Comprehensive Conservation and Management Plan 2015

Supplemental Document 4

Sound Science and Inclusive Management (SM) Theme

Implementation Actions 2015–2019

Summary Table. Sound Science and Inclusive Management (SM) Implementation Actions

Implementation Actions (IAs) have been formulated to carry out the SM strategies. The IAs are listed in the table with highest priority actions shaded in **bold blue**. The major strategies addressed by the action are also listed in the table.

IA Number	Implementation Action Title	Major Strategy Addressed
SM-1	**Identify and communicate high-priority science needs relating to the understanding and attainment of management objectives and ecosystem targets, and support research programs to fulfill these needs.**	**4-1a1, 1-1a7, 1-3a2, 2-4a4**
SM-2	Complete seafloor mapping conducted under the Sound Cable Fund, and use results to guide additional mapping.	4-1b1
SM-3	Identify key datasets needed to support coastal and marine spatial planning for Long Island Sound and initiate collection.	4-1b2
SM-4	Develop an integrated Monitoring Plan considering developing technologies and citizen science.	4-1b3, 1-3b1, 1-3b3, 1-3c1, 1-3c2
SM-5	Develop an integrated Data Management Plan considering local, regional, and national observing initiatives.	4-1b3, 1-3b1, 1-3b3, 1-3c1, 1-3c2
SM-6	Incorporate the Interstate Environmental Commission's (IEC) monitoring efforts into the Long Island Sound water quality monitoring program.	4-1b3
SM-7	Continue National Coastal Assessment monitoring of Long Island Sound.	4-1b3
SM-8	**Coordinate and leverage community water quality monitoring programs, enhancing the utility and application of data.**	**4-1b4**
SM-9	Assess options for establishing a secure, long-term Long Island Sound data portal that can be accessed by other regional data systems, such as the Northeast Ocean Data Portal.	4-1b5
SM-10	**Improve the use and utility of Long Island Sound data for GIS applications.**	**4-1b5**
SM-11	**Enhance modeling of eutrophication in Long Island Sound to support nitrogen management and Dissolved Oxygen TMDL implementation.**	**4-1c1; 1-3a2**
SM-12	Make publicly available the System-wide Eutrophication Model code and products to enhance transparency and collaboration.	4-1c1
SM-13	Link water quality models of Long Island Sound to watershed and groundwater pollutant loading models to better elucidate sources and relative contributions of nitrogen, including all coastal watersheds.	4-1c1. 1-3a2

IA Number	Implementation Action Title	Major Strategy Addressed
SM-14	Continue program administrative, financial, and technical assistance support to Management Conference.	4-2a1
SM-15	Continue state program coordination and involvement in the Management Conference.	4-2a1
SM-16	**Optimize structure and function of the Management Conference with a focus on implementation of the revised CCMP.**	**4-2a1**
SM-17	Reauthorize Clean Water Act sections 119 and 320, and other relevant statutes to support LIS.	4-2a1
SM-18	Support involvement of, and communication with, the bi-state Long Island Sound Congressional Caucus and bi-state Connecticut and New York legislative caucus on issues of common concern.	4-2a1
SM-19	**Support involvement of, and communication with, local governments, which have front line authority for implementing many of the CCMP strategies.**	**4-2a1**
SM-20	**Reach out to traditionally underrepresented stakeholders and encourage them to participate in the Management Conference.**	**4-2a1**
SM-21	Incorporate relevant updated elements of the CCMP into state regulatory and planning programs such as coastal zone management program consistency reviews and state environmental equality reviews (State Environmental Quality Review Act in New York).	4-2a2
SM-22	Convene senior EPA and State management to help direct, inform, and coordinate policy relevant to Long Island Sound.	4-2a3
SM-23	Foster involvement of the tributary states in Management Conference activities by maintaining the Five State/EPA TMDL Work Group.	4-2a4, 1-1a3, 1-1a4, 1-1a7, 1-3b1
SM-24	**Develop a bi-state framework (or guidance) for Coastal and Marine Spatial Planning for Long Island Sound to more comprehensively manage Long Island Sound resources.**	**4-2a5**
SM-25	Conduct primary valuations of the critical ecosystem goods and services supported by Long Island Sound and its coastal habitats.	4-2b1
SM-26	Conduct return-on investment analysis for Long Island Sound restoration and preservation strategies to inform priority-setting for implementation of the CCMP.	4-2b1
SM-27	Capitalize Connecticut Clean Water Fund and New York State Revolving Fund adequately to finance Clean Water infrastructure needs.	4-2b2
SM-28	**Research and develop innovative, locally appropriate funding mechanisms to provide sustained, reliable sources of investment capital to restore and protect ecosystem services.**	**4-2b2**

IA Number	Implementation Action Title	Major Strategy Addressed
SM-29	Coordinate and target funding for implementation of protection and restoration, science, and education and involvement projects.	4-2b2
SM-30	Develop an annual budget for each Federal department and agency involved in the protection and restoration of the Long Island Sound watershed.	4-2b3
SM-31	Incorporate climate change-driven factors such as temperature and sea level rise in model applications to assess factors that can influence future attainment of water quality standards and habitat protection and restoration goals.	4-3a1, 1-1a9, 1-3b3
SM-32	Develop a vulnerability assessment of how climate change will affect attainment of the CCMP goals and objectives.	4-3a1
SM-33	Incorporate desired ecosystem outcomes for planning and implementation of Hurricane Sandy Relief funds and ongoing coastal resiliency programs.	4-3a2
SM-34	Collaborate with the Connecticut Institute for Resiliency and Climate Adaptation (CIRCA).	4-3a2
SM-35	**Refine the ecosystem metrics and targets based on the underlying science of the Long Island Sound ecosystem to clearly identify the characteristics of a "restored" Long Island Sound.**	**4-3b1**
SM-36	Incorporate bioextraction analyses in Dissolved Oxygen TMDL assessments on the assimilative capacity of Long Island Sound to process nutrients without loss of designated uses.	4-3b2, 1-1a3
SM-37	Prepare and make available to the public annually the LISS Implementation Tracking Report using *E-Sound*.	4-3b3
SM-38	**Issue a "report card" on water quality conditions in Long Island Sound.**	**4-3b3**
SM-39	Refine and communicate information on the Long Island Sound ecosystem and watershed using environmental indicators (drivers, pressures, conditions, and response indicators).	4-3b3
SM-40	Develop annual Long Island Sound Study work plans that consider progress made and recommendations for improving implementation to achieve desired outcomes.	4-3b4
SM-41	**Every five years develop a comprehensive, specific, target-oriented implementation plan engaging all Long Island Sound partners.**	**4-3b4**

Implementation Action: SM-1

Identify and communicate high-priority science needs relating to the understanding and attainment of management objectives and ecosystem targets, and support research programs to fulfill these needs.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-1: The scientific understanding of Long Island Sound to support management is increased through strengthened research, monitoring, assessment, mapping, and modeling.
Objective: 4-1a: To enhance the research portfolio to answer questions relevant to Long Island Sound management.
Strategy: 4-1a1: Identify science activities needed to transparently link outcomes and objectives to strategies and actions, setting priorities based on management relevance and scientific merits. 1-1a7: Improve comprehensive management and performance of decentralized wastewater treatment systems, and residential, on-site wastewater treatments systems (OSWTSs). 1-3a2: Better understand eutrophication dynamics, effects, and mechanisms and continue support for modeling and synthesis efforts and their application to management scenarios. 2-4a4: Identify water quality conditions necessary to support priority habitats and use suitability models to evaluate appropriate restoration priorities through pollution controls.

Project Description/Background: Science is an integral element of integrated management of the ecosystem. This action will bring up-to-date a scientific needs assessment that has not been revised in many years. The science needs assessment will build upon the *Long Island Sound: Prospects for the Urban Sea* (Latimer et. al., 2014) synthesis book to identify the science needed to support the attainment of management objectives and ecosystem targets in the CCMP update. The LISS will annually consider elements of science needs that are a high-priority. Accurate and timely scientific information is necessary to support optimal management options to protect and restore Long Island Sound. The LISS has supported Biennial solicitations for scientific research that over the past 14 years has resulted in 33 investigations, numerous publications, and improved knowledge upon which to base management of Long Island Sound. The Connecticut and New York Sea Grant Programs also conduct biennial research competitions that can provide support for Long Island Sound research.

Cooperators and Partners: LISS MC, LISS STAC, NYSG, and CTSG

Funding Sources: LISS program funds

Funding Needs: $ for staff time, website development, and possible consultant support. $$ for research.

Expected Outputs:
- A searchable database and website collating all past funded scientific projects (including associated final reports and publications appended);
- A website/report outlining prioritized scientific needs (i.e., research, monitoring, assessment, and modeling) to support the attainment of management objectives and ecosystem targets
- Research results published in peer-reviewed scientific journals.
- New knowledge that supports the attainment of CCMP goals and objectives.

Performance Metric(s):
- Fully functional website of past scientific projects (searchable, with research products)
- Fully functional website/report with enumerated scientific priorities for the subsequent five years tied to CCMP goals and objectives.
- Funded science projects that produce results, including published reports and peer reviewed journal articles relevant to objectives of the CCMP
- For Research: biennial scientific solicitation; external peer reviews of applications; timely award and completion of projects; final project reports and presentations of findings.

Implementation Status: New

Expected Timeframe: The process will begin in 2015 and require staff or contractor support to construct a web-based science inventory and conduct meetings to aid in preparing the needs assessment. This Needs Assessment is expected to take one year to complete and should be updated every five years to support adaptive management of implementation actions. Afterwards the science needs assessment will be used to prioritize scientific project proposals. The current LISS research solicitation cycle began in spring of 2014 for scientific projects beginning spring 2015. The sequence of biennial solicitations will be 2016, 2018, and 2020.

Implementation Action: SM-2

Complete Seafloor Mapping conducted under the Sound Cable Fund, and use results to guide additional mapping.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-1: The scientific understanding of Long Island Sound to support management is increased through strengthened research, monitoring, assessment, mapping, and modeling.
Objective: 4-1b: To maintain and enhance monitoring and assessment programs to increase understanding of Long Island Sound and assess progress toward management outcomes.
Strategy: 4-1b1: Characterize, inventory, and map open and shallow water habitats to support resource management and marine spatial planning.

Project Description/Background: As a condition for permitting an underwater cable in Long Island Sound, a 2004 settlement between the states of Connecticut and New York, two power companies, and a cable company provided funding for a Long Island Sound Research and Restoration Fund. CTDEEP, NYSDEC, and EPA directed that the fund be used to map the seafloor of Long Island Sound to provide sound science in support of future review of proposed projects. A Sound Cable Fund Steering Committee is overseeing the mapping effort being conducted by a consortium of federal and university scientists. In an effort to better understand, describe, and analyze these seafloor (or "benthic") environments federal and state agencies, regional organizations, and academic institutions use high resolution underwater imaging techniques to characterize and map specific geographic locations.

Cooperators and Partners: Cable Fund Steering Committee (i.e., EPA Region 1 and Region 2, NYSDEC, CTDEEP, CTSG, NYSG)

Funding Sources: Lawsuit settlement

Funding Needs: $$$$. Approximately $7M was made available through the settlement fund. As products are completed, the cost of obtaining additional spatial coverage or detail will be assessed.

Expected Outputs: Completed digital maps of Long Island Sound seafloor environment including: acoustic intensity and seafloor topography, sediment texture and grain size distribution, sedimentary environment and chemistry, benthic habitats and ecological processes, and physical oceanographic characterization.

Performance Metric(s):
- Percent of Long Island Sound mapped.
- Products used in support of infrastructure planning.
- Demarcation of species and habitats, and increased understanding of the general physical, chemical, and biologic nature of the Long Island Sound seafloor.

Implementation Status: Underway

Expected Timeframe: Phase One was completed in March 2014. Phase Two will begin in fall 2015 and extend to 2016.

Implementation Action: SM-3

Identify key datasets needed to support coastal and marine spatial planning for Long Island Sound and initiate collection.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-1: The scientific understanding of Long Island Sound to support management is increased through strengthened research, monitoring, assessment, mapping, and modeling.
Objective: 4-1b: To maintain and enhance monitoring and assessment programs to increase understanding of Long Island Sound and assess progress toward management outcomes.
Strategy: 4-1b2: Characterize, inventory, and map human uses, both recreational and commercial, of open and shallow water habitats to support resource management and marine spatial planning.

Project Description/Background: Coastal and Marine Spatial Planning (CMSP) is a process that brings together multiple users of the ocean—including energy, industry, government, conservation, and recreation—to make informed and coordinated decisions about how to use marine resources sustainably. CMSP generally uses maps to create a more comprehensive picture of a marine area—identifying where and how an ocean area is being used and what natural resources and habitats exist. It is similar to land-use planning, but for marine waters.

Cooperators and Partners: Sound Spatial Planning Work Group (SSPWG), led by Connecticut Sea Grant (CTSG) and The Nature Conservancy (TNC).

Funding Sources: In-kind services for identification of data, multiple potential sources for data collection.

Funding Needs: In-house staff support is being provided by CTSG and TNC. $$ for data collection

Expected Outputs: The SSPWG is expected to identify and evaluate important data required to support CMSP

Performance Metric(s): An inventory of relevant data sources and a suitability assessment of potential data

Implementation Status: New

Expected Timeframe: Complete in 2015.

Implementation Action: SM-4

Develop an integrated Monitoring Plan considering developing technologies and citizen science.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-1: The scientific understanding of Long Island Sound to support management is increased through strengthened research, monitoring, assessment, mapping, and modeling.
Objective: 4-1b: To maintain and enhance monitoring and assessment programs to increase understanding of Long Island Sound and assess progress toward management outcomes.
Strategy: 4-1b3: Evaluate, enhance, integrate, and coordinate ongoing monitoring programs. 1-3b1: Improve identification and source tracking of nonpoint sources (e.g., watershed, groundwater, atmospheric deposition) and sinks of nutrients and their impacts on water and habitat quality. 1-3b3: Improve understanding of climate change (e.g., acidification, sea level rise, temperature) on Long Island Sound water and habitat quality and biota, and their interaction with other water quality issues (e.g., eutrophication). 1-3c1: Support collaboration between Long Island Sound Study (LISS) partner organizations including upper basin agencies/partners (USGS, CTDEEP, CTDOA, NYSDEC, MassDEP, SCDHS, etc.) to improve utility of monitoring data and the sentinel monitoring program. 1-3c2: Implement improved data storage and sharing solutions to support collaboration and incorporation of data into management decisions.

Project Description/Background: Assessing the status and trends of the condition of Long Island Sound requires regular measurements of important ecological variables. The LISS has funded water quality monitoring since 1987, adding elements over time and supporting survey of important habitats. This action is to develop an integrated monitoring plan (LIS-IMP) which will include an upgrade and integration assessment of the collection and analysis methods of the multiple agencies that currently comprise the program. Planning should consider offshore monitoring objectives related to assessment of wind energy activities and essential fish habitats, as well as focus on local embayment monitoring.

Cooperators and Partners: EPA, NOAA, USGS, NYSDEC, CTDEEP, IEC, LISS STAC

Funding Sources: LISS program funds

Funding Needs: $$

Expected Outputs:
- A coordinated, integrated monitoring plan with recommended actions.

Performance Metric(s):
- A workshop involving agency and academic scientists to assess the current monitoring in the light of new technologies, new management needs, and funding constraints.
- Modifications in the monitoring program.

Implementation Status: New

Expected Timeframe: Complete by 2016.

Implementation Action: SM-5

Develop an integrated Data Management Plan considering local, regional, and national observing initiatives.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-1: The scientific understanding of Long Island Sound to support management is increased through strengthened research, monitoring, assessment, mapping, and modeling.
Objective: 4-1b: To maintain and enhance monitoring and assessment programs to increase understanding of Long Island Sound and assess progress toward management outcomes.
Strategy: 4-1b3: Evaluate, enhance, integrate, and coordinate ongoing monitoring programs. 1-3b1: Improve identification and source tracking of nonpoint sources (e.g., watershed, groundwater, atmospheric deposition) and sinks of nutrients and their impacts on water and habitat quality. 1-3b3: Improve understanding of climate change (e.g., acidification, sea level rise, temperature) on Long Island Sound water and habitat quality and biota, and their interaction with other water quality issues (e.g., eutrophication). 1-3c1: Support collaboration between Long Island Sound Study (LISS) partner organizations including upper basin agencies/partners (USGS, CTDEEP, CTDOA, NYSDEC, MassDEP, SCDHS, etc.) to improve utility of monitoring data and the sentinel monitoring program. 1-3c2: Implement improved data storage and sharing solutions to support collaboration and incorporation of data into management decisions.

Project Description/Background: The LISS has funded water quality monitoring since 1987, adding elements over time and supporting survey of important habitats. This program involves multiple agencies and sources. There is a need to develop a holistic framework to provide data users with an efficient means to access, download, evaluate, or otherwise utilize the data from these multiple sources. In addition, there are significant historical data that need to be rescued and included into a digital form that is usable by the scientific community. A Long Island Sound Integrated Data Management plan (LIS-IDP) should be able to serve the multiple needs of the Long Island Sound community while also allowing seamless access to regional and national observing systems.

Cooperators and Partners: EPA, NOAA, USGS, NYSDEC, CTDEEP, IEC, LISS STAC

Funding Sources: LISS program funds

Funding Needs: $$

Expected Outputs: A Long Island Sound integrated data management plan

Performance Metric(s): Adopted guidelines and systems to store, manage, and access data.

Implementation Status: New

Expected Timeframe: Complete by 2017.

Implementation Action: SM-6

Incorporate the Interstate Environmental Commission's (IEC) monitoring efforts into the Long Island Sound water quality monitoring program.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-1: The scientific understanding of Long Island Sound to support management is increased through strengthened research, monitoring, assessment, mapping, and modeling.
Objective: 4-1b: To maintain and enhance monitoring and assessment programs to increase understanding of Long Island Sound and assess progress toward management outcomes.
Strategy: 4-1b3: Evaluate, enhance, integrate, and coordinate ongoing monitoring programs.

Project Description/Background: Assessing the status and trends of the condition of Long Island Sound requires regular measurements of important ecological variables. Since 1991 the CTDEEP has been providing monitoring support for the measurement of hypoxia related environmental variables in Long Island Sound. In addition, the IEC has been providing similar monitoring support for the western-most areas of Long Island Sound. The action will provide the necessary processes to combine the CTDEEP and IEC monitoring efforts into a unified whole.

Cooperators and Partners: EPA, NOAA, USGS, NYSDEC, CTDEEP, IEC, LISS STAC through a water quality monitoring work group.

Funding Sources: LISS program funds

Funding Needs: Most of the work is being performed in-house through the work group. There may be annually costs for implementing the recommendations.

Expected Outputs: A modified IEC monitoring plan.

Performance Metric(s): Incorporation of IEC data in Soundwide data analysis and representation.

Implementation Status: New

Expected Timeframe: Complete by 2016.

Implementation Action: SM-7

Continue National Coastal Assessment monitoring of Long Island Sound.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-1: The scientific understanding of Long Island Sound to support management is increased through strengthened research, monitoring, assessment, mapping, and modeling.
Objective: 4-1b: To maintain and enhance monitoring and assessment programs to increase understanding of Long Island Sound and assess progress toward management outcomes.
Strategy: 4-1b3: Evaluate, enhance, integrate, and coordinate ongoing monitoring programs.

Project Description/Background: To address questions about national coastal condition, the EPA, the National Oceanic and Atmospheric Administration (NOAA), and the U.S. Fish and Wildlife Service (USFWS) agreed to participate in a multi-agency effort to assess the condition of the nation's coastal resources. The agencies chose to assess condition using nationally consistent monitoring surveys to minimize the problems created by compiling data collected using multiple approaches. The results of these assessments are compiled periodically into a National Coastal Condition Report (NCCR). This series of reports contains one of the most comprehensive ecological assessments of the condition of our nation's coastal bays and estuaries (EPA, 2012). The next scheduled field program under the National Coastal Assessment Program is in 2015.

Cooperators and Partners: EPA, CTDEEP, NYSDEC, Stony Brook University

Funding Sources: EPA

Funding Needs: $$

Expected Outputs: Field data incorporated into the EPA Coastal Condition report.

Performance Metric(s):
- Field work conducted
- Environmental indicators using the data are updated.

Implementation Status: Underway

Expected Timeframe: Field work in 2015, with report after all quality assurance and analysis is completed.

Reference: EPA, 2012. National Coastal Condition Report IV. U. S. Environmental Protection Agency, Office of Research and Development, Office of Water, Washington, D. C., EPA-842-R-10-003, 368 pp.

Implementation Action: SM-8

Coordinate and leverage community water quality monitoring programs, enhancing the utility and application of data.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-1: The scientific understanding of Long Island Sound to support management is increased through strengthened research, monitoring, assessment, mapping, and modeling.
Objective: 4-1b: To maintain and enhance monitoring and assessment programs to increase understanding of Long Island Sound and assess progress toward management outcomes.
Strategy: 4-1b4: Strengthen monitoring of conditions in embayments and near-shore waters, and integrate the resulting data and assessments into open water monitoring programs.

Project Description/Background: In order to gage the effectiveness of management and restoration projects it is necessary to have near-shore water quality and other data available. The LISS has funded an analysis aimed at evaluating the feasibility of developing a framework for coordinating community-based water quality monitoring groups around the Sound. The report summarized the data needs of agencies charged with the protection of near-shore environments, identified existing LIS monitoring groups, developed a framework to guide implementation of a long-term community-based monitoring program, and a provided generalized Quality Assurance Project Plan (QAPP) template suitable in such a program (Vaudrey and Alonzo, 2013). This action would help implement a Long Island Sound Embayment Monitoring Cooperative (LISEMCO) based on the recommendations of the initial analysis.

Cooperators and Partners: LISS

Funding Sources: LISS program funds

Funding Needs: $$ (2015, 2016), $$ (2017–2020)

Expected Outputs: The next phase in the development of the LISEMCO is to identify appropriate entities to oversee and implement the program. The next phase would include securing an appropriate entity to oversee and implement the program.

Performance Metric(s): Establishment and funding for an organization (or consortium) to administer the LISEMCO; Selection of the entity and the development of an initial implementation plan by the selected organization. Coordination with entity will be ongoing.

Implementation Status: Underway

Expected Timeframe: If selected for funding in 2015, work would begin in 2016 and continue annually through 2019.

Reference: Vaudrey, J.M.P., Alonzo, J., 2013. Evaluation of Current Community-Based Monitoring Efforts and Recommendations for Developing a Cohesive Network of Support for Monitoring Long Island Sound Embayments. NEIWPCC, LISS, 231 pp.

Implementation Action: SM-9

Assess options for establishing a secure, long-term Long Island Sound data portal that can be accessed by other regional data systems, such as the Northeast Ocean Data Portal.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-1: The scientific understanding of Long Island Sound to support management is increased through strengthened research, monitoring, assessment, mapping, and modeling.
Objective: 4-1b: To maintain and enhance monitoring and assessment programs to increase understanding of Long Island Sound and assess progress toward management outcomes.
Strategy: 4-1b5: Improve regional identification, storage, and sharing of spatial and temporal data.

Project Description/Background: Over the past few years significant support has been growing for integration of LISS monitoring data/programs with regional data collection initiatives. These initiatives include the two regional ocean partnerships/data portals: Northeast Regional Ocean Council (NROC) and Mid-Atlantic Regional Council on the Oceans (MARCO) as well as the two relevant IOOS Regional Associations: Northeastern Regional Association of Coastal Ocean Observing Systems (NERACOOS), Mid-Atlantic Coastal Ocean Observing Regional Association (MACOORA). It important for the LISS looks to better integrate its monitoring data with these regional entities.

Cooperators and Partners: LISS MC and STAC, federal and state agencies

Funding Sources: LISS program funds

Funding Needs: $

Expected Outputs: Through the analysis of the LISS associated monitoring programs and the regional entities it is expected that a strategic plan outlining steps and resources needed to fine-tune the LISS monitoring program to better integrate with regional associations.

Performance Metric(s):
- RFP development and implementation for consultant;
- Consultant selection;
- Strategic plan resulting from consultant activity in coordination with STAC;
- Submission of strategic plan to LISS MC

Implementation Status: New

Expected Timeframe: It is expected that the RFP development will be in the fall of 2016 with consultant selection by the end of 2016. Strategic plan development will begin in early 2017 with the final draft report due to LISS MC by summer 2017.

Implementation Action: SM-10

Improve the use and utility of Long Island Sound data for GIS applications.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-1: The scientific understanding of Long Island Sound to support management is increased through strengthened research, monitoring, assessment, mapping, and modeling.
Objective: 4-1b: To maintain and enhance monitoring and assessment programs to increase understanding of Long Island Sound and assess progress toward management outcomes.
Strategy: 4-1b5: Improve regional identification, storage, and sharing of spatial and temporal data.

Project Description/Background: In 2012 the LISS secured a consultant, Corbel Analytics, to aid in the development of a comprehensive Geographic Information Systems (GIS) needs assessment to serve the needs of all of the LISS partners. The report, completed in 2013, recommended a number of steps that could improve the use and application of Long Island Sound data through regional GIS.

Cooperators and Partners: LISS

Funding Sources: LISS program funds

Funding Needs: In-house staff evaluation. $$—Implementation costs/year

Expected Outputs: Relevant members of the LISS community will utilize the results of the consultant analysis to develop a strategic plan for how to enhance and facilitate GIS tool use for LISS partners. The plan will include recommendations on approaches and funding needs.

Performance Metric(s): Strategic plan outlining how to implement augmented GIS tools for LISS partners

Implementation Status: Underway

Expected Timeframe: The Corbel Analytics report was completed in October 2013. Need to develop a strategy for implementing the recommendations and propose tasks for funding 2015.

Implementation Action: SM-11

Enhance modeling of eutrophication in Long Island Sound to support nitrogen management and dissolved oxygen TMDL implementation.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-1: The scientific understanding of Long Island Sound to support management is increased through strengthened research, monitoring, assessment, mapping, and modeling.
Objective: 4-1c: To develop and improve modeling capabilities to provide predictive assessments of resources, physical dynamics, and water quality.
Strategy: 4-1c1: Transition existing and new models to a community modeling framework that provides open source access to facilitate external collaboration, assessments, and enhancements. 1-3a2: Better understand eutrophication dynamics, effects, and mechanisms and continue support for modeling and synthesis efforts and their application to management scenarios.

Project Description/Background: The System Wide Eutrophication Model (SWEM) is a simulation model that has been used to relate nutrient loadings to water quality impairments in Long Island Sound and the New York/New Jersey Harbor. With LISS funding, UCONN, assisted by HDR, Inc., a) recalibrated the model in 2014 after making a series of technical improvements to its formulation; and b) took steps to advance the open-source accessibility of the model. The model is now more consistent with scientific observations in LIS of mixing, circulation, primary productivity, and respiration. However, the model fails to predict the observed minimums in dissolved oxygen. Therefore, further improvement in SWEM or development and application of other modeling tools is needed to improve eutrophication modeling and nutrient management. One key recommendation is to increase the spatial resolution of modeling to better represent wind-driven, cross-Sound water transport. Modeling should also support linkage or nesting of finer scale models of nearshore areas where effects of waves, shoreline evolution, eutrophication, and water quality can be integrated.

Cooperators and Partners: LISS, academic community, consultants

Funding Sources: LISS program funds

Funding Needs: $$$

Expected Outputs: Assessment of final SWEM recalibration report and MEG technical comments. Development of a eutrophication modeling strategy, which can include further enhancements to SWEM or the development of alternate modeling tools.

Performance Metric(s): Improved calibration of model-predicted versus measured parameters. MEG meetings and written evaluations.

Implementation Status: New

Expected Timeframe: Initiate modeling enhancements in 2016, completing them in 2018.

Implementation Action: SM-12

Make publicly available the System-wide Eutrophication Model code and products to enhance transparency and collaboration.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-1: The scientific understanding of Long Island Sound to support management is increased through strengthened research, monitoring, assessment, mapping, and modeling.
Objective: 4-1c: To develop and improve modeling capabilities to provide predictive assessments of resources, physical dynamics, and water quality.
Strategy: 4-1c1: Transition existing and new models to a community modeling framework that provides open source access to facilitate external collaboration, assessments, and enhancements.

Project Description/Background: The SWEM has undergone significant revisions, including the availability of the source code underling the model. Upon further revisions recommended by the model evaluation team, SWEM will made available to the broader research community to foster collaborations, applications, and continuous improvements. This will require a workshop whose aim is to train new users and facilitate the SWEM's future use.

Cooperators and Partners: LISS STAC, SWEM MEG

Funding Sources: LISS program funds

Funding Needs: $

Expected Outputs: Website with posted guidance and model information. A more informed modeling community and an increased capacity to apply advanced modeling tools to improve scientific and management decision making.

Performance Metric(s): Completed SWEM outputs, posted on a website

Implementation Status: Underway

Expected Timeframe: This was completed by the end of 2014.

Implementation Action: SM-13

Link water quality models of Long Island Sound to watershed and groundwater pollutant loading models to better elucidate sources and relative contributions of nitrogen, including all coastal watersheds.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-1: The scientific understanding of Long Island Sound to support management is increased through strengthened research, monitoring, assessment, mapping, and modeling.
Objective: 4-1c: To develop and improve modeling capabilities to provide predictive assessments of resources, physical dynamics, and water quality.
Strategy: 4-1c1: Transition existing and new models to a community modeling framework that provides open source access to facilitate external collaboration, assessments, and enhancements. 1-3a2: Better understand eutrophication dynamics, effects, and mechanisms and continue support for modeling and synthesis efforts and their application to management scenarios.

Project Description/Background: Coastal nitrogen source loading from surface and groundwater runoff are estimated using a variety of approaches. Eutrophication modeling would benefit from more refined estimates of this loading, both for individual embayment planning and Long Island Sound-wide planning. A number of efforts are underway, including estimates of nitrogen loads by embayment using the N-Load model, modeling the nitrogen load from regulated MS4 sources on Long Island, and researching groundwater fluxes of nitrogen. These efforts need to be synthesized to produce updated, source-specific loading estimates to support eutrophication and eelgrass suitability modeling.

Cooperators and Partners: LISS STAC/NEIWPCC

Funding Sources: LISS program funds

Funding Needs: $ over three years

Expected Outputs: Improved estimates of coastal nitrogen source loading from surface and groundwater runoff.

Performance Metric(s):
- Number of embayments with source-specific loading estimates
- Characterization of relative importance of contributing sources (e.g. septic, turf fertilizer, etc.) to groundwater or surface runoff of nitrogen.
- Improved groundwater model estimates of nutrient loads.

Implementation Status: Underway

Expected Timeframe: Improved estimates by 2016.

Implementation Action: SM-14

Continue program administrative, financial, and technical assistance support to Management Conference.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2a: To increase communication, coordination, and reduce institutional barriers to cooperation on an ecosystem level among all levels of government, stakeholder groups, and the general public.
Strategy: 4-2a1: Maintain and enhance the Long Island Sound Management Conference as the coordinating entity to implement the CCMP, and expand opportunities for local government involvement.

Project Description/Background: EPA should continue to provide lead agency support to the Management Conference consistent with the policies and requirements of Clean Water Act sections 119 and 320. This support has been centrally coordinated by an EPA Long Island Sound Office located in Stamford, CT since 1992.

Cooperators and Partners: EPA lead, with support from CTDEEP and NYSDEC

Funding Sources: EPA

Funding Needs: $$$/year for core program staff and functions

Expected Outputs: Core LISS products and functions defined in annual work plans

Implementation Status: Underway

Performance Metric(s): Completion of annual work plan products and activities.

Expected Timeframe: Annually 2015–2019.

Implementation Action: SM-15

Continue state program coordination and involvement in the Management Conference.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2a: To increase communication, coordination, and reduce institutional barriers to cooperation on an ecosystem level among all levels of government, stakeholder groups, and the general public.
Strategy: 4-2a1: Maintain and enhance the Long Island Sound Management Conference as the coordinating entity to implement the CCMP, and expand opportunities for local government involvement.

Project Description/Background: The involvement of Connecticut and New York is critical to the successful management of Long Island Sound. State coordinators have worked to involve and integrate diverse state programs into LIS-focused management. In addition to the lead state agencies, CTDEEP and NYSDEC, involvement and coordination with sister state agencies (e.g., CTDPH, CTDOA, NYSDOS, NYSOPRHP, etc.) on issues relating to the management of Long Island Sound is vital.

Cooperators and Partners: CTDEEP and NYSDEC lead with financial support from EPA

Funding Sources: EPA through Long Island Sound funding

Funding Needs: $$/year for core program staff and functions

Expected Outputs: Core LISS products and functions defined in annual work plans

Performance Metric(s): State staff participation in program projects and initiatives

Implementation Status: New

Expected Timeframe: Annually 2015–2019.

Implementation Action: SM-16

Optimize structure and function of the Management Conference with a focus on implementation of the revised CCMP.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2a: To increase communication, coordination, and reduce institutional barriers to cooperation on an ecosystem level among all levels of government, stakeholder groups, and the general public.
Strategy: 4-2a1: Maintain and enhance the Long Island Sound Management Conference as the coordinating entity to implement the CCMP, and expand opportunities for local government involvement.

Project Description/Background: The Management Conference structure and function (committees, work groups, and advisory committees) must support the attainment of the CCMP goals and outcomes.

Cooperators and Partners: LISS Management Committee lead, with support from advisory committees

Funding Sources: LISS program funds

Funding Needs: Staff time only

Expected Outputs: LISS Management Conference restructured as appropriate.

Performance Metric(s): New structure communicated and implemented among program partners.

Implementation Status: Underway

Expected Timeframe: Complete in 2015.

Implementation Action: SM-17

Reauthorize Clean Water Act sections 119 and 320, and other relevant statutes to support Long Island Sound.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2a: To increase communication, coordination, and reduce institutional barriers to cooperation on an ecosystem level among all levels of government, stakeholder groups, and the general public.
Strategy: 4-2a1: Maintain and enhance the Long Island Sound Management Conference as the coordinating entity to implement the CCMP, and expand opportunities for local government involvement.

Project Description/Background: Clean Water Act Sections 320 and 119 set the purpose and authority of the Long Island Sound Management Conference. Appropriations for Clean Water Act §119—Long Island Sound Restoration Act (LIS Restoration Act of 2000, Title IV, P.L.109-137) of $40M annually were authorized through FY2010. For §119 – Long Island Sound Stewardship Act (LIS Stewardship Act of 2006, P.L. 109-359), appropriations of $25M annually were authorized through FY2011. For §320—National Estuary Program (NEP), annual appropriations for the 28 estuary programs of $35M through FY2010 were authorized.

Cooperators and Partners: Congress lead with support from stakeholders

Funding Sources: N/A

Funding Needs: N/A

Expected Outputs: Reauthorized Clean Water Act sections 119 and 320

Performance Metric(s): Sponsored legislation introduced and passed by Congress.

Implementation Status: Underway

Expected Timeframe: For FY 2016 fiscal year budget or as soon as possible.

Implementation Action: SM-18

Support involvement of, and communication with, the bi-state LIS Congressional Caucus and bi-state Connecticut and New York legislative caucus on issues of common concern.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2a: To increase communication, coordination, and reduce institutional barriers to cooperation on an ecosystem level among all levels of government, stakeholder groups, and the general public.
Strategy: 4-2a1: Maintain and enhance the Long Island Sound Management Conference as the coordinating entity to implement the CCMP, and expand opportunities for local government involvement.

Project Description/Background: Legislators have a vital role in policy and funding and require both technical information and hearing from constituents to make informed decisions.

Cooperators and Partners: Legislators and staff, Management Conference partners, NGOs

Funding Sources: N/A

Funding Needs: N/A

Expected Outputs: Legislators that are informed and engaged on issues related to LIS.

Performance Metric(s): Briefings and events involving the Long Island Sound Congressional Caucus and Bi-State legislative caucus.

Implementation Status: New

Expected Timeframe: Annually 2015–2019.

Implementation Action: SM-19

Support involvement of, and communication with, local governments, which have front line authority for implementing many of the CCMP strategies.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2a: To increase communication, coordination, and reduce institutional barriers to cooperation on an ecosystem level among all levels of government, stakeholder groups, and the general public.
Strategy: 4-2a1: Maintain and enhance the Long Island Sound Management Conference as the coordinating entity to implement the CCMP, and expand opportunities for local government involvement.

Project Description/Background: Local governments have front line authority for implementing many of the CCMP strategies. The need is particularly important in meeting sustainability and adaptation objectives. The primary line of communication is through the states, but federal agencies and non-governmental organizations (NGOs) also have a support role.

Cooperators and Partners: NYSDEC/NYSDOS, CTDEEP, with support from Management Conference partners

Funding Sources: LISS and agency existing funding

Funding Needs: In-kind services of existing staff

Expected Outputs: Communications with local elected officials and local government staff to increase effectiveness of local programs and projects.

Performance Metric(s): Briefings and events involving the Long Island Sound.

Implementation Status: Underway

Expected Timeframe: Ongoing 2015–2019.

Implementation Action: SM-20

Reach out to traditionally underrepresented stakeholders and encourage them to participate in the Management Conference.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2a: To increase communication, coordination, and reduce institutional barriers to cooperation on an ecosystem level among all levels of government, stakeholder groups, and the general public.
Strategy: 4-2a1: Maintain and enhance the Long Island Sound Management Conference as the coordinating entity to implement the CCMP, and expand opportunities for local government involvement.

Project Description/Background: There is a need to broaden the conversation on environmental protection. The involvement and support of traditionally underrepresented groups is an important element of environmental justice (EJ) and can strengthen efforts to protect and restore Long Island Sound.

Cooperators and Partners: The LISS and participating organizations.

Funding Sources: LISS and agencies existing funding

Funding Needs: In-kind services of existing staff

Expected Outputs: Members of organizations traditionally underrepresented in environmental policy development are involved in the LISS.

Performance Metric(s):
- Number of organizations traditionally underrepresented in environmental policy development are involved in the LISS Management Conference (MC, CAC, work groups);
- Number of briefings and events involving organizations traditionally underrepresented.

Implementation Status: New

Expected Timeframe: Ongoing 2015–2019.

Implementation Action: SM-21

Incorporate relevant updated elements of the CCMP into state regulatory and planning programs such as coastal zone management program consistency reviews and state environmental equality reviews (State Environmental Quality Review Act in New York).

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2a: To increase communication, coordination, and reduce institutional barriers to cooperation on an ecosystem level among all levels of government, stakeholder groups, and the general public.
Strategy: 4-2a2: Ensure that the CCMP is incorporated into and carried out through existing state and local policies and regulatory programs.

Project Description/Background: Incorporating relevant parts of the CCMP into the state coastal zone management plan consistency reviews will help ensure that federal actions are consistent with the CCMP.

Cooperators and Partners: CTDEEP, NYSDEC, NYSDOS

Funding Sources: N/A

Funding Needs: N/A

Expected Outputs: State reviews of federal actions for consistency with coastal policies incorporate key elements of the CCMP.

Performance Metric(s): N/A

Implementation Status: Underway

Expected Timeframe: Ongoing 2016–2019.

Implementation Action: SM-22

Convene senior EPA and State management to help direct, inform, and coordinate policy relevant to Long Island Sound.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2a: To increase communication, coordination, and reduce institutional barriers to cooperation on an ecosystem level among all levels of government, stakeholder groups, and the general public.
Strategy: 4-2a3: Maintain EPA, NYSDEC, and CTDEEP support of the Management Conference to provide leadership and accountability.

Project Description/Background: The Long Island Sound Management Conference is led by a Policy Committee comprised of the Regional Administrators of EPA Regions 1 and 2, and the Commissioners of the CTDEEP, and NYSDEC. An Executive Steering Committee of division directors provides more frequent policy level input on LIS management.

Cooperators and Partners: EPA, CTDEEP, NYSDEC

Funding Sources: LISS and agency existing funding

Funding Needs: In kind work from existing staff

Expected Outputs: Improved integration of federal and state programs priorities into LIS program activities.

Performance Metric(s): Number of Policy Committee (one/year) and Executive Steering Committee meetings (three/year).

Implementation Status: Underway

Expected Timeframe: Ongoing 2015–2019.

Implementation Action: SM-23

Foster involvement of the tributary states in Management Conference activities by maintaining the Five State/EPA TMDL Work Group.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2a: To increase communication, coordination, and reduce institutional barriers to cooperation on an ecosystem level among all levels of government, stakeholder groups, and the general public.
Strategy: 4-2a4: Enhance opportunities for cooperation and involvement of the tributary states of Massachusetts, New Hampshire, Rhode Island, and Vermont to address stressors that contribute to downstream effects on Long Island Sound. 1-1a3: Enhance implementation of the existing 2000 Dissolved Oxygen Total Maximum Daily Load throughout the watershed; and adapt and revise it based on monitoring, modeling, research, and how climate change may affect attainment of water quality standards in the future. 1-1a4: Encourage cross-department collaboration and cooperation at the municipal level to implement MS4 BMPs (e.g., involve highway departments). 1-1a7: Improve comprehensive management and performance of decentralized wastewater treatment systems, and residential, on-site wastewater treatments systems (OSWTSs). 1-3b1: Improve identification and source tracking of nonpoint sources (e.g., watershed, groundwater, atmospheric deposition) and sinks of nutrients and their impacts on water and habitat quality.

Project Description/Background: Massachusetts Department of Environmental Protection now has a seat on the Management Committee. While distance and travel limitations may preclude regular, in-person attendance of staff from all the tributary states in Long Island Sound planning, there are opportunities to use technology to foster remote involvement. The Five State/EPA TMDL work group was specifically formed after adoption of the nitrogen TMDL as a forum for discussion on TMDL related issues. It has fostered improved monitoring and modeling of nitrogen loads, while also increasing dialogue on enhancing implementation of the TMDL.

Cooperators and Partners: EPA, CTDEEP, NYSDEC, MassDEP, NHDES, VTDEP

Funding Sources: LISS and agency existing resources

Funding Needs: $$/year

Expected Outputs: Improved integration of federal and state programs priorities into Long Island Sound TMDL activities.

Performance Metric(s): Nitrogen reductions from all watershed states.

Implementation Status: Underway

Expected Timeframe: Ongoing through 2019.

Implementation Action: SM-24

Develop a bi-state framework (or guidance) for Coastal and Marine Spatial Planning for Long Island Sound to more comprehensively manage Long Island Sound resources.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2a: To increase communication, coordination, and reduce institutional barriers to cooperation on an ecosystem level among all levels of government, stakeholder groups, and the general public.
Strategy: 4-2a5: Through Marine Spatial Planning, facilitate the management of multiple human uses of the Sound compatible with the conservation of natural resources and habitats.

Project Description/Background: Coastal and Marine spatial planning (CMSP) is a process that brings together multiple users of the ocean—including energy, industry, commercial fishing, government, conservation, and recreation—to make informed and coordinated decisions about how to use marine resources sustainably. CMSP generally uses maps to create a more comprehensive picture of a marine area—identifying where and how an ocean area is being used and what natural resources and habitat exist. It is similar to land-use planning, but for marine waters. New York currently has authorization to conduct CMSP. Legislation (the Connecticut Blue Plan) has been introduced in Connecticut. The desired outcome of this framework is to complete a bi-state marine spatial plan for LIS, adopted and implemented by both New York and Connecticut, to facilitate compatible uses of the Sound and conservation of its natural resources and habitats.

Cooperators and Partners: Sound Spatial Planning Work Group, led by Connecticut Sea Grant and The Nature Conservancy.

Funding Sources: In-kind services

Funding Needs: In-house staff support is being provided by CTSG and TNC.

Expected Outputs: The SSPWG will recommend a bi-state framework from marine spatial planning.

Performance Metric(s): Meetings of work group; draft and final reports.

Implementation Status: New

Expected Timeframe: 2015

Implementation Action: SM-25

Conduct primary valuations of the critical ecosystem goods and services supported by Long Island Sound and its coastal habitats.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2b: To maintain and enhance efficient public investments in restoration and management.
Strategy: 4-2b1: Apply concepts of economic valuations of the natural capital of LIS and its watershed (i.e., the value of the goods and services supported by natural ecosystems) to inform and sustain investment in protecting and restoring those assets.

Project Description/Background: The financial value of goods and services provided to the region's economy by the natural ecosystems in Long Island Sound and on the lands whose waters drain to it ranges between $17 billion and $37 billion annually (Kocian et al. 2014). Treated as a capital asset with a lifespan of 100 years, the value of these natural systems is $690 billion to $1.3 trillion). Unlike built systems that depreciate, however, natural assets often accumulate value over time, particularly if they are protected and restored. In addition, an estimated 191,000 direct and indirect jobs in the region result from the healthy function of these natural systems, and associated stewardship work. A recommendation for future research of primary ecosystem service valuations is first and foremost to fill in key gaps. The greatest limitation to this analysis is the gaps of primary valuation studies representing all of the ecosystem services provided in the Long Island Sound Basin. Granularity on valuation is lacking for more specific land covers, such as some of LISS's priority habitats: intertidal flats, cliffs and bluffs, and rocky intertidal zones.

Cooperators and Partners: Multiple research funders and economists

Funding Sources: Research funds

Funding Needs: $$

Expected Outputs: Studies that identify LIS-specific valuations

Performance Metric(s): Key data gaps identified, research conducted, products published resulting in increased confidence in ecosystem service valuations.

Implementation Status: New

Expected Timeframe: Ongoing starting in 2015.

Reference: Kocian, M., Fletcher, A., Schundler, G., Batker, D., Schwartz, A., Briceno, T., 2014. The Trillion Dollar Asset: The Economic Value of the Long Island Sound Basin. Earth Economics, Tacoma, WA, 76 pp.

Implementation Action: SM-26

Conduct return-on investment analysis for Long Island Sound restoration and preservation strategies to inform priority setting for implementation of the CCMP.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2b: To maintain and enhance efficient public investments in restoration and management.
Strategy: 4-2b1: Apply concepts of economic valuations of the natural capital of LIS and its watershed (i.e., the value of the goods and services supported by natural ecosystems) to inform and sustain investment in protecting and restoring those assets.

Project Description/Background: The financial value of goods and services provided to the region's economy by the natural ecosystems in Long Island Sound and on the lands whose waters drain to it ranges between $17 billion and $37 billion annually (Kocian et al. 2014). Treated as a capital asset with a lifespan of 100 years, the value of these natural systems is $690 billion to $1.3 trillion. Unlike built systems that depreciate, however, natural assets often accumulate value over time, particularly if they are protected and restored. In addition, an estimated 191,000 direct and indirect jobs in the region result from the healthy function of these natural systems, and associated stewardship work. Private or public understanding of the rate of return on investments is essential to allocating capital efficiently to generate significant and real returns. Understanding the size of assets and the relative returns on investments in those assets provides robust information for deciding the scale of and potential returns from investment. By utilizing metrics that incorporate ecosystem services, the true value of investments can be understood. The measurement of Return-on-Investment (ROI) has been proven to be superior to other decision-making tools for ensuring cost-efficiency and the maximization of benefits.

Cooperators and Partners: LISS and contractor

Funding Sources: In-kind services

Funding Needs: in-house staff support, through a workgroup to develop a scope of work to be done by a contractor, contractor cost $

Expected Outputs: A return on investment calculator that can be scaled from small to large protection and, or restoration activities throughout the Sound.

Performance Metric(s): Meetings of work group; SOW for contract; contractor selection and oversight

Implementation Status: New

Expected Timeframe: Complete by 2018.

Reference: Kocian, M., Fletcher, A., Schundler, G., Batker, D., Schwartz, A., Briceno, T., 2014. The Trillion Dollar Asset: The Economic Value of the Long Island Sound Basin. Earth Economics, Tacoma, WA, 76 pp.

Implementation Action: SM-27

Capitalize Connecticut Clean Water Fund and New York State Revolving Fund adequately to finance Clean Water infrastructure needs.

Theme:	Sound Science and Inclusive Management
Goal:	Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome:	4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective:	4-2b: To maintain and enhance efficient public investments in restoration and management.
Strategy:	4-2b2: Identify critical funding needs for protection and restoration projects, science, education, and involvement, and relate these needs to available or new funding sources.

Project Description/Background: EPA provides capitalization grants to the states that are matched by state monies to create loan funds to finance clean water infrastructure projects. The 20-year need for capital upgrades to water infrastructure that considers climate change adaptation must be identified and met. EPA has been encouraging states to re-evaluate their programs to ensure decentralized sewage needs are adequately determined and sufficiently funded. This is particularly important for Long Island Sound since on-site wastewater treatment systems represent an unmanaged source of nitrogen.

Cooperators and Partners: EPA, CTDEEP, NYSDEC, NYS Environmental Facilities Corporation (NYEFC)

Funding Sources: EPA, CTDEEP, NYEFC

Funding Needs: $$$/year needed in bonding to support infrastructure work

Expected Outputs: Clean Water implementation projects.

Performance Metric(s): Federal appropriations for the State Revolving Fund and leveraged state matching funds.

Implementation Status: Underway

Expected Timeframe: Annually 2015–2019.

Implementation Action: SM-28

Research and develop innovative, locally appropriate funding mechanisms to provide sustained, reliable sources of investment capital to restore and protect ecosystem services.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2b: To maintain and enhance efficient public investments in restoration and management.
Strategy: 4-2b2: Identify critical funding needs for protection and restoration projects, science, education, and involvement, and relate these needs to available or new funding sources.

Project Description/Background: The financial value of goods and services provided to the region's economy by the natural ecosystems in Long Island Sound and on the lands whose waters drain to it ranges between $17 billion and $37 billion annually (Kocian et al. 2014). Treated as a capital asset with a lifespan of 100 years, the value of these natural systems is $690 billion to $1.3 trillion. Unlike built systems that depreciate, however, natural assets often accumulate value over time, particularly if they are protected and restored. In addition, an estimated 191,000 direct and indirect jobs in the region result from the healthy function of these natural systems, and associated stewardship work.

Funding mechanisms refer to creative ways to meet financial needs for protecting and managing community assets (including natural capital). They include market mechanisms designed to obtain a desired value from community assets by providing incentives and disincentives for practices that protect or degrade them while also creating a revenue base to invest in their management. The utility and efficiency of funding mechanisms will become more apparent in coming years as new market opportunities develop for habitat, climate control, temperature, and water quality. Current funding mechanisms have limitations. Those benefiting from many aspects of the Long Island Sound Basin (property values, storm protection, and drinking water) might be willing to further contribute to investments that improve those assets. Those harming natural assets (e.g. through pollution) would benefit from a system that internalizes those costs and more efficiently allocates funds to mitigate damages or repair natural assets. Researching the full range of locally appropriate funding mechanisms could provide a sustained, reliable source of investment capital to restore and protect ecosystem services.

Cooperators and Partners: LISS, NFWF, LISS Citizens Advisory Committee. This action could be accomplished through an independent consultant or supported through a regional taskforce to evaluate options for establishing new funding tools to generate the financial resources needed to sustain investment in Long Island Sound's natural assets.

Funding Sources: Varied government and private funding sources.

Funding Needs: $$

Expected Outputs:
- a strategic planning document elucidating potential mechanisms for funding
- a prospectus for private/public sector parties to inform investment

Performance Metric(s):
- a plan with funding mechanisms
- a fund, administered by the appropriate agency, to apply investment funds to restore as well as track progress

Implementation Status: New

Expected Timeframe: Complete by 2019.

Reference: Kocian, M., Fletcher, A., Schundler, G., Batker, D., Schwartz, A., Briceno, T., 2014. The Trillion Dollar Asset: The Economic Value of the Long Island Sound Basin. Earth Economics, Tacoma, WA, 76 pp.

Implementation Action: SM-29

Coordinate and target funding for implementation of protection and restoration, science, and education and involvement projects.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2b: To maintain and enhance efficient public investments in restoration and management.
Strategy: 4-2b2: Identify critical funding needs for protection and restoration projects, science, education, and involvement, and relate these needs to available or new funding sources.

Project Description/Background: Multiple sources of funding exist on the federal, state, local, and non-governmental levels.

Cooperators and Partners: EPA and other federal agencies, CTDEEP, NYSDEC, CTSG, NYSG, foundations, Norwalk River Watershed Initiative, Harbor Watch and other watershed organizations in the region, etc.

Funding Sources: EPA and other federal agencies, CTDEEP, NYSDEC, CTSG, NYSG, foundations, etc.

Funding Needs: Coordination through existing staff and organizations to better direct available resources

Expected Outputs: Projects that implement the CCMP.

Performance Metric(s):
- Number of projects.
- Quantitative progress toward implementation metrics.
- Funding levels.

Implementation Status: Underway

Expected Timeframe: Annually 2015–2019.

Implementation Action: SM-30

Develop an annual budget for each Federal department and agency involved in the protection and restoration of the Long Island Sound watershed.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-2: Actions are implemented through coordinated strategies by all levels of government and diverse stakeholders.
Objective: 4-2b: To maintain and enhance efficient public investments in restoration and management.
Strategy: 4-2b3: Evaluate cross-agency expenditures on Long Island Sound to identify how funding levels match with priority needs, assess whether resources are being optimally applied, and identify leveraging opportunities.

Project Description/Background: This action is included in previous house and senate versions of bills to reauthorize CWA Section 119. It would evaluate current federal spending on Long Island Sound programs against established priorities and needs. Federal spending allocations can be better coordinated to promote specific regional outcomes if the distribution and level of investments are for each outcome are understood. This would help to better coordinate activities and implementation responsibilities among federal agencies with jurisdiction over Long Island Sound. This will include an interagency crosscut budget that displays for each department and agency: (A) The amount obligated during the preceding fiscal year for protection and restoration projects and studies relating to the watershed; (B) the estimated budget for the current fiscal year for protection and restoration projects and studies relating to the watershed; and (C) the proposed budget for succeeding fiscal years for protection and restoration projects and studies relating to the watershed.

Cooperators and Partners: EPA lead with other federal agencies in support roles

Funding Sources: N/A

Funding Needs: N/A

Expected Outputs: Published evaluations of federal expenditures by program elements.

Performance Metric(s): Reauthorized legislation with cross-budget analysis requirement.

Implementation Status: New

Expected Timeframe: Annually 2016–2019.

Implementation Action: SM-31

Incorporate climate change-driven factors such as temperature and sea level rise in model applications to assess factors that can influence future attainment of water quality standards and habitat protection and restoration goals.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-3: Implementation is adapted and improved through the application of new information and knowledge.
Objective: 4-3a: To frame sustainability, adaptation, and resilience in relation to the drivers of ecosystem change.
Strategy: 4-3a1: Include important environmental drivers (e.g., climate change) in all relevant management planning initiatives. 1-1a8: Incorporate climate change and sea level rise in planning, regulation, and BMPs for stormwater and wastewater treatment. 1-3b3: Improve understanding of climate change (e.g., acidification, sea level rise, temperature) on Long Island Sound water and habitat quality and biota, and their interaction with other water quality issues (e.g., eutrophication).

Project Description/Background: Physical factors can affect the susceptibility of Long Island Sound to impairments in water and habitat quality. Scenarios for future attainment of dissolved oxygen water quality standards or habitat protection and restoration goals must evaluate plausible alterations to the physical environment due to climate change.

Cooperators and Partners: LISS work groups responsible for modeling oversight

Funding Sources: LISS program funds

Funding Needs: $$

Expected Outputs: Model scenarios for water quality attainment that incorporate future physical conditions driven by climate change.

Performance Metric(s):
Modeling scenarios identified by work group.

Implementation Status: New

Expected Timeframe: FY 2019.

Implementation Action: SM-32

Develop a vulnerability assessment of how climate change will affect attainment of the CCMP goals and objectives.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-3: Implementation is adapted and improved through the application of new information and knowledge.
Objective: 4-3a: To frame sustainability, adaptation, and resilience in relation to the drivers of ecosystem change.
Strategy: 4-3a1: Include important environmental drivers (e.g., climate change) in all relevant management planning initiatives.

Project Description/Background: Federal agency and EPA-specific policies now direct EPA programs to promote smarter, more climate-resilient Federal investments in the face of increased risks from climate change stressors such as sea level rise and ocean acidification. EPA's National Estuary Program is working to implement those policies by providing technical assistance and funding support to the 28 National Estuary Programs funded under §320 of the Clean Water Act for risk-based vulnerability assessments. EPA's goal is to ensure that no later than FY 2020, each of the 28 NEPs will be prepared to demonstrate that its investments in CCMP implementation are informed by a risk-based vulnerability assessment and are climate resilient, i.e., that actions to implement a CCMP will result in their intended estuary protection and restoration benefits through time regardless of reasonably-anticipated climate changes.

Cooperators and Partners: EPA, LISS, CTDEEP, NYSDEC and all Long Island Sound partners.

Funding Sources: Resources permitting, in FY 2015 and in each of the following three fiscal years, EPA will provide technical assistance and funding to help ensure that §320-funded implementation of CCMP goals and of annual work plan activities is not at risk from near- and long-term climate change impacts.

Funding Needs: $ to conduct assessment, $ to integrate findings

Expected Outputs:
- Conduct a broad, risk-based climate change vulnerability assessment
- Integrate vulnerability assessment findings and planned response approaches into a CCMP appendix or supplemental document
- Implement specific response activities via annual work plans as necessary.

Performance Metric(s):
- Engaged and strong partnerships and information sharing at all levels of government
- Complete an inventory/assessment
- Develop or continue to develop, implement, and update comprehensive plans that integrate consideration of climate change into agency operations and overall mission objectives.

Implementation Status: New

Expected Time frame: Conduct a broad, risk-based climate change vulnerability assessment no later than 2019 and integrate vulnerability assessment findings and planned response approaches into a CCMP appendix or supplemental document by 2020

Implementation Action: SM-33

Incorporate desired ecosystem outcomes for planning and implementation of Hurricane Sandy Relief funds and ongoing coastal resiliency programs.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-3: Implementation is adapted and improved through the application of new information and knowledge.
Objective: 4-3a: To frame sustainability, adaptation, and resilience in relation to the drivers of ecosystem change.
Strategy: 4-3a2: Consider the spectrum of desired ecosystem outcomes when planning and implementing resiliency of both built and natural systems.

Project Description/Background: Multiple federal/state efforts are underway to recover from Hurricane Sandy and build resiliency from future storms. In general these efforts strive to reduce risk to vulnerable coastal populations, property, ecosystems, and infrastructure, considering future sea level rise and climate change. Management Conference partners need to ensure the best science informs recovery and resiliency efforts for both the built and natural environment in and around Long Island Sound.

Cooperators and Partners: Multiple agencies involved in Sandy recovery and resiliency efforts

Funding Sources: Existing staff resources

Funding Needs: Generally these activities will be supported with agency funds.

Expected Outputs: More resilient ecosystems.

Performance Metric(s): Project, plans and activities for coastal recovery and resiliency that incorporate ecosystem values and functions.

Implementation Status: New

Expected Timeframe: Annually 2015–2019.

Implementation Action: SM-34

Collaborate with the Connecticut Institute for Resiliency and Climate Adaptation (CIRCA).

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-3: Implementation is adapted and improved through the application of new information and knowledge.
Objective: 4-3a: To frame sustainability, adaptation, and resilience in relation to the drivers of ecosystem change.
Strategy: 4-3a2: Consider the spectrum of desired ecosystem outcomes when planning and implementing resiliency of both built and natural systems.

Project Description/Background: The Institute is designed to increase the resilience and sustainability of vulnerable communities and individuals along Connecticut's coast and inland waterways as they are affected by the growing impact of climate change on the environment. By bringing together experts in a wide range of academic disciplines, by developing cutting-edge research to solve practical problems, and collaborating with local, regional, and national partners, the institute will facilitate development of strategic plans for protecting the state's coastal region.

Cooperators and Partners: UConn, CTDEEP, NOAA

Funding Sources: Initial funding for the Institute, in the amount of $2.5 million, comes from a plea agreement approved by the U.S. Attorney's Office in a suit the State brought against Conopco Inc., for clean water violations related to wastewater treatment. Additional funding includes $610,000 from the Connecticut Sea Grant Coastal Storm Awareness program and federal funding of $425,000 from a grant to enhance coastal resilience in Connecticut.

Funding Needs: $$$ to $$$$. See above.

Expected Outputs:
- Improved scientific understanding of the changing climate and its local impacts communities;
- Developed and deployed best practices for climate resilience;
- Pilot projects to improve coastal resilience and sustainability;
- Resilient and sustainable communities;
- Enhanced resilience of critical infrastructure (e.g. power, water, communications); and
- Reduced loss of life and property, ecological damage, and social disruption from storms.

Performance Metric(s): A more climate-literate public

Implementation Status: New

Expected Timeframe: January 2015.

Implementation Action: SM-35

Refine the ecosystem metrics and targets based on the underlying science of the Long Island Sound ecosystem to clearly identify the characteristics of a "restored" Long Island Sound.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-3: Implementation is adapted and improved through the application of new information and knowledge.
Objective: 4-3b: To apply an adaptive management framework, when warranted by the level of uncertainty in the underlying science, to implementation.
Strategy: 4-3b1: Establish baselines of historical or pre-historical conditions of ecosystem attributes and magnitudes of change to help provide a basis for setting restoration goals.

Project Description/Background: The CCMP includes ecosystem targets for restoration to be tracked through measurable indicators. Progress toward attaining the ecosystem target conditions will be evaluated on an annual basis. The ecosystem targets will also be assessed for refinement and the inclusion of new targets.

Cooperators and Partners: LISS

Funding Sources: LISS program funds

Funding Needs: Part of the base LISS staff program activities

Expected Outputs: Assessments of progress toward ecosystem characteristics.

Performance Metric(s): Annual updates of environmental indicators. Published reports on progress toward attainment of targets.

Implementation Status: New

Expected Timeframe: Annually 2015–2019.

Implementation Action: SM-36

Incorporate bioextraction analyses in Dissolved Oxygen TMDL assessments on the assimilative capacity of Long Island Sound to process nutrients without loss of designated uses.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-3: Implementation is adapted and improved through the application of new information and knowledge.
Objective: 4-3b: To apply an adaptive management framework, when warranted by the level of uncertainty in the underlying science, to implementation.
Strategy: 4-3b2: Utilize and learn from cutting-edge approaches and methods to improve management options for pollution mitigation and ecosystem protection (e.g., marine spatial planning, innovative source reduction technologies, and in situ extractive technologies). 1-1a3: Enhance implementation of the existing 2000 Dissolved Oxygen Total Maximum Daily Load throughout the watershed; and adapt and revise it based on monitoring, modeling, research, and how climate change may affect attainment of water quality standards in the future.

Project Description/Background: Bioextraction of nutrients through shellfish and seaweed aquaculture harvests can increase the nutrient assimilative capacity of Long Island Sound, thereby increasing dissolved oxygen levels and improving water quality.

Cooperators and Partners: LISS, TMDL Work Group

Funding Sources: LISS program funds

Funding Needs: $$

Expected Outputs: Implementation Plan for nutrient bioextraction

Performance Metric(s):

Implementation Status: New

Expected Timeframe: January 2017.

Implementation Action: SM-37

Prepare and make available to the public annually the LISS Implementation Tracking Report using E-Sound.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-3: Implementation is adapted and improved through the application of new information and knowledge.
Objective: 4-3b: To apply an adaptive management framework, when warranted by the level of uncertainty in the underlying science, to implementation.
Strategy: 4-3b3: Prepare periodic progress reports on the health of the Sound and on implementation progress.

Project Description/Background: Full and transparent knowledge of the progress in implementation can be used to identify shortfalls and design solutions to enhance program implementation. This is one of the elements required under legislation for reporting to Congress.

Cooperators and Partners: LISS, Federal and state implementer agencies

Funding Sources: LISS program funds

Funding Needs: $$/year

Expected Outputs: Implementation tracking report

Performance Metric(s): Number of agencies reporting on implementation progress.

Implementation Status: New

Expected Timeframe: Annually 2015–2019.

Implementation Action: SM-38

Issue a "report card" on water quality conditions in Long Island Sound.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-3: Implementation is adapted and improved through the application of new information and knowledge.
Objective: 4-3b: To apply an adaptive management framework, when warranted by the level of uncertainty in the underlying science, to implementation.
Strategy: 4-3b3: Prepare periodic progress reports on the health of the Sound and on implementation progress.

Project Description/Background: Report cards can integrate diverse data into an easily understandable form to communicate to the public and build support for actions for improve assessments. Critical to the report card success is the scientific credibility of its underlying assumptions. This action will develop a report card on water quality based on the science-based approaches developed elsewhere, but applied specifically to Long Island Sound. The report card should be evaluated as to its effectiveness in communicating to the public the differences in conditions from east to west.

Cooperators and Partners: LISS, Science and Technical Advisory Committee, University of Maryland.

Funding Sources: LISS program funds, Long Island Sound Funders Cooperative

Funding Needs: $160,000 allocated in 2013. $$/year to maintain and publish report cards.

Expected Outputs: Annual published report card

Performance Metric(s):
- Science-based matrices for translating water quality conditions into grades;
- Review by the Science and Technical Advisory Committee

Implementation Status: New

Expected Timeframe: January 2015.

Implementation Action: SM-39

Refine and communicate information on the Long Island Sound ecosystem and watershed using environmental indicators (drivers, pressures, conditions, and response indicators).

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-3: Implementation is adapted and improved through the application of new information and knowledge.
Objective: 4-3b: To apply an adaptive management framework, when warranted by the level of uncertainty in the underlying science, to implementation.
Strategy: 4-3b3: Prepare periodic progress reports on the health of the Sound and on implementation progress.

Project Description/Background: Indicators are quantitative or qualitative measures that provide information about the status of or changes in natural, cultural, and economic aspects of an ecosystem. The LISS has been developing and reporting on the environmental pressures, conditions, and responses of the Long Island Sound ecosystem since the late 1990s. There is a need to maintain a robust environmental indicators program on the status and trends of Long Island Sound's water quality, habitats, and marine and coastal animal populations, and develop new climate change and socioeconomic indicators. Reporting on the health of LIS is one of the elements required under legislation for reporting to Congress.

Cooperators and Partners: LISS

Funding Sources: LISS program funds

Funding Needs: $

Expected Outputs: Web page of environmental indicators and publication of a Sound Health report

Performance Metric(s):
- Environmental indicators updated annually on www.longislandsoundstudy.net
- Biennial publication of Sound Health.

Implementation Status: Underway

Expected Timeframe: Every two years with September 2015 for next website update.

Implementation Action: SM-40

Develop annual Long Island Sound Study work plans that consider progress made and recommendations for improving implementation to achieve desired outcomes.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-3: Implementation is adapted and improved through the application of new information and knowledge.
Objective: 4-3b: To apply an adaptive management framework, when warranted by the level of uncertainty in the underlying science, to implementation.
Strategy: 4-3b4: At five-year intervals refine implementation actions and priorities by incorporating and integrating new information (including emerging issues) relating to science and management.

Project Description/Background: LISS develops annual work plans that document the desired outputs and outcomes from each funded task, while also providing an update from the activities funded in the prior year. The outputs and outcomes of the annual work plan should reflect the goals and objectives of the CCMP.

Cooperators and Partners: LISS Management Committee

Funding Sources: LISS program funds

Funding Needs: Work conducted by core LISS staff with no additional costs.

Expected Outputs: An annual work plan that clearly documents who will produce what, by when, to support a specified outcome.

Performance Metric(s): Proposed annual work tasks that are reviewed for how they support attainment of desired outcomes. Management Committee meetings to review and approve the work plans.

Implementation Status: Underway

Expected Timeframe: Annually in April 2015–2019.

Implementation Action: SM-41

Every five years develop a comprehensive, specific, target-oriented implementation plan engaging all Long Island Sound partners.

Theme: Sound Science and Inclusive Management
Goal: Manage Long Island Sound using sound science and cross-jurisdictional governance that is inclusive, adaptive, innovative, and accountable.
Outcome: 4-3: Implementation is adapted and improved through the application of new information and knowledge.
Objective: 4-3b: To apply an adaptive management framework, when warranted by the level of uncertainty in the underlying science, to implementation.
Strategy: 4-3b4: At five-year intervals refine implementation actions and priorities by incorporating and integrating new information (including emerging issues) relating to science and management.

Project Description/Background: The implementation actions included in this revision of the CCMP cover a period of five years. Every five years a new set of implementation actions will be developed considering success and challenges in implementation, changes in the health of Long Island Sound, and new science on the Sound.

Cooperators and Partners: LISS and partner agencies.

Funding Sources: LISS program funds

Funding Needs: Developed by LISS core staff

Expected Outputs: A five-year implementation plan

Performance Metric(s): Evaluation of the implementation tracking report and assessment of innovations and new information. Assessments of environmental indicators, and review of research and monitoring data to consider science gains.

Implementation Status: New

Expected Timeframe: Every five years. Next Implementation Action Plan due five years after the completion of the Implementation Action Plan (January 2020).