NATIONAL ESTUARY PROGRAM SUMMARY WORK PLAN

FOR

FEDERAL FISCAL YEAR 2022 FUNDING

FOR

COMPREHENSIVE CONSERVATION AND MANAGEMENT PLAN

IMPLEMENTATION ACTIVITIES

DURING THE PERIOD

October 1, 2022-September 30, 2023 or beyond
[FY2023]

WITH PRIOR YEAR GOALS/ACCOMPLISHMENTS/HIGHLIGHTS
FOR THE PERIOD

October 1, 2021- September 30, 2022
[FY2022]

July 2022

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 2022 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 Grant Program, and CCMP supplemental program (previously called the enhancement program). This FY2022 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 line item and has received funding under EPA's President's Budget request since FY1999.

Below is a list of items that were completed in FY2021 or are to be completed in FY2022 that relate to the CCMP:

a. **2022 Report to Congress.** In 2022, LISS initiated development of the 2022 Report to Congress. The two-year review reports on the investments and progress made by LISS from 2020-2021 by evaluating and assessing the status of investments and their relation to the implementation actions and ecosystem targets set by the CCMP. The review reports on ecosystem target progress, implementation action progress, success stories, status of priority implementation actions, and future areas of focus. LISS will submit the report to Congress by end of 2022.
b. **Governance Document.** As the LISS continues to grow and evolve, due to the increased amount of funding received over the last few years, the importance of a governance document for the Study has become more crucial than ever. The document describes the organizational function and governance for the LISS in advancing protection and restoration under the CCMP. This document is and must remain consistent with all that is described and defined under Clean Water Act §320 and §119. The structure and governance of the program will change and evolve over time to better plan, align and assess partner activities and resources to meet CCMP goals. Following approval from the Management Committee, the document to be presented to the Executive Steering Committee and to be formally adopted by the Policy Committee by the end of the fiscal year.
c. **Government Accountability Office Recommendations.** In April 2022, The Government Accountability Office (GAO) closed out the last of the three recommendations in *GAO-18-410: Long Island Sound Restoration: Improved Reporting and Cost Estimates Could Help Guide Future Efforts,* after determining the EPA had successfully responded. GAO made three recommendations to EPA in the report: 1) The Director, working with the Study, should ensure that as the Study finalizes its reporting format, it fully incorporates leading practices of performance reporting; 2) The Director, working with the Study, should develop cost estimates that include analyses of uncertainties for each of the targets in the 2015 plan; and 3) The Director, working with the Study, should estimate the range of potential costs for all implementation actions and include the estimates in future supplements to the 2015 plan.

2. FY2022 LISS Budget Breakdown

This work plan summarizes tasks and deliverables/outputs contained in EPA FY2022 assistance awards to Management Conference partners that account for the FY2022-23 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 $750,000 in NEP allocations under Clean Water Act (CWA) §320, and $31,400,000 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 $7,504,724 as shown in Attachment 2.

On November 6, 2021, Congress passed the Infrastructure Investment and Jobs Act of 2021 (P.L. 117-58) (also known as the Bipartisan Infrastructure Law or BIL), to enhance the nation's infrastructure and resilience. The BIL funds, for the first year of a five-year period, include $909,800 in NEP allocations under Clean Water Act (CWA) §320, and $21,000,000 under CWA §119 ($106,000,000 over five years). For the first year, there is no required match for the BIL funds.

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 21, 2022 meeting. The record of the Management Committee meeting is documented in the April 21, 2022 Long Island Sound Study Management Committee Meeting Notes.

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

Program Activities	Amount
Coordination	*$816,326*
Water Quality Planning and Implementation	*$1,586,638*
Modeling	*$2,527,636*
Monitoring	*$7,399,465*
Research	*$3,218,375*
Habitat Restoration and Protection	*$2,510,638*
Public Education and Outreach	*$1,090,007*
Stewardship and Resiliency	*$1,650,365*
Implementation Assistance	*$10,650,000*

BIL Activities	Amount
Environmental Justice	*$3,062,632*
Climate Resiliency	*$6,009,800*
Water Infrastructure	*$12,383,284*

To implement this summary Work Plan, as of this writing, EPA will issue 3 new assistance awards and amend 9 current assistance awards to include the FY2022 funding. Under BIL funding, EPA will issue 5 new assistance agreements. In addition, EPA will fund 8 interagency agreement and 2 contracts to support work tasks. The project tables, under Section B, is a detailed breakdown of the FY2022 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 FY2022 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 Long Island Sound 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 four 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 three 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, 50 percent of an FTE, and one 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.

With the increase in funding from BIL, EPA Region 2 hired one FTE in June 2022 and EPA Region 1 hired one FTE in June 2022 to assist with BIL program and grants management. Additionally, EPA Region 2 hired a modeler in June 2022 to coordinate various modeling efforts within the program. Since May 2021, LISS funds will be used to cover the stipend costs associated with an Oak Ridge Institute for Science and Education (ORISE) Fellow. 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. Both Region 1 and 2 provide Quality Assurance support for assistance and interagency agreements that require Quality Assurance Project Plans.

4. Grant awards

Attachment 2 lists the FY2022 LISS budget by recipient organization; the total funding for each recipient may consist of one or more EPA grant awards or amendments to existing grants, **Attachment 4** lists the FY2022 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 4 since this NEP summary Work Plan is completed in advance of the grant award process, which must be completed by September 30, 2022. 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 FY2022.

For FY2022 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 FY2022 funding for work that will take place in FY2023, the EPA is providing funding to twelve 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); National Audubon Society; and Massachusetts Department of Environmental Protection (Mass DEP). EPA is also establishing interagency agreements with four federal agencies: the United States Geological Survey (USGS), National Oceanic and Atmospheric Administration (NOAA), United States Fish and Wildlife Services (USFWS), United States Department of Agriculture – Natural Resources Conservation Service (NRCS). 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 (FY2022) Regular Appropriation 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 FY2021 work implemented to introduce the planned FY2022 activities. The following is the format we present our FY2022 projects:

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

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

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 FY2021 accomplishments and introduce planned FY2022 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 FY2021 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 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 main 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 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). Beginning in 2021, NYSDEC has organized monthly meetings with the three Estuary Programs on Long Island (LISS, Peconic Estuary Partnership, and South Shore Estuary Reserve) to better align communication and messaging relating to LINAP implementation. As a result, the programs are working on several initiatives to improve nitrogen management Long Island wide.
      - Bioextraction: Through a partnership with NEIWPCC 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. Other ongoing efforts include 1) field testing of locally-sourced sugar kelp (*Saccharina latissima*) fertilizer amendments in Long Island, NY, 2) refinement of Atlantic ribbed mussel (*Geukensia demissa*) aquaculture methods, 3) phase 2 of the economic feasibility market study for nutrient bioextraction, and 4) the May 18-19 seaweed symposium. New efforts include: 1) Assessment of wild harvest of seaweeds as a tool to bioextract nutrients from coastal waters, 2) investigating the long-term storage of viable sugar kelp spores and use of cultivated sugar kelp for seaweed turfgrass fertilizer amendments, 3 Long-term Quantification of nitrogen bioextraction and carbon capture by seaweed and bivalve aquaculture) (see table below).

The following projects have been funded to achieve our FY2022 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:	**Sound Coastal Gardening Program and Certificate**		
Activity Type:	Water Quality Planning and Implementation	Project Type:	New
Implementing Agency:	NYSDEC	Total Estimate Budget	$56,978.00
Responsible Partners:	Cornell Cooperative Extension Suffolk County	Federal Amount:	$34,187.00
		Match Amount:	$22,791.00
Objectives:	The objective of this project is to develop a self-paced online educational program that will include approximately 7 to 10 sessions with regional specialists on topics such as rain gardens, alternatives to lawns, native plants, pollinator pathways, the impact of land inputs on a watershed and within the marine environment.		
Description:	This project will inform area residents about best gardening practices and their environmental impact on water resources. The project will involve the creation of an online course, educational brochure, experiential field trips and a structure for interactive volunteer community outreach. Subsequent annual offerings of the online course, as well as an informed, growing volunteer cohort, will extend the program's educational reach beyond the course offering.		
Estimated Milestones:	October 1, 2022 - September 30, 2024		
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 #
Sound Coastal Gardening online course development	3-1.	SC-14
Sound Coastal Gardening educational brochure	3-1.	SC-14
Sound Coastal Gardening Course Pilot Program	3-1.	SC-14
Sound Coastal Gardening Pilot Program Volunteer Outreach (Suffolk County Volunteer Projects; Documentation of Volunteer Hours, and Volunteer Graduation)	3-1.	SC-14
Expanded launch of Sound Coastal Gardening Course, Westchester and Nassau Counties	3-1.	SC-14
Sound Coastal Gardening Pilot Program Volunteer Outreach (Nassau & Westchester County Volunteer Projects; Documentation of Volunteer Hours, and Volunteer Graduation)	3-1.	SC-14

Title:	NEIWPCC LISS Program Implementation Support: Task 4 LIS Regional Coordinator		
Activity Type:	Water Quality Planning and Implementation	Project Type:	Ongoing
Implementing Agency:	NEIWPCC	Total Estimate Budget	$155,519.00
Responsible Partners:	N/A	Federal Amount:	$155,519.00
		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 LISS NYS DOW Regional Coordinator (LISRC) position will supplement and increase NYSDEC DOW participation and involvement in all aspects of the LISS to advance the CCMP goals & objectives		
Estimated Milestones:	October 1, 2022 - 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 #
Project Management - Build, strengthen, and maintain effective partnerships and working relations with key stakeholders, especially local municipalities; Assist NYSDEC staff with TMDL implementation, evaluations, revisions, and implementation of additiona	1-1; 4-1; 4-2	WW-2; SM-8; SM-17
Funding Coordination - Serve as coordinator and project manager for LISS EPA grants to DOW, keeping project timelines intact and working closely with the EPA Project Officer. Prepare and provide timely reporting on grant and contract deliverables in coope	1-1; 4-1	WW-2; SM-8
Workgroups and Committees - Provide technical support and participation on the stakeholder group for EPA's LIS Nitrogen Reduction Strategy. In addition, participate in the Implementation Team (ITeam) meetings, Citizens Advisory Committee (CAC), Watersheds	1-1; 4-1	WW-2; SM-8
Homeowners Rewards Program - Reimbursements for Homeowners Rewards Program & Engagement with Homeowners Applicants	3-1.	SC-14
Outreach - Prepare informational materials and conduct outreach and education activities (e.g., meetings, presentations, web content, etc.), with municipalities to help them learn about the LISS program, the LISFF, and the integral role municipalities pla	1-1; 4-1; 4-2	WW-2; SM-8; SM-17
Reporting - Pertinent staff activity and progress towards outputs and outcomes will be reported as required by EPA under this grant award. Reporting is expected to include a narrative summary of successes, challenges, and lessons learned	4-3.	SM-35

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	$81,878.00
Responsible Partners:	NYSDEC	Federal Amount:	$81,878.00
		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, 2022 - 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	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 a Nonpoint Source & 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 en	1-1.	WW-10

Title:	**NEIWPCC LISS Program Implementation Support: Task 8 LIS Bioextraction Coordinator**		
Activity Type:	Water Quality Planning and Implementation	Project Type:	Ongoing
Implementing Agency:	NEIWPCC	Total Estimate Budget	$173,236.00
Responsible Partners:	NYSDEC	Federal Amount:	$173,236.00
		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 LISS Bioextraction Coordinator position will support the Bioextraction Initiative within Long Island Sound. The Initiative aims to improve water quality in Long Island Sound by removing excess nitrogen through the cultivation and harvest of seaweed and shellfish		
Estimated Milestones:	October 1, 2022 - 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 #
Nutrient Bioextraction Product Application: Field Testing of Locally-Sourced Sugar Kelp (Saccharina latissima) Fertilizer Amendments in Long Island, NY	1-2.	WW-25
Nutrient Bioextraction: Refinement of Atlantic Ribbed Mussel (Geukensia demissa) Aquaculture Methods	1-2.	WW-25
Economics of Nutrient Bioextraction: Phase 2 of Economic Feasibility Market Study for Nutrient Bioextraction Activities in the Long Island Sound	1-2.	WW-25
Seaweed Symposium	1-2.	WW-25
Project Management-Longterm Quantification of nitrogen bioextraction and carbon capture by seaweed and bivalve aquaculture in long Island Sound.	1-2.	WW-25
Committees and information Exchange	1-2.	WW-25
Reporting	4-3.	SM-35

Title:	**Enhancement of Bioextraction through Assessment, Experimentation, and Research: Assessment of wild harvest of seaweeds as a tool to bioextract nutrients from coastal waters**		
Activity Type:	Water Quality Planning and Implementation	Project Type:	New
Implementing Agency:	NEIWPCC	Total Estimate Budget	$239,965.00
Responsible Partners:	NYSDEC	Federal Amount:	$143,979.00
		Match Amount:	$95,986.00
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:	This project will determine the locations, in both New York and Connecticut, and species of naturally occurring seaweed beds that are growing in excess or are considered nuisance species. Targeted sites will be prioritized for areas that are impaired for nitrogen. Harvested seaweeds will be assessed for their content of: nitrogen, carbon content, heavy metals and other contaminants. Site assessments in the second year of the study will investigate impacts to grow-back of the beds following year one wild harvest/removal. This 2-year study aims to determine how much seaweed can realistically be removed from each site, and use that and nitrogen content information (from laboratory analysis) to estimate how much nitrogen can be removed from the water through wild harvest.		
Estimated Milestones:	October 1, 2022 - September 30, 2023		
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 #
Final report, shared with regulatory agencies and interested stakeholders, providing information about the long-term environmental impacts of bioextraction	1-3.	WW-25

Title:	**Enhancement of Bioextraction through Assessment, Experimentation, and Research: Investigating the long-term storage of viable sugar kelp spores and use of cultivated sugar kelp for seaweed turfgrass fertilizer amendment study**		
Activity Type:	Water Quality Planning and Implementation	Project Type:	New
Implementing Agency:	NEIWPCC	Total Estimate Budget	$382,546.67
Responsible Partners:	NYSDEC	Federal Amount:	$229,528.00
		Match Amount:	$153,018.67
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:	Previous year's (FY 20 and FY21) sugar kelp bioextraction work has demonstrated the need for a consistent supply of kelp spores at a consistent time of the year for bioextraction to be as efficient and successful as possible. This study will investigate whether kelp can be cultivated from these stored spores during the first year of this study. The component to be completed in the second year of the project will utilize the harvested kelp in a variation of previous Bioextraction Initiative fertilizer amendment studies, to determine its efficacy on turfgrass.		
Estimated Milestones:	October 1, 2022 - September 30, 2024		
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 #
Final report, shared with regulatory agencies and interested stakeholders, providing information about the long-term environmental impacts of bioextraction	1-3.	WW-25

Title:	**Enhancement of Bioextraction through Assessment, Experimentation, and Research: Long-term Quantification of nitrogen bioextraction and carbon capture by seaweed and bivalve aquaculture in long Island Sound**		
Activity Type:	Water Quality Planning and Implementation	Project Type:	New
Implementing Agency:	NEIWPCC	Total Estimate Budget	$583,333.33
Responsible Partners:	NYSDEC, SUNY SOMAS	Federal Amount:	$350,000.00
		Match Amount:	$233,333.33
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:	This study will seek to quantify the removal of nitrogen and carbon by seaweeds and bivalves across nearshore and open water regions of Long Island Sound over a three-year period. This study will seek to assess the cumulative impact, actual and modeled, of sustained aquaculture on nitrogen concentrations (total N, nitrate, ammonium) and total chlorophyll a as related to ecosystem resilience and multiple climate signals including pH, pCO_2, and calcium carbonate saturation.		
Estimated Milestones:	October 1, 2022 - September 30, 2027		
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 #
Final report, shared with regulatory agencies and interested stakeholders, providing information about the long-term environmental impacts of bioextraction	1-3.	WW-25

Title:	**Onsite Wastewater Treatment System Study Support**		
Activity Type:	Water Quality Planning and Implementation	Project Type:	Continuing
Implementing Agency:	CT DEEP	Total Estimate Budget	$166,666.67
Responsible Partners:	N/A	Federal Amount:	$100,000.00
		Match Amount:	$66,666.67
Objectives:	The primary objective is to develop a communication tool that includes study findings and other relevant information regarding study assumptions that represents the current state of OWTS science relative to CT. Using contract services, CT DEEP proposes to evaluate the assumptions made in the OWTS study, update OWTS technologies, and prepare a status report to articulate findings.		
Description:	Phase II of project was funded in FY2021 in which expanded on a previously funded project that was a quality controlled approach to improve the accuracy of the OWTS inventory, in which this funding will expand the improved inventory approach and method for estimating nitrogen loading to the north shore of LIS. Additional funding requested to support CT DEEP and DPH staff to evaluate the assumptions using available data and literature, and prepare a report to document this effort.		
Estimated Milestones:	October 1, 2022 - September 30, 2024		
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 #
Compare and evaluate assumptions relative to nitrogen attenuation and soils types in CT, and explore treatment technologies	1-1.	WW-7; WW-27
Prepare a report to document the activities and finding of this effort	1-1.	WW-12; WW-14; WW-35

Title:	**Nutrient Management Outreach and Planning for Animal Operations in Connecticut**		
Activity Type:	Water Quality Planning and Implementation	Project Type:	New
Implementing Agency:	NRCS	Total Estimate Budget	$191,572.00
Responsible Partners:	N/A	Federal Amount:	$191,572.00
		Match Amount:	$0.00
Objectives:	The objectives of the specialist are to reduce contaminant and nutrient loads from nonpoint sources; restore and protect the natural hydrologic and ecological functions of the watershed; reduce indirect sources of nutrients and contaminants to the Long Island Sound ecosystem; mitigate impacts of nutrients and contaminants to the ecosystem of Long Island Sound; assess water quality and factors that contribute to changes in water quality; expand opportunities for engaging traditionally underrepresented groups in the LISS area and continue consultation with federally-recognized Tribes with ties to Long Island Sound; and promote sustainable agriculture		
Description:	NRCS serves as the lead USDA agency that addresses natural resource issues on private lands. Nutrient Management Specialist positions on the Connecticut NRCS staff and funded by the Long Island Sound Study will allow NRCS to drive LISS progress toward attaining their Clean Waters/Health Watersheds goals to measurably reduce the area of hypoxia in Long Island Sound. The planning done by the Nutrient Management Specialists will assist farmers with proper nutrient applications which will decrease contaminated runoff fromentering Long Island Sound.		
Estimated Milestones:	October 1, 2022 - September 30, 2023		
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 #
Collaborate and work with a variety of federal, state, and community-based organizations to work toward fulfilling the LISS vision for the Sound to have clean, clear, and safe water	1-1; 1-3	WW-2; WW-9; WW-35
Provide technical assistance to historically underserved communities and assist them in meeting meet basic Environmental Quality Incentives Program (EQIP) requirements for animal feeding operations	1-1; 1-3	WW-2; WW-9; WW-35
Identify and reach out to producers and landowners to educate them about the impact their operation has on the state's natural resources and develop a plan to address those resourceconcerns.	1-1; 1-3	WW-2; WW-9; WW-35

Title:	**Outreach and Planning for Agricultural Operations in Connecticut**		
Activity Type:	Water Quality Planning and Implementation	Project Type:	New
Implementing Agency:	NRCS	Total Estimate Budget	$126,739.00
Responsible Partners:	N/A	Federal Amount:	$126,739.00
		Match Amount:	$0.00

Objectives: The objectives of the Specialist include informing landowners and operators of the importance of properly managed urban farms; educating and engaging the public, particularly in urban areas, in both large and small-scale sustainable agriculture; enhancing knowledge of habitats and living resources through collaboration and distribution of useful habitat and living resource data; expanding opportunities for engaging traditionally underrepresented groups in the LISS area and continuing consultation with federally-recognized Tribes with ties to Long Island Sound; building local partnerships to capitalize on national environmental justice initiatives; considering the needs and perspectives of underserved agricultural communities to build grassroots support for local action; promoting sustainable agriculture (i.e., sustainable urban agriculture, stormwater management practices, rain gardens, rainwater harvesting, and natural riverine buffers) in these communities; providing implementation strategies to increase participation in NRCS programs and benefits to underserved clientele and socially disadvantaged farmers and landowners; providing oversight for all proposed NRCS program and policy development to assure equity and accessibility by all customers, including underserved individuals and groups and socially disadvantaged farmers and landowners; providing leadership and guidance on developing NRCS outreach plans and to incorporate outreach strategies in business plans; developing and maintaining effective communication and working relationships with federal, community-based, and non-governmental organizations to engage them in fostering and promoting outreach strategies

Description: NRCS serves as the lead USDA agency that addresses natural resource issues on private lands. Outreach is an integral part of the overall delivery of programs and services and is defined as reaching out to people who are not traditional customers. Emphasis of this Outreach Specialist will be placed on reaching specific groups that have been historically underserved and connecting them with NRCS programs and technical assistance that directly align with LISS objectives. Effective outreach requires flexible approaches – listening first, then matching the message to the listener; communicating in new ways to new audiences to get the message to not only traditional customers, but also culturally and racially diverse customers.

Estimated Milestones: October 1, 2022 - September 30, 2024

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 #
Dissemination of LIS Agricultural Information and Outreach - Provide information about LIS to the agricultural community. Factsheets summarizing timely topics on LIS issues that can be widely distributed in paper or website formats	3-1.	SC-2; SC-7; SC-14
Public Education and Outreach - Information and fact sheets/web pages to inform the agricultural community of sustainable land use practices to address the resource concerns on the property.	3-1; 3-3	SC-7; SC-21
Coordinate Meetings, Workshops, and Resources- Meetings with landowners and producers to coordinate responses to resource concerns in the area. Discussion of updated Best Management Practices to suit the needs of the community. Tasks may include: To coord	4-2; 4-3	SC-4; SC-11; SC-28
General Outreach - Respond to requests for information including dissemination of written materials, handling requests for information, and making public presentations about theLIS to the agricultural community.	3-1; 3-3	SC-7; SC-14

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 and 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 Partnership , 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. A Management Advisory Group meets regularly to coordinate work with agency needs and a Model Evaluation Group provides independent technical review. The model selection is complete and calibration work will begin earnest in summer 2022. 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.
- Compound Flood Risk Model: As part of the first year of the implementation of the Sustainable and Resilient Communities Work Plan, USGS was funded in FY2021 to couple various models and accurately predict coastal flood extents and the impacts of sea-level rise on stormwater infrastructure and management. Additionally, the project will improve understanding of 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 sea-level rise 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. In FY2022, we plan to continue to fund this effort.

The following modeling projects were approved to be funded in FY2022 to further our progress:

Title:	**Embayment Data Collection for Modeling**		
Activity Type:	Modeling	Project Type:	Continuing
Implementing Agency:	CT DEEP	Total Estimate Budget	$1,050,000.00
Responsible Partners:	N/A	Federal Amount:	$630,000.00
		Match Amount:	$420,000.00
Objectives:	The objectives of this project are to collect data in the Farm River Estuary for nutrient modeling purposes and develop support documents for embayment data collection, modeling, and TMDL development.		
Description:	Funding is requested to continue the initial embayment monitoring and modeling effort started with FY19 funds and further supported with FY20 and FY21 funds. As described in earlier proposals, this effort supports monitoring and modeling of priority embayments in accordance with Connecticut's Second Generation Nitrogen Strategy. In 2017, CT DEEP prioritized the following eight embayment complexes (complexes include multiple waterbodies): Pawcatuck River, Mystic River, Niantic River, Farm River, Sasco Brook, Saugatuck River, and Norwalk Harbor.		
Estimated Milestones:	October 1, 2022 - September 30, 2024		
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 #
Collection of water quality, hydrodynamic, benthic, and macrophyte data.	1-3.	WW-27; WW-28; WW-35
Preparation of SOP, Core Document, and Templates.	1-3.	WW-14; WW-35; SM-8
Preparation of Final FY22 Report	1-3.	WW-14; WW-28

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:	Continuing
Implementing Agency:	USGS	Total Estimate Budget	$1,000,000.00
Responsible Partners:	New York and Connecticut Sea Grant; Sustainable and Resilient Communities Work Group	Federal Amount:	$1,000,000.00
		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, 2022 - 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

Title:	**Optimizing Best Management Practices to Minimize Seasonal and Annual Delivery of Nitrogen, Phosphorus, and Suspended Sediment Loadings to Long Island Sound: A Collaborative Modeling Approach**		
Activity Type:	Modeling	Project Type:	New
Implementing Agency:	USGS	Total Estimate Budget	$750,000.00
Responsible Partners:	EPA	Federal Amount:	$750,000.00
		Match Amount:	$0.00
Objectives:	The objective of the project is to develop a model to allow stakeholders to evaluate the effect of interannual variability in precipitation and temperature on loads to the LIS and how least-cost solutions might vary with changing climate.		
Description:	The USGS and EPA propose to collaboratively develop a modeling framework to allow stakeholders in the Long Island Sound basin to determine least-cost solutions to meet annual and seasonal load reductions for point and nonpoint sources of nitrogen, phosphorus, and suspended sediment, targeting management options at the National Hydrography Dataset Plus (NHDPlus) catchment scale. Management solutions to be considered include agricultural conservation practices, urban stormwater control measures, riparian restoration, septic-system upgrades and replacement by sewers, and wastewater treatment plant (WWTP) upgrades.		
Estimated Milestones:	October 1, 2022-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 #
Development, calibration, and application of dynamic SPARROW model	1-1; 1-3; 4-1	WW-1; WW-2; WW-27
Development, calibration of application of RBEROST	1-1; 1-3; 4-1	WW-1; WW-2; WW-27
USGS data release of updated SPARROW input datasets and model results	1-1; 1-3; 4-1	WW-1; WW-2; WW-27
Journal article(s) and (or) USGS series report(s) documenting SPARROW and RBEROST-SPARROW modeling framework results	1-1; 1-3; 4-1	WW-1; WW-2; WW-27
Participation/engagement of early- to mid-career staff in SPARROW and Optimization Modeling	1-1; 1-3; 4-1	WW-1; WW-2; WW-27
Public web access to the dynamic SPARROW results and scenario testing using R-Shiny	1-1; 1-3; 4-1	WW-1; WW-2; WW-27
Public access to RBEROST via R-Shiny apps and underlying data (via EDM) for optimization	1-1; 1-3; 4-1	WW-1; WW-2; WW-27

Title:	**Nitrogen concentrations and loads and seasonal nitrogen loads in selected Long Island Sound tributaries, water years 1995-2021**		
Activity Type:	Modeling	Project Type:	New
Implementing Agency:	USGS	Total Estimate Budget	$75,000.00
Responsible Partners:	N/A	Federal Amount:	$75,000.00
		Match Amount:	$0.00
Objectives:	The objective of this project is to analyze the data for the USGS fall line stations and create an updated data release and web page to display the results		
Description:	The USGS released data on nitrogen loads and concentrations, as well as flow normalized nitrogen loads and concentrations and seasonal loads for USGS fall line monitoring stations for the period of 1995-2016. The USGS has recently developed a web page to display the nitrogen loading information from the USGS data release, as well as future updates of the data set. There is a need to have information and analysis of nitrogen load and concentration information available to support public and scientific inquiry, as well as to review the efficacy of management efforts to reduce nitrogen loads to Long Island Sound.		
Estimated Milestones:	October 1, 2022 - September 30, 2023		
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 #
Project QAPP	1-1; 1-3	WW-7; WW-27; WW-28
Analyze flow and nutrient data for the period of 1995-2021	1-1; 1-3	WW-7; WW-27; WW-28
Prepare data release	1-1; 1-3	WW-7; WW-27; WW-28
Update USGS webpage	1-1; 1-3	WW-7; WW-27; WW-28

Title:	EPA/ORD RBEROST Contract Support		
Activity Type:	Modeling	Project Type:	New
Implementing Agency:	EPA ORD	Total Estimate Budget	$72,635.89
Responsible Partners:	USGS	Federal Amount:	$72,635.89
		Match Amount:	$0.00
Objectives:	1) Expand the geographic extent of supporting databases for RBEROST v1 to evaluate the most cost-effective suite of management practices within the full Long Island Sound Basin and subbasins of interest to meet downstream N loading targets protective of the Sound, as well as P loading targets within the network to meet TMDLs and other stakeholder targets with associated uncertainty, 2) to demonstrate how RBEROST can be used in conjunction with existing tracking and accounting tool inventories to provide a more comprehensive approach to tracking progress towards meeting load reduction goals, and 3) to adapt RBEROST v1 to allow optimization of nutrient management practices to meet targets for seasonally varying loads to Long Island Sound.		
Description:	EPA's River Basin Export Reduction Optimization Support Tool (RBEROST) was developed with an initial pilot in the Upper Connecticut River Basin to determine the most cost-effective management practices (wastewater treatment plant upgrades, agricultural conservation practices, stormwater BMPs, riparian zone restoration) to meet nitrogen and phosphorus loading targets at the mouth and intermediate points within the basin. The proposed project will not only identify cost-effective BMPs for communities in NY and CT to implement through proper tracking and accounting, but also better our understanding and implementation of new and innovative technologies, such as septic and wastewater treatment upgrades, and septic to sewer conversions.		
Estimated Milestones:	October 1, 2022-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		

c. **Monitoring.** LISS has continually invested in several water quality monitoring programs, including in 2021. 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 and continued in 2021, EPA HQ contractors conducted NCCA probabilistic sampling each year 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 FY2022 to further our progress:

Title:	**Data Management and Informational Support- CT ECO Maintenance**		
Activity Type:	Monitoring	Project Type:	New
Implementing Agency:	CT DEEP	Total Estimate Budget	$75,000.00
Responsible Partners:	UConn CLEAR	Federal Amount:	$45,000.00
		Match Amount:	$30,000.00
Objectives:	The objective of this project is to assure existing data is publicly accessible and in such a format that is both useful for partners and the general public.		
Description:	CT DEEP has identified the UConn Center for Land Use Education and Research (CLEAR) as the critical partner to develop and maintain a repository of various necessary data streams and tools for communicating said data streams, the repository is known as the Connecticut Environmental Conditions Online (CT ECO). More specifically, CT ECO provides several essential map viewers and data for CT DEEP's LISS program. CT ECO maintenance includes: the necessary security and server updates, maintaining the helpdesk, addressing minor routine updates and staff time to address these needed elements.		
Estimated Milestones:	October 1, 2022 - September 30, 2024		
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 #
Maintenance of CT ECO	4-1.	SM-10; WW-39; HW-5

Title:	**Data Management and Informational Support- Land Cover Comparison**		
Activity Type:	Monitoring	Project Type:	New
Implementing Agency:	CT DEEP	Total Estimate Budget	$120,000.00
Responsible Partners:	UConn CLEAR	Federal Amount:	$72,000.00
		Match Amount:	$48,000.00
Objectives:	The objective of this study is to assure the continuity of the long-term mapping trends, understand the differences in shifting data sources, and explore using high resolution data for habitat connectivity and impervious cover.		
Description:	For more than 20 years, the UConn Center for Land Use Education and Research (CLEAR) has provided the critical land cover data sets specifically for LISS to utilize for the landcover-based ecosystem indicators. The project will be to develop a comparison of the CLEAR 30m land covers dataset and National Land Cover Dataset (NLCD) 30m to understand the differences, potential benefits, limitations and similarities.		
Estimated Milestones:	October 1, 2022 – September 30, 2024		
CWA Program Elements	Strengthening WQ Standards, 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 #
Land Cover Comparison - Comparison Analysis: Including Land Cover Statistics (2010 & 2016), Change Maps, Summaries of differences and implications of the changing data source.	4-1.	SM-1; SM-10
Impervious Cover Comparison - Comparison of impervious cover methods with new tools.	1-1; 4-1	WW-17; SM-1
Final Report Including: Summary of comparative analyses, and the feasibility of habitat connectivity indicator	4-1; 2-1	SM-10; SM-1; HW-4

Title:	**Characterizing Deep-water Habitats and Developing Dynamic Habitat-Based Ecological Decision Support Tools**		
Activity Type:	Monitoring	Project Type:	New
Implementing Agency:	CT DEEP	Total Estimate Budget	$2,708,986.67
Responsible Partners:	N/A	Federal Amount:	$1,625,392.00
		Match Amount:	$1,083,594.67
Objectives:	The objective of this project is to build on the very significant body of seafloor mapping and related data existing for LIS, integrating comprehensive physical and ecological processes to develop more user-friendly and user-useful management tools		
Description:	The seafloor of Long Island Sound (LIS) is, arguably, one of the most well-mapped coastal areas in the United States. Numerous surveys have been conducted jointly by NOAA and the USGS, independent researchers and more recently the LIS Cable Fund mapping initiative. Many of these mapping efforts collected a variety of data including acoustic (bathymetry and backscatter), sediment grain size and environments, physical characteristics (bottom stress, temperature, salinity) and ecological characteristics (infaunal and epifaunal). Further, these data have been integrated into habitat maps by the teams working as part of the LIS Cable Fund Seafloor Habitat Mapping Initiative in the two phases conducted to date as spatial data products envisioned to provide science-based decisions tools to improve the management and sustainability of the Sound and its many resources.		
Estimated Milestones:	October 1, 2022-September 30, 2024		
CWA Program Elements	N/A		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Spatial Data Tools Assessment Workshop	4-1.	SM-1
Characterization of the 2020 LISS Enhancement Grant (EG) mapped area	4-1.	SM-2; SM-3
Development of dynamic spatial data tools	4-1.	SM-10

Title:	**Long Island Sound Water Quality Monitoring Program**		
Activity Type:	Monitoring	Project Type:	Ongoing
Implementing Agency:	CT DEEP	Total Estimate Budget	$2,105,195.00
Responsible Partners:	N/A	Federal Amount:	$1,263,117.00
		Match Amount:	$842,078.00
Objectives:	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.		
Description:	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.		
Estimated Milestones:	October 1, 2022 - September 30, 2024		
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 #
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
Hypoxia Surveys - 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	4-3.	SM-28
Participate in LISS workgroups and tasks (Water Quality Monitoring Work Group)	1-3.	SM-13

Title:	**Long Term Monitoring of Coastal Acidification Parameters in the Open Sound**		
Activity Type:	Monitoring	Project Type:	New
Implementing Agency:	CT DEEP	Total Estimate Budget	$157,553.00
Responsible Partners:	N/A	Federal Amount:	$94,532.00
		Match Amount:	$63,021.00
Objectives:	The objective of this project is to develop and maintain a long-term coastal acidification monitoring program in the off-shore waters of LIS at a subset of stations currently monitored by CT DEEP to better understand future impacts in relation to eutrophication, hypoxia, and climate change		
Description:	CT DEEP continues to oversee monitoring activities relevant to implementation of the actions within the LIS CCMP, Clean Waters and Healthy Watersheds (WW) priority implementation actions. Monthly nutrient water quality surveys are conducted throughout the year to document processes relevant to hypoxia and nutrient dynamics. This proposal will add coastal acidification parameters (Total Alkalinity (TA) and Dissolved Inorganic Carbon (DIC)) to the current monitoring program.		
Estimated Milestones:	October 1, 2022 - September 30, 2024		
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 #
Coastal Acidification Monitoring - TA and DIC data to evaluate current and future impacts of acidification on the biota of LIS, in relation to eutrophication, hypoxia, and nutrient management programs; Conduct monthly surface/bottom water quality data col	1-3; 4-1	WW-28; WW-32

Title:	**Unified Waters Study: LIS Embayment Research**		
Activity Type:	Monitoring	Project Type:	Ongoing
Implementing Agency:	Save the Sound	Total Estimate Budget	$1,651,360.00
Responsible Partners:	N/A	Federal Amount:	$990,816.00
		Match Amount:	$660,544.00
Objectives:	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 community science) and protection programs.		
Description:	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 26 water quality monitoring groups; coordination of an Equipment Loan Program; coordination of Tier 1 monitoring in 45 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 science community, and government and agency officials.		
Estimated Milestones:	October 1, 2022 - September 30, 2023		
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 #
Coordinate collaborative Water Quality Monitoring to be conducted by 26 groups-Train 26 groups in the SOPs for monitoring Tier 1 parameters in the UWS	2-3; 3-1; 4-1	HW-22; SC-11; SM-8
Coordinate collaborative Water Quality Monitoring to be conducted by 26 groups-Train 7 groups in the SOPs for monitoring Tier 2 parameters in the UWS	2-3; 3-1; 4-1	HW-22; SC-11; SM-8
Coordinate collaborative Water Quality Monitoring to be conducted by 26 groups-Conduct in-the-field quality control audits	2-3; 3-1; 4-1	HW-22; SC-11; SM-8
Conduct water quality monitoring - Collect sampling data from 45 embayments for dissolved oxygen, water clarity, temperature, salinity, chlorophyll a and qualitative macrophytes (Tier 1)	1-3.	WW-27; WW-28; WW-35
Conduct water quality monitoring - Collect sampling data for nitrogen, phosphorous, continuous DO, and Quantitative macrophytes from 12 embayments (Tier 2)	1-3.	WW-27; WW-28; WW-35
Report water quality data - Provide 4 email links to data to all project stakeholders; Use standardized UWS data spreadsheets; Publish data on Save the Sound website and enter into EPA WQX	3-1.	SC-7

Title:	**Water quality monitoring observations to support the hypoxia management in Long Island Sound**		
Activity Type:	Monitoring	Project Type:	Ongoing
Implementing Agency:	University of Connecticut	Total Estimate Budget	$765,247.00
Responsible Partners:	N/A	Federal Amount:	$600,104.00
		Match Amount:	$165,143.00
Objectives:	To sustain the distribution and analyses of the ship survey data that determines the area of hypoxia; continue of the monitoring of the duration of hypoxia in the region that is likely to experience improvement first with the ARTG buoy, and other water-quality and environmental parameters required to understand the variability in DO; evaluate the effectiveness of the use of an autonomous glider to map the location of the 3 and 5 mgL dissolved oxygen concentration contour on four 10-15 surveys; deploy and maintain the automated respiration/metabolism chambers (ARCs) used to acquire the data		
Description:	Since 2013 the LISS has supported the deployment and operation of a buoy (ARTG) as an element of the LISICOS array, a component of the NERACOOS. LISS has also been providing partial support for the data system that allows access to the observations, and those of the ship survey program of the Connecticut Department of Environmental Protection. In the last year, the data system was augmented to allow calculation of the hypoxic area and volume from the ship survey data archive and this will be sustained for 2022- 2023. Sampling using autonomous gliders was added to the program in 2021 to complement the ship and buoy data through a cost-sharing arrangement with MARACOOS. Finally, we propose to add Automated Respiration Chambers (ARCs) to the sustained buoy program.		
Estimated Milestones:	October 1, 2022 - September 30, 2023		
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 #
Mapping and Data Products - Data systemincluding hypoxia maps, trends and statistics	4-1.	WW-8; WW-27; WW-32
Data Products & maps - Data system for hypoxia mapping	4-1.	WW-8; WW-27; WW-32
Operate ARTG buoy with surface and bottom DO sensors - Measurements of salinity, temperature, dissolved oxygen near the bottom and surface near CT DEEP station E1; Measurements of nitrate concentration, fluorescence, and light (PAR) at three buoys in LIS;	4-1.	WW-8; WW-27; WW-32
Glider Surveys - Observations of the variability on the location of the 3 and 5 mgL near bottom DO contour	4-1.	WW-8; WW-27; WW-32
Automated Respiration Chambers - High frequency estimates of the rate of oxygen utilization	4-1.	WW-8; WW-27; WW-32
Reporting	4-1.	WW-8; WW-27; WW-32

Title:	**Support for Sustained Acidification Monitoring in Central Long Island Sound**		
Activity Type:	Monitoring	Project Type:	New
Implementing Agency:	University of Connecticut	Total Estimate Budget	$34,069.00
Responsible Partners:	N/A	Federal Amount:	$34,069.00
		Match Amount:	$0.00
Objectives:	The primary objective of this work is to improve our ability to track changes in pH and pCO2 to understand and predict the impact of climate change on the acidification of the LIS. This is a contribution to a larger program that will facilitate an open-science approach.		
Description:	University of Connecticut will purchase a pair of sensors to measure pH and pCO2 at 15-minute intervals at mid-depth (~20m) in central LIS by mounting them on the mooring cable of the CLIS buoy to support the expansion of ongoing water sampling programs to include pH and total alkalinity.		
Estimated Milestones:	October 1, 2022 - September 30, 2023		
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 - Time series of pH and pCO2	1-3; 4-1	WW-28; WW-32

Title:	**IEC 2022-2023 Water Quality Monitoring Program in Far Western LIS**		
Activity Type:	Monitoring	Project Type:	Ongoing
Implementing Agency:	IEC	Total Estimate Budget	$668,618.00
Responsible Partners:	N/A	Federal Amount:	$393,145.00
		Match Amount:	$275,473.00
Objectives:	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.		
Description:	The IEC's 2022-2023 monitoring surveys of western Long Island Sound will consist of eight monthly "winter" surveys throughout the WLIS and the upper East River from October 2022 through May 2023 and 12 weekly "summer" surveys (June 2023 through September 2023). 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.		
Estimated Milestones:	October 1, 2022 - September 30, 2024		
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 Surveys - Twelve weekly (June 2023-September 2023) 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	1-3; 4-1	WW-28; WW-32; SM-6
Water Quality Monthly Surveys - Monthly surface data (October 2022-May 2023) for chlorophyll and TSS from all 22 historical stations and surface data for BOD and nutrients from 11 stations.	1-3; 4-1	WW-28; WW-32; 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	1-3; 4-1	WW-28; WW-32; 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-28; WW-32; SM-6

Title:	**Building a regional fecal indicator bacteria monitoring network in the Long Island Sound watershed**		
Activity Type:	Monitoring	Project Type:	New
Implementing Agency:	IEC	Total Estimate Budget	$263,842.00
Responsible Partners:	Harbor Watch, CT DEEP	Federal Amount:	$158,305.00
		Match Amount:	$105,537.00
Objectives:	This project seeks to build a coordinated, geographically strategic, scalable pathogen monitoring network for fecal indicator bacteria in the Long Island Sound watershed.		
Description:	This project will develop a pathogen monitoring network by coordinating existing pathogen monitoring programs, standardizing protocols, expanding the network to fill geographic gaps and building technical and laboratory capacity. Geographic areas where elevated pathogen levels are consistently detected will be targeted for increased sampling, and municipalities will be identified and engaged with to foster a collaborative approach to pathogen source reduction. Monitoring expansion will be targeted and incorporate localized trackdown efforts, where warranted, to yield quantifiable reduction in pathogen loads that result in shellfish closures. The		
Estimated Milestones:	October 1, 2022 – September 30, 2023		
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 #
Inventory existing watershed monitoring efforts	1-1; 1-3; 4-1	WW-35; SM-8
Identify data gaps and priority areas based on existing data; engage municipalities	1-1; 1-3; 4-1	WW-35; SM-8
Create a set of standardized, shared, monitoring, quality assurance, and data management protocols	1-1; 1-3; 4-1	WW-35; SM-8
Bring new monitoring programs onboard to fill geographic data gaps; expand monitoring in areas where high pathogen levels are consistently detected	1-1; 1-3; 4-1	WW-35; SM-8
Build laboratory capacity for fecal indicator bacteria analysis.	1-1; 1-3; 4-1	WW-35; SM-8

Title:	IEC Coastal Acidification Monitoring in Far Western LIS		
Activity Type:	Monitoring	Project Type:	New
Implementing Agency:	IEC	Total Estimate Budget	$47,475.00
Responsible Partners:	N/A	Federal Amount:	$28,485.00
		Match Amount:	$18,990.00
Objectives:	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 - this added task will help develop and maintain a long-term coastal acidification monitoring program.		
Description:	The IEC's 2022-2023 monitoring surveys of western Long Island Sound will consist of eight monthly "winter" surveys throughout the WLIS and the upper East River from October 2022 through May 2023 and 12 weekly "summer" surveys (June 2023 through September 2023). During surveys, IEC monitors parameters related to coastal acidification (alkalinity, DIC, omega estimates) will be performed at all or a subset of stations during weekly (summer) runs.		
Estimated Milestones:	October 1, 2022 - September 30, 2024		
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 Surveys - Monitoring for parameters related to coastal acidification (alkalinity, DIC, omega estimates) will be performed at all or a subset of stations during weekly (summer) and monthly (winter) runs.	1-3; 4-1	WW-28; WW-32

Title:	USGS Coastal Acidification Monitoring		
Activity Type:	Monitoring	Project Type:	New
Implementing Agency:	USGS	Total Estimate Budget	$272,000.00
Responsible Partners:	N/A	Federal Amount:	$272,000.00
		Match Amount:	$0.00
Objectives:	Establish a long-term monitoring network to provide data for calculating aragonite saturation from embayments across Long Island sound		
Description:	USGS will contribute to the newly proposed long-term coastal acidification monitoring and increase spatial and temporal coverage of the Long Island Sound and its embayments. The proposed study would leverage the work done as part of multiple ongoing long-term monitoring programs of USGS, the Connecticut Department of Energy and Environmental Protection, New York Department of Environmental Conservation and other agencies. The analysis and presentation of these data for the proposed study would enhance their value to the funding agencies and to the public.		
Estimated Milestones:	October 1, 2022 - September 30, 2023		
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 #
Develop a network of continuous water quality monitoring stations in a group ofembayments on the north and south sides of Long Island Sound	1-3; 4-1	WW-28; WW-32
Collect discrete water samples in near bottom waters monthly from a networkof fixed locations in embayments across Long Island Sound	1-3; 4-1	WW-28; WW-32

Title:	**USGS Flax Pond Water Quality Monitoring**		
Activity Type:	Monitoring	Project Type:	New
Implementing Agency:	USGS	Total Estimate Budget	$105,000.00
Responsible Partners:	N/A	Federal Amount:	$105,000.00
		Match Amount:	$0.00
Objectives:	The primary objective of this proposed project is to establish a long-term record of observations of water temperature, salinity, dissolved oxygen, pH, turbidity, total algae (chlorophyll-a and phycoerythrin), and estuary elevation, which will help document how changes in climate and the watershed affect ecosystem health (including coastal acidification) in Oyster Bay and ultimately the Sound.		
Description:	This project would re-establish estuary elevation and water-quality data collection from the wetlands at Flax Pond in Old Field, NY. Collected data would provide information essential to understanding tidal wetland loss, sea level rise, coastal acidification, shellfish productivity, and eutrophication by understanding variations in tidal hydrology and water chemistry.		
Estimated Milestones:	October 1, 2022 - September 30, 2023		
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 #
Re-establish water quality monitoring station	1-1; 1-3	WW-7; WW-27; WW-28

Title:	**USGS Oyster Bay Water Quality Monitoring**		
Activity Type:	Monitoring	Project Type:	New
Implementing Agency:	USGS	Total Estimate Budget	$190,000.00
Responsible Partners:	N/A	Federal Amount:	$190,000.00
		Match Amount:	$0.00
Objectives:	The primary objective of this proposed project is to establish a long-term record of observations of water temperature, salinity, dissolved oxygen, pH, turbidity, total algae (chlorophyll-a and phycoerythrin), and estuary elevation, which will help document how changes in climate and the watershed affect ecosystem health (including coastal acidification) in Oyster Bay and ultimately the Sound.		
Description:	This project would establish continuous estuary elevation and water-quality monitoring in Oyster Bay, NY. Data collected at the Oyster Bay site will be directly comparable and complimentary to other USGS monitoring locations throughout the LIS and elsewhere on Long Island. Monitoring at this location will provide information essential to understanding tidal wetland loss, sea level rise, coastal ocean acidification, shellfish productivity, and eutrophication by understanding variations in tidal hydrology and water chemistry.		
Estimated Milestones:	October 1, 2022 - September 30, 2023		
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 #
Install, operate, and maintain multi-parameter water-quality monitor	1-1; 1-3	WW-7; WW-27; WW-28

Title:	CT River at Middle Haddam Nutrient Loading		
Activity Type:	Monitoring	Project Type:	Ongoing
Implementing Agency:	USGS	Total Estimate Budget	$75,000.00
Responsible Partners:	N/A	Federal Amount:	$75,000.00
		Match Amount:	$0.00
Objectives:	Continue collecting data for the computation of loads of nitrogen to LIS from the Connecticut River watershed at Middle Haddam, CT.		
Description:	Before 2009, the USGS calculated nitrogen loads at the Connecticut River at Thompsonville, CT because it is the only streamgage on the Connecticut River without tidal influence. In 2009, recognizing that a large portion of the urbanized land use in the watershed and many wastewater-treatment facilities are downstream from this site, the USGS established a station on the Connecticut River at Middle Haddam, CT. Unlike other stations where periodic data are collected, this station can provide continuous time-series data for nitrate, streamflow, turbidity, colored dissolved organic matter (CDOM), and specific conductance. In addition, discrete samples of nitrate, ammonia, total organic nitrogen, and total nitrogen are collected approximately 18 times per year to validate the total nitrogen concentration model that allows for the computation of instantaneous total nitrogen loads .		
Estimated Milestones:	October 1, 2022 - September 30, 2023		
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 #
Develop QAPP	1-1; 1-3	WW-7; WW-27; WW-28
Operate and maintain sensors for water temperature, specific conductance nitrate, CDOM, and turbidity.	1-1; 1-3	WW-7; WW-27; WW-28
Collect water-quality samples at Middle Haddam on a monthly basis with more frequent samples collected during high flow and low flow conditions.	1-1; 1-3	WW-7; WW-27; WW-28
Calculate loads using a regression-based surrogate relation between time-series data and samples for total nitrogen and total ammonia plus organic nitrogen to estimate total nitrogen concentrations and loads from continuous data.	1-1; 1-3	WW-7; WW-27; WW-28

Title:	**Major Long Island Sound Tributary Sampling**		
Activity Type:	Monitoring	Project Type:	Ongoing
Implementing Agency:	USGS	Total Estimate Budget	$275,000.00
Responsible Partners:	CT DEEP	Federal Amount:	$275,000.00
		Match Amount:	$0.00
Objectives:	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		
Description:	The project would be the fourth year of a long-term monitoring project to conduct water quality sampling in the three major tributaries to Long Island Sound (Thames, Connecticut, and Housatonic Rivers). The goal of the project is to characterize water quality in the three major tributary embayment's and to develop a nitrogen loading station in the lower tidally effected Housatonic River estuary.		
Estimated Milestones:	October 1, 2022 - September 30, 2023		
CWA Program Elements	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 #
Update the QAPP	1-1; 1-3	WW-7; WW-27; WW-28
Monitoring and data collection - Samples from the Housatonic streamflow station and the Connecticut River at Old Lyme will be collected monthly	1-1; 1-3	WW-7; WW-27; WW-28
Install, operate, and maintain multi-parameter water-quality monitors at a site on the Thames River at mouth of the river near New London and Housatonic River near the mouth of the river near Stratford	1-1; 1-3	WW-7; WW-27; WW-28
Operate and maintain a velocity-index streamflow-gaging station at one site on the Housatonic River	1-1; 1-3	WW-7; WW-27; WW-28

Title:	**USGS Lower Connecticut River water Quality monitoring**		
Activity Type:	Monitoring	Project Type:	Ongoing
Implementing Agency:	USGS	Total Estimate Budget	$81,500.00
Responsible Partners:	CT DEEP	Federal Amount:	$81,500.00
		Match Amount:	$0.00
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. A secondary objective is to document seasonal variations of salinity and temperature gradients in the Connecticut River estuary that can be expected at different times of the year in spite of human activities in the watershed.		
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, 2022 - September 30, 2023		
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 #
Continuous monitoring data available on the USGS NWIS website	1-1; 1-3; 4-1; 4-2; 4-3	WW-7; WW-27; WW-28

Title:	In-Stream Nitrogen Monitoring in the Upper Connecticut River Watershed		
Activity Type:	Monitoring	Project Type:	New
Implementing Agency:	USGS	Total Estimate Budget	$510,000.00
Responsible Partners:	N/A	Federal Amount:	$510,000.00
		Match Amount:	$0.00
Objectives:	The objectives of this nitrogen monitoring program are to: a) leverage existing and historical N data collection efforts in the upper Connecticut River watershed, and b) meet ongoing N loading, fate and transport modeling data needs		
Description:	In order to optimize efforts to reduce loading of nitrogen to Long Island Sound, managers need a better understanding of relative magnitude and timing of nitrogen transported to LIS from tributaries to the Connecticut River in the northern portion of the Connecticut River watershed. The primary goal of the proposed study is to develop and implement a water quality monitoring strategy for nitrogen (N) in the upper basin states of Massachusetts, Vermont, and New Hampshire. The secondary goal of the proposed study is to apply the data collected to analyze loads of nutrients, including N and Dissolved Organic Carbon (DOC), understand their drivers which will promote positive management outcomes, make comparisons to earlier time periods, and prepare a publication that quantifies stream loading of N and DOC from the upper watershed, and identifies their sources and drivers.		
Estimated Milestones:	October 1, 2022 - September 30, 2026		
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 #
Install sensors - Thompsonville data collection ongoing, need to continue data collection at Northfield, establish data collection at Wells River. Key to add Wells River to isolate the contribution of the northern versus southern portions of VT and NH	1-1; 1-3; 4-1; 4-2; 4-3	WW-7; WW-27; WW-28
Installs S::CANS - At the mainstem Connecticut R. sensor sites Northfield and Wells River, we will deploy Spectrolyzer s::cans. These instruments acquire a full uv-vis absorbance scan at each time step, from which nitrate, Turbidity, DOC, and potentially	1-1; 1-3; 4-1; 4-2; 4-3	WW-7; WW-27; WW-28
Collect three years of water-quality samples for nutrients at 10 locations. Samples would be collected monthly, with additional storm water-event samples (approximately 16 samples per site per year).	1-1; 1-3; 4-1; 4-2; 4-3	WW-7; WW-27; WW-28
Analyze samples for nitrite plus nitrate nitrogen, total kjeldahl nitrogen, particulate organicnitrogen, dissolved N (persulfate method), and DOC	1-1; 1-3; 4-1; 4-2; 4-3	WW-7; WW-27; WW-28

Title:	**Development of a mapper-based Long Island Sound data and research portal (Clearinghouse)**		
Activity Type:	Monitoring	Project Type:	New
Implementing Agency:	USGS	Total Estimate Budget	$586,000.00
Responsible Partners:	N/A	Federal Amount:	$586,000.00
		Match Amount:	$0.00
Objectives:	The objectives of this project are to create a cloud-based mapper and data clearinghouse that serves as a source of information related to environmental data needed for making informed decisions about water and ecological resources of the LIS; Allow for metadata exploration and data retrieval via dynamic links to WQP and other services; Increase the number of organizations providing public access to their data by encouraging use of the WQP.		
Description:	The USGS proposes creating a mapper-based clearinghouse that will provide information on sources of data available throughout the LIS watershed and allow for real-time metadata output and integration into visualization and modeling tools developed through a graphical interface. This project will not create new databases, but will leverage existing databases, and promote data storage and public access of data collected by Federal, State, and local agencies and organizations. The clearinghouse will provide links to access the data, reports, and other products available for researchers, decision-makers, and the public.		
Estimated Milestones:	October 1, 2022-September 30, 2024		
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 #
Build draft Mapper application	4-1.	SM-5; SM-4; SM-9
Compile information for LISS related research	4-1.	SM-5; SM-4; SM-9
Present draft Mapper and refine Mapper application based on feedback	4-1.	SM-5; SM-4; SM-9
Develop multimedia roll out plan	4-1.	SM-5; SM-4; SM-9
Conduct product release and outreach	4-1.	SM-5; SM-4; SM-9

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 NEIWPCC) and CT DEEP, who develop priority Long Island Sound 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 2 restoration projects for a total of 2.5 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 45.9 percent of the way to the goal of restoring 1,000 acres of habitat by 2035 from the 2014 baseline. The study partners protected 483 acres of open space through acquisitions or easements at 14 sites. By the end of the calendar year 2021, the program has now achieved 66.1 percent of the goal to protect 7,000 acres of land by 2035 from the 2014 baseline.

Due to COVID-19 implications, the partners were not able to complete any fish passage restoration projects by removing dams or building fishways. The program is at 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 FY2022: 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 FY2022 to further our progress:

Title:	**Connecticut Stewardship and Habitat Restoration**		
Activity Type:	**Habitat Restoration and Protection**	Project Type:	**Ongoing**
Implementing Agency:	**CT DEEP**	Total Estimate Budget	**$372,550.00**
Responsible Partners:	**N/A**	Federal Amount:	**$223,530.00**
		Match Amount:	**$149,020.00**
Objectives:	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.		
Description:	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).		
Estimated Milestones:	October 1, 2022 - September 30, 2024		
CWA Program Elements	Wetlands Program Support/Implementation		

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:	**Implementing Ecological Restoration and Resiliency at Connecticut's Largest Remaining Un-ditched Marsh: Great Meadows Marsh, CT**		
Activity Type:	Habitat Restoration and Protection	Project Type:	New
Implementing Agency:	National Audubon Society	Total Estimate Budget	$250,000.00
Responsible Partners:	CT DEEP	Federal Amount:	$250,000.00
		Match Amount:	$0.00
Objectives:	The objective of this project is 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. Successful implementation of phase 4 of this project will result in the ecological restoration of ~ 6 acres of high marsh habitat, creating a more resilient and sustainable Great Meadows Marsh and helping the LISS meet its acre of tidal wetlands restored ecosystem target		
Description:	The Ecological Restoration and Resiliency at Connecticut's Largest Remaining Un-ditched Marsh is a shovel-ready, permitted project that is applying multiple, proven restoration techniques at a large salt marsh complex within a federally-protected site with the goal of 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, diamondbacked terrapin, and other wildlife in the Long Island Sound		
Estimated Milestones:	October 1, 2022-September 30, 2023		
CWA Program Elements	Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Implementation and reporting of habitat and river corridor restoration projects in Connecticut; Approximately 75 projects underway. Identify funding to complete projects, and add technical expertise in planning and execution of those projects.	2-1.	HW-1; HW-3
New webpages for the website (form and function depends upon data entry into the HRI database).	2-3.	HW-20
Develop agenda for HRSWG meetings and conference calls as needed; actively participate in meetings and coordinate follow-up.	2-3.	HW-22

Title:	**NEIWPCC LISS Program Implementation Support: Task 3 - Habitat Restoration and Stewardship Coordination**		
Activity Type:	**Habitat Restoration and Protection**	Project Type:	**Ongoing**
Implementing Agency:	**NEIWPCC**	Total Estimate Budget	$166,963.00
Responsible Partners:	**NYSDEC**	Federal Amount:	$166,963.00
		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:	NEIWPCC'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, 2022 - 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	2-1; 2-3	HW-1; HW-22
Coordinate NYS habitat, wildlife, and stewardship activities in the LIS watershed	2-1.	HW-1; HW-9; HW-10
Promote habitat quality assessments for tidal wetlands.	2-1; 2-4	HW-6; HW-23; HW-27
Track habitat restoration and land protection activities in NYS	2-1; 2-4	HW-1; HW-9; HW-24
SET monitoring data	2-1; 2-4	HW-5; HW-23; HW-27
Public Communication and Outreach	2-2; 2-3	HW-13; HW-22; SC-12
Assessment of existing habitat connectivity data and 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 c	2-1; 2-4	HW-9; HW-27; HW-30
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

Title:	**Tidal Marsh Restoration Implementation at Priority Sites Through Increased Capacity and Funding**		
Activity Type:	Habitat Restoration and Protection	Project Type:	New
Implementing Agency:	USFWS	Total Estimate Budget	$305,000.00
Responsible Partners:	N/A	Federal Amount:	$305,000.00
		Match Amount:	$0.00
Objectives:	The objectives are to 1) work collaboratively within the tidal marsh working groups to identify priority projects, 2) provide technical expertise and financial resources to advance one or more of these projects through design and permitting, 3) provide technical support for projects that are permitted for implementation and 4) collect pre- and post-restoration monitoring data across sites to inform development of best practices for subsequent projects within the Long Island Sound watershed.		
Description:	This project will provide support through both capacity building within USFWS, hiring staff focused on working in the LISS boundary and leveraging additional Service technical expertise.		
Estimated Milestones:	October 1, 2022-September 30, 2026		
CWA Program Elements	**Wetlands Program Support/Implementation**		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Selection of one or more tidal marsh restoration projects to focus on	2-1; 2-2	HW-1; HW-3; HW-11; HW-14
Build efficiencies across agencies and organization	2-1.	HW-1
Cooperative agreements and / or contracts executed	2-1.	HW-1; HW-3
Initiate planning for one or more projects	2-1; 2-2	HW-1; HW-3; HW-11; HW-14; HW-17
Initiate marsh restoration activities for one or more projects	2-1; 2-2	HW-1; HW-3; HW-11; HW-14
Initiate monitoring on site using standard monitoring protocols	2-1; 2-2	HW-2; HW-16
Additional restoration actions initiated on sites as needed to ensure project goals achieved	2-1.	HW-1; HW-2
Project outcomes shared with LISS, and broader scientific community, progress reports submitted	2-1.	HW-1

Title:	**Critical assessment of baseline disease dynamics of natural oyster beds in Long Island Sound – establishing foundational knowledge to inform oyster restoration and aquaculture disease**		
Activity Type:	Habitat Restoration and Protection	Project Type:	New
Implementing Agency:	NOAA	Total Estimate Budget	$1,269,540.00
Responsible Partners:	CT Sea Grant, CT DA/BA	Federal Amount:	$1,269,540.00
		Match Amount:	$0.00
Objectives:	The objectives of this project are to 1) Establish baseline measurements of disease prevalence and reproductive fitness of natural and cultivated oyster populations near prospective restoration sites in LIS, and 2) Describe the key environmental and biological characteristics associated with observed burdens of disease.		
Description:	This project will establish baseline measurements of disease prevalence and reproductive fitness of natural and cultivated oyster populations near prospective restoration sites in LIS. Measures of water quality, oyster-bed structure, and recruitment will be recorded alongside health and disease data to identify key environmental and biological characteristics associated with disease burdens in the studied populations. Tissue samples will also be collected and preserved for future projects characterizing population genetic structure to identify genotypes associated with disease tolerance. By partnering with LIS stakeholders we will synthesize the new data with existing baseline disease state surveillance data on aquacultured oyster populations and water quality measures captured through existing LISS projects		
Estimated Milestones:	October 1, 2022-September 30, 2023		
CWA Program Elements	**Wetlands Program Support/Implementation**		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Identify priority regions for future restoration projects and target the existing natural and cultivated oyster beds in the area for disease monitoring and future characterization of genetic structure - 60 adult oysters will be sampled monthly from March	2-2.	HW-18
Key characteristics of water quality, oyster-bed structure, and recruitment will be recorded at survey sites on a monthly or annual basis as recommended	2-2.	HW-18

Title:	**Coastal resiliency assessment: near-term coastal change along the shorelines of Long Island Sound**		
Activity Type:	Habitat Restoration and Protection	Project Type:	New
Implementing Agency:	USGS	Total Estimate Budget	$295,605.00
Responsible Partners:	N/A	Federal Amount:	$295,605.00
		Match Amount:	$0.00

Objectives: The objectives of this project are to: Perform an assessment of shoreline change trends from historical data for both long-term (80+ years of positional data) and short-term (~30 years); Incorporate shoreline change data into a coastal change likelihood assessment that uses location-specific coastal hazards to estimate the potential for landscape change over the next decade; Aggregate the shoreline change metrics and coastal change likelihood assessment outputs with coastal classification schemes available in NOAA's Continuously Updated Shoreline Position and/or NOAA's Environmental Sensitivity Index data layers (for example, classify change for "natural" and "hardened" shorelines); Publish all geospatial data layers generated in this analysis and make available in the web accessible USGS Coastal Change Hazards data portal; Publish a peer-reviewed interpretative report on the model outputs and data aggregation; Connect USGS Research Social Scientist(s) with Sea Grant Extension Sustainable and Resilient Communities (SRC) professionals in the Long Island Sound Work Group to support product dissemination and solicit feedback on product use and applications.

Description: This project is designed to build out data and interpretative capabilities in three years where year-end product deliverables have independent value and can stand-alone. The project will first quantify rates of shoreline change, then use the rates to update a coastal landscape change assessment that incorporates multiple hazards datasets with geomorphic and ecologic characteristics via machine learning (ML) outcomes, to identify areas with the highest propensity for experiencing change. Combining the updated shoreline change rates into the coastal landscape change assessment can be used to identify coastal vulnerability hot spots, determine areas with more potential for resiliency, and can be used to help detect optimal areas for investing in protective measures, such as living shorelines. More broadly, these products can be used to inform decision makers about the increased likelihood of near-term (10 years) coastal change hazards in the coastal zone including impacts to landforms such as tidal wetlands, dunes, and human infrastructure.

Estimated Milestones: October 1, 2022-September 30, 2025

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

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Assess scope of historical shoreline suitability to conduct assessment of change. Identify which attributes from CUSP and ESI are a priority for LISS Work Group. Gathering/acquiring data layers, identify data gaps; Knowledge exchange on coastal resilienc	3-3; 4-1	SC-21; SM-1
Compile historical shoreline data and extract new shoreline data for LIS.	3-3; 4-1	SC-21; SM-1
Assess historical shoreline change as is occurring in LIS.	3-3; 4-1	SC-21; SM-1
Evaluate how current shoreline change trends influence the likelihood of a coast to respond dynamically.	3-3; 4-3	SC-21; SM-26
Explore shoreline change outputs (rates and vulnerability) and aggregate with coastal classification schemes in CUSP/ESI data.	3-5.	SC-31

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 FY2021 accomplishments and introduce planned FY2022 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 5].** 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 NEIWPCC, 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.
      - Communications, Outreach, and Engagement Plan: In FY2021, LISS funded NEIWPCC, in collaboration with CTSEA, NYSEA, and The Nature Conservancy, to develop a new coordinated Sound-wide Strategic Communications, Outreach, and Engagement Plan ("COE Plan") with measurable objectives, including the additional resources sufficient to implement

the new COE Plan, that will maximize the impact of communications, outreach, and engagement efforts and ensure the effective use of resources by and among the LISS Communications Team and partners. Marstel-Day, LLC ("MD Team") was contracted to develop the new COE Plan that will provide guidance for LISS staff and partners to implement effective COE efforts that inform, educate, and engage stakeholders and residents living in Long Island Sound. The COE Plan is to be approved by the Management Committee in FY2022.

The following Public Education and Outreach projects were approved to be funded in FY2022 to further our progress:

Title:	**Long Island Sound Mentor Teachers Program Work Plan FY22**		
Activity Type:	**Public Education and Outreach**	Project Type:	**Ongoing**
Implementing Agency:	**Connecticut Sea Grant**	Total Estimate Budget	**$35,265.00**
Responsible Partners:	**N/A**	Federal Amount:	**$32,876.00**
		Match Amount:	**$2,389.00**
Objectives:	**To increase awareness and understanding of the importance of LIS and its watershed**		
Description:	**Continue the Long Island Sound Mentor Teacher program in CT to recruit high quality, creative and respected teachers to assist their peers in incorporating LIS content into curricula within the scope of the newly adopted Next Generative Science Standards.**		
Estimated Milestones:	**October 1, 2022 - September 30, 2023**		
CWA Program Elements	**Wetlands Program Support/Implementation**		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Sustainable and Resilient Communities K-12 Education	**3-2.**	**SC-16**

Title:	Long Island Sound Connecticut Public Outreach Program FY22		
Activity Type:	Public Education and Outreach	Project Type:	Ongoing
Implementing Agency:	Connecticut Sea Grant	Total Estimate Budget	$164,046.00
Responsible Partners:	N/A	Federal Amount:	$154,490.00
		Match Amount:	$9,556.00
Objectives:	CT LISS Public Outreach Coordinator will continue to foster public involvement, support, and affinity for restoration and protection of the Sound and its watershed, and build active support for environmental stewardship among CT residents through development and implementation of a comprehensive public outreach program.		
Description:	Continue the CT LISS Public Outreach Program to collaborate with other LISS partners in CT and NY in disseminating research-based information about the Sound and highlighting CCMP implementation activities of partners. The Coordinator will facilitate public involvement and instill a sense of environmental stewardship and support for restoration and protection of the Sound.		
Estimated Milestones:	October 1, 2022 - September 30, 2023		
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 #
Committees - Communications/Outreach Team	3-1.	SC-6; SC-7; SC-9
Develop and implement a coordinated communications plan	3-1.	SC-6
Committees - Watersheds and Embayments Workgroup	1-1; 3-1	WW-15, WW-16, SC-7
Committees - Citizen Advisory Committee (CAC)	4-2.	SM-14; SM-15; SM-17
Committees - Habitat Restoration and Stewardship Workgroup	3-1.	SC-7; SC-12
LISS Meetings - Attend LISS meetings	4-2.	SM-14; SM-15
Outreach - Coastal Certificate Program	3-1.	SC-14; SC-30; SC-12
Outreach - CT Working Group for Native Plant	2-2; 3-1	HW-11, SC-15
Outreach - Behavior Change Initiatives	3-1; 3-3	SC-15, SC-22
Outreach - LIS/Coastal Public Access	3-5.	SC-31; SC-32
Grants - LISFF Grants	3-1.	SC-2; SC-11; SC=15
STAC Support	4-1.	SM-1

Title:	NEIWPCC LISS Program Implementation Support: Task 1 - Outreach & Education Coordination		
Activity Type:	Public Education and Outreach	Project Type:	Ongoing
Implementing Agency:	NEIWPCC	Total Estimate Budget	$386,502.00
Responsible Partners:	N/A	Federal Amount:	$386,502.00
		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:	NEIWPCC will assist with the development, coordination, and implementation of bi-state public involvement, education, outreach, and communication activities for LIS.		
Estimated Milestones:	October 1, 2022 - 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 #
Communications Coordination -Participate in 3-4 virtual meetings with the Communications and Outreach Team. The coordination helps to implement information, education and outreach projects that inform and engage the public and support efforts with communi	3-1; 3-5	SC-6; SC-7; SC-9
LISS Ecosystem Target and Indicators - Compile, interpret, and update LISS's 20 ecosystem targets (ET) and over 35 supporting indicators and continue to update the website; Use 2020 Census to update population indicators and to create Story Map on demogra	3-1; 4-3	SM-30; SM-34; SC-9
LISS Website Management - Maintain and regularly update LISS website pages and its component databases and micro-sites to communicate LISS program & partner efforts to restore and protect the Sound; -Update and maintain the lissclimatechange.net website;	3-1.	SC-7; SC-9; SC-10
LISS Congressional Report - Maintain CCMP tracking/reporting on the LISS website to communicate progress in restoring and protecting the Sound. Inform Congress of CCMP progress with a biennial report produced for the web and for print.	4-3.	SM-32; SM-34
Sound Matters and Social Media Content - Produce e-news and social media content to communicate efforts to restore and protect the Sound: Publish at least 3 issues of Sound Matters e-newsletter on LISS related news; and post 8 social media items per month	3-1.	SC-9; SC-10; SC-16
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
Habitat Restoration Database - Complete a major update of the habitat restoration database, which provides data supporting LISS's habitat and stewardship indicators. Ensure that all completed projects are entered into the database, and new projects are ad	2-4; 3-1; 4-3	HW-23; SC-7; SM-34
LISS Population and Demographic Story Map - Create an interactive story map about the population living within the Long Island Sound Watershed	2-4; 3-1; 4-3	HW-23; SC-7; SM-34

Title:	**Long Island Sound Study (LISS) New York Public Outreach Program - Public Outreach Coordinator**		
Activity Type:	**Public Education and Outreach**	Project Type:	**Ongoing**
Implementing Agency:	**New York Sea Grant**	Total Estimate Budget	**$274,162.00**
Responsible Partners:	**N/A**	Federal Amount:	**$260,454.00**
		Match Amount:	**$13,708.00**
Objectives:	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.		
Description:	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.		
Estimated Milestones:	October 1, 2022 - September 30, 2023		
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 #
LIS Mentor Teacher Program	3-2.	SC-17
Communications, Outreach, and Engagement Team- Coordinate social media posts, website updates, news releases, communications products	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, meeting minutes produced and distributed, maintaining contact lists and attendance tracking	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 Fut	2-3; 4-2	HW-22; SM-15
Watersheds and Embayment Work Group - Tasks in this category may 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	3-1; 4-2	SC-14; SM-15

Environmental Justice Work Group - Hold quarterly EJWG meetings; facilitate development and implementation of EJWG work plan; facilitate creation of new programming and tools in response to results of EJ Needs Assessment	3-1; 4-2	SC-4; SC-5; SM-17
Other Meetings - May include attending Sustainable and Resilient Communities Meetings; STAC Meetings, I-Team Meetings, Management Committee Meetings, etc.	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	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 wh	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 and Resources - To 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 and NYSG Research Grant proposals when appropriate, including collecting input from the EJWG members when necessary. Contribute ideas and resources for grant proposals. Assist NYSG staff i	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. Rev	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 e	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

Title:	**LISS New York City/Western Basin Public Outreach Program**		
Activity Type:	**Public Education and Outreach**	Project Type:	**Ongoing**
Implementing Agency:	**New York Sea Grant**	Total Estimate Budget	$269,685.00
Responsible Partners:	**N/A**	Federal Amount:	$255,685.00
		Match Amount:	$14,000.00
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. 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, 2022 - September 30, 2023		
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 Fut	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	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 wh	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. Rev	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 e	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. Stewardship and Resiliency. In FY2021, LISS developed two new working groups to progress this Stewardship and Resiliency, in which LISS has set out the following goals: 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. In FY2021, CT and NY SEA published the completed five-year work plan on the LISS website and hired five Sustainable and Resilient Communities Extension Professionals to support local communities. The Extension Professionals are currently working to conduct a Needs Assessment to obtain a better understanding of Long Island Sound coastal communities needs to increase resiliency.

- 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 minority 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). In January 2022, the EJ Work Group presented a five-year work plan to its members. The work plan outlines the activities the work group will implement to achieve the environmental justice goals of the program. By September 2022, EPA plans to release a Request for Applications to select an entity to administer a grants program focused on environmental justice issues.
- LIS Sentinel Monitoring Program: Initiated in 2017, the LISS Sentinel Monitoring strategy included three pilot projects to informed 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, NEIWPCC will hold a workshop in June 2022 to engage Long Island Sound stakeholders to help identify monitoring gaps 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 FY2022 to further our progress:

Title:	**Implementation of the LISS Sustainable and Resilient Communities working group work plan**		
Activity Type:	Stewardship and Resiliency	Project Type:	Continuing
Implementing Agency:	New York and Connecticut Sea Gra	Total Estimate Budget	$1,209,357.00
Responsible Partners:	N/A	Federal Amount:	$1,150,365.00
		Match Amount:	$58,992.00
Objectives:	The overall objective of this proposal is to implement the second 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 2. 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, 2022 - September 30, 2023		
CWA Program Elements	Supporting Sustainable Wastewater Infrastructure		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Hold annual bi-state workshop	3-3; 3-4	SC-20; SC-23; SC-24
Maintain a 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
Develop training programs to improve the use of tools	3-4.	SC-23
Improve coordination among levels of government	3-3; 3-4	SC-20; SC-23; SC-24
Continue the development of a project pipeline	N/A	N/A

Title:	**Implementation of the LISS Sustainable and Resilient Communities working group work plan: Breaking down barriers to implementation**		
Activity Type:	Stewardship and Resiliency	Project Type:	Continuing
Implementing Agency:	New York and Connecticut Sea Gra	Total Estimate Budget	$500,000.00
Responsible Partners:	N/A	Federal Amount:	$500,000.00
		Match Amount:	$0.00
Objectives:	The overall objective of this proposal is to implement the second 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:	Part of the LISS Sustainable and Resilient Work Group developed a 5-year work plan, the project includes a new task, Breaking Down Barriers to Implementation, in which each Extension Professional will work with municipalities to implement projects to enhance resiliency.		
Estimated Milestones:	October 1, 2022 - September 30, 2023		
CWA Program Elements	Supporting Sustainable Wastewater Infrastructure		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Develop and roll out programs to address barriers to implementation	3-3; 3-4	SC-20; SC-23; SC-24; SC-27

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 FY2021 accomplishments and introduce planned FY2022 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.
      - Federal Partners Coordination Work Group: In FY2021, EPA coordinated and lead the new Federal Partners Coordination Work Group to advance collaboration among participating agencies, expand involvement to new agencies as needed. Synchronize the development of consistent Federal policies, priorities, strategies, and projects for addressing the CCMP and assisting in the appropriate management of the related federal resources by capitalizing and focusing on utilizing existing federal resources. The group will work to ensure that our collective efforts will energize ongoing programs, bridge new cross-agency partnerships, engage new federal partners, and leverage existing resources.
      - 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 EPA LISNPO developed a LISS SharePoint Tracking and Reporting Tool to better track the progress of the 2020-2024 CCMP Implementation Actions. This tool fulfills 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 developed this tool, we recognized that there are many overlaps between all of our tracking and reporting efforts, and therefore collecting all information into a centralized location and creating linkages will streamlines our efforts. The tool consists of three interconnected data tables: 1) Implementation Actions Table, 2) Projects Table, and 3) Progress Reporting Table.

By linking these three tables, we are 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 LISS funded projects. The tool helps guide our annual cycle including providing financial assistance to partners to complete projects that address the CCMP, in which semi-annual Progress Reports, linked to the CCMP, are used to populate the Tool. We then utilize SharePoint and associated apps like Power Business Intelligence (BI) to build reports to drive future informed decision making and investments which is then communicated with LISS partners and the public. Additionally, LISS has developed a Program Progress and Implementation webpage which includes selected fields from the tool. This will enable the program to communicate in a transparent way how investments of public funds are achieving desired outcomes in the condition of the Long Island Sound ecosystem. The Tool holds the program accountable by linking our investments back to the CCMP and effectively measuring program implementation and progress.

The following Coordination projects were approved to be funded in FY2022 to further our progress:

Title:	**Connecticut State Coordination**		
Activity Type:	Coordination	Project Type:	Ongoing
Implementing Agency:	CT DEEP	Total Estimate Budget	$1,118,561.67
Responsible Partners:	N/A	Federal Amount:	$671,137.00
		Match Amount:	$447,424.67

Objectives: 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.

Description: 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.

Estimated Milestones: October 1, 2022 - September 30, 2024

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 #
LISSRCC - Oversee Cooperative Agreement Administration and develop work plans	4-2.	SM-14; SM-35
LISSRCC - Participation in LISS workgroups and tasks	4-2.	SM-13
LISSRCC - 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
LISSRCC - 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
LISSRCC - 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
LISSRCC - Dissemination of LIS Information and Outreach	3-2; 3-3	SM-13
LISSRCC - Dissemination of LIS Information and Outreach	3-2; 3-3	SM-13
LISSTC - Coordinate CT DEEP review of grant proposals for LISS	4-2.	SM-23; SM-24
LISSTC - Dissemination of LIS Information and Outreach	3-2; 3-3	SC-19; SC-20
LISSTC - Implement the LIS Nitrogen TMDL and CT DEEP's Second Generation Nitrogen Strategy (nutrient reduction programs)	1-1; 4-2; 4-3	WW-2; WW-4; WW-5; WW-6; SM-23; SM-36
LISSTC - Technical coordination of science and management for nitrogen reduction efforts.	1-1.	WW-2; WW-4
LISSTC - Watershed planning and stormwater/nonpoint source implementation; Participate in EPA's LIS Nitrogen Reduction Strategy	1-1; 1-3	WW-2; WW-4; WW-13; WW-24; WW-25
LISSPC - Coordinate and manage Connecticut watershed model update	1-1; 1-3	WW-14; WW-27; WW-28

Title:	NEIWPCC LISS Program Implementation Support: Task 2 - Program Management & Travel Support		
Activity Type:	Coordination	Project Type:	Ongoing
Implementing Agency:	NEIWPCC	Total Estimate Budget	$145,189.00
Responsible Partners:	N/A	Federal Amount:	$145,189.00
		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:	NEIWPCC will complete the following sub-tasks: Meeting Support, ANEP Support, Participant Support, Program Management		
Estimated Milestones:	October 1, 2022 - 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 #
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, an	4-2.	SM-13
Program Management & LISS Participation - Supervise NEIWPCC staff located at LIS and NYS offices; Provide program management for NEIWPCC partnership with LISS; Provide NEP support as requested by EPA or LISO; Staff participates in LISS workgroup and commi	4-2.	SM-13
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
Organize and chair regular quarterly meetings of a data management work group.	4-1.	SM-5; SM-9
Implement a shared Data Management Plan across LISS partners.	4-1.	SM-4; SM-5; SM-9
Enhance the utility and application of water quality monitoring data from LIS and its watershed that is collected by both agencies and communities.	4-1; 1-3	SM-8; WW-28
Assist with GIS and other data on habitat type, connectivity, and species of greatest conservation need.	2-1; 2-2; 2-4; 4-1	HW-3; HW-16; HW-23; SM-10
Review and improve data management by the Sentinel Monitoring Data Clearinghouse for climate change.	1-3; 4-1	WW-34; WW-40; SM-4
Establish uniform QA/QC standards for LISS data, consistent with the diverse data systems in use.	4-1.	SM-4; SM-5
Improve the utility of geospatial data for data visualizations and analyses	4-1.	SM-10
Improve data analysis, visualization, and reporting of LISS-funded data for LISS partners and the public	4-1; 1-3	SM-10; WW-32

b. Research. The LISS STAC met three times in FY2021, with primary investigators of funded projects and others making presentations to report on progress. The four meetings focused on shellfish, eelgrass, and macroalgae restoration, wind energy, hypoxia and climate change, modeling efforts, invertebrate monitoring, and open-science., 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 NYSEA 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. In FY2022, CT and NYSEA released a RFP for preliminary proposals to select research projects that will take place from 2023-2025. Preliminary proposals are due by June 6, 2022.
- 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. In October 2021, the Indicators Team developed an EPA-approved Quality Assurance Project Plan to management the Ecosystem Target and Supporting Indicators Microsite.

The following Research projects were approved to be funded in FY2022 to further our progress:

Title:	NEIWPCC LISS Program Implementation Support: Task 5 - Science Coordination		
Activity Type:	Research	Project Type:	Ongoing
Implementing Agency:	NEIWPCC	Total Estimate Budget	$175,375.00
Responsible Partners:	N/A	Federal Amount:	$175,375.00
		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, 2022 - 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 via staff participation in LISS MC and I-Team meetings; Report to LISS MC at least	1-3; 4-3	WW-28; SM-25; 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	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	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 i	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

Title:	Trends in nitrogen loading from forested areas - A preliminary assessment for Long Island Sound		
Activity Type:	Research	Project Type:	Continuing
Implementing Agency:	USGS	Total Estimate Budget	$43,000.00
Responsible Partners:	N/A	Federal Amount:	$43,000.00
		Match Amount:	$0.00
Objectives:	To investigate trends in nitrogen loads from forested areas and their implications for inputs to Long Island Sound		
Description:	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.		
Estimated Milestones:	October 1, 2022 - September 30, 2023		
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 #
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

Title:	**Long Island Sound Research Grant Program**		
Activity Type:	Research	Project Type:	Ongoing
Implementing Agency:	New York and Connecticut Sea Gra	Total Estimate Budget	$4,429,056.00
Responsible Partners:	N/A	Federal Amount:	$3,000,000.00
		Match Amount:	$1,429,056.00
Objectives:	The first objective is to identify and fund high priority, high quality research needed to best achieve the vision, goals, and targets of LISS 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 the Long Island Sound laid out in the CCMP.		
Description:	The NY and CT Sea Grant programs propose to jointly administer a competitive research program to address the needs of the LISS. These needs are derived from the LISS CCMP and prioritized for developing a request for proposals (RFP) with input from the LISS Science & Technical Advisory Committee and the Science Coordinator.		
Estimated Milestones:	October 1, 2022 - 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 #
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

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 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 FY2021, the LIS Futures Fund was funded at $6,000,000. The LISFF announced 39 grants totaling $5.4 million to local government and community groups to improve the health and ecosystem of Long Island Sound. The LISFF 2021 projects will reach more than 290,000 residents through environmental and conservation education programs. Water quality improvement projects will treat 353,000 gallons of stormwater, install 43,000-square-feet of green infrastructure and remove 97,700 pounds of marine debris from the Long Island Sound. The projects will also restore 25 acres of coastal habitat for fish and wildlife. The funds will be matched by $4.8 million from the recipients, resulting in $10.2 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. Since then, the LISFF invested $32 million in 529 projects. The program has generated an additional $49 million in grantee match, for a total conservation impact of $81 million for regional and local projects. The projects have added 115 river miles for fish passage, restored 805 acres of critical fish and wildlife habitat, treated 201 million gallons of pollution, and educated and engaged over 4 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 FY2022, the funding categories have changed again to Implementation Project ($50,000-$1,500,000), Design/Planning Projects ($50,000-$500,000), Community Science/Water Quality Monitoring ($50,000-$100,000), and Education and Public Participation Grants ($50,000-$250,000). 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 FY2022 funding to LISFF:

Title:	**Long Island Sound Futures Fund 2022**		
Activity Type:	Implementation	Project Type:	Ongoing
Implementing Agency:	NFWF	Total Estimate Budget	$14,200,000.00
Responsible Partners:	N/A	Federal Amount:	$10,650,000.00
		Match Amount:	$3,550,000.00
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, 2022 - September 30, 2023		
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 #
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
Administer subrecipient grants and recipient cooperative agreements	4-2.	SM-13
Finalize investment business planning	4-2.	SM-13
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

C. Proposed New (FY2022) BIL Projects

The Biden-Harris Administration has memorialized the priority to ensure that the benefits of the BIL reach all communities through the provision of technical and financial assistance. The BIL identifies EPA's Geographic Programs and NEPs as key partners to enhance implementation projects and assistance to communities.

The LISS's goal for BIL funding is to significantly improve Long Island Sound's environmental health, climate resilience, and economic vitality in an equitable manner in communities across the Sound's watershed. Stated in the F*Y2022-2026 Bipartisan Infrastructure Law National Estuary Program Interim*

Funding Guidance, BIL funding is to implement the CCMP that significantly support environmental justice and climate resilience. Furthermore, BIL funding should meet the following elements: 1) accelerate and more extensively implement the CCMP, 2) prioritize projects in, and benefits to, underserved and disadvantaged communities, 3) build the adaptive capacity of ecosystems and communities, and 4) leverage and support additional resources. The Study will abide to all guidance as it is developed.

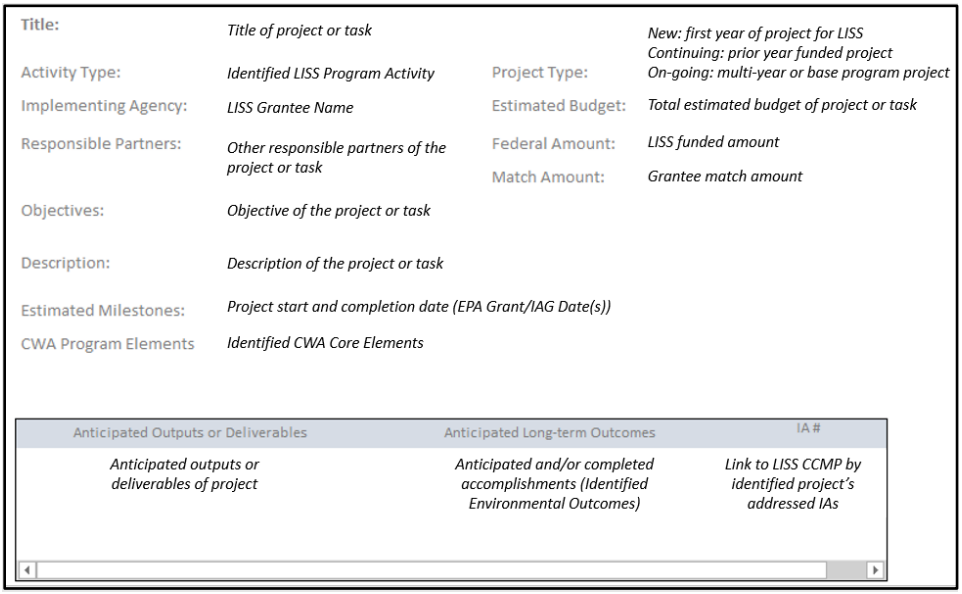
Additionally, the LISS is investing in projects that meet the Justice 40 Initiative in which 40 percent of BIL investments' benefits will accrue to disadvantaged communities. These projects include but are not limited to (see tables for more project details):

- Environmental Justice and Underserved Community Support- Addressing Language Barriers with Coastal Anglers by CT DEEP
- Nitrogen reduction upgrades to Wastewater Treatment Plants in Chicopee, Massachusetts by Mass DEP
- Long Island Sound Community Impact Program by EPA

Similar to Section B, this section outlines the BIL projects in which are 'broken up' by the following categories:

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

The following is the format we present our FY2022 projects:



1. **Clean Waters.**
   The first year and futures years of BIL funding will focus on infrastructure improvement projects in Connecticut, New York, and the upper watershed state of Massachusetts to enhance water quality. This will include funding toward green infrastructure, transition to innovative septic systems, and nitrogen reduction upgrades to wastewater treatment plants. Additionally, to better understand the embayment conditions and implement site-specific infrastructure improvement projects, the LISS will invest in a new vessel to be used for CT DEEP's Long Island Sound Water Quality Monitoring program and associated research projects.

a. **Water Infrastructure**

Title:	**Vessel to enhance the Long Island Sound Monitoring Program**		
Activity Type:	Infrastructure	Project Type:	New
Implementing Agency:	CT DEEP	Total Estimate Budget	$1,533,284.00
Responsible Partners:	N/A	Federal Amount:	$1,533,284.00
		Match Amount:	$0.00
Objectives:	The project objective is to purchase a new vessel to enhance the future monitoring programs and research of Long Island Sound.		
Description:	CT DEEP continues to oversee monitoring activities relevant to implementation of the actions within the Comprehensive Conservation and Management Plan (CCMP), Clean Waters and Healthy Watersheds (WW) priority implementation actions. The Research Vessel John Dempsey has been supporting monitoring efforts on Long Island Sound for the past 30 years. However, the vessel is nearing its life expectancy and we are currently evaluating options for replacement to make sure we maintain the ability to monitor and assess LIS. A vessel with a faster top speed, increased maneuverability and a shallower draft would allow for expansion of the monitoring program into areas currently inaccessible to the Dempsey, such as LIS embayments. The proposed vessel will allow us to better support these additional surveys and expand thenumber of projects we can support.		
Estimated Milestones:	October 1, 2022 – September 30, 2024		
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 #
Design of the vessel to accommodate improvements to address evolving monitoring needs and practical useability needs.	4-1; 1-3	SM-7; WW-39
Purchase of new vessel	4-1; 1-3	SM-7; WW-39

Title:	**NYS Water Quality Improvement Projects (WQIP)**		
Activity Type:	Infrastructure	Project Type:	New
Implementing Agency:	NYSDEC	Total Estimate Budget	$2,250,000.00
Responsible Partners:	N/A	Federal Amount:	$2,250,000.00
		Match Amount:	$0.00
Objectives:	The objective of adding funds to NYS's WQIP Program is to assist municipalities in the implementation of projects that would lead to improving the water quality of Long Island Sound.		
Description:	The Water Quality Improvement Projects (WQIP) Program is a competitive, reimbursement grant program that funds projects that directly address documented water quality impairments or protect a drinking water source. The program is managed by NYSDEC Division of Water staff and has funded hundreds of projects over 17 rounds of funding. It has been successful at assisting eligible applicants and at completing construction/implementation projects in categories such as wastewater treatment improvement, non-agricultural nonpoint source abatement and control, aquatic connectivity restoration. The WQIP program is on avenue for the NYS DEC to implement projects that advance implementation recommendations in TMDLs or Nine Element Plans for State waters.		
Estimated Milestones:	October 1, 2022 - 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 #
Grant Management	1-1; 1-3	WW-2; WW-35

Title:	**NYS Long Island Sound Watershed Septic System Replacement**		
Activity Type:	Infrastructure	Project Type:	New
Implementing Agency:	NYSDEC	Total Estimate Budget	$2,250,000.00
Responsible Partners:	N/A	Federal Amount:	$2,250,000.00
		Match Amount:	$0.00
Objectives:	The objective of this funding would be to grow the current septic replacement programs established in the two counties. The funds would be exclusively for the Long Island Sound watershed, as delineated by USGS in 2021. These additional funds will increase the rate and number of replacements in the watershed, leading to a reduction in the nitrogen entering the groundwater.		
Description:	NYS's Septic System Replacement Fund Program provides critical funding to counties to assist homeowners with replacing cesspools, or inadequate septic systems that impair water quality. Suffolk County with 380,000 systems, and Nassau County with 100,000 systems have the highest number of septic systems, per county, in New York State. Using state funding Each county has built a local grant programs to allow homeowners to upgrade their systems with innovative/alternative on-site treatment systems (I/A OWTS) that treat nitrogen to at least 19 mg/L. The level of nitrogen in the effluent from a conventional septic system is 40 mg/L.		
Estimated Milestones:	October 1, 2022 - September 30, 2024		
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 #
Grant Management	1-1.	WW-12; WW-7

Title:	**Nitrogen reduction upgrades to WWTPs**		
Activity Type:	Infrastructure	Project Type:	New
Implementing Agency:	MA DEP	Total Estimate Budget	$4,500,000.00
Responsible Partners:	N/A	Federal Amount:	$4,500,000.00
		Match Amount:	$0.00
Objectives:	The objective of this project is to implement the recommendations for nitrogen removal at the WPCF, which involves a variable operating model approach, and therefore achieve nitrogen reductions to the Long Island Sound.		
Description:	The Chicopee WPCF is a wet-weather treatment facility with an average flow of 15.5 million gallons per day (MGD) and a peak hourly flow of 47 MGD, serving a population of approximately 55,000. The WPCF utilizes a high purity oxygen (HPO) secondary treatment system that discharges to the Connecticut River, and ultimately Long Island Sound. The City has been issued a final permit that includes a mass-based annual average total nitrogen limit of 647 lbs/day (5 mg/L at 15.5 MGD). In 2017, Woodard & Curran began a high-level evaluation to study the feasibility and requirements to achieve this nitrogen limit at the Chicopee WPCF. In 2021, with the permit requirements becoming clearer coupled with a better understanding of the WPCF processes, performance and land/space available for improvements, Woodard & Curran updated the 2017 report culminating in a formal recommendation and refined cost estimates for upgrades to achieve the new total nitrogen permit limit at the WPCF.		
Estimated Milestones:	October 1, 2022 – September 30, 2027		
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 #
Design of necessary improvements to the WPCF	1-1.	WW-4; WW-2
Construction of the necessary improvements to the WPCF	1-1.	WW-4; WW-2

2. **Healthy Ecosystems**.
In addition to water quality, the LISS will focus on enhancing habitat quality through water infrastructure improvements. Specifically, the Study will work to restore existing or implement new fishways and remove dams. Additionally, LISS is restoring, protecting, and monitoring habitat to enhance climate resilience and sustainability. This will include living shorelines, wetland restoration, and flood mitigation.

a. Water Infrastructure

Title:	**LiDAR and multi-spectral imaging for baseline saltmarsh monitoring**		
Activity Type:	Climate Resiliency	Project Type:	New
Implementing Agency:	CT DEEP	Total Estimate Budget	$1,800,000.00
Responsible Partners:	N/A	Federal Amount:	$1,800,000.00
		Match Amount:	$0.00
Objectives:	The objective of this Project is to support future assessment, monitoring, research, and restoration of coastal saltmarshes by providing critical baseline elevation and current vegetation communities of the entirety of Connecticut's coastal saltmarshes		
Description:	This Project will provide very accurate and precise mapping (elevation and vegetation) of all of our coastal saltmarsh habitat. This mapping will provide baseline data that is currently lacking for our entire coastal marsh systems. These data, at between one and three cm accuracy, will provide for a myriad of different uses into the future. Having baseline data will allow for the tracking of impacts due to climate change, serve to facilitate permitting of restoration activities, and allow for tracking the success or failure of various conservation actions. Further, the establishment of detailed baseline information using drones also will allow for repeatable monitoring to track change over time.		
Estimated Milestones:	October 1, 2022-September 30, 2024		
CWA Program Elements	Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Drone Aerial Photography - A set of aerial photos (Multispectral Ortho Imagery) with 3+/-cm accuracy and saltmarsh community mapping, which will support baseline data for future monitoring and tidal marsh restoration	2-1; 2-4	HW-2; HW-7; HW-23
Modeling - Baseline data for monitoring, which will continue into the future, and for restoration of tidal marsh habitat	2-1; 2-4	HW-5; HW-6; HW-27
Monitoring - Baseline (year 1) data for comparison with future monitoring data	2-4.	HW-27

Title:	**Strong Pond Dam Removal**		
Activity Type:	Infrastructure	Project Type:	New
Implementing Agency:	CT DEEP	Total Estimate Budget	$250,000.00
Responsible Partners:	N/A	Federal Amount:	$250,000.00
		Match Amount:	$0.00
Objectives:	The objective of this project is to support the removal of Strong Pond dam to improve fish passage, stream connectivity and habitat restoration.		
Description:	CFE/Save the Sound has received a majority of the funding for the removal of Strong Pond Dam (aka Dana Dam), but additional support is needed to complete the project. Working with DEEP's Watershed Management Staff and Habitat Restoration Coordinator, CFE/Save the Sound will manage the removal of Strong Pond Dam and restoration of the site, located within Merwin Meadows Park. CFE/Save the Sound will manage the engineering design contractor; local permitting and memorandum of agreement process; bid process; and construction contractor.		
Estimated Milestones:	October 1, 2022-September 30, 2024		
CWA Program Elements	**Wetlands Program Support/Implementation**		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Coordinate with CT DOT (property owner) and consultant	2-1.	HW-3
Review and update to final design that was completed in 2013	2-1.	HW-3
Bidding for construction contractor	2-1.	HW-3
Construction phase	2-1.	HW-3
State and Federal permitting	2-1.	HW-3

Title:	**Fish Passage Restoration on the Pequabuck River - Middle Street Pond Dam Removal**		
Activity Type:	Infrastructure	Project Type:	New
Implementing Agency:	CT DEEP	Total Estimate Budget	$1,600,000.00
Responsible Partners:	N/A	Federal Amount:	$1,600,000.00
		Match Amount:	$0.00
Objectives:	The objective of this project is to completely remove Middle Street Pond dam in Bristol, CT to restore 8.5 miles of fish passage.		
Description:	This project will fully remove a defunct dam from Pequabuck River and mitigate contaminated sediment behind the dam. CT DEEP will oversee the removal of Middle Street Pond Dam which is located on the Pequabuck River in Bristol, CT. This will restore 8.5 stream miles to fish passage and remove 3000 cubic yards of contaminated sediment. CT DEEP will select a contractor to complete the engineering design; local permitting and memorandum of agreement process; bid process; and construction.		
Estimated Milestones:	October 1, 2022-September 30, 2024		
CWA Program Elements	**Wetlands Program Support/Implementation**		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Coordinate with CT DOT (property owner) and consultant	2-1.	HW-3
Review and update to final design that was completed in 2013	2-1.	HW-3
Bidding for construction contractor	2-1.	HW-3
Construction phase	2-1.	HW-3
State and Federal permitting	2-1.	HW-3

b. Climate Resiliency

Title:	Living Shorelines Implementation for Identified and Emergent Sites		
Activity Type:	Climate Resiliency	Project Type:	New
Implementing Agency:	CT DEEP	Total Estimate Budget	$1,300,000
Responsible Partners:	N/A	Federal Amount:	$1,300,000
		Match Amount:	$0.00
Objectives:	The primary objective of this project is to facilitate the implementation of at least one or more living shoreline projects that have either been identified or may emerge as a priority opportunity.		
Description:	Connecticut is actively pursuing implementations for living shorelines to increase resiliency through natural processes and reduce dependencies on traditional hardened structure for shoreline stabilization and associated restoration or sustainability of coastal resources such as beaches and dunes, coastal grasslands, and tidal wetlands. To date, several installations of varying size and design have been implemented, and there are expectations for several more across a landscape of private, municipal, and public properties. Access to funding, however, remains a barrier to implementation, as the identification of needs outpaces the capacity to properly plan, design, implement, and monitor efficacy. This project will provide a ready source of funding to be used for targeted and potential emergent living shoreline projects that present a significant opportunity for a living shoreline approach to mitigate erosion, support healthy coastal habitats, or improve access to and appreciation of Long Island Sound		
Estimated Milestones:	October 1, 2022 - September 30, 2024.		
CWA Program Elements	Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Quality Assurance Project Plans (QAPPs)	2-1.	HW-1; HW-11; HW-12
Initial Project Identification - Initial selection of at least one or more living shoreline projects/project components to pursue	2-1.	HW-1; HW-11; HW-12
Consultant Selection - Contract with a qualified project consultant for required services	2-1.	HW-1; HW-11; HW-12
Project Planning Services-Design - A set of professionally engineered design plans to be included in permit applications and to be used for construction	2-1.	HW-1; HW-11; HW-12
Project Planning Services-Permitting - State and federal authorization, allowing the construction phase to begin	2-1.	HW-1; HW-11; HW-12
Construction	2-1.	HW-1; HW-11; HW-12
Post-Project Monitoring	2-1.	HW-1; HW-11; HW-12
In-project Coordination and Reporting - Project updates delivered to NEPORT, LISS Committees & Workgroups, and various databases	2-1.	HW-1

Title:	**Support for Stewardship Land Acquisition by the New York State Department of Environmental Conservation**		
Activity Type:	Climate Resiliency	Project Type:	New
Implementing Agency:	NYSDEC	Total Estimate Budget	$2,909,800.00
Responsible Partners:	N/A	Federal Amount:	$2,909,800.00
		Match Amount:	$0.00
Objectives:	The objective of this project is to continue NYSDEC efforts, in partnership with the LISS Stewardship Initiative, to provide water quality, tidal wetland, and coastal habitat protection to Long Island Sound through preservation of land in its watershed.		
Description:	NYSDEC is requesting funds to provide support for the acquisition of three properties: Two acquisitions (Watson and Kozikowski) would be additions to NYSDEC's Conscience Bay- Little Bay State Tidal Wetland Area in the Conscience Bay-Little Bay- Setauket Harbor Significant Coastal Fish and Wildlife Habitat; and the third acquisition (Bateson) lies between and is in the watershed of both Little Bay and Port Jefferson Harbor, an LISS Inaugural Stewardship Area.		
Estimated Milestones:	October 1, 2022 – September 30, 2025		
CWA Program Elements	Wetlands Program Support/Implementation		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Purchase and protection of the Watson Property	2-1.	HW-3; HW-9
Purchase and protection of the Kozikowski Property	2-1.	HW-3; HW-9
Purchase and protection of the Bateson Property	2-1.	HW-3; HW-9

3. Strong Communities.

As highlighted in Section B, the integration of environmental justice goals with all Long Island Sound watershed protection and restoration activities is being met through implementation of the LISS 5-year Environmental Justice Work Plan. The plan includes public involvement, coastal public access, and human and ecosystem health goals. A key component is EPA's release of the RFA to support and build community capacity to address EJ within communities. Additionally, the Study is also working to better understand barriers – more specifically, language barriers with Connecticut's coastal anglers to better communicate and educate about environmental health issues associated with fishing.

a. Environmental Justice

Title:	**Environmental Justice and Underserved Community Support- Addressing Language Barriers With Coastal Anglers**		
Activity Type:	Environmental Justice	Project Type:	New
Implementing Agency:	CT DEEP	Total Estimate Budget	$62,632.00
Responsible Partners:	N/A	Federal Amount:	$62,632.00
		Match Amount:	$0.00
Objectives:	The objective of this project is to provide the necessary data to increase equitable access to LISS resources, information and participation.		
Description:	This program is to address one of the critical data gaps regarding the tracking of one of the primary uses of the LIS, fishing. The annual angler survey is the key data collection practice for understanding the angler needs and fisheries management needs in the LIS (and other coastal areas). It is CT DEEP's intent to provide this survey with the needed language support to eliminate the acknowledge language barrier to the equitable participation and thereby, an equitable un-biased data set for LISS programs to utilize.		
Estimated Milestones:	October 1, 2022 – September 30, 2024		
CWA Program Elements	N/A		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Bilingual Support for Annual Angler Surveys	4-2; 1-3; 3-1	SM-21; WW-39; SC-4
Translated Introductory Materials	3-1.	SC-3; SC-4; SC-7
Final Report	3-1.	SC-4; SC-7

Title:	**Long Island Sound Community Impact Program**		
Activity Type:	Environmental Justice	Project Type:	New
Implementing Agency:	EPA	Total Estimate Budget	$3,000,000.00
Responsible Partners:	N/A	Federal Amount:	$3,000,000.00
		Match Amount:	$0.00
Objectives:	The objective is to select an organization to 1. Develop and administer a competitive grant program focused on activities that address challenges and opportunities facing underserved communities within the scope of the LISS CCMP; and 2. Develop and implement an outreach and support program focused on involving underserved communities and providing them technical support as necessary.		
Description:	This RFA to select an organization to manage the Long Island Sound Community Impact Fund (LISCIF) is key to meeting LISS's EJ goals. EPA will provide funds to the LISCIF annually to be used for awards under this competitive opportunity. EPA expects to provide up to $5 million to cover 3 years for the development of the competitive grant program, two rounds of pass-through funds in years two and three of the award, and the technical assistance and support program for underserved communities.		
Estimated Milestones:	October 1, 2022 – September 30, 2027		
CWA Program Elements	N/A		

Anticipated Outputs or Deliverables	Anticipated Long-term Outcomes	IA #
Select an organization to develop and administer a competitive grant program focused on activities that address challenges and opportunities facing underserved communities within the scope of the LISS CCMP	3-1.	SC-4
Selected organization develops and implements an outreach and support program focused on involving underserved communities and providing them technical support as necessary.	3-1.	SC-4

D. Previous Year's (FY2021) 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 interested 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 FY2021 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 2021. The total Trade-Equalized (TE) point source nitrogen load for 2021 was 18,338 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 49 million pounds annually compared to baseline levels established in the 2000 TMDL. In 2021, discharges decreased by 4.8% compared to 2020, 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 6 depicts the reductions in Trade-equalized point source loadings from 1995-2021.

Area/Duration of Hypoxia. The maximum area of hypoxia (less than 3 milliliters (ml) of DO per liter of bottom water) in 2021 was 142 square miles. The 2020 5-year rolling average for the maximum summertime area of low dissolved oxygen (hypoxia) in Long Island Sound was estimated at 83 square miles. This represents a 59 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). The five-year average hypoxic area decreased even though the maximum area of hypoxia increased from 2020 to 2021 – 63 square miles in 2020 to 142 square miles in 2021. The continued declining trend is due to the removal of the 2016

measurement, a particularly large hypoxic area, from the current period, 2017-2021. Compared to the 2020, the severity of hypoxia has increased, from 0 to 8 square miles of area in the open waters below 1 mg/l dissolved oxygen. 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 2021 hypoxic event lasted an estimated 47 days, beginning on July 23 and ending September 7. Importantly, the duration was below the average of 54 days for the entire time series. Attachment 7 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

Typically, LISS partners have addressed marine litter reduction primarily through the LISFF program where projects focus on marine litter reduction, prevention, and education.; however there were no projects closed in FY2021. However, LISS partners, under the guidance of the NOAA Marine Debris Program and leadership of the CT and NY SEA programs, worked to develop a bi-state action plan for Long Island Sound. The Long Island Sound Marine Debris Action Plan, published in May 2022, represents a comprehensive framework of strategic actions to mitigate the impacts of marine debris in Long Island Sound over the next five years (2022-2027). The plan is organized under three main goals: 1) Understand, Prevent and Mitigate the Impacts of Single-Use Plastic and Other Water/Land-based Consumer Debris; 2) Understand, Prevent and Mitigate the Impacts of Abandoned and Lost Fishing/Aquaculture Gear; and 3) Understand, Prevent and Mitigate the Impacts of Microplastics and Microfibers. Over the next five years, tracking and monitoring of identified actions will help assess collective progress in achieving the goals for Long Island Sound.

d. Green Infrastructure and Resiliency

The LISS partners have addressed green infrastructure primarily through the LISFF program. The following projects closed in FY2021 which estimated 5,503 square feet of green infrastructure installed, 17,742 square feet of impervious surface removed, 7.9 pounds of nitrogen prevented annually, and 1,426,200 gallons of stormwater prevented annually:

- Rapid Action Plans to Deliver Green Infrastructure in Coastal Connecticut Communities where University of Connecticut, Center for Land Use Education and Research helped towns identify high priority areas for green infrastructure and implement projects.
- Bright Green Hartford- Residential Rainwater Management for A Greener, Cleaner, and Healthier Hartford where the City of Hartford conducted a city-wide Green Infrastructure program to provide residents with tools to reduce stormwater pollution into the Connecticut River and Long Island Sound.

- Rain Gardens at Port Jefferson Harbor: Linking Water, Wildlife and Waterways where the Maritime Explorium established four native plant rain gardens and educational signs in high visibility public locations around the Bridgeport and Port Jefferson Ferry dock in Port Jefferson, New York.

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 FY2021, seven partner's assistance award funded in prior fiscal years have been completed and their EPA awards closed out:

- LI00A00008, $1,269,695, National Fish and Wildlife Foundation Long Island Sound Futures Fund 2015
- LI00A00578, $203,991, Connecticut Sea Grant CCMP Implementation
- LI00A00156, $772,529, Connecticut Sea Grant CCMP Implementation
- LI00A00157, $691,408, University of Connecticut Water Quality Monitoring
- LI00A00354, $4,348,266, Connecticut Department of Energy and Environmental Protection CCMP Implementation 2019
- LI00A00166, $3,234,489, Connecticut Department of Energy and Environmental Protection CCMP Implementation 2018
- LI96187401, $1,991,055, NEIWPCC CCMP Implementation 2015

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ATTACHMENT 1

LONG ISLAND SOUND STUDY
NATIONAL ESTUARY PROGRAM WORK PLAN
LIST OF FY2022 LISS-FUNDED STAFF

ORGANIZATION/NAME	LISS TITLE	DESCRIPTION OF RESPONSIBILITIES/ACTIVITIES
EPA		
Mark Tedesco	Director, LIS Office	Direction of office and program
Leah O'Neill	EPA R1 Regional 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
Esther Nelson	EPA R2 Program Coordinator	Project officer, federal partner coordination, watershed & embayments
Casey Abel	EPA R1 Program Coordinator	Project officer, grants management, watershed & embayments
Melissa Duvall	EPA R2 Water Quality Modeler	Project officer, modeling coordination
Kristen Laccetti	EPA R2 Program Coordinator	Project officer, BIL management
Ashley Desrosiers	EPA R1 Program Coordinator	Project officer, BIL management
ORISE Fellow	Research Fellow	Open science, data management and reporting
CT DEEP		
Mark Parker (retired 4/20/22)	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
NYSDEC		
Samarra Scantlebury (state funded)	LIS Coordinator	Coordinates overall LIS program in New York
Mary Arnold	DW Coordinator	Coordinates Division of Water programs
NY Sea Grant		
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%)
Sara Powell	NY Sustainable and Resilient Community Extension Professional	Support local communities in implementing the Sustainable and Resilient Communities work plan.

Sarah Schaefer-Brown	NY Sustainable and Resilient Community Extension Professional	Support local communities in implementing the Sustainable and Resilient Communities work plan.
Elizabeth Hornstein	NY Sustainable and Resilient Community Extension Professional	Support local communities in implementing the Sustainable and Resilient Communities work plan.
Lillit Genovesi	NY WLIS Outreach Coordinator	Develops and implements communications plans and public information/education program in NYC and Westchester, NY.
NEIWPCC		
Robert Burg	LISS Outreach 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
CTSEA		
Jessica LeClair	CT Outreach Coordinator	Provides PI&E support and coordination in CT
Alicia Tyson	CT Sustainable and Resilient Community Extension Professional	Support local communities in implementing the Sustainable and Resilient Communities work plan
Deborah Abibou	CT Sustainable and Resilient Community Extension Professional	Support local communities in implementing the Sustainable and Resilient Communities work plan

Organization & Base Program Activity	2022 Requested Budget	2022 Required Match	2022 Actual Match
			Attachment 2 Draft as of 7/19/2022
1. EPA Long Island Sound Office	**$575,436**	**$0**	**NA**
a. LIS Program & ORISE support	$110,000	$0	NA
b. EPA HQ administration	$4,000	$0	NA
c. R2 LIS Program Support	$335,436	$0	NA
d. R1 LIS Program Support	$126,000	$0	
2. Connecticut Dept. of Energy & Environmental Protection	**$4,724,708**	**$3,149,806**	**$7,164,016**
a. CT State Coordination (two new positions)	$671,137	$447,425	
b. LIS Water Quality Monitoring Program	$1,263,117	$842,078	
c. CT Habitat Restoration Coordination	$223,530	$149,020	
d. Embayment Data Collection and Modeling	$630,000	$420,000	
e. Onsite Wastewater Treatment System Study Support	$100,000	$66,667	
f. Long Term Monitoring of Coastal Acidification Parameters in the Open Sound	$94,532	$63,021	
g. Developing Dynamic Habitat-Based Ecological Decision Support Tools	$1,625,392	$1,083,595	
h. CT ECO Maintenance	$45,000	$30,000	
i. Land Cover Comparison	$72,000	$48,000	
j. State Overmatch			$7,164,016
3. NY State Dept. of Environmental Conservation (Land)	**$0**	**$0**	**$0**
a. NY Habitat Coordination [via NEIWPCC]	See NEIWPCC	See NEIWPCC	
4. NY State Dept. of Environmental Conservation (Water)	**$34,187**	**$22,791**	**$3,100,000**
a. Sound Coastal Gardening Program and Certificate	$34,187	$22,791	
b. LIS Nitrogen Reduction Coordination [via NEIWPCC]	See NEIWPCC	See NEIWPCC	
c. LIS Nutrient Bioextraction Coordination [via NEIWPCC]	See NEIWPCC	See NEIWPCC	
d. Enhancement of bioextraction through assessment, experimentation & research	See NEIWPCC	See NEIWPCC	
e. State Overmatch			$3,100,000
5. Univ. of Connecticut/ CT Sea Grant Public Outreach	**$863,967**	**$462,795**	**$32,245**
a. CT PI&E Coordination & STAC support	$154,490	$8,131	$9,556
b. K-12 Mentor Teacher Program	$32,876	$1,730	$2,389
c. Sustainable & Resilient Communities tasks	$679,401	$452,934	$20,300
6. NY Sea Grant Cornell U. Public Outreach	**$1,487,103**	**$674,475**	**$58,375**
a. NY Public Outreach Program	$260,454	$13,708	$13,708
b. LISS Outreach Coordination in NYC and the Western Basin	$255,685	$13,457	$14,000
c. Sustainable & Resilient Communities	$970,964	$647,309	$30,667
7. NE Interstate Water Pollution Control Commission	**$2,008,169**	**$1,101,454**	**$0**
a. Task 1 Outreach/Education Support	$386,502	$20,342	$0
b. Task 2 Program Management & Participant Support	$145,189	$96,793	$0
c. Task 3 Habitat Restoration & Stewardship Coordination	$166,963	$111,309	See NYSDEC
d. Task 4 NYS Regional Coordinator	$155,519	$103,679	See NYSDEC
e. Task 5 Science Coordination	$175,375	$116,917	$0
f. Task 7 LIS Nitrogen Reduction Coordination	$81,878	$54,585	See NYSDEC
g. Task 8 LIS Nutrient Bioextraction Coordination	$896,743	$597,829	See NYSDEC
8. Interstate Environmental Commission	**$579,935**	**$386,623**	**$400,000**
a. Base WQ Monitoring	$421,630	$281,087	
b. Regional fecal indicator bacteria monitoring network	$158,305	$105,537	
9. Univ. of Connecticut Water Quality monitoring	**$634,173**	**$422,782**	**$165,143**

a. Base WQ Monitoring	$634,173	$422,782	
10. National Fish & Wildlife Foundation	**$10,650,000**	**$7,100,000**	**$3,550,000**
11. Save the Sound- Unified Water Study	**$990,816**	**$660,544**	**$660,544**
12. UConn/ CT Sea Grant Research Program	**$1,500,000**	**$1,000,000**	**$713,056**
13. Research Foundation SUNY/NY SeaGrant Program	**$1,500,000**	**$1,000,000**	**$716,000**
14. Audubon Connecticut	**$250,000**	**$166,667**	**$0**
a. Implementing Ecological Restoration at Great Meadows Marsh, CT	$250,000	$166,667	$0
15. EPA Nitrogen Contract	**$200,000**	**$0**	**NA**
16. EPA/ORD RBEROST contract support	**$72,636**	**$0**	**NA**
17. USGS NE Interagency Agreement - Severable	**$1,288,500**	**$0**	**NA**
a. Major Tributaries to LIS Monitoring	$275,000	$0	NA
b. Lower CT River Monitoring	$81,500	$0	NA
c. CT River at Middle Haddam Nutrient Load Monitoring Station	$75,000	$0	NA
d. Upper CT River Monitoring (Year 1 of 4)	$510,000	$0	NA
e. USGS Coastal Acidification monitoring	$272,000	$0	NA
f. Nitrogen concentrations and loads and seasonal nitrogen loads in tributaries	$75,000	$0	NA
18. USGS NE Interagency Agreement - Non-Severable	**$793,000**	**$0**	**NA**
a. Trends in nitrogen loading from forested areas Year 2	$43,000	$0	NA
b. Optimizing BMPs to Minimize Delivery of N, P, and SS Loadings to LIS: Modeling	$750,000	$0	NA
19. USGS NY Interagency Agreement - Severable	**$295,000**	**$0**	**NA**
a. Establish New Water Quality Monitoring Station in Oyster Bay, LI	$190,000	$0	NA
b. Re-establish Water Quality Monitoring Station on Flax Pond at Old Field, NY	$105,000		
20. USGS NY Interagency Agreement - Non-severable	**$1,586,000**	**$0**	**NA**
a. Assessment of compound flood risk (CWA 320)	$750,000	$0	NA
b. Assessment of compound flood risk (CWA 119)	$250,000	$0	NA
c. Development of a map-based Long Island Sound data and research portal (Clearinghouse)	$586,000	$0	NA
21. USGS CMSC- Building Coastal Resilience Equitably	**$295,605**	**$0**	**NA**
22. USFWS Interagency Agreement - Severable	**$305,000**	**$0**	**NA**
a. Tidal Marsh Restoration Implementation at Priority Sites	$305,000	$0	NA
23. NOAA Interagency Agreement - Non-severable	**$1,269,540**	**$0**	**NA**
a. Critical assessment of baseline disease dynamics of natural oyster beds in LIS	$1,269,540	$0	NA
24. NRCS Interagency Agreement - Severable	**$318,311**	**$0**	**NA**
a. Nutrient Management Outreach and Planning for Animal Operations in Connecticut	$191,572	$0	NA
b. Outreach and Planning for Agricultural Operations in Connecticut	$126,739	$0	NA
Total:	**$32,222,086**	**$16,147,937**	**$16,559,379**
Fiduciary Reserve	$0		
Final Total:	**$32,222,086**		

Budget target for FY22 $32,225,000 million

$31,400,000 for LIS Section 119 funds and $750,000 for NEP Section 320 funds with $75,000 FY21 carryover

Attachment 3
As of 7/18/2022

Organization & Program Activity	2022 Projected 119 Budget	2022 Projected 320 Budget	2023 Additional Incremental Funds	2024+ Additional Incremental Funds	Total Award Amount Total Funds Requested
1. EPA Long Island Sound Office	**$425,000**	**$0**	**$950,000**	**$1,010,000**	**$1,435,000**
a. Undetermined amount withheld by EPA HQ	$54,994	$0	$109,988	$110,000	$274,982
b. WCF	$18,006	$0	$36,012	$50,000	$104,018
c. EPA R2 FTE support	$88,000	$0	$276,000	$300,000	$664,000
d. EPA R1 FTE support	$264,000	$0	$528,000	$550,000	$1,342,000
2. Connecticut Dept. of Energy & Environmental Protection	**$6,545,916**	**$0**	**$7,500,000**	**$7,500,000**	**$21,545,916**
a. Living shorelines and habitat restoration for resiliency	$1,300,000	$0	$0	$0	$1,300,000
b. Strong Pond Dam removal	$250,000	$0	$0	$0	$250,000
c. Middle Street Pond Dam Removal Project	$1,600,000	$0	$0	$0	$1,600,000
d. LiDAR and multi-spectral imaging for baseline saltmarsh monitoring	$1,800,000	$0	$0	$0	$1,800,000
e. Vessel to enhance the Long Island Sound Monitoring Program	$1,533,284	$0	$0	$0	$1,533,284
f. Addressing Language Barriers - Coastal Anglers	$62,632	$0	$0	$0	$62,632
3. NY State Dept. of Environmental Conservation (Land)	**$2,000,000**	**$909,800**	**$3,409,800**	**$3,409,800**	**$9,729,400**
a. Land Acquisition	$0	$909,800	$909,800	$909,800	$2,729,400
b. Land Acquisition	$2,000,000	$0	$2,500,000	$2,500,000	$7,000,000
4. NY State Dept. of Environmental Conservation (Water)	**$4,500,000**	**$0**	**$6,000,000**	**$6,000,000**	**$16,500,000**
a. NYS Water Quality Improvement Projects (WQIP)	$2,250,000	$0	$3,000,000	$3,000,000	$8,250,000
b. NYS Long Island Sound Watershed Septic System Replacement	$2,250,000	$0	$3,000,000	$3,000,000	$8,250,000
5. MA Dept of Environmental Protection	**$4,500,000**	**$0**	**$4,000,000**	**$2,000,000**	**$10,500,000**
a. Nitrogen reduction upgrades to Chicopee	$4,500,000	$0	$0	$0	$4,500,000
a. Future nitrogen reduction upgrades to WWTPs	$0	$0	$4,000,000	$2,000,000	$6,000,000
6. Environmental Justice award to TBD	**$3,000,000**	**$0**	**$0**	**$2,000,000**	**$5,000,000**
a. Outreach & Implementation RFP	$3,000,000	$0	$0	$2,000,000	$5,000,000
Total:	**$20,970,916**	**$909,800**	**$21,859,800**	**$21,919,800**	**$64,710,316**
Planning Target	$21,000,000	$909,800	**$21,950,000**	**$21,950,000**	
Unallocated Funds:	$29,084	$0	$90,200	$30,200	

Budget target for FY22 = $21,909,800

$21,000,000 for LIS Section 119 funds ($106,000,000 over 5 years) and $909,800 for NEP Section 320 funds

Attachment 4
Draft as of 7/19/2022

Program Code/Grant #	Funding Opportunity # (grants.gov)	Lead Project Officer	Awarding Region	Recipient	Description	HQ hold Fed Award Amount (000B67) CWA 119	R1 Fed Award Amount (000B67) CWA 119	R2 Fed Award Amount (000B67) CWA 119	Fed Award Amount (000B89) CWA 320	HQ BIL CWA 119	R1 BIL CWA 119	R2 BIL CWA 119	BIL CWA 320
LI-96261117-2	EPA-CEP-01 CFDA 66.437	Chris Dere	2	NY State DEC	No Cost Time Extension								
LI-96261417-2	EPA-CEP-01 CFDA 66.437	Mark Tedesco	2	Cornell University Office of Sponsored Programs	No Cost Time Extension								
LI-96242321-1	EPA-CEP-01 CFDA 66.437	Cayla Sullivan	2	NY State DEC	This agreement would launch NYs Sound Coastal Gardening Program and Certificate program			$34,187					
4S- New BIL	EPA-CEP-01 CFDA 66.437	Cayla Sullivan	2	NYSDEC/DOW	Support for WQIP and Septic System Improvement programs in NY State.							$4,500,000	
4S- New BIL	EPA-CEP-01 CFDA 66.437	Cayla Sullivan	2	NYSDEC/DMR	Land acquisition							$2,000,000	$909,800
LI-96244521-1	EPA-CEP-01 CFDA 66.437	Mark Tedesco	2	Cornell University Office of Sponsored Programs	1) Conduct the planning, organization and implementation of public environmental education and involvement programs, including those from environmental justice communities. 2) Provide technical assistance to support Sustainable and Resilient Communities			$1,487,103	$0				
LI-96244421-1	EPA-CEP-01 CFDA 66.437	Nikki Tachiki	2	State University of New York SUNY Research Foundation (Sea Grant)	To administer the LIS Research Grant program to identify scientific research needs and priorities, solicit and manage scientific peer review of proposals, and			$1,500,000	$0				

					manage the selection and completion of the highest priority proposals.								
LI-96239522-0	EPA-CEP-01 CFDA 66.437	Chris Dere	2	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. Additionally, this agreement will design a living shoreline resiliency project at Chittenden Park, CT.			$990,816	$0				
LI-96244221-1	EPA-CEP-01 CFDA 66.437	Aimee Boucher	2	Interstate Environmental Commission	1) conduct water quality monitoring of summer hypoxic conditions in western LIS 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 CTDEEP			$579,934	$0				
LI-00A00954-1	EPA-CEP-01 CFDA 66.437	Nikki Tachiki	1	CT Sea Grant Research	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 LIS critical to improving water and habitat quality.		$1,500,000		$0				

4S-00A00885-0	EPA-CEP-01 CFDA 66.437	Ashley Desrosiers	1	MassDEP	This agreement is to fund upgrades to the Chicopee WPCF (which discharges to the CT River and LIS), to help the city meet its final permit that includes a mass-based annual average total nitrogen limit of 647 lbs/day.						$4,500,000		
LI-00A00578-2	EPA-CEP-01 CFDA 66.437	Casey Abel	1	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 LIS 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 LISS watershed. Additionally, this agreement will work to implement the Sustainable and Resilient Communities Work Plan.		$863,967		$0				
LI-New	EPA-CEP-01 CFDA 66.437	Bessie Wright	1	National Fish & Wildlife Foundation	NFWF LIS Futures Fund 2022. The grant supports activities to support community-based efforts to restore LIS 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.		$10,650,000		$0				

LI-00A00953-1	EPA-CEP-01 CFDA 66.437	Casey Abel	1	Univ. of Connecticut-WQ Monitoring	Water quality monitoring		$634,173						
LI-00A00579-3	EPA-CEP-01 CFDA 66.437	Leah O'Neill		CTDEEP	No Cost Time Extension								
LI-00A00354-2	EPA-CEP-01 CFDA 66.437	Leah O'Neill		CTDEEP	No Cost Time Extension								
LI-00A00820	EPA-CEP-01 CFDA 66.437	Leah O'Neill	1	Connecticut Department of Energy and Environmental Protection	Support the CCMP to protect and restore the chemical, physical and biological integrity of Long Island Sound.		$4,724,709		$0				
4S-New BIL	EPA-CEP-01 CFDA 66.437	Leah O'Neill		CTDEEP	CTDEEP BIL Funding						$6,545,916		
4S-New BIL	EPA-CEP-01 CFDA 66.437	Ashley Desrosiers		TBD	Community Impact Fund - EJ RFA						$3,000,000		
LI-00A00697-1	EPA-CEP-01 CFDA 66.437	Casey Abel	1	National Audubon Society	Implementing Ecological Restoration and Resiliency at Connecticut's Largest Remaining Un-ditched Marsh		$250,000						
LI-00A01059-0	EPA-CEP-01 CFDA 66.437	Bessie Wright	1	New England Interstate Water Pollution Control Commission	Assist the states of CT and NY and other public or nonprofit entities in conducting research, investigations, training, demonstration, surveys, or studies related to reducing pollution and improving the quality of the environment to sustain living resources in LIS		$2,008,169						
Interagency Agreement	EPA-CEP-01 CFDA 66.437	Esther Nelson	2	USGS NY - Severable	Severable. Establish New Water Quality Monitoring Station in Oyster Bay, LI. Re-establish Water Quality Monitoring			$295,000					

					Station on Flax Pond at Old Field, NY								
Interagency Agreement	EPA-CEP-01 CFDA 66.437	Nikki Tachiki	2	USGS NY - Non-Severable	Assistance to USGS NY 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.			$250,000	$750,000				
Interagency Agreement	EPA-CEP-01 CFDA 66.437	Nikki Tachiki	2	USGS NY - Non-Severable	Development of a mapper-based Long Island Sound data and research portal (Clearinghouse)			$586,000					
Interagency Agreement	EPA-CEP-01 CFDA 66.437	Casey Abel	1	USGS CT NE	Severable. a. Major Tributaries to LIS Monitoring; b. Lower CT River Monitoring; c. CT River at Middle Haddam; d. Upper Connecticut River Monitoring (Yr 1 of 4) e. USGS Coastal Acidification Monitoring; f. Nitrogen concentrations and loads and seasonal nitrogen loads in tributaries		$1,288,500						
Interagency Agreement	EPA-CEP-01 CFDA 66.437	Casey Abel	1	USGS CT NE	Non-Severable. a. Trends in nitrogen loading from forested areas Year 2 b. Optimizing BMPs to Minimize Delivery of N, P, and SS Loadings to LIS: Modeling		$793,000						
Interagency Agreement	EPA-CEP-01 CFDA 66.437	Casey Abel	1	USGS CT WH	Non-Severable. Building Coastal Resilience Equitably: An assessment of shoreline evolution		$295,650						
Interagency Agreement	EPA-CEP-01 CFDA 66.437	Esther Nelson	2	NRCS	Severable. Nutrient Management Outreach and Planning for Animal Operations in Connecticut. Outreach and Planning for			$318,311					

					Agricultural Operations in CT								
Interagency Agreement	EPA-CEP-01 CFDA 66.437	Casey Abel	1	NOAA	Non-Severable. Critical assessment of baseline disease dynamics of natural oyster beds in Long Island Sound – establishing foundational knowledge to inform oyster restoration and aquaculture disease management. (2 yrs)		$1,269,609						
Interagency Agreement	EPA-CEP-01 CFDA 66.437	Esther Nelson	2	USFWS	Severable. Tidal Marsh Restoration Implementation at Priority Sites Through Increased Capacity			$305,000					
Contract	EPA-CEP-01 CFDA 66.437	Leah O'Neill	1	EPA Nitrogen Contract	EPA Nitrogen Contract		$200,000						
Contract	EPA-CEP-01 CFDA 66.437	Mark Tedesco	2	EPA	RBEROST ORD contract (GIS work)			$10,524					
Contract	EPA-CEP-01 CFDA 66.437	Mark Tedesco	2	EPA	RBEROST ORD contract (Tasks 1-4)			$62,112					
FTE		Leah O'Neill	1	EPA	FTE assistance for R1 Staff Support.		$126,000				$264,000		
EPA HQ			HQ	EPA	EPA HQ Administration	$ 4,000							
EPA HQ			HQ	EPA	EPA HQ Administration BIL					$ 54,994			
R2 Office		Mark Tedesco	2	EPA	LIS Program & ORISE			$110,000					
R2 Office		Mark Tedesco	2	EPA	R2 LIS Program Support			$335,436				$88,000	
					Budget Total:	$4,000	$24,603,777	$6,864,423	$750,000	$54,994	$14,309,916	$6,588,000	$909,800

Final Budget total:			**$32,222,200**	**CWA 119 BIL TOTAL:** $20,897,916
Unallocated:				

Attachment 5

Long Island Sound Study

Travel Documentation for LIS NEP Work Plan

July 1, 2021 - June 1, 2022

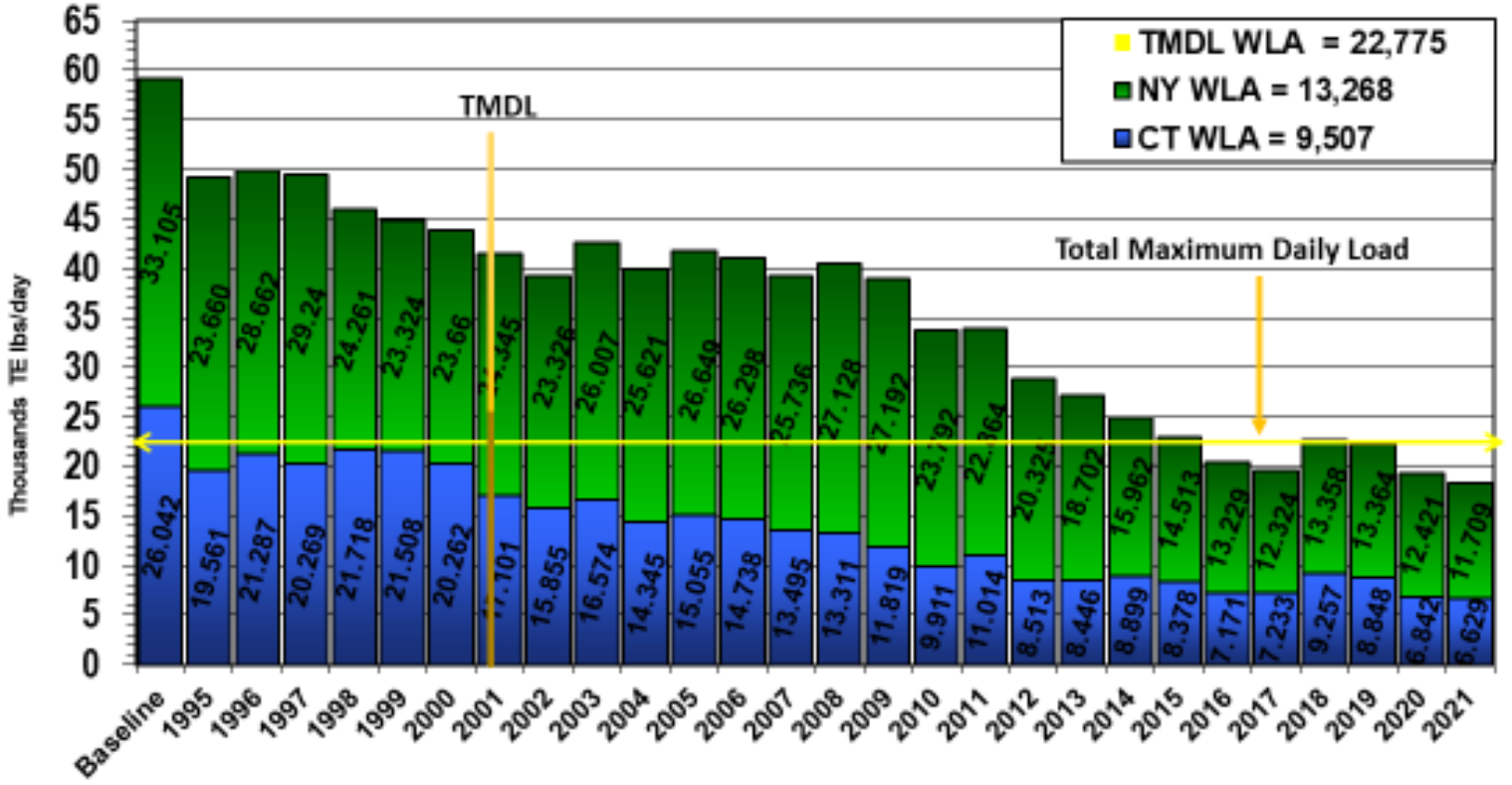
*Reimbursement transaction posted date (meeting date may be outside this timeframe)

LISS PARTNER PARTICIPANT SUPPORT					
Meeting Date(s)	Meeting Title	Meeting Location (Destination)	Agency/Committee Affiliation	Expense ($)	Grant Number
7/7/2021	Field visit to 3 poposed tidal marsh restoration site	Guilford, Clinton, & Old Saybrook	CTDEEP	59.36	LI-00A00384
9/6-9/17	Hempstead Harbor Protection Committee Meeting	Sea Cliff, NY	NYDEC	36.40	LI-00A00688
9/7/2021	Field Visit to proposed Thames River living shoreline site	New London, CT	CTDEEP	58.24	LI-00A00384
10/5/2021	Tidal Wetaland resoration training for CTDEEP Staff	Niantic, CT	CTDEEP	45.36	LI-00A00384
10/18-23/21	Living Shorelines Workshop/Restore America's Estuaries	Cape May, NJ	CTDEEP	1126.39	LI-00A00384
10/25/2021	Press event and ground-breaking for Great Meadows marsh resoration	Stratford, CT	CTDEEP	51.52	LI-00A00384
11/1-4, 8-11/2021	Coastal & Estuarine Research Federation Conference 2021	Virtual Conference	CTDEEP	276.00	LI-00A00384
11/1/2021	Marsh restoration coord. Mtg. with DEEP & CT Audubon	Madison, CT	CTDEEP	35.84	LI-00A00384
11/8/2021	Amtrak tidal marsh restoration/mitigation meeting	Old Lyme, CT	CTDEEP	39.20	LI-00A00384
12/9/2021	Southold Meeting	Southold, NY	NYSDEC	33.15	LI-00A00384
12/10/2021	Site Visit	Queens, NY	NYSDEC	68.10	LI-00A00384
12/17/2021	Site Visit	Port Jefferson, NY	NYSDEC	28.56	LI-00A00384
1/6/2022	Planning TW Restoration; Data logger troubleshooting	Waterford & East Lyme, CT	CTDEEP	52.65	LI-00A00384
2/28/2022	ANEP Registration Fee	Virtual Conference Online Registration	CTDEEP	125.00	LI-00A00384
2/8/2022	Sluice Creek Restoration Town Planning Meeting	Guilford, CT	CTDEEP	47.03	LI-00A00384
2/28-3/4/2022	ANEP- Bay Area Scientific Information Symposium 7	Virtual Conference Online Registration	CTDEEP	125.00	LI-00A00384
3/4/2022	Site Visit to Stony Brook Harbor-Round Trip	175 Diamond Lane, Peconic NY 11958	NYSDEC	32.88	LI-00A00384
3/10/2022	Site Visit to Goldsmths Inlet-Round Trip	22-34 Harbor Rd, St James, NY 11780	NYSDEC	35.33	LI-00A00384
3/30/2022	Site Visit to Cold Spring Harbor	101 Shore Rd, Cold Spring Harbor, NY 11724	NYSDEC	8.54	LI-00A00384
3/11/2022	2 Sites Visited; CCE & North Shore Land Alliance	Cold Spring Harbor, NY	NYSDEC	65.46	LI-00A00384
3/23/2022	Northport Harbor Protection committee meeting	Huntington Town Hall, NY	NYSDEC	27.83	LI-00A00384
3/23-3/25/2022	NEIWPCC All Staff Meeting	Westford, MA	NYSDEC	719.84	LI-00A00688
3/23-3/25/2022	NEIWPCC All Staff Meeting	Westford, MA	NYSDEC	714.08	LI-00A00688
3/23-3/25/2022	NEIWPCC All Staff Meeting	Westford, MA	NYSDEC	663.47	LI-00A00384
3/23-3/25/2022	NEIWPCC All Staff Meeting	Westford, MA	LISO	578.99	LI-00A00384
3/23-3/25/2022	NEIWPCC All Staff Meeting	Westford, MA	LISO	367.99	LI-00A00384
5/18/2022	LISS Research Conference	900 Lafayette Blvd, Bridgeport, CT (HCC)	NYSDEC	165.92	LI-00A00688
5/18/2022	LIS Research Conference (mileage) & NEERS Spring Meeting (registration)	900 Lafayette Blvd, Bridgeport, CT (HCC)	CTDEEP	108.45	LI-00A00384
5/18/2022	LISS Research Conference	900 Lafayette Blvd, Bridgeport, CT (HCC)	CTDEEP	53.24	LI-00A00384
5/25/2022	Permitting / Pre-application meeting to disucss Thin Layer Deposition and habitat restoration at Brides Brook marsh	Rock Neck, CT	CTDEEP	47.39	LI-00A00384
5/10/2022	Tidal wetland introduction / field trip for ~40 2nd graders from Goodwin Elementary in Old Saybrook, CT	Old Saybrook, CT	CTDEEP	41.13	LI-00A00384
5/24/2022	May Reimbursements for UHaul Van (Kelp Transport)	Stony Brook, NY	NYSDEC	268.68	LI-00A00384
		TOTAL		$6,153.02	
		TOTAL	LI-00A00688	$1,636.24	
		TOTAL	LI-00A00384	$4,516.78	

Clean Waters and Healthy Watersheds

Long Island Sound Study
A Partnership to Restore and Protect the Sound

Point Source Nitrogen Loads (1995-2021 NY/CT STPs)



Maximum Area of Hypoxia 1987-2021 (June-September)