



# **NATIONAL ESTUARY PROGRAM SUMMARY WORK PLAN**

**FOR  
FEDERAL FISCAL YEAR 2021 FUNDING  
FOR  
COMPREHENSIVE CONSERVATION AND MANAGEMENT PLAN  
IMPLEMENTATION ACTIVITIES**

**DURING THE PERIOD**

**October 1, 2021-September 30, 2022 or beyond  
[FY2022]**

**WITH PRIOR YEAR GOALS/ACCOMPLISHMENTS/HIGHLIGHTS  
FOR THE PERIOD**

**October 1, 2020- September 30, 2021  
[FY2021]**

**July 2021**

Prepared by:

EPA Long Island Sound National Program Office

in consultation with and on behalf of

the Long Island Sound Study Funded Management Conference Partners

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## A. General Information Reporting Requirements

### 1. CCMP 2021 Goal Focus

The Long Island Sound Study (LISS) Comprehensive Conservation and Management Plan (CCMP) was first approved in 1994 by the States of New York (NY) and Connecticut (CT) and by the U.S. Environmental Protection Agency (EPA). From 2011 through 2015 the LISS partners and EPA met and revised the CCMP. The new CCMP, approved in 2015, identifies four primary themes:

- 1) Clean Waters & Healthy Watersheds,
- 2) Thriving Habitats & Abundant Wildlife,
- 3) Sustainable & Resilient Communities, and
- 4) Sound Science & Inclusive Management.

The need to continue the Management Conference was identified as an important, unifying component to support implementation. With the enactment of the Long Island Sound Improvement Act of 1990 (P.L. 101-596), the LISS Management Conference was made permanent – “The Administrator *shall* continue the Management Conference of the Long Island Sound Study...” In October 2018, the Congress passed, and the President signed into law, the *America’s Water Infrastructure Act of 2018*. Among the many provisions of this far-ranging bill, Sec. 4104. *Amendments to Long Island Sound* revised the legislative underpinnings of the Long Island Sound Study and reauthorized funding through 2023. The bill’s passage is important for several reasons. It codifies Congress’s intent to authorize continued funding, it strengthens requirements for assessing program progress and financial integrity, and it lowers the non-federal share of grants from 50 percent to 40 percent. It also signals Congress’s general support for the Long Island Sound restoration program.

Under the Management Conference structure, the CCMP established a broad-based and integrated approach to addressing the primary environmental and management problem areas identified. This approach required significant and sustained Management Conference coordination, involvement, and funding – at all levels. Further, the CCMP identified many existing and ongoing environmental management programs of the Management Conference partners that would serve as the foundation for addressing the Sound’s priority problems. New or separate programs or efforts to implement the CCMP were only to be created to fill gaps or better integrate efforts, such as the LIS Futures Fund (LISFF), LIS Research Fund, and CCMP Enhancements program. This FY2021 Work Plan, prepared under EPA’s National Estuary Program (NEP) guidance, directly supports these goal areas with NEP and LISS funding as described herein.

Ongoing core environmental programs that contribute to or support CCMP implementation include other Federal programs and funds directed to land use and watershed management, water quality, living resource conservation, management and regulation, as well as state and local programs aimed at regulating human and environmental impacts on the Sound. Many of these programs are delegated to the states, which have the responsibility, authority, and accountability for implementing them.

The CCMP anticipates many funding streams and a variety of funding sources for successful implementation of its recommendations, over time, by the LISS partners. The CCMP also envisions an educated public and informed constituency for the sustained effort to restore, enhance, and preserve the Sound as a national treasure and a ‘green’ engine of economic activity. Designated as an Estuary of National Significance in 1987, Long Island Sound is an inherent part of EPA’s NEP and is a key geographic program of the national water program that includes Chesapeake Bay, Puget Sound, the Great

Lakes, and the Gulf of Mexico. Because of its economic, social, and environmental importance to the Northeast region, Long Island Sound is included as a separate budget line.

- a. **2020 Report to Congress.** In 2021, EPA approved LISS’s *Returning the Urban Sea to Abundance: A five-year review of the 2015 Comprehensive Conservation and Management Plan (CCMP)*. The five-year review reports on the progress made by LISS from 2015-2019 by evaluating and assessing the status of the implementation actions and ecosystem targets set by the 2015 CCMP. The review reports on ecosystem target progress, implementation action progress, success stories, status of priority implementation actions, and future areas of focus. The review was transmitted to Congress to communicate the progress, challenges, and future focus areas of the LISS.
- b. **2020-2024 Action Plan Update.** As part of the review, in 2020, LISS developed the 2020-2024 Action Plan to update the 2015 CCMP. The 2015 CCMP is a 20-year plan that calls for an update every five years. This update includes 136 revised or new implementation actions covering the period from 2020-2024. The implementation actions were revised, added, or deleted based off the recently completed evaluation, which assessed and reviewed the successes and challenges in implementation, changes in the health of the Long Island Sound, and new science. The Action Plan highlights various future focus areas for LISS including modeling, monitoring, and researching both natural and anthropogenic changes (e.g., nutrient flows, climate change, ocean acidification, biotoxins, and harmful algal bloom outbreaks) and their associated impacts to the Sound and its embayments, incorporating and expanding upon nitrogen-reducing technologies and techniques (e.g., new on-site wastewater treatment systems, green infrastructure, bioextraction), prioritizing habitat restoration and land protection (e.g., living shorelines, eelgrass, shellfish, macroalgae), fostering and supporting public engagement and knowledge with added emphasis on environmental justice initiatives, and adopting a five-year action plan, created by the new Sustainable & Resilient Communities Work Group, to help communities plan for climate change impacts while strengthening ecological health and protecting local economies.

**2. FY2021 LISS Budget Breakdown**

This work plan summarizes tasks and deliverables/outputs contained in EPA FY2021 assistance awards to Management Conference partners that account for the FY2021-22 EPA Environmental Programs and Management (EPM) appropriation for the LISS NEP, and for EPM funding provided by EPA for the Long Island Sound Geographic Program. These funds include \$700,000 in NEP allocations under Clean Water Act (CWA) §320, and \$30,400,000 under CWA §119 as enacted. Grants are awarded by EPA Region 1 and 2 as delegated under EPA Delegations of Authority 2-42 and 2-94 under the authority of §119 per NEP funding guidance. The required aggregate match for this funding cycle is \$19,010,411 as shown in Attachment 2.

The work activities and the budget amounts contained in this NEP Summary Work Plan were approved by EPA and the LISS Management Committee at its April 15, 2021 meeting. The record of the Management Committee meeting is documented in the April 15, 2021 Long Island Sound Study Management Committee Meeting Notes.

The LISS budget is organized into the nine Program Activities outlined below; the FY2021 LISS budget breakdown by Program Activity is:

Program Activities	Amount
<i>Coordination</i> .....	\$1,254,498
<i>Water Quality Planning and Implementation</i> .....	\$2,718,962
<i>Modeling</i> .....	\$4,000,000

<i>Monitoring</i> .....	\$3,675,940
<i>Research</i> .....	\$3,650,984
<i>Habitat Restoration and Protection</i> .....	\$6,746,233
<i>Public Education and Outreach</i> .....	\$1,033,418
<i>Stewardship and Resiliency</i> .....	\$1,139,965
<i>Implementation Assistance</i> .....	\$6,880,000

To implement this Work Plan, as of this writing, EPA will issue 13 new assistance awards and amend one current assistance award to include the FY2021 funding. In addition, EPA will fund three interagency agreements and four contracts to support work tasks. The project tables, under Section B, are a detailed breakdown of the FY2021 approved budget by LISS Program Activity, Products and/or Services, Implementing Agency, and Environmental Outcome(s). The Environmental Outcomes are derived from the individual partner grant work plans based on EPA Order 5120.

**3. LISS Staff and Their Official Responsibilities**

The LISS provides funding to certain partners to support staff resources to carry out key elements of implementing the CCMP. **Attachment 1** lists the FY2021 LISS-funded staff by name, title and description of their major roles and responsibilities. Each LISS partner’s federal assistance award work plan provides details on the deliverables, outputs and expected environmental outcomes for LISS-funded staff functions as required by EPA Order 5120. In addition to the staff listed in Attachment 1, the CT DEEP employs seasonal staff to assist with conducting the LIS summer water quality monitoring program as necessary; these, and overtime costs for water quality monitoring staff, are included in that award, but are not shown in Attachment 1 because of the seasonal nature of the positions that may be filled by different incumbents during the period of employment. Each EPA grantee is responsible for managing its personnel under its own organization’s human resource management policies and procedures.

As listed in Attachment 1, the EPA provides three full-time equivalent (FTEs) federal employees that staff the EPA Long Island Sound National Program Office (LISNPO). A director, appointed by the Administrator under §119, and two program coordinators to plan, organize, coordinate, and manage program operations to assist the Management Conference partners in CCMP implementation. EPA Region 1 provides approximately 75 percent of an FTE and 50 percent of an FTE to support EPA efforts for Long Island Sound in Region 1. These FTEs are not funded from the LISS, but from other EPA EPM resources.

To assist with grant management, EPA Region 1 hired an FTE and anticipates they will begin work by the Fall 2021. Additionally, LISS funds will be used to cover the stipend costs associated with an Oak Ridge Institute for Science and Education (ORISE) Fellow, who began work in May 2021. Additional staff in Region 1 and Region 2 are assisting with project officer duties relating to LIS awards. Region 1 also supports a US Government vehicle for LISNPO use via the General Services Administration (GSA). EPA supports, from its Working Capital Fund appropriation, leasing office space for the LISNPO through the GSA. EPA Region 2 provides technical and management support to the program through the Water Division and EPA Region 1 provides staff and technical support through the Water Division. By agreement between the Regions, Region 2 provides other administrative support for official business, such as procurements, funds control and management, information technology and telecommunications support, grants management, travel, training and other policy and program management requirements. Region 1 provides grants management, contract oversight and funds control for the awards processed through Region 1. This support is essential to operating and maintaining the EPA LISNPO, the national program office for the Long Island Sound Geographic Program.

#### 4. Grant awards

**Attachment 2** lists the FY2021 LISS budget by recipient organization; the total funding for each recipient may consist of one or more EPA assistance agreements or amendments to existing agreements, **Attachment 3** lists the FY2021 budget by individual EPA assistance award number by grantee. The actual EPA assistance award number is provided for reference where known now. However, the award process is dynamic and final grant award numbers and dollar amounts actually awarded by EPA may differ from Attachment 3 since this NEP summary Work Plan is completed in advance of the grant award process, which must be completed by September 30, 2021. Details of the award purpose, project deliverables, and project completion dates are provided in Section B of this Work Plan below. Attachments 2 and 3 also show the required non-federal matching funds and the overall actual aggregate match requirement for the LISS for FY2021.

For FY2021 Federal assistance awards, the Connecticut Department of Energy and Environmental Protection (CT DEEP) and the New York State Department of Environmental Conservation (NYSDEC) are providing an annual ‘overmatch’ in its EPA assistance awards to enable the LISS to meet the overall aggregate match for the NEP as required under CWA §320 [see Attachment 2]. The CT DEEP overmatch is from a conveyance and storage tunnel in CT. The NYSDEC overmatch is from stewardship acquisition project. This also allows other recipients and sub-awardees that are not able to meet matching funds requirements to apply for LISS grant programs, ensuring broader participation in the work of the LISS Management Conference from academic researchers and institutions, local environmental organizations, interest groups and associations, as well as other qualified regional or watershed organizations. **[NB: Final assistance award amounts and number designations are issued by EPA pending final EPA action on individual awards, and each award is subject to the special terms and conditions contained therein.]**

Using FY2021 funding for work that will take place in FY2022, the EPA is providing funding to eleven LISS partners through new or amended awards: CT DEEP; the Connecticut Sea Grant (CTSEA); the Interstate Environmental Commission (IEC); the National Fish and Wildlife Foundation (NFWF), the New England Interstate Water Pollution Control Commission (NEIWPCC); Save the Sound; NYSDEC; the New York Sea Grant College Program (NYSEA); the State University of New York Research Foundation (SUNY); the University of Connecticut Marine Sciences Department (UCONN); and the National Audubon Society. EPA is also establishing one interagency agreement with the United States Geological Survey (USGS). These partners assist in implementing the CCMP and conduct activities to support the LISS program. These awards are managed by staff of the EPA LISNPO, EPA Region 1, and EPA Region 2, who are trained and assigned as EPA Project Officers. Because of multi-year awards and varying federal appropriation levels, not all partners receive LISS funding in every annual budget/work plan cycle. The EPA Project Officers work with their grantees to ensure that any unliquidated obligation (ULO) balances are considered in awarding new year funding, and as necessary, award amounts are adjusted to compensate for ULO balances. It should also be noted that these partners also bring their own non-matching resources to restore and protect the Sound, which are not accounted for in this work plan.

#### B. Proposed New and Ongoing (FY2021) Projects

This work plan provides information as required under EPA’s *FY2021-2024 Clean Water Act §320 National Estuary Program Funding Guidance*. The format for Section B is the same as used by the LISS since FY2008, when the LISS adopted a combination of the FY2008 NEP Work Plan Guidance and the September 2008 NEP Program Evaluation Guidance Logic Model format (until updated). To adjust to this reporting format, to the extent feasible, the LISS Program Element activities have been ‘broken up’ under



the following categories contained in the NEP Program Evaluation Guidance (LISS has added the fourth category to better align with our CCMP):

1. Clean Waters
2. Healthy Ecosystems
3. Strong Communities
4. Sound Science and Inclusive Management

The categories will include highlights from FY2020 work implemented to introduce the planned FY2021 activities. The following is the format we present our FY2021 projects:

<b>Title:</b>	<i>Title of project or task</i>		<i>New: first year of project for LISS Continuing: prior year funded project On-going: multi-year or base program project</i>
<b>Activity Type:</b>	<i>Identified LISS Program Activity</i>	<b>Project Type:</b>	
<b>Implementing Agency:</b>	<i>LISS Grantee Name</i>	<b>Estimated Budget:</b>	<i>Total estimated budget of project or task</i>
<b>Responsible Partners:</b>	<i>Other responsible partners of the project or task</i>	<b>Federal Amount:</b>	<i>LISS funded amount</i>
		<b>Match Amount:</b>	<i>Grantee match amount</i>
<b>Objectives:</b>	<i>Objective of the project or task</i>		
<b>Description:</b>	<i>Description of the project or task</i>		
<b>Estimated Milestones:</b>	<i>Project start and completion date (EPA Grant/IAG Date(s))</i>		
<b>CWA Program Elements</b>	<i>Identified CWA Core Elements</i>		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
<i>Anticipated outputs or deliverables of project</i>	<i>Anticipated and/or completed accomplishments (Identified Environmental Outcomes)</i>	<i>Link to LISS CCMP by identified project's addressed IAs</i>

**1. Cleans Waters.** Clean Waters is addressed under the Clean Waters and Healthy Watersheds Theme of the CCMP as LISS sets out the mission to improve water quality by reducing contaminant and nutrient loads from the land and the waters impact Long Island Sound. The following program activities are used as subsections to highlight our FY2020 accomplishments and introduce planned FY2021 activities, including project details: Water Quality Planning and Implementation, Modeling, and Monitoring.

- a. **Water Quality Planning and Implementation.** The LISS partnership has worked intensely on water quality planning and implementation activities to improve the Sound’s conditions – specifically by reducing nitrogen. The following highlight our FY2020 accomplishments:
  - **Nitrogen Reduction Strategy:** EPA is implementing a strategy to aggressively continue progress on nitrogen reductions, in parallel with the States’ continued implementation of the 2000 Total Maximum Daily Load (TMDL) and achieve water quality standards throughout Long Island Sound and its embayments and near shore coastal waters. The [strategy](#) recognizes that more work must be done to reduce nitrogen levels, further improve dissolved oxygen (DO) conditions, and address other nutrient-related impacts in Long Island Sound. The nitrogen reduction strategy complements the 2000 TMDL in important ways. Foremost,

while the 2000 TMDL is premised on achieving water quality standards for DO in the open waters of the Sound, the EPA strategy expands the focus to include other nutrient-related adverse impacts to water quality, such as loss of eelgrass, that affect many of the Sound's embayments and near shore coastal waters.

- [Connecticut Second Generation Nitrogen Strategy](#): This effort combines existing efforts with new initiatives under one plan. It engages nitrogen reduction efforts in three focus areas: wastewater treatment plants, nonpoint source, and stormwater, and embayments. Near term actions that can be taken at the state level to enhance nutrient reduction efforts are proposed for each of the three focus areas.
- [Long Island Nitrogen Action Plan](#): The Long Island Nitrogen Action Plan (LINAP) is a multiyear initiative with a similar goal of reducing nitrogen in Long Island's surface, coastal, and ground waters. NYSDEC, in cooperation with Suffolk and Nassau Counties, the Long Island Regional Planning Council, local municipalities, environmental and business groups, and many other stakeholders, has been engaged in the development of the comprehensive [LINAP](#). As part of this program, the LINAP collaborative is developing county-wide watershed plans: The [Suffolk County Subwatershed Wastewater Management Plan](#) was completed in 2020 and evaluated 200 subwatersheds which developed initial nitrogen load reduction goals, established ecological sensitivity priority ranks for each surface waterbody, and provided implementation recommendation for a phased county-wide wastewater upgrade program. The Nassau County plan is currently underway and will estimate nitrogen entering groundwater from various sources (e.g., wastewater, fertilizer, stormwater, atmospheric deposition).
- [Save the Sound Long Island Sound Report Card](#): In 2020, Save the Sound published its [biennial Long Island Sound Report Card](#) to track and report on the ecological health of the Long Island Sound. Using monitoring data collected by the Unified Waters Study, basins, embayments, and harbors receive a grade based on the following indicators: dissolved organic carbon, dissolved oxygen, chlorophyll-a, water clarity, seaweeds, and oxygen saturation.
- [Bioextraction](#): Through a partnership with NEIWPC and the NYSDEC, an initiative has been developed that aims to improve water quality in NY coastal waters and the Long Island Sound by removing excess nitrogen through the cultivation and harvest of seaweed and shellfish. The [Bioextraction Initiative](#) is engaged in assessing the efficacy of and potential challenges involved in advancing seaweed and shellfish aquaculture to remove excess nitrogen loads from NY and CT surface waters. The Initiative is actively involved in reviewing and reporting on literature and policies; and providing recommendations to streamline the regulatory process. Additionally, the Initiative is working with industry professionals to develop markets for and assess cultivation costs of potential bioextraction species and evaluate overall economic viability of seaweed and shellfish bioextraction operations. The Geographic Information System (GIS)-based siting tool, "[New York and Connecticut Shellfish and Seaweed Aquaculture Viewer](#)" is publicly available on the Long Island Sound Study website. The site includes a story map that describes how to use the tool.

The following projects have been funded to achieve our FY2021 goals, which are to continue to reduce nitrogen pollution, implementing the Nitrogen Reduction Strategy to expand assessment of harbor and embayment conditions and develop the next generation water quality model for management; and continue to shrink the area and duration of hypoxia, reducing nonattainment of the water quality standards for dissolved oxygen in the Sound:

Title:	NEIWPCC LISS Program Implementation Support: Task 7 - LIS Nitrogen Reduction Coordination		
Activity Type:	Water Quality Planning and Implementation	Project Type:	Ongoing
Implementing Agency:	NEIWPCC	Total Estimate Budget	\$291,935.00
Responsible Partners:	EPA, NYSDEC, CTDEEP	Federal Amount:	\$291,935.00
		Match Amount:	\$0.00
Objectives:	NEIWPCC will continue promoting efforts to restore and protect the Sound and its resources; highlight the LISS role in the protection of the Sound; promote an understanding and appreciation of the Sound as a regional ecosystem and a national treasure; and encourage action to restore and protect the Sound.		
Description:	The LIS Management Committee has identified the need to continue coordination efforts between all of the states within the watershed in support of CCMP 2020-24 Implementation Action SM-19. NEIWPCC, as a regional interstate agency, is well positioned to support these coordination efforts, which will include the dissemination of information to interested parties on a regular basis.		
Estimated Milestones:	October 1, 2020 - September 30, 2025		
CWA Program Elements	Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
LIS Nitrogen Reduction Coordination - Host regular (at least two) meetings or conference calls each year, especially to coordinate bi-state actions/approaches; Develop & distribute written agendas and summaries of nitrogen-related activities, actions, and recommendations; Gather and summarize technical or policy information on relevant topics as needed.	4-2; 1-1	SM-19; WW-7
Reporting - Develop and report progress on NEIWPCC's sections of the annual Long Island Sound Study work plans to consider progress made and recommendations for improving implementation to achieve desired outcomes.	4-3.	SM-35
Development of Nonpoint Source and Stormwater Tracking Tool - Phase 2, Part 2 - Develop a nonpoint source and stormwater tracking system tool for the Long Island Sound watershed. Tracking tool in excel form that allows for Phase II Part-2 participants to enter and review data.	1-1.	WW-10

**Title:** Nutrient Bioextraction Product Application: Field Testing of Locally- Sourced Sugar Kelp (*Saccharina latissima*) Fertilizer Amendments in Long Island, NY

**Activity Type:** Water Quality Planning and Implementation      **Project Type:** New

**Implementing Agency:** NEIWPCC      **Total Estimate Budget:** \$100,000.00

**Responsible Partners:** NYSDEC      **Federal Amount:** \$100,000.00  
    **Match Amount:** \$0.00

**Objectives:** The objective of this project is to continue to evaluate the efficacy of locally-sourced kelp meal and extract as a fertilizer amendment on vegetables and/or ornamentals.

**Description:** This project will build on previously funded study to do the following: sugar kelp (*Saccharina latissima*) field grow-out component to supply the needed kelp for processing into meal and/or extract for the field test; and Field test designed and conducted by researchers at Cornell Cooperative Extension of Suffolk County to determine the presence of nutrients and trace minerals and contaminants such metals, PCBs and pesticides as well as growth and health of vegetables and/or ornamentals using locally-sourced kelp fertilizer amendments.

**Estimated Milestones:** October 1, 2021 - September 30, 2022

**CWA Program Elements:** Improving WQ Monitoring, Controlling NPS Pollution on a Watershed Basis, Wetlands Program Support/Implementation

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Identify an environmentally and economically useful application of bioextracted products from LIS.	1-2.	WW-25
Final Project Report, shared with county, state, and federal regulatory agencies and interested stakeholders	1-2.	WW-25

**Title:** Nutrient Bioextraction: Refinement of Atlantic Ribbed Mussel (*Geukensia demissa*) Aquaculture Methods

**Activity Type:** Water Quality Planning and Implementation      **Project Type:** New

**Implementing Agency:** NEIWPCC      **Total Estimate Budget:** \$100,000.00

**Responsible Partners:** NYSDEC      **Federal Amount:** \$100,000.00  
    **Match Amount:** \$0.00

**Objectives:** The objective of this project is to continue to investigate culturing methods to address bottlenecks and refine the process to allow for future development of large scale Ribbed Mussel bioextraction projects.

**Description:** This project will build on a previously funded study to conduct a ribbed mussel (*Geukensia demissa*) aquaculture trial to refine the process for spawning and culturing mussels, which have been identified as a potential species for nutrient bioextraction activities.

**Estimated Milestones:** October 1, 2021 - September 30, 2022

**CWA Program Elements:** Improving WQ Monitoring, Controlling NPS Pollution on a Watershed Basis, Wetlands Program Support/Implementation

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Better understanding of methods to use the Atlantic Ribbed Mussel as a bioextraction options to support lower concentrations of Nitrogen in LIS.	1-2.	WW-25
Final Project Report, shared with county, state, and federal regulatory agencies and interested stakeholders	1-2.	WW-25

**Title:** Economics of Nutrient Bioextraction: Phase 2 of Economic Feasibility Market Study for Nutrient Bioextraction Activities in the Long Island Sound

**Activity Type:** Water Quality Planning and Implementation **Project Type:** New

**Implementing Agency:** NEIWPC **Total Estimate Budget:** \$100,000.00

**Responsible Partners:** NYSDEC **Federal Amount:** \$100,000.00  
**Match Amount:** \$0.00

**Objectives:** The objective of this project is to conduct a third-party study that will build on the recommendations of a previously funded, high level economic feasibility/market analysis, and which may emphasize scalability

**Description:** This proposed project will be a continuation of a previously funded, but still-to-be-initiated study that will include the identification of markets for, and cultivation costs of potential bioextraction species and an evaluation of overall economic viability of bioextractive activities through an independent, third-party study. Phase 2 of this project will refine and build on the outcomes of the previously described, high level economic feasibility/market study, with a focus on the species, markets, and products that were identified as having the most economic potential.

**Estimated Milestones:** October 1, 2021 - September 30, 2022

**CWA Program Elements:** Improving WQ Monitoring, Controlling NPS Pollution on a Watershed Basis, Wetlands Program Support/Implementation

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Allow managers to better understand the economic viability of bioextraction products.	1-2.	WW-25
Final Project Report, shared with county, state, and federal regulatory agencies and interested stakeholders	1-2.	WW-25

**Title:** Pathogen monitoring program to mitigate shellfish harvesting water closures adjacent to Wading River and Baiting Hollow Creek, Suffolk County, New York

**Activity Type:** Water Quality Planning and Implementation **Project Type:** New

**Implementing Agency:** IEC **Total Estimate Budget:** \$500,000.00

**Responsible Partners:** N/A **Federal Amount:** \$300,000.00  
**Match Amount:** \$200,000.00

**Objectives:** To assess the source and impact of pathogens that are impacting shellfish harvesting waters in Long Island Sound.

**Description:** This project will implement a pathogen monitoring survey to identify the source(s) of elevated pathogen levels leading to these shellfish harvesting area closures and help inform a mitigation effort. IEC will conduct a total of 9 surveys at 24 stations to assess pathogen concentrations (fecal coliform, enterococcus, E. coli) and field water quality parameters in Wading River and Baiting Hollow Creeks, NY. Additionally, this project will develop and pilot a methodology that can be applied to areas with similar contamination issues throughout the Sound.

**Estimated Milestones:** October 1, 2021 - September 30, 2023

**CWA Program Elements:** Strengthening WQ Standards, Improving WQ Monitoring, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
EPA-approved QAPP, which outlines sampling scope and scientific methodologies to be used in project implementation	1-2; 1-3; 2-1	WW-23; WW-35; HW-1
Pathogen trackdown surveys, including sampling and laboratory analyses	1-2; 1-3; 2-1	WW-23; WW-35; HW-1

<b>Title:</b>	<b>New York State Asset Management Pilot Program Phase II</b>		
<b>Activity Type:</b>	Water Quality Planning and Implementation	<b>Project Type:</b>	New
<b>Implementing Agency:</b>	NYSDEC	<b>Total Estimate Budget</b>	\$1,666,667.00
<b>Responsible Partners:</b>	N/A	<b>Federal Amount:</b>	\$1,000,000.00
		<b>Match Amount:</b>	\$666,667.00
<b>Objectives:</b>	The objective of this project will be to build engineering capacity and technical expertise so that NYS's municipalities can access high quality asset management programs in a cost effective manner.		
<b>Description:</b>	Project will expand on a previously funded project which developed an asset management guidance document, through a pilot including 10 municipalities, that sets minimum requirements, suggests best practices, and provides consistent development of asset management projects. Phase II will focus on educating and training engineering firms on the development and implementation of a sound wastewater system asset management programs.		
<b>Estimated Milestones:</b>	October 1, 2021 – September 30, 2026		
<b>CWA Program Elements</b>	Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Inventory and Condition - Electronic asset inventories of WWTP and conveyance systems, including GIS mapping for 5 Municipalities.	1-1.	WW-5; WW-13
Level of Service and Risk Analysis - With assistance, each Municipality will develop a level of service profile with stakeholders and target goals identified. Each Municipality will be involved in the development of the risk analysis for all assets in the inventory. Each analysis will include: assessment likelihood of failure, assessment of consequence of failure, development of risk scores, and prepare mitigation strategies.	1-1.	WW-5; WW-13
Capital Improvement Planning - Each Municipality will be involved in the development of a Long-range Capital Improvement Plan that includes all inventoried assets, organized by risk. The plan will identify tentative target dates to address asset projects.	1-1.	WW-5; WW-13
Outreach and Training - Municipalities will receive a minimum of three (3) trainings on the following: electronic asset management (EAM) software, asset management program development, and asset management program implementation.	1-1.	WW-5; WW-13

<b>Title:</b>	<b>EPA Nitrogen Contract</b>		
<b>Activity Type:</b>	<b>Water Quality Planning and Implementation</b>	<b>Project Type:</b>	<b>Ongoing</b>
<b>Implementing Agency:</b>	<b>EPA</b>	<b>Total Estimate Budget</b>	<b>\$153,050.00</b>
<b>Responsible Partners:</b>	<b>Tetra Tech</b>	<b>Federal Amount:</b>	<b>\$153,050.00</b>
		<b>Match Amount:</b>	<b>\$0.00</b>
<b>Objectives:</b>	<p>The objectives of this project are to (1) refine and completing the technical approach to recommend nitrogen endpoints and load reductions necessary to protect water quality in embayments and tributaries of the Long Island Sound; (2) collaborate and communicating with other LIS nitrogen reduction efforts such as those from the Long Island Sound Nitrogen Action Plan (LINAP), Suffolk County, Nassau County, and the CTDEEP; (3) conduct data and trends analyses; and (4) use suggested reduction levels to develop nitrogen allocations for priority LIS embayments based on the technical approach.</p>		
<b>Description:</b>	<p>Tetra Tech will update the suggested range of nitrogen concentrations protective of water quality for all subject waterbodies. Ultimately, EPA expects that the Strategy will be used by States and communities to prioritize their nitrogen reduction projects, which will in turn focus nitrogen reductions on waterbodies that will benefit most from it.</p>		
<b>Estimated Milestones:</b>	<b>October 1, 2021 - September 30, 2022</b>		
<b>CWA Program Elements</b>	<p>Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation</p>		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Modification of the QAPP	1-1.	WW-1; WW-2
Project Management and Administration - Kickoff Teleconference; conference calls, meetings, webinars (project team support and stakeholder involvement); and in-person meetings	1-1.	WW-1; WW-2
Application and refinement of technical approach - Addition of up to 10 more embayments for analysis; finalize response to external technical review, public review and technical stakeholder group review; and public webinar and review	1-1.	WW-1; WW-2
Data and trends-prioritization and analyses - retrospective analysis of LIS water quality (hypoxia and nutrients) and biological data; collaboration and coordination with Long Island Sound scientific partners; present findings of retrospective data analysis	1-1.	WW-1; WW-2

<b>Title:</b>	<b>Development of an NRCS Watershed Operations Plan to Leverage Funding for Implementation of BMPs in Connecticut</b>		
<b>Activity Type:</b>	Water Quality Planning and Implementation	<b>Project Type:</b>	New
<b>Implementing Agency:</b>	CT DEEP	<b>Total Estimate Budget</b>	\$166,667.00
<b>Responsible Partners:</b>	CT Council on Soil and Water Conservation, Audubon Connecticut	<b>Federal Amount:</b>	\$100,000.00
		<b>Match Amount:</b>	\$66,667.00
<b>Objectives:</b>	This project will provide the necessary planning for assessment of priority watershed planning and provide the opportunity for ensuring the needed implementation is funded and employed in the priority watersheds impacting the Long Island Sound.		
<b>Description:</b>	This project will open the door for significant funding from USDA-Natural Resource Conservation Service (NRCS). Modeled after the successful Cape Cod Water Resources Restoration Project (see attached), the plan will identify specific sites to implement stormwater quality improvements and/or habitat restoration projects that will protect shellfish beds and restore/secure ecosystem services of near coastal habitats including tidal marsh. These projects will implement priority actions from the LISS CCMP and complement ongoing state and municipal resilience planning and water quality restoration efforts in CT embayments.		
<b>Estimated Milestones:</b>	October 1, 2021 - September 30, 2023		
<b>CWA Program Elements</b>	Strengthening WQ Standards, Controlling NPS Pollution on a Watershed Basis, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Advisory Committee	2-1; 3-1	SC-5; HW-1; SC-26
Stakeholder meetings	1-1; 3-3; 3-4	WW-2; SC-20; SC-26
Public informational hearing	1-1; 3-3; 3-4	WW-2; SC-20; SC-30
Final plan	1-1; 3-4; 4-2	HW-1; SC-26; SM-24



Title:	<b>South Hartford Conveyance and Storage Tunnel Contract 2 - LISS Nitrogen Reduction Strategy</b>		
Activity Type:	Water Quality Planning and Implementation	Project Type:	Ongoing
Implementing Agency:	CT DEEP	Total Estimate Budget	\$4,500,000.00
Responsible Partners:	N/A	Federal Amount:	\$0.00
		Match Amount:	\$4,500,000.00
Objectives:	To contribute to and maintain steady progress towards nitrogen removal at Connecticut's sewage treatment plants consistent with the waste load allocation in the LIS TMDL nitrogen cap recommended in the 2015 CCMP ecosystem targets. To address the LIS CCMP implementation action WW-2: Strategically plan for and implement capital improvements, BMPs, and improved operation and maintenance to mitigate CSO, stormwater, and nonpoint source loadings, considering the analysis of potential future changes in loading.		
Description:	The Metropolitan District Commission's South Hartford Conveyance and Storage Tunnel will be used to control combined sewer overflow (CSO) discharges in Hartford by storing the wastewater in the tunnel and pump the sewage to the Hartford Water Pollution Control Facility, where it will be treated and discharged into the Connecticut River. The tunnel will store 42 million gallons, as it is 4 miles long and 18 feet in diameter, and will be located 200 feet below ground surface. The project will prevent 106 million gallons of CSO discharges into the Connecticut River for a typical year of rainfall and will eliminate all CSO discharges to Wethersfield Cove.		
Estimated Milestones:	October 1, 2021 - September 30, 2022		
CWA Program Elements	N/A		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
This task will result in an overall reduction of untreated sewer overflow and an estimated removal of 8,000lbs/year of untreated nitrogen that was formerly discharged to Long Island Sound as a nonpoint source Load Allocation.	1-1.	WW-2

**Title:** Stormwater Management Education

**Activity Type:** Water Quality Planning and Implementation      **Project Type:** New

**Implementing Agency:** CT DEEP      **Total Estimate Budget:** \$308,333.00

**Responsible Partners:** UConn CLEAR      **Federal Amount:** \$185,000.00  
    **Match Amount:** \$123,333.00

**Objectives:** This project will provide the critical communication and education regarding the updates the Stormwater Manuals. This includes updates to the technical climate information, BMP selection processes, clarifications regarding applicability and requirements, and others as defined in the final manual update process.

**Description:** This project will leverage an existing, successful outreach effort to efficiently launch an integrated stormwater education program that includes outreach on the new manual with outreach on the MS4, construction, and industrial general permits. The extension and expansion of this effort will not only ensure the continued success of the revised MS4 permit, but also ensure a successful roll-out of revised Stormwater Manuals that is integrated into the State’s multi-faceted stormwater programs. Leveraging this program will provide the needed expertise, collaborations and materials, and it will enable this project to be implemented without the startup costs of a traditional outreach program.

**Estimated Milestones:** October 1, 2021 - September 30, 2023

**CWA Program Elements:** Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Circuit Rider - Municipality education regarding the updated Manuals.	1-1.	WW-2; WW-18; SC-20
Webinars - Stakeholder education for municipalities and other audiences impacted by the updates to the Manuals updates of 20-07.	3-3.	WW-2; WW-18; SC-20
Posting the updated manual and materials	3-3.	WW-2; WW-18; SC-20

Title:	Transport of freshwater cyanobacteria toxins to marine shellfish populations in Greenwich, CT: An emerging human health concern in Long Island Sound		
Activity Type:	Water Quality Planning and Implementation	Project Type:	New
Implementing Agency:	CT DEEP	Total Estimate Budget	\$166,667.00
Responsible Partners:	CT DABA, NOAA, UConn	Federal Amount:	\$100,000.00
		Match Amount:	\$66,667.00
Objectives:	The objectives of this project are to develop an understanding of environmental factors involved in transport of cyanotoxins from freshwater systems into the coastal marine environment; provide high-resolution environmental and toxin data for target area to inform biotoxin management in commercial and recreational LIS growing areas; develop species-specific microcystin depuration rates for the eastern oyster and hard clam; and inform federal risk assessment framework for microcystin in shellfish and provide data towards the development of regulatory guidance for state biotoxin management plans		
Description:	Project will improve understanding of the dynamics of cyanotoxin transfer from freshwater systems into the marine environment in the Sound (Greenwich Cove, CT), including the subsequent uptake and depuration of toxin by molluscan shellfish species.		
Estimated Milestones:	October 1, 2021 - September 30, 2023		
CWA Program Elements	Strengthening WQ Standards, Improving WQ Monitoring		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Prepare the EPA approved QAPP	1-3.	WW-37
Field studies, shell-fish tissue sample collection and analysis. Water quality sample collection and analysis	1-2; 1-3	WW-23; WW-36
Laboratory shellfish depuration studies	1-2; 1-3	WW-24; WW-39
Final Report - Develop species-specific microcystin depuration rates for the eastern oyster ( <i>Crassostrea virginica</i> ) and hard clam ( <i>Mercenaria mercenaria</i> )	1-3.	WW-36; WW-37

- b. **Modeling.** LISS has invested in a multitude of modeling efforts to improve the technical tools used to understand and manage the sources and impacts of nutrients on Long Island Sound.
- CT DEEP is currently developing several models:
    - A watershed model to analyze the movement of water, sediment, and pollutants over the landscape to the waterbody. The model will be able to predict sediment supply to tidal marshes, point and nonpoint source loads, and streamflow and pollutant loads under current and possible future precipitation and land use scenarios.
    - A groundwater model to incorporate groundwater budgets, travel time distributions, and loadings to receiving waters. The model will provide an estimated time context for management scenarios that have an impact on nitrogen into the Sound.
    - An embayment model to analyze the movement of water and impacts of nutrients from surface and groundwater sources. The results will be used to validate upland watershed models and develop an estuarine nutrient process model specific to each embayment. In coordination with the watershed and groundwater models, the embayment modeling project will help develop embayment specific nutrient targets to manage water quality, specifically to combat eutrophication.
  - Solute Transport Model: USGS, in collaboration with NYSDEC and Peconic Estuary Program (PEP), is developing this model for Long Island. The modeling looks at water table

- fluctuation over time, water use, and nitrogen loading—as a function of changing land use and atmospheric deposition rates—from predevelopment (e.g., 1900) through the present. Using FY2020 funds, LISS is supporting the completion of the central and western portions. Once complete, LISS will be able to use the model to predict how nitrogen reduction strategies will impact the Sound. Furthermore, this modeling effort, combined with the companion groundwater modeling effort in CT will provide complete coverage of the groundwater contributing area to the entire Long Island Sound watershed. Coordination between these modeling efforts will eventually allow for a comprehensive analysis of time-varying nitrogen loading and the simulation of the effects of various nitrogen-management scenarios at the regional watershed scale for the Sound.
- Systemwide Eutrophication Model: LISS and its partners have taken the initiative to develop a new generation of models to better describe dissolved oxygen concentrations as well as address new challenges such as warming temperatures, increasing precipitation and more development that can threaten the progress that has been made. The newly updated model will allow researchers to forecast how the Sound may respond to changes in human (e.g., pollution) and natural (e.g., weather) drivers that impact the system. The model will also enable managers to evaluate potential impacts of point source discharges, nonpoint source discharges, and sediment fluxes on water quality. From a Request for Proposals (RFP) released in 2019, NYCDEP entered into a contract with HDR, Inc., in 2020, to conduct the modeling effort. This multi-year project will strengthen management of Long Island Sound and guide investments in pollution control for the next decade by NYCDEP, NYSDEC, CT DEEP, New Jersey Department of Environmental Protection, and EPA.

The following modeling projects were approved to be funded in FY2021 to further our progress:

<b>Title:</b>	<b>Solute Transport Model</b>		
<b>Activity Type:</b>	Modeling	<b>Project Type:</b>	Ongoing
<b>Implementing Agency:</b>	NYSDEC	<b>Total Estimate Budget</b>	\$500,000.00
<b>Responsible Partners:</b>	USGS	<b>Federal Amount:</b>	\$300,000.00
		<b>Match Amount:</b>	\$200,000.00
<b>Objectives:</b>	<p>The objectives of this project are to develop data sets needed to represent current and historic land uses relevant to nitrogen loading in coastal watersheds; incorporate these data sets as nitrogen source terms in numerical models capable of simulating groundwater-transport processes to estimate current loading rates and nutrient concentrations in the aquifer; use these current-condition solute-transport models to simulate changes in nitrogen-loading rates in response to proposed wastewater-management actions; and prepare reports and data releases that document nitrogen sources, numerical models, and their application to nitrogen-load estimates.</p>		
<b>Description:</b>	<p>The Solute Transport Modeling for Entire LIS Watershed on Long Island Project would complete a solute transport model for the Long Island section of the Long Island Sound ground watershed. This proposal is for the second solute transport model for Long Island and is proposed for the western portion of Long Island. New York (DEC), the Peconic Estuary Program (PEP), and USGS are developing a solute-transport model for the eastern portion of Long Island, N.Y. Both models are needed to have the ability to simulate nitrogen reduction from Long Island to the Long Island Sound</p>		
<b>Estimated Milestones:</b>	October 1, 2021 - September 30, 2023		
<b>CWA Program Elements</b>	Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Geospatial data of nitrogen sources: wastewater, agricultural, and atmospheric	1-1; 1-3	WW-14; WW-27
Numerical model(s) of remaining Long Island aquifer system. The model(s) and associated data will be published online as publicly available USGS data releases.	1-1; 1-3	WW-14; WW-27
Results for a set of nitrogen-management scenarios (at least five)	1-1; 1-3	WW-14; WW-27
USGS Scientific-Investigations Report	1-1; 1-3	WW-14; WW-27

Title:	Assessment of compound flood risk from the combined effects of sea level rise on storm surge, tidal and groundwater flooding, and stormwater		
Activity Type:	Modeling	Project Type:	New
Implementing Agency:	USGS	Total Estimate Budget	\$500,000.00
Responsible Partners:	New York and Connecticut Sea Grant; Sustainable and Resilient Communities Work Group	Federal Amount:	\$500,000.00
		Match Amount:	\$0.00
Objectives:	To develop a better understanding of the risks of compound flooding from the combined efforts of sea level rise (SLR) on storm surge, tidal flooding, groundwater, and stormwater over multiple timescales ranging from short-term storm events to decadal-scale SLR; effectively communicate with and educate municipalities and their residents about the compound-flood risks associated with SLR (i.e., exacerbated flooding from storm surge, groundwater, and stormwater); and establish strategies for mitigating and adapting to effects of compound flooding		
Description:	As part of the first year of the Implementation of the Sustainable and Resilient Communities Work Plan, this project will couple various models to accurately predict coastal flood extents and the impacts of SLR on stormwater infrastructure and management; and better understand compound flood risk on event, seasonal, and long-term scales. The resulting coupled modeling framework may be used by public and private entities seeking to identify future capital-improvement and operational management needs that address increased flooding caused by SLR and groundwater table rise. This underlying framework can help agencies develop cost and benefit data associated with financing projects under future climate scenarios, including consideration for environmental justice.		
Estimated Milestones:	October 1, 2021 - September 30, 2024		
CWA Program Elements	Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Approved QAPP for compound flood risk modeling	4-3.	SM-26
List of Steering Committee members	4-3.	SM-27
Compilation and analysis of available data and resources - context for clearinghouse website	3-3; 3-4	SC-20; SC-23; SC-24
Initial spatial analysis - draft maps of compound flood vulnerability index	3-3; 3-4	SC-20; SC-23; SC-24
Obtain and compile feedback on initial analysis and scenarios - draft tier 1 spatial analysis	3-3; 3-4	SC-20; SC-23; SC-24
Outreach and communication - compound flooding fact sheet	3-3; 3-4	SC-20; SC-23; SC-24
Develop model framework - model and code releases	4-3.	SM-26
Run coupled model scenarios - Draft maps of spatio-temporal extents of flooding under considered scenarios and locales	3-3; 3-4	SC-20; SC-23; SC-24
Evaluate strategies for mitigating and adapting to effects of compound flooding - drafter report on coupled modeling scenarios	3-3; 3-4	SC-20; SC-23; SC-24

<b>Title:</b>	<b>Embayment Data Collection for Modeling</b>		
<b>Activity Type:</b>	<b>Modeling</b>	<b>Project Type:</b>	<b>New</b>
<b>Implementing Agency:</b>	<b>CT DEEP</b>	<b>Total Estimate Budget</b>	<b>\$2,500,000.00</b>
<b>Responsible Partners:</b>	<b>N/A</b>	<b>Federal Amount:</b>	<b>\$1,500,000.00</b>
		<b>Match Amount:</b>	<b>\$1,000,000.00</b>
<b>Objectives:</b>	This project will increase the spatial and temporal water quality and hydrodynamic data collection efforts in the four embayments targeted for monitoring and modeling using FY19 and FY20 funds, which is consistent with the three-year plan. The project will also include biological monitoring for macrophytes/benthic algae and sediment analyses to the four embayments and support a benthic processes study. The four study embayments covered by LISS enhancement grant funding include the Norwalk Harbor, Mystic River, Saugatuck Harbor, and Sasco Brook (Southport Harbor).		
<b>Description:</b>	To continue the final year of monitoring embayments to develop water quality and hydrodynamic models in priority embayments. The project will increase the spatial and temporal water quality and hydrodynamic data collection efforts, and also will add biological monitoring for macrophytes/benthic algae and sediment analyses to the four embayments (Norwalk Harbor, Mystic River, Saugatuck Harbor, and Sasco Brook).		
<b>Estimated Milestones:</b>	October 1, 2021 - September 30, 2023		
<b>CWA Program Elements</b>	Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Monitoring and data collection - Quality assured water quality and hydrodynamic data for model input	1-3.	WW-27; WW-28; WW-35
Sediment nutrient flux study - Relationships of sediment types to sediment rate processes	1-3.	WW-27; WW-28; WW-35
Final project report - Summary report on Year 3 data collected, results of modeling efforts thus far, and recommendations for additional actions (if needed)	1-3.	WW-14; WW-28

- c. **Monitoring.** LISS has continually invested in several water quality monitoring programs, including in 2020. These programs include:
- CT DEEP’s Long Island Sound Water Quality and Hypoxia Monitoring Program: Since 1991, the program has monitored surface and bottom waters at 17 stations throughout the Sound. The following water quality parameters are measured: temperature, salinity, dissolved nitrogen, particulate nitrogen, water clarity, and dissolved oxygen. The program provides the basis for the determination of hypoxic, and other ambient conditions in LIS and to determine state compliance with water quality standards for DO. This information is reported by CT DEEP and is used by the LISS to report annual progress in meeting CCMP goals.
  - IEC Long Island Sound Monitoring: Since 1991, IEC has monitored the far western Sound (the Narrows) and its embayments and the Upper East River. The following water quality parameters are measured: temperature, salinity, DO, pH, and secchi disk depths. Additionally, IEC also measures chlorophyll-a, total suspended solids, biological oxygen demand, and nutrients in surface samples.
  - UConn’s Long Island Sound Integrated Coastal Observing System (LISCOS) Buoys: Implemented in 2003, LISICOS was conceptualized as part of a water quality monitoring

program that combined the traditional ship-based point sampling surveys with continuous, real-time sampling stations. LISICOS continuously monitors in situ water quality parameters and meteorological parameters, every 15 minutes, at up to 8 stations across the Sound.

- USGS’s River Monitoring Stations: Since 2017, USGS has performed enhanced monitoring of the Connecticut River to establish a long-term record of observations of temperature, salinity and sea level that will allow the assessment of the effect of global-scale changes in climate on the ecosystem of the Sound and Connecticut River. In 2019, the LISS supported a three-year USGS pilot project to expand water quality sampling in the three major tributaries to Long Island Sound (Thames, Connecticut, and Housatonic Rivers). The goal of the project is to continue to characterize the tributaries to develop a longer-term monitoring plan for each of the three tributaries.
- Save the Sound’s Unified Waters Study (UWS): Since 2018, the UWS monitors 40 embayments conducted by 25 monitoring groups which include various communities, organizations, and citizen scientists. The following parameters are collected: water depth, temperature, salinity, DO, alkalinity, pH, Secchi disk, light intensity, chlorophyll-a, turbidity or TSS, nitrogen, phosphorus, bacteria, dinoflagellates and their toxic products, nonindigenous plants/animals, presence of sewage, biological monitoring.
- EPA’s National Coastal Condition Assessment (NCCA): Initiated in 2020, CT DEEP is continuing to work with EPA HQ contractors to conduct NCCA probabilistic sampling at 60 sites in Long Island Sound embayments. This project will utilize the power of random statistical design and standard collection and analytical techniques of the NCCA Program to characterize the nutrients, sediments, and benthic macroinvertebrate community in embayments.

The following monitoring projects were approved to be funded in FY2021 to further our progress:

<b>Title:</b>	<b>Major Long Island Sound Tributary Sampling</b>		
<b>Activity Type:</b>	<b>Monitoring</b>	<b>Project Type:</b>	<b>New</b>
<b>Implementing Agency:</b>	<b>USGS</b>	<b>Total Estimate Budget</b>	<b>\$240,000.00</b>
<b>Responsible Partners:</b>	<b>CT DEEP</b>	<b>Federal Amount:</b>	<b>\$240,000.00</b>
		<b>Match Amount:</b>	<b>\$0.00</b>
<b>Objectives:</b>	<b>The objective of the proposed work is to develop a water-quality monitoring network in the estuarine reaches of the Thames, Connecticut, and Housatonic Rivers</b>		
<b>Description:</b>	<b>This project will assist with data collection of salinity, temperature, dissolved oxygen, nutrient concentrations and chlorophyll a data patterns to inform future management decisions for habitat preservation and restoration of the Thames, Connecticut, and Housatonic River estuaries portion of the LIS</b>		
<b>Estimated Milestones:</b>	<b>October 1, 2021 - September 30, 2022</b>		
<b>CWA Program Elements</b>	<b>Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits</b>		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Monitoring and data collection - Dataset of existing and project specific data	1-3; 4-1	WW-28; SM-12
Final project report - Summary data; release data collected for all 3 years of the project.	1-3; 4-1	WW-28; SM-12



<b>Title:</b>	<b>IEC 2021-2022 Water Quality Monitoring Program in Far Western LIS</b>		
<b>Activity Type:</b>	<b>Monitoring</b>	<b>Project Type:</b>	<b>Ongoing</b>
<b>Implementing Agency:</b>	<b>IEC</b>	<b>Total Estimate Budget</b>	<b>\$525,113.00</b>
<b>Responsible Partners:</b>	<b>N/A</b>	<b>Federal Amount:</b>	<b>\$315,068.00</b>
		<b>Match Amount:</b>	<b>\$210,045.00</b>
<b>Objectives:</b>	The objective of the IEC water quality monitoring program is to address the LIS updated CCMP 2020 goal of reducing the area of hypoxia by identifying the most problematic areas in western Long Island Sound that are most in need of improved management actions.		
<b>Description:</b>	The IEC's 2021-2022 monitoring surveys of western Long Island Sound will consist of eight monthly "winter" surveys throughout the WLIS and the upper East River from October 2021 through May 2022 and 12 weekly "summer" surveys (June 2022 through September 2022). During surveys, IEC monitors the following in situ parameters at 22 stations: water temperature, salinity, pH, Secchi Disk depth, and dissolved oxygen. In addition to in situ monitoring, chlorophyll a and Total Suspended Solids (TSS) are collected at all 22 stations and nutrients and Biochemical Oxygen Demand (BOD) are collected at 11 stations.		
<b>Estimated Milestones:</b>	October 1, 2021 - September 30, 2023		
<b>CWA Program Elements</b>	Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Water Quality Monitoring Surveys - Twelve weekly (June 2022-September 2022) surveys to assess the onset, extent and duration of hypoxia and hypoxia-related parameters. Bi-weekly surveys will include collection and subsequent analysis for nutrients and BOD at 11 stations and collection of TSS at all 22 stations (surface)	1-3; 4-1	WW-1; WW-28; SM-6
Water Quality Monthly Surveys - Monthly surface data (October 2021-May 2022) for chlorophyll and TSS from all 22 historical stations and surface data for BOD and nutrients from 11 stations.	1-3; 4-1	WW-1; WW-28; SM-6
Reporting - Staff will work with the LIS Water Quality Workgroup and CTDEEP to deliver a coordinated Soundwide water quality report after the monitoring season. Improved assessment of WLIS in terms of environmental factors affecting dynamics of hypoxia in LIS. Coordinated summary of Long Island Sound monitoring program data.	1-3; 4-1	WW-1; WW-28; SM-6
Coordination - Assessment of need for additional or modified monitoring in WLIS and/or embayments. Cooperation with LISS workgroups, stakeholders and community groups, as appropriate.	1-3; 4-1	WW-1; WW-28; SM-6

<b>Title:</b>	<b>Long Island Sound Water Quality Monitoring Program</b>		
<b>Activity Type:</b>	<b>Monitoring</b>	<b>Project Type:</b>	<b>Ongoing</b>
<b>Implementing Agency:</b>	<b>CT DEEP</b>	<b>Total Estimate Budget</b>	<b>\$2,174,848.00</b>
<b>Responsible Partners:</b>	<b>N/A</b>	<b>Federal Amount:</b>	<b>\$1,304,909.00</b>
		<b>Match Amount:</b>	<b>\$869,939.00</b>
<b>Objectives:</b>	DEEP's core LIS Monitoring Program supported with LISS funding includes monthly water quality analyses and hypoxia surveys at 17 stations located throughout the Sound. All these efforts are complementary to, and some were previously supported by, the National Coastal Condition Assessment monitoring program.		
<b>Description:</b>	At these stations, hydrographic profiles are taken of depth, salinity, temperature, dissolved oxygen, chlorophyll a, pH and turbidity. Grab samples are collected at surface and bottom depths and filtered and preserved for laboratory analyses of nitrogen, phosphorus, carbon, suspended solids, and chlorophyll-a. The monitoring program includes zooplankton (6 stations, net tow, surface to bottom) and phytoplankton (10 stations, surface) sampling with researchers from the University of Connecticut at Avery Point; phyto-pigment analysis (10 stations, surface and bottom) with the University of Maryland Center for Environmental Science/Horn Point; and cooperating in research on such topics as phytoplankton productivity, and zooplankton.		
<b>Estimated Milestones:</b>	October 1, 2021 - September 30, 2023		
<b>CWA Program Elements</b>	Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Monthly Nutrient Surveys - Conduct monthly surface/bottom water quality data collection from 17 (year round) stations in LIS; Nutrient and ancillary data to evaluate benefits of nutrient management programs and health of LIS	1-3.	WW-24; WW-25
Monthly oxygen profiles at 17 stations; Supplementary profiles at up to 30 stations during June – Sept period on bi-weekly basis	4-1.	SM-4; SM-5
Reporting - Organized and available databases to researchers and the public; interpretive graphics and factsheets for the public on website	1-3; 4-1	SM-6; SM-7
Plankton Community Assessment - Continue to collect plankton community data to evaluate biological condition and response to changing water quality; incorporate this data into the LISS WQ Indicators Reporting; Collect monthly zooplankton and phytoplankton community data from 6 and 10 stations respectively (subset of the 17 nutrient stations).	4-3.	SM-28
Participate in LISS workgroups and tasks (Water Quality Monitoring Work Group)	1-3.	SM-13

<b>Title:</b>	<b>Acoustic telemetry array for monitoring tagged, migratory fish in Long Island Sound, including Atlantic sturgeon</b>		
<b>Activity Type:</b>	<b>Monitoring</b>	<b>Project Type:</b>	<b>New</b>
<b>Implementing Agency:</b>	<b>CT DEEP</b>	<b>Total Estimate Budget</b>	<b>\$168,250.00</b>
<b>Responsible Partners:</b>	<b>N/A</b>	<b>Federal Amount:</b>	<b>\$100,950.00</b>
		<b>Match Amount:</b>	<b>\$67,300.00</b>
<b>Objectives:</b>	<p>To maintain an acoustic monitoring array in Long Island Sound that was started circa 2006 but will be unfunded as of June 30, 2021. To deploy and monitor Acoustic Receivers in areas of Long Island Sound in order to detect migratory fishes, particularly Atlantic sturgeon, already implanted with long-term transmitters from previous CT DEEP research efforts and dozens of other researchers along the US Atlantic East Coast. Provide data to established telemetry network, MATOS (Mid-Atlantic Acoustic Telemetry Observation System) to share data and identify species tagged by researchers.</p>		
<b>Description:</b>	<p>CT DEEP Fisheries Staff have held a Federal Endangered Species permit for Atlantic Sturgeon since the species was listed in 2012 and have tagged numerous Atlantic sturgeon. Research collections of Atlantic Sturgeon in Connecticut waters date to 1984, so it is well established that sturgeon migrate into CT waters during spring and summer months. Genetic typing of sturgeon tissue samples collected here (Waldman et al., 2013) established that Atlantic sturgeon from all 5 US East Coast DPSs (Distinct Population Segments) seasonally migrate into Long Island Sound and Connecticut’s major rivers. These results were also confirmed by physical recapture of tagged sturgeon and identified acoustic detections. Staff have years of expertise in deploying and maintaining acoustic receiver arrays in the CT River and sturgeon concentration areas in LIS.</p>		
<b>Estimated Milestones:</b>	<b>October 1, 2021 - September 30, 2023</b>		
<b>CWA Program Elements</b>	<b>N/A</b>		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Prepare the EPA approved QAPP	2-2.	HW-16
Deploy, maintain, and monitor acoustic telemetry array in LIS	2-2.	HW-16; HW-17
Update CT DEEP sturgeon layer in the Long Island Sound Blue Plan Map Viewer	3-1; 4-1	SC-7; SM-3
Update the 2025 CT Wildlife Action Plan Conservation Opportunity Area Map	2-2.	HW-19
Publish ESRI StoryMap	4-1; 4-2	SM-3; SM-20

**Title:** Repair and modification of the RV John Dempsey

**Activity Type:** Monitoring **Project Type:** New

**Implementing Agency:** CT DEEP **Total Estimate Budget:** \$166,667.00

**Responsible Partners:** N/A **Federal Amount:** \$100,000.00  
**Match Amount:** \$66,667.00

**Objectives:** To make short-term repairs to the R/V Dempsey to improve its functionality and safety to keep the vessel operational while pursuing a long term solution for replacement of this 30 year old vessel.

**Description:** This project builds on the FY19 project which conducted an assessment of the viability of the RV John Dempsey to continue and carry on the LIS Water Quality Monitoring needs.

**Estimated Milestones:** October 1, 2021 - September 30, 2023

**CWA Program Elements:** Improving WQ Monitoring

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Repair, modifications and improvements to the research vessel	1-3; 4-1	WW-39; SM-7

**Title:** Water Quality monitoring enhancements to support the hypoxia management in Long Island Sound, Operation & Maintenance of CT River sensors at Essex

**Activity Type:** Monitoring **Project Type:** Ongoing

**Implementing Agency:** CT DEEP **Total Estimate Budget:** \$86,667.00

**Responsible Partners:** USGS **Federal Amount:** \$52,000.00  
**Match Amount:** \$34,667.00

**Objectives:** The scientific goal of this project is to establish a long-term record of observations of temperature, salinity and sea level that will allow the assessment of the effect of global scale changes in climate on the ecosystem of the Sound and Connecticut River.

**Description:** Continuation of monitoring activities in the Connecticut River to determine climate change trends influencing river flow and salt-water intrusion into river main-stems and to assist with model calculations of riverine nutrient inputs into the Long Island Sound.

**Estimated Milestones:** October 1, 2021 - September 30, 2022

**CWA Program Elements:** Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Water quality monitoring enhancements to support the hypoxia management in LIS	1-2; 1-3	WW-23; WW-31; SM-11
Water quality monitoring of estuarine habitat	1-3.	WW-31

<b>Title:</b>	<b>Unified Waters Study: LIS Embayment Research</b>		
<b>Activity Type:</b>	<b>Monitoring</b>	<b>Project Type:</b>	<b>Ongoing</b>
<b>Implementing Agency:</b>	<b>Save the Sound</b>	<b>Total Estimate Budget</b>	<b>\$1,275,862.00</b>
<b>Responsible Partners:</b>	<b>N/A</b>	<b>Federal Amount:</b>	<b>\$765,000.00</b>
		<b>Match Amount:</b>	<b>\$510,862.00</b>
<b>Objectives:</b>	To continue to monitor and assess the ambient conditions of water quality nearshore harbors and embayments throughout LIS, and therefore identify and control local pollution sources through community-based watershed monitoring (including citizen science) and protection programs.		
<b>Description:</b>	Save the Sound seeks funding to coordinate and implement the UWS, which establishes a comparable bay-to-bay dataset describing the eutrophic conditions and environmental health of bays and harbors around the Sound. Activities will include training and support of 25 water quality monitoring groups; coordination of an Equipment Loan Program; coordination of Tier 1 monitoring in 40 Sound bays and harbors and of Tier 2 monitoring in at least 12 of those locations, with a focus on priority bays identified by the CTDEEP and NYSDEC; and communication of the findings to the public, the sciencecommunity, and government and agency officials.		
<b>Estimated Milestones:</b>	October 1, 2021 - September 30, 2023		
<b>CWA Program Elements</b>	Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Coordinate collaborative water quality monitoring to be conducted by 23 groups - Train 24 groups in the SOPs for monitoring Tier 1 parameters; Train up to 7 groups in the SOPs for monitoring Tier 2 parameters; Conduct in-the-field quality control audits	2-3; 3-1; 4-1; 4-2	HW-22; SC-11; SM-25; SM-7; SM-8
Conduct water quality monitoring in LIS bays and harbors - Tier 1: Sampling data from 40 embayments for dissolved oxygen, water clarity, temperature, salinity, chlorophyll a and qualitative macrophytes and Tier 2: Sampling data for nitrogen, phosphorous, continuous dissolved oxygen, and quantitative macrophytes from at least 12 embayments	2-4; 4-1; 4-3; 1-1; 1-3	HW-24; SM-1; SM-30; SM-8; WW-1; WW-14;
Reporting water quality data - standardized data spreadsheet; data published on Save the Sound website; email links to data to all project stakeholders	3-1.	SC-7

**2. Healthy Ecosystems.** Healthy Ecosystems is addressed under the Thriving Habitat and Abundant Wildlife Theme of the CCMP as LISS sets out the mission to restore and protect the Sound’s ecological balance in a healthy, productive, and resilient state to benefit both people and the natural environment. The Habitat Restoration and Protection is the only program activity that applies to this section. Because of the complexity of planning, organizing and carrying out restoration projects in both states, the LISS funds two habitat coordinators, one each in NYSDEC (via NEIWPC) and CT DEEP, who develop priority LIS projects, including fish passage projects, in their state. These staff positions are included in the description of LISS-funded staff in this Work Plan in Attachment 1. It should be noted that the acres restored/protected and river miles reopened were not all funded by the LISS; the CCMP called for many and varied funding sources to implement its actions. LISFF projects do help contribute to the total acres restored/protected, to the extent that eligible projects are qualified, apply, and are approved for funding.

- a. **Habitat Restoration and Stewardship.** As reported in EPA’s NEPORT reporting system, LISS partners completed eight restoration projects for a total of 46.5 acres. The program achieved its goal to restore 350 acres of coastal habitat in 2018, two years ahead of the 2020 target and LISS is 45.6 percent of the way to the goal of restoring 1,000 acres of habitat by 2035 from the 2014 baseline. The study partners protected 524 acres of open space through acquisitions or easements at 19 sites. By the end of the calendar year 2020, the program has now achieved 59.2 percent of the goal to protect 7,000 acres of land by 2035 from the 2014 baseline.

The partners also completed one fish passage restoration projects by removing dams or building fishways that reconnected 10.4 stream miles to Long Island Sound. The program has now achieved 60.7 percent of the goal to reconnect 200 river miles to Long Island Sound for fish passage by 2035 from the 2014 baseline. The LISS-funded CT DEEP and NYSDEC habitat restoration coordinators develop projects to reopen fish passage in each state. Because CT’s river and stream network along the Long Island Sound shoreline is much more extensive than NY’s, the bulk of the fish passage projects are in CT rivers and streams. Historically there were approximately 562 miles of river in CT that supported diadromous fish runs; currently there are approximately 490 miles of river reaches open to fish passage. This is not meant as a management target for restoration. It should be noted that the river miles reopened were not all funded by the LISS; the CCMP called for many and varied funding sources to implement its actions.

LISS has set out the following goals for FY2021: Restore 10 acres of coastal habitat, protect 600 acres of coastal habitat, and reopen 11 river miles to diadromous fish passage (i.e., migrating between fresh and salt water).

- Long Island Sound Stewardship Initiative: Additionally, the LISS website contains an updated online [Stewardship Atlas](#). The LISFF supported several Stewardship Initiative projects and public involvement efforts centered around trails days at stewardship sites.

The following habitat restoration and protection projects were approved to be funded in FY2021 to further our progress:

<b>Title:</b>	<b>Support for Stewardship Land Acquisition by the New York State Department of Environmental Conservation</b>		
<b>Activity Type:</b>	Habitat Restoration and Protection	<b>Project Type:</b>	New
<b>Implementing Agency:</b>	NYSDEC	<b>Total Estimate Budget</b>	\$3,677,933.00
<b>Responsible Partners:</b>	N/A	<b>Federal Amount:</b>	\$2,000,000.00
		<b>Match Amount:</b>	\$1,677,933.00
<b>Objectives:</b>	The objective of this project is to provide additional support for the acquisition of the Shoreham Power Plant property.		
<b>Description:</b>	The Shoreham property is a roughly 800-acre parcel of pristine habitat located on Long Island Sound in Wading River, NY. This acquisition will provide water quality, tidal wetland, and coastal habitat protection to the Sound and add significant acreage to an existing LISS Stewardship Area: Shoreham – Wading River.		
<b>Estimated Milestones:</b>	October 1, 2021 - September 30, 2023		
<b>CWA Program Elements</b>	Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Purchase and protection of large parcel of land, "Shoreham", located in Wading River, NY.	2-1.	HW-3; HW-9

**Title:** Installation of Self Regulating Tide Gates at Hammock River, Clinton, CT

**Activity Type:** Habitat Restoration and Protection      **Project Type:** New

**Implementing Agency:** CT DEEP      **Total Estimate Budget:** \$366,667.00

**Responsible Partners:** N/A      **Federal Amount:** \$220,000.00  
    **Match Amount:** \$146,667.00

**Objectives:** The objectives of this project are to restore high and low marsh vegetation in Hammock River east of Old Beach Road; increase nesting success of salt marsh obligate bird species; and reduce flooding of private property in Hammock River system.

**Description:** This project will design, authorize, and implement the installation of self-regulating tide gates under Beach Park Rd. These gates will serve a multitude of ecological purposes and provide a myriad of benefits, both social and ecological. Reducing tidal volume and, at the same time, reducing residence time of water on the ebb tide, will result in a restoration of high marsh and low marsh habitat. This will also reduce the frequency of flooding of private property further upstream in the system.

**Estimated Milestones:** October 1, 2021 - September 30, 2023

**CWA Program Elements:** Wetlands Program Support/Implementation

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Collect baseline data on water flow, salinity, vegetation, and nesting success of saltmarsh obligate bird species	2-1.	HW-1; HW-3; HW-16
Draft final design of the marsh restoration project	2-2.	HW-22
Obtain federal and state authorization	2-1; 2-3	HW-6; HW-27

**Title:** Acoustic Data Acquisition for Seafloor Mapping

**Activity Type:** Habitat Restoration and Protection      **Project Type:** Ongoing

**Implementing Agency:** CT DEEP      **Total Estimate Budget:** \$477,500.00

**Responsible Partners:** N/A      **Federal Amount:** \$286,500.00  
    **Match Amount:** \$191,000.00

**Objectives:** To acquire acoustic data within the portion of the LIS central basin where no current bathymetric data is available

**Description:** Benthic mapping of LIS has long been identified as a priority need and is essential to improving science-based environmental management and mitigation decisions. Sea floor landscape maps depicting habitat structure and the ecological characteristics associated with those habitats are critical pieces of information. This project will perform an acoustic survey of a 99.5 square-mile area, where the depth is at least 8 meters, using a multibeam track spacing that is consistent with NOAA hydrographic mapping standards

**Estimated Milestones:** October 1, 2021 - September 30, 2023

**CWA Program Elements:** Controlling NPS Pollution on a Watershed Basis, Wetlands Program Support/Implementation

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Five 5-day trips for a total of 25 days of surveying to cover the remaining 50 square miles of survey area	4-1.	SM-2
Digitized bathymetric map	4-1.	SM-2

**Title:** Enhancement of Tidal Flow Restoration at the Barn Island Wildlife Management Area, Stonington, CT

**Activity Type:** Habitat Restoration and Protection      **Project Type:** New

**Implementing Agency:** CT DEEP      **Total Estimate Budget:** \$2,000,000.00

**Responsible Partners:** N/A      **Federal Amount:** \$1,200,000.00  
    **Match Amount:** \$800,000.00

**Objectives:** This project will replace and install several culverts to restore tidal flushing in the impoundments. The new plastic pipe culverts will also be beneficial for the passage of aquatic organisms in the impoundments. Many of the deteriorated metal pipes are rusted which can be harmful for fish passages.

**Description:** The requested funding will cover the construction costs for the Barn Island Wildlife Management Area Enhancement project in Stonington, CT, the largest tract of saltmarsh adjacent to undeveloped coastal forest in southern New England. This project involves the replacement of three existing culverts, installation of one new culvert, and repairs to the existing dike.

**Estimated Milestones:** October 1, 2021 - September 30, 2023

**CWA Program Elements:** Wetlands Program Support/Implementation

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Order materials	2-2.	HW-1
Bid for construction	2-2.	HW-1
Construction - New & larger pipes will be installed at the proper invert elevation, resulting in improved tidal exchange and restored marsh habitat.	2-2.	HW-1



<b>Title:</b>	<b>Connecticut Stewardship and Habitat Restoration</b>		
<b>Activity Type:</b>	<b>Habitat Restoration and Protection</b>	<b>Project Type:</b>	<b>Ongoing</b>
<b>Implementing Agency:</b>	<b>CT DEEP</b>	<b>Total Estimate Budget</b>	<b>\$348,940.00</b>
<b>Responsible Partners:</b>	<b>N/A</b>	<b>Federal Amount:</b>	<b>\$209,364.00</b>
		<b>Match Amount:</b>	<b>\$139,576.00</b>
<b>Objectives:</b>	<p>The coordinator will provide technical support and leadership to the HRSWG, serving as co-chair with NYSDEC. Much of the work supporting the LISS HRSWG will be through two habitat restoration sub-work groups Connecticut has developed for tidal wetlands and riverine migratory corridors. These groups meet at least once per year to formulate new work plans and coordinate implementation activities. The coordinator organizes these meetings and based upon work group priorities will assist the teams in securing funding, project engineering/design, securing permits and managing contracts where consulting firms are hired to develop restoration plans and designs. DEEP will enter into contracts to acquire and preserve habitat acreage.</p>		
<b>Description:</b>	<p>Connecticut’s habitat restoration coordinator will continue to promote coastal habitat restoration and stewardship to maximize acres and miles restored annually. Specifically, the emphasis is upon project implementation (e.g., design, permitting, and securing funding) but will include support for habitat restoration planning (e.g., database management, outreach).</p>		
<b>Estimated Milestones:</b>	<b>October 1, 2021 - September 30, 2023</b>		
<b>CWA Program Elements</b>	<b>Wetlands Program Support/Implementation</b>		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Implementation of LISS Habitat Restoration implementation actions of the 2015 CCMP including riverine migratory and tidal wetland restoration project coordination and assistance	2-1.	HW-1; HW-3
Updating the Habitat Restoration website	2-3.	HW-20
Co-chair LISS Habitat Restoration and Stewardship work group (HRSWG)	2-3.	HW-22
Shellfish Reef Initiative	2-2.	HW-18
Climate Change Adaptation and Sentinel Monitoring	2-1.	HW-11
Shoreline Public Access Preservation	2-1.	HW-9
Site Stewardship/Restoration	2-2; 2-4	HW-13; HW-27

**Title:** Design for a Living Shoreline Resiliency Project at Chittenden Park, in Guildford CT

**Activity Type:** Habitat Restoration and Protection      **Project Type:** New

**Implementing Agency:** Save the Sound      **Total Estimate Budget:** \$515,000.00

**Responsible Partners:** Town of Guildford      **Federal Amount:** \$515,000.00  
    **Match Amount:** \$0.00

**Objectives:** To design a living shoreline project at Chittenden Park in Guildford, CT to provide stabilization through elements that mimic natural features and processes.

**Description:** Save the Sound proposes to partner with the Town of Guilford to design a living shoreline project to restore the site's coastal wetlands, stop the loss of landward tidal marsh habitat, buffer the Park's recreational resources and nearby low-lying residences along Field Road and Seaside Avenue from destructive storm surges, and protect navigation in the West River by reducing channel sedimentation and erosion.

**Estimated Milestones:** October 1, 2021 - September 30, 2022

**CWA Program Elements:** Wetlands Program Support/Implementation

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Final construction designs for Chittenden Park Living Shoreline	2-1.	HW-1; HW-3; HW-11
Permitting documents for Chittenden Park Living Shoreline	2-1.	N/A
Quarterly Project Advisory Committee meetings	4-3.	SM-29
Resilience Implementation Action Plan, with conceptual designs for 2-3 sites	2-2.	HW-16; HW-17
Bi-monthly PAC meetings, three virtual events, two annual Tidal Wetlands Working Group meetings, and 10 multimedia posts	2-3.	HW-22; SM-34

**Title:** **Implementing Ecological Restoration and Resiliency at Connecticut's Largest Remaining Unditched Marsh**

**Activity Type:** Habitat Restoration and Protection **Project Type:** New

**Implementing Agency:** National Audubon Society **Total Estimate Budget:** \$2,000,000.00

**Responsible Partners:** NOAA, USFWS, CT DEEP **Federal Amount:** \$2,000,000.00  
**Match Amount:** \$0.00

**Objectives:** To restore and improve resilience of salt marsh degraded by historic filling, non-native invasive plants that outcompete native species, failing infrastructure that is causing inundation and marsh degradation, and climate-induced sea level rise

**Description:** This project will apply multiple, proven restoration techniques at a large salt marsh complex within a federally-protected site to restore 39+ acres of lost or degrading salt marsh and other coastal habitats for marsh-dependent species of conservation concern including saltmarsh sparrow, marsh pink, and diamond-backed terrapin.

**Estimated Milestones:** October 1, 2021 - September 30, 2022

**CWA Program Elements:** Wetlands Program Support/Implementation

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Phragmites and other invasive plants removed from up to 10 acres	2-1.	HW-1
Remove fill from ~30 acres of transitional and phragmites dominated habitat, redistribute to areas with degraded low marsh, and regrade	2-1.	HW-1
Soil placement to create hummocks on ~1 acre near existing Saltmarsh Sparrow habitat.	2-1.	HW-16; HW-17
Remove two culverts and create ~2000 linear ft of tidal channels	2-1.	HW-1; HW-3
With the help of volunteers, replant up to 30 ac with native species	2-1.	HW-1; HW-22
Enhance up to 7 ac of habitat for and plant propagated Marsh Pink ( <i>Sabatia stellaris</i> )	2-2.	HW-16; HW-17
Re-open previously closed trail and install viewing platforms	2-1.	HW-9

Title:	<b>NEIWPCCLISS Program Implementation Support: Task 3 - Habitat Restoration and Stewardship Coordination</b>		
Activity Type:	Habitat Restoration and Protection	Project Type:	Ongoing
Implementing Agency:	NEIWPCCLISS	Total Estimate Budget	\$315,369.00
Responsible Partners:	NYSDEC	Federal Amount:	\$315,369.00
		Match Amount:	\$0.00
Objectives:	NEIWPCCLISS will continue promoting efforts to restore and protect the Sound and its resources; highlight the LISS role in the protection of the Sound; promote an understanding and appreciation of the Sound as a regional ecosystem and a national treasure; and encourage action to restore and protect the Sound.		
Description:	NEIWPCCLISS's NYS Habitat Restoration and Stewardship Coordinator will facilitate and conduct activities associated with the LISS Habitat Restoration Initiative including: Preparing, assisting, and evaluating project applications for habitat restoration, assessment, monitoring, and research funding; Developing partnerships to restore LIS habitats and promote stewardship (public access, land acquisition, land management); Working with regional staff to help partners prepare project workplans that are compatible with state regulations; and Assisting NYSDEC with activities associated with the LISS Habitat Restoration & Stewardship Workgroup.		
Estimated Milestones:	October 1, 2020 - September 30, 2025		
CWA Program Elements	Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Coordinate LISS Habitat Restoration & Stewardship Workgroup - Hold up to 4 in-person workgroup meetings annually, and engage new and current membership. Coordinate with other LIS workgroups as appropriate; Develop partnerships among members to restore LIS habitats and promote stewardship.	2-1; 2-3	HW-1; HW-22
Coordinate NYS habitat, wildlife, and stewardship activities in the LIS watershed - Provide guidance and/or evaluate project applications to LISFF. Review LISFF proposals and serve as technical advisor. Assist partners to plan and implement habitat restoration projects.	2-1.	HW-1; HW-9; HW-10
Promote habitat quality assessments for tidal wetlands - work with partners to complete habitat quality assessments that focus on tidal wetlands at 5-10 NY sites using the NYS Tidal Wetland Rapid Assessment.	2-1; 2-4	HW-6; HW-23; HW-27
Track habitat restoration and land protection activities in NYS - Collect data and synthesize reports on habitat restoration and land protection efforts for LIS communications; Track and report on coastal LIS habitat restoration and land protection (acquisition/protection) projects.	2-1; 2-4	HW-1; HW-9; HW-24

SET monitoring data - Conduct monitoring at 4 sites to determine erosion/accretion rates at tidal wetlands; Coordinate with partners that monitor additional sites along the north shore. Maintain internal records and submit data to TNC.	2-1; 2-4	HW-5; HW-23; HW-27
Public Communication and Outreach - Contribute information on habitat restoration and stewardship within LIS watershed for press releases, promotional materials, newsletters, and other communication items (at least 5 annually); Support and assist partners with completing education/outreach events, field trips, and workshops (at least 5 annually).	2-2; 2-3	HW-13; HW-22; SC-12
Assessment of existing habitat connectivity models - Provide tool to support habitat project site selection, monitoring, and associated metrics via final report summarizing existing habitat connectivity data, models, and metrics.	2-1.	HW-4
Developing conservation plans for NY's LIS Marsh Complexes, Phase 2 - Expanded marsh migration Viewer and develop at least one, but up to three marsh conservation plans to increase coastal resiliency. Provides tool for local communities to develop marsh conservation plans.	2-1; 2-4	HW-9; HW-27; HW-30
Participant Support - Provide participant support (financial assistance) for state partners to participate in LISS or NEP meetings/workshops/trainings in order to engage state and local governments, organizations, and other environmental stakeholders in LISS activities.	4-2.	SM-13; SM-14
Reporting - Develop and report progress on NEIWPCC's sections of the annual Long Island Sound Study work plans to consider progress made and recommendations for improving implementation to achieve desired outcomes.	4-3.	SM-35

3. **Strong Communities.** Strong Communities is addressed under the Sustainable and Resilient Communities Theme of the CCMP as LISS sets out the mission to support vibrant, informed, and engaged communities that use, appreciate, and help protect Long Island Sound. The following program activities are used as subsections to highlight our FY2020 accomplishments and introduce planned FY2021 activities, including project details: Public Education and Outreach, and Stewardship and Resiliency.

a. **Public Education and Outreach.** The LISS provides grants to several of its partners to support their public outreach, information, and education (PI&E) program activities, a key Program Element of the LISS. NEIWPCC, NYSEA and CTSEA are primarily responsible under their LISS grant awards for public outreach assistance. The LISS communications team consists of staff of these partners and other interested parties, including members of the LISS Citizens Advisory Committee (CAC). The communications team meets periodically to develop and carry out work as reflected in each grant award. The LISNPO and LISS partners provide significant support to the CAC, which is co-chaired by an elected member each from NY and CT. Coordinated by the NY/CTSEAs, the CAC meets quarterly at alternating locations in CT and NY in the LIS watershed (however, this past year was all virtual due to COVID-19) and provides advice to the Management Conference partners in implementation of the CCMP. The CAC operates under its Bylaws and is composed of up to 60 members who represent organizations with a demonstrated interest in Long Island Sound. Financial support for CAC meetings is provided through NEIWPCC's PI&E line item in its LISS assistance award. CAC members are reimbursed for their travel expenses directly related to attending CAC meetings. However, this past year there was minimal travel due to the COVID-19 pandemic, in which all CAC meetings were held virtually [see Attachment 4]. In addition, the CAC meets as needed with the STAC to jointly review program priorities from a scientific perspective and to update each other on issues

of scientific and public concern. The CAC co-chairs are members of the Management Committee and provide a public perspective at Management Committee meetings. The CAC also appoints two liaisons to the STAC, one each from New York and Connecticut to represent the CAC at STAC meetings. CAC members participate on LISS teams and work groups and attend those meetings as appropriate.

The LISS will continue to fund the CT and NY Sea Grant LIS Mentor Teacher program, which trains a cadre of K-12 educators to train-the-trainers in the use of LIS as a teaching tool and resource for NY and CT teachers. The Long Island Sound Mentor Teacher (LISMT) program has consistently recruited high quality, creative, and respected teachers to assist their peers in incorporating LIS content into curricula within the scope of the CT Science Frameworks.

- **LISS Communications:** The LISS partners produce their own materials and press releases to communicate their accomplishments and plans to their public or special audiences. The LISS, via a grant to NEIWPC, maintains its website for public information and access, and produces *SoundBytes*, an electronic email product to keep constituents informed in topical and timely areas. *Sound Update and Outlook* are also produced several times a year, but paper copy distribution has been phased down to conserve resources and be more 'green.' LISS-produced materials emphasize the bi-state nature of public information on the Sound, its ecology or status, while individual partners' public information programs may focus on single state or communities of interests' priorities or needs. Examples of these publications are on the LISS website. Furthermore, LISS has set out to develop a new five-year strategic communication plan to increase the knowledge of and engagement in the Sound's restoration efforts by key stakeholders for FY2021.

The following Public Education and Outreach projects were approved to be funded in FY2021 to further our progress:

**Title:** Long Island Sound Study Public Perception Survey

**Activity Type:** Public Education and Outreach      **Project Type:** New

**Implementing Agency:** Connecticut Sea Grant      **Total Estimate Budget:** \$172,673.00

**Responsible Partners:** N/A      **Federal Amount:** \$172,673.00  
    **Match Amount:** \$0.00

**Objectives:** The objectives of this project are to develop and implement a public perception survey with the assistance of a qualified contractor; analyze the results and compare them to results from 2006 survey; recruit and hold focus groups to test the survey questions as well as messaging developed by the Communications Team; and share the results broadly in written report form, digital graphics and presentations so they can be used to inform future communications and education efforts.

**Description:** Tied to the implementation of the 2020 CCMP, a 2021-2022 public perception survey will provide data and an assessment to track the LISS Public Engagement and Knowledge Ecosystem Target. The assessment will help the Communications team evaluate current and past education activities and public information products and will provide a basis to better implement the education and outreach strategies outlined in the CCMP over the next five years.

**Estimated Milestones:** October 1, 2021 - September 30, 2022

**CWA Program Elements** Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Establish a steering committee, issue request for bids and hire a qualified contractor	3-1; 3-3; 4-3	SC-22; SC-6; SM-30
EPA-approved QAPP	3-1; 3-3; 4-3	SC-22; SC-6; SM-30
Recruit and hold focus groups to test developed survey questions	3-1; 3-3; 4-3	SC-22; SC-6; SM-30
Implementation of survey	3-1; 3-3; 4-3	SC-22; SC-6; SM-30
Final report: An executive summary of the study's major findings; A detailed discussion of the survey, including key graphics, divided into key topic areas. As an example, the 2006 report included such topic areas as (1) recreational use of the Long Island Sound, (2) perceived water quality, (3) the enactment of behaviors that have some impact on water quality, and (4) knowledge about the environment in general and the Long Island Sound specifically; An appendix that includes the methodology used to develop and conduct the survey, results of the focus groups, the questionnaire with the full results, and information on the study sample, including a table of the zip codes included in the study sample; Digital graphics developed using data visualization software; and PowerPoint presentation or similar format and summary text for use in press releases, social media, and LISS website.	3-1; 3-3; 4-3	SC-22; SC-6; SM-30

**Title:** LISS New York City/Western Basin Public Outreach Program

**Activity Type:** Public Education and Outreach      **Project Type:** New

**Implementing Agency:** New York Sea Grant      **Total Estimate Budget:** \$263,158.00

**Responsible Partners:** N/A      **Federal Amount:** \$250,000.00  
    **Match Amount:** \$13,158.00

**Objectives:** The coordinator will develop programs to educate NYC and other western basin residents about Long Island Sound and encourage environmental stewardship focusing on environmental justice communities.

**Description:** The LISS NYC-Western Basin Outreach Coordinator will be based in NYC and focus on providing outreach support and programming materials, primarily in environmental justice communities, as well as in other areas of the western Basin in NY (NYC-WB). The goals and activities will combine community needs with LISS outcomes, objectives and measures in a manner that demonstrates the relevance of the Sound to these communities.

**Estimated Milestones:** October 1, 2021 - September 30, 2022

**CWA Program Elements:** Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Communications Team- Social media posts, website updates, news releases, communications products; Public Perception Survey Enhancement Grant Proposal	3-1.	SC-1; SC-6; SC-7
Citizens Advisory Committee (CAC) - CAC meetings coordination and planning, EJ work group update, meeting minutes produced and made available online	3-1; 4-2	SC-13; SM-15; SM-17
Public Involvement and Education Work Group- Strategic Communications Plan	3-1.	SC-6
Habitat Restoration and Stewardship Work Group - Tasks in this category include- provide advice and technical assistance to work group meetings and identify outreach products, assist with public participation with NY projects as appropriate (e.g., LIS Futures Fund projects), provide the public with information on the initiative and its progress, represent NY Sea Grant on the work group, and work with the HRI NY Coordinator and Work Group to develop stewardship projects, such as Sound Stewards and Open Space Stewardship Program (OSSP) projects.	2-3; 4-2	HW-22; SM-15
Environmental Justice Work Group - Hold quarterly EJWG meetings; Enhancement Grant Proposals to support EJ in LISS- EJ Needs Assessment, NYC Outreach Coordinator, and EJ Small Grants Program	3-1; 4-2	SC-4; SC-5; SM-17



Other Meetings - 5-year work plan for Sustainable and Resilient Communities meetings; Presentation on CAC discussions at the LIS Funders Collaborative Meetings; STAC meetings	4-2; 4-3	SM-15; SM-37
Stewardship Days - This project is centered around providing volunteer opportunities in LIS's Stewardship Sites. Tasks include to work with State Parks and other managers of NY Stewardship Areas to develop ideas for volunteer projects, set dates, prepare for events, advertise, recruit volunteers, send out Media Advisories, and host volunteer events.	3-1.	SC-12
Volunteer Opportunities - Involve community members in hands-on activities to increase understanding, appreciation, and stewardship. Tasks include updating the "Volunteer Opportunities" webpage on the LISS website and organizing volunteer opportunities when appropriate.	3-1.	SC-11; HW-13; HW-21
Sound Stewards Program - Continue Sound Stewards Program to involve students and teachers in research projects in LISS stewardship and habitat restoration sites.	3-2.	SC-3; SC-5; SC-19
LISS Web Page- Work with the Communications Team and the Web Page Contractor to update the LISS web site.	3-1.	SC-7; SC-11
LISS Social Media - Social media posts on Facebook, Twitter, and Instagram	3-1.	SC-1; SC-2; SC-8
E-news - Assist LISS Communications Coordinator with the development of content.	3-1.	SC-7; SC-8
Research and Enhancement - Review LISS Enhancement grant proposals, including collecting input from the new EJ Work Group members. Review for NYSG Research grant pre-proposals	3-1.	SC-8
National Fish and Wildlife Foundation's LIS Futures Fund - Provide support and technical assistance to LISFF applicants during application process and if funded. Identify possible outreach opportunities within proposals and to promote funded projects. Review grant proposals and participate in the grant review discussion and selection meetings. Provide assistance to funded projects. Add priorities to RFP as identified by the Public Involvement and Education Work Group; Social Media posts promoting LISFF grantees and program.	3-1; 4-2	SC-8; SM-25; SC-15
General Outreach - Respond to requests for information, including dissemination of written materials, handling requests for information, making public presentations about the LISS to community and business groups, and staffing LISS displays at community events. Seek out new locations to distribute publications and educational materials such as ferry terminals, museums, etc. Provide information to the media about LISS, and where appropriate, issue press release and/or hold press events.	3-1.	SC-2; SC-7
Professional Development - Identify and attend professional development activities to improve programs	4-2.	SM-15
Coordinated NEPs - Assist and coordinate activities with the NY-NJ Harbor Estuary Program, the Peconic Estuary Program Outreach Coordinator, and the SSER Science and Outreach Coordinator.	3-1.	SC-1

<b>Title:</b>	<b>Long Island Sound Study (LISS) New York Public Outreach Program - Public Outreach Coordinator</b>		
<b>Activity Type:</b>	<b>Public Education and Outreach</b>	<b>Project Type:</b>	<b>Ongoing</b>
<b>Implementing Agency:</b>	<b>New York Sea Grant</b>	<b>Total Estimate Budget</b>	<b>\$239,286.00</b>
<b>Responsible Partners:</b>	<b>N/A</b>	<b>Federal Amount:</b>	<b>\$227,400.00</b>
		<b>Match Amount:</b>	<b>\$11,886.00</b>
<b>Objectives:</b>	To continue to develop programs to educate NY residents about LIS and encourage environmental stewardship; to fill requests for information from the public and extent publications.		
<b>Description:</b>	Continue the NY Public Outreach Program through 2023, which will fund a full-time public outreach coordinator to oversee the dissemination of accurate, up-to-date, research-based information about the LIS, LISS, and implementation activities of the partnership; and some of the funds will be allocated for a administrative assistant to help carry out the program.		
<b>Estimated Milestones:</b>	October 1, 2021 - September 30, 2023		
<b>CWA Program Elements</b>	Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
LIS Mentor Teacher Program- 2 workshops for teachers centered around LIS topics and led by educators	3-2.	SC-17
Communications Team- Social media posts, website updates, news releases, communications products; Public Perception Survey Enhancement Grant Proposal	3-1.	SC-1; SC-6; SC-7
Public Involvement and Education Work Group	3-1.	SC-6
Citizens Advisory Committee (CAC) - CAC meetings coordination and planning, EJ work group update, meeting minutes produced and distributed	3-1; 4-2	SC-13; SM-15; SM-17
Habitat Restoration and Stewardship Work Group - Tasks in this category include- provide advice and technical assistance to work group meetings and identify outreach products, assist with public participation with NY projects as appropriate (e.g., LIS Futures Fund projects), provide the public with information on the initiative and its progress, represent NY Sea Grant on the work group, and work with the HRI NY Coordinator and Work Group to develop stewardship projects, such as Sound Stewards and Open Space Stewardship Program (OSSP) projects.	2-3; 4-2	HW-22; SM-15

Watersheds and Embayment Work Group - Responsibilities in this category include- to provide advice and technical assistance to work group meetings and identify outreach products, assist with public participation with NY projects as appropriate (e.g. LIS futures Fund projects), provide the public with information on nonpoint source pollution and how it impacts their local embayment areas, and represent NY Sea Grant in the work group on the work group, and work with the HRI NY Coordinator and Work Group to develop Sound Stewards and Open Space Stewardship Program (OSSP) projects.	3-1; 4-2	SC-14; SM-15
Environmental Justice Work Group - Hold quarterly EJWG meetings; Enhancement Grant Proposals to support EJ in LISS- EJ Needs Assessment, NYC Outreach Coordinator, and EJ Small Grants Program	3-1; 4-2	SC-4; SC-5; SM-17
Other Meetings - 5-year work plan for Sustainable and Resilient Communities meetings; STAC meetings	4-2; 4-3	SM-15; SM-37
Stewardship Days - This project is centered around providing volunteer opportunities in LIS's Stewardship Sites. Tasks include to work with State Parks and other managers of NY Stewardship Areas to develop ideas for volunteer projects, set dates, prepare for events, advertise, recruit volunteers, send out Media Advisories, and host volunteer events	3-1.	SC-12
Volunteer Opportunities - Involve community members in hands-on activities to increase understanding, appreciation, and stewardship. Tasks include updating the "Volunteer Opportunities" webpage on the LISS website and organizing volunteer opportunities when appropriate (e.g., invasive species removal).	3-1.	SC-11
Sound Stewards Program - Continue Sound Stewards Program to involve students and teachers in research projects in LISS stewardship and habitat restoration sites.	3-2.	SC-19
Teacher Workshops - Coordinate, host, and promote NY workshops as needed. Continue to promote and distribute LIS educational resources to teachers and informal educators. Adapt resources, programing, workshops, and webinars as needed.	3-2.	SC-17, SC-18, SC-19
LISS Web Page- Work with the Communications Team and the Web Page Contractor to update the LISS web site.	3-1.	SC-7; SC-11
LISS Social Media - Social media posts on Facebook, Twitter, and Instagram	3-1.	SC-1; SC-2; SC-8
Sound Update Newsletter - One issue of Sound Update is produced each year.	3-1.	SC-7
E-news - Assist LISS Communications Coordinator with the development of content.	3-1.	SC-7; SC-8

Research and Enhancement - Review LISS Enhancement grant proposals, including collecting input from the new EJ Work Group members. Review for NYSG Research grant pre-proposals	3-1.	SC-8
National Fish and Wildlife Foundation's LIS Futures Fund - Provide support and technical assistance to LISFF applicants during application process and if funded. Identify possible outreach opportunities within proposals and to promote funded projects. Review grant proposals and participate in the grant review discussion and selection meetings. Provide assistance to funded projects. Add priorities to RFP as identified by the Public Involvement and Education Work Group; Social Media posts promoting LISFF grantees and program.	3-1; 4-2	SC-8; SM-25; SC-15
General Outreach - Respond to requests for information, including dissemination of written materials, handling requests for information, making public presentations about the LISS to community and business groups, and staffing LISS displays at community events. Seek out new locations to distribute publications and educational materials such as ferry terminals, museums, etc. Provide information to the media about LISS, and where appropriate, issue press release and/or hold press events.	3-1.	SC-2; SC-7
Professional Development - Identify and attend professional development activities to improve programs	4-2.	SM-15
Coordinated NEPs - Assist and coordinate activities with the NY-NJ Harbor Estuary Program, the Peconic Estuary Program Outreach Coordinator, and the SSER Science and Outreach Coordinator. Organize NY outreach staff meetings.	3-1.	SC-1

b. **Stewardship and Resiliency.** In FY2020, LISS developed two new working groups to progress Stewardship and Resiliency, for which LISS has set out the following goals for FY2021: Adopt and support the five-year action plan, created by the new Sustainable and Resilient Communities Work Group, to help communities plan for climate change impacts while strengthening ecological health and protecting local economies; foster and support public engagement and knowledge with added emphasis on environmental justice initiatives; and increase environmental justice considerations in implementation and decision-making through the new Long Island Sound Study Environmental Justice Work Group.

- Sustainable and Resilient Communities Work Group: In FY2020, the LISS funded CT and NY SEA to support a year-long process to develop a focused and strategic five-year work plan for the Sustainable and Resilient Working Group. The work group was charged with the ultimate goal to improve implementation of CCMP goals related to the Sustainable and Resilient Communities theme. Through a transparent and inclusive process, the work plan identifies five priorities: 1) better coordinated regional response, 2) better trained community decision makers, 3) infrastructure improvements planning, 4) viability of government services, and 5) facilitated implementation. The first year of the work plan was approved for funding in FY2021 (see below).
- Environmental Justice (EJ) Work Group: In October 2020, the EJ Work Group was formally approved by the Management Committee, in which brings together people in the watershed to help LISS actively move forward in its EJ implementation work and better serve the needs of underserved and underrepresented communities who are disproportionately affected by environmental hazards. The Work Group is currently undergoing an iterative process to outline its main goals collaboratively (see the [website](#) for current identified outcomes).
- LIS Sentinel Monitoring Program: Initiated in 2017, the [LISS Sentinel Monitoring strategy](#) included [three pilot projects](#) to inform the Sentinel Monitoring work team to update the strategy. The report, [Sentinel Monitoring for Climate Change in the Long Island Sound](#)

[Estuarine and Coastal Ecosystems of New York and Connecticut \(Vol 2\)](#), was completed and posted on the LISS website in 2018. The work team also reviewed drafts of the LIS Climate Vulnerability Assessment conducted by Dr. Juliana Barrett of Connecticut Sea Grant. Dr. Juliana Barrett presented the completed LIS Climate Vulnerability Assessment at the July 18, 2019 Management Committee Meeting. Using FY2020 funds, LISS plans to hold a workshop in 2021 to engage LIS stakeholders to help identify monitoring data sources and develop a LISS sentinel monitoring network.

- Climate Ready Estuaries:** Under an agreement, UCONN acquired, deployed, and tested the pH and total CO2 sensors for monitoring acidification in Long Island Sound. These systems require additional development to reduce operations and maintenance effort and to improve data quality. In addition, remote sensing reflectance and derived products from several sensors and methodologies were tested. Algorithms to retrieve chlorophyll concentrations were tested. The evaluation of data suggests that data from new sensors, such as Sentinel, may allow the distribution of near real-time CHL products for LIS in the future. This work allowed for a more thorough application of a local algorithm, leading to interesting observations of the relationships between optical patterns and environmental forcing that may drive their variability over time and space. LISS assisted in the development of EPA’s [Measuring Coastal Acidification Using In Situ Sensors in the National Estuary Program](#) report, which discusses LISS’ experiences, and nine other NEPs, in conducting coastal acidification monitoring using these sensors.

The following Stewardship and Resiliency projects were approved to be funded in FY2021 to further our progress:

<b>Title:</b>	<b>EJ Needs Assessment in the Long Island Sound Watershed</b>		
<b>Activity Type:</b>	Stewardship and Resiliency	<b>Project Type:</b>	New
<b>Implementing Agency:</b>	New York Sea Grant	<b>Total Estimate Budget</b>	\$228,085.00
<b>Responsible Partners:</b>	LISS EJ Work Group	<b>Federal Amount:</b>	\$228,085.00
		<b>Match Amount:</b>	\$0.00
<b>Objectives:</b>	To determine and investigate the following: main environmental challenges faced; interests, needs, and concerns related to their environment; resources needed to provide relief and improve implementation of local environmental justice initiatives; barriers to addressing such environmental concerns identified in the CCMP; role of the LIS in their lives; and preferred channels of communication and delivery methods.		
<b>Description:</b>	NYSG will hire a contractor to develop and conduct the assessment targeted at community-based groups focused on EJ projects or primarily working with minority and underserved communities in the New York and Connecticut portions of the LIS watershed. The goal of this assessment is to better understand the needs of underserved communities, especially those most affected by environmental injustices and bearing a disproportionate amount of the effects of environmental challenges, such as climate change and pollution.		
<b>Estimated Milestones:</b>	October 1, 2021 – July 1, 2023		
<b>CWA Program Elements</b>	N/A		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Finalized list of EJ stakeholder groups per region	3-1; 4-2	SC-4; SC-5; SM-17
Report detailing EJ Needs Assessment process, raw data, and key takeaways	3-1; 4-2	SC-4; SC-5; SM-17
Presentation on main takeaways to EJ Work Group and Management Committee	3-1; 4-2	SC-4; SC-5; SM-17

Title:	Implementation of the LISS Sustainable and Resilient Communities working group work plan		
Activity Type:	Stewardship and Resiliency	Project Type:	New
Implementing Agency:	New York and Connecticut Sea Gra	Total Estimate Budget	\$959,874.00
Responsible Partners:	N/A	Federal Amount:	\$911,880.00
		Match Amount:	\$47,994.00
Objectives:	The overall objective of this proposal is to implement the first year of the work plan developed by the Sustainable and Resilient Communities Working Group to advance the Sustainable and Resilient Communities theme of the CCMP.		
Description:	The LISS Sustainable and Resilient Work Group developed a 5-year work plan, in which this proposal will implement year 1. The work plan has the following desired outcomes: coordinated regional response; trained decision-makers; planned infrastructure improvement; viable government services; and facilitated implementation of Long Island Sound sustainability and resilience projects.		
Estimated Milestones:	October 1, 2021 - September 30, 2022		
CWA Program Elements	Supporting Sustainable Wastewater Infrastructure		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Hire 3 extension staff (circuit riders) to provide additional capacity to advance sustainability and resilience	N/A	N/A
Develop a needs assessment	3-3; 4-3	SC-20; SC-23; SM-26
Hold first annual bi-state workshop	3-3; 3-4	SC-20; SC-23; SC-24
Develop and maintain a first draft clearinghouse of tools and resources	3-3; 3-4	SC-20; SC-23
Support Sustainable and Resilient Communities work group and other administrative tasks	3-3; 3-4	SC-20; SC-23
Improve coordination among levels of government	3-3; 3-4	SC-20; SC-23; SC-24
Initiate the development of a project pipeline	N/A	N/A

4. **Sound Science & Inclusive Management** sets out the mission to manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable. The following program activities are used as subsections to highlight our FY2020 accomplishments and introduce planned FY2021 activities, including project details: Coordination, and Research.

a. **Coordination.** As mentioned throughout the workplan, LISS has funded staff positions to carry out the program, in addition to the EPA staff. Please refer to Attachment 1 for a full list of staff positions that better our coordination.

- **Tracking and Reporting:** As the only Federally led NEP, EPA’s authority to require and collect information is limited to that contained in enabling statutes and regulations. CWA §320 and §119 indicate specific reporting requirements and EPA regulations, under 40 CFR Parts 30 and 31, provide further reporting requirements for grantees. Finally, EPA grant

regulations provide several reporting requirements (e.g., quarterly, or semi-annual reporting on grant progress). EPA LISNPO is responsible for the overall LISS tracking and reporting systems for the NEP. In 2011 the LISS Management Conference partners agreed to a process to revise and update the 1994 CCMP, which was completed and issued in Spring 2015. The [2015 CCMP](#) also sets 20 ambitious, but achievable, long-term targets for the ecosystem. These ecosystem targets are intended to drive progress toward attaining CCMP goals. Measuring, tracking, and reporting [environmental indicators](#) of each ecosystem target will provide information to assess progress and refine and adapt management as needed. Some of the targets include intermediate goals. For example, the ecosystem target to reduce effective impervious cover by ten percent in twenty years would assume a pace of 0.5 percent per year. Progress at any point in time would be assessed against the rate needed to attain the long-term target. In July 2018, the Government Accountability Office (GAO) completed a review of the LISS, Long Island Sound Restoration: Improved Reporting and Cost Estimates Could Help Guide Future Efforts (GAO-18-410). The GAO recommended that the EPA work with the LISS to ensure that it fully incorporates leading practices into performance reporting efforts. The LISS supported contractor work to enhance performance tracking and reporting of implementation actions and progress, most likely through web-based platforms. This new system will replace the annual eSound CCMP Implementation Tracking Report, which was organized around the 1994 CCMP.

To better coordination efforts, the Long Island Sound Office is developing a SharePoint Tracking and Reporting Tool to better track the progress of the [2020-2024 CCMP Implementation Actions](#). The development of this tool will fulfill the GAO recommendation to ensure that as the Study finalizes its reporting format, it fully incorporates leading practices of performance reporting by mid-year 2021. As we were developing this tool, we recognized that there are many overlaps between all our tracking and reporting efforts, and therefore collecting all information into a centralized location and creating linkages will better streamline our efforts. The tool will consist of three interconnected data tables: 1) Implementation Actions Table, 2) Projects Table, and 3) Progress Reporting Table.

By linking these three tables, we will be able to use grant progress reporting to fulfill our Implementation Action reporting requirement since the progress of Implementation Actions directly relies upon the progress of both LISS funded and leveraged projects. Additionally, LISS will post selected fields collected through the tool onto the LISS website for public viewing, particularly focusing on the funded projects, to increase transparency and communication. These projects would then be linked to our Implementation Actions to show the relationship between the project and the CCMP. LISS also plans on tracking the estimated costs of each Implementation Action through both what we fund and leverage. Through SharePoint, LISS can create helpful and digestible visuals for our partners and also the public as we can plan to post them on the website, as well.

The following Coordination projects were approved to be funded in FY2021 to further our progress:

<b>Title:</b>	<b>NEIWPCCLISS Program Implementation Support: Task 2 - Program Management &amp; Travel Support</b>		
<b>Activity Type:</b>	Coordination	<b>Project Type:</b>	Ongoing
<b>Implementing Agency:</b>	NEIWPCCL	<b>Total Estimate Budget</b>	\$123,194.00
<b>Responsible Partners:</b>	N/A	<b>Federal Amount:</b>	\$123,194.00
		<b>Match Amount:</b>	\$0.00
<b>Objectives:</b>	NEIWPCCL will continue promoting efforts to restore and protect the Sound and its resources; highlight the LISS role in the protection of the Sound; promote an understanding and appreciation of the Sound as a regional ecosystem and a national treasure; and encourage action to restore and protect the Sound.		
<b>Description:</b>	NEIWPCCL will complete the following sub-tasks: Meeting Support, Participant Support, Program Management		
<b>Estimated Milestones:</b>	October 1, 2020 - September 30, 2025		
<b>CWA Program Elements</b>	Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
LISS Meeting Coordination - Coordinate logistical support for quarterly in-person MC and CAC Meetings.	4-2.	SM-13
Participant Support - Provide participant support (financial assistance) for LISS CAC & MC members, state, and other LISS partners to participate in LISS or NEP meetings/workshops/trainings in order to engage state and local governments, organizations, and other environmental stakeholders in LISS activities.	4-2.	SM-13; SM-14
Program Management & LISS Participation - Supervise NEIWPCCL staff located at LIS and NYS offices; Provide program management for NEIWPCCL partnership with LISS; Provide NEP support as requested by EPA or LISO; Staff participates in LISS workgroup and committee meetings.	4-2.	SM-13; SM-14
Reporting - Develop and report progress on NEIWPCCL's sections of the annual Long Island Sound Study work plans to consider progress made and recommendations for improving implementation to achieve desired outcomes.	4-3.	SM-35



<b>Title:</b>	<b>Connecticut State Coordination</b>		
<b>Activity Type:</b>	Coordination	<b>Project Type:</b>	Ongoing
<b>Implementing Agency:</b>	CT DEEP	<b>Total Estimate Budget</b>	\$863,923.00
<b>Responsible Partners:</b>	N/A	<b>Federal Amount:</b>	\$518,354.00
		<b>Match Amount:</b>	\$345,569.00
<b>Objectives:</b>	<p>These positions bring devoted CT DEEP resources to the LISS to achieve the full benefits of the partnership. These positions contribute to research, data analysis, planning, report writing and peer review essential to meeting LISS goals. These goals are implemented through the 2020 Long Island Sound CCMP and are consistent with the objectives of Connecticut's LISS 3 positions proposed here. Additionally, the positions assure Connecticut's goals address the appropriate targets to address these and other goals toward improving the quality of the LIS through the review and evaluation and implementation of the following Connecticut initiatives.</p>		
<b>Description:</b>	<p>Provide support for CT DEEP's LISS Coordinator, Technical Coordinator, and Modeling Coordinator to plan, implement, coordinate, manage, and progress projects that support the CCMP.</p>		
<b>Estimated Milestones:</b>	October 1, 2021 - September 30, 2023		
<b>CWA Program Elements</b>	<p>Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation</p>		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Oversee Cooperative Agreement Administration and develop work plans	4-2.	SM-14; SM-35
Participation in LISS workgroups and tasks	4-2.	SM-13
Coordinate and support diverse participation of state agency staff in activities relevant to the LISS partnership and implementation of the CCMP that meet state commitments to LISS	4-2.	SM-18; SM-29
Implementing the LIS 2015 CCMP - Update progress of CCMP priorities in the areas of hypoxia, toxic contamination, pathogens, living marine resources and land use; will contribute towards implementing CCMP revisions to water and watersheds, habitat and wildlife, communities and people, and science and management.	4-2.	SM-15; SM-36
Tracking and Reporting - Report on progress to ensure commitments to protect and restore LIS, and implementation plans are on track.	4-2.	SM-32; SM-33; SM-34
Coordinate DEEP review of grant proposals for LISS	4-3.	SM-23; SM-24

Dissemination of LIS Information and Outreach	3-2; 3-3	SC-19; SC-20
Implement the LIS Nitrogen TMDL and DEEP's Second Generation Nitrogen Strategy (nutrient reduction programs)	1-1.	WW-2; WW-4; WW-5; WW-6; SM-23; SM-36
Technical coordination of science and management for nitrogen reduction efforts	1-1.	WW-2; WW-4
Watershed planning and stormwater/nonpoint source implementation; Participate in EPA's LIS Nitrogen Reduction Strategy	1-1.	WW-2; WW-4; WW-13; WW-24; WW-25
Coordinate and manage watershed model update	1-1; 1-3	WW-14; WW-27; WW-28

b. **Research.** The LISS STAC met four times in FY2020, with primary investigators of funded projects and others making presentations to report on progress. The four meetings focused on Long Island Sound water quality monitoring, groundwater and nitrogen attenuation/role of forage fish, ocean acidification impacts, and environmental justice, respectively. STAC meeting minutes are posted on the [LISS website](#).

- **Long Island Sound Research Program:** Scientific research provides a key to better understanding and more effectively managing Long Island Sound. Recognizing the important role that research plays in decision-making, the EPA, CTSEA, and NYSEA developed a cooperative program to fund research in support of the LISS. Initiated in 1999, the Long Island Sound Research Grant Program awards funds to researchers whose work helps meet the needs of decision-makers to improve the management of Long Island Sound. Generally, the LISS has held competitions biennially, combining funds from two fiscal years. Research projects funded from prior cycles of the Research Program are ongoing. The LISS, through the CT and NY Sea Grant programs, continued to monitor the [four projects](#) selected for funding in 2019 and selected [eight new projects](#) to take place from 2021-2023. These projects will continue to be reported on in subsequent NEP work plans as the projects are completed.
- **Ecosystem Status and Trends:** The LISS federal, state, local and academia partners monitor ecosystem status and trends for a suite of [environmental indicators](#). The indicators are linked back to CCMP ecosystem targets and provide information on the abundance, diversity, distribution, viability, and/or quality and trends of the resource being monitored. As noted previously, the 2015 CCMP sets 20 ecosystem targets. Measuring, tracking, and reporting the ecosystem targets and indicators provides information to assess progress and refine and adapt management as needed. Reporting on targets and indicators on a periodic basis is a complex process, because the LISS does not directly pay for or support the data collection efforts for many of them. These are the province of other entities that are either directly responsible for that data collection by law, statute, regulation or by history or organizational preference. Instead, LISS works to use existing data when available, and collect new data as needed.

The following Research projects were approved to be funded in FY2021 to further our progress:

<b>Title:</b>	<b>Base-flow sampling to enhance understanding of the groundwater discharge component of nitrogen loading, in coastal basins draining to Long Island Sound</b>		
<b>Activity Type:</b>	Research	<b>Project Type:</b>	New
<b>Implementing Agency:</b>	USGS	<b>Total Estimate Budget</b>	\$250,000.00
<b>Responsible Partners:</b>	N/A	<b>Federal Amount:</b>	\$250,000.00
		<b>Match Amount:</b>	\$0.00
<b>Objectives:</b>	The objective of this project is to determine groundwater budgets and estimated nitrogen loads from groundwater streams and embayments.		
<b>Description:</b>	Project will sample a network of 30-50 stream sites during typical base-flow conditions to enhance understanding of the effects of onsite residential wastewater systems, and other urban land uses on stream base-flow water quality, by providing ground truth to nitrogen loads estimated by models.		
<b>Estimated Milestones:</b>	October 1, 2021 - September 30, 2022		
<b>CWA Program Elements</b>	Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
QAPP for streamflow measurement, nutrient sampling, and analysis	1-1; 1-3	WW-7; WW-27; WW-28
GIS analysis for site selection	1-1; 1-3	WW-7; WW-27; WW-28
Field reconnaissance	1-1; 1-3	WW-7; WW-27; WW-28
Water sample collection and discharge measurement	1-1; 1-3	WW-7; WW-27; WW-28
Data analysis	1-1; 1-3	WW-7; WW-27; WW-28
Reporting	1-1; 1-3	WW-7; WW-27; WW-28

<b>Title:</b>	<b>Trends in nitrogen loading from forested areas - A preliminary assessment for Long Island Sound</b>		
<b>Activity Type:</b>	Research	<b>Project Type:</b>	New
<b>Implementing Agency:</b>	USGS	<b>Total Estimate Budget</b>	\$127,000.00
<b>Responsible Partners:</b>	N/A	<b>Federal Amount:</b>	\$127,000.00
		<b>Match Amount:</b>	\$0.00
<b>Objectives:</b>	To investigate trends in nitrogen loads from forested areas and their implications for inputs to Long Island Sound		
<b>Description:</b>	The proposed work is to compile and review available data from long-term monitoring stations within the Long Island Sound watershed and in nearby areas in New England and New York in order to quantify nitrogen exports from undeveloped forested watersheds, document the pace of change in forest nitrogen exports and, to the extent possible, relate the observed changes to watershed dynamics. A first step in understanding these processes, which is proposed in this study, is to identify basins in which exports have and haven't increased, and then to begin to investigate the ancillary changes that have occurred in and around these basins, given the available data.		
<b>Estimated Milestones:</b>	October 1, 2021 - September 30, 2022		
<b>CWA Program Elements</b>	Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Compile available stream water-quality and flow data	1-1; 1-3	WW-7; WW-27; WW-28
Analyze trends in stream water-quality data	1-1; 1-3	WW-7; WW-27; WW-28
Compile information on atmospheric loads and changes overtime	1-1; 1-3	WW-7; WW-27; WW-28
Investigate changes in watershed characteristics where trends are identified	1-1; 1-3	WW-7; WW-27; WW-28
Prepare publications; publish results	1-1; 1-3	WW-7; WW-27; WW-28
Project QAPP and management	1-1; 1-3	WW-7; WW-27; WW-28

<b>Title:</b>	<b>Connecticut embayment tributary nitrogen removal: calibrating rates to geomorphology to improve parameterization of watershed loading models</b>		
<b>Activity Type:</b>	Research	<b>Project Type:</b>	New
<b>Implementing Agency:</b>	University of Connecticut	<b>Total Estimate Budget</b>	\$148,554.00
<b>Responsible Partners:</b>	N/A	<b>Federal Amount:</b>	\$98,670.00
		<b>Match Amount:</b>	\$49,884.00
<b>Objectives:</b>	The objectives are to measure rates of nitrate removal in stream tributaries discharging to eight Long Island Sound embayments; characterize stream geomorphology and discharge in stream reaches where nitrate removal is measured; and establish model proxies for nitrogen removal based on channel slope, hypsometry, sinuosity, discharge, and sediment grain size.		
<b>Description:</b>	This project aims to measure rates of nitrate removal in stream tributaries discharging to eight Long Island Sound embayments in CT. Rates will be measured in the field at the reach scale of several hundred meters to one kilometer. Rate measurements will be conducted under a range of discharge conditions and in reaches of varying geomorphology to establish model proxies for N removal based on channel slope, hypsometry, sinuosity, discharge, and sediment grain size. This calibration between rates and more-easily measured stream metrics can extrapolated to all embayment tributary modeling in CT.		
<b>Estimated Milestones:</b>	October 1, 2021 - September 30, 2022		
<b>CWA Program Elements</b>	Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Stream tracer experiments	1-3.	WW-27
Stream characteristics	1-3.	WW-27
Deriving model proxies	1-3.	WW-27
Reporting	1-3.	WW-27

**Title:** NY and CT Sea Grant Research Program

**Activity Type:** Research **Project Type:** Ongoing

**Implementing Agency:** New York and Connecticut Sea Gra **Total Estimate Budget** \$4,444,618.00

**Responsible Partners:** N/A **Federal Amount:** \$3,000,000.00  
**Match Amount:** \$1,444,618.00

**Objectives:** The first objective is to identify and fund high priority, high quality research needed to best achieve the vision, goals, and targets of the LIS CCMP. The second objective is to promptly share the results of the research and assessment work, providing critical, new, science-based information that can inform decision-making and actions towards reaching the vision and goals for Long Island Sound laid out in the CCMP.

**Description:** The New York and Connecticut Sea Grant programs (NYSG and CTSG ) propose to jointly administer a competitive research program to address the needs of the Long Island Sound Study (LISS). These needs are derived from the LISS Comprehensive Conservation and Management Plan (CCMP) and prioritized for developing a request for proposals (RFP) with input from the LISS Science & Technical Advisory Committee (STAC) and the Science Coordinator.

**Estimated Milestones:** October 1, 2021 – September 30, 2025

**CWA Program Elements** Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Select research projects through an open, competitive, peer review process.	4-1.	SM-1
Fund and administer the selected projects	4-1.	SM-1
Share results at the LISS Research Conference	4-1.	SM-1

Title:	NEIWPCC LISS Program Implementation Support: Task 5 - Science Coordination		
Activity Type:	Research	Project Type:	Ongoing
Implementing Agency:	NEIWPCC	Total Estimate Budget	\$175,314.00
Responsible Partners:	N/A	Federal Amount:	\$175,314.00
		Match Amount:	\$0.00
Objectives:	NEIWPCC will continue promoting efforts to restore and protect the Sound and its resources; highlight the LISS role in the protection of the Sound; promote an understanding and appreciation of the Sound as a regional ecosystem and a national treasure; and encourage action to restore and protect the Sound.		
Description:	The NEIWPCC LISS Science Coordinator will develop and maintain professional scientific and technical contacts among the LISS partners, as well as among local/regional/national/international scientific communities, as the issues or topics warrant. NEIWPCC's Science Coordinator will manage the scientific resources of the LISS, including collecting and organizing relevant references; and organizing and conducting conferences, meetings, symposia, or other web-based discussions on topics of relevance or concern to the science of the LIS ecosystem.		
Estimated Milestones:	October 1, 2020 - September 30, 2025		
CWA Program Elements	Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Coordinate scientific research activities - Coordinate and integrate science and research activities with state and federal partners and other scientists/scientific bodies; An informative report on a priority topic of the LIS will support informed management decision-making and funding to implement appropriate actions; Collect/organize references and conduct conferences/meetings on relevant topics and add to research bibliography database; Track, promote, or participate in research proposals as appropriate; Coordinate scientific resources of LISS and include in reports to EPA (2x per year)	1-3; 4-3	WW-28; SM-26; WW-39
Science liaison to partner groups and agencies - Represent LISS at one regional or national event annually; Assist Sea Grant programs with competitive research grant programs and biennial LIS research conference; Participate in development and assessment of data/analytical/modeling tools, including NYCDEP/EPA modeling efforts.	4-1; 1-1	SM-5; SM-11; WW-8
Coordination of the STAC and Water Quality Monitoring Workgroup - Hold regular meetings (3 times annually) of the STAC and Water Quality Monitoring workgroups. Distribute meeting agendas and minutes; Documented scientific research needs assessment process and priorities, to be updated regularly (approx. annually).	4-1; 1-3	SM-1; WW-28
Technical input - Provide approx. monthly input on science topics and priority issues for LISS communications/ website (see Task 1), including LISS environmental indicators and ecosystem targets and associated monitoring and reporting; Provide technical input to CAC and partner groups on LISS issues, as needed.	4-3.	SM-30; SM-34
Reporting - Develop and report progress on NEIWPCC's sections of the annual Long Island Sound Study work plans to consider progress made and recommendations for improving implementation to achieve desired outcomes.	4-3.	SM-35

- c. **Implementation Assistance.** The LISFF Grant program is the primary LISS vehicle for funding implementation projects to address CCMP and other program priorities at a local scale. The LISFF is administered by NFWF who provide technical Assistance to communities of practice in developing project proposals for their communities, including environmental justice, urban waters, youth and underserved communities and areas designated as distressed communities in Connecticut.

Up until FY2021, LISFF consisted of High Impact Projects (up to \$500,000); Large Implementation Grants (\$20,000-\$300,000); Planning and Design Grants (\$20,000-\$200,000); Citizen Science and Water Quality Monitoring Grants (\$20,000-\$75,000); and Education and Public Participation Grants (\$5,000-\$75,000) projects. In FY2020, the LIS Futures Fund was funded at \$3,600,000 and the Small Grants component is funded at \$50,000. The LISFF announced 38 grants totaling \$3.8 million to local government and community groups to improve the health and ecosystem of Long Island Sound. The LISFF 2020 projects will reach more than 670,000 residents through environmental and conservation education programs. Water quality improvement projects will treat 5.4 million gallons of stormwater, install 23,000-square-feet of green infrastructure, and prevent 3,000 pounds of nitrogen from entering Long Island Sound. The projects will also open 3.7 river miles and restore 108 acres of coastal habitat for fish and wildlife. The funds will be matched by \$4.6 million from the recipients, resulting in \$8.4 million in funding for on-the-ground conservation projects. The LISS initiated the Long Island Sound Futures Fund in 2005 through the U.S. EPA's Long Island Sound Office and NFWF. Prior to this year's grants the LISFF invested \$23 million in 450 projects. The program has generated an additional \$40 million in grantee match, for a total conservation impact of \$63 million for regional and local projects. The projects have added 105 river miles for fish passage, restored 773 acres of critical fish and wildlife habitat, treated 200 million gallons of pollution, and educated and engaged 3 million people in protection and restoration of the Sound. These [projects](#) are responsive to the new Long Island Sound CCMP and other LISS priorities.

For FY2021, the funding categories have changed to Implementation Project (\$50,000-\$1,000,000), Design/Planning Projects (\$50,000-\$400,000), Community Science/Water Quality Monitoring (\$50,000-\$100,000), and Education and Public Participation Grants (\$50,000-\$100,000). In December 2021, when the projects are selected and awards are administered, they will be categorized into one of the following program activities for tracking and reporting purposes: 1) Coordination, 2) Water Quality Planning and Implementation, 3) Modeling, 4) Monitoring, 5) Research, 6) Habitat Restoration and Protection, 7) Public Education and Outreach, or 8) Stewardship and Resiliency. The following table shows the level of FY2021 funding to LISFF:



Title:	Long Island Sound Futures Fund 2021		
Activity Type:	Implementation Assistance	Project Type:	Ongoing
Implementing Agency:	NFWF	Total Estimate Budget	\$11,466,667.00
Responsible Partners:	N/A	Federal Amount:	\$6,880,000.00
		Match Amount:	\$4,586,667.00
Objectives:	To help accelerate the restoration and protection of Long Island Sound through support of implementation activities that address the specific commitments and recommendations of the 2020-2024 CCMP.		
Description:	This project will 1) provide support for management of the Long Island Sound Futures Fund (LISFF) grant program NFWF, the direct recipient of the EPA Co-op funds; 2) provide individual grants to subrecipients with EPA Co-op monies towards projects that contribute to the protection and restoration of the health and living resources of Long Island Sound; and 3) make investments in on-the-ground actions in communities to improve water quality, protect habitat and living resources, educate and involve the public, improve the long-term understanding of how to manage the Sound, monitor progress, and redirect management efforts as described in the 2020 CCMP.		
Estimated Milestones:	October 1, 2021-September 30, 2026		
CWA Program Elements	Strengthening WQ Standards, Improving WQ Monitoring, Developing TMDLs, Controlling NPS Pollution on a Watershed Basis, Strengthening NPDES Permits, Supporting Sustainable Wastewater Infrastructure, Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Adapt the LISFF to strategically address the CCMP Update, increased funding and changing scope of work	4-2.	SM-13
Develop LISFF RFP and associated application materials	4-2.	SM-13
Disseminate RFP through partners and multiple formats	4-2.	SM-13
Deliver multiple forms of applicant and subrecipient technical assistance	4-2.	SM-13
Conduct proposal evaluations	4-2.	SM-13
Deliver technical networking and grant announcement event	4-2.	SM-13
Deliver multiple forms of education about LISFF investments and impact	4-2.	SM-13
Engage federal and nonfederal partnerships and networks	4-2.	SM-13

**C. Previous Year’s (FY2020) Projects/Activities Highlights**

- 1. Goals and Accomplishments. Describe goals that the program met and highlight programmatic accomplishments as well as project/activity short-term and intermediate outcomes. Highlight long-term environmental results achieved wherever possible. Include outcome and/or environmental results information about projects that required substantial NEP staff time but which were sponsored/funded by others, e.g.,**

*foundations, Federal or state partners.*

The following goals and accomplishments focus on the areas of special interest mentioned in the NEP Program Evaluation Guidance: a) Reduction in Nutrient Pollution, b) Water Reuse and Conservation, c) Marine Litter Reduction, and d) Green Infrastructure and Resiliency. In Section B, we highlight FY2020 activities and accomplishments related to 1. Clean Waters, 2. Healthy Ecosystems, 3. Strong Communities, and 4. Sound Science and Inclusive Management. The LISS is willing to discuss any of its ongoing programs and activities with NEP staff that were felt to be worthy of technology transfer to other NEPs; this can be done in conjunction with this Work Plan. The LISS website, the nitrogen TMDL, the bioextraction projects funded in prior years, the LISS environmental indicators, *Sound Health* and *Protection & Progress* are all examples of successful and transferable products and activities from which the other NEPs may benefit.

**a. Reduction in Nutrient Pollution**

Point Source Load Reduction. The LISS partners continued the point source nitrogen reduction program in Long Island Sound in 2020. The total Trade-Equalized (TE) point source nitrogen load for 2020 was 19,263 TE lbs/day. This is below the wasteload allocation set in the 2000 Nitrogen TMDL. In total, the 100 NY and CT wastewater treatment plants (WWTPs) discharging to Long Island Sound have reduced nitrogen by 47 million pounds annually compared to baseline levels established in the 2000 TMDL. In 2020, discharges decreased by 12.7% compared to 2019, and remained below the final TMDL targets. In both 2018 and 2019, the annual total nitrogen discharged from wastewater treatment plants (WWTP) in CT and NY increased for the first time since 2011 but remained below the Total Maximum Daily Load (TMDL) allocation and permit limits. The observed increase was likely caused by a greater than normal amount of precipitation in both years. Rainfall entering a wastewater treatment plant, either through the sewage pipe system or by depositing directly onto sewage storage tanks, can reduce the efficiency of the plant's ability to treat and remove nitrogen before discharging into Long Island Sound. However, the annual total nitrogen discharged from WWTPs has been the lowest on record for CT and NY. While the LISS does not directly fund this goal area and important CCMP activity, funds for STP nitrogen upgrades result from a combination of EPA State Revolving Funds, Connecticut's state Clean Water Fund and Bond Acts, and New York State's Clean Water/Clean Air Bond Act funds and other sources, including NYC bonds and funding for NYC STP upgrades. Attachment 5 depicts the reductions in Trade-equalized point source loadings from 1995-2020.

Area/Duration of Hypoxia. The maximum area of hypoxia (less than 3 milliliters (ml) of DO per liter of bottom water) in 2020 was 63 square miles. The 2019 5-year rolling average for the maximum summertime area of low dissolved oxygen (hypoxia) in Long Island Sound was estimated at 94 square miles. This represents a 55 percent decline in the five-year rolling average compared to the pre-2000 average of 205 square miles (i.e., before the Total Maximum Daily Load was put in place by EPA and the states). This is the fourth smallest area of hypoxia recorded in the past 33 years; the hypoxic areas in 2015, 2018, 2020, and 2017 are the second, third, fourth and fifth smallest recorded. The severity of hypoxia has also declined, with no area in the open waters below 1 mg/l dissolved oxygen in eight of the past nine years. The LISS provides funding to CT DEEP to conduct the LIS WQ monitoring program year-round, with additional monitoring runs during the summer months. Other ambient factors affect the formation of the hypoxic zone in the Sound, including water and air temperature, rainfall, solar radiation, wind direction and velocity, currents, storm events and any resulting biological effects such as algae formation. The 2020 hypoxic event lasted an estimated 43 days, beginning on July 10 and ending September 10. However, the duration does not include the period between August 16 and September 7 when

oxygen levels in those three stations were greater than 3.0 mg/L. Importantly, the duration was below the average of 54 days for the entire time series. Attachment 6 depicts the area/duration of the maximum hypoxia event in Long Island Sound since 1987 as measured by CT DEEP.

NPS Load Reductions/On-Site Treatment. The CCMP calls for actions to address NPS (NPS) pollution to the Sound, including actions to address on-site waste treatment systems (OWTS), or septic systems. The LIS TMDL addresses NPS pollution, requiring a 10 percent reduction through direct projects or best management practices and other methodologies. CT DEEP also is engaged in the Second-Generation Nitrogen Strategy, which endeavors to complement the sound wide TMDL by assessing local impairments and local nitrogen sources contributing to them.

**b. Water Reuse and Conservation**

The LISS does not particularly fund projects focused on this special interest as it is not a prominent issue in our region.

**c. Marine Litter Reduction**

The LISS partners have addressed marine litter reduction primarily through the LISFF program where projects focus on marine litter reduction, prevention, and education. The following projects closed in FY2020 which estimated 52,534 pounds of marine debris collected:

- Project WASTE (Waterway and Street Trash Elimination) where Bronx River Alliance addressed floatable trash through hands-on data collection and assessment, source detection, and student-driven community outreach and education along the Bronx River, a major subwatershed of Long Island Sound, in the Bronx and up-stream in Westchester.
- Going Strawless for Sea Turtles: Educating to Protect Marine Life and Eliminate Single-use Plastics where Citizens Campaign Fund for the Environment, Inc. used environmental education, social marketing, and hands-on activities to reduce the use and amount of plastic straws and utensils polluting Long Island Sound beaches, bays and harbors, in Nassau and Suffolk Counties within the Long Island Sound watershed, New York.
- Long Island Sound Beach Cleanup 2018 where American Littoral Society coordinated the annual International Coastal at 58 sites throughout the Sound, engaged local kayak and dive groups to collect floatable trash, and educated volunteers about the risks of marine pollution to the Sound, and provide actions people can take to prevent pollution.
- Partnering for Marine Debris & Trash Prevention and Animal Rescue around Long Island Sound where Sea Research Foundation, Inc. provided the public with opportunities for educational programming and direct environmental stewardship to increase interest in and knowledge of solutions to reduce the impact of floatable trash and marine debris on the Long Island Sound and its waterways.

**d. Green Infrastructure and Resiliency**

The LISS partners have addressed green infrastructure primarily through the LISFF program. The following projects closed in FY2020 which estimated 9,211 square feet of green infrastructure installed and 8,581 gallons of stormwater prevented:

- Promoting Green Infrastructure through Monitoring & Evaluation of Bioswales where the New Haven Urban Resources Initiative evaluated the effectiveness of Green Infrastructure bioswales at a large-scale in New Haven, Connecticut.
- Rain Gardens and Rain Barrels for Eastern Connecticut where the Eastern Connecticut Conservation District addressed stormwater pollution into the Thames River and Long Island Sound by installing rain gardens and rain barrels in Eastern Connecticut.

**2. Completed Projects.** *For completed projects that were funded by a CWA §320 sub-award, indicate: project purpose; entity that led project implementation; final grant amount – if project came in under budget, describe how remaining funds will be reallocated to ensure expenditure during the project period; project deliverable(s) and project completion date.*

The LISS is an ongoing partnership of Federal, state, and local organizations implementing the cleanup and restoration plan for Long Island Sound. The LISS is not organized by ‘project’ and its program functions are distributed across its partners. Therefore, unless there are specific and discrete sub-grant projects that have been completed, this reporting category does not adequately represent the LISS organizational and reporting structure. However, in FY2020, one partner’s assistance award funded in prior fiscal years have been completed and their EPA awards closed out:

- LI96196201, \$427,393.29 to Connecticut Sea Grant for Long Island Sound Research Program 2015-2020

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**LONG ISLAND SOUND STUDY  
NATIONAL ESTUARY PROGRAM WORK PLAN  
LIST OF FY2021 LISS-FUNDED STAFF**

<b>ORGANIZATION/NAME</b>	<b><u>LISS TITLE</u></b>	<b><u>DESCRIPTION OF RESPONSIBILITIES/ACTIVITIES</u></b>
<b><u>EPA</u></b>		
Mark Tedesco	Director, LIS Office	Direction of office and program
Leah O'Neill	EPA R1 Program Coordinator	Project officer, nitrogen strategy, program policy, NEPORT
Nikki Tachiki	EPA R2 Program Coordinator	Project officer, sustainable and resilient communities, EJ
Cayla Sullivan	EPA R2 Program Coordinator	Project officer, habitat, marine debris
Bessie Wright (0.5 FTE)	EPA R1 Program Coordinator	Project officer, nonpoint source management, EJ
Alex Huddell	ORISE Research Fellow	Open science, data management and reporting
Esther Nelson	EPA R2 - Detail	QAPPs, coordination with federal partners, support for watershed & embayments
Jordan Welnetz	EPA R2 Summer Intern	EJ mapping, climate change and sentinels, behavior change
<b><u>CT DEEP</u></b>		
Mark Parker	Environmental Analyst 3	Coordinates overall LIS program in CT
Kelly Streich	Environmental Analyst 3	TMDL and technical support lead
Kathleen Knight	Environmental Analyst 2	Modeling lead
Katie Clayton-O'Brien	Environmental Analyst 2	Water quality sampling/analysis
Matthew Lyman	Environmental Analyst 3	Water quality sampling/analysis
Tommy Seda	Boat Captain	RV John Dempsey CT DEEP WQ Monitoring.
Christine Olsen	Environmental Analyst 3	Water quality sampling/analysis
Harry Yamalis	Environmental Analyst 2	Coordinates habitat restoration plans/projects in CT
<b><u>NYSDEC</u></b>		
Vacant (state funded)	LIS Coordinator	Coordinates overall LIS program in New York
Mary Arnold	DW Coordinator	Coordinates Division of Water programs
<b><u>NY Sea Grant</u></b>		
Jimena Beatriz-Perez Viscasillas	NY Outreach Coordinator	Develops and implements communications plans and public information/education program in NY
Karen Palmeri	Administrative Support	Supports Extension Specialist. (33%)
Three Positions TBD	NY Sustainable and Resilient Community Circuit Riders	Support local communities in implementing the Sustainable and Resilient Communities work plan.
TBD	NY WLIS Outreach Coordinator	Develops and implements communications plans and public information/education program in NYC and Westchester, NY.
<b><u>NEIWPC</u></b>		
Robert Burg	LISS Communications Coordinator	Coordinates the overall LISS communications program
James Ammerman	Science Coordinator	Coordinates LISS science and research program

Jordan Bishop (0.5 FTE)	Environmental Analyst I	Overall LIS coordination and support
Victoria O'Neill	NYSDEC Habitat Restoration Coordinator	Coordinates habitat restoration plans/projects in the NY
Kristin Kraseski	Bioextraction Coordinator	Coordinate bioextraction planning and projects
<b>CTSEA</b>		
Judy Preston	CT Outreach Coordinator	Provides PI&E support and coordination in CT
Two Positions TBD	CT Sustainable and Resilient Community Circuit Riders	Support local communities in implementing the Sustainable and Resilient Communities work plan

<b>Organization &amp; Base Program Activity</b>	<b>Final Budget Request</b>	<b>Required Program Match</b>	<b>Actual Match Via Award</b>	<b>Overmatch Required or (Provided)</b>
<b>1. EPA Long Island Sound Office</b>	<b>\$362,950</b>	<b>NA</b>	<b>NA</b>	<b>\$0</b>
a. Office operating expenses	\$10,500	\$0	NA	
b. EPA HQ administration	\$4,000	\$0	NA	
c. LIS R2 Program Support & ORISE	\$198,450	\$0	NA	
d. R1 LIS Program	\$150,000	\$0	NA	
<b>2. Connecticut Dept. of Energy &amp; Environmental Protection</b>	<b>\$7,873,077</b>	<b>\$5,248,718</b>	<b>\$9,478,719</b>	<b>(\$4,230,001)</b>
a. CT State Coordination and Technical Support	\$518,354	\$345,569	\$345,569	
b. LIS Water Quality Monitoring Program	\$1,304,909	\$869,939	\$869,939	
c. CT Habitat Restoration Coordination	\$209,364	\$139,576	\$139,576	
d. Metropolitan District Commission, South Hartford Conveyance and Storage Tunnel project (CWF 692-C) as LIS Match and Program Overmatch	State Overmatch		\$4,500,000	
e. CT River Monitoring (USGS)	\$52,000	\$34,667	\$34,667	
f. Stormwater Management Education	\$185,000	\$123,333	\$123,333	
g. Repair and modification of the RV John Dempsey	\$100,000	\$66,667	\$66,667	
h. Acoustic Data Acquisition for Seafloor Mapping (\$701,000)	\$286,500	\$191,000	\$191,000	
i. Transport of freshwater cyanobacteria toxins to marine shellfish	\$100,000	\$66,667	\$66,667	
j. Embayment Data Collection for Modeling	\$1,500,000	\$1,000,000	\$1,000,000	
k. Expansion of Phase II Onsite Wastewater Treatment System Study	\$296,000	\$197,333	\$197,333	
l. Development of Watershed Operations Plan for Implementation of BMPs	\$100,000	\$66,667	\$66,667	
m. Connecticut Watershed Model - Year 3 of 3	\$1,700,000	\$1,133,333	\$1,133,333	
n. Acoustic telemetry array for monitoring fish in LIS	\$100,950	\$67,300	\$67,300	
o. Tidal Flow Restoration at the Barn Island Management Area, Stonington	\$1,200,000	\$800,000	\$800,000	
p. Installation of Self-Regulating Tide Gates at Hammock River, Clinton, CT	\$220,000	\$146,667	\$146,667	
<b>3. NY State Dept. of Environmental Conservation (Div. Marine Resources)</b>	<b>\$2,000,000</b>	<b>\$1,566,667</b>	<b>\$1,677,933</b>	<b>(\$111,266)</b>
a. NY State Match & Overmatch: Stewardship Acquisition			\$1,677,933	
b. Support for Stewardship Land Acquisition by the NYSDEC (CWA 320)	\$700,000	\$700,000		
b. Support for Stewardship Land Acquisition by the NYSDEC (CWA 119)	\$1,300,000	\$866,667		
<b>4. NY State Dept. of Environmental Conservation (Div. Water)</b>	<b>\$1,300,000</b>	<b>\$866,667</b>	<b>\$1,266,667</b>	<b>(\$400,000)</b>
a. New York State Asset Management Pilot Program Phase II	\$1,000,000	\$666,667	\$1,266,667	
b. Solute Transport Model Western portion of LI	\$300,000	\$200,000		
<b>5. Univ. of Connecticut/ CT Sea Grant Public Outreach (Coop. Agreement)</b>	<b>\$551,001</b>	<b>\$268,317</b>	<b>\$29,402</b>	<b>\$238,915</b>
a. CT PI&E Coordination & STAC support	\$130,586	\$6,873	\$6,873	\$0
b. K-12 Mentor Teacher Program	\$30,670	\$1,614	\$1,614	\$0
b. Implementation of Sustainable and Resilient Communities work plan	\$389,745	\$259,830	\$20,513	\$239,317
<b>6. NY Sea Grant Cornell U. Public Outreach (Coop. Agreement)</b>	<b>\$999,535</b>	<b>\$506,848</b>	<b>\$53,367</b>	<b>\$453,481</b>
a. NY Public Outreach Program	\$218,402	\$145,127	\$11,495	\$133,632
b. K-12 Mentor Teacher Program	\$8,998	\$474	\$474	\$0
c. LISS Outreach Coordination in NYC and the Western Basin	\$250,000	\$13,158	\$13,158	\$0
d. Implementation of Sustainable and Resilient Communities work plan	\$522,135	\$348,090	\$27,481	\$320,609
<b>7. NE Interstate Water Pollution Control Commission</b>	<b>\$1,427,901</b>	<b>\$815,564</b>	<b>\$0</b>	<b>\$815,564</b>
a. Task 1 Outreach/Education Support	\$222,089	\$11,689	\$0	\$11,689
b. Task 2 Program Management & Participant Support	\$123,194	\$82,129	\$0	\$82,129

d. Task 3 NYSDEC Habitat Restoration	\$315,369	\$210,246	\$0	\$210,246
e. Task 5 Science Coordination	\$175,314	\$116,876	\$0	\$116,876
f. Task 7 Nitrogen Reduction Coordination	\$291,935	\$194,623	\$0	\$194,623
g. Task 8 Bioextraction Initiative	\$300,000	\$200,000	\$0	\$200,000
<b>8. Interstate Environmental Commission</b>	<b>\$608,045</b>	<b>\$405,363</b>	<b>\$400,000</b>	<b>\$5,363</b>
a. Ongoing water quality sampling	\$315,068	\$210,045	\$204,682	\$5,363
b. Pathogen monitoring to mitigate shellfish harvesting water closures, NY	\$292,977	\$195,318	\$195,318	\$0
<b>9. Univ. of Connecticut Water Quality monitoring</b>	<b>\$498,013</b>	<b>\$332,009</b>	<b>\$91,437</b>	<b>\$240,572</b>
a. Ongoing water quality sampling	\$192,013	\$128,009	\$16,437	\$111,572
b. Recapitalization of Instruments and Autonomous Hypoxia Mapping	\$306,000	\$204,000	\$75,000	\$129,000
<b>10. Univ. of Connecticut Water Quality modeling</b>	<b>\$98,670</b>	<b>\$65,780</b>	<b>\$49,884</b>	<b>\$15,896</b>
a. CT embayment tributary N removal: to improve watershed loading models	\$98,670	\$65,780	\$49,884	\$15,896
<b>11. EPA Nitrogen Contract</b>	<b>\$153,050</b>	<b>\$0</b>	<b>NA</b>	<b>\$0</b>
<b>12. National Fish &amp; Wildlife Foundation</b>	<b>\$6,880,000</b>	<b>\$4,586,667</b>	<b>\$4,586,667</b>	<b>\$0</b>
<b>13. Save the Sound/CT Fund for the Environment</b>	<b>\$1,280,000</b>	<b>\$853,333</b>	<b>\$514,862</b>	<b>\$338,471</b>
a. Unified Water Study Embayment Monitoring	\$765,000	\$510,000	\$514,862	\$0
b. Design for a Living Shoreline Resiliency Project at Chittenden Park, CT	\$515,000	\$343,333	\$0	\$338,471
<b>14. Univ. of Connecticut/ CT Sea Grant Research Program (Grant)</b>	<b>\$1,722,673</b>	<b>\$1,042,421</b>	<b>\$724,618</b>	<b>\$317,803</b>
a. LIS Research Program	\$1,500,000	\$1,000,000	\$724,618	\$275,382
b. Long Island Sound Study Public Perception Survey	\$172,673	\$9,088	\$0	\$9,088
c. Research Conference	\$50,000	\$33,333	\$0	\$33,333
<b>15. Research Foundation SUNY/NY Sea Grant Program (Grant)</b>	<b>\$1,678,085</b>	<b>\$1,118,723</b>	<b>\$720,000</b>	<b>\$398,723</b>
a. LIS Research Program	\$1,450,000	\$966,667	\$720,000	\$246,667
b. EJ Needs Assessment in the Long Island Sound Watershed	\$228,085	\$152,057	\$0	\$152,057
<b>16. USGS CT Interagency Agreement - WQ Sampling</b>	<b>\$240,000</b>	<b>\$0</b>	<b>NA</b>	<b>\$0</b>
b. Major Long Island Sound Tributary Sampling	\$240,000	\$0	NA	
<b>17. USGS CT Interagency Agreement - Program Support</b>	<b>\$627,000</b>	<b>\$0</b>	<b>NA</b>	<b>\$0</b>
a. LISS Staff Program Support	\$250,000	\$0	NA	
b. Base-flow sampling to enhance understanding of the groundwater discharge	\$250,000	\$0	NA	
c. Trends in N loading from forested areas - Preliminary assessment for LIS	\$127,000	\$0	NA	
<b>18. USGS NY Interagency Agreement - Compound flood risk modeling</b>	<b>\$500,000</b>	<b>\$0</b>	<b>NA</b>	<b>\$0</b>
<b>19. National Audubon Society</b>	<b>\$2,000,000</b>	<b>\$1,333,333</b>	<b>\$150,000</b>	<b>\$1,183,333</b>
<b>20. NCCA Sampling EPA Contract</b>	<b>\$300,000</b>	<b>\$0</b>	<b>NA</b>	<b>\$0</b>
<b>Total:</b>	<b>\$31,100,000</b>	<b>\$19,010,411</b>	<b>\$19,743,556</b>	<b>-\$733,145</b>
<b>Fiduciary Reserve</b>	<b>\$0</b>			
<b>Final Total:</b>	<b>\$31,100,000</b>			
<b>Funding Target:</b>	<b>\$31,100,000</b>			
<b>Funds Remaining:</b>	<b>\$0</b>			
<b>Final budget target for FY21 = \$31,100,000</b>				
<b>\$30,400,000 for LIS Section 119 funds and \$700,000 for NEP Section 320 funds</b>				
		<b>Amount Exceeding Required Program Match:</b>	<b>\$733,145</b>	



Program Code/Grant #	Funding Opportunity # (grants.gov)	Project Officer	Awarding Region	Grants Specialist	Recipient	Description	R1 Fed Award Amount (000B67) CWA 119	R2 Fed Award Amount (000B67) CWA 119	Fed Award Amount (000B89) CWA 320
LI-96248820-0	EPA-CEP-01 CFDA 66.437	Chris Dere/ Cayla Sullivan	2	Janeime Castro	NY State DEC	This agreement provides assistance to the NYSDEC to provide additional support for the acquisition of the Shoreham Power Plant property, which will support the CCMP to protect and restore land in Long Island Sound.		\$1,300,000	\$700,000
LI-New	EPA-CEP-01 CFDA 66.437	Cayla Sullivan	2	Janeime Castro	NY State DEC	This agreement would launch Phase II of the Asset Management Pilot Program to build engineering capacity and technical expertise so that NYS's municipalities can access high quality asset management programs in a cost effective manner. Additionally, this agreement will provide assistance to further develop the Solute Transport Model to predict how nitrogen reduction strategies impact the Sound in relation to water table fluctuation, water use, and nitrogen loading as a function of changing land use and atmospheric deposition rates.		\$1,300,000	\$0
LI-96244521-0	EPA-CEP-01 CFDA 66.437	Mark Tedesco	2	Janeime Castro	Cornell University Office of Sponsored Programs	This agreement provides assistance to the Cornell University Office of Sponsored Programs to implement its project to support the Long Island Sound Comprehensive Conservation and Management Plan to protect and restore Long Island Sound. Specifically, this cooperative agreement has two elements: 1) Conduct the planning, organization and implementation of public environmental education and involvement programs, including those from environmental justice communities, for the Long Island Sound in the State of New York. This project will promote citizen involvement and citizen education to protect New York coastal resources in the Long Island Sound watershed. This will be accomplished through two full-time public education and outreach coordinators that will develop and disseminate accurate, up-to-date, research-based information about Long Island Sound, the Long Island Sound Study, and implementation activities of the various Long Island Sound Study partner agencies. This work will support activities that report on or promote implementation of the Long Island Sound Comprehensive Conservation and Management Plan. 2) Provide technical assistance to support Sustainable and Resilient Communities, consistent with the Long Island Sound Comprehensive Conservation and Management Plan. Three extension staff will act as "circuit riders" who will link programs for sustainability and resilience to local governments. Initial work will assess local government needs for assistance, develop and maintain a clearinghouse of tools and resources, create and deliver training programs to improve the use of existing tools, improve coordination among levels of government, and identify and lower the barriers to local initiatives to increase sustainability and resilience.		\$999,535	\$0
LI-9624421-0	EPA-CEP-01 CFDA 66.437	Nikki Tachiki	2	Janeime Castro	SUNY Research Foundation (Sea Grant)	This agreement provides assistance to the State University of New York - Research Foundation (SUNY Research Foundation) to administer the Long Island Sound Research Grant program to identify scientific research needs and priorities, solicit and manage scientific peer review of proposals, and manage the selection and completion of the highest priority proposals. The project will result in at least one sub-award for research to improve understanding of Long Island Sound critical to improving water and habitat quality. Additionally, this agreement will implement the environmental justice needs assessment.		\$1,678,085	\$0

LI-96244321-0	EPA-CEP-01 CFDA 66.437	Chris Dere	2	Janeime Castro	Save The Sound	This agreement provides assistance to Save the Sound to coordinate and implement the Unified Water Study, which establishes a comparable bay-to-bay dataset describing the eutrophic conditions and environmental health of bays and harbors around the Long Island Sound. Additionally, this agreement will design a living shoreline resiliency project at Chittenden Park, CT.		\$1,280,000	\$0
LI-96244221-0	EPA-CEP-01 CFDA 66.437	Aimee Boucher R2	2	Janeime Castro	Interstate Environmental Commission	This agreement provides assistance to the Interstate Environmental Commission to 1) conduct water quality monitoring of summer hypoxic conditions in western Long Island Sound and its embayments; 2) continue coordinated monthly, weekly and bi-weekly long-term monitoring of a suite of in-situ parameters at a network of 22 historical monitoring stations; and 3) coordinate with the Connecticut Department of Energy and Environmental Protection and other Long Island Sound Study partners involved in monitoring Long Island Sound. Additionally, this agreement will implement a new pathogen monitoring project to mitigate shellfish harvesting water closures.		\$608,045	\$0
LI-00A00954-0	EPA-CEP-01 CFDA 66.437	Nikki Tachiki R2	1	Adam Blanchette for Julie Ross	CT Sea Grant Research	This agreement provides assistance to the University of Connecticut to administer the Long Island Sound Research Grant program to identify scientific research needs and priorities, solicit and manage scientific peer review of proposals, and manage the selection and completion of the highest priority proposals. The project will result in at least one sub-award for research to improve understanding of Long Island Sound critical to improving water and habitat quality. Additionally, this agreement will implement the first year, of five, of the Sustainable and Resilient Communities Work Plan.	\$1,722,673		\$0
LI-00A00697-0	EPA-CEP-01 CFDA 66.437	Leah O'Neill	1	Brian Tocci	National Audubon Society	This agreement provides assistance to the National Audubon Society to apply multiple, proven restoration techniques at a large federal-protected salt marsh complex to restore ~39 acres for marsh-dependent species of conservation concern including saltmarsh sparrow, marsh pink, and diamond-backed terrapin.	\$2,000,000		
LI-00A00954	EPA-CEP-01 CFDA 66.437	Nikki Tachiki R2	1	Trevor Tavano for Julie Ross	CT Sea Grant PI & E	This project will 1) plan, organize, coordinate and implement public environmental education programs, including the K-12 Mentor Teacher Program, for the Long Island Sound program in the State of Connecticut by working with the LISS Management Conference partners in assessing needs and developing priorities, and 2) promote citizen involvement and citizen education to protect coastal resources in the Long Island Sound watershed.	\$551,001		\$0
LI-New	EPA-CEP-01 CFDA 66.437	Bessie Wright	1	Brian Tocci	National Fish & Wildlife Foundation	NFWF LIS Futures Fund 2021----As directed by Sections 119(d) and 320 of the Clean Water Act, this project implements recommendations of the CCMP. The grant supports activities to support community-based efforts to restore Long Island Sound by providing sub-grants, through the NFWF, on a competitive basis through the Long Island Sound Futures Fund. Funded projects will educate and involve the public, protect, and restore habitat, and reduce polluted runoff. This program will promote direct citizen involvement and individual and community actions to protect and restore the Sound.	\$6,880,000		\$0
LI-00A00953-0	EPA-CEP-01 CFDA 66.437	Cayla Sullivan	1	Adam Blanchette for Julie Ross	Univ. of Connecticut -WQ	UCONN Dept Marine Services WQ Monitoring---- As directed by Sections 119(d) and 320 of the Clean Water Act, this project implements recommendations of the CCMP. The grant agreement supports activities to assess the accuracy of water quality monitoring data used to measure the area and extent of hypoxia, or lack of dissolved oxygen, in Long Island Sound, and enhance those data by acquisition and deployment of new equipment and the application of new or enhanced water quality monitoring and assessment methodologies and techniques, including remote sensing.	\$498,013		\$0

LI-00A00990-0	EPA-CEP-01 CFDA 66.437	Cayla Sullivan	1	Trevor Tavano for Julie Ross	Univ. of Connecticut -WQ Modeling	CT embayment tributary N removal: to improve watershed loading models	\$98,670		\$0
LI-00A01032-0	EPA-CEP-01 CFDA 66.437	Leah O'Neill	1	Robert Smith for Julie Ross	CTDEEP	This agreement provides assistance to the Connecticut Department of Energy and Environmental Protection to implement its project to support the CCMP to protect and restore the chemical, physical and biological integrity of Long Island Sound. Specifically, projects include coordination and technical support, monitoring and modeling initiatives, and multiple habitat restoration efforts.	\$7,873,077		\$0
LI-00A00688-1	EPA-CEP-01 CFDA 66.437	Bessie Wright	1	Brian Tocci	NEIWPC	This agreement provides assistance to the New England Interstate Water Pollution Control Commission to implement its project to support the CCMP to protect and restore the chemical, physical and biological integrity of Long Island Sound and to assist the states of Connecticut and New York, and other public or nonprofit entities in conducting research, experiments, investigations, training, demonstration, surveys, or studies related to reducing pollution and improving the quality of the environment to sustain living resources in the Long Island Sound. Specifically, the projects include coordination and support, water quality planning implementation, and habitat restoration efforts	\$1,427,901		\$0
Contract		Leah O'Neill	1	Ray Cody	Phase 3 N Strategy	EPA contract for Nitrogen Strategy through Tetra Tech, Phase 2 - Option Period	\$153,050		
Contract		Hugh Sullivan	1		EPA HQ	This agreement will provide assistance to EPA HQ for the National Coastal Condition Assessment, which will sample 60 sites in embayments in CT and NY for physico-chemical, dissolved nutrient, sediment, and benthic macroinvertebrate community assemblage data.	\$300,000		
Interagency Agreement		Nikki Tachiki	2		USGS NY	This agreement will provide assistance to USGS NY to initiate a 3-year modeling initiative on the compound flood from upstream river flow and downstream tides, storm surge and sea level rise. This project is part of the 5-year Sustainable and Resilient Communities Work Plan.		\$500,000	
Interagency Agreement		Bessie Wright	1		USGS CT	This agreement will provide assistance to USGS CT for Tributary monitoring.	\$240,000		
Interagency Agreement		Bessie Wright	1		USGS CT	This agreement will provide assistance to USGS CT to support modeling initiatives including CT staff support (\$250,000), Base-flow sampling for groundwater discharge (\$250,000) and Trends in N loading (\$127,000).	\$627,000		
FTE		Leah O'Neill	1		EPA	This contract will provide assistance for R1 Staff Support.	\$150,000		
FTE		Mark Tedesco	2		EPA	This contract will provide assistance for R2 Staff support, ORISE and QAPP contract		\$198,450	
Budget Total:							\$22,521,385	\$7,864,115	\$700,000
<b>Final Budget total:</b>									<b>\$31,085,500</b>
<b>Unallocated:</b>									<b>\$0</b>

**Long Island Sound Study**  
**Travel Documentation for LIS NEP Work Plan**  
**July 1, 2020 - June 1, 2021**

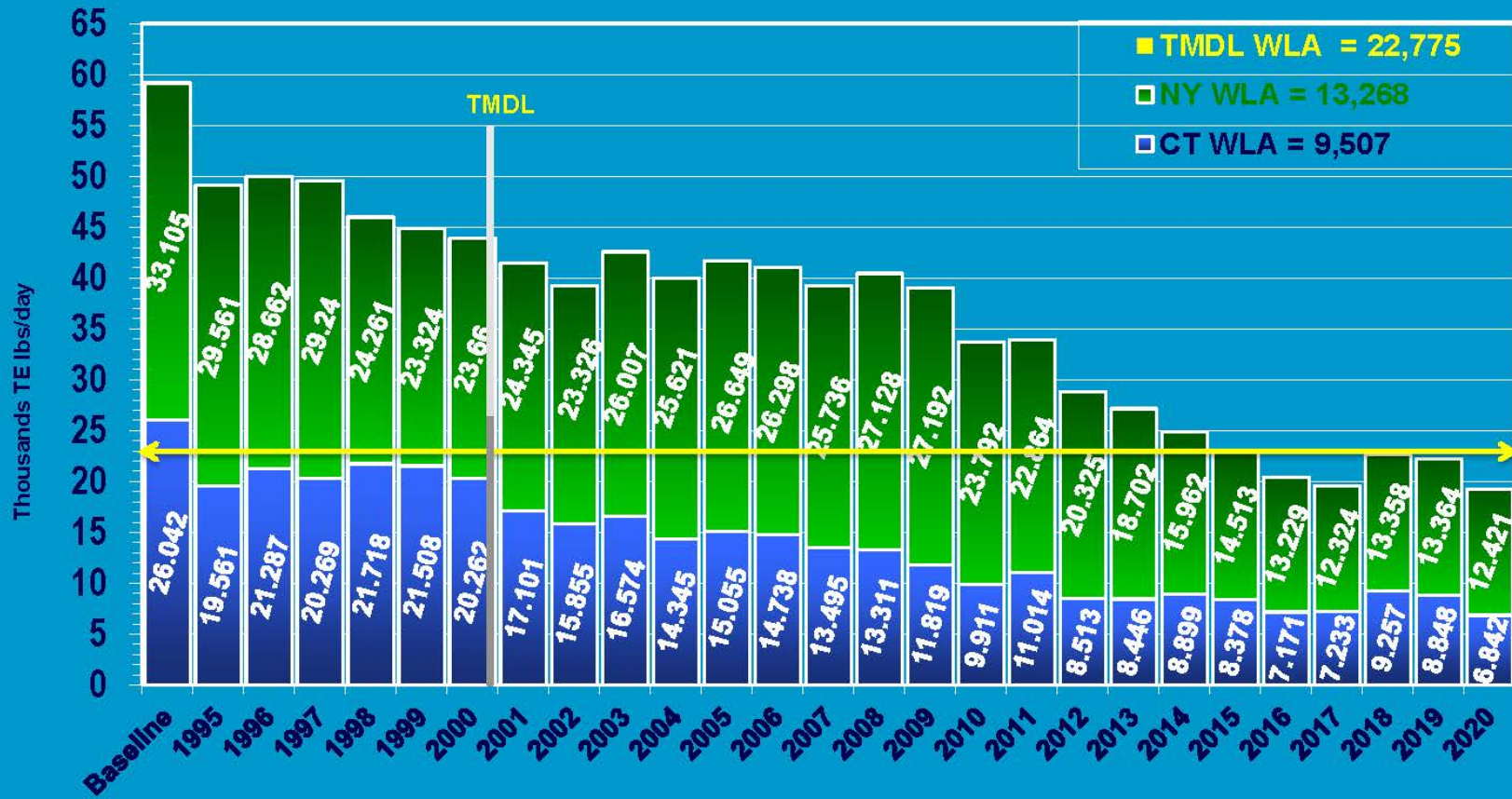
<b>LISS PARTNER TRAVEL SUPPORT</b>					
<b>Meeting Date</b>	<b>Meeting Title</b>	<b>Meeting Location</b>	<b>Affiliation</b>	<b>Expense (\$)</b>	<b>Grant Number</b>
9/29-10/1/2020	Restore America's Estuaries 2020 Virtual Summit	Virtual	NYC Parks	275.00	LI-00A00384
10/9/2020	Site visit at Minor Rd, East Haven (house proposed in/near TW)	East Haven, CT	CT DEEP	40.25	LI-00A00384
10/15/2020	NEERS Fall 2020 Registration	Virtual	CT DEEP	10.00	LI-00A00384
10/26/2020	Regulatory & Planning Site visit for Tidal Marsh Restoration Project	Guilford, CT	CT DEEP	48.30	LI-00A00384
10/28/2020	Regulatory site visit to Hepburn Dunes Living Shoreline project, under construction	Borough of Fenwick, Old Saybrook, CT	CT DEEP	42.55	LI-00A00384
10/15-10/22/2020	NEERS – New England Estuarine Research Society	Virtual	CT DEEP	30.00	LI-00A00384
11/6/2020	Pre-app meeting for living shoreline project	Lyme, CT	CT DEEP	46.58	LI-00A00384
11/16/2020	Pre-app meeting for living shoreline project	Mystic, CT	CT DEEP	64.40	LI-00A00384
4/19-4/23/2021	National Water Quality Monitoring Conference	Virtual	CT DEEP	135.00	LI-00A00384
4/19-4/23/2021	National Water Quality Monitoring Conference	Virtual	CT DEEP	155.00	LI-00A00384
4/26-4/28/2021	Northeast Fish & Wildlife Conference	Virtual	CT DEEP	200.00	LI-00A00384
4/27-4/30/2021	NEERS – New England Estuarine Research Society	Virtual	CT DEEP	40.00	LI-00A00384
<b>TOTAL TRAVEL SUPPORT</b>				<b>\$ 1,087.08</b>	

\*\* This past year there was minimal travel due to the COVID-19 pandemic. Funds allocated for travel were used for trainings.

# LONG ISLAND SOUND STUDY

A PARTNERSHIP TO RESTORE AND PROTECT THE SOUND

## Point Source Nitrogen Trade-Equalized Loads vs. Total Maximum Daily Load Waste Load Allocations 1995-2020 NY/CT STPs

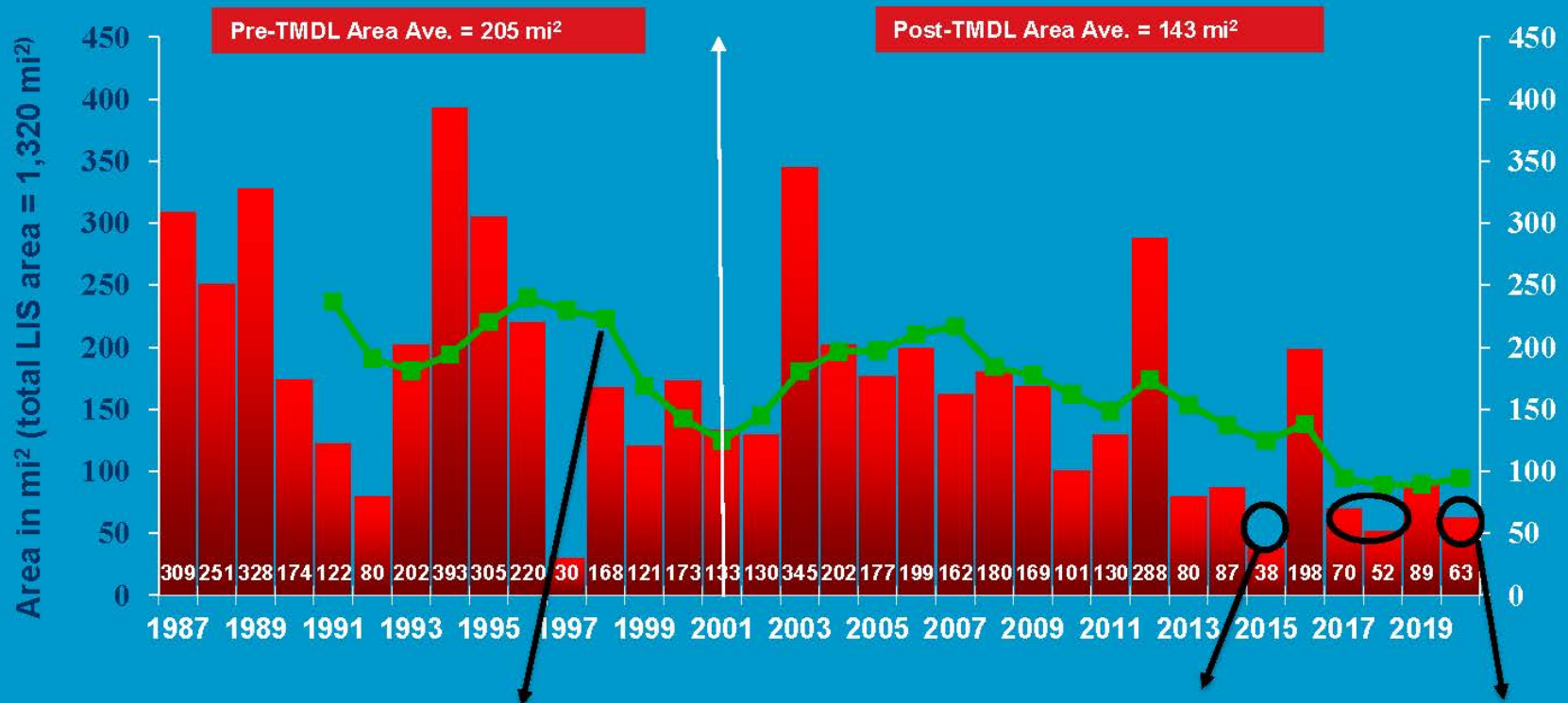


# LONG ISLAND SOUND STUDY

A PARTNERSHIP TO RESTORE AND PROTECT THE SOUND

## Maximum Area of Hypoxia

1987-2020 (June-September)



Five-year rolling average

Second, third, fourth, and fifth smallest areas in 34 years