



# **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
<b>SM-1</b>	<b>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.</b>	<b>4-1a1, 1-1a7, 1-3a2, 2-4a4</b>
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
<b>SM-8</b>	<b>Coordinate and leverage community water quality monitoring programs, enhancing the utility and application of data.</b>	<b>4-1b4</b>
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
<b>SM-10</b>	<b>Improve the use and utility of Long Island Sound data for GIS applications.</b>	<b>4-1b5</b>
<b>SM-11</b>	<b>Enhance modeling of eutrophication in Long Island Sound to support nitrogen management and Dissolved Oxygen TMDL implementation.</b>	<b>4-1c1; 1-3a2</b>
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
<b>SM-16</b>	<b>Optimize structure and function of the Management Conference with a focus on implementation of the revised CCMP.</b>	<b>4-2a1</b>
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
<b>SM-19</b>	<b>Support involvement of, and communication with, local governments, which have front line authority for implementing many of the CCMP strategies.</b>	<b>4-2a1</b>
<b>SM-20</b>	<b>Reach out to traditionally underrepresented stakeholders and encourage them to participate in the Management Conference.</b>	<b>4-2a1</b>
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
<b>SM-24</b>	<b>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.</b>	<b>4-2a5</b>
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
<b>SM-28</b>	<b>Research and develop innovative, locally appropriate funding mechanisms to provide sustained, reliable sources of investment capital to restore and protect ecosystem services.</b>	<b>4-2b2</b>

## **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-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-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-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-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.