, which will be launched with the HRI database.	Keep map updated and continue improvements
5. LISS staff, from NYSDEC and NYSG, and NYC Department of Parks and Recreation published an article in the September 2008 volume of Ecological Restoration titled "The Big Apple and Beyond: Challenges and Successes of Habitat Restoration in the Long Island Sound Watershed."	Continue to collaborate as possible.
6. Every year the Riverhead Foundation conducts public lectures throughout Long Island, NY about different marine mammals and sea turtles. Starting in the fall, lectures focus on training beach-walker volunteers about cold-stunned sea turtles and stranded seals, their identification, and appropriate protocols for reporting sightings. These lectures have been held within the LIS watershed at libraries in Riverhead, Southold, and Huntington, among other locations. Through the volunteer monitoring of the winter beach, the Foundation has seen increases in the number of strandings and reportings in LIS which may be due to increases in animal populations and numbers of volunteers. The foundation uses reports of strandings to refine their monitoring locations and to target specific areas. The Foundation has a 24 hour hot-line and e-mail, (631) 369-9829, <a href="mailto:sightings@riverheadfoundation.org">sightings@riverheadfoundation.org</a>	Continue the program
7. The Long Island Sound Foundation, in partnership with Dominion, Inc., annually sponsors a Long Island Sound calendar contest for K-8 school children. The LIS calendar is made up of drawings by the children representing some aspect of Long Island Sound. The calendar may be accessed at: <a href="http://www.lisfoundation.org/calcontest.php">http://www.lisfoundation.org/calcontest.php</a>	Conduct the program in 2009.
8. More than 100 K-12 formal and informal Connecticut and New York teachers attended the 2008 biennial Long Island Sound Educators Conference in May 2008, held at The Maritime Aquarium at Norwalk, receiving resources on aquatic invasive species (AIS) resources for their classrooms. Fifteen teachers were introduced to activities that utilize these AIS materials during a CTSG-led workshop. Ten other CT teachers were provided AIS resource materials as part of the Nab the Aquatic Invader workshops conducted for Marine Sciences Day in May 2008, at UConn Avery Point.	Next LIS Educators conference scheduled for 2010

<b>9.</b>	<p>Connecticut Sea Grant:</p> <ul style="list-style-type: none"> <li>collected and edited content and resources for a comprehensive LIS Resource Guide (150 pp) in collaboration with LIS mentor teachers, which includes classroom and field activities utilized by the LIS mentor teachers in their classrooms, and taught during LISMT workshops from 2002-2008.</li> <li>provided hands-on training for 75 teachers and students from 31 CT schools on marine invasive species in Long Island Sound as part of the DEP-sponsored aquatic workshops for the 2008 Envirothon.</li> <li>facilitated the translation and production of the EPA LISS "Step by Step" NPS brochure into Spanish ("Paso a Paso"), and began distribution to Hispanic and Latino audiences.</li> <li>continued distribution of many LIS-related publications to formal and informal educators, including the LIS Educational Resources CD, <i>Living Treasures</i> (English and Spanish versions), LIS Invasive Species posters, <i>Sound Health</i>, <i>Seaweeds of Long Island Sound</i>, and LISS fact sheets.</li> <li>began production on new LISS-supported publication, a salt marsh guide.</li> </ul>	<p>Published in print and on CD and distributed in CT and NY</p> <p>Distribution in CT and NY will continue.</p> <p>Distribution in CT and NY will continue.</p> <p>Complete publication</p>
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### 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

	2008 Description	2009 Planned Action
1.	The LISS management Committee approved funding for development of a habitat restoration database in 2006. NEIWPC coordinated development of the database through a subcontractor, who worked with the LISS habitat restoration team during development. (see L-3 above)	The database will be established on the LISS website during 2009.
2.	NYSDEC, in partnership with SUNY Stony Brook's Marine Sciences Center, finished the draft Unit Management Plan (UMP) for the State Owned Flax Pond Tidal Wetland property.	Finalize UMP.

### 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.

	2008 Description	2009 Planned Action
1.	The LISS provided \$87,394 in 2008 to the USFWS to conduct triennial eelgrass surveys. The survey results will be posted on the LISS website when available.	An aerial survey will be conducted in 2009.
2.	NYSDEC completed its 25 <sup>th</sup> season of the striped bass young-of-the-year survey in western Long Island Bays which include Little Neck Bay, Manhasset Bay, Oyster Bay and Hempstead Harbor from the north shore. A total of 365 bass were tagged in LIS and a full report will be completed late in 2009. This survey is used by ASMFC (Atlantic States Marine Fishery Council) as part of a collective data set of population and recruitment status info that is used in stock management decisions.	Continue survey, hopefully, despite state budget cuts.
3.	Since December 2007, the U.S. Geological Survey--New York Water Science Center has	Continue operating monitoring stations.

2008 Description	2009 Planned Action
<p>operated a monitoring station that collects data on tidal water elevation, water temperature and specific conductance (which is used to compute salinity) at each of three wetland embayments along the north shore of Long Island; East Creek, Frost Creek and Flax Pond. Since April 2008, Flax Pond has been equipped with an add-on water-quality monitor that collects data on pH, dissolved oxygen, turbidity, temperature, and specific conductance. All continuous datasets are available in real time via the Internet:  <a href="http://waterdata.usgs.gov/ny/nwis/uv/?site_no=01302250">http://waterdata.usgs.gov/ny/nwis/uv/?site_no=01302250</a>,  <a href="http://waterdata.usgs.gov/ny/nwis/uv/?site_no=01302845">http://waterdata.usgs.gov/ny/nwis/uv/?site_no=01302845</a>,  <a href="http://waterdata.usgs.gov/ny/nwis/uv/?site_no=01304057">http://waterdata.usgs.gov/ny/nwis/uv/?site_no=01304057</a></p> <p>A fourth station (West Pond) is presently under development, and will be operational in 2009. This is part of a larger effort to identify the potential causes of tidal marsh loss.</p>	<p>Install gauge at West Pond.</p>
<p>4. In late May and early June 2008, 40 fish traps were deployed by NYSDEC marine fisheries staff at 40 stations in Eastern Long Island Sound. The stations were located from Mattituck Inlet east to Rocky Point East in Southold. The traps were checked weekly, weather permitting and were left in the water until late October. During 2008, the study caught over 3000 tautog with an average catch per unit effort of 4.57 tautog per trap haul. The LIS tautog trap study is funded from a combination of state and federal funds.</p>	<p>The original scope proposed a 3-5 year initial sampling effort, but due to budget constraints, the project may not go forward. The sampling vessel is in need of new engines which may not be replaced before the sampling season due the cited fiscal crisis.</p>
<p>5. NYSDEC conducted the annual Long Island Colonial Waterbird and Piping Plover Survey (LICWA), this year counting terns, skimmers, and plovers at about 290 sites, over 40 of which are in the LIS watershed. The information is used in multiple ways. On a regional basis, data collected is used in regulatory and permit issuing. On the national level, the information is used to protect the nesting and foraging habitats of these species which are listed as either threatened, endangered or special concern.</p>	<p>Continue monitoring these species.</p>
<p>6. In 2008, NYSDEC and Cornell Cooperative Extension (CCE) staff with the aid of contracted fishermen sampled NYSDEC ventless lobster traps at 26 sites throughout the entire LIS twice a month from July through September. This was part of a greater fisheries-independent, standardized survey, funded by the Atlantic States Marine Fisheries Commission, which occurs along the coast from Maine to New York. This project began in NY in 2006 and is strictly a population monitoring and assessment survey which does not take into account environmental factors. In 2,268 trap hauls, 1,970 lobsters were sampled. This is down 200 lobsters from 2007.</p>	<p>There is currently no funding to continue this work in 2009.</p>
<p>7. In 2008, NYSDEC and CCE staff coordinated a largely volunteer based horseshoe crab (HSC) spawning survey on West Meadow Beach. The survey is modeled after the Delaware Bay HSC spawning survey. Five hundred meters of beach were surveyed during the night-time high tide 2 days before, 2 days after, and on the date of each new and full moon from May 17<sup>th</sup> through July 16<sup>th</sup>. Over the course of the survey, 2,278 crabs were counted and 187 were tagged with USFWS button tags.</p>	<p>Funding for this work is through a NY State Wildlife Grant and should continue in 2009. Shorebird interaction with horseshoe crab eggs will also be studied to determine the ecological importance of this resource for migrating birds.</p>
<p>8. NYSDEC in cooperation with TNC and NYC Dept of Parks &amp; Recreation installed triplicate Surface Elevation Tables (SETs) in six marsh complexes throughout the NY LIS watershed. These installations will allow for the tracking of changes in the relative marsh surface elevations. The project was supported by LISS base proposal funds awarded previously. The bulk of the equipment used to do the installations was loaned by USGS.</p>	<p>Submit and receive approval of an associated QAPP. Establish baseline and begin taking quarterly measurements.</p>
<p>9. <i>The Second Atlas of Breeding Birds in New York State</i>, edited by Kevin J. McGowan of the Cornell Lab of Ornithology and Kimberley Corwin of the NYSDEC and published by Cornell University Press was released in December 2008. It details the status of bird populations in NY and documents that over half of New York State's birds have experienced dramatic population changes since 1980. The atlas was initiated by the New York State Ornithological Association and implemented by the NYSDEC, which provided the funding, management personnel, oversight, direction, and data capture and management. The majority of the funding</p>	

	2008 Description	2009 Planned Action
	<p>came from the state tax check-off program, <i>Return a Gift to Wildlife</i>. Additionally, nearly 1,200 volunteers across New York State completed the fieldwork required for the project and provided data.</p> <p>The publication will be used by NYSDEC and other state agencies involved in land management and conservation, as well as counties and towns who make management decisions on smaller scales. Data will also be used at the national level by federal agencies, non-governmental agencies such as the NY Natural Heritage Program and Audubon, as well as universities across the country. More information can be found on-line at <a href="http://www.dec.ny.gov/animals/7312.html">http://www.dec.ny.gov/animals/7312.html</a></p>	
10.	<p>CTSG and NYSG administered the 2008 LIS Research funds and five projects were funded for two years (2009-2011).</p> <p>PI: Mark Altabet; Department of Estuarine and Ocean Science, School of Marine and Technology, University of Massachusetts, Dartmouth; geochemistry of dissolved gases in the Sound to gain insight into oxygen exchange between surface and bottom waters.</p> <p>PI: Robert Wilson and Brian Colle; School of Marine and Atmospheric Sciences (SoMAS), Stony Brook University will partner with Daniel Codiga, University of Rhode Island to evaluate the relationship between summertime storms and hypoxia.</p> <p>PI: Darcy Lonsdale and Christopher Gobler (SoMAS, Stony Brook) will look at seasonal temperature differences and the effects on the Sound's food web.</p> <p>PI: Christopher Gobler (SoMAS, Stony Brook) will study the causes and impacts of recent red tide blooms in the Sound.</p> <p>PI: Kamazima Lwiza and Gordon Taylor, SoMAS; will investigate phytoplankton and microbial production and mortality and their effects on the Sound's bottom water oxygen.</p>	Project progress reports will be submitted.
11.	<p>The CTDEP marine fisheries program continued its fish trawl survey of Long Island Sound in 2008, funded with a 'Federal Aid in Sport Fish Restoration' grant from the USFWS. Trawl survey maps and finfish survey results are posted on the CTDEP web at: <a href="http://www.ct.gov/dep/lib/dep/fishing/general_information/marinefishsurveyreport2007.pdf">http://www.ct.gov/dep/lib/dep/fishing/general_information/marinefishsurveyreport2007.pdf</a></p>	Continue to conduct trawl and estuarine seine surveys

**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.**

	2008 Description	2009 Planned Action
1.	<p>The following LIS LMR/habitat research projects were completed in 2008:</p> <ul style="list-style-type: none"> <li>• <i>Food Webs in Long Island Sound: Review, Synthesis &amp; Potential Applications</i>. PI: Dr. Roman Zajac, University of New Haven; EPA grant #LI-97101401, \$117,545</li> <li>• <i>Understanding the Role of Nutrient Enrichment in Tidal Marsh Loss in Long Island Sound</i>. PI: Dr. Shimon Anisfeld, Yale University; EPA grant #LI-97100801, \$125,372</li> <li>• <i>Application of Remote Sensing Technologies for the Delineation and Assessment of Coastal Marshes and their Constituent Species</i> (UConn/Wesleyan University; PI: Gilmore/Civco; LIS 2004 Research Fund; LI-97101801; \$70,578</li> </ul>	Final reports submitted to EPA.
2.	The 2008 biennial Long Island Sound Research Conference was held at Connecticut College,	Publish proceedings



	2008 Description	2009 Planned Action
	New London, Connecticut from October 30-31, 2008. The conference, <i>Environmental Changes in Long Island Sound</i> , was co-sponsored by the Long Island Sound Foundation and the New England Estuarine Research Society. The conference agenda is posted at: <a href="http://lisfoundation.org/researchConf2008.php">http://lisfoundation.org/researchConf2008.php</a>	volume for 2008 conference. Plan for the 2010 research conference.
3.	Through the LISS Research and Enhancements Grant Programs, the following LIS projects continued in 2008: <ul style="list-style-type: none"> <li>• <i>Simulation of Long Island Sound with the System-wide Eutrophication Model (SWEM): Inter-annual Variability and Sensitivity</i> (UConn/DMS; PI: Dam/O'Donnell; LI-97127101; LIS 2005 Enhancement Fund; \$251,164)</li> <li>• <i>Multi-component Evaluation to Minimize the Spread of Aquatic Invasive Seaweeds and Harmful Algal Bloom Microalgae via Live Bait Vectors in Long Island Sound</i> (UConn and State University of New York, Purchase; PI: Yarish; LIS 2006 Research Fund; LI-97149601; \$101,756)</li> </ul>	Report progress on ongoing research projects.
4.	The Connecticut and New York Sea Grant programs jointly administered the 2008 LIS research fund, awarding \$820,000 in Long Island Sound Study research grants to five projects that will look into some of the most serious threats to the ecological health of the Sound (see Section L-9 above). This research will address the historical problem of the Sound's low oxygen conditions as well as emerging issues of red tide and the effects of climate change on the Sound's ecosystem. Research results from the two-year projects are expected to provide valuable information to resource managers throughout the Long Island Sound watershed.	Obtain progress reports from research projects
5.	Connecticut Sea Grant is supporting research to survey tidal wetlands along Connecticut's Long Island Sound and along Cape Cod, Massachusetts for Sudden Wetland Dieback (SWD) (Elmer/LaMondia, CT AG Station; 2008-2010). The project is sampling and mapping (GPS) sites with symptomatic and asymptomatic plants; isolating from affected and nonaffected tissues for <i>Fusarium</i> species, other phytopathogenic fungi, and root rot nematodes; identifying organisms via morphology and molecular genotyping; and confirming pathogenicity on healthy <i>Spartina alterniflora</i> . Experimental tests will assess how abiotic stressors, such as drought, flooding, and salinity, affect the susceptibility of <i>Spartina</i> to known pathogens.	Project is expected to be completed in early 2010
6.	Connecticut Sea Grant is supporting research using otolith microchemistry from returning anadromous river herring to determine the ratio of homing to natal streams (Vokoun et al, UCONN; 2008-2010). Juvenile habitats in Connecticut watersheds are being tested to determine if they have different minor and trace element concentrations, then it will be determined if emigrating juvenile river herring captured in their natal streams have minor and trace elemental signatures recorded in their otoliths which correspond to source waters. Returning adults will be captured, their otoliths analyzed, and the stream-of-origin determined statistically. The same otolith microchemistry is being used to determine when an individual emigrated to the ocean. Tank experiments will document that movement from fresh to salt water generates a distinct chemical signal in the otolith; then the age and timing of emigration to the ocean for the returning herring analyzed will be determined.	Project is expected to be completed in early 2010
7.	Connecticut Sea Grant is supporting a research project that is quantifying, comparing, and contrasting the effects of the newly established no-harvest zones with respect to horseshoe crab reproductive ecology (i.e. number of spawning adults, nest density, egg density, and hatching success) (Mattei et al, Sacred Heart; 2008-2010). These spawning beaches at Milford Point and Sandy Point in CT are also "Important Bird Areas" as acknowledged by CTDEP. The researchers are determining horseshoe crab population dynamics (i.e. adult movement patterns, site fidelity, sex ratio, spawning behavior) employing conventional tagging methods, and if ecological links exist between spawning horseshoe crabs, shorebirds (migratory and resident species), and aquatic predators (native and invasive) at Milford Point and Sandy Point.	Project is expected to be completed in early 2010
8.	Beginning in 2008, the TNC LIS Program funded climate change adaptation work done by UConn's Center for Land Use Education and Research (CLEAR) at eight focus areas along the CT coast of LIS. These areas were chosen because of their potential susceptibility to sea level rise. Some of the associated work entails modeling the impacts of SLR at these eight areas.	Project and funding will continue in 2009.



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## 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 for public involvement and education activities.

**LIS 2003 Agreement Goal:** *Promote an informed and educated constituency involved in community decisions affecting the ecological health of Long Island Sound and its living resources.* There are five action items in this section of the *LIS 2003 Agreement*, including biennial reporting on the health of the Sound, establishing LIS curricula, offering LIS field/learning experiences for school children, and expanding membership in the CAC. In 2008, *Sound Health 2008* was released, with more than 450,000 copies distributed in the watershed. LISS continued to fund Connecticut Sea Grant to conduct its Mentor Teacher program to train teachers as peer-mentors for Long Island Sound curricula in schools. The CAC expanded its membership base by adding two new organizations in 2008

**Environmental Indicators/Results/Trends:** *Sound Health 2008*, LISS's environmental indicators report, was released in July 2008 in print and on the Web site. More than 420,000 copies of the report were distributed as inserts in daily and weekly newspapers. Readers learned about environmental trends in water quality, marine living resources, land use, and habitat protection. Besides the newspaper distribution, communications staff distributed more than 30,000 copies upon request to schools, municipalities, libraries, and community groups. Several teachers used *Sound Health* as part of their curriculum to teach the environment and marine studies. Advertising was placed on the Web site of two local newspapers, the Hartford Courant and Newsday, to notify its on-line readers of the Web version of *Sound Health*.

### **2008 Highlights**

- LISS produced and distributed its *UPDATE* newsletter to over 4,500 watershed residents; the issues covered climate change on Long Island Sound and Sound-friendly lawn and garden care.
- LISS staff initiated a "Sound Stewards" program in which 450 students participated in research projects in LISS stewardship sites.
- The LISS followed up on its 2007 release of a public perception survey of Long Island Sound by hosting two workshops on Community Based Social Marketing in September 2008. The workshops helped community groups and municipalities develop education programs to encourage citizens to engage in supportive environmental behaviors.
- CT Sea Grant facilitated the filming of one episode of the award-winning TV show, *AquaKids*, at the UConn Avery Point campus, featuring a faculty member and two Sea Grant staff members.
- produced six issues of the online newsletter *SoundBytes* in 2008.

## SUMMARY OF MANAGEMENT ACTIONS: PUBLIC INVOLVEMENT AND EDUCATION

### E-1. BUILDING COMMUNITY AWARENESS AND STEWARDSHIP (CCMP TABLE 51, P.146)

**KEY ELEMENTS:** THE CCMP EMPHASIZES EXISTING AND ENHANCED PUBLIC INVOLVEMENT AND EDUCATION PROGRAMS AT THE STATE LEVEL TO BUILD COMMUNITY AWARENESS AND STEWARDSHIP OF LIS. SUPPORT FOR CONFERENCES, INCLUDING RESEARCH AND THE LONG ISLAND SOUND WATERSHED ALLIANCE, IS AN IMPORTANT ELEMENT OF THE PROGRAM. THE DEVELOPMENT AND DISTRIBUTION OF INFORMATIONAL MATERIALS FOR SPECIFIC AUDIENCES, INCLUDING PRINTED MATERIALS, PUBLIC EXHIBITS, EDUCATIONAL CURRICULA, AND RESEARCH PROGRAMS WAS IDENTIFIED AS A PRIMARY OUTREACH AND EDUCATION MECHANISM.

2008 Description	2009 Planned Action
<p>1. The LISS Outreach Program:</p> <ul style="list-style-type: none"> <li>• produced the LISS <i>UPDATE</i> newsletter; the two issues covered the effects of climate change on Long Island Sound and Sound-friendly lawn and garden care. These issues were distributed more than 5,000 watershed residents via the mailing list and outreach events. Throughout 2008, more than 100 NY residents were added to the <i>UPDATE</i> mailing list. The newsletter was also posted on the LISS website.</li> <li>• assisted in producing and distributing three issues of the CTDEP LIS newsletter <i>Sound Outlook</i> to a circulation of 3,000 in addition to making it available on the CTDEP website. The <i>Sound Outlook</i> webpage averages hits per month.</li> <li>• responded to more than 150 requests for information.</li> <li>• produced six issues of the online newsletter <i>SoundBytes</i> in 2008. Approximately 200 subscribers have signed up to receive this newsletter.</li> </ul>	<p>LISS staff will continue to respond to requests for information, provide presentations, staff displays at events, and publish newsletters and other pertinent materials.</p> <p><i>Sound Update</i> will continue to be produced and distributed.</p> <p><i>Sound Outlook</i> will no longer be available as a printed hard copy in 2009 but will continue to be produced for online viewing on the CTDEP website.</p>
<p>2. NYSDEC LISS staff prepared a display about the LISS Habitat Restoration Initiative that highlighted tidal wetland loss and eelgrass restoration, which was presented at two different 2008 Earth Day festivals (April 18, Earth Stock, Stony Brook; April 20, Indian Island State Park, Riverhead).</p> <p>NYSG LISS staff attended 10 public events (April 18, Earth Stock, Stony Brook; April 20, Indian Island State Park, Riverhead, April 23, Brookhaven National Lab; April 26 and 27, Spring Fest, Heckscher State Park; May 2, Long Island Sound Educator's Conference, Mystic, CT; May 8, Nissequogue River Watershed Action Plan public meeting; June 7, Long Island Trails Conference; June 14, Sweetbriar Farm Festival; September 27, Stony Brook Harbor Day; and September 27, Port Jefferson Family Day). At these events, Long Island Sound Study promotional and educational materials were distributed to the attending public.</p>	<p>Continue to attend events to educate the public about Long Island Sound, specifically target events in LIS watershed.</p>
<p>3. NYSDEC launched a new webpage titled <i>Green Living</i>, which gives the public tips on how to be more environmentally friendly every day. The webpage can be found on the NYSDEC website at: <a href="http://www.dec.ny.gov/public/337.html">http://www.dec.ny.gov/public/337.html</a></p>	
<p>4. NY Environmental Facilities Corporation (EFC) published boating education advertisements in the Long Island Edition of <i>Boating World</i>. The half page ads urged boaters to use pumpouts and directed them to the EFC website for more information. <a href="http://www.nysefc.org">www.nysefc.org</a></p>	<p>EFC will continue to publish educational materials in <i>Boating World</i>.</p>
<p>5. Westchester County SWCD staff:</p> <ul style="list-style-type: none"> <li>• produced a postcard and bookmark on the District and Aquatic Restoration Program. The front side of the bookmark features the signature banner for the program with several photographs that are representative of the program. The back side of the bookmark provides a summary of the program's objectives and goals. The postcard points its readers to the District's webpage, most easily accessed at <a href="http://www.westchestergov.com/waterquality">www.westchestergov.com/waterquality</a>. Twelve hundred copies of the postcard and bookmark were printed for distribution</li> <li>• designed six interpretive signs for four restoration sites. Three interpretive signs were designed for a salt marsh restoration site at Harbor Island Park in Mamaroneck Village.</li> </ul>	<p>Remaining copies of the bookmark will be distributed at outreach events in 2009.</p>

	2008 Description	2009 Planned Action
	<p>These three interpretive signs described phases of the restoration project, flora and fauna of salt marshes, the functional significance of tidal salt marshes and their importance to Long Island Sound. Two interpretive signs described aquatic buffer restoration and were installed at two different sites: the stream restoration projects at Columbus Park in Mamaroneck Village and Stephenson Brook in front of New Rochelle High School. Another sign described the StormTreat™ system, which was installed at Glen Island Park in New Rochelle.</p> <ul style="list-style-type: none"> <li>developed an interpretive display describing the Aquatic Restoration Program, including its objectives to restore aquatic resources, improve water quality by controlling polluted storm water, and enhance biodiversity. The display was unveiled to a national audience during the 4th National Conference on Coastal and Estuarine Habitat Restoration. Additionally, copies of publications (brochures, postcard and bookmark) and water quality awareness buttons were distributed.</li> </ul>	<p>The display will be continually used at upcoming events, such as workshops and those for Earth Day.</p>
6.	<p>Connecticut Sea Grant, in collaboration with CT DEP and Project Oceanology, hosted two cruises on the lower CT River for teachers and municipal officials, to renew awareness of the designation of the lower CT River as a Wetland of International Importance under the Ramsar Convention. The first cruise was held on May 22, 2008 and the second cruise was held on June 16, 2008.</p> <p>Two complementary public lectures on the CT River were held at CTDEP Marine Headquarters in Old Lyme: <i>Geologic History of the Lower Connecticut River Marshes</i> by Ralph Lewis, UCONN on June 5, 2008 ; <i>Ramsar Marshes of the Connecticut River</i> by Scott Warren, Professor Emeritus, Connecticut College on June 19, 2008. Approximately 50 people attended each lecture.</p>	<p>Complete CD with PowerPoint presentation for teachers on tidal marshes of Lower CT River; publicize International Wetlands Day (Feb 2) through printing and distribution of a poster (student contest); distribute</p>
7.	<p>Connecticut Sea Grant continued its long-term co-sponsorship of the University of Connecticut's Coastal Perspectives lecture series in 2008. Monthly evening seminars are offered every spring, open to the public. University-named marine scholars from local high schools attend every lecture as part of their year-long program, to interact with the speakers and increase their awareness of key coastal issues.</p>	<p>Continue co-sponsorship of the series, focusing on the Year of Science</p>
8.	<p>Connecticut Sea Grant gave a talk on the <i>Flora and Fauna of Long Island Sound</i> to 24 members of the New London County Extension Advisory Council in Norwich.</p>	
9.	<p>Two Connecticut Sea Grant staff serve on the Eastern Long Island Sound Advisory Council. One was involved in writing, researching and editing the LIS Assembly Report to the Connecticut General Assembly (pursuant to Section 25-155 of CT Gen Stat) completed in December 2008, and served on committees charged with drafting chapters on pharmaceuticals, storm water management, environmental education, lobster and shellfish fisheries.</p>	<p>Continued active participation on the Council.</p>
10.	<p>The LIS Foundation, with co-sponsors and a planning committee, organized the 2008 Long Island Sound (biennial) Research Conference, held at Connecticut College on October 30-31, 2008. Nearly 150 people attended the Thursday portion of the conference and 122 attended on Friday. There were 36 oral presentations and 15 posters presented. Of those presenting 26 were undergraduate students. The impact and outcome of this event was gathering together scientists from throughout New England to discuss and present their research on Long Island Sound, from which a "Proceedings" volume will be published, made up of manuscripts and abstracts from the conference.</p>	<p>The next LIS research Conference will be held in 2010. The 2008 proceedings volume is expected to be completed and distributed in 2009.</p>
11.	<p>The LISS held a LIS Synthesis workshop in 2008 in Port Jefferson NY. The purpose of the workshop was to discuss the topics for individual chapters of the environmental data synthesis volume and to develop topical writing teams. The LISS funded the Connecticut and New York Sea Grant programs in 2005 to coordinate the development of a compendium volume of scientific research on Long Island Sound.</p>	<p>Ongoing work on synthesis volume by authors; publication facilitated by CTSG and NYSG</p>
12.	<p>LISS staff initiated a program, in collaboration with Brookhaven National Laboratory's Open Space Stewardship Program, to actively engage students in watershed-related research projects. To date, more than 440 students from 6 schools have collected data on the effects of invasive invertebrate and plant species, polluted runoff, and habitat disturbance in Long Island Sound.</p>	<p>Continue this program, expanding into NY City if possible.</p>
13.	<p>In 2008 the Cornell Cooperative Extension's (CCE) educators in Western Suffolk provided 40 free programs to children in grades K-3. Students learned about their local watershed, the water cycle and how rain water carries pollutants into local lakes, rivers, bays, ocean and Long Island Sound. In addition, CCE's educators strive to incorporate at a minimum a brief discussion on the negative human impacts facing Long Island's vital marine and woodland habitats into all educational programming. CCE's educators (inclusive of all sites) annually reach over 25,000 students, teachers and adults with high-quality education programs.</p>	

	2008 Description	2009 Planned Action
14.	In 2008, Friends of the (Oyster) Bay (NY) coordinated two major cleanup efforts: the Earth Day Beach Clean Up on April 25 and the International Coastal Clean Up on September 20. Partners included the Oyster Bay Power Squadron, Oyster Bay Anglers, Sagamore Yacht Club, students from East Woods, and Friends of the Bay volunteers, for a total of approximately 240 volunteers for both events, combined.	
15.	<p>The WaterFront Center (WFC) in Oyster Bay, New York, participates in The Town of Oyster Bay Department of Environmental Resources Marine Education Day on an annual basis. On June 6, 2008, the WaterFront Center provided a touch tank of live local marine organisms to promote curiosity, understanding and stewardship to approximately 400 4<sup>th</sup> Grade students and 40 adults.</p> <p>In 2008 the WFC worked in collaboration with a local Oyster Bay community group, Youth and Family Counseling, and hosted two sails for the Hispanic families of our local community. On July 7, 2008, nine children and 12 adults participated, and on August 3, nine children and 15 adults participated. This collaboration was an effort to facilitate communication, promote awareness of the resources of the Bay and to build upon common interests. With the help of an interpreter and a Spanish speaking educator, the majority of the information was presented in Spanish. The event was free for participants and sponsored by the Oyster Bay Sailing Foundation. The WFC hosts Public Marine Education Sails each season where an educator and captain teach the participants about the resources of the Bay. In 2008, about 30 children and 25 adults attended these family outings.</p>	
16.	LISS, through the New England Interstate Water Pollution Control Commission (NEIWPCC), purchased promotional items such as pens, pencils, rulers and key chains, that raise awareness of LISS, and encourages people to use the LISS website. These give-away items carry the LISS logo and LISS website address to promote the program and encourage website access.	The LISS will continue to produce promotional items for public distribution in 2009.
17.	Boater education continued to be a focus of the CTDEP Clean Vessel Act (CVA) program. CTDEP staff attended two boat shows and other events to distribute information regarding clean boating practices, marine sanitation devices and pumpouts. CTDEP staff displayed outreach materials at the Connecticut Marine Trades Association Hartford Boating & Fishing Show reaching over 3,000 people with information about protecting and restoring LIS. Two interactive kiosks have been developed for use at boat shows and other various locations throughout the state to educate the public about the CVA, pumpouts and other clean boating practices. An <i>Action Guide for Boaters</i> has been published and will continue to be distributed at events such as boat shows and other informational events.	Continue to promote the clean boating initiative by increasing media usage via radio. Incorporate clean boating practices into the DEP-Boating AquaSmart program, which teaches children about water and boat safety. Clean boating materials will also be distributed to boaters and marinas throughout the state.
18.	<p>CTDEP provided technical assistance in the form of coastal management and coastal nonpoint source program workshops to coastal nonpoint source management area municipalities. The <i>Connecticut Coastal Management Manual</i> is available on the CTDEP website <a href="http://www.ct.gov/dep/cwp/view.asp?a=2705&amp;q=323814&amp;depNav_GID=1622">http://www.ct.gov/dep/cwp/view.asp?a=2705&amp;q=323814&amp;depNav_GID=1622</a> and fact sheets from the manual are made available upon request. In addition, a Coastal Nonpoint Source Program website was developed by CTDEP: <a href="http://www.ct.gov/dep/cwp/view.asp?a=2705&amp;q=323554&amp;depNav_GID=1709">http://www.ct.gov/dep/cwp/view.asp?a=2705&amp;q=323554&amp;depNav_GID=1709</a></p> <p>In 2008 CTDEP produced a brochure for distribution to the public: "Connecticut's Section 6217 Coastal Nonpoint Source Pollution Control Program."</p>	CTDEP will continue to provide coastal management and coastal nonpoint source workshops to municipalities as necessary. Website updates will also be conducted as necessary.
19.	CTDEP continued its public involvement initiative "No Child Left Inside," to encourage the public – especially families and children from urban areas – to enjoy the outdoors by taking advantage of the recreational opportunities state parks have to offer. This effort is also aimed at building the next generation of environmental stewards. With several State Parks and Wildlife Management Areas along the coast of CT, this initiative supports the LIS 2003 Agreement Goal of offering a Long Island Sound field experience to 50% of school children in CT and NY. One component of the initiative is a partnership with Connecticut television WFSB Channel 3 and other partners, called "The Great Park Pursuit," initiated in May 2006, which had over 900 families register to participate in 2008 with 170 families completing the visit to all 7 parks from Hamonasset State park on Long Island Sound to Peoples State Park in Barkhamsted. Participants, primarily families, have the opportunity to visit a number of state parks and forests over a seven-week period and compete in various challenges at those parks. The challenges will be linked to the general theme of each of the state parks and forests hosting events (e.g., historic sites, shoreline	The Great Park Pursuit adventure challenge will again be launched in 2009 from May and conclude at the end of June. As of May over 1100 families had registered for the 2009 events.

2008 Description	2009 Planned Action
parks, forests, etc.). CT DEP has a web page dedicated to the NCLI initiative.	

## E-2. PROMOTING UNDERSTANDING (CCMP TABLE 52, P.147)

**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.**

2008 Description	2009 Planned Action
<p>1. In 2008, LISS and its partners distributed the following press releases concerning LISS-related projects:</p> <ul style="list-style-type: none"> <li>o September 26, 2008 - <i>Nearly \$1 Million Awarded for Projects to Improve Health of Long Island Sound Funding for Habitat Restoration, Water Quality and Wildlife Conservation among Initiatives.</i></li> <li>o July 24, 2008 - <i>Sound Health Report Highlights Differing Conditions in Long Island Sound's Three Basins.</i></li> <li>o April 24, 2008 - <i>A new study indicates that wetland and stream protection regulations in Connecticut are having an effect in retarding — but not stopping — development close to coastal streams.</i></li> <li>o March 8, 2008 - <i>The Long Island Sound Fishery: Flourishing or Floundering? Citizens Summit Explores Sustainability Issues.</i></li> </ul>	Continue to issue press releases as needed.
<p>2. The number of visits to the LISS website averaged 20,050 visits a month and 6,600 unique visits a month. In addition, LISS staff responded to more than 150 requests for public information materials and questions about Long Island Sound through the website feedback form.</p>	The LISS Communications Team will continue to work to update the website in 2009, and further encourage the use of the Internet to communicate with the public.
<p>3. CTDEP issued the following press releases concerning Long Island Sound projects:</p> <ul style="list-style-type: none"> <li>• January 16, 2008 - <i>DEP Issues Proposed Final Decision to Issue Discharge Permit for Madison Landing Proposal</i></li> <li>• January 18, 2008 - <i>Governor Rell Announces \$665,000 for Madison Shoreline Greenway Trail</i></li> <li>• March 13, 2008 - <i>Governor Rell Announces \$804,000 for Tidal Wetlands Restoration</i></li> <li>• April 2, 2008 - <i>New Film About Long Island Sound Released on Cable Television and Sent to All Sixth Grades in Connecticut Schools</i></li> <li>• May 2, 2008 - <i>Statement of Governor M. Jodi Rell on Appeals Court Decision in Islander East Case</i></li> <li>• July 1, 2008 - <i>Nesting Shorebirds Need Special Protection Over Fourth-of-July Weekend and Throughout the Summer Beach Season</i></li> <li>• July 9, 2008 - <i>Governor Rell Announces Long Island Sound Grants</i></li> <li>• July 15, 2008 - <i>Three Belles Marina Receives Recognition as a "Connecticut Clean Marina"</i></li> <li>• July 21, 2008 - <i>Connecticut DEP Says Success of Lobster "V-notch" Program Postpones Increase in Minimum Size</i></li> <li>• September 16, 2008 - <i>Ritts Marine Center and Brewer Pilots Point Marina Receive Recognition as "Connecticut Clean Marinas"</i></li> </ul>	CTDEP will continue to issue press releases as needed and posted on the DEP web site.

2008 Description	2009 Planned Action
<ul style="list-style-type: none"> <li>• September 23, 2008 - <i>DEP Issues Final Approval for Madison Landing Discharge Permit</i></li> <li>• September 29, 2008 - <i>Parties Reach Agreement Concerning Water Discharge Permit for Millstone</i></li> <li>• October 9, 2008 - <i>\$3.3 Million to Improve New York and Connecticut Water Quality and Coasts</i></li> <li>• November 3, 2008 - <i>Shorebirds And Horseshoe Crabs A Very Old Story That Tests Our Conservation Instincts</i></li> <li>• December 3, 2008 - <i>DEP Names New Director Of Marine Fisheries</i></li> </ul>	
<p>4. In 2008, the WaterFront Center (WFC) in Oyster Bay, New York, worked with Boy Scouts and Girl Scouts in variety of programs (136 boys and 110 troop leaders/chaperones and 892 girls and 287 troop leaders/chaperones) and presented an exhibit and touch tank at the annual Ecology Fair and Science Exposition on March 17, 2008 (550 students and 30 teachers)</p>	
<p>5. In 2008, Cornell Cooperative Extension (CCE)'s educators in Western Suffolk visited over 30 schools and libraries, educating over 5,000 participants on Long Island with a variety of educational programs focused on Marine and Environmental Sciences.</p>	
<p>6. During 2008, the New York Sea Grant Nonpoint Education for Municipal Officials Program (NYSG NEMO) provided direct storm water management support to municipalities throughout Long Island. In-depth consultations, presentations, and written feedback on Phase II storm water program reports were provided to dozens of Long Island Sound communities. Of note, presentations were provided to the Nassau County Storm water Coalition, the Nassau County Planning Federation, the Towns of Oyster Bay and Huntington, the Suffolk County Highway Superintendents Association, and to the Villages of Northport, Asharoken, Shoreham, and The Branch. Further, NYSG NEMO launched the "Phase II LI" listserve. Reaching over 140 Long Island officials, "Phase II LI" has proven to be an effective means of fostering inter-municipal resource sharing and communication.</p>	<p>Continue to deliver outreach and support designed to ensure integration of municipal PH II storm water management with advancement of LIS CMP objectives.</p>
<p>7. Connecticut Sea Grant displayed LISS-related information and materials at four events in 2008: LIS Educators Conference (Maritime Aquarium at Norwalk), Marine Sciences Day (Groton), National Estuaries Day (Mystic Aquarium and Institute for Exploration), and the Southeastern New England Marine Educators annual conference (Groton).</p>	<p>Expect to set up display at minimum of 4 events</p>
<p>8. Connecticut Sea Grant continued its longtime co-sponsorship with the UCONN Department of Marine Science for the graduate student-led Taste, Touch and Smell of Science (TTSS) program for middle school age students. The program is designed to convey the graduate students' enthusiasm for science while introducing middle school students to the exciting world of marine science. TTSS gives children an affordable opportunity to explore and learn about the coastal processes that contribute to coastal ecosystems. At the same time, it has always been a goal of TTSS to expose graduate students to methods of educating the general public.</p>	<p>Continued program support in 2009</p>
<p>9. Connecticut Sea Grant facilitated the filming of one episode of the award-winning television show, <i>AquaKids</i>, at the Avery Point campus, featuring a UCONN faculty member and two Sea Grant staff members. The show, which targets a teenage audience, covered marine invasive species, seaweeds, and Long Island Sound. The show is syndicated across the US as well as in several countries, and has the potential to be viewed in millions of households.</p>	<p>The producers of the show are currently working with CTSG to schedule more dates for filming in 2009.</p>
<p>10. Connecticut Sea Grant and Project Oceanology served as co-regional coordinators for the Quahog Bowl, the southern New England regional bowl of the National Ocean Sciences Bowl. Teams of high school students from Connecticut and Rhode Island competed for the honor of representing their region at the national finals by answering questions related to a broad diversity of ocean and marine science related topics over the course of a day.</p>	<p>The Quahog Bowl was held at UConn Avery Point in Feb 2009, with 16 teams competing. The next Bowl is scheduled for Feb 2010.</p>
<p>11. CTDEP LISS Outreach staff is contributing editor of <i>Sound Outlook</i>, the CTDEP Long Island Sound newsletter is funded through a LISS grant. 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 3,000 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 <i>Sound Outlook</i> web page received over 1300 hits in 2008. Staff contributed six articles and assisted in editing other articles.</p>	<p>Continue to publish <i>Sound Outlook</i> in online format only and cooperate with the LISS newsletter UPDATE.</p>
<p>12. CTDEP staff distributed over 5,000 copies of the Sound Health 2008 environmental indicators report to four CT coastal State Parks in summer 2008. Copies of the report were also distributed to several schools and civic groups during LIS presentations and at environmental fairs and events. NYSG staff distributed over 5,700 copies of Sound Health to local, county, and state parks, museums, and educators.</p>	<p>Sound Health 2008 will continue to be distributed to user groups and State Parks in 2009.</p>

	2008 Description	2009 Planned Action
13.	CTDEP LISS staff displayed and provided LISS information at nine events to nearly 4,000 people in 2008; the CMTA Hartford Boating & Fishing Show, the Connecticut Conference of Natural Resources at UConn Storrs campus, the Long Island Sound Citizens Summit in Bridgeport, the National Estuaries Day event at the Mystic Aquarium, three environment days at public schools, and at two Earth Day events at private industries.	

**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.

	2008 Description	2009 Planned Action
1.	The LISS funded small grants projects totaling over \$65,000 in 2008 through the LIS Futures Fund program. The American Littoral Society, Mitchell College, Town of Greenwich, and Alley Pond Environmental Centers, and others received small grants funding for environmental education and implementation projects and programs for teachers and students.	The LISS Small Grants program will continue in 2009.
2.	The CTDEP Long Island Sound License Plate Fund provided \$74,051 in 2008 for three education grants.	Continue to provide funding for future grants.
3.	<p>The LIS Citizens Advisory Committee (CAC) met in, March, June, September and December 2008 to identify and address issues concerning LIS and CCMP implementation. The CAC:</p> <ul style="list-style-type: none"> <li>• Elected a new Connecticut co-chair and secretary, and reorganized its subcommittee structure, forming three new subcommittees: policy, advocacy and legislative; accountability and tracking; and local government. CAC members will participate on existing LISS work groups and teams to increase public participation and involvement in CCMP implementation.</li> <li>• Supported passage of the American Recovery and Reinvestment Act, writing to the Governors of New York and Connecticut to advocate for jobs and projects to support CCMP implementation activities.</li> <li>• Hosted NYSDEC deputy commissioner Jim Tierney, CTDEP commissioner Gina McCarthy, City of Norwalk public works director Harold Alvord, and CAC chairs for Peconic Estuary and NY/NJ Harbor Estuary programs Kevin McDonald and Carter Craft to discuss their programs, priorities and projects and encourage closer communications and collaboration.</li> <li>• Reviewed and provided input to and priorities for the draft LIS 2008 Agreement and the 2008 LIS budget and work plan development process.</li> </ul>	Quarterly meetings are planned for 2009.9
4.	<p>The LISS communications team held two social marketing workshops in Connecticut and New York on September 9 and 10, 2008 respectively. More than 100 people attended. According to the participant evaluations, more than 80 percent of participants agreed that the workshop helped them to be more likely to begin a social marketing campaign in their area. As a result of the workshop, LISS staff also established a social marketing discussion forum on the LISS website that gives participants who attended the workshop a forum to exchange ideas, which will help establish local environmental campaigns.</p> <p>LISS staff created a "Get Involved" webpage <a href="http://www.longislandsoundstudy.net/volunteer.htm">http://www.longislandsoundstudy.net/volunteer.htm</a> that lists the contact information for and links to the websites of 25 NY-based and 19 CT-based organizations that are in need of volunteers.</p>	



2008 Description		2009 Planned Action
5.	The Oyster Bay Friends of the Bay's (FOB) water quality monitoring program is conducted by trained volunteers under the supervision of its Water Quality Monitoring coordinator. FOB also partners with a variety of local groups on projects including beach cleanups, tree planting, and invasives control work.	
6.	In 2008 Cornell University Cooperative Extension's Marine Program: <ul style="list-style-type: none"> <li>continued to implement the horseshoe crab monitoring program by leading 50+ citizen volunteers to help survey horseshoe crab spawning abundance, size and tagging at West Meadow Beach, Stony Brook. This data is being utilized by the NYSDEC for conservation management and funded by the USFWS State Wildlife Grants.</li> <li>cultured and raised over 500,000 clam and oyster that were seeded in the Huntington Harbor-Northport Bay Complex. This program involved 8+ youth as seasonal interns who were trained in shellfish aquaculture and marine ecology of Long Island Sound.</li> <li>offered seven weeks of its annual summer camp, serving 336 children ages 6-12. More than 23,000 flyers were distributed among local stores, libraries, the 10 nearest school districts and to all local newspapers. In addition three programs were run during the school breaks and six programs were offered for pre-school aged children with a parent. More than 200 children participated in these programs, which were also publicly advertised</li> </ul>	
7.	The WaterFront Center, in Oyster Bay, New York, hosts the annual Bay Day which is a free fun day designed for families to come explore and enjoy the western waterfront. WFC provides free kayaking, free sails aboard the sloop <i>Christeen</i> , free music, an <i>Anything that Floats</i> race and a touch tank of animals from the bottom of the Bay. In 2008, approximately 500 children and 200 adults attended. WFC also co-sponsors of The Oyster Festival (1,000 children and 600 adults), and participates in Sanctuary Day at Theodore Roosevelt Sanctuary (100 children and 50 adults), Sagamore Hill in Oyster Bay Cove (200 children and 100 adults), and at a SCIMEX workshop (150 Nassau County Teachers).	

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

**KEY ELEMENTS:** THE CCMP COMMISSIONED THE STATES OF CONNECTICUT AND NEW YORK AND EPA, 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.

2008 Description		2009 Planned Action
1.	LISS outreach staff continued to provide technical information and resources (about LIS and LISS CCMP actions) to state and local agency staff and to other state and federal agency partners to facilitate cooperation and outreach with each other and the public at large. For example: CTDEP/LISS staff made a LISS presentation Connecticut Coastal Health Officials Bathing Water meeting, participated in and staffed a Long Island Sound display at the second annual Connecticut Conference of Natural Resources and to DEP Water Bureau staff in Hartford.	Staff will continue to make LIS information available to all state, local and federal partners and work with CT Sea Grant LISS Outreach staff.
2.	NYSDEC Bureau of Marine Resources staff that are most heavily involved in LISS activities and coordination, distributed copies of the 2008 'Sound Health' issue to other NYSDEC staff including the commissioner and assistant commissioners with a memo describing LISS activities and NYSDEC's involvement. In total, 59 copies were distributed in this manner. Additionally, copies were also made available to NYSDEC staff on Long Island.	Distribute the 2009 'Protection and Progress' in the same fashion.
3.	In 2008, The Nature Conservancy (TNC) on Long Island unveiled a Coastal Resiliency Tool for localities. The initial project originally focused only on the south shore of LI, but since then project participants have been working to expand the project into the LIS watershed on both the NY and CT sides of the estuary. TNC is working with Pace University personnel in its Land Use Center to perform legal analyses of the ramifications of climate change and sea level rise on LIS coastal communities. The final goal is to provide guidance to coastal localities on implementation of	Continue expanding the program into the LIS watershed.

2008 Description	2009 Planned Action
adaptation strategies.	
4. In the fall of 2007, TNC created its Long Island Sound Program which spans both the Connecticut and Long Island TNC Chapters. In the fall of 2008, TNC hired the first director and only full-time staff for the program; other program staff is made up of different personnel from LI and CT contributing an allotted number of work hours to the Program. The LISS is a partner with TNC to further the protection of LIS.	Continue development and implementation of TNC Long Island Sound Program.
5. In 2007 and 2008, The WaterFront Center initiated an Intergenerational Project with Friends of the Arts called <i>Bridging Generations: Our Stories of Oyster Bay</i> . This project included students from Oyster Bay/East Norwich High School, Seniors from The Double Day Babcock Senior Center, Friends of the OBHS Performing Arts Center, the OBHS PTSA Cultural Arts and singer/songwriter/folk artist in residence, Steve Schuck. The project was funded by a NYS Legislative Grant and private funding. The WaterFront Center kicked off the project by hosting four sails in September 2007, bringing together Seniors from the community and students to share stories and learn from one another. The students heard first-hand about the history of the Bay and the oyster industry. The culminating performance was held on April 2008, and included film, live music, poetry and stories.	
6. Through collaboration with Brookhaven National Laboratory's Open Space Stewardship Program, LISS established strong partnerships with NYSDEC, New York State Parks, Brookhaven National Laboratory, Cornell Cooperative Extension, and various schools throughout Suffolk County. In 2008, six research projects were established, involving and collecting data for numerous agencies.	This program will continue in 2009.

**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.**

2008 Description	2009 Planned Action
<p>1. Connecticut Sea Grant continued the LIS Mentor Teacher Program with LISS funding. Three teams (5 certified teachers, one of whom served on two teams) of mentor teachers (grades K-3, 5-8, and high school) with experience in using LIS in their classroom curricula were established through an application process. The teams held several planning sessions and offered one-day workshops ("From Me to the Sea", "Seine the Sound", "Build It!") for their peers to demonstrate effective "tried and true" ways to incorporate age-appropriate multidisciplinary information about the Sound into the classrooms. Thirty (30) educators participated in the workshops from 9 school districts including 5 new ones (Hartford, Bloomfield, Killingly, Newington, West Hartford, Middletown, Fairfield, Darien, Thomaston) and two non-profit marine education organizations. Through these educators, more that 2,445 students were reached.</p> <p>The evaluation process for all workshops was both formative and summative. In addition, a formal evaluation of the mentor teacher program was undertaken in 2006, with the results providing substantive examples of how the workshop materials are being used in classrooms, the benefits derived from the program, and some suggestions for improvement. Cumulatively, the LIS mentor teacher program has utilized 17 mentor teachers to train more than 110 educators, and through them, reached more than 5,445 K-12 students in Connecticut.</p> <p>LIS-based resources distributed through the workshops included: <i>Living Treasures</i>, <i>Sound Health 2005</i>, <i>Marine Animals of Southern New England</i>, <i>An Underwater Tour of LIS CD</i>, <i>Long Island Sound in a Jar</i>, and <i>Seaweeds of Long Island Sound</i>.</p>	<p>Review &amp; evaluate LISMT lessons from workshops and develop LIS and LIS watershed multimedia resource for distribution;</p> <p>Translate booklet, <i>Living Treasures</i>, a basic LISS fact sheet, and selected LISMT resources into Spanish</p>

	2008 Description	2009 Planned Action
2.	<p>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 at the New York Museum of Natural History on June 8, 2008. Staff provided a display that was viewed by the 300 participants.</p>	<p>Staff will continue on the Board and distribute information. Staff will also assist with the planning of the annual conference on June Jun 5-7, 2009 at SBU's Southampton campus.</p>
3.	<p>In 2008, CCE's educators in Western Suffolk taught more than 5,000 students, teachers and adults. Students ranged from pre-school through 12<sup>th</sup> grade. Adults were of all ages up to a group of seniors, a few well into their nineties. Through grants, school funding and Board of Cooperative Educational Services (BOCES) contracts CCE was able to provide programs to public schools (including those in under-served areas), Private schools, libraries, Boy/Girl Scout groups, Montessori schools and pre-schools throughout Suffolk County and Eastern Nassau County.</p>	
4.	<p>In 2008, the Waterfront Center (WFC) hosted 332 children (1<sup>st</sup> - 9<sup>th</sup> grades) onsite in its Summer Programs and Camp, during which students explore the estuary habitat, conduct experiments, join in cooperative games, kayak, row, fish, sail and conduct sampling aboard the <i>Christeen</i>. During the summer months, WFC also host outside camp organizations. In 2008, these programs included 804 children and 224 adults.</p> <p>The WFC also conducts programs at public and private schools. In 2008, WFC held programs for approximately 40 schools with programs are geared for students ages 4 through college level. In 2008, WFC taught 3177 students and 599 adults. Additionally, approximately 50 students and 3 Jericho High School teachers join WFC each fall for 5 full days of study where they study the declination and the effects of erosion, water quality testing at mouth of Mill Creek and other shoreline locations, flow rate of the Creek and a survey of the various vertebrates and invertebrates off shore. Aboard the <i>Christeen</i>, the students rotate through different stations at different locations including: plankton study, water quality at a set depth, a touch tank, navigation station and a dredge.</p>	
5.	<p>In 2008, IEC conducted <i>in situ</i> testing of water quality parameters in the upper East River and western Long Island Sound as part of the seventh annual World Water Monitoring Day to promote water quality awareness internationally. While comprehensive monitoring goes on throughout the year, IEC conducted in situ testing of water quality parameters at nine sites in the upper East River and western Long Island Sound, covering a distance of about 29 nautical miles, aboard the <i>R/V Natale Colosi</i>. These are the same sites monitored by IEC since 2002. The ambient water quality stations represent a subset of the LISS sampling network. In addition to meteorological and tidal conditions, parameters collected include dissolved oxygen, salinity, temperature, and water clarity. The data IEC collected was submitted to the World Water Monitoring Day website, <a href="http://www.worldwatermonitoringday.org">www.worldwatermonitoringday.org</a>.</p>	<p>IEC will continue participation in this annual event as resources allow.</p>

**E-6. SECURE FUNDING FOR PUBLIC INVOLVEMENT AND EDUCATION ACTIVITIES  
(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.

	2008 Description	2009 Planned Action
1.	<p>The CTDEP Long Island Sound License Plate Fund distributed \$ 311,000 in 2008 for 14 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</p>	<p>Due to budget constraints, a 2009 RFP will not be issued. CTDEP will issue a</p>

2008 Description	2009 Planned Action
www.ct.gov/dep.	RFPF for 2010
<p>2. Since the inception of the LISS Small Grants Program under the umbrella of the Long Island Sound Futures Fund (starting in 2006), the LISS has provided funds for 31 projects totaling \$159,295 (median grant award \$6,000). These projects assisted hundreds of teachers and thousands of school children, and produced over 20,000 pieces of literature. In 2008 the LISS Futures Fund Small Grants program provided funds totaling \$68,000 for 13 projects that provided \$311,394 in match, or more than \$4 for every grant dollar allocated.</p>	Continue the program in 2009.
<p>3. The National Fish and Wildlife Foundation (NFWF) conducted grant workshops in to assist potential applicants in developing grant applications in response to the NFWF Request for Proposals (RFP) under the 2008 Long Island Sound Futures Fund. An online workshop was held January 6, 2009 for interested applicants attracting 100 participants. The RFP was posted on the NFWF website: <a href="http://www.nfwf.org/lisff">www.nfwf.org/lisff</a>. More than --- 42 large grant project proposals were received totaling \$1,195,339.97 and 18 small grant project proposals totaling \$93, 314.98 under the RFP. Final decisions will be made regarding funding in August 2009.</p>	NFWF will work with the LISS to select projects for funding in 2009. NFWF will award funds and track progress in implementing projects.
<p>4. The LISS posts announcements on its <i>Grants at a Glance</i>, page on its website, which provides information on funding opportunities within the larger Long Island Sound community. Links to Requests for Proposals are provided at <a href="http://www.longislandsoundstudy.net">http://www.longislandsoundstudy.net</a>.</p>	Continue to post notices of funding opportunities as appropriate.
<p>5. NYS Environmental Facilities Corporation posts information about grants they administer, in particular the Clean Vessel Assistance Program, on its website: <a href="http://www.nysefc.org/home/index.asp">http://www.nysefc.org/home/index.asp</a></p>	Continue posting CVAP opportunities.
<p>6. NYSDEC posts grant opportunities through the department on a public website: <a href="http://www.dec.ny.gov/pubs/grants.html">http://www.dec.ny.gov/pubs/grants.html</a> This site lists the various grants and gives application instructions.</p>	Redesign website to be more user friendly through a grants outreach project (currently underway).
<p>7. In 2008, Cornell Cooperative Extension's educators in Western Suffolk County implemented three grant programs that allowed for fully funded programming:</p> <ul style="list-style-type: none"> <li>• Fourteen (14) free nature hikes were held at 4 County Parks (Blydenburgh, West Hills, Gardiner's &amp; Lakeland County Parks). All were open to the general public.</li> <li>• Forty (40) free storm water education programs were provided funded by Suffolk County under the Suffolk County Stomacher Management Program for grades K-3.</li> <li>• Twenty-six (26) free field trips were provided for classes from nine under-served school districts in Nassau and Suffolk County. The program was implemented at the Oyster Bay Waterfront Center and included classroom, beach and shipboard components focused on Long Island's watershed and stewardship practices. More than 300 students participated.</li> </ul>	

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## Appendix A

## Long Island Sound Futures Fund 2008 Large Grant Projects

Project Name/Type	Organization	LISFF Awards	Total nonfederal match
Orient Point County Park Grassland Restoration	The Nature Conservancy	\$59,500	\$12,300
Parks Citywide Greenroof Pilot Project	GreenApple Corps	\$50,000	\$103,509
Engineering and Modelling Study - Sunken Meadow Creek	Long Island Region, Office of Parks, Recreation & Historic Preservation	\$30,000	\$30,000
The Eastern Long Island Sound Eelgrass Restoration Initiative	Cornell Cooperative Extension of Suffolk County	\$75,000	\$47,070
Shellfish Seeding in Hempstead Harbor	County of Nassau	\$72,000	\$66,900
Hempstead Harbor 2008 Water Monitoring Program	Hempstead Harbor Protection Committee through the Village of Sea Cliff	\$35,000	\$53,000
Mattituck Inlet Stormwater Mitigation & Education	Town of Southold	\$40,000	\$48,100
Oyster Bay/Cold Spring Harbor Watershed	Friends of the Bay, Inc.	\$15,000	\$69,000
Citizen Water Quality Monitoring	Cornell University Cooperative Extension of Suffolk County	\$33,000	\$36,000
Rocking the Boat Water Quality Monitoring Project	Rocking the Boat, Inc.	\$35,000	\$7,505
Huntington Stormwater Video	Town of Huntington	\$12,000	\$7,900
TMC Streamside Incubation Facility	Tributary Conservancy, Inc.	\$22,500	\$28,200
An Integrated Management Plan for the Long Island Sound Stewardship Area Milford Point	Sacred Heart University	\$40,000	\$81,000
Crowley Parcel Acquisition at Barn Island	The Nature Conservancy in CT	\$57,500	\$310,000
Land Use Policy Evaluation for the Salmon River	The Nature Conservancy	\$48,600	\$34,100
Land Use Leadership Alliance for Connecticut Land use Decision Makers	Eastern Connecticut Resource Conservation and Development Area, Inc.	\$29,800	\$43,400
Watershed Trading to Improve the LIS Water Quality	HydroQual, Inc.	\$61,150	\$5,725
Sherwood Island State Park Nature Center Displays, Habitats and Homes	Sherwood Island State Park, State Parks Division (CT DEP)	\$27,000	\$24,500
Housatonic Estuary Low Impact Development Partners	Housatonic Valley Association	\$35,000	\$31,180
Making Sound Choices from Source to Sea	Quinebaug-Shebaug Heritage Corridor, Inc.	\$29,944	\$58,670
Caring for Long Island Sound: a 3 Part Video Series	Document Video Services, LLC	\$35,000	\$24,000
HOLA: Hands-On Outdoor Learning Adventure	Solar Youth, Inc.	\$35,000	\$10,730
	<b>TOTAL:</b>	<b>\$877,994</b>	<b>\$1,132,789</b>

## **Appendix B**



# Long Island Sound Study Comprehensive Conservation and Management Plan Actions

## CONTINUING THE MANAGEMENT CONFERENCE

- 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.
- 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.

**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.

**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.

**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.

**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.

**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.

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**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.

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

**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.

**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.

**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

**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.

**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.

**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.

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

**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.

**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.
- 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.

## **LIVING RESOURCES AND THEIR HABITATS**

- L1-1.** Connecticut, New York, and federal agencies will continue to pursue restoration of degraded habitat.
- 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.
- L1-3.** Connecticut preparing a tidal wetland management plan that includes an identification of potential wetland restoration sites.
- L1-4.** Connecticut will continue the Coves and Embayments Restoration program to restore degraded tidal and coastal embayments and coves.
- 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.
- 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 mosquitoes and restore pools and ponds on tidal wetlands.
- 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.
- L1-8.** Connecticut's Coves & Embayments Program will complete nine restoration projects in progress and commitments to begin three new projects.



**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.

**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.

**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.

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

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

**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.

**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.

**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.

**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).

**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.

**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.

**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.

**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.

**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).

**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.)

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

**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.

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

**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.

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

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

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

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

**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.

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

**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.

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

**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).

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

**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.

**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.

**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.

**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.

**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.

**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 Geographical Information System.

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

**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.

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

**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.

**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.

**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.

**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.

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

**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.

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

**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.

**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.

**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.

**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.

**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.

**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.
- 

**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, 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.

**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.

**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.

**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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## **Appendix C**

**Wasteload Allocation and Upgrade Progress  
by Management Zone -- Connecticut**

<b>Total Nitrogen Wasteload Allocation for Connecticut Point Source Discharges.</b>							
<b>Facility</b>	<b>Baseline End-of- Pipe (lbs/day)</b>	<b>TMDLWLA End-of-Pipe (lbs/day) 2014</b>	<b>2008 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	110	*	-	-	Phase II
Groton Town	420	153	451	Yes	<b>B</b> -2010	2.5	Phase II
Jewett City	42	15	12	Yes	<b>C</b> - 2005	1.5	Phase III
Killingly	359	131	191	*	-	-	Monitoring
Ledyard	20	7	6	Yes	<b>C</b> - 1997	0.04	Phase III
Montville	323	118	82	*	-	-	Phase II
New London	1057	386	377	Yes	<b>C</b> - 2002	.37	Phase II
Norwich	550	201	672	Yes	<b>B</b> - 2008	30	Phase II
Plainfield North	94	34	105	*	-	-	Monitoring
Plainfield Village	65	24	42	*	-	-	Monitoring
Putnam	145	53	206	*	-	-	Monitoring
Sprague	20	7	15	*	-	-	Monitoring
Stafford Springs	164	60	160	*	<b>B</b> - 2010	1.58	Monitoring
Stonington Borough	37	14	19	*	-	-	Monitoring
Stonington Mystic	74	27	30	*	-	-	Monitoring
Stonington Pawcatuck	66	24	19	*	-	-	Monitoring
Thompson	28	10	21	*	-	-	Monitoring
UConn	120	44	103	Yes	<b>C</b> - 1996	1.058	Phase II
Windham	344	125	258	Yes	<b>B</b> -2010	1.64	Phase II
Pfizer (Industrial)	2900	1059	8	N/A	-	-	-
<b>Subtotal</b>	7100	2591	2887				



<b>Total Nitrogen Wasteload Allocation for Connecticut Point Source Discharges.</b>							
<b>Facility</b>	<b>Baseline End-of- Pipe (lbs/day)</b>	<b>TMDL WLA End-of- Pipe (lbs/day) 2014</b>	<b>2008 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	511	Yes	C - 2004	0.132	Phase II
Canton	66	24	99	*	-	-	Monitoring
Mattabasset	2285	834	1053	Yes	B - 2011	50	Phase III
East Hampton	148	54	135	Yes	C - 2001	0.69	Phase II
East Hartford	801	292	416	Yes	B - 2007	1.96	Phase II
East Windsor	163	59	27	Yes	C - 1996	1.0	Phase III
Enfield	763	278	272	Yes	C - 2004	2.39	Phase III
Farmington	486	178	309	*	-	-	Monitoring
Glastonbury	268	98	364	Yes	C - 2009	6.67	Phase III
Hartford (phase 1)	6512	2377	5326	Yes	B - 2006	.75	Monitoring
Manchester	855	312	705	*	-	-	Monitoring
Middletown	569	208	446	*	-	-	Monitoring
Plainville	277	101	315	Yes	C - 2009	2.383	Phase III
Plymouth	114	42	87	*	-	-	Phase II
Portland	86	31	32	Yes	C - 2002	1.05	Phase III
Rocky Hill	789	288	483	*	-	-	Monitoring
Simsbury	293	107	70	Yes	B - 2007	4.044	Phase III
South Windsor	289	106	323	Yes	B - 2007	18.0	Phase II
Suffield	122	45	88	*	-	-	Phase III
Vernon	504	184	426	Yes	B - 2007	2.5	Monitoring
Windsor Locks	180	66	110	Yes	C - 2003 B - 2007	1.84 1.5	Phase II
Windsor Poquonock	268	98	457	*	-	-	Monitoring
Winsted	175	64	82	Yes	B - 2007	1.1	Phase III
<b>Subtotal</b>	17104	6244	12136				

Total Nitrogen Wasteload Allocation for Connecticut Point Source Discharges.							
Facility	Baseline End-of-Pipe (lbs/day)	TMDL WLA End-of-Pipe (lbs/day) 2014	2008 Nitrogen Discharge (lbs/day)	BNR Upgrade Planned (Yes/No)	Year Upgrade To Be/or Completed	Cost Estimate \$\$ (M)	Design Capability (Mg/l)
<b>Zone 3</b>							
Branford	526	192	104	Yes	C - 2003	3.158	Phase III
Cheshire	281	103	75	Yes	C - 2007	5.78	Phase III
Meriden	1230	449	1008	Yes	B - 2011	32.52	Phase II
New Haven East	4294	1568	1649	Yes	C - 1997	8.2	Phase II
North Haven	433	158	249	Yes	C - 2006	1.0	Phase II
Southington	557	204	911	Yes	B - 2009	4.0	Phase II
Wallingford	737	269	381	Yes	C - 2006	2.28	Phase II
West Haven	967	353	779	Yes	B - 2011	13.2	Phase II
Cytec (Industrial)	2543	928	808	N/A	-	-	
Upjohn (Industrial)	309	113		N/A	-	-	
<b>Subtotal</b>	11877	4337	5964				

Total Nitrogen Wasteload Allocation for Connecticut Point Source Discharges.							
Facility	Baseline End-of-Pipe (lbs/day)	TMDL WLA End-of-Pipe (lbs/day) 2014	2008 Nitrogen Discharge (lbs/day)	BNR Upgrade Planned (Yes/No)	Year Upgrade To Be/or Completed	Cost Estimate \$\$ (M)	Design Capability (Mg/l)
<b>Zone 4</b>							
Ansonia	314	115	260	Yes	B - 2010	10.015	Phase III
Beacon Falls	33	12	57	*	-	-	Monitoring
Danbury WPC	1211	442	1885	Yes	B - 2008	.5	Monitoring
Derby	195	71	64	Yes	C - 2000	0.677	Phase II
Heritage Village	54	20	This is a	private	Plant.	No data	Available.
Litchfield	64	24	45	Yes	C - 2004	1.0	Phase III
Milford Beaver Brook (phase 1)	258	94	121	Yes	C - 2008	1.613	Phase III
Milford Housatonic	844	307	742	Yes	C - 2008	10.04	Phase III

<b>Total Nitrogen Wasteload Allocation for Connecticut Point Source Discharges.</b>							
<b>Facility</b>	<b>Baseline End-of-Pipe (lbs/day)</b>	<b>TMDL WLA End-of-Pipe (lbs/day) 2014</b>	<b>2008 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>							
Naugatuck Treatment Co.	675	246	344	*	-	-	Phase III
New Milford	66	24	103	Yes	<b>B</b> - 2011	27.5	Phase II
Newtown	115	42	19	Yes	<b>C</b> - 1997	1.06	Phase II
Norfolk	30	11	29	*	-	-	Monitoring
North Canaan	36	13	24	*	-	-	Monitoring
Salisbury	58	21	34	*	-	-	Monitoring
Seymour	167	61	58	Yes	<b>C</b> - 1993	0.25	Phase II
Shelton	290	106	218	Yes	<b>B</b> - 2008	4.29	Monitoring
Southbury T.S.	41	15	8	*	<b>B</b> - 2009 discontinue	-	Monitoring
Stratford (phase 1) (phase 2)	974	356	1425	Yes	<b>C</b> - 1996	0.8	Phase II
				Yes	<b>C</b> -2009	10.116	Phase III
Thomaston	114	42	42	Yes	<b>C</b> - 2001	1.16	Phase III
Torrington	680	248	275	*	-	-	Phase II
Waterbury	2766	1010	869	Yes	<b>C</b> - 2000	17.36	Phase III
Watertown ***	106	39		<b>This</b>	<b>Plant is</b>	<b>Closed.</b>	
Unknown Industrial	1152	420		<b>N/A</b>			
<b>Subtotal</b>	10243	3739	6622				

<b>Total Nitrogen Wasteload Allocation for Connecticut Point Source Discharges.</b>							
<b>Facility</b>	<b>Baseline End-of-Pipe (lbs/day)</b>	<b>TMDL WLA End-of-Pipe (lbs/day) 2014</b>	<b>2008 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	253	Yes	C - 2004	2.09	Phase II
Bridgeport West	2852	1041	1226	Yes	C - 2004	2.37	Phase II
Fairfield	1113	406	488	Yes	C - 2003	15.96	Phase III
Westport	238	87	44	Yes	B - 2008	8.25	Phase III
<b>Subtotal</b>	5194	1896	2011				
<b>Zone 6</b>							
Greenwich	1313	479	479	Yes	C - 2008	0.5	Phase III
New Canaan	175	64	29	Yes	C - 2000	1.235	Phase III
Norwalk	1967	718	766	Yes	C - 2000	6.64	Phase II
Ridgefield South St.	80	29	34	Yes	C - 1996	0.2	Phase III
Stamford	2536	926	550	Yes	C - 2006	59.5	Phase III
<b>Subtotal</b>	6071	2216	1858				
<b>Total Zones 1-6</b>	57589	21023	31478				

- \* 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
- C = Project Completed
- B= Project is expected to Be completed (has begun)

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

<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) 2014</b>	<b>2008 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)	2,135	829	1,375	yes	2012	unknown	4.83
Port Chester (6.0)	563	219	628	yes	unknown	unknown	4.38
Blind Brook (5.0)	338	131	303	yes	unknown	unknown	3.15
New Rochelle (19.2)	1,516	589	1,725	yes	2014	unknown	3.68
North Castle (0.38)	33	13	61				
<b>Subtotal</b>	4,585	1,781	4,092				
<b>Zone 8</b>							
Wards Island (275) -BNR Upgrade -SHARON Demo - Battery E Demo - Supplemental Carbon	43,140	17,903	34,900	yes	2011	\$142.0	7.82
Hunts Point (200) - BNR upgrades - Supplemental Carbon	28,630	11,881	20,400	yes	2009 2015	\$203.0	7.13
Bowery Bay (150) - BNR Upgrades - Supplemental Carbon	17,270	7,167	17,300	yes	2006-2012 2014-2016	\$77.0	5.74
Tallman Island (80) - BNR Upgrade - Supplemental Carbon	6,860	2,847	9,000	yes	2006-2011 2017	\$80.0	4.27
CSOs	3,170	1,316					
<b>Subtotal</b>	99,070	41,114	81,600	\$502.0			
<b>Zone 9</b>							
Newtown Creek (310)	45,270	18,787	38,400	no			7.28
Red Hook (60)	4,610	1,913	3,300	no			3.83
CSOs	1,721	714					

<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) 2014</b>	<b>2008 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>	51,601	21,414	41,700				
<b>Zone 10</b>							
Belgrave (2.0)	213	77	274	yes	2009	unknown	4.62
Glen Cove (5.5)	893	323	157	yes	C2006		7.05
Great Neck SD (3.8)	457	165	468	yes	2012	\$36.0	5.22
Great Neck (Village) (1.5)	212	77	280	yes (MBBR)	2012	\$17.0	6.17
Oyster Bay (1.8)	220	80	62	yes	C2006		5.34
Port Washington (4.0)	655	237	467	yes	2010	\$11.0	7.12
<b>Subtotal</b>	2650	959	1,708	\$64.0			
<b>Zone 11</b>							
SUNY (SCSD #21) (2.5)	208	40	78		unknown	\$5.3	1.92
Port Jefferson (SCSD1) (0.85)	202	39	18	yes	C2008	\$13.3	5.51
Huntington (2.5)	448	87	112	yes	C2008	\$9.3	4.18
Kings Park (SCSD #6) (0.60)	134	26	50	yes	2009	\$7.9	5.20
Northport (Village) (0.45)	52	10	20	yes	C2005	\$1.1	2.67
<b>Subtotal</b>	1044	202	278	\$36.9			
<b>Zone 11 East</b>							
Greenport (Village) (0.65)	76	11	72	yes	2009	\$6.2	2.03
<b>Total Zones 7-11</b>	159026	65481	129450				

C= Completed Construction

B=Beginning Construction

\*Cost estimates include disinfection upgrades as needed.

# Glossary of Acronyms

## **A**

ACOE Army Corps of Engineers  
ANS Aquatic Nuisance Species

## **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

## **H**

HEP Harbor Estuary Program (New York/New Jersey)  
Hg Mercury

## **I**

ICM Integrated Crop Management  
IEC Interstate Environmental Commission  
IPM Integrated Pest Management  
ISTEA Intermodal Surface Transportation Efficiency Act

**K**

K thousand  
k kilogram  
km Kilometer  
Km<sup>2</sup> Square kilometer

**L**

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

**M**

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)

**N**

N Nitrogen  
NDD National Diversity Database  
NDZ No Discharge Zone  
NEIWPCC 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  
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<sup>2</sup> 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 Unites States Army Corps of Engineers  
USCG United States Coast Guard  
USDA United States Department of Agriculture  
USDOI 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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