



Options for Developing Marine Spatial Planning in Long Island Sound:

Sound Marine Planning Interim Framework Report

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**A Discussion Piece Prepared by the
Interim Framework Report Team**

DRAFT

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This report was produced by the Interim Framework Report Team, a subcommittee of the Connecticut-New York Bi-State Marine Spatial Planning Working Group (Working Group). This Interim Framework Report can be used by interested parties during the period needed to complete a review process leading to a final report.

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Executive Summary

1. Framework Purpose and Approach

The purpose of this Sound Marine Plan Interim Framework Report is to help initiate and inform a discussion about how marine spatial planning (MSP) could be applied in Long Island Sound (LIS) given its unique social, cultural, ecological and political characteristics. This report is offered as a potential foundation and guide for an official MSP process as well as an educational tool for interested parties. It presents the states of Connecticut and New York, stakeholders, and other interested parties with a series of potential planning options for MSP in LIS. These options are neither prescriptive nor binding but reflect the results of extensive review and assimilation of MSP efforts undertaken in other parts of the U.S. and internationally. The authors acknowledge that this document does not intend to solve sensitive issues where state or stakeholder interests may differ, but rather focuses on a range of potential options to guide a planning process. Choices are presented as multiple paths and approaches by which MSP could be applied to LIS. Given that the states of New York and Connecticut have formal responsibility for determining an official process, it would be premature to identify a specific path as being the most appropriate.

Additionally, stakeholder input and participation will be critical in shaping an official process. Although there has been informal stakeholder involvement in this preparatory phase, formal stakeholder input is yet to come. Overall, the intention of this Interim Sound Marine Plan Framework Report is to support and inform a formal MSP process in LIS. It is important to note that this Report represents the efforts and professional judgment of the authors in presenting a set of options to consider but does not necessarily reflect the views of the State of New York or Connecticut.

The role of this Interim Report:

This Interim Report integrates comments received to date and provides updated information including that associated with the passage of Public Act 15-66 by the Connecticut General Assembly, commonly referred to as the “Blue Plan.” Produced by the Interim Framework Report Team, a subcommittee of the CT-NY Bi-State Marine Spatial Planning Working Group (Working Group), the document can be used by interested parties while the Final Report is reviewed, edited, and potentially endorsed by the full

Working Group. The Interim Framework Team is submitting this draft to the Working Group purely as a discussion and reference document and is not seeking endorsement of its content.

Passage of Public Act 15-66, the “Blue Plan”

The Blue Plan legislation passed in Connecticut in 2015 launches an official MSP process for the Sound. It is discussed in greater detail later in report. This document and the options it presents reflect passage of the Blue Plan, however, the document, with most of it being drafted prior to passage of the Blue Plan, also presents other options that may be less likely or relevant given passage of the recent legislation. This draft nevertheless includes much of the original content to provide a broader view and context of MSP for LIS.

2. The Case for Marine Spatial Planning in Long Island Sound

LIS is a significant environmental, economic, cultural and recreational resource for both Connecticut and New York, and the Southern New England region as a whole. With more than nine million people living in the Sound’s watershed and more than 20 million people living within 50 miles of its coast, LIS hosts diverse uses including recreation, commercial and recreational fishing and boating, aquaculture, marine trades and transportation, and habitats for fish, shellfish, birds, wildlife and plants.

MSP refers to a science-based comprehensive planning process that considers the human uses, natural resources, and processes in a given coastal or ocean area in order to characterize areas that may be appropriate for new uses or new applications of existing uses, resolve conflicts between uses, and achieve a range of other management objectives. Other states including Rhode Island, Massachusetts, and Oregon, as well as regions including the Northeast and Mid-Atlantic, have recently undertaken the MSP approach to improve decision-making and maximize regulatory efficiencies; identify data for transparent, science-based decision-making; and improve ecosystem health.

Long Island Sound is poised to benefit from marine spatial planning. With its numerous human activities and the proximity of its natural resources to densely populated areas, LIS needs comprehensive, coordinated, and proactive planning for the future. This is critical because LIS is a public trust resource owned by the people of New York and Connecticut. Demand for new uses of the Sound has increased significantly in recent years, ranging from energy developments to submarine cables to new forms of aquaculture. A LIS MSP effort would identify and consider the Sound’s human uses and natural resources in order to prepare for these new uses. It could result in strong protection for LIS’s time-honored traditional uses and valued ecosystem services, while reducing user conflicts, facilitating bi-state coordination, and shaping a more efficient decision-making process.

Currently decisions about future uses are made on a case-by-case basis, often in a reactive and uncoordinated manner. The increasing number of proposed new uses of LIS underscores the need for proactive, coordinated planning.

While there are other existing LIS and regional plans and initiatives, none of these meet the need for a comprehensive, coordinated, enforceable spatial management plan for the Sound (see section below for more detail on existing plans and initiatives). Unlike these other initiatives, a LIS MSP process may best be led by the States of New York and Connecticut. The states would also be able to assure adequate representation of New York and Connecticut residents, businesses, and other interests.

A Sound Marine Plan could help reduce and resolve conflicts among those who use or who wish to use the Sound, while protecting LIS traditional uses and natural resources through an open and transparent process. It could build coordinated management of the Sound, as one ecosystem, between the States of Connecticut and New York, who share responsibility for managing Sound resources and uses. A Sound Marine Plan could be incorporated into Connecticut and New York’s federally-approved coastal zone management programs pursuant to the federal Coastal Zone Management Act, and the information

in the Plan used to make better decisions within the states' existing federal consistency authority over federal agency actions such as project permits to assure federal actions are consistent with the Plan. (It is intended that further clarification of the potential opportunities, mechanisms, and benefits associated with federal consistency authority will be addressed in the final version of this report, the "Sound Marine Planning Framework Report" (Final Report)).

In the opinion of the authors, LIS is ready for MSP. There is widespread public support for LIS MSP, as illustrated through several recent Long Island Sound initiatives involving the public and government agencies such as the 2015 Long Island Sound Study Comprehensive Conservation and Management Plan update, which calls for LIS MSP. Additionally, the 2015 draft New York Ocean Action Plan discusses the MSP approach and identifies the need for integrated planning and management of offshore marine resources.

Additionally, the time for LIS MSP is now because undertaking a LIS MSP process with interested stakeholders during a period of relative calm, is preferable to waiting for the next controversial development or crisis, which could easily polarize those same sets of stakeholders. LIS can also benefit from current MSP activities and investments in the Northeast and Mid-Atlantic regions — a window of opportunity that may not last. With nearby states such as Rhode Island and Massachusetts having completed marine spatial plans, if a MSP is not completed for LIS, the Sound may find itself left behind and could conceivably be targeted for undesirable offshore development or facilities that are barred from other states' waters. Finally, a Connecticut-New York Bi-State Marine Spatial Planning Working Group, described below, has been working for over two years to build the enabling conditions for such a process. This report is one outcome of this group's effort. Finally, and potentially most significantly, passage of the Blue Plan legislation means there will be a LIS MSP process for the Sound. As such the Blue Plan serves as a potential driver of interest in LIS MSP that may not otherwise be as strong.

In short, the authors of this report would assert that a primary purpose for marine spatial planning in LIS is to be much better prepared than we are today to make effective and efficient decisions in the public interest about if, where and how to site new major developments and uses taking in consideration existing uses and users. These "better decisions" could also apply to new applications or new locations for the types of uses that currently exist in the Sound. Potential new uses or new applications could be in the form of an industrial or energy facility, a new form of aquaculture or transportation or something in the future we don't anticipate today. MSP would be filling an important gap — the lack of a forward looking, publicly — supported, planning and decision-making process for the Sound as a whole that assures new uses will be compatible with its existing public and environmental benefits.

3. Coordination with Existing Plans and Initiatives

As stated above, while there are multiple planning, research and management efforts associated with LIS, there remains a distinct and compelling need for a marine spatial plan that considers the Sound as a whole system. In short, there is no overarching plan for how best to manage uses immediately over, on and under the surface of Long Island Sound. LIS MSP, referred to as a process that may produce a plan (e.g. "Sound Marine Plan"), would fill this important gap, and would be developed in close coordination with other existing planning efforts without duplicating them. Such a planning process would be led and developed by the States of Connecticut and New York and developed in close coordination with existing LIS and regional planning efforts and studies. These LIS initiatives include but are not limited to (1) the Long Island Sound Study (LISS), (2) the Long Island Sound Dredged Material Management Plan, and (3) the Long Island Sound Seafloor Mapping Program. The LISS, a partnership of the States of Connecticut and New York with the U.S. Environmental Protection Agency through its National Estuary Program and other organizations and institutions, provides important stakeholder

input, research, and management recommendations for the Sound, but is neither designed nor authorized to prepare or implement a marine spatial plan. As the Sound is completely within state waters, an MSP effort would most appropriately be led by the states with the jurisdiction and authority to do MSP. The Long Island Sound Dredged Material Management Plan, led by the U.S. Army Corps of Engineers, is a regional plan with the goal of reducing or eliminating the need for open-water disposal as agreed by New York, Connecticut, EPA, and the Corps. It addresses an important management topic for the Sound but is limited to dredging and dredged material disposal. The Long Island Sound Seafloor Mapping Program is gathering important data and information about the Sound, but is not a planning or management initiative. Large-scale regional planning efforts such as those of the Northeast Regional Planning Body and Mid-Atlantic Regional Planning Body help provide a broad, regional context for future MSP work at the state scale but they do not meet the need for MSP that can be directly implemented at the state level. The data, information, stakeholder participation and management recommendations developed through each of these initiatives will represent important inputs into a Sound Marine Plan. A Sound Marine Plan could seek to coordinate with and integrate these existing plans and initiatives, identify and fill information gaps, and develop a comprehensive spatial management plan.

4. Report Authors and Audience

This report was developed by the Interim Framework Team, a sub-committee of the Connecticut-New York Bi-State Marine Spatial Planning Working Group (“Working Group”). The Working Group was voluntarily and informally formed in 2012 to assist in initiating an MSP process for LIS that would recognize and engage the state agencies of New York and Connecticut as the lead parties to officially launch and implement MSP. The Working Group is composed of state and federal agencies, non-governmental organizations, the Connecticut and New York Sea Grant programs, regional ocean entities and user/trade organizations. See page vi above for a listing of

the Interim Framework Team and Appendix II of this report for a list of Working Group members.

An official LIS MSP process would be led and developed by the States of Connecticut and New York. As such, the primary intended audience for this document is the Connecticut Department of Energy and Environmental Protection (Connecticut DEEP) and the New York Department of State (New York DOS), which house the states’ respective coastal management programs, as well as the New York Department of Environmental Conservation (New York DEC), which plays a key role in LIS resource management. This document is also intended for the Blue Plan Advisory Committee and all LIS users and user groups, federal agencies, tribal governments and interests, local communities and agencies, interested non-governmental organizations (NGOs), academic institutions, and any other stakeholders or parties with an interest in LIS.

5. The Connecticut Blue Plan

The Connecticut Blue Plan legislation (Public Act 15-66) is currently shaping when and how Connecticut undertakes an official LIS MSP process. Introduced in the 2014 Connecticut General Assembly session as “An Act Concerning a Long Island Sound Resource and Use Inventory and a Long Island Sound Blue Plan” (or “the Blue Plan”), the bill was passed during the 2015 legislative session and signed into law by Governor Malloy. To access the bill, please place the following URL in your browser: <https://www.cga.ct.gov/2015/ACT/pa/pdf/2015PA-00066-R00HB-06839-PA.pdf>

The bill grew out of a realization that in order for a LIS marine spatial plan to have the force of law in Connecticut, legislation must be passed to grant the Connecticut DEEP the authority to use such a plan in considering applications for various permitted activities in Long Island Sound waters or in other ways. The Act calls for the development of a Blue Plan (synonymous with “Sound Marine Plan”), specifies various types of resources and uses that will be inventoried, articulates objectives and principles on which the Blue Plan should be based, and lays out

timelines for plan completion. Under the Blue Plan, the Connecticut DEEP will chair and convene an “Advisory Committee,” including both agency and stakeholder representatives, and the University of Connecticut will convene a science subcommittee. The Act also includes multiple provisions for stakeholder engagement; these include stakeholder membership on the Advisory Committee, a required minimum of three public meetings, and provisions for additional meetings and stakeholder engagement opportunities.

Principles identified in the Act include consultation with the existing Connecticut-New York Bi-State Marine Spatial Planning Working Group and coordination with counterparts in New York to the maximum extent feasible. Although it is Connecticut legislation, the Blue Plan recognizes the importance of managing the Sound as one whole system, including New York in the process, and identifies the goal of a bi-state plan with basic elements to achieve that goal.

6. Options: Elements of a Sound Marine Plan

The Sound Marine Planning Framework Report includes an analysis of MSP elements and Sound Marine Plan options. This analysis was informed by an assessment of seven completed or ongoing MSP initiatives worldwide conducted by the Working Group. This assessment as well as MSP guidance documents, scientific and technical literature, and examples from current MSP practice were used to examine the multiple elements of MSP, and to identify for each element a range of options for how the element could be approached in LIS. These elements (e.g. “stakeholder engagement”) serve as the building blocks for MSP — they are collectively what is needed to create a complete MSP process and plan.

This Framework Report provides basic descriptions of each element and offers a range of options to consider for LIS. Marine spatial planning efforts continue to mature throughout the U.S. and internationally, so while the options outlined in this draft report illustrate a range of ways marine spatial planning can be undertaken in LIS, they are by no

means all inclusive. The continuum that each range of options covers includes consideration of resource availability, political feasibility, geographic scale, complexity, ease of implementation, and other factors. This Executive Summary includes brief explanations of each element accompanied by one detailed example; all examples correspond to “Scenario 3” in Table A provided below. For full background explanation on each element and a detailed range of options for each, please see the full Interim Framework Report.

The range of options for each element noted above was drawn from and used to assemble four summary scenarios, each representing a different overall potential LIS MSP initiative. Each scenario illustrates different ways in which the elements can be assembled to comprise one complete LIS MSP initiative. Although the four scenarios cover a reasonable range of an overall process and plan, they remain illustrative examples, not a finite set of choices. An actual process and plan can be designed to fit the particular circumstances, drawing from the examples provided. These four scenarios represent the culminating result of the report.

A brief summary of the individual elements follows below. These elements include plan authority and structure; scope and scale; vision, guiding principles, goals and objectives; plan preparation process; plan elements and content; funding mechanisms; and implementation, monitoring and evaluation. Plan preparation process includes discussion of starting the process; planning timeframe and key milestones; stakeholder engagement; and core team, science advisors and interagency coordination. Plan elements and content include discussion of data collection, standardization, and sharing; biological/ecological characterization and assessment; human use characterization and assessment; potential future uses; decision support tools; and planning and policy options.

A. Plan Authority and Structure

To apply the MSP approach, the lead agencies must have appropriate authority to develop a plan. Because LIS is both a CT and NY resource, a LIS MSP

process would ideally be led and developed jointly by the States of Connecticut and New York — or a process that approaches this. New York DOS could participate in MSP in LIS through the New York Waterfront Revitalization of Coastal Areas and Inland Waterways Act (New York Executive Law Article 42 §910-923), however to adopt and/or implement MSP, New York may need additional authority (a key topic which is to be more fully addressed in completing the Final Report). The Connecticut Blue Plan Act assigned Connecticut DEEP the necessary authority to conduct MSP. Once a Sound Marine Plan is developed, Connecticut and New York may seek approval of the plan as part of their respective federally-approved coastal management programs pursuant to the federal Coastal Zone Management Act.

A key consideration in the case of Long Island Sound is a bi-state plan structure — i.e. how the two states will work together to facilitate coordination. The range of options presented for plan authority and structure includes 1) the “status quo” (in which states continue the existing LIS management approach); 2) a two-state solution where each state adopts its own plan for its own waters; 3) a unified bi-state plan (“the Blue Plan approach”) where each state adopts its own plan but the plans are very similar so they can each effectively function for all of LIS; or 4) one single comprehensive plan adopted and implemented by the two states where each state is bound by the plan. For the example of the unified bi-state plan or “Blue Plan Approach,” each state would adopt or use its own separate marine spatial plan through its own legal and/or administrative processes, but the plan each state adopts or uses would be, for all intents and purposes, the same plan.

Given that CT and NY may have different levels and types of legal authority to develop and/or adopt a MSP at any given time, the approach would entail working within those differences to craft a plan or approach that achieves as much consistency, similarity and ability to apply Sound-wide as is reasonably possible. For this option to work most effectively and efficiently, legislative or administrative changes that provide sufficient authority may need to be considered. Once an approach in each state is established, an appropriate bi-state agreement could

potentially structure how the states will cooperate and communicate to effectively implement the respective plans. The goal is to ensure as much uniformity and consistency in implementation as is reasonably possible with the result that LIS can be collectively managed as a whole.

B. Scope and Scale

Scope and scale of a MSP initiative includes multiple spatial and temporal considerations. Geographic boundaries define the scope of a planning area, and may include part or all of an area of marine space. Temporal considerations include consideration of when existing conditions are defined, and a period to plan for future uses. They also include consideration of seasonal patterns in human activities and environmental and biological processes. Finally, a marine spatial plan requires consideration of both two- and three-dimensional space.

The range of options for this element focus on MSP boundaries, primarily the landward boundary of a planning area. A landward boundary could be set offshore of, or could align with, the mean high water (MHW) line, or it could extend inland into coastal watersheds. Multiple boundaries can be set for different purposes (i.e. a study area boundary might be more inclusive than a management area boundary). For example, the “Blue Plan Approach” option suggests adopting separate planning and management boundaries. The landward planning boundary would be the MHW line. The landward management boundary would be the 10-foot bathymetric contour seaward of MHW and seaward of auto and rail transportation (i.e. downstream of bridges), thus focusing on offshore issues. This approach is consistent with other regional and state MSP efforts, which have been framed as “salty” initiatives focusing on the marine areas where there is the greatest need for information and coordination. The seaward boundary could be the limit of state waters, i.e. the line in the middle of the Sound between NY and CT, if no bi-state agreement emerges, and/or the boundary w/ Rhode Island. It is worth noting that all of LIS is state waters with no federal waters.

C. Vision, Guiding Principles, Goals, and Objectives

Developing a vision, guiding principles, goals and objectives will be essential for the success of a LIS MSP initiative. A vision articulates the desired future state for a place — in this case, Long Island Sound. It is a high-level aspiration that can motivate stakeholders participating in a MSP effort over the long-term, and can be stated either as one or a series of statements. Principles are basic qualities determining the intrinsic nature or characteristic behavior of a MSP process, and provide insight into how planners will conduct their work. Goals and objectives shape and focus the substance of an MSP process. Goals are typically broad and address the “what” to be accomplished, while objectives are used to describe specific outcomes or observable changes that, once completed or met, contribute to the achievement of a particular goal. A best practice is to develop a vision, guiding principles, goals and objectives early in the planning process, through rigorous and transparent stakeholder engagement.

The range of options offered for this element considers level of bi-state coordination, depth of approach, and method of development. For example, one option is “bi-state coordinated, stakeholder-driven process to develop shared vision, principles, goals and measurable objectives.” Under this option, Connecticut and New York would develop a shared vision statement, guiding principles, goals, and objectives, to facilitate the development of one integrated Sound Marine Plan or two well-coordinated state plans. A bi-state Stakeholder Advisory Group or equivalent could be set up at the beginning of the planning process. Vision, principles, goals and objectives could be drafted with this group in coordination with the states, and distributed for public review and comment. Given the recent passage of the CT Blue Plan, another approach would be for that state’s Advisory Council to move forward in the short-term to implement steps outlined above.

D. Plan Preparation Process

Plan preparation involves mechanisms or drivers for starting the MSP process; planning timeframe and key

milestones; structures for stakeholder engagement; and the core team, science advisors, and interagency coordination. Different scenarios and options are offered for each of these sub-elements.

Starting the Process: The MSP process typically begins when a problem or issue is identified which MSP can help address, and the appropriate authority, capacity, and resources are in place to facilitate the process. Many MSP initiatives have unfolded in response to a “driver” or the emergence of an issue which has motivated use of MSP as a mechanism to improve how the issue is addressed. The possible siting of offshore renewable energy development is an example of an issue which has generated interest in MSP as a tool. MSP may also take place in response to legislative action (e.g. the CT Blue Plan).

Planning Timeframe and Key Milestones: An MSP process must be structured according to a well-planned timeframe with associated planning milestones in order to be successfully completed. The planning timeframe must include a structure for the plan development itself, which can be guided by a set of planning milestones identified early in the process. It must also include an interval for future plan updates and revisions. Other MSP initiatives have unfolded over widely varying timeframes ranging from 18 months to six years. The planning timeframe for a LIS MSP process would be defined by the states of Connecticut and New York, which would work within all of these parameters. The range of scenarios presented covers planning timeframes that are derived from a review of other domestic and international MSP processes as accelerated (12-18 months) to extended (4-5 years). For example, under the extended timeframe, the first 12-24 months could be spent on pre-planning, fundraising, issue identification, formulation of institutional arrangements, and goal setting. The second 24 months could be spent on data collection, analysis, and plan development, and the final 12-14 months on public review and comment, document revisions, and final plan approval. Stakeholder engagement is presumed to begin in the first month and continue throughout.

Stakeholder Engagement: Stakeholder engagement is considered central to MSP and should take place

early, often, and consistently through all phases of a MSP process. Stakeholder engagement ensures the openness, transparency, and legitimacy of MSP; increases buy-in; and contributes local knowledge to the process. A broad range of stakeholders should be engaged in MSP; in LIS these could include but are not limited to sectors such as the marine trades; conservation organizations; energy, commercial and recreational fishing and boating, shellfishing, commercial boating/shipping, telecommunications; tourism and recreational industries; recreational interests; ports and waterfront businesses; local municipalities; non-traditional aquaculture interests; defense; academic interests; tribes; and others.

There are many options for structuring stakeholder engagement, which range from utilizing existing processes to establishing new structures for stakeholder engagement. In addition to public meetings and workshops, there are numerous formal structures that can be implemented to ensure adequate stakeholder representation and involvement. The Connecticut Blue Plan includes provisions for stakeholder engagement including formal standing as members of the Advisory Committee, the official body responsible for preparing the Plan. The options presented in this report include and build upon the Connecticut Blue Plan provisions and recognize that stakeholder advisory roles can include participation in plan preparation and decision-making. For example, the “informal bi-state stakeholder advisory group” option would establish a group to facilitate cross-Sound stakeholder participation following completion of a basic stakeholder outreach and engagement plan. The group would be recognized by the body managing the plan development process and would provide input into that process. In addition to providing input, the group would run and/or contribute to a series of Sound-wide interactive public meetings and workshops to gather additional input and contribute local knowledge in developing plan content. All stakeholders would be welcome. A stakeholder-friendly approach for gathering data and information from interested stakeholders would be used.

Core Team, Science Advisors, and Interagency Coordination: Developing a marine spatial plan requires building a core plan development team,

ensuring access to science advisors and facilitating interagency and inter-organizational coordination. Stakeholders, discussed above, are also critical to the plan development process and can work within the core and/or advisory teams or can contribute input to them. The core team must represent a range of disciplinary backgrounds and skills such as project management, facilitation and conflict resolution. Scientific advisors are also needed to help shape and enhance all science and data-related aspects of the plan. Ongoing coordination with government agencies, programs and initiatives is critical given the comprehensive nature of MSP.

For LIS, the Connecticut Blue Plan prescribes a structure for establishing a core team, science advisory functions and interagency coordination. Options for this category of MSP elements range from establishing a core team to incorporating stakeholder advisory groups, topic-specific technical advisory groups and science advisory groups. For example, one option is to build upon the Connecticut Blue Plan’s Advisory Committee structure, establish equivalent leadership and advisory functions in New York, and establish a Stakeholder Advisory Group and topic-specific technical advisory groups. Technical advisory groups would be formed to provide in-depth assistance on specific LIS MSP topics (e.g. fisheries; habitat; marine transportation; recreation). Technical advisory groups can include scientific and technical experts as well as key stakeholders and can advise the planning staff or function as work groups, helping staff generate content.

E. Plan Elements and Content

A marine spatial plan typically includes several elements and content areas: data collection, standardization, and sharing; biological/ecological characterization and assessment; human use characterization and assessment; potential future uses; decision support tools; and planning and policy options. Different options are offered for each of these sub-elements.

Data collection, standardization, sharing: Data are critical for informing a MSP effort. Collecting and mapping information about ecological, environmental,

and oceanographic conditions, as well as human activities, are important steps in the MSP process. Other key tasks include data standardization, data sharing, and presentation through multiple map products and decision support tools. Steps to develop such inventories and maps include collecting spatially explicit data from sources including government, scientific, and local sources. One strategy for both data management and data sharing is to standardize and aggregate all data into a web-based data portal. The Working Group's Data and Information Team has made progress on these tasks by assembling a LIS MSP baseline data inventory; reviewing data standards; and recommending the adoption of the New York Geographic Information Gateway for LIS MSP.

In addition, this option would involve posting MSP-relevant documents, map products, links, and educational and outreach materials to the site. Other resources including the [Northeast](#) and [Mid-Atlantic](#) data portals would remain important supplementary resources for LIS planners and stakeholders.

Biological/ecological characterization and assessment: A central component of a marine spatial plan is addressing and planning for the natural resources and ecological processes and features of the planning area. This requires collecting appropriate data and information; assessing and analyzing those data to address the goals and objectives of the planning process; and producing data products to inform management. A marine spatial plan typically includes data and/or assessments characterizing biological and ecological distributions of species, habitats and other areas significant for their contribution to ecological integrity (e.g. places that support high levels of species diversity and abundance over time), including areas known for species or biological communities, as well as data characterizing oceanographic and other physical environmental features. Spatial data are necessary to conduct spatial analysis, though additional forms of data and information are necessary to fully characterize and contextualize the spatial data. Fundamentally, a MSP effort must address overarching ecological considerations such as ecosystem-based management and biodiversity.

Once data are collected, they can be aggregated, assessed and analyzed in a variety of ways to support a marine spatial plan. These can range from simple characterization, detailing the state of existing knowledge; to an assessment, which identifies patterns, trends, gaps, and research needs; to the identification of important ecological areas using one of many different methods. To accomplish these tasks, LIS planners can use existing resources and ongoing initiatives such as the NE Regional Planning Body's [marine life characterization, assessment and analysis](#).

The options presented for biological/ecological characterization and assessment range from focused characterization of select key resources to comprehensive identification of important ecological areas, with numerous options in between. For example, the "focused identification of some important ecological areas" incorporates a comprehensive ecological assessment including maps and identification of some important ecological areas in the Sound. Focused analysis could address specific LIS priorities (e.g. protected species or areas with a concentration of ecologically significant characteristics). Identification of important areas could be accomplished using either a scientific- or a policy-driven approach; choice of method would be shaped by available budget and guided by input from stakeholders and scientific advisors.

Human use characterization and assessment: Another fundamental component of a marine spatial plan is addressing and planning for the human uses and associated management issues of the planning area. This requires collecting appropriate data and information; assessing and analyzing those data to address the goals and objectives of the planning process; and producing data products to inform management. Spatial data are necessary to conduct spatial analysis, though additional forms of data and information are necessary to fully characterize and contextualize the spatial data. Integrating human uses into MSP requires a comprehensive approach that considers the historic, cultural and economic aspects of these uses and the connectivity of human uses with adjacent ports, harbors, and coastal communities. Methods for inventorying and mapping

human uses of marine waters are rapidly developing. In general, human uses are characterized by spatial data identifying specific locations, routes, or polygons where infrastructure exists or where human activities take place over a given time period. As with biological/ecological data, human use data can be aggregated, assessed and analyzed in a variety of ways to support marine spatial planning. These can range from simple characterization, detailing the state of existing knowledge; to an assessment, which identifies patterns, trends, gaps, and research needs; to the identification of important human use areas using one of many different methods. To accomplish these tasks, LIS planners can review and utilize existing resources and current initiatives such as the NE Regional Planning Body's [recreational use study](#) and other human use characterizations.

Options presented for human use characterization and assessment range from focused characterization of select human uses to comprehensive identification of human use areas, with numerous options in between for different levels of characterization and assessment. For example, under the option "focused identification of some important human use areas," planners would conduct a comprehensive assessment including maps and identification of some important human use areas in the Sound. Focused analysis can address specific priorities (e.g. recreational boating or shellfishing). Methods for identifying important areas would vary according to the human use being assessed and would be shaped by the available budget, guided by input from stakeholders and scientific advisors.

Potential Future Uses: A key objective of most marine spatial plans is to identify and plan for potential future uses and scenarios. This can include a focused approach, addressing one or a few specific future uses or considerations, and in many cases designating preferred or priority use areas for such future uses. Alternatively it can involve a comprehensive approach to potential future uses shaped by different sets of goals and objectives, and a preferred scenario that the plan is intended to help achieve. LIS future uses that may be considered in a Sound Marine Plan include a wide range of potential development or infrastructure proposals. The options presented for

approaching potential future uses in LIS range from a narrow focus on one future use to comprehensive future use scenarios. For example, under the option "targeted focus on a few key future uses and issues," Connecticut and New York would prioritize a few key issues. The planning process would include identifying potential areas for these uses and/or developing targeted recommendations. The plan may focus data collection and analysis efforts around these issues and assemble new or integrate existing working groups to address these topics.

Decision support tools: Decision support tools refer to the types of data, information and tools that are needed to guide the direction and decisions of the marine spatial planning process. Tools range from static map products that help visualize data, to analytical methods such as human use compatibility analysis, to interactive computer- or web-based tools. Biological/ecological and human use data described above can be analyzed, and data products developed, using these tools. Basic decision support tools include data and information in any form, and static maps visualizing foundational information about key resources and uses, both of which can help inform decision-making. A third type of decision support tool is some form of use compatibility analysis that considers the potential interactions among a range of human activities. A fourth type is an interactive software or web-based tool that enables users to interact with spatial data and generate maps.

The range of options presented for decision support tools considers the form in which the information is presented and analyzed as well as the means by which a user can interact with the information. Choice of approach may be shaped by available capacity and plan authority. The options presented include combinations of different types of decision support tools ranging from simple use of data and information to use of the full suite of tools (data and information; thematic maps; use compatibility analysis; and interactive web-based tools).

Planning and policy options: A marine spatial planning exercise can result in a variety of different planning and policy outcomes. Arguably, the planning and policy elements are the most important

outcomes of a MSP process. Planning and policy outcomes can range from simple management recommendations to the establishment of new decision-making processes to the designation of specific areas for some level of protection or priority use. Considerations include the authority of the implementing government agencies and the structure of the plan itself. Any planning and policy options that emerge from a LIS MSP process must be structured so that they can be implemented by the States of Connecticut and New York pursuant to their relevant authorities. It is also important to note that the feasibility of the planning and policy options presented in the report depend on several factors (e.g. sufficient data and information, time, resources, political support) that may require more than is initially available to the process. As such, at the beginning of a planning process, the options presented in this report may be most helpful to explore and consider vs “choose.”

One planning and policy option for a marine spatial plan is to identify important ecological and/or human use areas for some level of protection or prioritization. Another approach to important ecological and/or human use areas is to manage them as impact avoidance areas, categorized by criteria such as depth, habitat type or other factors. A third method is to identify preferred or priority areas for new uses. A marine spatial plan can also result in planning and policy options designed to improve decision-making, such as the establishment of new advisory committees or working groups.

Planning and policy options employed in a Sound Marine Plan will be fundamentally shaped by the resources available to support a planning process, the types of data and information analyzed through the process, and the choice of decision support tools developed to analyze this information. Options presented range from development of thematic maps and a compatibility assessment to be used by permitting agencies to the identification of important ecological and human use areas and priority use areas.

For example, one option represents a combination of important human use/ecologically important areas and preferred/priority use areas. The important

human use/ecological areas and preferred/priority use areas would be identified through credible and transparent methodologies as discussed in Sections IV.6.3 and IV.6.4 of the Framework and would be vetted through a rigorous stakeholder process.

Human use/ecological areas could be managed through siting and performance standards. Generally, performance standards offer a set of design or implementation requirements that a project proponent must utilize to avoid or minimize impact to the identified area. In Connecticut, with passage of the Blue Plan, different standards could be developed for different types of areas (e.g. important fish habitat, important recreational use areas, or areas afforded different levels of attention based on the sensitivity of the uses or resources within the area). In New York new authority may be needed if performance standards are deemed desirable as they would not be enforceable under existing NYS law. Some uses may not be feasible in some identified areas either because they are identified as such (e.g. pipeline over a recognized shellfish bed or an anchoring site within a navigational channel) or because it is not practical for the proposed use to meet the performance standards.

New uses could be sited in preferred/priority use areas subject to existing, applicable regulatory authorities. Unlike performance standards, which typically add hurdles to discourage development in important areas, priority use areas are generally intended to make it easier to locate the identified use. Other activities could be allowed in these areas provided that they don't affect the priority use. For example, designated cable or pipeline corridors could be identified, ensuring *de facto* protection for human uses and natural resources in other areas.

F. Funding Mechanisms

Funding must be on hand to start a LIS MSP process, support it through the plan completion and approval phase, and facilitate plan implementation activities including monitoring and evaluation. In addition to support for the basic planning process, funding needs may include but are not limited to additional staffing; data management and analysis; facilitation of a

comprehensive stakeholder outreach and engagement process; and any field science that must be conducted in support of planning. The funding needs for a Sound marine planning process will depend on the breadth and ambition of the effort and the extent to which it will include new scientific research. The development of a Sound Marine Plan might be supported through one or a combination of government and non-governmental sources. Existing state resources may represent one source of capacity. Connecticut has considered obtaining funds through state submerged lands leases which may represent another option. Other regional entities with access to federal funds might present options for supporting LIS MSP. Private funding is another potentially critical source of funding and support.

A memo prepared in conjunction with the 2015 Blue Plan proposal estimated that \$1.44 million in funding was needed to support a LIS MSP effort. With reliance on existing and projected capacity including significant in-kind contributions (i.e. without new appropriations of state funding), it was estimated that \$280,000 in new private and/or federal funding was needed to complete the initial planning process. This is only a rough estimate of funding needs for a Sound Marine Plan but illustrates how MSP could be implemented with a modest budget.

G. Implementation, Monitoring and Evaluation

Additional considerations for a marine spatial plan are how the plan would be implemented, monitored and evaluated. Monitoring and evaluation are essential for implementing an adaptive management approach to marine spatial planning and to ensure that goals and objectives are achieved. A marine spatial plan must include specific, measurable objectives to facilitate monitoring and evaluation, and must have a built-in planning interval to facilitate plan update and revision. Few marine spatial plans have been in place long enough for there to be many practical examples of monitoring and evaluation. Options presented for implementing monitoring and evaluation provisions into a Sound Marine Plan vary in level of intensity and investment and may be shaped by available capacity.

Options range from conducting informal ongoing monitoring and updates to implementing a comprehensive performance monitoring and evaluation process. For example, one option is “Conduct a post-planning evaluation and comprehensive five-year reviews/ updates.” In this option, the states of Connecticut and New York could conduct an independent evaluation and comprehensive five-year review/update following plan completion. A requirement for a post-planning evaluation and a five-year update cycle could be written into the plan. Measurable progress toward achieving plan goals and objectives could be evaluated, and stakeholders would be engaged in the evaluation process.

7. Four Scenarios for Implementing Marine Spatial Planning in Long Island Sound

The above MSP elements and options were used to assemble four different summary scenarios, each representing a different complete potential LIS MSP initiative, presented in Table A below. (Element categories are shown in the headings for each of the rows of Table A). These scenarios illustrate how various MSP elements can be assembled to create an overall, complete MSP process and spatial plan, but are not intended as specific recommendations or to limit the set of choices available to LIS spatial planners and managers. The four scenarios follow a continuum of ways a process might unfold. Scenario 1 is the most minimal scenario, and illustrates how LIS planners and managers could implement elements of MSP even without the newly-enacted Connecticut Blue Plan. Scenarios 2 and 3 are both based on implementation of the Connecticut Blue Plan Act and the opportunity it presents to create a bi-state plan with New York. Scenario 2, “Blue Plan Light,” is a smaller-scale MSP scenario, assuming minimal funding, resources and support for MSP. Scenario 3, “Thorough Blue Plan,” is a more developed MSP scenario, assuming full funding and resources to support MSP. Scenario 4 assumes either the Connecticut Blue Plan or another driver helps build strong consensus and support for a fully-integrated and comprehensive bi-state planning process.

To keep the text manageable, the examples used above in this Executive Summary illustrate the elements corresponding to just one scenario, Scenario 3: “The ‘Thorough’ Blue Plan approach.” Further details on these examples, or on scenarios 1, 2, and 4, can be found in the body of this Interim Framework report. Also, for each of the elements in Table A, one option from the table of options discussed in the body of the report is presented. For each of these, Table A references the table in the

body of the report where more detail can be found on the particular option shown. This will also take the reader to the broader set of potential options for a particular element. Finally, an important point is reiterated: that the Scenarios are for illustration only and that elements from different columns or different options from the different tables — or options not covered in this report — could be used to construct a final approach.

Table A. Four Scenarios for Implementing MSP in Long Island Sound

	Scenario 1.	Scenario 2.	Scenario 3.	Scenario 4.
Plan Structure	<p>The Two-State Solution Each state adopts a marine spatial plan or uses its coastal management program for its own state waters in LIS. This assumes no Blue Plan or bi-state coordination. (Table 1 Option 2.)</p>	<p>The “Light” Blue Plan approach Each state either formally adopts or informally uses a separate marine spatial plan or programmatic approach within their own states through their own legal and/or administrative processes, but the plan or approach they adopt or use in each state contains a high level of similarity, consistency and ability to apply Sound-wide and address many key management issues. (Table 1 Option 3). <i>*Assumes Blue Plan but there is minimal funding, resources, and support available.</i></p>	<p>The “Thorough” Blue Plan approach Each state either formally adopts or informally uses a separate marine spatial plan or programmatic approach within their own states through their own legal and/or administrative processes, but the plan or approach they adopt or use in each state contains a high level of similarity, consistency and ability to apply Sound-wide and address many key management issues. (Table 1 Option 3). <i>*Assumes Blue Plan is supported with ample funding and resources.</i></p>	<p>One Comprehensive Plan The States incorporate into their Coastal Management Programs the same bi-state marine spatial plan or if the necessary authorizing legislation was passed in both CT and NY, the same marine spatial plan would be adopted by both States at the same time and developed and implemented by a bi-state body granted authority by both states. Although highly unlikely politically, this option generally represents the ideal of a bi-state approach. (Table 1 Option 4).</p>
Scope and Scale	Minimal area covered (landward boundary set approx. 1,000 ft. offshore). (Table 2, Option 1)	Blue Plan boundaries (Planning: MHW; Management: landward boundary set at the 10-ft. bathymetric contour). (Table 2, Option 2)	Blue Plan boundaries (Planning: MHW; Management: landward boundary set at the 10-ft. bathymetric contour). (Table 2, Option 2)	Study area includes coastal watershed boundaries; planning/management area set at MHW. (Table 2, Option 4)
Vision, Principles, Goals and Objectives	States independently set goals and objectives. (Table 3, Option 1)	Shared vision statement; independent state goals and objectives developed through bi-state coordination. (Table 3, Option 2)	Fully coordinated vision, principles goals and measurable objectives. (Table 3, Option 3)	Fully coordinated vision, principles goals and measurable objectives. (Table 3, Option 3)
Plan Prep: Timeline and Milestones	Moderate (24-30 months). (Table 5, Option 2)	Long (36-48 months). (Table 5, Option 3)	Extended (60+ months). (Table 5, Option 4)	Extended (60+ months). (Table 5, Option 4)
Stakeholder Engagement Structure	Facilitated Through Existing Structures. (Table 6, Option 1)	Blue Plan Advisory Committee and NY equivalent facilitate rigorous engagement. (Table 6, Option 3)	NY and CT facilitate rigorous engagement including informal bi-state stakeholder group. (Table 6, Option 4)	Formal Bi-State Stakeholder Advisory Council and Stakeholder Working Groups. (Table 6, Option 5)

Table A. Four Scenarios for Implementing MSP in Long Island Sound

	Scenario 1.	Scenario 2.	Scenario 3.	Scenario 4.
Team and Advisors	Core Team (state agencies, university and advisors). (Table 7, Option 1)	Core Team (state agencies, university and advisors). (Table 7, Option 1)	Core Team, Stakeholder Advisory Group and topic-specific technical advisory groups. (Table 7, Option 3)	Core Team, Stakeholder Advisory Group and Science Advisory Group. (Table 7, Option 4)
Data Sharing	NY Gateway LIS Focus Area Populated. (Table 8, Option 2)	NY Gateway LIS Focus Area built out in support of LIS MSP. (Table 8, Option 3)	NY Gateway LIS Focus Area built out in support of LIS MSP. (Table 8, Option 3)	NY Gateway LIS Focus Area built out to support all LIS MSP functions including education and stakeholder outreach. (Table 8, Option 4)
Approach to Ecological/ Human Use Characterization	Comprehensive characterization of ecological resources/ human uses. (Table 9, Option 2 and Table 10, Option 2)	Focused identification of important ecological and human use areas. (Table 9, Option 4 and Table 10, Option 4)	Focused identification of important ecological and human use areas. (Table 9, Option 4 and Table 10, Option 4)	Comprehensive identification of important ecological and human use areas. (Table 9, Option 5 and Table 10, Option 5)
Approach to Future Uses	Narrow focus on one future use. (Table 11, Option 1)	Targeted focus on a few key future uses and issues. (Table 11, Option 2)	Targeted focus on a few key future uses and issues. (Table 11, Option 2)	Comprehensive future use scenarios. (Table 11, Option 3)
Use of Decision Support Tools	Data and information and thematic maps. (Table 12, Option 2)	Data and information, thematic maps and limited conflict/ compatibility analysis. (Table 12, Option 3)	Data and information, thematic maps and comprehensive conflict/ compatibility analysis. (Table 12, Option 4)	Data and information, thematic maps, conflict/compatibility analysis and interactive web-based decision support tool. (Table 12, Option 5)
Planning/ Policy Options	Recommended use of Data/Information and Thematic Maps. (Table 13, Option 1)	Important Ecological/ Human Use Areas Managed Through Performance Standards. (Table 13, Option 3)	Combination of Important Ecological/ Human Use Areas Managed Through Performance Standards and Preferred/Priority Use Areas. (Table 13, Option 6)	Combination of Important Human Use/ Ecologically Important Areas and Preferred/ Priority Use Areas plus general prohibition on selected set of new, non-traditional, non-water dependent development. (Table 13, Option 7)
Monitoring and Evaluation	Informal/Ongoing Monitoring and Evaluation. (Table 14, Option 1)	Regular 5-Year Review/ Updates. (Table 14, Option 2)	Post-Plan Evaluation plus Regular 5-Year Review/Updates. (Table 14, Option 3)	Comprehensive Performance Monitoring and Evaluation Process. (Table 14, Option 4)



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I. Overview

A. Introduction

Long Island Sound (LIS) is a significant environmental, economic, cultural and recreational resource for both Connecticut and New York, and the Southern New England region as a whole. With more than nine million people living in the Long Island Sound watershed and more than 20 million people living within 50 miles of its coast, LIS hosts diverse and extensive uses including recreation, commercial and recreational fishing and boating, coastal aquaculture, marine trades and transportation, and more, as well as habitat for fish, shellfish, birds, wildlife and plants. A 1992 study estimated LIS's value to the regional economy from water quality-dependent uses to be \$5.5 billion per year (Altobello, 1992), and this is undoubtedly much higher today.

With its numerous human activities and the proximity of its natural resources to densely populated areas, LIS is poised to benefit from a marine spatial planning (MSP) effort focused on preserving traditional uses, protecting ecosystem services and reducing user conflicts while improving the decision-making process for the ever-increasing number of proposals for new uses. LIS may be one of few sub-regions in the U.S. for which an MSP

initiative would not be driven by the prospect of offshore renewable energy development, but by the need to manage a crossroad of uses such as new energy and telecommunications infrastructure overlaid on a historic network of existing recreation, aquaculture, marine transportation and other uses. The controversial Broadwater Liquefied Natural Gas (LNG) terminal previously proposed in LIS represents a good example of evolving needs and potentially conflicting uses. LIS could also derive particular benefit from the MSP approach due to the unique characteristics that differentiate it from other planning sub-regions: although a single estuarine ecosystem, Long Island Sound is administratively divided between two states and between the Northeast and Mid-Atlantic regional ocean planning initiatives (discussed below).

A primary task on the road toward establishing an MSP process for LIS is to consider how the planning process might work and what a LIS marine spatial plan might include. Although the ultimate answers will be developed through an official process once established, an important enabling step is to conduct research and develop guidance on the MSP options

that may be best to consider for LIS. This research and guidance could be a starting point for the state agencies and others who would be involved in the official process. Thus, the primary purpose of this “Framework Report” is to serve as a potential foundation and guide. Additionally, this document serves as an educational tool, illustrating the potential viability of a LIS MSP process and providing a means of building consensus among the agencies, institutions, and stakeholders who may ultimately be interested or involved in such a process.

B. Marine Spatial Planning

Marine spatial planning refers to a science-based comprehensive planning process that considers human uses, natural resources, and processes in a given coastal or ocean area in order to identify areas that may be appropriate for new uses or new applications of existing uses, resolve conflicts between uses, and achieve a range of other management objectives (Douvere, 2008; C. Ehler & Douvère, 2009). MSP is alternatively referred to by other terms including “coastal and marine spatial planning”; this report utilizes the shorter term MSP, but considers it to be inclusive of coastal uses and issues. MSP may help guide planning for future uses such as energy infrastructure. Additionally MSP may identify areas most suitable for various types of activities, such as shipping, energy facilities, commercial and recreational boating and fishing, aquaculture, and others, in order to reduce conflicts among uses, minimize environmental impacts, and facilitate compatible uses to meet economic, environmental, security, and social objectives. The National Oceanic and Atmospheric Administration (NOAA) has summarized five tangible benefits resulting from marine spatial planning:

1. Increased predictability and certainty for users planning investments in ocean and coastal areas;
2. Improved decision-making across multiple levels of government;

3. Maximized regulatory efficiencies;
4. Access to data for transparent, science-based decision making; and
5. Improved ecosystem health and services by planning human uses in concert with the conservation of important ecological areas (Lubchenco, 2011).

C. About This Report: Developing a Framework for LIS MSP

1. Purpose and Approach

The purpose of this Framework Report is to provide clarity and guidance on how MSP could work for LIS. Recognizing that there is a great deal of written guidance and analysis on MSP and its implementation, this report instead focuses on LIS, addressing MSP options relevant to the unique social, cultural, ecological and political characteristics of the Sound. Additionally, this report presents a range of options or examples to consider rather than a narrow, prescribed set of recommendations. Stakeholder input and participation will be critical in shaping an official process. Although there has been informal stakeholder involvement in this preparatory phase (e.g. through the participation of stakeholders in the Working Group) and in other related Sound-wide management efforts (e.g. the Long Island Sound Study Citizens Advisory Committee), formal stakeholder input has yet to come.¹ This report presents the states, stakeholders, and other interested parties with options that span a reasonable range for MSP in LIS. Its intention is to enable the process, not direct it by making decisions that those interested parties will need to make.

The role of this Interim Report:

This Interim Report integrates comments received to date and provides updated information including that associated with the passage of Public Act 15-66 by the Connecticut General Assembly, commonly referred to as the “Blue Plan.” Produced by the

¹ “Sound Vision: An Action Plan for Long Island Sound,” developed in connection with the Long Island Sound Study, summarizes one example of recent stakeholder engagement in planning for the future of Long Island Sound. See Long Island Sound Study Citizens Advisory Committee (2011).

Interim Framework Report Team, a subcommittee of the CT-NY Bi-State Marine Spatial Planning Working Group (Working Group), the document can be used by interested parties while the Final Report is reviewed, edited, and potentially endorsed by the Working Group. The Interim Framework Team is submitting this draft to the Working Group purely as a discussion and reference document and is not seeking endorsement of its content.

Passage of Public Act 15-66, the “Blue Plan”

The Blue Plan legislation passed in Connecticut in 2015 launches an official MSP process for the Sound. It is discussed in greater detail later in report. This document and the options it presents reflect passage of the Blue Plan, however, the document, with most of it being drafted prior to passage of the Blue Plan, also presents other options that may be less likely or relevant given passage of recent the legislation. This draft nevertheless includes much of the original content to provide a broader view and context of MSP for LIS.

2. Audience

The intended audience for this Framework Report includes New York and Connecticut State agencies, the Blue Plan Advisory Committee, any LIS users and user groups, federal agencies, tribal governments and interests, local communities and agencies, interested non-governmental organizations (NGOs), academic institutions, and any other stakeholders or parties with an interest in LIS. Federal agencies that may be most interested include those who play a role in Long Island Sound management, conservation, planning, research and project permitting, including but not limited to the Environmental Protection Agency (EPA), Federal Energy Regulatory Commission (FERC), National Oceanic and Atmospheric Administration (NOAA), U.S. Army Corps of Engineers (USACE), U.S. Coast Guard (USCG), U.S. Dept. of Transportation (USDOT), U.S. Geological Survey (USGS), U.S. Fish and Wildlife Service (USFWS), and U.S. Navy (USN).

3. Content and Use of This Report

This report was developed drawing upon existing MSP guidance and theory as well as lessons learned

from MSP practice in the U.S. and abroad. There is a broad and rapidly growing technical and academic body of literature on MSP (e.g. Collie et al., 2013; Douvère, 2008; C. N. Ehler & Douvère, 2007; Foley et al., 2010; Halpern et al., 2012). This report draws upon some of this expertise, focusing in particular on widely-recognized MSP guidance documents published by the U.N. Educational, Scientific and Cultural Organization (UNESCO) Marine Spatial Planning Initiative (C. Ehler & Douvère, 2009; C. N. Ehler, 2014) and others (Beck, Ferdana, Kachmar, Morrison, & Taylor, 2009; Gold et al., 2011; McCann, Schuman, Fugate, Kennedy, & Young, 2013; McCann, Smythe, Fugate, Mulvaney, & Turek, 2014).

a. MSP Assessment Document

Additionally, this Framework report draws upon outputs, outcomes, and lessons learned to date from MSP practice. This information was gathered through an assessment (the MSP Assessment Document) conducted by the Framework Team (see below), of seven completed or ongoing MSP and related initiatives worldwide: the Massachusetts Ocean Management Plan (OMP); the Rhode Island Ocean Special Area Management Plan (Ocean SAMP); the Washington State Marine Spatial Planning initiative (Washington MSP); the Oregon Territorial Sea Plan amendment process (OR TSP); the New York Atlantic Ocean Study and the New York Ocean Action Plan (New York AOS); the California Marine Life Protection Act Initiative (MLPA); the Great Barrier Reef Marine Park Zoning Plan (GBR); the Baltic Sea Plan Initiative (BaltSeaPlan); and the UK Marine Planning Framework and initiatives (UK Marine Planning). See Appendix I for the complete MSP Assessment Document; MSP initiatives included in the assessment are referenced by name throughout this document.

These sources of information were used to examine the multiple elements of MSP, and to identify for each element a range of options for how the element could be approached in LIS. This represents the bulk of the report. These elements (e.g. “stakeholder engagement”) serve as the building blocks for MSP — collectively they are what is needed to create a complete MSP process and plan. This Framework Report provides basic descriptions of each element

and offers a range of options to consider for LIS. The continuum that each “range of options” covers includes consideration of resource availability, political feasibility, geographic scale, complexity, ease of implementation, and other factors. An especially important MSP element discussed in this report is the range of planning and policy options that could shape implementation of a Sound Marine Plan (Section IV.E.7 “Planning and Policy Options”). These include but are not limited to use of thematic maps or the results of a conflict/compatibility assessment, as well as the potential identification of important human use and ecological areas or priority use areas.

The MSP elements and range of options were used to develop four distinct scenarios for LIS MSP, the primary output of the Framework Report. Each scenario illustrates a complete approach, including all MSP elements, for how MSP could work in and for LIS. Each scenario’s MSP elements illustrate the planning process as well as the plan itself (both form and function). These scenarios, as illustrations, allow the reader to consider a range of choices and assess which may be best for an official MSP process. These scenarios can be used in multiple ways, including: 1) offering a scenario that could be chosen to shape an official process, 2) providing the foundation to adjust or amend a scenario to form a new, customized version, 3) demonstrating how the elements of a MSP process can be assembled together such that a new scenario, different than those presented here, can be formed. These four scenarios are illustrated in one final matrix (see Section V).

Last, this report refers to a “LIS MSP process,” initiative, or effort, as well as a “Sound Marine Plan.” Any reference to a LIS MSP process, initiative or effort refers to the planning process more broadly, including means of bi-state coordination and stakeholder engagement as well as the plan that would be developed through such a process. The term “Sound Marine Plan” is offered as an informal title for the plan itself that might be developed through such a process. These terms do not suggest any specific structure for the planning process or the form and function of the plan.

4. Report Authors

This report was developed by the Interim Framework Team, a sub-committee of the ad hoc Connecticut-New York Bi-State Marine Spatial Planning Working Group (Working Group). The informal Working Group was voluntarily formed in 2012 to assist in initiating an MSP process for LIS that would recognize and engage the state agencies of New York and Connecticut as the lead parties to officially launch and implement MSP. The Working Group is composed of state and federal agencies, non-governmental organizations, the Connecticut and New York Sea Grant programs, regional ocean entities and user/trade organizations. The role of the Working Group, its history and products are described more fully in the section below. See page vi above for a listing of the Interim Framework Team and Appendix II of this report for a list of Working Group members.

D. The Case for LIS MSP

Coastal and marine spatial plans have been produced for the states of Rhode Island, Massachusetts, and Oregon, largely in response to the prospect of offshore wind energy development, which has served as a driver for many MSP initiatives. Although the 2001 proposal for the Broadwater Liquefied Natural Gas (LNG) terminal for LIS is often referenced to demonstrate why planning makes sense, as of this report, there is no single prominent issue, problem or proposed development in LIS that is motivating citizens, users, government agencies or other interests to pursue LIS MSP. Instead there are multiple reasons which, when considered together, make a compelling case for LIS MSP.

1. Basic Need

It is widely acknowledged that existing human uses of Long Island Sound are extensive and that LIS also contains important ecological habitats and services. Historical battles such as those over the proposed Broadwater LNG terminal and the proposed Islander East and Iroquois pipelines have underscored the need for a better approach to management and decision-making regarding new uses of LIS. In addition, demand for new uses of the Sound is

increasing. Examples include but are not limited to new energy and telecommunications infrastructure, an underground cross-Sound railroad tunnel to carry Northeast Corridor trains around New York City, new forms of aquaculture, changes in ports and marine transportation, increased interest in sand and gravel mining, and continued concerns regarding dredging. Connecticut DEEP staff note that in recent years the agency has been contacted about a variety of new activities that could be of concern to traditional users of the Sound; these include barges moored offshore as ferry terminals or floating restaurants; a private confined aquatic disposal (CAD) cell for contaminated dredged materials; underwater turbines and transmission cables for generating electricity; and large-scale seaweed farms. The need is clear for an intelligent and efficient vehicle for considering and guiding new uses so that they are compatible with traditional uses and environmental resources and so that conflicts can be minimized.

In short, the authors of this report would assert that a primary purpose for marine spatial planning in Long Island Sound is to be much better prepared than we are today to make effective and efficient decisions in the public interest about if, where and how to site new major developments and uses taking in consideration existing uses and users. These “better decisions” could also apply to new applications or new locations for the types of uses that currently exist in the Sound. Potential new uses or new applications could be in the form of an industrial or energy facility, a new form of aquaculture or transportation or something in the future we don’t anticipate today. MSP would be filling an important gap — the lack of a forward looking, publicly — supported, planning and decision-making process for the Sound as a whole that assures new uses will be compatible with its existing public and environmental benefits.

2. Larger Public Good at Stake

Long Island Sound is a public trust resource owned by the people of New York and Connecticut. Currently, the States of Connecticut and New York do not have either the authority or completed marine spatial plans that together could help to comprehensively guide multiple future uses of the Sound as a whole.

By default, project applicants set the agenda, and state agencies can only engage and respond through the regulatory process. This means that decisions about the use of LIS are often made in a reactive and uncoordinated manner. This approach does not allow the states to be proactive in securing the public interest or the best future for the social, environmental and economic benefits provided by the Sound. Marine spatial planning can provide a better foundation for managing the entire Sound in the face of future challenges and use conflicts. Long Island Sound constituents have a choice: we can manage the Sound through the existing, uncoordinated, case-by-case approach, or through a planned utilization strategy developed with extensive stakeholder input.

3. Greater Protection for Traditional Uses and Natural Resources

A LIS MSP initiative could provide an opportunity to better understand and recognize traditional uses such as fishing, aquaculture, boating, and other existing commercial activities as well as the Sound’s natural resources. Depending on how the planning is structured and if appropriate legal authority is put in place, there could also be an increased level of protection for places important to these traditional uses and natural resources.

4. Conflict Avoidance

A LIS MSP process and plan would help avoid use conflicts among those who use the Sound. Communities, interest groups, government agencies and project applicants often spend substantial time and resources in fighting battles such as the one over the proposed Broadwater LNG terminal. MSP can often serve as a vehicle for reaching understanding and consensus among varied users of LIS. In addition, once completed, a Sound Marine Plan could be consulted by potential project applicants, prior to applying for a permit for information that is helpful and informative for use during the environmental review process (NEPA or SEQRA). In this sense a Sound Marine Plan could provide project proponents greater predictability about both the permitting process and areas of potential conflict with users and interest groups.

5. Close the Gap in Existing Management Plans and Initiatives

Whereas there are other existing Long Island Sound and regional plans and initiatives, none of these meet the need for a comprehensive, coordinated spatial management plan for the Sound. Important LIS initiatives include but are not limited to the Long Island Sound Study, the Long Island Sound Dredged Material Management Plan, and the Long Island Sound Seafloor Mapping Program. The Long Island Sound Study (LISS), led by the States of Connecticut and New York, in partnership with the U.S. Environmental Protection Agency, provides important stakeholder input, research, and management recommendations for the Sound, but is neither designed nor authorized to prepare or implement a spatial marine plan — which is what is needed. The Long Island Sound Dredged Material Management Plan, led by the U.S. Army Corps of Engineers, primarily addresses dredging and dredged material disposal and the issue of reducing and/or eliminating open water disposal in LIS. The Long Island Sound Seafloor Mapping Program is gathering important data and information about the Sound, but is not a planning or management initiative. Additionally, large-scale regional planning efforts such as those of the Northeast Regional Planning Body and Mid-Atlantic Regional Planning Body, while beneficial to a LIS planning effort, are broad in scope and don't have the necessary implementing authority, and therefore do not meet the need for a state-led, Long Island Sound-specific spatial management plan. Unlike these other initiatives, the LIS MSP process would be led by the states of New York and Connecticut who have the potential to use or acquire the necessary authority both to prepare and implement a plan. The states will also be able to assure adequate representation of New York and Connecticut residents, businesses, and other interests.

6. Bi-State Cooperation

A LIS MSP process may provide an opportunity for the States of Connecticut and New York to increase their level of collective understanding of the Sound and their cooperation in its management and protection.

7. Federal Consistency

A Sound Marine Plan could be incorporated into Connecticut's and New York's federally-approved coastal zone management programs pursuant to the federal Coastal Zone Management Act. As neighboring states have done with their marine spatial plans, officially adopted elements of a Sound Marine Plan could be used to make better decisions within the states' existing federal consistency authority over federal agency actions such as project permits to assure federal actions are consistent with the Plan. (Further clarification of the potential opportunities, mechanisms, and benefits associated with federal consistency authority is to be addressed in the Sound Marine Planning Framework Report (Final Report).

8. The Timing is Now

The timing is now for a Long Island Sound MSP initiative. There are five compelling reasons for this. First, there is currently considerable attention and resources being invested in MSP in the Northeast and Mid-Atlantic regions (see Section II). A LIS MSP process could benefit from these regional initiatives in multiple ways, especially while they are active including but not limited to use of their data and optimizing policy options in concert with the regional efforts.

Second, with nearby states such as Rhode Island and Massachusetts having completed marine spatial plans, the Sound may find itself left behind in realizing the benefits of such planning and could conceivably be targeted by undesirable facilities that are barred from other states' waters. Third, it is preferable to undertake a LIS MSP process with interested stakeholders during a period of relative calm, rather than to wait for the next controversial development or crisis, which could easily polarize those same sets of stakeholders. Planning during the current period of calm would allow for a reasoned and consensus-based planning process that may otherwise be much harder to achieve. Fourth, the informal Connecticut-New York Bi-State Marine Spatial Planning Working Group continues to make significant voluntary contributions of expertise and

capacity, which could help inform a LIS MSP process. Fifth and potentially most significantly, passage of the Blue Plan legislation in Connecticut means the timing is now — there will be a LIS MSP process. As a consequence, the Blue Plan will likely serve as a potential driver of interest in LIS MSP if for no other reason than it will actually be happening and potentially affect the interests of stakeholders.

9. LIS Marine Spatial Planning is Widely Endorsed

Many formal Long Island Sound and regional plans, particularly those associated with the LISS, call for marine spatial planning. For example, the *Long Island Sound Study Action Agenda: 2011-2013*, includes a priority action to “Support development of Coastal Marine Spatial Planning that balances human use needs with ecosystem protection and is integrated with regional marine spatial plans” (Long Island Sound Study, 2011).² Additionally *The Sound Vision: An Action Plan for Long Island Sound 2011-2020* calls for MSP in multiple supporting actions identified

under the action item “Develop effective planning for multiple uses” (Long Island Sound Study Citizens Advisory Committee, 2011).³ Moreover, the updated *Long Island Sound Study Comprehensive Conservation and Management Plan* (Long Island Sound Study, 2015) (see Section II.B) calls for MSP as part of its “Sound Science and Management” theme (Long Island Sound Study, 2014b). Additionally, the 2015 New York Ocean Action Plan discusses the MSP approach and identifies the need for integrated planning and management of offshore marine resources (NY Department of Environmental Conservation and NY Department of State, 2015). Finally, results of a 2013 survey of approximately 400 LIS respondents suggest a strong consensus in support of LIS MSP, as well as strong support for a bi-state planning process. This consensus is notable given the broad cross-section of LIS interests sampled in these results; respondents were categorized as managers, scientist, active recreation, passive recreation, businesses/economic interests, community members, government, and NGOs (O’Connell, 2013).

² Outcome 3-2, Priority 6, in the “Sound Communities” section.

³ This highly-publicized document was developed collaboratively by the LISS Citizens Advisory Committee and other partners. MSP is referenced under Goal 3, “Build LIS Communities That Work,” Action Step 4.



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II. Long Island Sound Governance Context: Existing Institutions and Authorities

A. State Agency Authorities and Long Island Sound

An official Long Island Sound MSP process could be led and developed by the states of Connecticut and New York. Unlike other bays or estuaries, the entirety of LIS consists of state-owned submerged lands and waters that are held in trust for the public by the states of Connecticut and New York. As a result, Connecticut and New York may exercise sovereign and proprietary authority as owners, as well as regulatory authority as governments over activities within LIS. Thus, state management of its own public property offers an additional level of stewardship that cannot readily be overruled or pre-empted by federal agencies.

In Connecticut, LIS activities are managed in part through the state's coastal management program, which is administered by the Connecticut Department of Energy and Environmental Protection's (Connecticut DEEP) Office of Long Island Sound Programs. The Connecticut Coastal Management Act (1980) provides the basis for Connecticut's coastal management program under the federal Coastal

Zone Management Act of 1972 (16 U.S.C. §1451 *et. seq.*). Connecticut exercises its coastal management authority through statutory policies rather than regulations or published policies, and the enforceable policies contained in the Connecticut Coastal Management Act are the basis for Connecticut's federal consistency authority under the CZMA (see discussion below). Whereas Connecticut administers a shellfish bed leasing program, it does not have a comprehensive submerged lands leasing program like that administered by New York (see discussion below). It is important to note that neither DEEP nor any other Connecticut agency or entity has the legal authority to systematically exercise public trust authority in LIS outside the context of case-by-case regulation; Connecticut employs regulatory but not proprietary authority over the Sound. As such, the Connecticut General Assembly passed "Blue Plan" legislation to support MSP in Long Island Sound; see Section II.E below for further discussion.

New York's coastal management program is administered through the New York Department of State through the Office of Planning and Development (New York DOS). New York exercises its coastal management authority through a set of enforceable statewide coastal policies; NYS also has a regional LIS Coastal Management Program with 13 enforceable coastal policies and interstate consistency authority through the CZMA to review federal agencies activities in Connecticut state waters. The 13 enforceable coastal policies in the LIS CMP are used in New York's federal consistency authority under the CZMA. In New York, the Department of Environmental Conservation (New York DEC) also plays a key role in the management of LIS, separate from DOS's CZMA federal consistency review authority, to issue permits in accordance with state laws for protection of natural resources and water quality in New York's coastal area. DOS works cooperatively with DEC on a range of issues, especially concerning water quality, fisheries and wildlife issues, coastal erosion, and adaptation and resilience to climate change. Additionally, New York's local governments have home rule powers of zoning, comprehensive planning, and adopting local waterfront revitalization plans (including harbor management plans for adjacent coastal waters). New York DOS is authorized to engage in MSP in Long Island Sound in accordance with the New York Waterfront Revitalization of Coastal Areas and Inland Waterways Act (New York Executive Law Article 42 §910-923).

The federal consistency provision of the federal CZMA (section 307) means that federal actions which may have "reasonably foreseeable effects" on a resource or use of the state's coastal zone must be consistent with the enforceable policies of the state's federally approved coastal management program (NOAA Office of Coastal Management, n.d.). A Sound Marine Plan, if incorporated into each state's federally-approved coastal management program, could add new and/or different data, information and policies to each state's existing federal consistency authority in the Sound. For example, a Sound Marine Plan could give Connecticut DEEP and New York DOS a more robust vehicle to utilize existing federal consistency authority through which to evaluate

future LNG and other marine energy proposals licensed by the Federal Energy Regulatory Commission (FERC).

B. Inter-Agency and Inter-Jurisdictional Cooperation and Coordination

Connecticut DEEP, New York DOS and New York DEC cooperate and coordinate with each other and with an expansive list of other federal, state, and municipal agencies and other entities, crossing jurisdictions and all levels of government. Connecticut DEEP and New York DOS's cooperation with NOAA to implement the federal CZMA, discussed above, is one of many such examples. Connecticut's coastal management program is integrated within Connecticut DEEP which also handles water quality, coastal development, and tidal wetlands permitting as well as fisheries management and energy planning. Connecticut DEEP also coordinates with other state agencies including the Connecticut Department of Agriculture's Bureau of Aquaculture, the Connecticut Siting Council (which handles energy and telecommunications facility siting), the Connecticut Department of Transportation, and the Connecticut Port Authority for maritime commerce.

One example of interagency cooperation relevant to MSP is New York State's *New York Ocean Action Plan: 2015-2025* (NY Department of Environmental Conservation and NY Department of State, 2015). This plan was developed by the New York Department of Environmental Conservation and New York Department of State. The *Ocean Action Plan* discusses the need for integrated planning and management of New York's offshore marine resources, demonstrating the New York agencies' collaboration and commitment to offshore planning.

The Long Island Sound Study is a particularly relevant example of Sound-wide inter-jurisdictional cooperation, especially within the context of LIS MSP. The LISS is one of the nation's 28 National Estuary Programs and a bi-state partnership involving the federal Environmental Protection Agency (EPA), the states of New York and Connecticut, and other government agencies, user groups, non-governmental

organizations and stakeholders. Program goals include improving water quality, preserving ecosystem integrity, and realizing the social and economic benefits of using the Sound while considering associated costs. The LISS Comprehensive Conservation and Management Plan (CCMP) was originally completed in 1994 and underwent a comprehensive review and update in 2013-2014 (Long Island Sound Study, 2014c). As noted above, MSP is identified numerous times in the 2015 LIS CCMP within the context of CCMP strategies and implementation actions as a means to increase collaboration, facilitate management of multiple human uses of the Sound compatible with the conservation of natural resources and habitats, and to improve ecosystem protection (Long Island Sound Study, 2015).

The LISS provides numerous resources and structures that may be uniquely relevant to a future bi-state LIS MSP initiative. These include the bi-state Management Committee, Citizens Advisory Committee, and the Science and Technical Advisory Committee. The Management Committee comprises representatives of relevant federal, regional and state agencies and entities, the Connecticut and New York Sea Grant programs, and representatives from the Citizens Advisory Committee; the Management Committee develops goals and plans and oversees projects. The Citizens Advisory Committee is a volunteer stakeholder body that provides advice to the Management Committee on implementing the CCMP; members represent municipal and county governments, non-governmental organizations, user groups, and private firms. The Science and Technical Advisory Committee comprises a group of science and technical experts from universities, government and the private sector who provide the Management Committee direction and advice on science and technical issues. For further information see Long Island Sound Study (2014a).

As an existing bi-state entity that unites New York and Connecticut's coastal and environmental programs, as well as federal agencies, the LISS could provide an institutional venue for coordinating MSP functions under different scenarios. In particular, the

LISS CAC could potentially function as a stakeholder advisory group for MSP.

LIS coastal municipalities are another important part of the MSP governance context. A Sound Marine Plan would presumably take into consideration and be informed by existing community plans in the marine and coastal areas of LIS. Almost all of these existing plans have a narrow focus (economic development, transportation, energy, watershed water quality, hazard mitigation plan, comprehensive plan for zoning and development, etc.), but key issues could be drawn from these existing documents.

In envisioning various forms of bi-state cooperation, a LIS MSP initiative does not require that both states agree, or must necessarily agree, on every aspect of managing uses in the Sound. Rather, bi-state cooperation to facilitate MSP suggests that the states agree to work together on issues of ecosystem-wide or mutual concern. Although one state does not have authority to dictate or control regulatory decisions in another state, and a LIS MSP process would not change that, it is important to note that each state already has interstate consistency review authority over federal permits or activities in each other state's waters in LIS.

C. Coordination with Existing Plans and Initiatives

A Sound Marine Plan would both fill a gap in, and coordinate with, existing Long Island Sound and regional plans and initiatives. A Sound Marine Plan would draw upon and be developed in close coordination with existing Long Island Sound and regional planning efforts and studies including but not limited to the Long Island Sound Study, the Long Island Sound Dredged Material Management Plan, the Long Island Sound Seafloor Mapping Study, and the regional ocean plans being produced by the Northeast Regional Planning Body and the Mid-Atlantic Regional Planning Body. The latter two are further discussed in Section II.D below. The stakeholder participation, data, information, and management recommendations developed through each of these initiatives would represent important

inputs into a Sound Marine Plan. A Sound Marine Plan could seek to coordinate with and integrate these existing plans and initiatives, identify and fill information gaps, and develop a comprehensive enforceable spatial management plan.

D. Other State and Regional MSP Initiatives

1. The Rhode Island Ocean Special Area Management Plan

The Rhode Island Ocean Special Area Management Plan (Ocean SAMP) is Rhode Island's marine spatial plan for both offshore state and federal waters, including those directly adjacent to Long Island Sound. The Ocean SAMP was completed and approved by the Rhode Island Coastal Resources Management Council (CRMC) in 2010 and received federal approval from NOAA as part of its coastal zone management program in 2011. The Ocean SAMP was initiated in response to the prospect of offshore wind development and was developed pursuant to Rhode Island's existing coastal zone management authorities by the CRMC in partnership with the University of Rhode Island. The Ocean SAMP involved an extensive two-year stakeholder process, the evaluation of existing data, and gathering new data. It resulted in the establishment of new enforceable policies for Rhode Island waters designed to protect important habitats and traditional ocean uses such as fishing, shipping and recreation. It also included the designation of a Renewable Energy Zone as well as several Areas of Particular Concern and Areas Designated for Preservation. For further information see McCann et al. (2013) and Rhode Island Coastal Resources Management Council (2010).

Other noteworthy aspects of the Ocean SAMP include agreements with adjacent states and federal consistency authority in federal waters. During the development of the Ocean SAMP, a Memorandum of Understanding was developed with the Commonwealth of Massachusetts, establishing the Area of Mutual Interest (AMI) in federal waters adjacent Massachusetts and Rhode Island state

waters. Through the AMI, Rhode Island and Massachusetts are coordinating management and planning for offshore wind. Additionally, the Ocean SAMP process resulted in a Geographic Location Description (GLD) for federal waters. The GLD was developed pursuant to the federal CZMA to give Rhode Island broad federal consistency authority over activities in the federal waters included in the SAMP planning area. For further information see McCann et al. (2013). The Ocean SAMP was evaluated in 2013 (see Mulvaney, 2013) and is undergoing its first five-year update in 2015.

2. The Massachusetts Ocean Plan

In December 2009, the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) issued the Massachusetts Ocean Management Plan (Massachusetts OMP) (MA Executive Office of Energy and Environmental Affairs, 2009). The plan was mandated by a state law, the Massachusetts Oceans Act of 2008 ("An Act Relative to Oceans," 2008), which provided general objectives and defined the scope of the plan. The planning process was led by the Massachusetts Office of Coastal Zone Management in collaboration with the state's Ocean Advisory Commission and Ocean Science Advisory Council. The resultant plan provides protections for important marine habitat and marine uses and sets standards for new ocean-based development. These protections included the designation of a prohibited area, renewable energy areas, and multi-use areas. They also include the designation of special, sensitive and unique (SSU) areas protecting key resources and habitats; new activities in these areas would be subject to siting and performance standards. The plan's management framework is implemented within Massachusetts' existing regulatory structure, with the relevant agencies coordinating review and approval of proposed ocean projects. Like the Ocean SAMP, Massachusetts' MSP effort was driven by the prospect of offshore wind development as well as other potentially conflicting uses and emerging management issues.

In early 2013, Massachusetts initiated a review and update of the 2009 Massachusetts OMP. During the review phase, a comprehensive assessment was

conducted, which reported progress toward achieving the requirements and commitments established by the Oceans Act and the original plan (MA Executive Office of Energy and Environmental Affairs, 2014). The plan update phase began in June 2013 and six technical work groups were convened to review scientific data and information and identify and characterize important trends in ocean resources and uses. A draft revised plan was released in September 2014 for a 60-day public comment period, and the final amended plan was released in January 2015 (Massachusetts Executive Office of Energy and Environmental Affairs, 2015).

3. The Northeast Regional Planning Body

The Northeast Regional Planning Body (Northeast RPB) is one of several regional planning bodies established pursuant to the 2010 National Ocean Policy (National Ocean Council, 2013; White House, 2010), which gives momentum to regional and sub-regional ocean planning efforts. The Northeast RPB is responsible for developing an ocean plan for Northeast ocean waters in 2016; the LIS subregional effort's timing can benefit from available data, information, and engagement happening at the regional scale. As directed by the National Ocean Policy, the RPB membership includes federal, tribal, state, and New England Fishery Management Council representatives. The Governors of each New England state nominated two agency representatives to the Northeast RPB, with two ex-officio members representing Canada and New York State. CT DEEP staff are involved in the regional effort and bring knowledge and experience from the regional effort to MSP efforts being made the Sound. The composition of the RPB in part reflects the geography of the planning area, which includes state and federal marine waters of the New England states (e.g., from Long Island Sound, north around Cape Cod and including the United States and state waters of the Gulf of Maine.)

The Northeast RPB was established in 2012 and expects to complete existing projects, which together will comprise a regional ocean plan, in 2016. Its work is guided by three overarching goals: 1) healthy ocean and coastal ecosystems, 2) effective decision-making,

and 3) compatibility among past, current, and future ocean uses (Northeast Regional Planning Body, 2014c). Ongoing projects include substantial data collection and mapping efforts, including a marine life characterization and baseline economic assessment. The Northeast Regional Ocean Council, a regional ocean partnership, has provided significant staffing and technical support to the Northeast RPB on the regional ocean planning process and has been a resource for the LIS effort as well.

Importantly, the Northeast RPB must work within existing regulatory authorities and is developing options to improve decision making under existing authorities through the use of data and other baseline information, interagency coordination, and enhanced public and stakeholder participation. For more information, see Northeast Regional Planning Body ([http://neooceanplanning.org/.](http://neooceanplanning.org/))

Long Island Sound is included within the scope of the Northeast RPB's work. Several ongoing Northeast RPB projects, such as the marine recreational use study, marine life characterization and baseline economic assessment, include LIS in the scope of data collection and resource characterization and will result in products that will benefit ongoing LIS MSP efforts. Staff from New York and Connecticut state agencies and other organizations are included in working groups that are helping provide input and guidance on methodology and draft products related to these projects. Ultimately, a Northeast Ocean Plan will involve engagement strategies and contacts, new data products, and recommendations to improve decision-making, all of which can support a LIS MSP effort. Moreover, regional ocean planning is by necessity taking place at too coarse of a scale to address many of the management considerations relevant to the Sound.

4. The Mid-Atlantic Regional Planning Body

Similar to the Northeast, regional ocean planning in the Mid-Atlantic is led by the Mid-Atlantic Regional Planning Body (Mid-Atlantic RPB). The Mid-Atlantic RPB is composed of federal, state (from New York to Virginia) and tribal governments and the Mid-Atlantic Fisheries Management Council. The Mid-Atlantic

RPB is primarily focused on the ocean, but bays and estuaries, including Long Island Sound, are also included; this came about as a result of public input on a draft Mid-Atlantic planning framework. The Mid-Atlantic RPB was established in 2013 and is working toward the development of a Regional Ocean Action Plan that will be supported by a Regional Ocean Assessment. Its work is shaped by two goals: 1) Promote ocean ecosystem health, functionality, and integrity through conservation, protection, enhancement, and restoration; and 2) Plan and provide for existing and emerging ocean uses in a sustainable manner that minimizes conflicts, improves effectiveness and regulatory predictability, and supports economic growth (Mid-Atlantic Regional Planning Body, 2014a). As in the Northeast, the Mid-Atlantic Regional Council on the Oceans, a regional ocean partnership, is a key partner in Mid-Atlantic regional ocean planning. Additionally, like in the Northeast, the Mid-Atlantic RPB must work within existing regulatory authorities to accomplish its work. For more information see generally Mid-Atlantic Regional Planning Body (<http://www.boem.gov/Mid-Atlantic-Regional-Planning-Body/>.)

While the Mid-Atlantic RPB is also considering LIS, its work cannot replace a proposed bi-state LIS MSP initiative. The Mid-Atlantic RPB is focusing on offshore waters, leaving bays and estuaries for later; moreover, like the Northeast RPB, its planning work is taking place at a scale appropriate for the large Mid-Atlantic region but not for Long Island Sound.

E. Description of Connecticut Blue Plan Legislation

The Connecticut Blue Plan legislation (Public Act 15-66) is currently shaping when and how Connecticut undertakes an official LIS MSP process. Initially introduced in the 2014 Connecticut General Assembly as “An Act Concerning a Long Island Sound Resource and Use Inventory and a Long Island Sound Blue Plan” (or “the Blue Plan”), the bill was re-introduced in the 2015 legislative session sponsored by Governor Malloy and the Environment Committee. It passed unanimously during the 2015 legislative

session and was signed into law by Governor Malloy. Public Act 15-66 is included in Appendix III.

The bill grew out of a realization that in order for a LIS marine spatial plan to have the force of law in Connecticut, legislation had to be passed to grant the Connecticut DEEP the authority to use such a plan in considering applications for various permitted activities in Long Island Sound waters or in other ways. By contrast, the State of New York has authority to engage in marine spatial planning in Long Island Sound as noted above in Section II.A, (however this does not include the authority to enforce a marine spatial plan). Prior to the Blue Plan, Connecticut DEEP could only react to the details of specific proposals as they were submitted; it could not base regulatory decisions on a marine spatial plan or Sound-wide considerations. This lack of authority was both an issue for evaluating applications and issuing permits, as well as a major disincentive for Connecticut DEEP to spend limited capacity on developing a Sound Marine Plan of which they could make no official use. Additionally, for Connecticut to be able to participate on a practical or useful basis with New York in planning for the Sound, Connecticut needed this new legislation.

In working with legislators to develop a bill that would enable Connecticut DEEP to use a Sound Marine Plan, it became clear that the Connecticut General Assembly would be very unlikely to grant such authority unless the bill specified who would develop a plan and how, and gave the legislature the chance to approve the final plan. The legislative proposal therefore included the establishment of an advisory committee, with representatives of various interest groups being appointed by the Governor and legislative leaders, with a charge to develop the plan. See Section IV.D.4 for a more detailed description of how the Blue Plan addresses stakeholder engagement.

Under the Act, Connecticut DEEP will chair and convene the committee, and the University of Connecticut will convene a science subcommittee. The Act specifies various types of resources and uses that would be inventoried, various objectives and principles on which the Blue Plan should be based, and timelines for various stages in the completion of

the plan. Principles identified in the Act include consultation with the existing Bi-State Working Group (some Working Group members will likely be appointed to the committee) and maximum coordination with counterparts in New York, without making either state legally bound by the other's actions or inactions pertaining to the plan. Although it is Connecticut legislation, through its provisions it recognizes the importance of managing the Sound as one whole system, involving New York State in the process to the extent possible, the goal of a bi-state plan, and provides for basic elements to achieve that goal (see Section IV.A.3 for further discussion). It is also noted that the products of the Bi-State Working Group can contribute, potentially significantly, to the process and outcome of the Blue Plan process.

The Act specifies that upon approval by the legislature of a final plan, the DEEP, the Connecticut Department of Agriculture/ Bureau of Aquaculture (DA/BA), and the Connecticut Siting Council would consider the plan in deciding whether to approve various types of permitted activities pursuant to

sections 16-50k (Connecticut Siting Council approval of certificate of need for energy/telecommunications facilities), 22-11h (DA/BA permits for aquaculture operations), 22-11i (DA/BA licensing of aquaculture producers), 22-11j (DA/BA licensing of seaweed cultivation), 22a-6k (DEEP emergency authorizations for in-water structures, discharges and other considerations), 22a-359 and 22a-361 (DEEP structures, dredging and fill permits), 22a-363b (DEEP certificate of permission), 22a-363d (DEEP emergency authorization for coastal structures), 22a-430 (DEEP water discharge permits), 25-157b (DEEP and Connecticut Siting Council for cross-sound cables and pipelines), 26-194 (DA/BA shellfish bed leasing) and 26-257a (local shellfish commission leasing) of the Connecticut General Statutes and Section 401 of the Federal Water Pollution Control Act. DEEP would also seek necessary federal approval to incorporate the plan as part of the state's coastal management program under the federal CZMA. This could ultimately enhance the State's use of existing federal consistency authority in the Sound (see Section II.A above for further discussion).



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III. Connecticut-New York Bi-State Marine Spatial Planning Working Group

A. Overview

Since August of 2012, an informal, unofficial working group has been meeting regularly with the goal of creating the enabling conditions for a LIS MSP effort. Initially referred to as the Sound Spatial Planning Work Group, it has also been referred to as the “LIS Coastal and Marine Spatial Planning Work Group.” The Connecticut Blue Plan bill refers to this group as the “Connecticut-New York Bi-State Marine Spatial Planning Working Group” reflecting the importance of both states in this effort. Hereafter this group is referred to as the “Working Group.”

The Working Group was formed following workshops and discussions about marine spatial planning for Long Island Sound along with recognition of the 2010 National Ocean Policy and associated planning efforts unfolding for the Northeast and Mid-Atlantic regions. There was informal consensus that, as an intensely utilized, ecologically important water body, Long Island Sound needed and deserved its own marine spatial plan. This perspective is furthered by consideration that LIS, although a multi-state body, is a sub-region without direct and specific attention

from the regional planning efforts and that it is also geographically sub-divided between the regional efforts of the Northeast and Mid-Atlantic.

The Working Group is made up of voluntary participants from key state and federal agencies (e.g. Connecticut DEEP, New York DOS, New York DEC, EPA, and NOAA); regional ocean entities (the Northeast Regional Ocean Council and the Northeast RPB); trade organizations (the Connecticut Marine Trades Association) and other user interests (the Coastal Conservation Association); conservation organizations (e.g. The Nature Conservancy and Connecticut Fund for the Environment); and the Connecticut and New York Sea Grant programs (see Appendix II for complete membership list). The Working Group has worked to form consensus on the purpose and potential guiding principles that may be appropriate for MSP in LIS, the types of data and information that may be important, and the options that may make the most sense in structuring and implementing a LIS MSP process. As an unofficial effort, the Working Group is assisting in “doing the

homework” in support of the states of New York and Connecticut who would have the ultimate authority should they decide to pursue an official LIS MSP process. One of the notable benefits of the Working Group is that it has fostered and facilitated the cooperation and coordination of the states of Connecticut and New York in addressing LIS MSP.

B. Working Group Functioning and Progress

As part of its formation, the Working Group agreed on how it would operate and the role that was appropriate for it to play in supporting development of a LIS MSP initiative (see Appendix IV for the Working Group “overview” document). In recognizing the primacy of the New York and Connecticut state agencies as the entities who would be responsible for any potential official MSP effort (as noted above), the Working Group was careful to identify appropriate roles and to avoid overreaching beyond that. The Working Group has contributed support in the form of providing expertise, information, facilitation and consensus-building; data research and MSP-related products; and general capacity.

The original Working Group plan called for the creation of a large stakeholder partnership that would facilitate the engagement of a broad range of stakeholders beyond those on the Working Group. After further consideration and consultation with the state agencies it was decided that further steps were needed prior to pursuing the partnership. All Working Group members have consistently recognized the critical importance of stakeholder involvement — as early as possible — and welcomed a wide range of interests to participate on the Working Group. However, the timing has not yet come for the larger partnership because: 1) widespread stakeholder engagement is more appropriate when there is an official, state agency-led and supported process in which to participate; 2) it may be difficult to motivate stakeholders to participate in an unofficial process, and those who do participate may burn out before an official process begins; and 3) pursuing a larger partnership can still be done if and when there is greater clarity on what would be asked of the

partnership and whether or to what extent it would be supported by the state agencies.

The Working Group does not participate in any lobbying or legislative advocacy. Certain members of the Working Group have been involved in such efforts, though these have been separate efforts, independent of the Working Group, where members were representing their individual interests.

The Working Group operates on general consensus and has been informally co-chaired by Connecticut Sea Grant and The Nature Conservancy. The Working Group conducts conference calls and meets in-person about eight times per year; additionally it has identified sub-teams to carry out work plans and complete work products. These include the Framework and Data & Information Teams whose members are listed in Appendix V along with the broader Working Group membership. Both teams conduct calls approximately once a month. Preparation of this Framework Report and the separate but related Data and Information Report are two major products of these teams and the overall Working Group.

The Working Group produced several other products that are included together in Appendix V. These include: 1) a preliminary guidance document on “Sound Spatial Planning,” including general goals and principles to guide the Working Group effort and potentially to be considered for an official LIS MSP process (“Background Document”); 2) a written piece on factors or drivers supporting Sound planning (“Drivers”); 3) a more specific and focused set of goals proposed for Sound marine planning reflecting further consideration and perspectives of the Working Group; 4) approaches to data and information needs; 5) an assessment of State agency agreements that would be needed before the Working Group should proceed on certain work items; and 6) a draft outreach fact sheet.

Through its two years of work with members representing both New York and Connecticut, including Connecticut DEEP, New York DOS, and New York DEC as the appropriate state agencies, the Working Group has generated a level of bi-state cooperation and communication on the issue of managing Long Island Sound. It has been a forum for reaching consensus on

issues associated with launching and implementing a LIS MSP process. An important example is that of New York's Geographic Information Gateway (NY portal), (<http://opdgig.dos.ny.gov/#/home>), which could potentially serve as a primary data portal for a future official LIS MSP process. New York DOS invited the Working Group to participate in a bi-state manner in the further development and use of the Gateway. After consideration and deliberation, the Working Group, including the State of Connecticut, decided to contribute to further development of the Gateway as a bi-state resource with the prospect of it being used in an official Sound marine planning process.

C. Working Group Goals and Principles

The goals and principles prepared by the Working Group (Appendix V) were designed to shape and give definition to the Working Group's work and direction, but not necessarily this Framework or a future official LIS MSP process. They are included here in an appendix as background and as material to be considered for potential use by those who may be involved in an official LIS MSP process.



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IV. MSP Elements: Range of Options

A. Plan Authority and Structure

1. Planning Authority

Adjacent state-based MSP initiatives have been led by state coastal management programs pursuant to their coastal zone management authorities. For example, the Rhode Island Ocean SAMP was developed and implemented by the Rhode Island Coastal Resources Management Council pursuant to Rhode Island's existing coastal management authority. No new law or authority was required and the SAMP resulted in numerous new policies and regulations that were adopted as amendments to the Rhode Island Coastal Resources Management Program. By contrast, the Massachusetts Ocean Management Plan was developed and implemented by the Massachusetts Office of Coastal Zone Management pursuant to existing coastal management authority and implemented through existing state regulations and permitting procedures. The 2008 Massachusetts Oceans Act established a mandate for an ocean plan and while it did not give the state new regulatory authority, it gave the state new authority to implement ocean planning policies under existing programs. This is similar to the proposed Connecticut Blue Plan. Washington and

Oregon's MSP initiatives have also been conducted pursuant to their state coastal management authorities.

As stated above, an official Long Island Sound MSP process would be led and developed by the states of Connecticut and New York under the two states' coastal zone management authorities. NYS DOS is authorized to engage in MSP in Long Island Sound in accordance with the New York Waterfront Revitalization of Coastal Areas and Inland Waterways Act (New York Executive Law Article 42 §910-923). Under this act, New York DOS has authority to adopt new coastal policies using existing state authority and work with local coastal communities to develop and implement local plans. It is the current understanding of the authors that New York State has the authority to engage in MSP and do associated planning if it is in concert with its existing federal consistency authority and coastal management program, however, we understand that New York State does not currently have the authority to implement or enforce any MSP that may extend

beyond this existing authority and program. A full and accurate understanding of New York State authority regarding development and enforcement of MSP, federal consistency and its Coastal Management Program remains an important task yet to be completed. The Connecticut Coastal Management Act, implemented by the Connecticut DEEP, provides the basis of Connecticut's coastal management program. However, as noted above, neither DEEP nor any other Connecticut agency had the authority to systematically exercise public trust authority in Connecticut waters of LIS outside the context of case-by-case regulation. It is for these reasons that Connecticut pursued passage of the "Blue Plan" bill to support a LIS MSP initiative. If the Blue Plan, developed and completed through Public Act 15-66, is approved by the Connecticut legislature, it would ensure that a spatial plan would be legally applicable to Connecticut waters and that it could be legally incorporated into Connecticut's federally-approved coastal management program, thus potentially affecting what is included in Connecticut's federal consistency authority over federal agency projects and permitting. For further information on the Blue Plan please see Section II.E.

2. Plan Approval and Implementation

Now that CT Public Act 15-66 has launched development of a "Blue Plan," once the plan is completed and then approved by the Connecticut General Assembly, Connecticut will have the authority to implement it. New York State does not currently have a legal authority to adopt a Sound Marine Plan as legally binding for decision-making in NYS. It would serve as data and information only. If New York was to amend its Coastal Management Program, the process for doing so is found at 15 CFR 923.80 and 923.84.

Connecticut may then seek approval by the NOAA Office of Coastal Management to include the Sound Marine Plan as part of their respective federally-approved coastal management programs implemented pursuant to the federal Coastal Zone Management Act. If New York gains the needed legal authority it may also be able to seek similar approval. Adoption of a Sound Marine Plan as part of the states' coastal

management programs may provide Connecticut and potentially New York with many benefits including better coordination and communication with federal agencies and with stakeholders regulated by federal agencies. A Sound Marine Plan may be approved by NOAA as part of a state's existing coastal program through either a "Routine Program Change" or an "Amendment." Changes are approved through Routine Program Change procedures if they are not considered "substantial." Amendment procedures are required for "substantial" changes and are more rigorous, triggering review under the National Environmental Policy Act (NEPA). It should be noted that NOAA approved the marine spatial plans developed by the states of Rhode Island, Massachusetts and Oregon through the Routine Program Change procedures. For further information on procedures for amending state coastal management programs, see NOAA Office of Coastal Management (1996).

Once approved, a Sound Marine Plan would be implemented by Connecticut pursuant to its authority. In Connecticut, as stated in the Blue Plan Act, an approved plan must be considered in state permit decisions for activities regulated by Connecticut DEEP under the Structures & Dredging statutes and other applicable regulatory programs. If agreed to, the plan could also apply to other Connecticut state agency decisions regarding activities within the Sound. Once NOAA approves the Plan as an amendment to Connecticut's coastal program, it will be able to apply the plan's enforceable policies to federal agency decisions (e.g., placement of navigation projects, locations of channels and mooring areas) through its federal consistency authority.

3. Range of Options

A central question in implementing MSP in LIS is how to develop and enact an approach that addresses Long Island Sound as one integrated, contiguous system and that operates on a bi-state basis within the context of existing jurisdictional boundaries. An official LIS MSP initiative may result in one or a series of plans, developed and implemented through the states of Connecticut and New York utilizing their existing authorities and, for Connecticut, new planning authority based on the recently-passed Blue

Plan legislation. Additionally it is important to emphasize that Connecticut and New York may proceed with MSP on different timeframes. The legislation allows for some flexibility in timing to help foster the ability of New York and Connecticut to work through planning under a similar overall time horizon by virtue of allowing for a longer time frame (~4 years) than was originally contemplated. In all cases, the assumed goal is to coordinate and synchronize the two states' efforts to the maximum extent possible. This section includes four options for how MSP could be conducted given these considerations. These options outline possible plan structures, focusing in particular on the different ways in which the two states can work together. Given the importance of this topic, some of the options summarized in Table 1 below are further discussed in narrative text that follows.

Option 2: The Two-State Solution: This option allows Connecticut to pursue the Blue Plan without depending on a given response or outcome associated with New York, and for New York to operate in its own way and on its own timeframe. NYS does not currently have the legal authority to adopt an MSP so unless it gains new authority and develops and adopts a plan beyond the scope of its current Coastal Management Program, it would not likely have a plan which directly corresponds with Connecticut's Blue Plan. Nevertheless, to coordinate the two approaches, a memorandum of understanding or other form of bi-state agreement could serve to bring the separate approaches closer together in structure, content and means of implementation. Such an agreement could guide shared use of data and outreach sources from the two states and from the Northeast and Mid-Atlantic

Table 1. Range of Options: Plan Structure

<p>OPTION 1.</p>	<p>Status quo CT and NY continue existing LIS management according to their existing needs, data and policies, with the existing level of informal coordination and communication. The Bi-State Working Group may continue to meet, but there is no official implementation action.</p>
<p>OPTION 2.</p>	<p>The two-state solution Each state adopts a marine spatial plan or uses its coastal management program for its own state waters in LIS, according to its own institutional structure and organizing its own stakeholder input. A bi-state agreement could be enacted to facilitate some level of coordination between the two states including edge-matching the plans. Decision- making is coordinated on an ad-hoc per-project and issue basis.</p>
<p>OPTION 3.</p>	<p>The Blue Plan approach (unified bi-state planning) Each state either formally adopts or informally uses a separate marine spatial plan or programmatic approach within its own borders through its own legal and/or administrative processes, but the plan or approach adopted or used in each state contains a high level of similarity, consistency and ability to apply Sound-wide and address many key management issues. Once the plan or approach is completed, an appropriate bi-state agreement is developed to structure how the states will cooperate and communicate with each other in implementing the respective plans or approaches. The goal is to ensure as much uniformity and consistency in implementation as is reasonably possible.</p>
<p>OPTION 4.</p>	<p>One comprehensive plan The States incorporate into their Coastal Management Programs the same bi-state marine spatial plan or if the necessary authorizing legislation was passed in both CT and NY, the same marine spatial plan would be adopted by both States for the entirety of LIS at the same time and developed and implemented by a bi-state body granted authority by both states. . Although highly unlikely politically for several reasons including the passage of the Blue Plan, this option generally represents the ideal of a bi-state approach.</p>

regional planning efforts. Additionally, a standing bi-state stakeholder group could be developed to further facilitate coordination between the two states. One downside to this approach is that there would likely be significant discrepancies between the two approaches and the result could fall far short of the goal of achieving a truly uniform bi-state approach to LIS MSP. Despite this, there are undoubtedly countless ways in which efforts could be made to bring the “Two-State Solution” into a more uniform position, especially over time.

Option 3: The “Blue Plan” approach (unified bi-state planning): This could be accomplished through the passage and careful implementation of the Connecticut Blue Plan bill in concert with New York State. Given that Connecticut and New York may have different levels and types of legal authority to develop and/or adopt a MSP at any given time, the approach would entail working within those differences to craft a plan or approach that achieves as much consistency, similarity and ability to apply Sound-wide as is reasonably possible. Development of the Blue Plan would be carried out in coordination with New York State so that the shape and content of the Blue Plan would be as consistent and similar to the management approach sought by New York State as is reasonably possible. Given that New York State does not currently have legal authority to adopt an MSP but does have authority to conduct marine planning according to its existing coastal management program, one scenario could be that Connecticut develops the Blue Plan with New York and it is adopted in Connecticut but New York uses the information and guidance developed from the Blue Plan process to update and enhance its decision-making and/or other management approaches regarding the Sound. If a plan that is enforceable in both states is to be sought, it may need additional authorizing legislation to be realized. The need, benefit, feasibility or likelihood of gaining new legislative authority in either Connecticut or New York or of amending the coastal management programs of either state or of doing none of these would need to be determined by the relevant parties in the course of conducting the process.

It is important to note that the intended outcome of the Connecticut Blue Plan legislation is a coordinated bi-state approach and outcome to the extent possible. For this goal to be realized, a bi-state plan would need to meet both Connecticut and New York goals and perspectives. Assuming there is appropriate interest and means to facilitate bi-state development of a plan and/or approach, the Blue Plan process would need to take full advantage of the Act’s provisions to include and work with New York. This includes the basic design of the process itself. To this end the Act makes several references worth noting. It calls for the plan to “reflect the importance of planning for LIS as an estuary that crosses state boundaries, including the identification of potential measures that encourage such planning.” It calls for the Advisory Committee to consult with applicable New York state agencies and its advisory counterparts and for the Bi-State Working Group to “devise a mutually agreeable process for developing ... the Long Island Sound Blue Plan.” (New York counterparts are any entity that New York believes is appropriate to include and as such could resemble the Connecticut Advisory Committee called for in the Public Act). The Act also calls for Blue Plan development to be coordinated, developed and implemented to the maximum extent feasible, with the State of New York. Because of the considerable standing that the State of New York, their “advisory counterparts,” and the Bi-State Working Group would have in the Blue Plan process, their active participation alongside Connecticut counterparts could help produce a plan and/or approach that both states support. Because this is a potential outcome, not a given, it will require the vigilance and dedication of those involved to make it work.

To achieve this unified bi-state plan, it is clear that New York’s participation is critical to ensure that the Blue Plan, which would become legally enforceable in Connecticut, can address the same content that New York would seek to include in their own plan. Therefore, this option makes the assumption that sufficient commitment from New York state authorities and officials are secured so that substantive and sufficient New York participation can take place within the Blue Plan process and

timeframe. This option allows for there to be varying outcomes regarding adoption and/or enforceability in New York State given the uncertainties in whether administrative or legislative actions could or would be sought. However, this option would presumably need to be stronger if and when plan adoption and enforceability in New York State became possible.

Timing may also be a critical factor in implementing this unified bi-state plan option. Although New York has indicated it plans to pursue MSP for LIS, the Blue Plan's prescribed timing may not be ideal for New York given that it also has other large water bodies (the Great Lakes and New York's Atlantic Ocean waters) to consider for MSP. The Blue Plan Act allows approximately four years for completing the plan to increase the opportunity for New York participation. Both parties have the option of completing the plan sooner. It is also theoretically possible that New York could pursue its own planning process either in parallel with the Blue Plan or at a later date, but make efforts to coordinate with Connecticut such that the resultant plan or approach is, in practice, very similar to what Connecticut may develop while potentially reflecting some differences that do not undermine the overall consistency and uniform approach.

To support this option, a standing bi-state stakeholders group, and potentially a technical advisory group, could be formed as part of the process. This group may incorporate existing groups like the LISS Citizens Advisory Committee. The Blue Plan Act makes it possible for such a group to be formed by stating that the legislation's Advisory Committee may provide for other public outreach and input measures to assure sufficient stakeholder engagement and representation. This outcome would be determined by the choice and the capacity of lead planning entities.

A milestone already achieved in supporting this approach is the agreement facilitated by the Working Group, and agreed to by Connecticut and New York agency staff, that calls for Connecticut and New York to cooperate with other LIS MSP interests in using, supporting and developing New York's Geographic Information Gateway (NY portal) as the primary data portal for a bi-state LIS MSP process. This portal is a substantial, well-supported long-term resource that

can provide significant capacity in support of a LIS MSP process.

In summary, this option conceives of working within the Connecticut Blue Plan process to create a plan and/or approach that in practical terms, both states support. Although there may be differences in form and details and the process of adoption and/or implementation, it allows there to be cooperative and pragmatic agreement between the states on spatial management of the Sound while allowing each state autonomy to act within its own existing authorities, coastal management programs and timing. It also means that if one state does not participate, either in the same time frame or in exactly the same way, the other state is free to continue to use the plan to serve its own sovereign waters.

Option 4: One Comprehensive Plan: This option generally represents the ideal of a bi-state approach. It embodies a pure form of bi-state cooperation and stands out for being adopted by both States at the same time and developed and implemented by a bi-state body granted authority by both states. The States incorporate into their Coastal Management Programs the same bi-state marine spatial plan or if the necessary authorizing legislation was passed in both Connecticut and New York, the same marine spatial plan would be adopted by both States for the entirety of LIS. It would necessitate authorizing legislation in both Connecticut and New York. It would also be dependent on ongoing agreement by and support from each state.

The overarching bi-state approach remains a concept worthy of illustration but would need to overcome significant political and operational challenges before being considered a viable approach.

B. Scope and Scale

1. Overview, Key Considerations and Best Practices

Scope and scale are critical and foundational elements of any MSP effort. Scope and scale refer to the geographic, spatial and temporal extent of a

planning initiative. In their discussion of MSP best practices, Beck et al. (2009) identify the need to make clear decisions about the geographic boundaries, scope, scale, and resolution of an MSP initiative.

Geographic boundaries define the extent of a planning area. Ehler and Douvere (2009) point out that there can be different boundaries established for analysis than for management; encompassing more area in the planning or study area can enable managers to identify and consider influences on the system, such as nitrogen pollution from upland sources. Collie et al. (2013) note that the geographic boundaries for MSP can encompass a broad range of scales, ranging from smaller than an ecosystem to a national scale.

Temporal considerations are another element of scope and scale. Ehler and Douvere (2009) advise that spatial planners define a two-part timeframe: a base year or period through which to define existing conditions, and a target year or period in the future to allow for consideration of future conditions. Taken at a smaller scale, temporal considerations also include taking account of seasonal variations in factors such as spawning seasons, boating and fishing activity, and environmental fluctuations.

Finally, MSP requires consideration of both two-dimensional and three-dimensional marine space (C. N. Ehler & Douvere, 2007). As such, an initiative must include the seabed, the water column, the water sheet, and the air space above the water.

2. Range of Options

There are numerous ways in which scope and scale considerations may be applied to a Long Island Sound MSP initiative.

Temporal and three-dimensional considerations offer planners a small range of options. While consideration of all three dimensions of marine space is important, surface, water column and seabed activities and impacts can all be addressed either separately or together. Temporal options include what future timeframe to consider with regard to potential future conditions and scenarios.

LIS planners will have a broad range of options for defining LIS MSP geographic and jurisdictional boundaries. Choices in defining geographic boundaries include the extent of planning area. For example, the Massachusetts Ocean Management Plan's landward boundary was set 0.3 nautical miles (nm) seaward of the mean high water line, and extends seaward out to the 3 nm state waters boundary. By contrast, the Rhode Island Ocean SAMP's landward boundary was set 500 feet seaward of mean high water and the planning area excluded Narragansett Bay but extended offshore out to approximately 30 nm; and the Washington State MSP initiative's landward boundary begins at the MHW line, extends out to the 700-fathom line, and includes several coastal embayments. The jurisdictional boundaries of a LIS MSP initiative would depend on whether there is one joint plan adopted by both states, two separate plans, or an effort to identify areas of common interest. Other choices may include dividing the planning area into multiple sub-areas for the purposes of implementing a phased approach or conducting one or more preliminary pilot planning exercises. For example, the Baltic Sea region's international MSP initiative, BaltSeaPlan, identified eight discrete areas for the development of eight different issue-oriented MSP pilot initiatives. The following are just a sample of the many possible options for defining geographic and political boundaries to shape a LIS MSP process.

Table 2. Range of Options: Boundaries

OPTION 1.	Seaward of mean high water boundary States set landward boundaries a set distance seaward of the MHW line (e.g. 1,000 ft.). This will enable planners to avoid nearshore issues such as docks, marinas and seawalls that are already subject to existing local harbor management plans, shellfish commissions, and coastal permitting.
OPTION 2.	Blue Plan approach Both states adopt the CT Blue Plan approach, which sets separate planning and management boundaries. Planning boundary is MHW line; management boundary is the 10-foot bathymetric contour seaward of MHW and seaward of auto and rail transportation (i.e. downstream of bridges), thus focusing on offshore issues.
OPTION 3.	Mean high water boundary States set landward boundaries at the MHW line. This will avoid affecting the use and regulation of private property and duplicating existing regulatory mechanisms. This will enable planners to consider the influence and importance of these features on Sound resources and uses (e.g. shallow water habitat for juvenile fish; recreational ports and harbors).
OPTION 4.	Encompassing coastal watersheds in study area boundary States set two different landward boundaries: a planning/management boundary (MHW line) and a study area boundary (encompassing coastal watersheds). This enables consideration of influences from adjacent land and watersheds without being redundant with coastal plans and regulations. This approach could also be developed to help planners focus on one part of the Sound at a time (e.g. implementing the pilot approach utilized in the Baltic Sea).

C. Vision, Guiding Principles, Goals and Objectives

1. Overview, Key Considerations and Best Practices

Developing a vision, guiding principles, goals and objectives will be essential for the success of a LIS MSP initiative. There is broad agreement that clearly-articulated goals and objectives are critical for an MSP initiative, and that these should follow a vision formulated early in the process. McCann et al. (2013) identify setting goals and principles as a critical early stage of an MSP effort, and Ehler and Douvère (2009) note that goals and objectives should emerge from the issues and problems that establish the need for MSP.

a. Vision

A vision or vision statement is intended to articulate the desired future state for a place — in this case, Long Island Sound. It is a high-level aspiration that

can motivate stakeholders participating in a MSP effort over the long-term. The vision can be a simple, one-sentence statement that is supported by complementary guiding principles, goals and objectives that outline the desired process and specific outcomes necessary to achieve the vision. Or, the vision can be a longer and more complex series of statements that delineate more fully what the desired future state is and the process by which it will be achieved. A vision statement is not required for the successful implementation of MSP for Long Island Sound or elsewhere, as the associated guiding principles, goals and objectives will also collectively point to the desired future state. However, a brief, clearly articulated vision can help stakeholders stay focused on the ultimate objective through a long planning process. A best practice is to develop a vision statement through a transparent, stakeholder-driven process. Development of a vision can also help facilitate stakeholder support, engagement and understanding.

A vision is not widely considered to be a requirement for MSP, though some have identified the importance of engaging all MSP stakeholders in developing a shared vision for the planning area (e.g. Ritchie & Ellis, 2010); see also stakeholder engagement, Section IV.D.4, below. Additionally, some MSP initiatives have adopted this approach. The BaltSeaPlan initiative involved seven nations working together to develop a common vision for the Baltic Sea, and the UK's marine plans each include a vision statement for the planning area for 20 years into the future. In another example, the Mid-Atlantic RPB articulated a one-sentence vision statement: "A Mid-Atlantic ocean where safe and responsible use and stewardship support healthy, resilient, and sustainable natural and economic ocean resources that provide for the wellbeing and prosperity of present and future generations" (Mid-Atlantic Regional Planning Body, 2014a). By contrast, the Northeast RPB did not articulate a vision statement.

A LIS MSP vision, along with associated planning goals and objectives, would ideally be developed through a transparent public process involving agencies and stakeholders from both states. The result of such a participatory process — a vision statement articulating the future desired state of Long Island Sound through the employment of MSP — might look like one of the following examples:

- A resilient and healthy Long Island Sound supports existing and new sustainable economic, recreational, and cultural opportunities for present and future generations.
- A Long Island Sound where safe and responsible use and stewardship support healthy, resilient and sustainable natural and economic coastal resources that provide for the wellbeing and prosperity of present and future generations.

The vision for Long Island Sound included in the 2015 Long Island Sound Study Comprehensive Conservation and Management Plan:

"The vision for the Sound is of waters that are clean, clear, safe to swim in, and charged with life. It is a vision of waters nourished and protected by extensive coastal wetlands, by publicly accessible,

litter-free beaches and preserves, and of undeveloped islands. It is a vision of abundant and diverse wildlife, of flourishing commercial fisheries, of harbors accessible to the boating community, and of a regional consciousness and a way of life that protects and sustains the ecosystem." (Long Island Sound Study, 2015).

Please see Appendix VI for more examples of vision statements.

b. Guiding Principles

Principles are basic or essential qualities or elements determining the intrinsic nature or characteristic behavior of a MSP process, and provide insight into how planners will conduct their work (Mid-Atlantic Regional Planning Body, 2014a). They are high-level elements that form the foundation of, and thus guide the overall outcomes and planning process (Northeast Regional Planning Body, 2014c). Guiding principles describe "hows" (as opposed to "whats", which are addressed through goals below) — e.g. how geographic boundaries will be delineated for planning, how data will be shared, how conflicts will be resolved, how stakeholders will be brought into the process, how the planning process will relate to existing regional ocean planning efforts, etc. Guiding principles are ideally developed through a transparent, stakeholder-driven process, ensuring public support for these principles.

For example, guiding principles are being used to shape the work of the Northeast RPB and the Mid-Atlantic RPB, and were used to develop the Rhode Island Ocean SAMP. Common themes that were addressed across all three sets of guiding principles for these MSP initiatives were stakeholder participation; use of the best available science; and transparency in decision-making.

As with a vision, guiding principles for an official LIS MSP process would ideally be developed through a participatory stakeholder-driven process led by the two states. The results of such a participatory process might result in principles such as the following examples, which are based on draft ideas assembled by the LIS MSP Working Group:

- Seek wide and sufficient representation of Long Island Sound users, interests and official agencies;
- Use a science-based approach that incorporates sound science responsibly; and
- Be transparent and inclusive, using a diversity of communication methods so that stakeholders of Long Island Sound resources are adequately informed and represented.

For further examples, see a more complete set drafted by the Working Group, as well as other examples, in Appendix VI.

c. Goals and Objectives

Goals and objectives are widely viewed as foundational to a MSP process. Ehler and Douvere (2009) emphasize the need for both goals and objectives but distinguish between them, noting how goals are broad, general and abstract, whereas objectives are narrow, precise, and tangible. Collie et al. (2013) discuss the difference between conceptual objectives (those which are broader and more aspirational) and operational objectives (which are more tangible) and note that making conceptual objectives operational is a key part of the planning process. Additionally, because of the inherently multi-objective nature of the MSP approach, goals and objectives must embody this approach in order to ensure that the plan itself is multi-objective.

As utilized in recent MSP initiatives, goals address the “what” to be accomplished — they are typically high-level statements of general direction or purpose that highlight the desired outcomes to be achieved (Mid-Atlantic Regional Planning Body, 2014a). Objectives, by contrast, are used to describe specific outcomes or observable changes that once completed or met, contribute to the achievement of a particular goal. As such, high-level goal statements are usually accompanied by a list of short, medium and long-term objectives and actions that will help support the achievement of the goal. As with vision and principles, the widely-accepted best practice is for goals and objectives to be developed through a transparent, stakeholder-driven process to ensure public support and understanding.

For example, the Northeast RPB has three main goals: 1) Healthy Ocean and Coastal Ecosystems; 2) Effective Decision-making; and 3) Compatibility Among Past, Current and Future Ocean Uses (Northeast Regional Planning Body, 2014c). Each of these is accompanied by two to five objectives. By comparison the Rhode Island and Massachusetts MSP efforts each articulated four planning goals but no accompanying objectives, and the Washington MSP effort utilizes one overarching goal, five planning goals, and five objectives.

Goals and objectives that have been developed through comparable MSP processes typically address a range of conservation, use protection, and decision-making goals such as those articulated by the Northeast RPB. Review of comparable MSP initiatives, including those of the Northeast RPB, Mid-Atlantic RPB, and Rhode Island, Massachusetts and Washington state planning efforts indicate remarkable similarity in planning goals. Official goals and objectives for a LIS MSP process would be most effective if developed through a transparent, stakeholder-driven process; some possible draft goals that have been considered by the Working Group include:

- Support and help protect traditional and culturally significant uses of the Sound;
- Facilitate new sustainable uses where appropriate and compatible with existing uses and minimizing conflicts when they are unavoidable;
- Sustain and improve the critical habitats, ecological processes, natural resiliency and biodiversity of the Sound;
- Facilitate the coordination and cooperation of Connecticut and New York State governments along with federal and local government agencies, non-governmental entities and other partner organizations, as appropriate, on spatially-based decisions for the Sound; and
- Enable both states to manage their public trust submerged lands in the public interest.

These goals could be summarized in a manner similar to those of the Northeast or Mid-Atlantic RPB, with

more detail provided through the objectives and actions associated with each goal, as follows; effective decision-making could be a separate goal or an outcome of these goals.

- 1.) Healthy Long Island Sound Ecosystem
- 2.) Compatibility among Past, Current and Future Sound Uses

As stated above, the Working Group has developed draft goals to inform their own pre-planning work, and goals presented here are a sample of these. For these and other examples, as well as further discussion of goals and objectives, see Appendix VI.

2. Range of Options

LIS marine spatial planners have many options in establishing a vision, principles, and goals and objectives for a LIS MSP process. Important variables

include content; the extent to which these are coordinated between the two states; depth of approach (e.g. developing general goals vs. developing a full suite of vision, principles, goals and measurable objectives); and method of development. The range of options below reflects a sample of the many possible ways these different variables can be combined to guide a LIS MSP process.

D. Plan Preparation Process

1. Overview

This section discusses the process by which an official LIS MSP initiative may begin and be carried out in order to achieve plan development and approval. Key elements of the plan preparation process include: (a) starting the process (which may involve responding to a legislative mandate or an

Table 3. Range of Options: Goals and Principles

OPTION 1.	<p>State goals and principles; stakeholder input.</p> <p>CT and NY independently develop principles and general goals to support their individual state marine spatial plans. CT Blue Plan Advisory Committee and NY equivalent draft goals and principles (in CT case, starting with the Blue Plan) and distribute for public review and comment.</p>
OPTION 2.	<p>Shared vision statement; state principles, goals and measurable objectives; inter-state coordination and stakeholder input.</p> <p>CT and NY independently develop their own guiding principles and goals, as well as detailed measurable objectives. Additionally the two states work together to develop one overarching vision statement for the Sound that facilitates coordination between two state plans. A shared vision will reduce confusion among stakeholders, facilitating viewing the Sound as one ecosystem, and would follow the practice currently in place through the states' participation in the LISS and the development of the CCMP. A bi-state stakeholder process is set up to facilitate development of the shared vision statement; state-specific principles, goals and objectives are developed as described in Option 1.</p>
OPTION 3.	<p>Bi-state coordinated, stakeholder-driven process to develop shared vision, principles, goals and measurable objectives.</p> <p>CT and NY develop one shared vision statement, guiding principles, goals, and objectives, in order to facilitate the development of one integrated Sound Marine Plan or two very well-coordinated state plans. A bi-state Stakeholder Advisory Group or equivalent is set up at the beginning of the planning process; vision, principles, goals and objectives are drafted with this group in coordination with the Blue Plan Advisory Committee and NY equivalent, and are distributed for public review and comment. Each state could also independently adopt additional principles, goals, objectives, and actions, which would be most effective if they supported any joint goals.</p>

urgent issue, such as a new offshore development proposal, which motivates planners to start the process); (b) establishing a planning timeframe and planning milestones; (c) facilitating ongoing and rigorous stakeholder engagement; and (d) assembling a core planning team, science advisors, and mechanisms for interagency coordination. Because of its unique importance, stakeholder engagement is discussed separately and before the section devoted to the core planning team. Stakeholders are critical to the planning process and can in many cases contribute to or from within the planning team.

2. Starting the Process

A MSP process typically begins when a problem or issue has been identified which MSP can help address, and the appropriate authority, capacity, and resources have been put in place to facilitate the process.

MSP initiatives often unfold in response to a “driver,” or the emergence of a new problem, conflict, ocean activity, or use (Collie et al., 2013; Eastern Research Group Inc., 2010; Gold et al., 2011). A driver is a problem that is sufficiently prominent to gain the attention of both policymakers and the general public, thus galvanizing action — in this case a spatial planning process. Gold et al. (2011) discuss how drivers for MSP have included offshore renewable energy, national security concerns, and climate change adaptation. The prospect of offshore renewable energy development is widely acknowledged to have been a key driver for the Rhode Island Ocean SAMP as well as for the Massachusetts Ocean Management Plan. However, this is not the case with all MSP initiatives; for example, Washington State’s MSP initiative did not come about in response to a prominent issue, but rather in response to a new (2010) state law. While a driver is not a necessary precondition for MSP, a

driver may help motivate both government agencies and stakeholders to come to the table and commit time, resources, and political will to the process (McCann et al., 2014). It is important to emphasize that drivers can and should fundamentally shape the goals and objectives (discussed above) of a MSP process. McCann et al. (2013) recommend defining drivers, and how they will influence MSP, early in the pre-planning phase of a project.

The Bi-State Working Group identified several potential circumstances or drivers that could ultimately push forward a LIS MSP initiative. Generally, these include new legislation (e.g. Washington State), new development or construction projects, or a large-scale natural or ecological disaster. Most prominent among legislative drivers for LIS is the Connecticut Blue Plan; this Public Act now requires Connecticut to engage in a MSP process, which will be conducted in coordination with New York to the maximum extent possible. New development projects that could drive a MSP process could include large-scale energy projects, including transmission cables or pipelines; underwater turbines; large-scale seaweed farms; and more (see Overview and “Case for MSP” above for more examples). Finally, a large-scale natural or ecological disaster such as a fisheries collapse or another devastating storm like Hurricane Sandy could garner sufficient support for MSP. The LIS MSP Working Group developed a draft working paper on potential drivers in a MSP process; see Appendix V.

a. Range of Scenarios

Given passage of the Connecticut Blue Plan, it is now presumed that the “starting the process” question is largely answered. There may be other scenarios that emerge or will need to emerge if the Blue Plan is not successful, however, that is beyond the scope of this report at this time. Absent the emergence of a new offshore development proposal as a driver, two possible scenarios are shown below.

Table 4. Range of Scenarios: Beginning a LIS MSP Process.

<p>SCENARIO 1.</p>	<p>Working Group merged with Long Island Sound Study (LISS) Prior to passage of the CT Blue Plan, there had been consideration of alternative means for moving LIS MSP forward. Although presumably unnecessary as a result of the Blue Plan, unless complications arise in the Blue Plan process, conceptually the idea of the Working Group becoming part of the LISS as an established committee is noted. Together the Working Group and LISS could work to continue pre-planning and facilitate discussion between CT and NY. This approach might facilitate a future bi-state agreement and build greater commitment to an official bi-state MSP effort. It is not suggested that this scenario would represent an actual planning process, rather an alternative means for helping launch such a process.</p>
<p>SCENARIO 2.</p>	<p>LIS MSP with Support of Blue Plan The Blue Plan Act is passed, the Working Group continues to actively contribute to the process and a bi-state planning process is established. This is the scenario that exists at present. This scenario also presumes to include active participation by the State of New York however that has not been established at the time of this report.</p>

3. Planning Timeframe and Key Milestones

An MSP process must be structured by a well-planned timeframe and associated planning milestones in order to be successfully completed. A planning timeframe must include a structure for the plan development process itself; McCann et al. (2013) recommend identifying a set of planning milestones early, during the pre-planning process. It must also include a clear end date for concluding the plan development phase (C. Ehler & Douvère, 2009). Last, a planning timeframe must consider a planning interval that will facilitate plan update and revision — thus implementing adaptive management (Collie et al., 2013).

Planning timeframes and milestones utilized in comparable MSP processes have varied somewhat depending on scope and geography of the planning process; legislative or political mandate; the history of planning efforts in the area; and resources available to support the process. In general, key planning phases and milestones may include pre-planning and issue identification; data collection and analysis; draft plan development; a public comment period followed by plan revisions; and plan finalization and approval, with stakeholder input ongoing through all phases. For example, the Massachusetts Ocean Management

Plan was drafted over a 13-month period, distributed for public comment, and then finalized six months after that, in response to a planning timeframe mandated by the legislature in the Massachusetts Oceans Act (“An Act Relative to Oceans,” 2008). Some observers felt this was too short of a planning timeframe. The Rhode Island Ocean SAMP was completed in a little over two years in response to a timeframe mandated by senior officials; Rhode Island planners note that pre-existing relationships between agencies and stakeholders, established through the development of six previous Special Area Management Plans over previous decades, were critical in helping the state to develop such a substantial plan in this timeframe. By contrast, the Washington State MSP initiative has unfolded more slowly; planning began in 2010 in response to a new state law, picked up speed in 2012 when the legislature set up a new source of funding, and is expected to conclude in late 2016. In Washington State’s case, the longer planning horizon was due in part to the delay in funding as well as to the larger geography being considered. In the case of both the Northeast and the Mid-Atlantic RPBs, planning began in late 2012/early 2013, and planners are working to reach key planning milestones by early 2016.

Table 5. Range of Options: Planning Timeframes and Milestones

<p>OPTION 1.</p>	<p>Accelerated (12-18 months) This follows the approach utilized in the MA Ocean Management Plan: The first 4-6 months are spent on information gathering, the second 4-6 months are spent on data analysis and plan development, and the final 4-6 months are spent on public review and comment, document revisions, and final plan approval. Stakeholder engagement begins in month 1 and continues throughout.</p>
<p>OPTION 2.</p>	<p>Moderate (24-30 months) This follows the approach utilized in the RI Ocean SAMP: The first 9-12 months are spent on pre-planning, issue identification, and preliminary data collection, and the second 9-12 months are spent on additional data collection, data analysis, and plan development. The final 6 months are spent on public review and comment, document revisions, and final plan approval. Stakeholder engagement begins in month 1 and continues throughout.</p>
<p>OPTION 3.</p>	<p>Long (36-48 months) This is similar to the approach utilized by the NE RPB and timetable identified in the Blue Plan PA 15-66. The first 12-14 months are spent on pre-planning, issue identification, formulation of institutional arrangements, and goal setting. The second 12-14 months are spent on data collection, analysis, and plan development. The final 12-14 months are spent on public review and comment, document revisions, and final plan approval. Stakeholder engagement begins in month 1 and continues throughout.</p>
<p>OPTION 4.</p>	<p>Extended (60 months+) This is somewhat similar to the approach that seems to be in place in Washington State. The first 12-24 months are spent on pre-planning, fundraising, issue identification, formulation of institutional arrangements, and goal setting. The second 24 months are spent on data collection, analysis, and plan development. The final 12-14 months are spent on public review and comment, document revisions, and final plan approval. Stakeholder engagement begins in month 1 and continues throughout.</p>

a. Range of Options

The planning timeframe for an official LIS MSP process would be defined by the states of Connecticut and New York. The Connecticut Blue Plan legislation states that the draft plan must be completed by March 1, 2019. Additionally it includes a minimum of three public hearings prior to the release of a draft plan, a 90-day public comment period for review of a draft plan, and minimum time periods for plan finalization and approval by the General Assembly. It is important to emphasize that the states of Connecticut and New York may pursue LIS MSP on different timeframes. However, depending on the extent of timing differences and how the planning is pursued, this timeline could still allow for preparation of a “bi-state” plan.

Following are four options (found on page 30) for a planning timeframe and milestones, all of which are based on the timeframes utilized in other MSP initiatives; these are just examples of possible approaches to structuring a planning process:

4. Stakeholder Engagement

a. Overview

There is overwhelming agreement among practitioners and experts, and in widely-referenced MSP guidance documents such as Ehler and Douvere (2009), that stakeholder engagement is a key tenet of MSP. Stakeholder engagement ensures the openness, transparency, and legitimacy of MSP; increases buy-in; and contributes local knowledge to

the process (Douve, 2008; Gilliland & Lafolley, 2008; Pomeroy & Douve, 2008). There is a consensus that stakeholder engagement for MSP should adhere to a set of best practices. For example, MSP experts differentiate MSP stakeholder engagement from some legally-mandated forms of public participation such as public hearings and public comment periods, emphasizing the need for ongoing two-way communication and collaboration (Gopnik et al., 2012). This section outlines these best practices and then offers a range of options for implementing these best practices through various structures of stakeholder engagement.

b. Connecticut Blue Plan and Stakeholder Engagement

The Connecticut Blue Plan legislation will establish a Long Island Sound Resource and Use Inventory and Blue Plan Advisory Committee (“Connecticut Advisory Committee”). This committee, which would be charged with assisting in the development of the Blue Plan, would include, in addition to relevant government agencies and the University of Connecticut, representatives from various stakeholder groups: the marine trades industry; a conservation organization focusing on coastal issues; the gas and electric distribution industry; the commercial shellfish and finfish industries; the recreational fishing and hunting community; a nonprofit conservation organization with expertise in marine assessments and planning; the shellfish industry; two coastal municipalities; and the commercial boating/shipping industry. In addition to these the Blue Plan identifies applicable New York agencies and their advisory counterparts and the Bi-State Working Group as entities to be consulted with in devising and carrying out the process. The Blue Plan also identifies the telecommunications industry, waterfront businesses, a tribal nation and the tourism or recreation industry, local, regional and federal planning entities and agencies (e.g. Coast Guard, Navy) and the Long Island Sound Study to either be coordinated or consulted with as part of developing the plan.

The legislation also instructs the Advisory Committee to work with New York state agencies and their advisory counterparts and the Bi-State Working

Group in devising a mutually agreeable process for developing the Blue Plan. Official recognition of these groups and the flexibility provided regarding such groups, along with the role of “devising a mutually agreeable process,” affords additional opportunities for recognizing stakeholders and providing enhanced stakeholder recognition, involvement and influence in the official process

Per the legislation, the Connecticut Advisory Committee, will hold “not less than three public hearings in different coastal municipalities of the state to receive comments and submissions from the public and interested persons and *may provide for other public outreach and input measures, as appropriate, to assure sufficient stakeholder engagement and representation*” (emphasis added). This wording provides for additional measures, if needed, to assure that the overall stakeholder engagement process is sufficient. Finally, the legislation calls for the Blue Plan to “be developed through a transparent and inclusive process that seeks widespread participation of the public and stakeholders and encourages public participation in decision making.”

For the purposes of stakeholder engagement, the Connecticut Advisory Committee and required public meetings are included within the range of options presented in this document with the idea that most other options would potentially build upon and enhance these Blue Plan requirements. It is recognized that there could be different approaches than those associated with the Blue Plan specifically. Many of the same option attributes, however, would be appropriate to consider under an alternate MSP process and the options presented reflect this. These are presented to provide broader context.

c. Key Considerations and Best Practices

i. Who and When

MSP practitioners and experts agree that stakeholder engagement should take place early, often, and consistently through all phases of an MSP process (e.g. C. Ehler & Douve, 2009; Gilliland & Lafolley, 2008). For example, the Rhode Island Ocean Special Area Management Plan (Ocean SAMP) team assembled its Stakeholder Group as one of its first

steps, and convened monthly stakeholder meetings for the full two years, the first one taking place during the pre-planning/issue identification phase (McCann et al., 2013). Stakeholder engagement can begin sufficiently early such that stakeholders can be involved in shaping the engagement process itself to ensure their motivation and participation; for example, UK marine planners seek input on the development of their stakeholder engagement plans (UK Department for Environment Food and Rural Affairs, 2011). Moreover, stakeholder involvement should continue from the goal-setting, issue identification and plan development phases — in which stakeholders can help identify, define existing and anticipate future conditions, issues and opportunities — through the evaluation and implementation phases. For example, in the Commonwealth of Massachusetts’ recent five-year evaluation and update of the Massachusetts Ocean Management Plan, four public meetings were held and a public comment period was established to provide for ongoing stakeholder input (MA Executive Office of Energy and Environmental Affairs, 2015).

A broad range of stakeholders should be engaged in an MSP process. There are numerous potential stakeholders who may have an interest in MSP, including those dependent on marine resources, those with legal claims or jurisdiction over resources in or parts of the planning area, those who conduct activities in the area, and those with conservation or cultural heritage interests in the area (C. Ehler & Douvère, 2009). Some MSP practitioners are explicitly inclusive; UK marine planners define stakeholders broadly as “interested persons” (UK Department for Environment Food and Rural Affairs, 2011) and Rhode Island marine planners recommend including “both traditional and non-traditional stakeholders”; traditional stakeholders may include commercial fishermen, while non-traditional stakeholders may include local unions with an interest in the prospect of new offshore development projects (McCann et al., 2013).

ii. Potential Long Island Sound Stakeholders

It is important to recognize potential LIS stakeholders, users and interests early so it is clear that the intent is to be as inclusive as is reasonably possible. To that

end, this report includes a preliminary list of potential stakeholders that was developed by the Working Group and further updated in a contract carried out by the Working Group with the Consensus Building Institute (see Appendix VII). Because it is a preliminary list without the benefit of public input, it may not include all the entities that can or should be considered. It should also be noted that the Northeast and Mid-Atlantic Regional Planning Body processes have engaged with stakeholders, including helping to identify who they are. This work can potentially add significantly to a MSP process for LIS. Some of the stakeholders that have been repeatedly mentioned as likely to have an interest in LIS MSP are those referenced in the Blue Plan (as discussed above in section IV.D.4.b “Connecticut Blue Plan and Stakeholder Engagement”). Additional stakeholders that are not specifically identified in the Blue Plan include ports, ferry operators, non-traditional aquaculture interests (e.g. seaweed farming), other potential commercial interests (e.g. energy production), national defense, and additional academic institutions/interests, among others, and include representatives from both New York and Connecticut. It is also noted that a category such as “commercial fishing” is broad and is meant to include all potential interests within this category, ranging from charter boat operators to larger commercial vessels. This paragraph is intended to highlight the importance of recognizing stakeholders and to provide preliminary guidance, but it likely does not include all the stakeholders that may have an interest in LIS MSP.

One widely-used best practice for identifying stakeholders and their interests, concerns, and values is to conduct a stakeholder analysis. The NOAA Office of Coastal Management completed such an analysis at the national level in 2010 in response to the National Ocean Policy’s call for regional MSP (Eastern Research Group Inc., 2010). Stakeholder analysis can include a stakeholder mapping exercise, resembling a matrix for a given issue area in which the full range of stakeholders are listed, and their given interests, influence, concerns, and values are identified. This enables the identification of potential areas of conflict as well as synergistic opportunities

(Pomeroy & Douvere, 2008). Stakeholder analysis can also involve conducting interviews with stakeholders or stakeholder organizations representing different industries and sectors to understand a sector's interests, concerns, and preferred means of participation. For example, the shipping industry has unique interests and expertise to contribute to MSP (The Nautical Institute and the World Ocean Council, 2013).

d. How to Engage

Types of stakeholder participation in MSP can vary widely between the two extremes of one-way communication (with no actual participation) and full-fledged negotiation (where decision-making power is shared with and among stakeholders) (C. Ehler & Douvere, 2009; Pomeroy & Douvere, 2008). MSP best practices indicate that stakeholder engagement should be fully interactive, allowing for stakeholder empowerment (Pomeroy & Douvere, 2008) and collaboration (Gopnik et al., 2012). Additionally, in order to have sustained and comprehensive stakeholder involvement, there must be intensive and targeted outreach to different sectors, with the goal of helping each stakeholder understand the unique ways in which MSP can benefit them. Finally, stakeholder engagement should be structured such that meetings are held at times and in places where stakeholders can attend. For example, meetings held during business hours may be difficult for representatives of small maritime businesses, such as fishermen and vessel operators, to attend; and meetings requiring long-distance travel and an overnight stay may deter all except those who are attending as part of their job.

An emerging best practice for MSP is the development of a stakeholder outreach and engagement plan that articulates the planning effort's entire stakeholder engagement strategy. For example, in the UK, marine planners develop and publish a "Stakeholder Participation Plan" (SPP) at the beginning of each regional marine planning process. The SPP is sufficiently specific such that stakeholders can plan ahead for their participation (UK Department for Environment Food and Rural Affairs, 2011). Outreach and stakeholder engagement activities articulated in this plan can be implemented by the lead planning

agency or by an external institution, such as a Sea Grant program or a professional facilitation group, which specializes in communication and outreach. For example, stakeholder outreach in support of Oregon's Territorial Sea Plan amendment process was implemented by the lead agency, Oregon's state coastal management program, whereas the Washington State Department of Ecology contracted Washington Sea Grant to facilitate MSP outreach (Trosin, 2013).

This plan should include the development of effective outreach messages and communication materials to build stakeholder understanding of and support for MSP as well as a plan for disseminating these materials and facilitating ongoing communications with stakeholders and the media. For example, Washington State's MSP outreach plan included a series of "MSP 101" presentations (Trosin, 2013). A key consideration in developing communications and outreach materials is to build stakeholder motivation for participating in MSP: communications should articulate the benefits of stakeholder participation, and clearly explain how the resulting plan will be implemented. Additionally, some communications should be tailored to specific audiences (e.g. the fishing or offshore renewable energy industries) to ensure all sectors' active involvement and that all sectors see the ways in which MSP may affect them.

The stakeholder outreach and engagement plan should also identify a mix of stakeholder events and input opportunities, including traditional public hearings and public comment periods as well as interactive workshops, focus groups, and participatory mapping exercises. Such interactive exercises can be used to gather stakeholder input, explore issues and opportunities, and articulate goals and values. For example, the Rhode Island Ocean SAMP team held monthly interactive stakeholder meetings with free refreshments, public lectures by university scientists, and a series of targeted workshops on specific issues (e.g. fisheries), as well as a series of formal public hearings and public comment periods toward the end of the plan development phase (McCann et al., 2013). It is critical to emphasize that successfully implemented

MSP initiatives, including the Rhode Island Ocean SAMP and the Massachusetts Ocean Management Plan, involved numerous stakeholder meetings, listening sessions, and hearings interspersed throughout the plan development process.

Surveys and geospatial data portals are other methods of engaging stakeholders and can ideally be used to both disseminate and receive input; for example, UK marine planners utilize questionnaires and workshops to gather information from stakeholders, and use their data portal as a means of soliciting stakeholder input on data products as well as allowing stakeholders to submit new data for potential use in planning (UK Department for Environment Food and Rural Affairs, 2011). Stakeholders are important sources of local, real-world knowledge, and MSP initiatives including the Rhode Island Ocean SAMP and the New York Atlantic Ocean Study have included participatory GIS workshops and activities designed to engage stakeholders in developing this type of information for inclusion in a MSP process. Because some local knowledge may be either culturally sensitive (e.g. indigenous cultural resources) or proprietary (e.g. precise trawl lines or other indications of fishing grounds), such activities must be conducted with sensitivity and with clear and transparent communication about how the information will be used and how it could benefit the stakeholders involved.

Last, a MSP best practice is to consider how best to resolve conflict through the stakeholder engagement process. In itself, engaging the full range of stakeholders from the outset, and involving stakeholders throughout the entire planning process, are considered important tools through which to resolve conflict. Marine spatial planners may also consider incorporating explicit procedures for conflict resolution into a stakeholder process.

e. Structures for Engagement

There is a wide range of options for structuring stakeholder engagement in MSP. In addition to the many possible mixes of public meetings and workshops as described above, there are numerous formal structures which may be implemented to ensure stakeholder representation and involvement.

Some MSP initiatives have involved the establishment of a formal stakeholder advisory board or council, established by law with clearly defined membership and voting authority. For example, the Washington Coastal Marine Advisory Council (WCMAC) was established to facilitate stakeholder involvement in Washington State coastal and marine issues, including the development of the state's marine spatial plan. WCMAC membership includes only stakeholders, but the Council is provided administrative support by the Washington Dept. of Ecology. Other MSP initiatives have benefited from informally established entities like Rhode Island's Stakeholder Group, which was established to ensure adequate representation from all relevant sectors and interests, but which had no formal structure or mandate. Still other MSP initiatives have elected to not establish a representative stakeholder group; for example the Northeast Regional Planning Body elected not to establish a standing Stakeholder Advisory Body in part because of the planning horizon's short timeline and concerns about the lack of flexibility associated with such a group (Northeast Regional Planning Body, 2014d).

As described above, the Connecticut Blue Plan will result in the formal establishment of an Advisory Committee, which will include stakeholder representatives as well as those from governmental agencies. This Advisory Committee will be responsible for assisting in the development of the Blue Plan and conducting at least three public meetings. It is important to emphasize that this Advisory Committee gives formal legal standing to stakeholders representing the marine trades (intended to include recreational boating interests among others), conservation interests, the gas and electric distribution industry, commercial fishing, recreational fishing and hunting, commercial boating/shipping, and coastal municipalities. As noted above, additional stakeholders are also recognized in the legislation. Other states have established similar advisory committees with legal standing and comprising both stakeholder and agency members; for example, in Massachusetts an Ocean Advisory Commission (OAC), a 17-member body, including representatives from local and

regional government, the fishing and offshore energy industries, and the conservation community, which advised on Massachusetts Ocean Plan development and implementation.

It is important to emphasize that such an Advisory Committee would represent one key component of stakeholder engagement, but does not limit the range of options for additional stakeholder participation that would build upon this structure. The options below include the Advisory Committee model and other options that build upon the Advisory Committee should it be established.

f. Range of Options

While rigorous stakeholder engagement is critical for MSP, there are multiple structures that can be used to shape a stakeholder process. These range from utilization of existing stakeholder processes to developing a formal bi-state Stakeholder Advisory Group. Such a group could be formalized in a variety of ways, including, for example, formal recognition by the Connecticut Blue Plan Advisory Committee or

legislative action. It is important to emphasize that the term “advisory,” as used in this section, can in practice represent a wide range of functions, ranging from commenting on draft documents and products to actively contributing content to those products and participating in decision-making associated with them. In the latter case, stakeholders are effectively included within the core of the process — whether through direct membership within the official body managing the process as noted above for the Connecticut Blue Plan or as part of a stakeholder group that has formal recognition within the process. Stakeholder advisory groups can play a very active role in the plan development process, functioning as a working group that develops content for the plan itself.

The below table represents just a few of the many different such structures that could be applied in a LIS MSP initiative. Choice of approach may be shaped by plan structure (discussed above), expertise held within the core plan development team, and the available funds and resources available to support a LIS MSP initiative.

Table 6. Range of Options: Structures for Stakeholder Engagement

<p>OPTION 1.</p>	<p>Existing processes Stakeholder involvement through existing programs and regulatory processes. This may include utilizing existing structures such as the LISS Citizen’s Advisory Committee.</p>
<p>OPTION 2.</p>	<p>CT Blue Plan Advisory Committee and NY equivalent CT’s “Advisory Committee” is established and implements three minimally required public meetings; Through the Working Group or on its own, NY establishes a parallel advisory committee and outreach process (“NY Advisory Group”) that is formally recognized by those responsible for conducting the Blue Plan process and this is included in the Blue Plan process.</p>
<p>OPTION 3.</p>	<p>Robust stakeholder process facilitated by CT Blue Plan Advisory Committee and NY equivalent CT’s Advisory Committee and NY’s Advisory Group facilitate robust series of state-specific public meetings as well as at least one or two bi-state stakeholder workshops to facilitate input and coordination. Members of Advisory Committee and NY equivalent are actively involved in plan development process, contributing local knowledge and developing plan content.</p>

(continued)

<p>OPTION 4.</p>	<p>Informal Bi-State Stakeholder Advisory Group</p> <p>An informal (non-legislative) bi-state stakeholder group is established to facilitate cross-Sound stakeholder participation following completion of a basic stakeholder outreach & engagement plan. The body managing the plan development process informally recognizes the stakeholder group as providing input to that process. It runs and/or contributes to a series of Sound-wide interactive public meetings and workshops throughout the entire plan development process. The Group’s input to the official process includes contributing local knowledge and developing plan content. All stakeholders are welcome and included but not proactively sought. A stakeholder-friendly process to gather data and information from interested stakeholders is included to better represent stakeholder interests and gain important data.</p>
<p>OPTION 5.</p>	<p>Formal Bi-State Stakeholder Advisory Council and Stakeholder Working Groups</p> <p>A formal (e.g., official recognition by CT Blue Plan Advisory Committee or legislative action) bi-state stakeholder council is established to facilitate cross-Sound stakeholder participation following completion of a thorough stakeholder outreach & engagement plan. In addition, one or more stakeholder working groups are formally established to gather local knowledge and develop plan content. The Council runs and/or contributes to a series of Sound-wide interactive public meetings and workshops through the entire plan development process. The input of both the Council and working groups is recognized and included within the official process which results in contributing local knowledge, developing plan content and effective participation in decision-making. A diligent, pro-active effort is made to engage a wide range of stakeholders and sectors. The Council and the working groups oversee a process to gather data and information from interested stakeholders in order to better represent stakeholder interests and gain important data.</p>

5. Core Team, Science Advisory Functions and Inter-Agency Coordination

a. Key Considerations and Best Practices

Given the inherently interdisciplinary, multi-purpose nature of MSP, a key consideration is building the plan development team. As described above, stakeholders are critical for plan development and can play a central role in contributing to the plan development process, thus augmenting the plan development team. See section IV.D.4 above for detailed discussion of stakeholder engagement. Other key participants in plan development will include those directly responsible for writing the plan and facilitating the stakeholder process, as well as other agency and institutional representatives and stakeholders. This section focuses on those, other than stakeholders, who may contribute to plan development. This includes the core team of professionals responsible for developing the plan, science advisors, and the role and involvement of other agency and institutional representatives. For

this section, it is recognized that stakeholders can work alongside or with the core team, science advisors, and agency partners in the plan development process, either as advisors or direct contributors to the analysis and decision-making process of plan development.

Ehler and Douvère (2009) describe creation of the core marine spatial planning team as one of the most important pre-planning tasks. They emphasize that the team must represent a range of disciplinary backgrounds (e.g. biologists, ecologists, geographers, economists, and planners) but also point out the importance of other skills like program management, strategic planning, conflict resolution, and communications. Other important skills include facilitating the inclusion of local knowledge and building buy-in among a broad range of stakeholders. Ehler and Douvère (2009) also emphasize that not all skills need to be included within the core team, but can be obtained from other agencies, non-governmental organizations, consultants, or the university

community. Reporting on their experience developing the Rhode Island Ocean SAMP, McCann et al. (2013) underscore some of these points, emphasizing the importance of involving both university scientists and project management professionals who had prior experience with the study area and with the special area management planning process. McCann et al. also emphasize how the Ocean SAMP team comprised members of multiple institutions — Rhode Island’s state coastal management agency and multiple colleges and programs within the University of Rhode Island, as well as Rhode Island Sea Grant and the Roger Williams University School of Law Marine Affairs Institute.

Other comparable MSP efforts provide diverse examples of how a core team can be shaped. As stated above, the research, writing and stakeholder outreach required to develop the Ocean SAMP was facilitated largely through the University of Rhode Island; one benefit of this approach was that URI was respected by many government agencies, non-governmental organizations and stakeholders as transparent, objective and science-based (McCann et al., 2013). The Massachusetts Ocean Management Plan similarly benefited from a partnership with an independent non-governmental organization, the Massachusetts Ocean Partnership (now SeaPlan). The Massachusetts Ocean Partnership worked alongside staff at the Massachusetts Office of Coastal Zone Management to facilitate stakeholder engagement, thus augmenting the plan development team. The Washington State MSP initiative is also relying, to some extent, on external partners; for example, the lead agency, Washington State Dept. of Ecology, contracted Washington Sea Grant to facilitate the stakeholder outreach and engagement process (Trosin, 2013). Last, both the NE and the MidA RPB are perhaps the best examples of engaging multiple agencies and organizations in forming a core team. Both RPBs are completing their work with strong staffing and technical assistance from the relevant regional ocean partnerships, and through a series of subcontracts issued to universities, non-governmental organizations, professional facilitators, and consultants for performing various necessary scientific research, data management, and outreach and communications tasks.

A second consideration is to provide both the core team and stakeholders with access to expert scientific advice. Some form of a scientific advisory function may help enhance scientific identification, characterization, and analysis of natural resources, human uses and future activities; advise how best to use existing data and fill data gaps; and advise on whether or how to identify important ecological and human use areas. Other MSP initiatives provide examples of the various ways in which to do this. For example, an Ocean Science Advisory Council was established to support the development of the Massachusetts Ocean Management Plan; this group comprised scientists from universities, government agencies, environmental non-governmental organizations and private consulting firms. In another example, the Rhode Island Ocean SAMP assembled a Science Advisory Task Force, similar to Massachusetts’s Ocean Science Advisory Council, as well as topic-specific Technical Advisory Committees (TAC) for each component of the SAMP. For example, the fisheries TAC included government agency representatives and university scientists with specific fisheries science and ecological expertise, as well as numerous commercial and recreational fishermen. It is important to emphasize that all TACs assembled for the SAMP included stakeholders working alongside core team members and science advisors, and in many cases, these stakeholders made substantive contributions to the data collection, analysis, and policy development process. SAMP team members report that the topic-specific TACs proved to be especially useful in SAMP development (McCann pers. comm. 2014). Key institutions which could offer science advisory support for a LIS MSP initiative include but are not limited to the University of Connecticut, Stony Brook University, and the Connecticut and New York Sea Grant programs; the Connecticut Blue Plan specifies a leadership role for UConn in convening a LIS Inventory and Science subcommittee and coordinating the completion of a LIS Resource and Use Inventory (see Appendix III). The new Connecticut Institute for Resilience and Climate Adaptation (CIRCA) and the University of Connecticut’s Center for Land Use Education and Research (CLEAR) are other potential partners and facilitators. Additionally the Long Island Sound Study

Science and Technical Advisory Committee could be an important resource in advising a LIS MSP initiative.

A third critical element is involving and coordinating with other government agencies, programs and initiatives. Given the numerous jurisdictional overlaps and gaps that characterize marine governance in U.S. waters (e.g. Young et al., 2007), including Long Island Sound, this is a critical component of MSP. Comparable MSP initiatives in nearby areas provide a number of examples of how best to do this. As stated above, the NE and MidA RPBs deal with this primarily through their membership, which per the National Ocean Policy, comprises representatives from all relevant federal departments, state and tribal governments, and the regional fishery management councils. Some state plans have facilitated this in part by establishing state advisory groups comprising representatives from multiple state and municipal agencies. For example, the Massachusetts Ocean Management Plan was guided in part by the Massachusetts Ocean Advisory Commission, which included some stakeholders as well as several legislators, state agency representatives, and municipal and regional government representatives. Additional coordination with state and federal agencies was managed by the plan development team. By contrast, as discussed above the Rhode Island Ocean SAMP assembled Technical Advisory Committees (TAC) for each SAMP chapter, and each TAC included representatives from relevant state and federal agencies. For example, the fisheries TAC included representatives from the Rhode Island Dept. of Environmental Management, the NOAA National Marine Fisheries Service, the NE Fisheries Management Council, and the Atlantic States Marine Fisheries Commission (RI Coastal Resources Management Council, 2010). TACs were engaged on an ongoing basis in the development of each chapter, and in some cases invited to chapter development workshops or to review draft sections prior to chapter completion.

For a LIS MSP initiative, key government agencies and institutions with which to coordinate will include both the NE and MidA RPB efforts; the Connecticut Blue Plan legislation specifies the need to coordinate with the Northeast RPB. The Long Island Sound Study,

coordinated by the EPA, is another critical partner explicitly acknowledged by the Blue Plan. Other federal agencies that may be particularly important include but are not limited to NOAA, which has played a leadership role in the regional planning efforts pursuant to the National Ocean Policy, as well as FERC, USACE, EPA, USCG, and others with regulatory authority in LIS. State agencies that should be integrated include other Connecticut and New York agencies with authority in LIS; for example the Connecticut Blue Plan specifies that the Connecticut Dept. of Transportation, Dept. of Agriculture and Connecticut Siting Council should be formally included as members on the Advisory Committee. Last, Connecticut and New York coastal municipalities are especially important given that both Connecticut and New York are home rule states, and coastal residents are critically important stakeholders in LIS; the Connecticut Blue Plan legislation specifies that two municipal representatives be included on the Blue Plan Advisory Committee.

b. Range of Options

For LIS, the Connecticut Blue Plan prescribes a structure that would provide a starting point for establishing a core team, science advisory functions and interagency coordination. While this specifies Connecticut-specific arrangements, New York may choose to develop similar structures to facilitate coordination with Connecticut. The Blue Plan specifies the leadership role that Connecticut DEEP and UConn will play in leading plan development and developing the Resource and Use Inventory, and calls for the development of an Advisory Committee which would address, to some extent, science advisory and interagency coordination as well as stakeholder representation needs (see Appendix III). The below range of options provide a sample of ideas for how different combinations of core team members, science advisors, agency staff and stakeholders might be assembled to support a LIS MSP process. Most options include the Blue Plan structure summarized above. A separate range of options for stakeholder engagement is provided in Section IV.D.4 above, providing much more detail on the various ways stakeholder engagement can be structured. It is important to emphasize that the term “advisory,” as

Table 7. Range of Options: Core Planning Team and Advisory Functions

<p>OPTION 1.</p>	<p>Core Team A core CT planning team is established following Blue Plan structure (CT DEEP leads plan development; UConn leads Resource and Use Inventory; Advisory Committee includes many key agencies and stakeholders). NY assembles a parallel team and advisory structure. Both states utilize LISS, NE RPB, and MidA RPB to support advisory functions. Additional staff or consultants would be utilized by agencies or universities as needed and only if funding were secured.</p>
<p>OPTION 2.</p>	<p>Core Team and Stakeholder Advisory Group In addition to Option 1 (the CT Blue Plan dictates basic CT leadership and advisory structure and equivalent leadership and advisory functions are established in NY), a Stakeholder Advisory Group (SAG) is formed to provide input to the CT Advisory Committee and NY planners. The SAG may be a bi-state group with arrangements made for both bi-state and individual meetings to minimize travel costs.</p>
<p>OPTION 3.</p>	<p>Core Team, Stakeholder Advisory Group, and topic-specific technical advisory groups In addition to Options 1 and 2 (the CT Blue Plan dictates basic CT leadership and advisory structure; equivalent leadership and advisory functions are established in NY; and a Stakeholder Advisory Group is established), topic-specific technical advisory groups are formed to provide in-depth assistance on specific LIS MSP topics (e.g. fisheries; habitat; marine transportation; recreation). Advisory groups may include scientific and technical experts as well as key stakeholders, and can either advise planning staff or function as work groups, helping staff generate content.</p>
<p>OPTION 4.</p>	<p>Core Team, Stakeholder Advisory Group and Science Advisory Group In addition to Options 1 + 2 (the CT Blue Plan dictates basic CT leadership and advisory structure and equivalent leadership and advisory functions are established in NY, and a Stakeholder Advisory Group informs these groups), a formal Science Advisory Group is formed to complement other advisory functions. Group includes scientists representing government, universities, and NGOs and may help enhance scientific and technical components of planning process. Advisory groups can either advise planning staff or function as work groups, helping staff generate content.</p>

used in this section, can in practice represent a wide range of functions, ranging from commenting on draft documents and products to actively contributing content to those products and participating in decision-making associated with them.

E. Plan Elements and Content

1. Overview

Marine spatial plans can be structured and can function in many different ways depending on the planning authority, scope and scale of the planning process, and issues driving the planning process.

This section describes some of the basic components of a marine spatial plan and outlines a range of options for how each might be approached for LIS. A more precise range of options for each would ultimately be shaped by the vision, guiding principles, goals, and objectives developed for a LIS MSP process, and all of this content would be developed by the aforementioned plan development team and through a stakeholder process as outlined above.

2. Data Collection, Standardization, and Sharing

a. Overview

As MSP is, by definition, an exercise in characterizing existing natural resources and human uses of a marine area, data are critical for informing an MSP effort. The MSP approach has become prevalent in marine management in recent years due in part to technological developments that have made it easier to collect, aggregate, analyze and visualize geospatial data characterizing the marine environment (Young et al., 2007). Ehler and Douvère (2009) note that collecting and mapping information about ecological, environmental, and oceanographic conditions, as well as human activities, is an important step in the MSP process. Other key tasks include data standardization, data sharing, and presentation through multiple map products and decision support tools. These tasks are discussed in this section, and specific matters related to data characterizing ecological conditions and human activities follow in subsequent sections.

b. MSP Best Practices & Key Considerations

In their step-by-step guide to MSP, Ehler and Douvère (2009) identify a key step as “defining and analyzing existing conditions” and indicate that outputs should include inventories and maps of important biological and ecological areas and current human activities.

Steps that must be taken in order to develop such inventories and maps include collecting spatially explicit data from sources including government, scientific, and local sources. Ehler and Douvère (2009) further note that this work can be very time-consuming but that initial data collection and mapping can typically be undertaken by interagency working groups and by consulting topical experts. Because of the volume and diversity of datasets needed to inform MSP, Collie et al. (2013) and Halpern et al. (2012) note the need for clear criteria for data inclusion. Additionally, both Beck et al. (2009) and Gold et al. (2011) emphasize the need for data management processes to acquire and integrate data and ensure it is appropriate and credible. A critical part of screening and managing data from multiple different sources is applying data standards

to ensure data are of appropriate quality and are appropriately integrated and analyzed through MSP-related data processes. Given the complexity of data management tasks, many comparable MSP efforts rely on external terms of geospatial data experts to perform this work. For example, the Washington State MSP initiative contracted The Nature Conservancy and EcoTrust to develop a data catalogue as well as a website and data viewer, and the Ocean SAMP team contracted the University of Rhode Island Environmental Data Center to perform most geospatial data-related tasks.

One strategy for both data management and data sharing is to aggregate all data into a web-based data portal. A data portal is a web-based point of entry through which users can access, view and potentially interact with geospatial data. Data portals are especially appropriate for MSP because they bring together a variety of datasets on a diversity of natural resource and human use topics provided by multiple different government agencies, academic institutions, non-profit organizations, and stakeholders. Thus, a data portal helps build the integrated management approach and the inter-organizational coordination and collaboration that is the hallmark of MSP. Moreover, data portals help build public engagement in participation in MSP. While not often specified in the general MSP guidance documents, portals have been used in many MSP efforts.

For example, the NE regional planning process utilizes the [Northeast Ocean Data Portal](#), which provides access to data, interactive maps, tools, and other information needed for ocean planning and decision-making, and the Massachusetts Ocean Management Plan utilized the [Massachusetts Ocean Resource Information System \(MORIS\)](#), a web-based data portal which can be used to search and display spatial data relevant to Massachusetts coastal issues. In some cases, data portals are fully developed with interactive tools that provide stakeholders with a great deal of information as well as opportunity to offer input. For example, the [UK Marine Planning Portal](#) built in support of UK marine planning includes a mechanism for stakeholders to submit comments on draft data layers or the evidence base as a whole, as well as a means through which stakeholders can

directly contribute data layers for possible inclusion in planning; and a different webpage provides access to a map server for just two of Britain's 11 planning areas, and shows relevant data layers adjacent to relevant policy considerations for a given activity (e.g. "energy" policies and data showing existing infrastructure and possible licensing blocks). However it is important to emphasize that a data portal is not a requirement for MSP; older MSP initiatives like the Great Barrier Reef Marine Park Zoning Plan did not benefit from one, and a very simple [portal](#) developed for the Rhode Island Ocean SAMP was not actively used through the planning process.

Finally, spatial planners have many options for creating data products for use in planning and policy-making and to communicate MSP-related concepts to the general public. Data products may include thematic maps visualizing basic data on key MSP themes (e.g. fish distribution and abundance, commercial fishing areas, or commercial marine traffic areas); products showing the results of data analysis (e.g. important ecological areas identified through one of numerous screening methodologies); and a variety of interactive maps and tools. These are all different forms of decision support tools; see section IV.E.6 below for further discussion.

c. Summary of the LIS MSP Data and Information Report

The Data and Information Team (D&I Team) of the Working Group has already made significant headway in building a data and information foundation for a future LIS MSP process. This work is detailed in the team's Data and Information Report, which is attached as Appendix VIII. The D&I Team, including representatives from the states of Connecticut and New York and from key non-governmental partners, worked for over a year to perform key background tasks in support of a future LIS MSP initiative. The team sought to: (a) identify and evaluate available LIS geospatial datasets for potential use in a future Sound Marine Plan; (b) evaluate data standards to be applied to individual datasets and MSP data processes; and (c) explore options for aggregating and sharing these data through one or more publicly-accessible data portals.

As a result of this process, the team developed a comprehensive LIS MSP baseline inventory comprising 361 geospatial datasets, which together form the starting point for the data analysis that would need to be accomplished in support of LIS MSP. In developing this inventory, the team also identified a series of datasets in development as well as a few data gaps, both of which should be considered in further developing this inventory in support of LIS MSP. Second, the team recommended the adoption of the New York Geographic Information Gateway's data standards for use in standardizing all geospatial data in support of MSP. Third, the team recommended the adoption of the New York Geographic Information Gateway when it's available for use as a data portal in support of LIS MSP. This recommendation was supported by the entire LIS MSP Working Group, which includes the states of Connecticut and New York, as evidenced by a consensus statement drafted by the group (dated September 3, 2014). For further details, see the complete report in Appendix VIII.

While the New York Gateway represents an important resource for a LIS MSP initiative, it is important to emphasize that LIS planners and managers should continue to utilize and coordinate with other data portals to the extent these can be useful or augment the New York Gateway, such as the Northeast Ocean Data Portal and the Mid-Atlantic Ocean Data Portal, which offer a wealth of resources and expertise. For example, regional data products developed in connection with the NE RPB's marine life characterization could be particularly useful to a LIS MSP initiative. This inclusive approach is generally assumed in the range of options, presented below, which place significant emphasis on the New York Gateway.

d. Range of Options: Data Sharing

While data collection, management and standardization activities are likely to adhere to MSP and spatial data best practices, LIS spatial planners will have a range of options for sharing data. As discussed in the D&I Report and referenced above, the Working Group has recommended the use of the New York Geographic Information Gateway to

Table 8. Range of Options: Data Sharing

<p>OPTION 1.</p>	<p>No data portal No LIS-specific data portal is used. Geospatial data are managed internally by professional planners, but are not made available for interactive viewing by those outside the plan development team. Instead, static maps and other data products are made available. Planners continue use of other data portals including the Northeast and Mid-Atlantic data portals.</p>
<p>OPTION 2.</p>	<p>LIS Focus Area Populated The LIS Focus Area of the NY Information Gateway is populated with LIS data identified through the inventory, and MSP stakeholders can view and interact with relevant data and view static map products. The Northeast and Mid-Atlantic data portals remain important supplementary resources for LIS planners and stakeholders. This option would be similar to the Northeast Ocean Data Portal.</p>
<p>OPTION 3.</p>	<p>LIS Focus Area Developed to Support LIS MSP The LIS Focus Area of the NY Information Gateway is further developed in support of LIS MSP. In addition to existing features, this would mean posting MSP-relevant documents, map products, links, and educational and outreach materials. The Northeast and Mid-Atlantic data portals remain important supplementary resources for LIS planners and stakeholders. This option would be similar to the Mid-Atlantic Ocean Data Portal.</p>
<p>OPTION 4.</p>	<p>LIS Focus Area Developed to Support LIS MSP, Incl. Stakeholder Outreach and Education The LIS Focus Area of the NY Information Gateway is explicitly developed and promoted to support LIS MSP. In addition to existing features, this would mean posting MSP-relevant documents, map products, links, and educational and outreach materials; building in other interactive tools; and providing an interface for LIS MSP stakeholders to provide feedback. The Northeast and Mid-Atlantic data portals remain important supplementary resources for LIS planners and stakeholders. This option would be developed consistent with Great Britain’s data portal.</p>

support LIS MSP; as such, the Gateway is considered in nearly all of the below options. It should be noted that this approach, which relies on the Gateway as the foundation for a set of the options presented here, remains conceptual until and unless both Connecticut and New York State confirm it as such. Additionally, it is understood that in all circumstances, a LIS MSP initiative will benefit from ongoing use of and coordination with other data portals, such as the Northeast and Mid-Atlantic data portals.

3. Biological and Ecological Characterization and Assessment

a. Overview

A central component of any marine spatial plan is addressing and planning for the natural resources, physical processes and features and management issues of the planning area. This requires collecting the appropriate data and information; assessing and analyzing those data to address the goals and objectives of the planning process; and producing data products to inform management. This section focuses on how biological and ecological information might be characterized, assessed, and incorporated into a MSP; data products and management

decisions are discussed below in sections IV.E.6 and IV.E.7 (“Decision Support Tools” and “Planning and Policy Options”).

It is noted that Northeast Regional Planning Body set up an Ecosystem-Based Management Work Group to address the challenges and opportunities associated with biological and ecological characterization and assessment (see “NE RPB Projects” on the neoceanplanning.org website). The work of this group could be a resource to draw on for LIS MSP. There are CT and NY reps on this EBM work group. Although the group is focused on a regional scale, much of the work could benefit a LIS effort as well.

Fundamentally, a marine spatial plan must address numerous overarching ecological considerations. Importantly, these include ecosystem-based management (EBM) as a fundamental overarching approach; marine spatial planning is widely acknowledged to be a practical means of applying the EBM approach, which has long been recommended as the preferred approach to marine and environmental management (e.g. Foley et al., 2010; Young et al., 2007). Additionally, emphasizing biodiversity, Foley et al. (2010) identify four overarching ecological principles for MSP; these include maintaining or restoring: native species diversity; habitat diversity and heterogeneity; populations of key species; and connectivity among habitats and populations. The authors further advise that context and uncertainty be considered as overarching guidelines in applying these principles.

While MSP is widely considered to be a means of implementing an ecosystem approach, many existing MSP initiatives have focused on characterizing and assessing individual species and habitat features. These measures are important, but are only part of the picture; ecological features and functions work together to support the biodiversity of Long Island Sound. Individual species and habitats must be considered in combination with other factors in order to consider ecosystem interactions and, ideally, to identify areas that are ecologically important. Areas that are ecologically important may include more than those that are important for an individual species or species grouping, but may be important

for supporting marine life in general. Such areas may give rise to greater marine life concentrations and/or overall ecological integrity. For example, The Nature Conservancy’s Long Island Sound Ecological Assessment (LISEA) is an example that moves in that direction by identifying places where species continue to persist over time and in relatively high numbers of diversity and abundance.

In order to apply a comprehensive, ecosystem-based approach that addresses these principles, a marine spatial plan must also consider both spatial and temporal considerations and variability. Analysis of natural resources and habitats should consider three-dimensional space — e.g. marine as well as avian species — and connectivity between coastal habitats and marine waters. Additionally, temporal considerations are critical. These involve considering seasonality (e.g. seasonal migrations of marine and avian species) as well as the timeframe to consider when establishing baseline datasets (e.g. number of years of annual fish survey data). Finally, these include climate change and climate resilience, which is increasingly recognized to be a fundamental component of MSP (Craig, 2012; EcoAdapt, 2014).

b. Biological and Ecological Data and Key Issues

Ehler and Douvère (2009) recommend collecting data characterizing biological and ecological distributions of species and habitats, including areas known for species or biological communities, as well as data characterizing oceanographic and other physical environmental features. Spatial data are necessary to conduct spatial analysis, though additional forms of data and information will be necessary to fully characterize and contextualize the spatial data. Ehler and Douvère (2009) note that data can be drawn from diverse sources including scientific literature, expert scientific input, government sources, local knowledge, and direct field measurements.

Comparable marine spatial plans in adjacent jurisdictions have sought to characterize and address an expansive range of species, habitats and processes. For example, the Massachusetts Ocean Management Plan’s comprehensive baseline assessment addressed water column features (upwelling, fronts, and waves; riverine inputs; sea

temperature; seasonal changes; water quality; and biological features); seabed features (geomorphology; sediment transport; sediment quality; and biological features); and habitat (primary and secondary producers; benthic communities; fisheries resources, shellfish and habitat; seafood quality/chemical contaminants; avifauna; marine mammals and reptiles; invasive species; and man-made habitat mitigation and restoration) (MA Executive Office of Energy and Environmental Affairs, 2009). In another example, scientists under contract with the NE RPB are currently undertaking a [marine life characterization](#) that is focused on marine mammals and sea turtles, marine birds, finfish, and shellfish (Northeast Regional Planning Body, n.d.). This project is one important example of regional data products that could directly inform LIS MSP — species distribution and abundance data and map products will include Long Island Sound, and LIS planners could draw from or build upon this information in developing a Sound Marine Plan.

The estuarine waters of Long Island Sound are nursery and feeding grounds for over 100 species of resident and migratory fishes. To develop a LIS marine spatial plan, data and information will be important for characterizing these and other species and habitats; the physical oceanography and biochemistry of the Sound; pollutants in the Sound; and other key ecological conditions. The LIS MSP Working Group's Data and Information Report and baseline data inventory (Appendix VIII) report progress made to date in identifying appropriate data sets. These documents highlight the wealth of data available and under development characterizing the biological and ecological elements of LIS. Whereas more data are always needed to improve planning and management (e.g. data in hard-to-sample areas such as the rocky and coarse bottom habitats of eastern and western LIS), existing data provide a strong foundation with which to launch a LIS MSP initiative.

Additionally a plan may focus in particular on one or more Sound management issues. For example, many LIS management issues focus on organisms' response to stresses such as commercial and recreational fishing and shellfishing, eutrophication, hypoxia, habitat degradation, invasion of non-native

species, ocean acidification, and climate change. Other management issues include the ongoing challenge of managing LIS lobsters following the 1999 die-off; declining tidal wetlands and the need to consider wetlands retreat and restoration options; declining seagrass beds; increasing harmful algal blooms; managing legacy industrial waste (e.g. bioaccumulation of toxins); and the decreasing gradient from east to west of spatial patterns of abundance and biomass of various planktons in association with eutrophication and hypoxia. A LIS marine spatial plan may also pay particular attention to overarching climate change and climate resilience-related considerations given the vulnerability of Sound natural resources, as well as coastal communities and economies, to climate disruptions including warming waters, ocean acidification, sea level rise, and an increase in high-intensity coastal storms and flooding events. The management issues addressed through a Sound Marine Plan would be guided by plan goals and objectives, developed by the two states, ideally with the support of a transparent stakeholder-driven process.

Last, a LIS MSP process may provide a means of addressing other LIS ecologically-related management objectives or supporting other initiatives that could ultimately benefit the Sound. For example, a LIS MSP initiative could support items in the draft update of the Long Island Sound Study Comprehensive Conservation and Management Plan including outcome 4-1, "The scientific understanding of Long Island Sound to support management is increased through strengthened research, monitoring, assessment, mapping, and modeling," and implementation action SM-3, "Complete Seafloor Mapping under the Sound Cable Fund" (Long Island Sound Study, 2014b). In doing so, LIS MSP could draw upon much of the science already generated in connection with the Long Island Sound Study; examples include the Long Island Sound Stewardship Initiative Stewardship Atlas (Long Island Sound Study, 2006) and Sound Health (Long Island Sound Study, 2012). Additionally, an MSP initiative could support priorities identified in the 2015 Northeast Regional Association of Coastal and Ocean Observing Systems (NERACOOS) five-year

strategic plan (Northeast Regional Association of Coastal Ocean Observing Systems, 2011).

c. Approaches to Biological and Ecological Characterization and Analysis

Once data are collected, they can be aggregated, assessed and analyzed in a variety of ways to support a marine spatial plan. Ehler and Douvere (2009) recommend that data be used to create an inventory and maps of important biological and ecological areas. In practice, marine spatial planners have employed a range of approaches to incorporating ecological data and information into the plan and associated management measures. A best practice is that important ecological areas should be identified through a transparent public process that enables stakeholders to understand how and why these areas were selected and prioritized.

One approach is to simply use MSP to develop a comprehensive **characterization** detailing the state of existing knowledge about the planning area. For example, the Rhode Island Ocean SAMP document includes three chapters, “The Ecology of the SAMP Area,” “Global Climate Change” and “Commercial and Recreational Fisheries,” with scientific summaries developed by University of Rhode Island scientists. Each chapter includes descriptions, based on peer-reviewed and technical data and information, summarizing the best available knowledge on the planning area. Data are presented in text descriptions, accompanied by tables and figures as well as maps visualizing key datasets and features. Similarly, the Massachusetts Ocean Management Plan is accompanied by a “Baseline Assessment,” with chapters covering water column and seabed features, habitat, and climate change, which was meant to “catalogue the current state of knowledge” regarding these activities. When finished, the summary product of the NE RPB’s marine life characterization may represent a more focused version of this approach.

A characterization may also inform conducting an **assessment** of the planning area. This means taking the summary state of knowledge to the next level by using it to identify patterns, trends, data gaps and research needs, management issues meriting

attention, or areas of conflict and compatibility. The MidA RPB’s planned Regional Ocean Assessment is intended to result in these outcomes (Mid-Atlantic Regional Planning Body, 2014b).

A step to take beyond characterization and assessment is to use baseline ecological information to identify important ecological areas. There are numerous ways to identify **important ecological areas**, and methodologies vary significantly depending on the available data and the resources and habitats being considered. In 2014 the NE RPB produced a comprehensive review of available methods to identify important ecological areas (see Northeast Regional Planning Body, 2014b). The authors distinguish between those utilizing Tier 1 (maps based on species observations alone) and Tier II products (based on species observations plus habitat information). Additionally they define a continuum between scientific and policy-driven approaches, noting that the scientific approach is typically more quantitative and utilizes overlays of Tier I and/or Tier II data products to define species hotspots; they highlight New York State’s biogeographic assessment conducted as part of the 2012 Atlantic Ocean Study (New York Department of State, 2013) as an example of this. A second scientific approach utilizes Tier 1 and/or Tier II data products, along with research, to define criteria beforehand and then to use this to define important areas; they highlight The Nature Conservancy’s Northwest Atlantic Marine Ecological Assessment as an example of this. The authors describe a third, policy-driven approach, in which Tier I and/or Tier II data products are interpreted to identify ecological areas according to a management criteria or need; they highlight the methods used to develop the Special, Sensitive or Unique (SSU) habitats within the Massachusetts Ocean Management Plan as an example of this.

It is notable that both Massachusetts and Rhode Island initiated some form of ecological valuation assessment in connection with their planning efforts, but did not ultimately use the outputs of these in the final plans. Rhode Island contracted Applied Science Associates (ASA) to model and map the non-economic ecological value of marine biological

resources in the Ocean SAMP area; this approach is a dimensionless weighting or ranking of ecological importance based on existing data. Utilizing a similar approach Massachusetts explored and tested methods of modeling areas of high ecological value and produced Ecological Valuation Index (EVI) maps. Neither Massachusetts nor Rhode Island managers found the outcomes of these approaches to be appropriate for management purposes; for further information see Northeast Regional Planning Body (2014a).

These same efforts, the Rhode Island Ocean SAMP and the Massachusetts Ocean Management Plan, ultimately identified important ecological areas utilizing the third, policy-driven approach toward interpreting ecological data. The Massachusetts Ocean Plan identified 12 species- or habitat-based SSUs prioritizing habitat for several whale and marine bird species; hard/complex seafloor; eelgrass; intertidal flats; and important fish resource areas; and the Rhode Island Ocean SAMP identified Areas Designated for Preservation (e.g. sea duck foraging habitat) and Areas of Particular Concern (e.g. moraines as a habitat for multiple species). For further information see Northeast Regional Planning Body (2014b). It is important to emphasize that Massachusetts and Rhode Island important areas were determined, for the most part, utilizing existing data, which is a relatively cost-effective approach. Additionally, it should be emphasized that these states' efforts to determine how best to identify important ecological areas illustrate both the challenge and the importance of developing ecological models that can be utilized for management purposes.

As noted above, the topic of decision support tools (e.g. maps based on information discussed here) and management options (e.g. how important areas may be managed or protected) are discussed below.

d. Range of Options

LIS marine spatial planners have a range of options for how best to approach ecological content. These range from basic characterization (summarizing existing ecological data) to assessment (drawing conclusions based on data) to the identification of important ecological areas using one of many different methods. The below table represents just a few of the many different ways these options could be applied in a LIS MSP initiative. The word "comprehensive" is not meant literally and should be understood to mean a broad and inclusive approach that encompasses what is reasonable and possible for a marine spatial plan. Choice of approach may be shaped by the capacity available and the ultimate authority the plan will have.

In all cases, the states of Connecticut and New York may choose to work separately or together, depending on the plan structure (discussed above in Section IV.A), though ecological content will be most effectively approached in a coordinated manner to reflect the integrated ecosystem of Long Island Sound. It is important to emphasize that all of these options are intended to inform the management of LIS. The extent to which these tools are used would depend on plan structure as well as the specific planning and policy options pursued through the marine spatial plan; see Section IV.E.7, Planning and Policy Options, below for detailed discussion.

Table 9. Range of Options: Approaches to Ecological Content

<p>OPTION 1.</p>	<p>Focused characterization of select key resources</p> <p>CT and NY develop a characterization of select key ecological resources in the Sound. Characterization is a written narrative, based on scientific and technical literature, accompanied by thematic maps. This focused characterization could comprise the “LIS Resource and Use Inventory” described in the Blue Plan. This would be similar to the focused nature of the NE RPB’s marine life characterization. The benefit of this approach would be developing one authoritative document summarizing scientific information focused on some of the important LIS resources and issues.</p>
<p>OPTION 2.</p>	<p>Comprehensive characterization of ecological resources</p> <p>CT and NY develop a comprehensive characterization encompassing ecological resources in the Sound. Characterization is a written narrative, based on scientific and technical literature, accompanied by thematic maps. This characterization could comprise the “LIS Resource and Use Inventory” described in the Blue Plan. This would be similar to the comprehensive nature of the MA baseline assessment. The benefit of this approach would be developing one authoritative, comprehensive document summarizing the best available existing scientific information about LIS.</p>
<p>OPTION 3.</p>	<p>Comprehensive ecological assessment</p> <p>CT and NY further develop an ecological assessment based on the comprehensive ecological characterization of Option 2. The assessment builds upon the written narrative and maps described in Option 2, and identifies key ecological insights, long-term trends, data gaps and research needs, issues meriting priority attention, and areas of conflict or compatibility. This assessment could build upon the “LIS Resource and Use Inventory” described in the Blue Plan. The benefit of this approach would be developing one authoritative, comprehensive document summarizing the best available existing information and shaping research needs and priorities moving forward. This process would be guided by input from stakeholders and scientific advisors.</p>
<p>OPTION 4.</p>	<p>Focused identification of some important ecological areas</p> <p>In addition to Option 3 (comprehensive ecological assessment including maps), CT and NY identify some important ecological areas in the Sound. Focused analysis can address specific LIS priorities (e.g. protected species) and employs the approach used by the MA Ocean Management Plan and the RI Ocean SAMP. Identification of important areas may be accomplished utilizing either a scientific- or a policy-driven approach as described above; choice of method would be shaped by available budget and guided by input from stakeholders and scientific advisors.</p>
<p>OPTION 5.</p>	<p>Comprehensive identification of important ecological areas</p> <p>In addition to Option 3 (comprehensive ecological assessment including maps), CT and NY conduct a comprehensive assessment whose purpose is to identify important ecological areas within the Sound. Identification of important areas may be accomplished utilizing either a scientific- or a policy-driven approach as described above; choice of method would be shaped by available budget and guided by input from stakeholders and scientific advisors.</p>

4. Human Use Characterization and Assessment

a. Overview

An additional, fundamental component of any marine spatial plan is addressing and planning for the human uses and associated management issues of the planning area. This requires collecting the appropriate data and information; assessing and analyzing those data to address the goals and objectives of the planning process; and producing data products to inform management. Spatial data are necessary to conduct spatial analysis, though additional forms of data and information are necessary to fully characterize and contextualize the spatial data. This section focuses on how human information might be characterized, assessed, and incorporated into a MSP. Data products and management decisions are discussed separately in sections IV.E.6 and IV.E.7 below (“Decision Support Tools” and “Planning and Policy Options”).

As with biological and ecological resources, integrating human uses into MSP requires a comprehensive approach that considers the historic, cultural and economic aspects of these uses and the connectivity of human uses with adjacent ports, harbors, and coastal communities. Additionally, the spatial and temporal heterogeneity of human uses must be considered; in particular, this includes seasonal variations in activities, such as recreational boating, and areas of concentrated high-intensity use, such as commercial shipping.

b. Human Use Data and Key Issues

As part of defining and analyzing existing conditions, Ehler and Douvere (2009) recommend collecting spatial information and developing an inventory and maps of current human activities. Developing high-resolution data layers and maps characterizing human uses of marine waters is a relatively new activity (Dalton, 2001; St. Martin & Hall-Arber, 2008) and methods and approaches are rapidly developing. In general, human uses are characterized by spatial data identifying specific locations, routes, or polygons where infrastructure exists or where human activities take place over a given time period.

MSP initiatives in adjacent jurisdictions have placed significant emphasis on human use mapping, characterizing a wide range of human activities utilizing a combination of pre-existing data sources and original data collection. For example, the Rhode Island Ocean SAMP team collected spatial and accompanying quantitative and qualitative data and information characterizing cultural and historic resources including submerged shipwrecks and indigenous cultural resources; commercial and recreational fishing; recreation and tourism (recreational boating; offshore sailboat racing; offshore diving; offshore wildlife viewing; and cruise ship tourism); and marine transportation, navigation, and infrastructure (high-density marine traffic areas; shipping lanes, anchorages and other charted features; passenger ferry routes; Navy restricted areas; and locations of unexploded ordnance). In another example, the NE RPB has been working to expand and refine many human use data sets, also addressing the general categories of cultural resources, fishing, recreation, and marine transportation, while also investigating aquaculture and energy-related infrastructure in the planning area. The NE RPB’s ongoing work in this area, such as its current [recreational use study](#), presents another example of data that planners could build upon in developing a Sound Marine Plan. One key difference is whether a marine plan addresses shoreside infrastructure human uses and infrastructure; for example, the Rhode Island Ocean SAMP included a map of historic landmark buildings on Block Island because of the prospect of offshore wind, but did not systematically map all relevant human uses of adjacent coastlines.

Long Island Sound is an intensively-used body of water with a long history of human activities. To develop a Sound Marine Plan, data and information should be collected to the extent possible on uses including, but not limited to, commercial fishing; shipping and ports; recreational boating, fishing, diving, and wildlife viewing; military uses; aquaculture; underwater archaeology; marine research and environmental education; communication cables; energy pipelines; dredging and dredge disposal; marine energy generation;

aggregate (sand) extraction; marine pharmaceuticals; other marine products (e.g. seaweed, marine biofuels); restoration; and tribal cultural practices. Additional considerations may include shore-based recreation as well as ecosystem services such as storm protection and sewage disposal. Additionally a plan may focus in particular on one or more Sound management issues. Management issues related to current human activities might include natural gas pipelines, oil/fuel spills, identified alternatives for dredged disposal, etc.

c. Approaches to Human Use Characterization and Analysis

Once human use data are collected, they can be aggregated, assessed and analyzed in a variety of ways to support a marine spatial plan. Approaches for characterizing and analyzing individual human uses vary considerably based on the type of use and associated data; for example, recreational uses might be mapped using a survey and participatory GIS approach, such as has been used by the MidA and NE RPBs, whereas commercial marine traffic can be mapped and analyzed using Automatic Identification System (AIS) data. However, in general, the approaches to human use characterization and analysis follow the same continuum as with ecological data above. A best practice is that important human use areas should be identified through a transparent public process that enables stakeholders to understand how and why these areas were selected and prioritized.

One approach is to **characterize** human uses by simply compiling the current state of knowledge about these uses in the study area. This involves reviewing available scientific and technical literature and may also require conducting stakeholder interviews, and results in a written narrative, accompanied by tables, figures, and basic static maps. This approach was employed in part through the Rhode Island Ocean SAMP, which devoted separate chapters to cultural and historic resources, commercial and recreational fisheries, marine transportation, and recreation and tourism. In the case of fisheries, marine transportation, and recreation, the SAMP team conducted one-on-one and small group interviews with key stakeholders to

supplement the published information on these topics, and in many cases conducted participatory GIS analyses with those stakeholders (McCann pers. comm. 2015). As with ecological data, a second option is to further develop a baseline characterization into an **assessment**, by using the current state of knowledge to identify patterns, trends, data gaps and research needs, management issues meriting attention, or areas of conflict and compatibility. For example, the NE RPB is facilitating the characterization and mapping of multiple human uses in a baseline assessment.

A third step is to **identify important human use areas**. Approaches to this vary by necessity based on the type of human use and the source and quality of available data. For example, areas important for navigation are easily identified through a combination of charted shipping lanes and other features and an analysis of available AIS data; both data sources are widely considered credible and an appropriate basis for decision-making. By contrast, identifying important commercial fishing areas is more difficult due to a variety of factors; see

(2013) for progress a team funded by the NE RPB has made in improving fisheries mapping. In some cases, computer-based decision support tools such as Marxan and MarineMap have been used to facilitate this level of analysis; see section IV.E.6 below for extensive discussion of such tools. There does not appear to be a set of agreed-upon methodologies for scientifically determining important human use areas; rather, evidence suggests that most important human use areas in MSP are identified to explicitly address policy objectives.

For example, the Rhode Island Ocean SAMP prioritized the identification of important human use areas; these include a series of Areas of Particular Concern including but not limited to areas of importance for recreational boating, sailboat racing, diving and wildlife viewing (based on participatory GIS-based datasets); marine transportation (based on charted features and AIS data); and historic and cultural areas (based on an assessment of shipwrecks and archaeological and historical sites. The Massachusetts Ocean Management Plan also

identified important commercial fishing, recreational fishing, commercial ship traffic, and recreational boating activity areas, though did not formally designate them as protected areas (see Planning and Policy Options discussion below).

d. Range of Options

LIS marine spatial planners have a range of options for how best to approach human use content. These range from basic characterization (summarizing existing data) to assessment (drawing conclusions based on data) to the identification of important areas using one of many different approaches. The below table represents just a few of the many different ways these options could be applied in a LIS MSP initiative. As noted above, the word “comprehensive” is not meant literally and should be understood to mean a broad and inclusive approach

that encompasses what is reasonable and possible for a marine spatial plan. Choice of approach may be shaped by the capacity available and the ultimate authority the plan will have.

In all cases, the states of Connecticut and New York may choose to work separately or together, depending on the plan structure (discussed above in section IV.A.1), though human use content will be most effectively approached in a coordinated manner. It is important to emphasize that all of these options are intended to inform the management of LIS. The extent to which these tools are used in management would depend on plan structure as well as the specific planning and policy options pursued through the marine spatial plan; see section IV.E.7 below for detailed discussion.

Table 10. Range of Options: Approaches to Human Use Content

<p>OPTION 1.</p>	<p>Focused characterization of select key human uses CT and NY develop a characterization of select key human uses in the Sound. Characterization is a written narrative, based on scientific and technical literature, accompanied by thematic maps. This characterization could comprise the “LIS Resource and Use Inventory” described in the Blue Plan. The benefit of this approach would be developing one authoritative document summarizing scientific information focused on important LIS uses and issues.</p>
<p>OPTION 2.</p>	<p>Comprehensive characterization of human uses CT and NY develop a comprehensive characterization encompassing all human uses in the Sound. Characterization is a written narrative, based on scientific and technical literature, accompanied by thematic maps. This characterization could comprise the “LIS Resource and Use Inventory” described in the Blue Plan. The benefit of this approach would be developing one authoritative, comprehensive document summarizing the best available existing human use information about LIS.</p>
<p>OPTION 3.</p>	<p>Comprehensive human use assessment CT and NY further develop a human use assessment based on a comprehensive characterization (Option 2). The assessment builds upon the written narrative and maps described (Option 2) and identifies key human use insights, long-term trends, data gaps and research needs, issues meriting priority attention, and areas of conflict or compatibility. This assessment could build upon the “LIS Resource and Use Inventory” described in the Blue Plan. The benefit of this approach would be developing one authoritative, comprehensive document summarizing the best available existing information and shaping research needs and priorities moving forward. This process would be guided by input from stakeholders and scientific advisors.</p>

(continued)

<p>OPTION 4.</p>	<p>Focused identification of some important human use areas</p> <p>In addition to Option 3 (comprehensive assessment including maps), CT and NY identify some important human use areas in the Sound. Focused analysis can address specific priorities (e.g. recreational boating). This employs the approach used by the MA Ocean Management Plan. Method of identifying important areas will vary according to the human use being assessed and would be shaped by available budget and guided by input from stakeholders and scientific advisors.</p>
<p>OPTION 5.</p>	<p>Comprehensive identification of important human use areas</p> <p>In addition to Option 3 (comprehensive assessment including maps), CT and NY conduct a comprehensive assessment whose purpose is to identify important human use areas within the Sound. This would employ the approach used by the RI Ocean SAMP. Methods of identifying important areas will vary according to the human use being assessed, would be shaped by available budget and guided by input from stakeholders and scientific advisors.</p>

5. Potential Future Uses

a. Overview and Best Practices

A key objective of most marine spatial plans is to identify and plan for potential future uses and scenarios. Ehler and Douvere (2009) identify a key step in marine spatial planning as defining and analyzing future conditions. They recommend a comprehensive approach to the future which includes developing a trend scenario based on present conditions, alternative spatial sea use scenarios to illustrate how the area might look under different sets of goals and objectives, and a preferred scenario that management measures are intended to help achieve. They note that one purpose of MSP is to help envision and create a desirable future, and to facilitate proactive decision-making in the short run to move toward that future state.

In practice, many marine planners seem to take a more focused approach by addressing one or a few specific future uses or considerations, and in many cases designating preferred or priority use areas for such future uses. The goal of designating these areas is to eliminate or minimize conflict. For example, Oregon’s recent marine spatial planning was in practice an update to the state’s existing territorial sea plan to explicitly identify the prospect of offshore renewable energy, and the Rhode Island Ocean SAMP and the Massachusetts Ocean Management Plan both placed particular focus on potential future offshore wind development. All three plans resulted

in the designation of areas preferred for such development and the Rhode Island plan included a series of new policies and regulations for permitting offshore renewable energy in state waters. The NE RPB is considering future renewable energy development as well as aquaculture in federal waters and sand and gravel mining for beach replenishment.

By contrast, the UK adopts a more future-oriented approach to marine planning. For example the 2014 “East Inshore and East Offshore Marine Plans” include a 20-year vision for the plan areas and includes broad consideration and detailed policies addressing a range of expanding existing and potential future uses and activities, including defense, oil and gas, offshore wind energy, tidal stream and wave energy, carbon capture and storage, ports and shipping, dredging and disposal, aggregates, subsea cabling, fisheries, aquaculture, and tourism and recreation (UK Department for Environment Food and Rural Affairs, 2014).

b. Long Island Sound Future Use Considerations

A LIS marine spatial plan might consider a wide range of potential future uses and associated management issues. These can include future proposed aquaculture-related projects (e.g. seaweed for biofuels or structural (non-bottom) shellfish aquaculture); additional energy and telecommunications transmission cables and pipelines; new or expanded commercial navigational routes and facilities; new energy projects and proposals (e.g. LNG or

hydrokinetic electricity generation); new facilities for disposal or beneficial re-use of dredged material (e.g. containment islands, confined disposal facilities, dredged material processing facilities); or new infrastructure projects (e.g. a bridge or tunnel for rail or vehicle traffic). They can also include conditions related to the impacts of climate change (e.g. sea level rise reclaiming coastal lands; depletion of sand supply needed for beach replenishment; warming waters and acidification magnifying bioavailability of toxic chemicals and releasing nitrogen into LIS; or other unanticipated climate-related effects), future regional growth and increased demand on Sound resources for food production; or other large-scale environmental change. Any proposed future uses may conflict with traditional existing fishing, boating, navigational or bottom-culture aquaculture uses depending on where they are located and, in some cases, when they take place. In addition to spatial and temporal incompatibility the visual impact of new facilities may be considered significant.

c. Range of Options

LIS marine spatial planners have multiple options to choose from in approaching future uses. These range from focused analysis on one particular future use, to

targeted focus on a few key potential future uses, to comprehensive assessment of future scenarios for LIS uses and activities. The below table represents just a few of the many different ways these options could be applied in a LIS MSP initiative. As noted above, the word “comprehensive” is not meant literally and should be understood to mean a broad and inclusive approach that encompasses what is reasonable and possible for a marine spatial plan. Choice of approach may be shaped by whether or to what extent a specific urgent issue drives an official LIS MSP process; available capacity; and the ultimate authority of the plan.

In all cases, the states of Connecticut and New York may choose to work separately or together, depending on the plan structure (discussed above in section IV.A.1), though future uses will be most effectively approached in a coordinated manner to reflect the integrated MSP approach. It is important to emphasize that all of these options are intended to inform the management of LIS. The extent to which these tools are used in management would depend on plan structure as well as the specific planning and policy options pursued through the marine spatial plan; see section IV.E.7 below for detailed discussion.

Table 11. Range of Options: Approaches to Future Uses

<p>OPTION 1.</p>	<p>Narrow focus on one future use CT and NY focus their future orientation on one specific future use that they see as most likely in the near-term (e.g. new forms of aquaculture or energy transmission, alternatives for open water disposal of dredged material). Plan seeks to identify potential areas for these future uses and/or develop targeted recommendations. This requires agreement on one future issue but may be beneficial insofar as it can help focus and build a constituency for a planning effort. This would resemble, to some extent, the Oregon Territorial Sea Plan update’s focus on renewable energy. Plan can later be adapted to respond to other future uses.</p>
<p>OPTION 2.</p>	<p>Targeted focus on a few key future uses and issues CT and NY prioritize a few key future uses and issues. Planning process may include identifying potential areas for these uses and/or developing targeted recommendations. Plan may focus data collection and analysis efforts around these issues and assemble new or integrating existing working groups for ongoing work on these topics. This is similar to the approach currently utilized by the NE RPB.</p>

(continued)

Comprehensive future use scenarios

CT and NY undertake a comprehensive analysis to project the demand for a wide range of future uses and expansion of existing uses, and develop alternative scenarios based on these projections. Planners could also identify a preferred future spatial use scenario, as recommended by Ehler and Douvere, which would specify a desired future state of LIS.

6. Decision Support Tools

a. Overview and Key Considerations

The term “decision support tools” refers here to the types of data, information and tools that are needed to guide the direction and decisions of both the planning process and plan implementation. This ranges from static map products that help visualize data, to analytical methods such as conflict or compatibility analysis, to interactive computer- or web-based tools. Given the inherently integrated, multi-objective nature of marine spatial planning, decision support tools are essential to help marine planners achieve basic MSP goals and objectives. As discussed above, key steps in MSP, following the collection of ecological and human use data, may include analyzing data to identify important ecological or human use areas. Additional analytical steps may include identifying conflicts and compatibility between existing uses and between uses and the environment, and developing and evaluating alternative management measures. Decision support tools are essential for helping planners achieve all of these goals. The Center for Ocean Solutions’ *2011 Decision Guide: Selecting Decision Support Tools for Marine Spatial Planning* notes that decision support tools can aid planners in the following planning steps: data management; mapping and visualization; alternative scenario development and analysis; management measure option proposal; and adaptive management and evaluation. Importantly, they point out that some decision support tools can also aid in stakeholder participation, collaboration, and community outreach and engagement. This guide also includes a comprehensive review and assessment of decision support tools for MSP; for further information see Center for Ocean Solutions (2011). There is an

enormous range of decision support tools; this section focuses on the tools that have been most widely used in MSP and that could be of use in a LIS marine spatial plan.

The most basic type of decision support tool is **data and information** in any form. These data do not necessarily need to be represented visually to help support decision-making. A comprehensive baseline characterization or assessment, as described above in discussion of ecological and human use data, can achieve this goal. For example, one of the key objectives of the Rhode Island Ocean SAMP in developing comprehensive summaries of scientific knowledge was to provide state decision-makers with improved information for making decisions in the offshore environment; prior to the SAMP, no such document existed about Rhode Island’s offshore waters.

A second type of decision support tool is the development of **maps** visualizing basic information about key resources and uses. GIS analysts can identify the best available datasets and use them to depict important planning area themes (e.g. commercial fishing; fish abundance and distribution) in an easily intelligible format. Additionally, analysts can create maps depicting important ecological or human use areas determined through one of the approaches discussed above.

The importance and utility of such simple maps should not be underestimated. Such maps can be presented in static form, as PDF documents, or can be viewed through an interactive data portal (below). These maps provide planners, stakeholders and even potential future project applicants or developers with simple visual references that can enhance their understanding of the study area. For example, the

Rhode Island Ocean SAMP, which did not rely heavily on an interactive data viewer, produced a series of such maps, and Ocean SAMP leaders describe how showing a map depicting Navy submarine lanes to a prospective project developer played a role in discouraging the developer from pursuing a development in this area of potential conflict.

A third type of decision support tool is some form of **conflict/compatibility analysis**. This approach is widely recommended in MSP guidance documents; for example, Ehler and Douvere (2009) identify this as a key component of assessing existing conditions, and provide an example matrix identifying compatibilities, probable compatibilities, and incompatibilities between a range of human activities. A similar type of exercise was conducted for the Massachusetts Ocean Management Plan; a “Compatibility Determination” was developed, including an overarching compatibility matrix considering natural resources and human uses, as well as compatibility tables focusing in particular on offshore wind energy, submarine pipelines, submarine cables, aquaculture, and sand and gravel mining (University of Massachusetts Boston Planning Frameworks Team and the Massachusetts Ocean Partnership, 2009). Results of this analysis increased understanding about interactions between uses, and provided examples of siting and performance standards and mitigation measures from other locations. While this analysis did not result in information of appropriate detail and geographic specificity to directly inform the Massachusetts Ocean Management Plan, its content indirectly informed plan development by providing planners with a broader understanding of possible use interactions and possible approaches to siting and performance standards (Napoli pers. comm). Another approach to conflict/compatibility analysis is to focus in-depth on one potential type of compatibility by conducting a narrowly focused site selection or site exclusion process. For example, a Technology Development Index (TDI) analysis was performed in support of the Ocean SAMP to identify potential sites for offshore wind development (Spaulding, Grilli, Damon, & Fugate, 2010), and a Wind Energy Screening process was conducted in support of the Massachusetts Ocean Management

Plan (Massachusetts Executive Office of Energy and Environmental Affairs, 2009). Some planners have commented that compatibility analyses have their limitations; given the rapidly evolving nature of new offshore technologies, like offshore wind, most uses are generally ‘conditionally compatible’ pending detailed review of the specific technology, project, and site. However others have pointed out that conducting conflict and compatibility analysis early in the planning process can help to identify all of the potential interactions between resources and uses, and that this information can be invaluable during the plan development process.

Another type of decision support tool is an **interactive, web-based tool**. A data portal, as discussed in section IV.E.2 above and the Data and Information Report (see Appendix VIII), may include an interactive web-based mapping application that can enable both planners and stakeholders to interact with MSP data. While many MSP initiatives utilize web-based interactive data viewers, some such tools offer additional decision support such as enabling both managers and stakeholders to generate different maps and management scenarios, evaluate the effectiveness of scenarios in meeting objectives, and/or collaborate with others in performing all of these tasks. Examples that have been used in comparable MSP efforts include MarineMap and SeaSketch. MarineMap was used for the public review process of the Oregon Territorial Sea Plan amendment so that stakeholders could visualize and analyze spatial data (Klarin, 2011); and [SeaSketch](#) is being used to support stakeholder engagement in the Hauraki Gulf Marine Spatial Planning initiative in New Zealand. In another example, the predecessor to MarineMap was used in the California Marine Life Protection Act initiative; stakeholders used MarineMap to draw potential protected areas and to generate reports evaluating the effectiveness of those areas in meeting objectives (Gleason et al., 2010).

b. Range of Options

LIS planners have many options for utilizing decision support tools in support of a MSP initiative. Options include the form in which the information is presented and analyzed as well as the means through

which a user can interact with the information. Choice of approach may be shaped by available capacity and authority of the ultimate plan. In all cases, the states of Connecticut and New York may choose to work separately or together, depending on plan structure (discussed above in section IV.A.1), though decision support tools will be most effective if utilized in a coordinated manner to reflect an integrated MSP approach. It is important to emphasize that all of these options are intended to inform the management of LIS. The extent to which these tools are used in management would depend on plan structure as well as the specific planning and policy options pursued through the marine spatial plan; see section IV.E.7 below for detailed discussion.

In this case, the range of options presented here provides a few of the many different ways these options could be applied in a LIS MSP initiative, but planners would not be limited to choosing just one; indeed, a MSP initiative could theoretically utilize all of these options. Many would work well in combination. For example, Option 1 (data and information) would likely provide the basis for all remaining options, and Option 5 (interactive decision support tool) could help stakeholders apply data displayed in Option 2 (thematic maps) or help them understand the outcomes of a conflict/compatibility analysis (Options 3-4). Additionally, as noted above, the word “comprehensive” is not meant literally and should be understood to mean a broad and inclusive approach that encompasses what is reasonable and possible for a marine spatial plan.

Table 12. Range of Options: Decision Support Tools

<p>OPTION 1.</p>	<p>Data and information Data and information gathered through a LIS MSP effort (i.e. through a baseline characterization and assessment) could in itself function as a decision support tool. This information could be used by planners, decision-makers, and stakeholders in a wide range of settings.</p>
<p>OPTION 2.</p>	<p>Thematic maps In addition to Option 1 (data and information), data gathered through a LIS MSP effort could be used to develop a series of thematic maps characterizing ecological resources and human uses of the planning area. These maps can be based on data found in the LIS MSP baseline data inventory, and/or could highlight important areas identified through a range of methodologies. Maps could be made available as PDF documents and/or through an interactive viewer embedded in the LIS MSP data portal.</p>
<p>OPTION 3.</p>	<p>Limited conflict/ compatibility analysis In addition to Option 2 (data and information plus thematic maps), a focused conflict/compatibility analysis could be conducted in support of LIS MSP. A focused analysis could be conducted to address conflicts relating to a particular issue area. This is best conducted early in the planning process. Results can be used to inform planners’ understanding of interactions in the planning area and help inform management recommendations.</p>
<p>OPTION 4.</p>	<p>Comprehensive conflict/compatibility analysis In addition to Option 2 (data and information plus thematic maps), a comprehensive conflict/compatibility matrix could be developed evaluating compatibility across the full range of resources and uses. This is best conducted early in the planning process. Results can be used to inform planners’ understanding of interactions in the planning area and help inform management recommendations.</p>

(continued)

OPTION**5.****Interactive decision support tool**

In addition to Option 4 (data and information, thematic maps and a conflict/compatibility analysis), the LIS MSP data portal (NY Gateway or alternative) could be enhanced with an interactive web-based tool through which both planners and stakeholders can generate and evaluate different scenarios for identifying and protecting important areas. Planners and stakeholders can use the tool to develop different management scenarios, compare and evaluate these scenarios. This option could both help planners and help build stakeholder involvement and support for the outcomes of an MSP process.

7. Planning and Policy Options

a. Overview

A marine spatial planning exercise can result in a variety of different planning and policy outcomes. Planning and policy outcomes can range from simple management recommendations to the establishment of new decision-making processes to the designation of specific areas for some level of protection or priority use. The feasibility of the planning and policy options presented below will depend on the amount of time, resources, political support and data and information that are available. It is possible that a desirable policy outcome will require more of these capacities than exists at the time it is first pursued and an extra or ongoing effort may be necessary to bring it to fruition. Nevertheless, the options presented provide a view of the various approaches that can and have been taken to make a positive difference in managing offshore waters. In considering planning and policy options, overall considerations include the authority of the implementing government agencies and the structure of the plan itself. Any planning and policy options that emerge out of a LIS MSP process must be structured so that they can be implemented by the states of Connecticut and New York pursuant to their relevant authorities (see Section IV.A “Planning Authority and Structure” above). Moreover, planning and policy options should derive from the overall plan vision, principles, goals and objectives; options should comprise management measures designed to achieve those goals and objectives. In particular, given the inherently multi-objective nature of marine spatial planning, planning and policy options should, in sum, ensure that multiple objectives are achieved for the planning area. Last, planning and policy

options must consider overall plan scope and scale. That being said, planning and policy options can be targeted to address different parts of the overall area; for example, the Baltic Sea Plan involved conducting a series of pilot planning exercises focused on different issues and different parts of the overall planning area (BaltSeaPlan, n.d.).

b. Key Considerations and Possible Approaches: Designating Management Areas

One planning and policy option for a marine spatial plan is to identify important ecological and/or human use areas for some level of protection or prioritization utilizing state coastal zone management authority. In Massachusetts, this resulted in the designation of one Prohibited Area (the pre-existing Cape Cod Ocean Sanctuary) as well as a series of Special, Sensitive, and Unique (SSU) areas within an overall Multi-Use management area. Future activities taking place within SSUs are subject to a series of siting and performance standards; some specified uses are presumptively excluded unless a series of performance standards are met. However it is important to emphasize that these protections are implemented pursuant to existing Massachusetts regulations; the Massachusetts Ocean Management Plan did not result in any new regulations. In Rhode Island, a series of new Areas of Particular Concern and Areas Designated for Preservation were designated and are protected pursuant to a series of new policies and regulations promulgated under Rhode Island’s existing coastal zone management authority. Certain uses, such as large-scale offshore developments, are prohibited within Areas Designated for Preservation; similar activities are subject to a series of siting and performance standards in Areas of Particular Concern. Oregon’s

Territorial Sea Plan also resulted in the designation of Resources and Uses Management Areas (RUMA) and Resources and Uses Conservation Areas (RUCA); performance standards are applied to both, and are much more rigorous in RUCAs.

Another approach to important ecological and/or human use areas is to manage them as impact avoidance areas, categorized by depth (water surface/atmosphere, water column, and benthic/sub-benthic zones). In surface/atmosphere zones, visual impacts, encroachments and navigational impediments would tend to be the primary concerns, as well as oil spills, floating debris and other surface pollution. Water column zones would also focus on encroachments and occupations of the water column that might impede navigation and fishing, as well as subsurface discharges and interference with natural currents and temperature gradients. Benthic/sub-benthic zones would be concerned with any disruption of the benthic morphology and habitat, including uses that generated turbidity. Impact avoidance areas might work as follows: For areas frequently used for navigation, regattas or boating activities, surface encroachments would be restricted, while subsurface and bottom-culture aquaculture, for instance, could be allowed. Other aquaculture areas might allow unrestricted surface navigation and recreational fishing, so long as there was no interference with in-water bags, nets or cages used for plant or shellfish cultivation. Some bottom areas of particular habitat value, or those used for aquaculture or cables/pipelines, may prohibit bottom impacts, possibly including boat moorings, but would allow free navigation and in-water aquaculture.

Another option is to identify preferred or priority areas for new uses. The Rhode Island and the Massachusetts plans each resulted in the designation of renewable energy areas; for Rhode Island, the Renewable Energy Zone designation, which is the site of the permitted Block Island Wind Farm project, was accompanied by an entirely new set of policies and regulations for siting offshore renewable energy in state waters. Oregon's Territorial Sea Plan resulted in the designation of Renewable Energy Permit Areas (REPA) and Renewable Energy Suitability Study

Areas (REFSSA). In LIS there might be consideration of a priority area for underwater cables which would help protect other areas from cable conflicts and make placement of compatible cables more efficient.

It is worth noting that with various types of designated or management areas, typically only a small portion of the overall planning area is identified as such (e.g. as important human use or ecological areas or as preferred or priority use areas). The remainder of a planning area is typically by default considered a multi-use area, given no special treatment through a marine spatial plan. As a point of reference, no other marine spatial plan referenced in this document has resulted in the zoning of the entire planning area; the Rhode Island Ocean SAMP only resulted in the designation of one renewable energy zone and the Massachusetts plan resulted in two such zones. It is also important to be clear that Sound marine planning as it has been envisioned does not mean "marine zoning" or that there is any goal or objective requiring the entire Sound to be carved up and classified, particularly given that one of the goals broadly espoused is to safeguard and maintain traditional uses.

One additional consideration in approach or option is to seek explicit means for supporting traditional/existing uses and the conservation of natural resources. This is different than the approaches discussed above in that it asserts a particular philosophy for serving the public interest and embeds these pro-actively into the overall approach. Planners could begin with an outright prohibition principle against a select set of new, non-traditional, non-water-dependent developments like the previously proposed Broadwater LNG Terminal. This would assure the public and stakeholder groups that, whatever the ultimate details or procedures established under the LIS plan, the plan would not result in the permitting of new, non-traditional structures that had been clearly identified as incompatible with LIS or certain areas within it. For example, such a principle might say that no new regulated structures or activities (unless fishing or aquaculture-related) may take place in LIS except in accordance with the marine spatial plan, and all

submerged lands leases would be required to be consistent with the plan. This would create a reference point for the public and an indication of the types of issues that MSP is intended to address. Such an approach could also be modified by including special considerations or exceptions. It is not clear that such an approach is most appropriate or that it would be politically viable, though it is important to note it on the continuum of possible options.

c. Key Considerations and Possible Approaches: Improving Decision-Making

While identifying protected or priority use areas is often a focus of MSP, another key planning and policy outcome can be improved decision-making through improved coordination and collaboration between and among federal, state and tribal government agencies, scientific experts, user groups, stakeholders, and others. For example, Effective Decision-making is one of the NE RPB's three overarching planning goals; some related objectives include enhancing interagency coordination, maps and other products into existing agency decision-making processes, and improving coordination with local communities.

Planning and policy options related to this goal may involve establishing new processes to facilitate improved decision-making. For example, the Rhode Island Ocean SAMP established a Fishermen's Advisory Board and a Habitat Advisory Board to formally facilitate ongoing stakeholder input into offshore decision-making, and identified an Ocean SAMP Joint Agency Working Group, comprising relevant federal and state agencies, to be convened in order to specify permitting requirements and streamline communications for offshore development projects.

d. Range of Options

Planning and policy options are arguably the most important considerations in developing a LIS MSP process. It is important to emphasize that the planning and policy elements of a Sound Marine Plan will be determined, above all else, by Connecticut and New York's respective authorities and by the plan structure that the two states decide to implement (see section IV.A above for discussion).

For example, some of the options discussed herein are based on the Connecticut Blue Plan Act as a legal foundation for a MSP process and potential policy outcomes. Secondly, because it is not clear as of this report that New York State has the authority to create an enforceable marine spatial plan, it is proposed as an option to consider that relevant information, guidance and approaches coming out of marine spatial planning either through the Blue Plan or other marine spatial planning processes could potentially be integrated, if appropriate, into the existing New York Coastal Management Program and as such potentially provide improved decision-making and continuity in bi-state management of the Sound. It should be stressed that the feasibility, desirability and appropriateness of this idea has not been vetted or confirmed with New York State as of this report. Thirdly, planning and policy options will be fundamentally shaped by the resources available to support a planning process, the types of data and information analyzed through the process, and the choice of decision support tools developed to analyze this information.

On one end of the range, a Sound Marine Plan could involve development of thematic maps and a compatibility assessment that informs understanding of interactions between uses, resulting in two products that can be used by state agencies reviewing LIS permit applications. On the other end of the range, a Sound Marine Plan could represent a comprehensive characterization of LIS natural resources and human uses that result in the identification of important ecological and human use areas and priority use areas. In Connecticut, with legislative approval of a Blue Plan, these areas could conceivably be managed through a combination of siting and performance standards enforceable through the states' coastal zone management program. In New York there would need to be new legislation or regulation for this to occur and such a path has not been discussed or proposed as of the completion of this report. One possible outcome that integrates this potential difference in enforceability between Connecticut and New York could be that siting and performance standards are enforceable in Connecticut and the information contained in these

standards is used to improve decision-making and/or other considerations in a way that is consistent and supportive of the current New York Coastal Management Program. New York consideration of the performance standards would not involve or imply any enforceability that does not exist.

For examples of how some of the MSP elements might be linked together to support some of the planning and policy options outlined here, please see Section V below. For further detail on how a planning and policy option might work, one of the examples is explained in depth; please see text following the table below.

Table 13. Range of Options: Planning and Policy Options

As noted above, the feasibility of these options depends on several factors (e.g. sufficient data & information, time, resources, political support) such that at the beginning of a process, these options may be most helpful to explore and consider vs “choose.”

<p>OPTION 1.</p>	<p>Recommended Use of Thematic Maps</p> <p>Develop thematic maps of key LIS resources and uses and include these in the plan. Regulators would be encouraged to consult these maps and accompanying data and information when permitting projects. Project applicants could also consult maps and data and information prior to filing project applications. This information alone could be invaluable to regulators and project proponents insofar as it will be authoritative, comprehensive and, ideally, developed through a coordinated bi-state transparent public process.</p>
<p>OPTION 2.</p>	<p>Conflict/Compatibility Assessment and Use of Thematic Maps</p> <p>Develop thematic maps of key LIS resources and uses and include these in the plan. Additionally conduct a comprehensive conflict/compatibility assessment that results in matrices indicating incompatible uses and potentially compatible uses. Regulators could consult thematic maps and accompanying data and information, and conflict/compatibility matrices, when permitting projects. With the passage of the Blue Plan, this consultation could become a requirement in CT. Project applicants could also consult these items prior to filing project applications. These tools alone could be invaluable to regulators and project proponents. Thematic maps and a conflict/ compatibility assessment do not exist for LIS and could provide extremely valuable input to the regulatory process. Use of thematic maps and conflict/compatibility matrices could be recommended or required by the states in their respective regulatory permit application processes, if and as consistent with the final plan and/or authority.</p>
<p>OPTION 3.</p>	<p>Important Human Use and Ecologically Important Areas Subject to Siting and Performance Standards.</p> <p>In addition to Option 2 (conflict/ compatibility assessment and use of thematic maps), important human use and ecological areas are recognized in the planning process (e.g. included within the Blue Plan or its equivalent) and siting and performance standards are developed to be applied to new uses in these areas. In CT the standards could be enforceable if included in a legislatively approved Blue Plan or its equivalent. The concept of using performance standards is similar to MA’s Special, Sensitive or Unique Areas and RI’s Areas of Particular Concern. Managing important areas through performance standards could be an effective strategy at steering future development away from important areas without establishing outright prohibitions. See narrative below for further discussion.</p>

(continued)

<p>OPTION 4.</p>	<p>Important Human Use and Ecologically Important Areas with Impact Avoidance Areas Categorized by Depth.</p> <p>In addition to Option 3 (important human use and ecologically important areas subject to siting and performance standards), a management approach differentiated by vertical location (water surface/ atmosphere; water column; subsea/seabed) is developed. As noted above, this approach could become enforceable in CT if the actual Blue Plan, once completed, is approved by the Connecticut Legislature. To illustrate this option, navigation might be unrestricted in areas important for bottom culture aquaculture; fixed development might be restricted in areas important for navigation. This approach could be beneficial for managing important areas while recognizing ways multiple uses can occupy the same three-dimensional space.</p>
<p>OPTION 5.</p>	<p>Preferred or Priority Use Areas</p> <p>In addition to Option 3 (important human use and ecologically important areas subject to siting and performance standards), the information needed to identify preferred or priority use areas for certain activities (e.g. aquaculture) is developed. In CT these areas could be established as part of an adopted Blue Plan or its equivalent. Preferred or priority use areas would guide future developments to areas pre-screened through the MSP process. Uses would be permitted in those areas subject to applicable regulatory authorities. Other activities would be allowed in these areas provided that they don't affect the priority use. For example, new pipeline corridors would be sited separately from aquaculture lease areas and other types of uses so as to avoid potential conflict between the two uses.</p>
<p>OPTION 6.</p>	<p>Combination of Important Human Use/Ecologically Important Areas (Option 4) and Preferred/Priority Use Areas (Option 5)</p> <p>A series of important human use/ecologically important areas (Option 4) as well as one or more preferred or priority use areas (Option 5) are identified. For CT, if the completed Blue Plan or its equivalent is adopted with appropriate measures, human use/ecological areas could be managed through siting and performance standards, and uses sited in preferred/priority use areas (Option 5) subject to applicable regulatory authorities. See narrative below for further discussion.</p>
<p>OPTION 7.</p>	<p>Important Human Use/Ecologically Important Areas, Preferred/Priority Use Areas, and a General Prohibition on a selected set of New, Non-Traditional, Non-Water Dependent Development (e.g. "Broadwater 2" LNG terminal)</p> <p>In addition to Option 6 (human use/ecological areas managed through siting and performance standards, and preferred/priority use areas managed through applicable regulatory authorities), a general prohibition is established at the outset of the planning process for a selected set of new, non-traditional, non-water-dependent uses. This option assumes there is strong existing consensus to this approach and could be tempered by allowing for special approval if circumstances require.</p>

e. Detailed Description of One Planning and Policy Option: Option 6

To provide an example and further details on how these planning and policy options might work, here we provide further discussion of Option 6 above. Option 6 assumes that the actual Blue Plan has been completed and approved/adopted by the Connecticut Legislature, that both Connecticut and New York have support for

leveraging their coastal management authorities, and that sufficient resources have been allocated to support a detailed characterization and assessment of the planning area, a conflict/compatibility analysis, and the identification of important ecological and human use areas as well as preferred/priority use areas. This option includes multiple policy elements; a subset of these could also be chosen.

The important human use and ecological areas, conflict/compatibility analysis and priority use area designations would be identified through credible and transparent methodologies as discussed in sections IV.E.3 and IV.E.4 above and would be vetted through a rigorous stakeholder process. See Figure 1 below for a basic illustration. Additionally, the approach could be designed to pick a practical, limited “no-regrets” subset of areas from the broad scope of possible important and priority use areas. This could help assure a conservative and focused approach to identifying such areas. Employing an adaptive management approach could allow for future identification of new areas based on new information and analysis and stakeholder input.

This option includes the development of performance standards that would be applied to important ecological and human use areas. These standards would be developed based on planners’ understanding of interactions, which may be informed in part through the outcomes of a conflict/compatibility analysis. Generally, performance standards offer a clear set of design or implementation requirements that a project proponent must utilize in order to avoid or minimize impact to the identified area. Different standards could be developed for different types of areas (e.g. important fish habitat, important recreational use areas, or areas afforded different levels of attention based on the sensitivity of the uses or resources within the area). To assure practicality, a limited set of identified areas could be designated as could a more limited set of performance standards for managing them. Some uses may not be feasible in some identified areas either because they are identified as such (e.g. pipeline over a recognized shellfish bed or an anchoring site within a navigational channel) or because it is not practical for the proposed use to meet the performance standards. As such, for some identified areas and particular uses, there may be, in practical effect, a prohibitory result. However, as proposed in this option, there would not be any outright prohibitions. See Appendix IX for examples of performance standards applied to important areas identified through the Massachusetts Ocean Management Plan and the Rhode Island Ocean Special Area Management Plan.

This option also includes the designation of priority use areas so that proposed new uses would be directed to the preferred — and most easily permitted — locations. Unlike performance standards, which typically add hurdles to discourage development in important areas, priority use areas include no such hurdles and may include mechanisms for facilitating permitting of priority uses. Other activities would be allowed in these areas provided that they don’t affect the priority use. For example, designated cable or pipeline corridors could be identified, ensuring *de facto* protection for human uses and natural resources in other areas. A cable or pipeline priority use area could also preclude or limit activities that might uncover or damage a pipeline cable.

Under Option 6, areas of the Sound not designated as important ecological or human use areas or priority use areas would be considered, by default, as multiple use areas. New uses or proposals would go forward in these areas according to the existing regulatory framework without any special consideration through the Sound Marine Plan.

To illustrate this option, Figure 2 below depicts a proposed use (e.g. a new pipeline) that is proposed to cross one of the identified areas (e.g. habitat area). The performance standards associated with this use and this type of identified area would identify the conditions under which the pipeline could cross into the important habitat area (e.g. limit the size of impact or determine and specify a compatible location within the habitat for the pipeline). Alternatively it may in effect preclude the use (e.g. use must not demonstrably alter or damage the habitat). Similarly, if a proposed use (e.g. new aquaculture location) was proposed in a recognized traditional fishing area, there could also be performance standards for the new use (e.g. aquaculture carried out in a way that would not damage the fishery or unreasonably interfere with fishing activity). Figure 3 below illustrates how priority use areas would direct uses to pre-identified suitable locations.

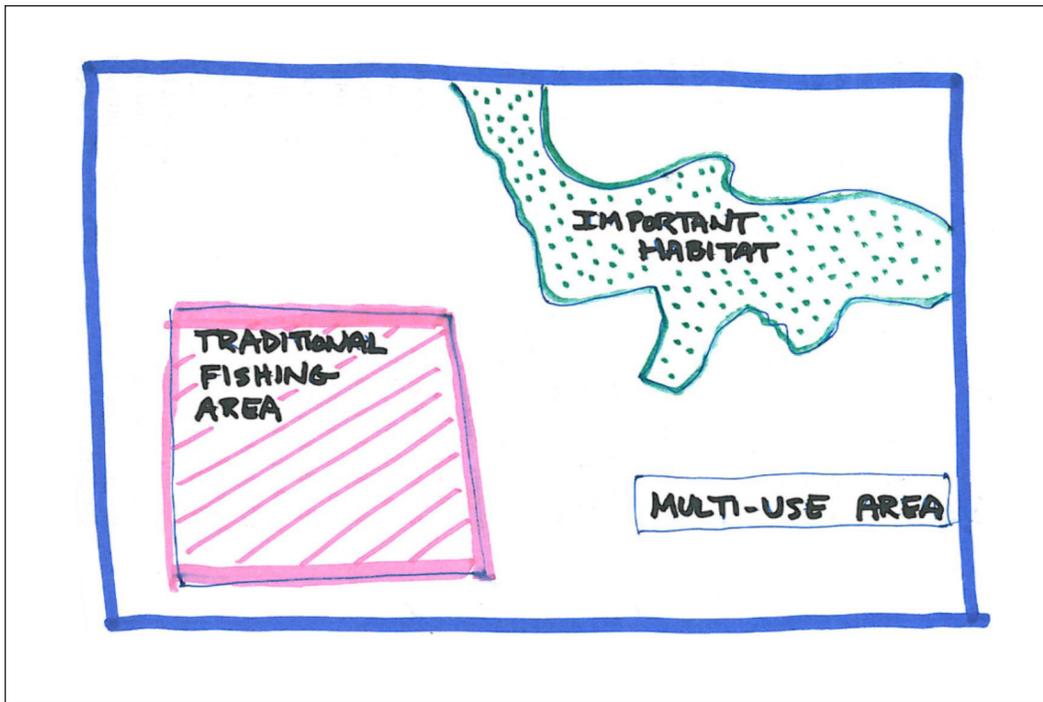


Figure 1. Example of Important Human Use and Ecological Areas

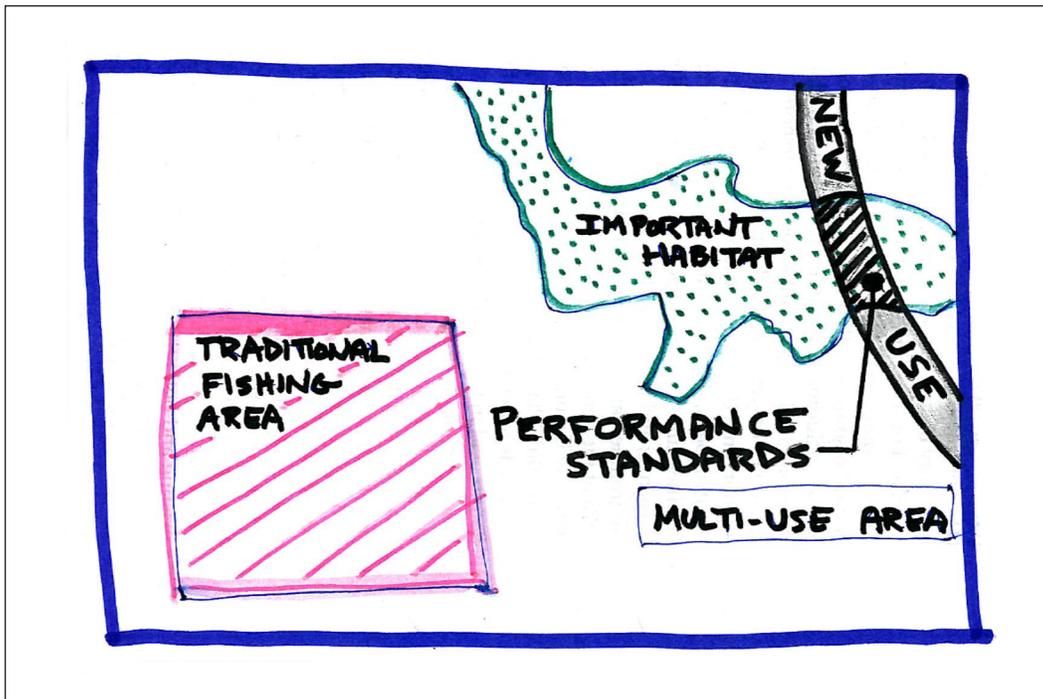


Figure 2. Example of Important Human Use and Ecological Areas Managed Through Performance Standards

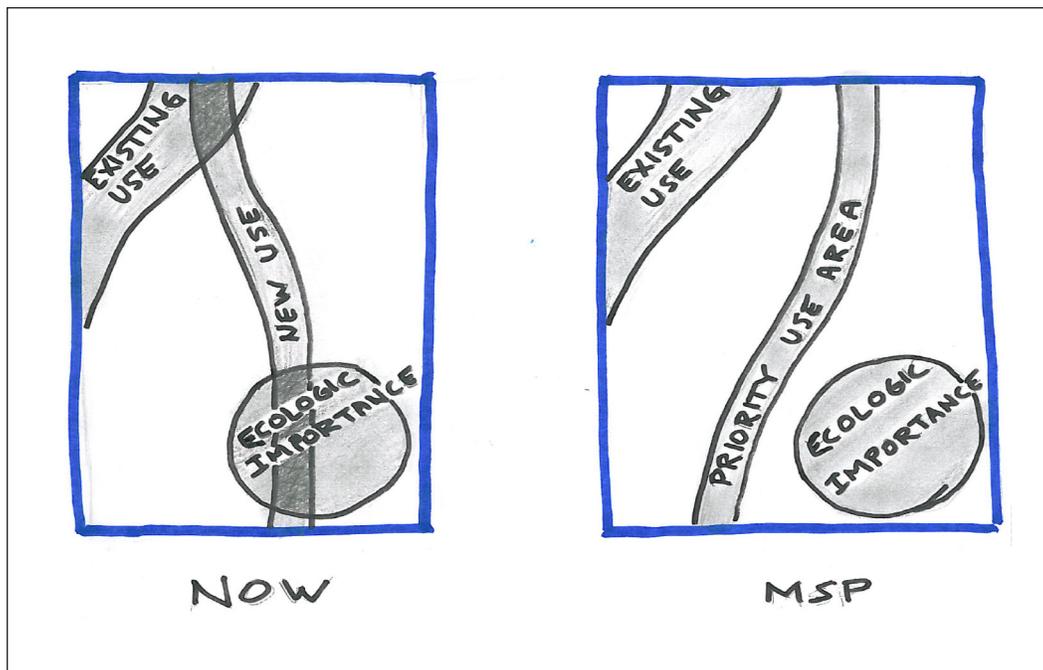


Figure 3. Example of a Conflicting New Use (left) and a Priority Use Area (right)

The Priority Use Area guides the location of applicable new uses to improve compatibility with existing uses and ecological resources.

F. Funding Mechanisms

1. Overview

Developing and implementing a LIS marine spatial plan will require funding. Ehler and Douvère (2009) note the need for obtaining financial support early in the process once need and authority have been established, and they provide a useful discussion about identifying and determining the feasibility of alternative funding mechanisms, and Collie et al. (2013) discuss that different funding structures may influence the structure, outputs and outcomes of a MSP process. Funding must be on hand to start the MSP process, support it through the plan completion and approval phase, and to facilitate plan implementation activities including monitoring and evaluation. In addition to support needed for the basic planning process, funding needs may include but are not limited to additional staffing; data management and analysis; facilitating a comprehensive stakeholder outreach and engagement process; and any field science that must be conducted in support of planning.

2. Funding for Other MSP Initiatives

Funding quantities and sources that supported other MSP initiatives provide one point of reference for how MSP can be funded. However it is important to emphasize that MSP does not necessarily require large sums of money. Existing MSP efforts represent budgets covering a range of different activities, not all of which would be required to implement MSP in Long Island Sound. For example, while the Rhode Island Ocean SAMP is known to have cost about \$8 million, half of this budget directly supported new scientific research, including conducting offshore surveys utilizing large oceanographic research vessels; developing the SAMP document and conducting outreach represented the smallest component of the budget (McCann et al., 2013).

The state MSP initiatives conducted to date have relied primarily on state funding. The Massachusetts Ocean Management Plan was funded through

\$5-\$10 million in funding cost-shared between the Commonwealth of Massachusetts and the Gordon and Betty Moore Foundation (which funded the Massachusetts Ocean Partnership). Of the roughly \$8 million spent on the Rhode Island Ocean SAMP, \$1 million was contributed in kind by the University of Rhode Island. The majority of funding came from state sources (including the Rhode Island Renewable Energy Fund and the Rhode Island Economic Development Corporation) with some supplementary funding from federal sources (U.S. Dept. of Energy). Additionally, Deepwater Wind, the developer of the BI Wind Farm, is obligated to repay the state \$3.2 million in SAMP development costs through the Rhode Island Renewable Energy Fund (State of Rhode Island and Providence Plantations, 2009). The Washington MSP initiative has not yet concluded so a final funding amount is not available; to date the initiative is funded primarily by a state source, the Marine Resources Stewardship Trust, established in 2012 for the sole purpose of supporting marine spatial planning and management. Mid-Atlantic and New England regional ocean planning initiatives, which rely both on the respective regional planning bodies and regional ocean partnerships (discussed above under “Other State and Regional MSP Initiatives”), are supported through a range of public and private funding sources, including considerable private funding through the Gordon and Betty Moore Foundation. Again, as noted above, conducting MSP does not require budgets as substantial as those utilized in Massachusetts and Rhode Island.

b. Potential Funding for LIS MSP

The funding needs for a Sound marine planning process will depend on the breadth and ambition of the effort and the extent to which it will include new scientific research (beyond studies already under way or conducted independently). A memo (see Appendix X), prepared in conjunction with the 2015 Connecticut Bill 6839 proposal (the “Blue Plan”), provided an estimate of funding needs for a LIS MSP effort and consideration of existing capacity to meet the funding need. A total of \$1.44 million was projected. With reliance on existing and projected capacity including significant in-kind contributions (i.e. without new appropriations of state funding), it

was estimated that \$280,000 in new private and/or federal funding was needed to complete the initial planning process. This is a rough estimate designed to avoid reliance on new state funding and as such is not necessarily a complete or definitive statement on actual funding needs for a Sound Marine Plan. Nevertheless, it does make the case for basic financial efficacy of a LIS MSP process.

The development and implementation of a Sound Marine Plan might be supported through one or a combination of government and non-governmental sources. Existing state resources may represent one source of capacity. New York DOS, New York DEC and Connecticut DEEP may be able to leverage and coordinate existing staff and GIS resources and access start-up and implementation funding through state-based sources. For Connecticut this may include leveraging staff resources within the Office of Long Island Sound Programs and the new Connecticut Institute for Resilience and Climate Adaptation (CIRCA). This may also include leveraging state funding sources including the LIS License Plate Fund and the Supplemental Environmental Project (SEP) Fund, which supports habitat restoration and other environmental projects with funds paid by violators of Consent Orders. The NOAA Coastal Management Fellowship may also offer the opportunity to enhance staffing resources during the planning process. This program, established in 1996, provides on-the-job education and training opportunities in coastal resource management and policy for postgraduate students and provides project assistance to state coastal zone management programs.

Funds obtained through state submerged lands leases may represent another option. Most coastal states, including New York, impose a fee or assessment for the private use of publicly-owned submerged lands — the same public trust area that would be subject to marine spatial planning. New York State’s submerged lands leasing program is run by the New York Dept. of General Services.⁴ Aside from its longstanding practice of shellfish bed leasing

⁴ See <http://ogs.ny.gov/BU/RE/LM/EGLP.asp>

and similar leases by the Department of Agriculture, Connecticut does not currently have a submerged lands leasing program in place to support MSP. Since 1989, the Connecticut DEEP has periodically raised the idea of a submerged lands leasing program in various forms. These previous proposals could form the basis of a new proposal to the Connecticut legislature for a program to revisit submerged lands leasing fees for cables and pipelines, perhaps adding other non-water-dependent, non-riparian uses. These leasing fees could be allocated in support of MSP plan development and implementation. A 2010 draft of a Blue Plan included provisions for submerged lands leasing for non-riparian, non-water-dependent uses (see Appendix XI, primarily section IV).

Other regional entities with access to federal funds might present options for supporting LIS MSP. Although they have not been queried on this topic, these include the Long Island Sound Study, which is a part of EPA's National Estuary Program, as well as the Connecticut and New York Sea Grant programs. For data needs, the Northeast Regional Ocean Council or the Northeast Regional Association of Coastal and Ocean Observing Systems may present additional options for funding or technical assistance.

It is uncertain whether federal funding may be available to support LIS MSP in the near-term. The regional RPBs do not have a federal funding allocation and NOAA funding for the regional ocean partnerships, including the Northeast Regional Ocean Council, was terminated for the 2014-2015 year. NE RPB-affiliated colleagues advised that federal funding for MSP, especially if labeled as such, will likely not be available for at least the next two years. Funding may be available on a regional basis, through a competitive process, for resilience-related work, but it is unclear whether a LIS MSP initiative would qualify for such funding; resilience grants are likely to prioritize coastal communities and ports and harbors. Outcomes from the NE regional ocean planning effort, which will achieve key milestones in 2015-2016, may further determine what resources and

support will be available at the regional scale moving forward.⁵

Private funding is another potentially critical source of funding and support. For example, the Gordon and Betty Moore Foundation has provided substantial resources to prior MSP efforts and may be an important opportunity for additional MSP work in LIS. (The Moore Foundation has provided funding to assist in the work of developing the enabling conditions for marine spatial planning in Long Island Sound). In addition to the Moore Foundation, there is the opportunity to seek funding from large individual donors, other foundations or corporations who see the benefit of MSP. For any private funding, it is critical to assure that these funders do not inappropriately influence the transparent and objective nature of the MSP process and its outcome.

G. Plan Implementation, Monitoring and Evaluation

1. Overview and Key Considerations

The final considerations for a marine spatial plan are plan implementation, monitoring, and evaluation. As discussed above in "Planning Authority and Structure," plan will be facilitated by the states of Connecticut and New York through the plan or plan's well-defined goals, objectives, and planning and policy tools.

Monitoring and evaluation are essential for developing an adaptive management approach to marine spatial planning and to ensure that goals and objectives are achieved. In their step-by-step guide to MSP, Ehler and Douvere (2009) devote an entire section to monitoring and performance. Additionally, Charles Ehler (2014) has recently published a guide providing detailed and specific guidance on methods of monitoring and evaluating the performance of marine spatial plans. Ehler advises planners to conduct performance monitoring and evaluation, rather than state-of-the-environment or compliance monitoring, and outlines a comprehensive eight-step

⁵ NE RPB colleagues suggest contacting Whitley Saumweber (whitley.saumweber@noaa.gov), Deputy Associate Director for Ocean and Coastal Policy with the National Ocean Council, to explore what opportunities may exist for sub-regional initiatives like LIS MSP to take advantage of the momentum that has been achieved through the National Ocean Policy.

process: (1.) prepare an evaluation plan for the MSP; (2.) identify MSP objectives; (3.) identify management actions for each objective; (4.) identify performance indicators and targets; (5.) establish a baseline for selected indicators; (6.) monitor the selected indicators; (7.) evaluate the results of monitoring; and (8.) communicate results of evaluation to decision-makers and stakeholders.

In anticipation of the need for monitoring and evaluation during the plan implementation phase, Ehler (2014) emphasizes that the marine spatial plan must include specific, measurable objectives (e.g.: “Reduce the time required to make decisions on marine construction permits by 50% by 2015.”) Additionally, planners must plan ahead for monitoring and evaluation. Collie et al. (2013) note the need for a planning interval that will facilitate plan update and revision; such a planning interval can be specified in the plan from the outset.

Few marine spatial plans have been in place long enough for there to be many practical examples of monitoring and evaluation. The Massachusetts Ocean Management Plan, completed in 2009, recently underwent a five-year review and update, pursuant to the Massachusetts Oceans Act requirement that the plan be reviewed at least once every five years. During the review phase, a comprehensive assessment was conducted, which included semi-structured interviews with members

of the Ocean Advisory Commission and Science Advisory Council. Additionally, six technical work groups were convened to review scientific data and information and identify and characterize important trends in ocean resources and uses. The Rhode Island Ocean SAMP also required a Progress Assessment and Monitoring Process, which also called for a major revision once every five years; this revision is due to take place in 2015. Additionally, a formal independent evaluation of the Ocean SAMP was conducted in 2013 (Mulvaney, 2013), utilizing semi-structured interviews with key informants representing a broad range of agencies, organizations, and constituents.

2. Range of Options

LIS planners have many options for incorporating proposed monitoring and evaluation provisions into a Sound Marine Plan. Choice of approach may be shaped by available capacity. In all cases, the states of Connecticut and New York may choose to work separately or together, depending on plan structure. The range of options presented here provides just a few examples of the many different ways adaptive management provisions could be built into a Sound Marine Plan. Additionally, as discussed above, New York and Connecticut may proceed with monitoring on different timeframes even with successful bi-state implementation of the Connecticut Blue Plan.

Table 14. Range of Options: Monitoring and Evaluation

<p>OPTION 1.</p>	<p>Informal ongoing monitoring and updates CT and NY would informally monitor progress toward achieving MSP goals and objectives. This may include targeted environmental monitoring and efforts to gain constituent feedback. Plan may be revised and updated opportunistically in response to this feedback.</p>
<p>OPTION 2.</p>	<p>Conduct five-year reviews/updates Consistent with the Blue Plan, CT and NY would conduct reviews/ updates of the marine spatial plan at least every 5 years following plan completion and approval. A requirement for a five-year update cycle would be written into the plan. Measurable progress toward achieving plan goals and objectives would be evaluated, and stakeholders would be engaged in the evaluation process.</p>

(continued)

<p>OPTION 3.</p>	<p>Conduct a post-planning evaluation and comprehensive five-year reviews/ updates CT and NY would conduct an independent post-planning evaluation and would conduct comprehensive five-year reviews/updates every five years following plan completion and approval. A requirement for a post-planning evaluation and a five-year update cycle would be written into the plan. Measurable progress toward achieving plan goals and objectives would be evaluated, and stakeholders would be engaged in the evaluation process.</p>
<p>OPTION 4.</p>	<p>Comprehensive performance monitoring and evaluation process CT and NY would undertake a comprehensive performance monitoring and evaluation process at intervals following plan completion. This could involve full utilization of Ehler’s (2014) monitoring program.</p>

H. Additional Considerations

Additional considerations that may be integrated into a LIS MSP initiative include incorporating the latest developments in research on ecosystem-based management and integrated social-ecological systems. In particular, integrating social-ecological systems approaches and analysis will include more integration of social science research. Additionally, the latest research on climate change adaptation and systems resilience (as opposed to narrowly-defined hazards resilience) may be useful in informing LIS MSP.

A Sound Marine Plan may also identify opportunities for creating mechanisms for ongoing innovation via adaptive governance and propose options for sustainable and resilient coastal economic development for the promotion of livelihoods in the

LIS region. It could also consider and propose options for sustainable and resilient coastal economic development for the promotion of livelihoods (the type of development that has neutral or insignificant impacts, or even better, contributes toward restoration or enhancement of coastal and marine ecosystems).

Finally, a LIS MSP initiative may also consider incorporating some of the latest analytical tools. These may include the Stockholm Resilience Center’s (2013) guidance for applying resilience thinking and Elinor Ostrom’s “Institutional Analysis and Development Framework” which includes a “Social-Ecological Systems Analysis” tool (Ostrom, 2011). These may also include the use of scenario planning for Long Island Sound, which can be especially effective for helping the public to grasp the complexity of scientific information.



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V. Four Scenarios for Implementing MSP in Long Island Sound

Following are four different scenarios for how the MSP approach could be implemented in Long Island Sound. They are not intended as specific recommendations or to limit the set of choices available to LIS spatial planners and managers. They illustrate how the various MSP elements discussed in this document can be assembled to create an overall, complete MSP process and spatial plan. These scenarios illustrate four plan structures and accompanying MSP elements that consider the particular circumstances and attributes of LIS; there are other options that could also work for Long Island Sound outside of these four. As such, these scenarios are intended to help illustrate how MSP could look for LIS but not as a way to limit the options available to Sound planners.

The four scenarios here are based on a continuum of ways a process might unfold. Scenario 1 is the most minimal scenario, and assumes that the Connecticut Blue Plan process does not pan out and that no other driver pushes the LIS MSP agenda forward. This scenario illustrates how LIS spatial planners and

managers could still implement elements of MSP in these conditions. Scenarios 2 and 3 are both based on the Connecticut Blue Plan, which jumpstarts the MSP process in Connecticut and creates an opportunity for a bi-state plan with New York. Scenario 2, “Blue Plan Light,” is a smaller-scale MSP scenario, assuming minimal funding, resources and support for MSP. Scenario 3, “Thorough Blue Plan,” is a more developed MSP scenario, assuming full funding and resources to more fully support MSP. Additionally, both scenarios 2 and 3 assume that the Connecticut Blue Plan Bill leads to the development of a bi-state spatial plan, though it is understood that each state would pursue its own plan approval process and that the states of Connecticut and New York may proceed on different timelines. Scenario 4 is a scenario that assumes either the Connecticut Blue Plan or another driver, such as a new Broadwater-style development proposal, helps build strong consensus and support for a fully-integrated and comprehensive bi-state planning process where each state is bound by the plan.

Table 15. Four Scenarios for Implementing MSP in Long Island Sound

	Scenario 1.	Scenario 2.	Scenario 3.	Scenario 4.
Plan Structure	The Two-State Solution Each state adopts a marine spatial plan or uses its coastal management program for its own state waters in LIS. This assumes no Blue Plan or bi-state coordination. (Table 1 Option 2 above.)	The “Light” Blue Plan approach Each state either formally adopts or informally uses a separate marine spatial plan or programmatic approach within their own states through their own legal and/or administrative processes, but the plan or approach they adopt or use in each state contains a high level of similarity, consistency and ability to apply Sound-wide and address many key management issues. (Table 1 Option 3 above). *Assumes Blue Plan but there is minimal funding, resources, and support available.	The “Thorough” Blue Plan approach Each state either formally adopts or informally uses a separate marine spatial plan or programmatic approach within their own states through their own legal and/or administrative processes, but the plan or approach they adopt or use in each state contains a high level of similarity, consistency and ability to apply Sound-wide and address many key management issues. (Table 1 Option 3 above). *Assumes Blue Plan is supported with ample funding and resources.	One Comprehensive Plan The States incorporate into their Coastal Management Programs the same bi-state marine spatial plan or if the necessary authorizing legislation was passed in both CT and NY, the same marine spatial plan would be adopted by both States at the same time and developed and implemented by a bi-state body granted authority by both states. Although highly unlikely politically, this option generally represents the ideal of a bi-state approach. (Table 1 Option 4 above).
Scope and Scale	Minimal area covered (landward boundary set approx. 1,000 ft. offshore). (Table 2, Option 1 above)	Blue Plan boundaries (Planning: MHW; Management: landward boundary set at the 10-ft. bathymetric contour). (Table 2, Option 2 above)	Blue Plan boundaries (Planning: MHW; Management: landward boundary set at the 10-ft. bathymetric contour). (Table 2, Option 2 above)	Study area includes coastal watershed boundaries; planning/management area set at MHW. (Table 2, Option 4 above)
Vision, Principles, Goals and Objectives	States independently set goals and objectives. (Table 3, Option 1 above)	Shared vision statement; independent state goals and objectives developed through bi-state coordination. (Table 3, Option 2 above)	Fully coordinated vision, principles goals and measurable objectives. (Table 3, Option 3 above)	Fully coordinated vision, principles goals and measurable objectives. (Table 3, Option 3 above)
Plan Prep: Timeline and Milestones	Moderate (24-30 months). (Table 5, Option 2 above)	Long (36-48 months). (Table 5, Option 3 above)	Extended (60+ months). (Table 5, Option 4 above)	Extended (60+ months). (Table 5, Option 4 above)
Stakeholder Engagement Structure	Facilitated Through Existing Structures. (Table 6, Option 1 above)	Blue Plan Advisory Committee and NY equivalent facilitate rigorous engagement. (Table 6, Option 3 above)	NY and CT facilitate rigorous engagement including informal bi-state stakeholder group. (Table 6, Option 4 above)	Formal Bi-State Stakeholder Advisory Council and Stakeholder Working Groups. (Table 6, Option 5 above)

Table 15. Four Scenarios for Implementing MSP in Long Island Sound *(continued)*

	Scenario 1.	Scenario 2.	Scenario 3.	Scenario 4.
Team and Advisors	Core Team (state agencies, university and advisors). (Table 7, Option 1 above)	Core Team (state agencies, university and advisors). (Table 7, Option 1 above)	Core Team, Stakeholder Advisory Group and topic-specific technical advisory groups. (Table 7, Option 3 above)	Core Team, Stakeholder Advisory Group and Science Advisory Group. (Table 7, Option 4 above)
Data Sharing	NY Gateway LIS Focus Area Populated. (Table 8, Option 2 above)	NY Gateway LIS Focus Area built out in support of LIS MSP. (Table 8, Option 3 above)	NY Gateway LIS Focus Area built out in support of LIS MSP. (Table 8, Option 3 above)	NY Gateway LIS Focus Area built out to support all LIS MSP functions including education and stakeholder outreach. (Table 8, Option 4 above)
Approach to Ecological/ Human Use Characterization	Comprehensive characterization of ecological resources/ human uses. (Table 9, Option 2 and Table 10, Option 2 above)	Focused identification of important ecological and human use areas. (Table 9, Option 4 and Table 10, Option 4 above)	Focused identification of important ecological and human use areas. (Table 9, Option 4 and Table 10, Option 4 above)	Comprehensive identification of important ecological and human use areas. (Table 9, Option 5 and Table 10, Option 5 above)
Approach to Future Uses	Narrow focus on one future use. (Table 11, Option 1 above)	Targeted focus on a few key future uses and issues. (Table 11, Option 2 above)	Targeted focus on a few key future uses and issues. (Table 11, Option 2 above)	Comprehensive future use scenarios. (Table 11, Option 3 above)
Use of Decision Support Tools	Data and information and thematic maps. (Table 12, Option 2 above)	Data and information, thematic maps and limited conflict/ compatibility analysis. (Table 12, Option 3 above)	Data and information, thematic maps and comprehensive conflict/ compatibility analysis. (Table 12, Option 4 above)	Data and information, thematic maps, conflict/compatibility analysis and interactive web-based decision support tool. (Table 12, Option 5 above)
Planning/ Policy Options	Recommended use of Data/Information and Thematic Maps. (Table 13, Option 1 above)	Important Ecological/ Human Use Areas Managed Through Performance Standards. (Table 13, Option 3 above)	Combination of Important Ecological/ Human Use Areas Managed Through Performance Standards and Preferred/Priority Use Areas. (Table 13, Option 6 above)	Combination of Important Human Use/ Ecologically Important Areas and Preferred/ Priority Use Areas plus general prohibition on selected set of new, non-traditional, non-water dependent development. (Table 13, Option 7 above)
Monitoring and Evaluation	Informal/Ongoing Monitoring and Evaluation. (Table 14, Option 1 above)	Regular 5-Year Review/ Updates. (Table 14, Option 2 above)	Post-Plan Evaluation plus Regular 5-Year Review/Updates. (Table 14, Option 3 above)	Comprehensive Performance Monitoring and Evaluation Process. (Table 14, Option 4 above)



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VI. References

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