



# DATA AND INFORMATION PHASE II FINAL REPORT: QUALITY AND USABILITY

Long Island Sound Marine Spatial Planning Initiative

Prepared by SeaPlan and the Data and Information Team for the  
Connecticut-New York Bi-State Marine Spatial Planning Working Group

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## Executive Summary

Between 2012 – 2015, the Data and Information Team (“D&I Team”) of the Connecticut-New York Bi-State Marine Spatial Planning Working Group (“Working Group”) laid the groundwork for the geospatial data and information components of Long Island Sound marine spatial planning (“LIS MSP”). Through this effort, the D&I team developed a baseline inventory of existing relevant datasets (“Inventory”), evaluated data standards, and explored options for making these datasets publically available through an online portal. SeaPlan, a Boston-based non-profit, was contracted by The Nature Conservancy (TNC) in Connecticut on behalf of the D&I Team to complete a second phase of the project which would build upon this work to: (a) establish data quality and usability criteria; (b) apply criteria to datasets contained within the inventory; (c) identify steps to improve data quality and usability; (d) obtain and update the inventory with newly available data and additional relevant datasets; (e) identify datasets currently in development; and (f) advance the utility of existing datasets.

This report presents the outcomes of the project, including:

- A framework for evaluating data quality and usability
- An improved overall understanding of datasets that can be incorporated into a publically-available planning portal either now, or in the near future, along with any applicable data usability and/or quality caveats
- Usability and quality improvements (including updated metadata and symbology) implemented on selected datasets
- A menu of options for future work to advance dataset usability

This report is accompanied by two additional deliverables: (a) the updated data inventory which includes results of data evaluation, including data usability and quality scores and proposed next steps, (b) a geodatabase which contains datasets not available as web services. This report concludes with suggested next steps, which include 1) developing a workflow to identify, evaluate, and integrate new and/or updated datasets as they become available, 2) evaluating proposed options for advancing data usability and 3) other next steps to advance the understanding and usability of data for LIS MSP.

### I. Introduction and Purpose

Following the enactment of the State of Connecticut’s Blue Plan (“Plan”) legislation into law in 2015, marine spatial planning efforts are continuing to progress in Long Island Sound (“LIS”). The Plan formally launches a marine spatial planning (“MSP”) process for Connecticut waters of LIS and directs the Connecticut Department of Energy and Environmental Protection (CT DEEP) and the University of Connecticut (UConn) to coordinate among state agencies, academic institutions and stakeholders to inventory existing information about natural resources and human uses of LIS, and to use that information to guide future uses within LIS waters. Formalized discussions of the process have begun,

and a draft discussion document outlining options for developing MSP in LIS was developed to inform and guide this process.<sup>1</sup>

To support informed marine spatial planning in LIS, there is a continued need to identify and evaluate geospatial datasets which characterize natural resources and human uses in Long Island Sound. The project described in this report builds upon initial work by the Data and Information Team (“D&I Team”) subcommittee of the Connecticut-New York Bi-State Marine Spatial Planning Working Group (“Working Group”) to lay the groundwork for the geospatial data and information components of LIS MSP. This effort, conducted from 2012 – 2014, identified and evaluated available datasets in order to develop a baseline inventory of existing spatial datasets (“Inventory”), evaluated existing data standards for potential future use at a Long Island geographic planning scale, and explored options for visualizing and sharing these data through publically-accessible data portals. Virtually all of the inventoried datasets are map-based, viewable through online portals, in mapping software, and/or through other web-based resources. This work represented the first phase of the project. Please see the report (“D&I Final Report”) on this project for more details and contextual background on the role of geospatial data in the MSP process.<sup>2</sup> The second phase of this project, described here, aimed to advance this effort by evaluating data quality and usability of the inventoried datasets, to improve the usability of datasets in the short-term, and to identify options for advancing dataset utility in future phases of the work.

## II. Working Group

### Overview of CT-NY Bi-State Marine Spatial Planning Working Group

The CT-NY Bi-State Marine Spatial Planning Working Group (“Working Group”) is an informal, unofficial body that has been meeting regularly since 2012 with the goal of contributing toward a LIS MSP effort. The Working Group was formed following workshops and discussions about MSP for the Sound and recognition that Long Island Sound, as an intensely utilized, ecologically important water body, needed and deserved its own marine spatial plan.

The Working Group is made up of voluntary participants from state and federal agencies, trade organizations, conservation and user groups, regional ocean entities, academic institutions and Sea Grant programs. The Working Group has formed consensus on the purposes and potential guiding principles that may be appropriate for MSP in the Sound, the types of data and information important for MSP, and what options may make the most sense with regard to shaping and implementing a LIS MSP process.

The Working Group conducts conference calls and meets in person about eight times per year and has identified sub-teams – the Stakeholder Team, the Framework Team and the D&I Team - to carry out

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<sup>1</sup> Frohling, N. & Smythe, T. (2015). Options for Developing Marine Spatial Planning in Long Island Sound: Sound Marine Planning Interim Framework Report [DRAFT]. Connecticut-New York Bi-State Marine Spatial Planning Working Group Interim Framework Report Team.

<sup>2</sup> Smythe, T. (2015) Data and Information Report: Long Island Sound Marine Spatial Planning Initiative. Connecticut-New York Bi-State Marine Spatial Planning Working Group.

work plans and complete work products. These two teams conduct calls approximately once a month. Working Group members and affiliations are listed in Appendix A.

## Data & Information Team

To produce this Data and Information Report, the D&I Team was formed in the fall of 2013. The D&I Team is interested in and has worked on developing and overseeing the data inventory, data standardization, data management and development of relevant datasets that are integral to the LIS MSP process. The D&I team has advanced LIS MSP through a baseline inventory of spatially explicit data from sources including government, scientific, and other local sources. Please see the inside cover for members and their affiliations.

## III. Overview of Approach

There are a number of challenges in compiling spatial data for MSP efforts. Datasets originate from a variety of sources using disparate data management and quality control procedures. Datasets may also exist in a variety of formats with varying degrees of accessibility and usability. Finally, datasets are generated for a variety of purposes and are often not curated specifically for use by the planning community. Before being incorporated into a planning process, relevant datasets must undergo a process of evaluation to determine their overall quality and usability.

The Inventory that accompanied the D&I Final Report is considered to be highly comprehensive (though not exhaustive), but it did not systematically evaluate the quality and usability of the datasets it describes. This report describes the second phase of data compilation work which focuses on evaluating and advancing dataset quality and usability. The objectives of this project consisted of the following:

- Establish data quality and usability criteria
- Use criteria to evaluate the quality and usability of datasets contained in the Inventory
- Identify steps to improve data and metadata quality
- Update the Inventory with newly-available data, additional relevant datasets, and identify datasets currently in development
- Obtain datasets and metadata not available through web mapping services
- Advance the usability of datasets by a) improving existing datasets and b) providing options for next steps to develop aggregated, synthetic, or interpretive data products

This project was accomplished by first identifying data quality and usability criteria, and developing a rating system with which to assign an overall data usability score to each dataset identified in the Inventory. Data criteria and ratings were established by SeaPlan using input from the D&I Team. The criteria and scoring system are described in greater detail in Section II. Once data quality scores were applied and assigned to each dataset, suggestions for improving data quality were developed for each dataset whose score indicated low data quality and/or usability. Datasets were sorted according to the type of improvement needed. If the improvement could be achieved given the time and resource constraints of this project, improvements were made. Additional discussions between SeaPlan and the D&I Team also yielded ideas for how data usability could be improved in future project phases by

developing aggregate, synthetic, or interpretive data products. These options are described in Section V. Finally, discussions between the contractor, the D&I Team, and members of regional data portal working groups led to the identification of additional datasets of interest currently in development that should be included in the Inventory when they are available.

## IV. Methodology

### A. Establishing data quality and usability criteria

While the original project description called for this phase of the project to identify, from the existing Inventory, those datasets which are high priority in terms of their relevance to the LIS MSP process, members of the D&I Team indicated that during this phase, all datasets included in the Inventory should be given equal priority for the purpose of LIS MSP. As such, this task focused on applying data quality and usability criteria to identify which datasets require additional attention before being used in the planning process. For the purposes of this project, the identification of specific criteria was driven by the requirements of posting the data to the [New York State Geographic Information Gateway](#) ("Gateway").

#### i. Defining data quality and usability

While the distinction between data usability and quality are somewhat fluid, for the purpose of this project, "**usability**" criteria referred to aspects of the data which determine the ease of integrating a dataset into the Gateway, such as data format and the availability of symbology. This is similar to the idea of data readiness, as it indicates how ready the data is to be integrated into the Gateway. "**Quality**" criteria referred to parameters such as timeliness and metadata availability which are components of overall data reliability and accuracy.

#### ii. Evaluation approach

The D&I team also suggested that using a quantitative approach to evaluating data quality would be the most efficient and objective methodology. SeaPlan and the D&I team discussed evaluating data quality and usability based on the following characteristics:

- Data availability
- Timeliness (e.g. whether a data product is up to date)
- Maintenance schedule (e.g. how often a product is updated)
- Metadata (presence and/or quality)
- Available formats (e.g. downloadable data vs. services)
- Symbology
- Pixel Resolution (applicable to raster datasets)

Table 1 breaks out criteria and ranks characteristics that are used to calculate a data quality and usability index score for each dataset in the Inventory. The overall score is a reflection of both usability and quality. A rank is assigned to each criteria category, and the ranks are multiplied to calculate the index score, such that low scores indicate highly usable data, while high scores indicate datasets that need additional work prior to inclusion in the Gateway. The final scores were then divided by 10 to

narrow the range of possible data quality and usability scores. Numerical rankings of each criteria category are weighted to account for the severity of specific data deficiencies. For example, a lack of metadata will have a bigger impact on the data usability score than a lack of easily usable symbology.

*Table 1. Criteria and scores used to evaluate inventoried datasets' quality and usability*

Criteria	Characteristic	Ranking
Data Availability	The spatial dataset is currently available from an online portal	x 1
	The dataset is not currently available on an online portal, but is expected to be available by the end of 2016	x 2
	The dataset is known to be available but it must be requested through established channels (i.e. an online request form)	x 2.5
	Although data quality criteria are known, this dataset will need to be obtained from the originator	x 3
	Data criteria are not known because the dataset is not currently available on existing portals. Criteria will be assigned once the dataset is obtained from the originator	NO SCORE
Timeliness	The dataset appears to be current	x 1
	The dataset appears out of date but an update is anticipated	x 2
	The dataset appears to be out of date and no update is anticipated or update schedule is unknown	x 3
Maintenance schedule	The dataset does not require regular updates/is not updated regularly and/or the datasets is updated regularly but is hosted on an external service	x 1
	The dataset is updated regularly but is not hosted on an external service (i.e. will require regular maintenance)	x 3

<b>Criteria</b>	<b>Characteristic</b>	<b>Ranking</b>
Metadata	Metadata is available and compliant with Gateway metadata standards	x 1
	Metadata is available but is incomplete and/or not compliant with Gateway metadata standards	x 3
	Metadata availability unknown	x 4
	Metadata is not available	x 5
Data format	Dataset is available as a web service	x 1
	Dataset is available as an ArcGIS shapefile, feature class, or tile cache	x 2
	Dataset is available in a different format (e.g. excel table) containing coordinates that will need to be converted into a shapefile or feature class or is available as an online map only.	x 4
Symbology	Dataset is available as a service containing appropriate symbology	x 1

Criteria	Characteristic	Ranking
	A downloadable lyr. File contains symbology	x 2
	Symbology is described in the metadata	x 2.5
	Symbology is present in an online viewer but will need to be manually created based on visual reference	x 3
	Symbology will need to be manually created and cannot be discerned from data originator	x 3.5

SeaPlan applied criteria to datasets in the Inventory and show the results within columns that were added to the Inventory spreadsheet that corresponded to each individual quality/usability criteria, along with a column for a final score. Scores for each criteria were applied by examining the data through a public portal, downloading a dataset into ArcGIS software, and/or reading the dataset's metadata.

Timeliness criteria were applied using SeaPlan's best professional judgement, knowledge of the dataset, and information contained in the metadata. Evaluating timeliness can be somewhat subjective, given that some datasets may reflect conditions which change frequently (e.g. yearly marine mammal sightings) and some datasets may not require regular updates (e.g. bathymetry contours). Datasets within data portals that are known to be regularly maintained (state and regional portals) were generally given timeliness scores of "1" unless there was some indication that the datasets were known to be out of date. The D&I Team was given the opportunity to review the updated Inventory with the criteria applied to identify any instances when timeliness or other criteria were not accurately evaluated.

In the event that a dataset was listed in the Inventory but does not appear to be accessible, and nothing is known about data quality criteria, no overall data usability score was assigned. Datasets that were identified in the Inventory but which no longer appear to be accessible through the named source were highlighted in red in the Inventory document.

An additional column was added to calculate the overall quality and usability score. This score was then divided by 10 to provide a more linear score scale. Scores were then grouped and color-coded as described in Table 2.

*Table 2. Data quality and usability score ranges and descriptors*

Score	Description
0.1	Dataset is usable in its current form
.1 - 1	Dataset is usable with minor caveats and/or minor refinements
1 - 5	There are a few uncertainties associated with this dataset and/or dataset may be usable with moderate caveats and efforts to refine
5 - 9	There are moderate uncertainties associated with this dataset and/or dataset may be usable but will require somewhat substantial efforts to refine
9 +	There are substantial uncertainties associated with this dataset. The dataset is unlikely to be usable without very time-consuming efforts to obtain or refine
No Score	This dataset is currently not available through online portals and therefore there is not enough information available to apply criteria

In addition to the criteria, the following fields were added to the Inventory for reference, but did not contribute to the overall data quality score:

- Temporal Resolution (if applicable)
- Pixel Resolution (if applicable)
- Update frequency (if known)
- Point of contact – list individual closest to data point of origin, but can also list data provider/metadata writer if no other POC noted.

## B. Improvements to data quality and usability

Applying data quality and usability criteria allowed SeaPlan to identify specific actions and next steps that would improve data quality and usability based on the specific deficiencies highlighted by criteria rankings and scores. These actions were identified in the Inventory by adding an additional column to the Inventory which described proposed next steps, where they were applicable. Where time and resources permitted, SeaPlan addressed these deficiencies over the course of the project. A description of the most common data deficiencies and the actions taken to remedy them are summarized in Table 3, with more detailed descriptions of specific data deficiencies in the following paragraphs. A list of datasets improved by this task can be found in Appendix E.

*Table 3. Types of data deficiencies and suggested improvements*

Type of Data Deficiency	Suggested Improvement(s) to Datasets
Symbology is unavailable	Assign symbology based on visual inspection of data represented on the portal or using best professional judgement
Metadata is incomplete	Use metadata template to request additional information from data originator
Dataset is not available through a public portal	Request data from data originator through formal channels
Dataset is not in an ArcGIS compatible format	Convert dataset to compatible format

### *Symbology*

Symbology refers to how the features of a spatial dataset are visually represented on a map. Before a dataset can be incorporated into the Gateway, it must have a defined symbology which assigns shapes, colors or other graphical representation to map features based on the type of information conveyed within the dataset. If the dataset is available through a web service, a symbology definition is automatically available when ingesting the web service into a GIS/online portal. Symbology also may be defined through a downloadable .lyr (“layer) file. A layer file is a file format used in Esri® ArcGIS® which allows a user to store a symbology definition specific to a dataset. A layer file will sometimes accompany a downloadable spatial dataset so that the symbology does not have to be recreated on the fly. If a dataset was not available as a web service, and when there was no available layer file for downloading, SeaPlan defined dataset symbology by creating a layer file in ArcMap. When a dataset was symbolized in an existing web portal, an attempt was made to replicate that symbology in the creation of the layer file. If no symbology existed, a layer file was created using the best professional judgement of SeaPlan, referencing symbology of similar types of datasets where possible and/or appropriate.

### *Metadata*

Metadata refers to documentation about the dataset’s characteristics. Metadata for inventoried datasets was evaluated based on its compliance with metadata standards articulated by the [Gateway's Data Acceptance and Metadata Standards](#). The Gateway accepts both FGDC and ISO 19115 formats. Anticipating that some identified datasets would not meet these standards, SeaPlan and the D&I team developed a metadata template which could be filled in to create compliant metadata. The metadata template can be found in Appendix B. Where metadata was not compliant with Gateway Standards, or if the information contained in the metadata was otherwise deemed incomplete by SeaPlan, one of two actions were proposed. One action was to reach out to the data originator and request that they fill in metadata gaps using the template. Where possible, SeaPlan filled in the template with known information about the dataset and identified areas where information was missing. This action was taken to obtain more detailed methodology for datasets resulting from the Long Island Sound Cable Study. The second action was to develop compliant metadata based on available materials, such as

technical reports by filling in the template. While there were no circumstances where this was action was undertaken during the course of the project, it can be considered as an option in the future if necessary.

#### *Data availability*

There were two categories of unavailable datasets identified in this project. In some cases, a dataset was not available through a public portal, but could be requested from the data originators. Under these circumstances, SeaPlan requested datasets formally. In other cases, datasets that were listed in the Inventory were no longer available through their identified data sources. This could happen in cases where datasets were replaced by more up-to-date data or if the sources were no longer considered reliable, or because of technical issues such as broken links. In most cases, no action was taken to try to obtain these datasets due to time constraints; however, the reason for lack of availability was identified in the Inventory, when known.

#### *Data format*

Datasets not in an appropriate format were most often .kml files. This is a spatial data format commonly used in Google Earth™. These files were converted into usable format using the KML to Feature Class tool in ArcMap and stored in the file geodatabase.

### C. Identifying additional, new, and upcoming data products

While the existing data Inventory was considered to be relatively comprehensive, it was not considered exhaustive. It was anticipated that this project would identify additional datasets of interest, especially datasets that were newly available. In some cases, these datasets were identified by scanning regional and state-based portals for updated data, or by referencing the D&I Final Report<sup>2</sup> and locating the upcoming data products identified in that report and adding them to the Inventory. SeaPlan also worked with the D&I Team to identify datasets currently in development that will likely inform LIS MSP. These datasets are listed in Section VI.

### D. Obtaining and storing data and metadata

Datasets that are available as web services can be integrated into the Gateway with the greatest level of efficiency. In cases where web services are available for a given dataset, the link to the service is listed in the Inventory. In cases where the dataset is not available as a web service, SeaPlan downloaded and stored the dataset in a geodatabase, which accompanies this report as a project deliverable. Within the geodatabase, the datasets are organized by data sources and stored as feature classes. In these cases, the names of the feature classes as named in the geodatabase are listed in a column added to the data Inventory. Metadata is stored with the dataset in ArcCatalog, wherever possible.

### E. Advancing data usability

Feedback from the D&I Team indicated that while identifying and completing short-term steps to enhance the quality and usability of select datasets would be of high value, this project also afforded the opportunity to identify options for future work to advance the usability of existing datasets. SeaPlan

and the D&I Team worked together to identify a series of proposed next steps for advancing data usability, quality, and planning utility (see Section VI.D). Advancements in data usability could include: aggregated products which would combine similar, existing datasets into new, composite product(s); a synthetic data product which leverages data and information from a variety of data products and sources to create a novel data product; or an interpretive data product that leverages analytical techniques to provide greater clarity about existing data (e.g. a hot spot analysis or data interpolation).

## V. Findings

This section provides an overview of the project deliverables and their contents and presents major findings from the data evaluation. The updated data Inventory, described in greater detail below, represents the primary body of results from this project, and contains data quality and usability rankings and scores, proposed next steps, and other information about the dataset. The tables in the appendices referenced in this section provide a more complete breakdown of results, by categorizing and presenting the inventoried data according to data evaluation results.

### A. Project deliverables

In addition to this report, this project resulted in a number of discreet project deliverables that can be used to facilitate the evaluation and integration of data into the Gateway or other portal and other processes moving forward. These deliverables are stored in a digital file folder and are described in the following sections.

#### i. Evaluation criteria

The data quality and usability evaluation criteria and scoring system described in Section IV can be used as a stand-alone methodology for evaluating datasets which are candidates for use in the LIS MSP process.

#### ii. Metadata template

As described in Section IV, SeaPlan developed a metadata template which can be used to develop metadata compliant with Gateway standards. Data originators can use the template to supply relevant information about a dataset so that there is complete information accompanying the dataset in the Gateway and other LIS MSP activities.

#### iii. ArcGIS file geodatabase and layer files

Datasets that were not available as a web service but were available for download are stored in a file geodatabase so that they can be uploaded to the Gateway and accessed for future LIS MSP activities. A file geodatabase is a spatial data storage format specific to ArcGIS. Datasets are organized according to their source (e.g. Northeast Ocean Data Portal). In many cases, datasets were renamed for improved specificity or to avoid duplication with other datasets. So that datasets can be easily cross-referenced with the Inventory (described below), a column was added to the Inventory to provide the name of each dataset as it appears in the geodatabase, where applicable.

As described in Section IV, layer files, which define symbology for a given dataset, were either downloaded or created for downloadable datasets. These layer files are stored in a digital file folder meant to accompany the geodatabase. In cases where symbology was missing for a downloadable dataset, symbology was created manually and saved in a layer file using the online map or other technical documentation as a reference. For the LIS Cable Data, symbology was created for a select set of datasets based on anticipated applicability for LIS MSP. These datasets are listed in Appendix E. It should be noted that there may be a need to alter symbology based on various cartographic considerations (i.e. basemap, presence of other datasets on a map), and that the symbology found in the layer files should be considered suggestions.

#### iv. Updated Inventory with applied criteria results

The updated Inventory constitutes the main body of results for this project and contains both quantitative and qualitative information describing characteristics of each dataset included in the Inventory, as well as for any new datasets added to the Inventory during this project. These results are found in Columns Z - AO. As described in Section IV, data quality and usability criteria were given rankings to calculate an overall data quality and usability index score (Columns Z – AF); however, the Inventory also contains qualitative information (Columns AG - AK) that may be helpful in evaluating the utility and relevance of the dataset both in terms of inclusion in the Gateway, and in terms of relevance to LIS MSP efforts. The original data Inventory accompanying the D&I Final Report organizes datasets by tabs, which were preserved from the first phase of this project (i.e. D&I Final Report) and generally correlate with an online source from which they can be accessed or a study/project from which they originated. These sources include the following (blue lettering indicates presence of a hyperlink):

[\*\*Northeast Ocean Data Portal\*\*](#) – provides access to datasets depicting ocean uses, marine life and environment covering areas from Long Island Sound through the Gulf of Maine. (Referred to in the Inventory as NE Ocean Data Portal)

[\*\*Mid-Atlantic Regional Council on the Ocean Data Portal\*\*](#) – contains datasets depicting ocean uses, marine life, and the environment covering areas from New York through Virginia. (Referred to in the Inventory as Mid-Atlantic Portal Inventory)

[\*\*Marine Cadastre\*\*](#) – a national data resource for ocean energy planning and other marine mapping needs.

[\*\*NYS Geographic Information Gateway\*\*](#) – refers to datasets found on the Gateway, which provides access to datasets relevant to the New York State Office of Planning and Development's activities throughout New York State. (Note: Referred to in the Inventory as NY Spatial Data Inventory)

[\*\*LIS Inventory May 2011 Revised\*\*](#) – contains data from a variety of sources, including [Connecticut Environmental Conditions Online](#), the [Long Island Sound Study](#), [CT DEEP](#), and other miscellaneous sources of data in or adjacent to Long Island Sound.

[\*\*LIS Cable Fund Mapping\*\*](#) – provides access to data collected during the Long Island Sound Mapping Project, and includes acoustic data (bathymetry, backscatter, sub-bottom), geological data, and biological data.

**LISRC Inventory** – provides access to datasets catalogued by the Long Island Sound Resource Center and includes bathymetric, benthic, chemical, geological, multi-beam, navigational, regulatory, and sonar data.

**LISEA** – The Long Island Sound Ecological Assessment, which contains ecological data describing Long Island Sound’s submerged habitats, including an analysis of biological data, seafloor complexity, and the identification of “Ecologically Notable Areas”.

**Other Data Inventory** – Contains data from a variety of sources, including National Oceanic and Atmospheric Administration (NOAA), National Geophysical Data Center (NGDC), CT DEEP, TNC, and others. In some cases, this tab contains groups of datasets and/or online viewers containing thematic data.

It should be noted that regional portals which include Northeast Ocean Data Portal, the Mid-Atlantic Regional Council on the Ocean Data Portal, and the Marine Cadastre serve a combination of datasets provided “as is” from outside sources (e.g. state and federal agencies and academic institutions) in addition to datasets developed or modified specifically for inclusion in that portal by members of the portal team.

As described in the methodology, the Phase I Inventory was appended with the following fields:

- Data quality and usability criteria (Scores for: data availability, timeliness, maintenance schedule, metadata, data format, and symbology and calculated data quality and usability index score) (Columns Z – AF)
- Temporal resolution (if applicable) (Column AG)
- Pixel size (if raster) (Column AH)
- Update frequency (if known) (Column AI)
- Point of contact (Column AJ)
- Data quality and usability notes (Column AK)
- Proposed next steps (Column AL)
- Dataset file name in geodatabase (where applicable) (Column AM)
- Layer file name to accompany dataset in geodatabase (where applicable) (Column AN)
- Data category (described further in Section V) (Column AO)

Added column headers are colored in grey to indicate additions to the Inventory. Each tab in the Inventory contains a header indicating whether its contents were updated in this phase of the project, or whether contents were preserved from the first phase of this project (i.e. D&I Final Report). The results from this phase of the report can be found in Inventory tabs which aggregate data by data source (e.g. the Northeast Ocean Data Portal).

Quantitative data quality and usability rankings and overall calculated scores are captured in the Inventory (Columns Z – AF). The Inventory also contains qualitative information (Columns AG – AK) that may be helpful in evaluating the utility and relevance of the dataset both in terms of inclusion in the Gateway, and in terms of relevance to LIS MSP efforts. Temporal resolution (Column AG), pixel size (Column AH), and points of contact (AJ) are characteristics that may further inform dataset usability, and were generally pulled from metadata or other documentation. Dataset evaluation was only performed

on datasets that were included in the final Inventory (indicated by a ‘Yes’ in Column D). General criteria for exclusion from the final Inventory are described in the D&I Final report and additional, dataset-specific details may be found in Column E.

The data quality and usability notes field (Column AK) contains additional qualitative results not captured by other categories. Where applicable, SeaPlan used this field for any other information that may be helpful in assessing data quality, usability, or relevance. In many cases, this field was used to further describe why a dataset received a specific score for any of the criteria, whether the dataset should be acquired through other means, or any other information that might be helpful to future LIS MSP efforts.

The proposed next steps field (Column AL) allowed SeaPlan to recommend specific actions that would improve overall data quality and usability. In some cases, these actions were undertaken as a component of this project. In other cases, proposed next steps would have to be accomplished in future phases of the project, or by the data originator or data supplier.

Changes in data availability were also highlighted in the Inventory. Datasets which are newly available are highlighted in green, while datasets that are not currently available through public portals are highlighted in red, and described in greater detail in Section B.V.v. The Inventory is available in a separate document.

## B. Categories for inventoried datasets

In order to facilitate dataset assessment, datasets were assigned to categories based on proposed next steps. Each dataset in the Inventory was assigned a next step category based on the data quality and usability evaluation and the overall assessment of relevance to LIS MSP. These categories are as follows and are described in greater detail in following sections:

- **Usable data** – datasets that can be incorporated into the Gateway in their current state
- **Usable data with caveats** – datasets that can be incorporated into the Gateway in their current state, with some noted caveats
- **Improved data** – datasets that have undergone a quality or usability improvement as part of this project and can now be incorporated into the Gateway; additional improvements may be desired before incorporation into the Gateway
- **Other datasets**– datasets which may be of indirect interest to LIS MSP (e.g. land-based or land-oriented data) but should not be incorporated into the Gateway for LIS MSP purposes at this time. Most of these datasets would require additional data quality and usability improvements before incorporation into the Gateway
- **Datasets not currently downloadable through public portals**

The next step category in the Inventory allows a user to determine how a dataset was treated in the context of project results by cross referencing the Inventory with the categories described in the sections below, along with their associated tables.

### i. Usable data

This exercise identified 130 datasets that are ready to be integrated into the Gateway as is, with no noted improvements or major caveats. These are all of the datasets that have a data usability score of .1, and are characterized as current, available as a web service, and accompanied by appropriate metadata. Datasets in this category were not evaluated for their relevance to the geographic scope of LIS MSP; therefore, some of the datasets in this category may not end up being relevant to LIS MSP. They were included because of the relatively low effort associated with incorporating them into the Gateway. These datasets are listed in Appendix C.

### ii. Usable data with caveats

An additional 56 datasets were identified that, despite not having perfect quality and usability scores, can be integrated into the Gateway as is. These datasets have scores within the range of .2 to 1.2 and are listed in Appendix D. In general, these are datasets where potential improvements were not possible given the scope of this study. Datasets that fall under this category may, for example, be datasets which are not available through a web service, but are otherwise high quality and publically available for download. In these cases, the datasets have been stored in a geodatabase for the purpose of this project, and can be identified through their file name and layer name (if applicable) noted in columns AM and AN of the Inventory. In other cases, they may be datasets with data quality caveats, such as data which is not considered current, or where metadata is incomplete but is being sought out by other parties such as the Northeast Ocean Data Portal working group. In these cases, datasets are generally considered the best available data and should be incorporated into the planning portal with caveats articulated appropriately.

### iii. Improved data

Improvements were made by SeaPlan and others to a total of 57 datasets, as summarized in Appendix E. In their current format, these datasets can be incorporated into the Gateway, although other improvements, noted in the table, can be made in the future to maximize the data quality and usability score.

As described in Section IV, types of improvements included the following:

#### *Symbology*

SeaPlan assigned symbology, saved in a layer file, to a total of 57 datasets. The majority of the datasets that were assigned symbology as part of this project were from LISRC and the Long Island Sound Cable Study. Symbology reflects source materials such as online maps and project technical reports. Details about these datasets can be found in the data quality and usability notes column in the Inventory and in Appendix E.

#### *Metadata*

This project determined that metadata from the LIS Cable Study required improvement before it could be included in the Gateway or other LIS MSP materials. While some metadata existed, it was not

detailed enough to discern sufficient detail about the project or the resultant datasets. Further analysis of the datasets and associated metadata determined that a separate metadata document would not be required for each dataset, but rather, one metadata document per study could include enough information about the features present in each study's datasets. SeaPlan requested that metadata be created for the following projects in the LIS Cable Study:

- Long Island Sound Epifauna
- Long Island Sound Carbon and Nitrogen Content and Mud, Sand, and Gravel Content
- Long Island Sound Metals
- Long Island Sound Sedimentary Environments and Texture Interpretations
- UConn FVCOM
- Long Island Sound Infauna

A member of the D&I team requested updated metadata from project contacts at Long Island Sound Mapping and Research Collaborative (LISMARC) and Lamont-Doherty Earth Observatory by sending a copy of the metadata template with required fields highlighted. Members of that project team are in the process of updating the metadata, and will return updated metadata to the D&I team upon completion. Details about these datasets can be found in the data quality and usability notes column in the Inventory and in Appendix E.

#### *Data availability*

In this phase of the analysis, it was determined that a number of datasets included in the Inventory are no longer available through the indicated source. In many cases, it was determined that some datasets had been replaced with more up-to-date data, or that the data was likely to be outside of the geographic scope of the planning. A next step includes deciding which, if any of the datasets that are currently unavailable through public portals are needed for LIS MSP so that they may be requested from originators. Datasets that are no longer available are listed in Appendix G, along with information from the data usability and quality notes column about possible reasons for this change.

There were several instances where data listed in the Inventory needed to be requested through formal channels. One of these datasets was entitled "Distribution Maps of the Western Hemisphere", which represents a number of individual datasets compiled by Birdlife International. SeaPlan obtained the datasets, and while some may be useful, the datasets require authorization for publication on a public portal or elsewhere. As described in Section VI, the D&I team may want to explore possible applications of these datasets to create composite products and request permission for use after composite datasets are created. Another example of data that needs to be formally requested in the NYS Natural Heritage Community data from NYSDEC. Conversations with D&I team members from NYSDEC determined that this dataset is not likely relevant to LIS MSP because it does not depict offshore species. Details about these datasets can be found in the data quality and usability notes column in the Inventory and in Appendices F and G.

#### *Data format*

While the formats of the inventoried datasets varied, all datasets were available either on a web-based map, mapping portal, and/or are viewable in mapping software (e.g. ArcMap). The majority of datasets

in the Inventory were in formats that are compatible with ArcGIS. In several cases, datasets were only available as .kml (file formats commonly used to display spatial data in Google Earth), but were converted by SeaPlan to ArcGIS-compatible shapefiles using a conversion tool in ArcMap. Other datasets with incompatible formats included datasets that were only available as static online maps or pdfs. These were evaluated on a case by case basis for relevance to LIS MSP and it was determined that the datasets in incompatible formats were either a) outside the geographic scope of the project (e.g. Important Bird Areas) or b) soon to be updated with more current data (e.g. CT Orthophotos). Details about these datasets can be found in the data quality and usability notes column in the Inventory and in Appendices E and F.

#### iv. Other datasets

There were 55 datasets included in the Inventory that are not recommended for inclusion in the Gateway for the purpose of LIS planning at this time. These are listed in Appendix F. In general, these are datasets that are either outside of the geographic scope of the LIS MSP process (i.e. coastal or land-based), or which can likely be more accurately represented through more up to date datasets which are currently available. Two of the avian datasets, including the Breeding Bird Atlas Data and the Birds of the Western Hemisphere Data will require improvements which were beyond the resources available to this project. As described in Section VI, the D&I team may want to further evaluate these datasets to determine whether they would be useful in creating additional avian data products for Long Island Sound. These datasets may be of interest for parallel or related efforts, but are not specifically relevant to the LIS MSP as it is currently defined, and therefore, it is not recommended that any additional effort go into improving these datasets for inclusion in the current effort.

#### v. Datasets not currently downloadable through public portals

SeaPlan identified a number of datasets that were included in the Inventory but which are not currently downloadable through the source indicated in the Inventory. A list of these datasets can be found in Appendix G. In ~75% of those cases, these datasets are no longer available from the indicated source because they were replaced by higher quality or more up to date data in the source data portal. In other cases, the original Inventory was not specific as to how the data could be acquired. In the case of certain datasets from the LIS Cable Study are not readily available as standalone products, but rather would have to be created using existing LIS Cable Study data products. In general, even though these datasets may not be readily acquirable through the source indicated in the Inventory, they may be acquired by contacting the data originator or data portal manager, or through additional data analysis efforts. A suggested next step for the planning effort is to review the datasets in this category to determine whether any of them are required for the planning effort and if so, use the appropriate channels to acquire the data.

### C. Tracking data partnerships

One of the tasks identified in the project scope was tracking informal partnerships and lines of communication with data suppliers. However due to the nature of the project trajectory as determined by data quality and usability analysis results, there was little emphasis on developing new partnerships or outreach to data originators. In a few cases, D&I team members reached out to data originators on

behalf of the D&I team to either fill in metadata gaps or gather information about dataset availability. These instances are noted in the data quality and usability notes in the data Inventory. Points of contact for specific datasets are also noted in the data Inventory where available, and future work by the D&I team may be to foster and formalize partnerships and relationships with data originators and providers.

## VI. Next Steps

This section identifies a menu of options for next steps in identifying, preparing, and developing datasets relevant to LIS MSP. Some of the next steps stem from the analyses described in previous sections. Other next steps are based on suggestions from the D&I team, and include next steps for data maintenance, management, and development. Finally, some of the next steps are organizational in nature and are dependent on the continuation of an engaged LIS MSP working group and D&I team to provide guidance and expertise in prioritizing next steps to meet both short and long term planning objectives and milestones. To reflect the fact that this project identifies several categories of next steps, with a number of discreet next steps identified within each category, this section is organized according to next step categories, with descriptions of specific next step options outlined under each category's subheading.

### A. Data quality and usability improvements

The updated Inventory and Section V of this report describe improvements to datasets undertaken by SeaPlan over the course of this project to enhance data quality and usability; however, in some cases, SeaPlan noted additional improvements that would have to be made by the data provider or originator, such as supplying the data via a web service, or updating out of date data. These next steps are described in the Inventory. Future work can identify those datasets which are both a priority to LIS planning and which require additional improvements and work with data suppliers to evaluate the feasibility of these suggested improvements.

### B. Upcoming datasets

This project identified a number of forthcoming datasets which should be added to the Inventory and evaluated for utility in LIS MSP when they become available. These datasets include:

- The Marine Life Data and Analysis team (MDAT) which is comprised of scientists from Duke Marine Geospatial Ecology Lab, NOAA Centers for Coastal Ocean Science, Loyola University and NOAA Northeast Fisheries Science Center is producing a suite of data products depicting the modeled distribution and abundance of marine mammals and seabirds, and the observed biomass of fish. This work is being conducted for the Northeast Regional Planning Body and the Northeast Regional Ocean Council, and data products will be available as web services through the Northeast Ocean Data Portal in the spring of 2016. Models are being generated for both individual species, species groups, and whole taxa and will include depictions of total abundance, total biomass (fish only), species richness, Shannon diversity, core abundance areas, and core biomass areas (fish only). Although LIS is excluded from these model outputs due to interpolation and interpretation parameters; data

from marine environmental adjacent to LIS may be relevant to LIS MSP. There also may be source datasets which include LIS geographically that were not included in regional modeling for reasons noted above, but which may be relevant to the LIS MSP effort. The D&I team may also consider coordinating with the MDAT team to identify any relevant source datasets.

- CT DEEP conducts a monthly trawl survey in LIS to sample fish species, abundance, and other environmental metrics each spring and fall. Technical reports available online contain coordinates and other spatial information about survey results, but map-compatible data are currently available for download from a public portal, despite their significant biological importance for LIS MSP. Results from this effort contributed to TNC LISEA products documented in this Inventory. Additionally the Northeast Ocean Data Portal team is also exploring the possibility of representing additional data products from the trawl survey on the portal.
- An upcoming CT DEEP project will collect 6" multispectral resolution color-infrared (CIR) imagery of the Connecticut coastal areas during June-October 2016. Data will be available by late 2016. There will also be a statewide (CT) orthophoto/LiDAR flight in the spring of 2016 that collects multispectral 3" imagery as well as 1m LiDAR postings. While orthophotos would likely not represent downloadable data, they might be of value as a basemap option for the LIS focus area map viewer.
- The Nature Conservancy is updating its [Northwest Atlantic Marine Ecoregional Assessment](#) Benthic Habitat model using Video Survey datasets being developed by the University of Massachusetts – Dartmouth School for Marine Science and Technology.
- NOAA's Office of Coast Survey is responsible for planning hydrographic surveys and maintains this [map viewer](#) to depict footprints of planned surveys. The map viewer currently shows that a survey was planned off the coast of Guilford and Madison, CT in 2015; however, the data does not yet appear to be available. [NOAA's digital coast data viewer](#) also depicts the footprints of various bathymetric surveys, including the results from topobathy LiDAR surveys. Many of these surveys are ongoing, or reflect footprints of datasets currently being processed. This site can be monitored periodically to identify new bathymetric data for LIS.
- The EPA is collecting data to inform an environmental impact statement (EIS) on dredged material disposal sites in Long Island Sound. The D&I team is awaiting additional details as to the nature and expected release of these datasets.
- NOAA's Office of Response and Restoration is currently updating Environmental Sensitivity Index (ESI) data and maps in areas affected by Hurricane Sandy. Long Island Sound is the first region to be updated as part of this effort. Over 200 species and birds, fish, reptiles, marine and, terrestrial mammals, invertebrates and habitats were mapped, in addition to a variety of human uses and shoreline derived from post Hurricane Sandy imagery. PDF maps and downloadable spatial datasets are expected to be available from NOAA in mid-2016.
- SeaPlan continues to work with the Northeast Regional Ocean Council (NROC), state and federal fisheries officials, the Atlantic Coastal Cooperative Statistics Program, George LaPointe Consulting, HarborLight Software, and industry members to conduct a pilot study to map the activities of party and charter fishing vessels in the Northeast. Current efforts are focused on vessels leaving from New York, Connecticut and Rhode Island ports. No date has been set for

data to become available; however, when it is, it will likely be available through the Northeast Ocean Data Portal as a web service.

- Phase II of the Long Island Sound Cable Fund Mapping Project is expected to produce data outputs which will include acoustic intensity and seafloor topography, sediment texture and grain size distribution, sedimentary environment and chemistry, benthic habitats and ecological processes, and physical oceanographic characterization in eastern LIS between the mouth of the Connecticut River and the Rhode Island state line. Additional data products resulting from this phase will depend on the results of acoustic data processing, which is currently underway. Data collection for this phase will likely begin in late 2016 or 2017. A work plan hasn't been finalized yet but is expected later in 2016. The work plan will provide an estimate of the project schedule. A third phase of the project is expected to target western LIS.
- Multi-beam acoustic mapping surveys take place periodically in the region. The Northeast Ocean Data Portal plans to update these datasets on the portal's bathymetry resource page as they become available. Daniel Martin (NOAA) also maintains an updated inventory of these projects and can supply information on these surveys upon request.
- NYS DEC is finalizing a group of datasets which will be publically available in 2016 through the Gateway and which will likely be useful to LIS MSP. These datasets include:
  - NY Regulatory Tidal Wetlands (1974)
  - Updated NY Tidal Wetlands (2005, non-regulatory)
  - Artificial Reefs
  - LIS Eelgrass (2002, 2006, 2009)
  - Shellfish Closures
  - Western LIS Seine Survey Data (ongoing)
  - Horseshoe Crab Survey Data (ongoing)
  - Western Long Island Lobster Trap Survey (2003 – 2009)
  - Ventless Long Island Lobster Trap Survey (2006 – 2009)
- MARCO has listed the following as upcoming datasets that are expected to be available in 2016 through the Mid-Atlantic data portal:
  - Improved sediment and seafloor habitat maps – an analysis of 10 years of video survey data and integration with FVCOM oceanography data to produce high resolution sediment, habitat, and force stability regime maps (source: UMass Dartmouth (SMAST) and The Nature Conservancy)
  - Seasonal/anomaly maps including surface/bottom temperatures, currents, wind speed, and shear stress. Data will include standalone map layers and spatial datasets for models to support regional ocean planning (source: Multiple, including MARACOOS, UMass Dartmouth, Rutgers, and NERACOOS).
- The Northeast Ocean Data Portal will soon make the following data products available in March 2016:
  - Priority Restoration and Conservation Projects – Locations of priority restoration and conservation projects that are not fully-funded and which represent opportunities for investments in ocean health.
  - usSEABED Atlantic Coast Offshore Surficial Sediment – a point coverage of known sediment samplings, inspections, and probings from the USGS usSEABED data collection. This dataset will be accompanied by a companion data quality layer which evaluates the

- overall quality of each data point based on sampling methodology, sampling/publication year, and analysis technique.
- FVCOM oceanographic data products including temperature (surface and bottom), surface currents, salinity and stratification.
- Seabed Forms – A combination of Slope and Land Position Index from TNC’s NAMERA.

## C. Data gaps

The next steps in addressing data gaps will depend on a number of factors, including project time and resources, and LIS MSP priorities, and the emergence of new data that will help address these gaps. One way to categorize data gaps is based on the attainability of data. Some data gaps may require only minimal effort to fill, and may be in the process of being filled by other efforts. Some data gaps may be filled realistically, but only given sufficient time and resources. In other cases, filling a data gap may not be achievable even if it does represent an important planning consideration. In those cases, planners may need to identify proxies to approximate those footprints in the planning effort. In general, a next step for this project may include a more thorough gap analysis which a) provides a narrative assessment of what data areas are relatively complete and up to date with respect to LIS MSP data priorities and their utility to the planning process; b) identifies missing data more methodically and categorizes missing data according to how easy they would be to attain and how important they are to the planning effort; and c) provides a more in-depth plan for obtaining or identifying proxies for missing or incomplete data.

The D&I Final Report noted a small number of data gaps, which included, but were not limited to, the following:

- Shellfish habitat suitability data (CT data are out of date and NY does not have such a dataset)
- A contiguous dataset of shoreline characterization (substrate type) and coastal erosion data for the entire LIS coastline
- Coastal risk/vulnerability data for the northern LIS (CT) coastline

These gaps have not been addressed since they were originally reported; however, it is possible that the upcoming LIS ESI data may address some of the shoreline data gaps.

This project also identified several areas where data are limited and could be better addressed through future studies or data development.

- **Zooplankton data** – Data on zooplankton abundance for four species (*C. finmarchicus*, Euphausiids, Gammarid amphipods, and Mysid shrimp) are available through the Northeast Ocean Data Portal but only depict average Fall abundance for 2003 – 2007. The Northeast Fisheries Science Center (NEFSC) updates zooplankton abundance data annually, and raw data is available for download; however, the data would likely require additional processing before it would be in a format useful to LIS MSP.
- **Satellite data** – Chlorophyll a data available from the Northeast Ocean Data Portal are derived from satellite imagery (SeaWiFS) and depict seasonal averages from 1998 – 2006. More up to date data, or data that reflects a finer temporal scale may be useful to LIS MSP.

- **Benthic habitat data** – The Inventory contains datasets which characterize benthic habitats; however, datasets do not cover the entirety of LIS, and some datasets may not be considered current. MARCO has also identified fine-scale near shore benthic habitat mapping as a data portal priority.
- **Marine Mammals and Sea Turtles** – Data on the Northeast Ocean Data Portal shows little to no marine mammal or sea turtle sightings or survey effort in Long Island Sound. While cetaceans are not known to inhabit the sound on a regular basis, periodic whale and dolphin sightings in Long Island Sound<sup>3</sup> suggest that there may be value in compiling data on cetacean sightings in Long Island Sound and including this data in LIS MSP. Sea turtles and harbor seals are both present in Long Island Sound with some regularity<sup>4</sup> but are not represented by inventoried data products.
- **Recreation** –While there have been a number of efforts to characterize recreational activities in the region (e.g. recreational boating), and additional efforts are underway (e.g. recreational charter fishing), data gaps remain. Results from coastal recreation surveys on the Northeast Ocean Data Portal and the MARCO Mid-Atlantic portal largely show activities in coastal areas, without much representation offshore. While the 2015 Characterization of Coastal and Marine Recreational Activity in the U.S. Northeast attempted to capture the offshore marine events such as sailing races and fishing tournaments<sup>5</sup>; however, the results are not considered complete and are not available from a public portal. This study also did not target recreational fishing.
- **Tourism** – There do not appear to be any datasets depicting the spatial footprints or shore-based locations of vessel-based tourism in Long Island Sound. Charter and party boats, as well as vessel-based wildlife viewing may represent another ocean uses that is relevant to LIS MSP.

## D. Options for future data product development

As described in Section IV, identifying possibilities for future data development work was an additional task within the scope of this project. This task included proposing a menu of options for advancing the planning utility of inventoried datasets through the development of aggregated, synthetic, or interpretive data products. Given the number of datasets in the Inventory, there are a vast number of possibilities for creating combinations of data, or applying additional analysis to existing data. This can be as simple as combining certain datasets that address similar categories of interest so a more complete picture can be seen in one place for that area of interest. The utility of composite, interpretive, and synthetic products will depend not only on the quality and usability of the source data, but also on planning priorities and objectives. Some options and proposed framework methodologies are presented below, and are not intended to be exhaustive, nor is the order of presentation intended to imply ranking or priority. A task of future work would include developing more detailed methodology for these

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<sup>3</sup> Shay, J. (2015, September 26). More whales spotted in Long Island Sound. *CT Post*. Retrieved from: <http://www.ctpost.com/news/article/More-whales-spotted-in-Long-Island-Sound-6521791.php>

<sup>4</sup> Schuh, J. (Fall 2009). The Sound's seals and sea turtles. Sound Update: Newsletter of the Long Island Sound Study. Retrieved from: <http://longislandsoundstudy.net/wp-content/uploads/2010/03/fall2009.pdf>

<sup>5</sup> Bloeser, J., Chen, C., Gates, M., Lipsky, A., & Longley-Wood, K. (2015). Characterization of Coastal and Marine Recreational Activity in the U.S. Northeast. Point 97, SeaPlan, & Surfrider

options, and vetting both methodology and final products with both data originators and planners in the LIS MSP process to ensure the validity and utility of final products.

### *Option 1: Habitat data classification and standardization*

Several of the data sources in the Inventory, particularly the LIS Cable Fund Mapping, the Long Island Sound Resource Center, and the Long Island Sound Ecological Assessment (LISEA), contain a large number of datasets collected and analyzed using a variety of approaches and which map several types of habitat descriptors, including biological communities, geological data, and seabed forms. From a planning perspective, integrating all of these datasets so that they can be interpreted using a standardized classification scheme presents a substantial challenge. LISEA, already included in this project's Inventory and assessment, is an example of a set of synthetic habitat classification data products. LISEA used grid cells to incorporate multiple data layers and particular abiotic and biotic features that together produced ecological insight into each of the grid cells; however, it may be possible to glean additional value from LISEA, and other data products by applying additional classification schemes.

At a regional level, the Northeast Regional Ocean Council Habitat Classification and Ocean Mapping Working Group has identified the [U.S. Coastal and Marine Ecological Classification Standard \(CMECS\)](#), as a method of translating the diverse habitat data from around the region using a single scheme, so that data from a diverse suite of seafloor mapping and characterization projects can be compared on a regional level.<sup>6</sup> This method was also applied using a series of datasets covering the Northwest Atlantic at the regional, subregional, and local scale.<sup>7</sup>

CMECS has the advantage of being able to integrate different types of data collected using different methodologies into a single database. CMECS organizes coastal and marine habitat data according to settings (biogeographic and aquatic) and components (water column, geoform, substrate, and biotic). A dataset may include one or more of these settings and associated components, and using the CMECS classification scheme, components can be combined to identify biotopes, which are unique ecological units with biotic and abiotic elements.<sup>8</sup>

Regional planning goals include cross-walking state-level habitat mapping data with the CMECS classification scheme. Cross-walking refers to the process of comparing the classified map features or samples from the input data with the CMECS classification scheme and units. This effort would likely target Long Island Sound-focused projects such as the Long Island Sound Study. However, LIS MSP may

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<sup>6</sup> Shumchenia, E. J., Guarinello, M.L., Carey, D.A., Lipsky, A., Greene, J., Mayer, L., Nixon, M.E., Weber, J. (2015). Inventory and comparative evaluation of seabed mapping, classification, and modeling activities in the Northwest Atlantic, USA to support regional ocean planning. *Journal of Sea Research*, 100, 133 – 140.

<sup>7</sup> Weaver, K.J., E.J. Shumchenia, K.H. Ford, M.A. Rousseau, J.K. Greene, M.G. Anderson and J.W. King. (2013). Application of the Coastal and Marine Ecological Classification Standard (CMECS) to the Northwest Atlantic. The Nature Conservancy, Eastern Division Conservation Science, Eastern Regional Office. Boston, MA.

<http://nature.ly/EDcmecs>

<sup>8</sup> Federal Geographic Data Committee Marine and Coastal Spatial Data Subcommittee. (2012). Coastal and Marine Ecological Classification Standard. [FGDC Technical Report FGDC-STD-018-2012]. Retrieved from: [https://coast.noaa.gov/digitalcoast/sites/default/files/files/publications/14052013/CMECS\\_Version%20\\_4\\_Final\\_for\\_FGDC.pdf](https://coast.noaa.gov/digitalcoast/sites/default/files/files/publications/14052013/CMECS_Version%20_4_Final_for_FGDC.pdf)

want to explore habitat classification standardization techniques such as CMECS at a finer scale, using the numerous habitat datasets identified in the Inventory from the Long Island Sound Cable Fund Mapping Pilot Program, Long Island Sound Resource Center, and some components of the Long Island Sound Ecological Assessment (which is already a synthetic data product), and any other datasets depicting biotic or abiotic habitat characteristics in the planning area.

A first step of this effort would involve identifying datasets of interest from the existing Inventory. This process may include identifying criteria such as dataset extent or time period of data collection to select high priority datasets. Each dataset's attributes and metadata would then need to be analyzed to identify which CMECS settings, components, and sub-components are applicable to each dataset. The next step would be cross-walking the source data with the CMECS classification units. This is typically accomplished using a table which lists the source classification, the CMECS classification, an estimation of certainty, and the relationship between the source and the CMECS classifications (i.e. if one classification unit is more broadly defined than the other, or if they are equal) (Figure 1).

Cowardin Class/Subclass	Relationship to CMECS	CMECS Class/Subclass	Confidence	Relationship Notes
Rock Bottom	<	Rock Substrate	Certain	CMECS Rock Substrate = Cowardin Rocky Shore + Rock Bottom.
Unconsolidated Bottom	<	Unconsolidated Substrate	Certain	CMECS Unconsolidated Substrate = Cowardin Unconsolidated Shore +Unconsolidated Bottom.

Figure 1. Example of CMECS cross-walking table (From Table H1 in FGDC 2012 CMECS manual)

Appendix H of the CMECS documentation provides more detailed methodology and best practices for the process of crosswalking data with CMECS, and could be used as a guidance document should this approach be pursued. Final outputs of the CMECS application process include spatial data and maps which depict source datasets classified using CMECS units.

CMECS is only one of a number of methodologies used to classify habitat data for planning purposes. The Rhode Island Ocean Special Area Management Plan (RI OSAMP) employed both Habitat Typology and Habitat Template approaches to characterize habitats across the planning area. The Habitat Typology approach divides the planning area into grid cells, with each grid cell containing data on a number of environmental variables (e.g. depth, mean sea surface temperature). Cells are then grouped using a principal component analysis and a cluster analysis to depict general spatial patterns of similar habitat area types within the planning area. The Habitat Template approach characterizes data based on their modeled “Scope for Growth”, which includes variables such as sea surface temperature,

stratification, and chlorophyll availability and “Natural Disturbance” which includes variables such as tidal velocity and wave height and creates habitat maps based on the magnitude of each of those modeled characteristics.<sup>9</sup>

The habitat classification scheme chosen will depend on availability and reliability of source data, and planning priorities and objectives.

### *Option 2: Survey footprints and sampling locations*

There are a number of datasets in the Inventory which depict the footprints, survey lines, and sampling locations of scientific studies which have taken place in Long Island Sound. Developing a dataset or several datasets which aggregate these locations and storing them in a central location would be useful to researchers and planners trying to identify the types and locations of studies that have taken place within the planning area. Datasets could be organized by vector geometry (i.e. polygons, lines, and points) such that one data product would depict the outlines of all study footprints in the area, a second data product would depict navigational lines of the of all the studies which used tracklines or tow lines as part of their survey methodology (e.g. multibeam studies or trawl surveys), while a third dataset would depict the point locations of all of the sampling locations of studies which sampled at specific locations.

Suggested attributes for the composite datasets could include the name of the study, the study’s purpose, the year the sampling was carried out, the research entity or entities in charge of the study, the sampling and/or analysis methodology, an overview of the data collected during the study, and a link to more information about the study/source for data products.

Datasets could be symbolized according to the type of data being collected (sediment, biological, bathymetric), the data originator, or the study year.

The following list is an example of datasets which could be included, but is not intended to be exhaustive:

- Atlantic Wildlife Survey Tracklines (Marine Cadastre)
- Biological Sampling Station Locations (LIS Cable Fund Mapping)
- Sediment Core Locations (LIS Cable Fund Mapping)
- Geo-Acoustic Sub-bottom Survey Tracks (LIS Cable Fund Mapping)
- Acoustic Data Pilot Survey Extents (LIS Cable Fund Mapping)
- Various Biological Sample locations in the LISRC Inventory
- Seismic Lines (LISRC)
- CT Trawl Survey – Sampling Grid Cells (Available from CT DEEP)

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<sup>9</sup> Shumchenia, E. J. & Grilli, A. (2012) Enhanced ocean landscape and ecological value characterization for the Rhode Island Special Area Management Plan study area using Habitat Typology and Habitat Template approaches. (RI Ocean Special Area Management Plan Technical Report #25). University of Rhode Island.

Given sufficient data and coverage, an interpretive product such as an interpolation could be explored to identify areas associated with higher or lower survey and sampling efforts. This would be helpful for identifying data gaps by providing a map of where survey effort has and has not occurred.

### *Option 3: Data quality companion datasets*

Datasets listed in the Inventory, particularly those which depict habitat characteristics such as biological communities, geology, and bathymetry, vary by age, sampling methodology and analysis technique. As described in previous paragraphs, the LIS Cable Fund Mapping, the Long Island Sound Resource Center, and the Long Island Sound Ecological Assessment all contain a variety of datasets which mapped various habitat characteristics. While the project described in this report was intended to provide a broad description and metric of dataset quality and usability, sample age and sampling methodology can provide more detailed and accurate information about data quality and usability for some types of datasets.

Quantitative analyses of data quality has been attempted elsewhere in the region for sediment texture datasets. Massachusetts used a methodology which ranked sediment samples on the collection and/or publication date, the sampling methodology (e.g. grab, dredge, photo) and analysis technique (e.g. laboratory or visual) to create a data quality score for all sediment data samples collected in state waters.<sup>10,11</sup> The Northeast Ocean Data Portal working group has applied this technique at a regional level to USGS usSEABED Atlantic Coast Offshore Surficial Sediment extracted data for the U.S. Atlantic Coast to create a companion dataset to the source usSEABED dataset, also hosted on the portal. Data quality datasets such as these can be valuable in providing planners and research with a quick snapshot of data quality and availability for regions of interest and to help identify data gaps.

Future phases of LIS MSP may want to explore the creation of companion datasets which provide similar quantitative analyses of LIS-specific datasets. A similar sediment data quality analysis could be applied to the Long Island Sound Surficial Sediment data identified in the portal, to create a sound-wide data quality dataset. This analysis could also be applied to the samples collected within a more narrow geographic scope, such as those collected as part of the LIS Cable Fund Mapping project. Data quality metrics accounting for sample age and sampling methodology could also be developed and tailored to other data types, including biotic data and bathymetric data, and applied systematically to create a suite of data quality companion datasets which would complement existing datasets listed in the Inventory.

### *Option 4: Identifying areas of particular consideration, value, and/or concern*

Depending on the goals and objectives articulated in the plan, there may be a need to identify important areas for environmental resources and/or human uses. There are a number of ways that existing datasets can be used as source material for interpretive or synthetic data products that are useful for

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<sup>10</sup>Ford, K.H. & Voss, S. (2010). Seafloor Sediment Composition in Massachusetts Determined Using Point Data (Massachusetts Division of Marine Fisheries Technical Report TR-45). New Bedford: Massachusetts Division of Marine Fisheries.

<sup>11</sup>Sampson, D. & Huntley, E. (2015, April). Creating a comprehensive seafloor sediment map in Massachusetts. Presentation at Coastal Geotools, Charleston, SC.

planning purposes. For example, the Massachusetts Ocean Management Plan developed maps of “special, sensitive, or unique” (SSU) estuarine and marine life and habitats and marine water-dependent uses. These included “core habitats” for endangered or otherwise sensitive flora and fauna, and marine habitats, as well as resource areas important to fisheries. Generally, SSUs were identified through expert work group review of existing data collected and maintained by state and federal agencies and academic institutions.<sup>12</sup>

There are also a number of methodological options for identifying important ecological areas (IEAs) within a planning region. IEAs are generally considered to be areas that have a high value in terms of ecosystem function, but their specific definition and delineation can vary greatly by analysis methodology and approach. A regionally-relevant example is LISEA, whose data products are inventoried as part of this project. LISEA data products represent the synthesis of multiple sources of information to identify “ecologically notable areas”. Information from this effort may be used to inform or contribute to additional data products or methodologies to reflect this concept. While an inventory and evaluation of each approach is outside the scope of this report, NROC has compiled a summary of approaches to defining IEAs and measuring ocean health within a regional ocean planning context.<sup>13</sup>

#### *Option 5: Cumulative impacts modeling*

LIS MSP may have the need to assess relative ecosystem vulnerabilities of areas within the planning region. A cumulative impact analysis can provide a spatial visualization of marine ecosystems and their various stressors to highlight areas that may need additional consideration in the planning process. Depending on interest, resources, and the availability of appropriate data, LIS MSP may wish to develop an approach similar to the cumulative impacts modeling and mapping in Massachusetts waters in support of the Massachusetts Ocean Management Plan. The first phase of this project included a survey which gathered expert opinion on relative vulnerabilities of marine ecosystems to a variety of anthropogenic stressors. Using these scores, the spatial footprint of marine ecosystems were mapped along with the footprints and magnitudes of stressors. The results yielded a picture of the combinatory effects of anthropogenic stressors and located areas with the highest vulnerability.<sup>14</sup>

#### *Option 6: Ecosystem services modeling*

LIS MSP may wish to incorporate information about the relationship between marine ecosystems and ocean economies. Ecosystem functions that result in economic benefits, either directly or indirectly are collectively known as ecosystem services. Mapping ecosystem services as a component of ocean planning can help identify priority areas within the planning area. There are a number of tools that can be employed to create visualizations of ecosystem services. [InVEST](#) is an open source software model that results in maps of both ecosystem service footprints, as well as their estimated economic value.

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<sup>12</sup> Massachusetts Executive Office of Energy and Environmental Affairs (2009), *Massachusetts Ocean Management Plan Vol. 1*.

<sup>13</sup> Shumchenia, E.J. (2014). Draft summary of marine life data sources and approaches to define ecologically important areas and measure ocean health.

<sup>14</sup> Kappel, C.V., Halpern, B.S. and Napoli, N. (2012). Mapping cumulative impacts of human activities on marine ecosystems (03. NCEAS.12). Boston: SeaPlan.

InVEST provides models of a variety of sectors, including aquaculture, recreation, water quality, wave energy, and many others. Each model has specific data requirements; however, in some cases, a user will have the option of providing their own data, or using default data included with the model.<sup>15</sup> Multiscale Integrated Models of Ecosystem Services (MIMES)/Marine Integrated Decision Analysis System (MIDAS) is another combined model and model interface that was developed to analyze and visually represent the relationship between natural and human components of Northern Massachusetts Bay.<sup>16</sup> LIS MSP may want to explore adapting these or other tools in order to integrate ecosystem service valuation into the planning process.

### *Option 7: Avian data*

Because upcoming MDAT products will not cover LIS, the D&I team may want to consider a more thorough evaluation of the avian datasets contained in the Inventory to determine whether there is sufficient data to create a composite product depicting the ranges of birds in Long Island Sound. This process may include reaching out to the MDAT team to identify additional datasets of interest that contributed to their models. One option for a composite dataset might include a gridded data product containing presence/absence data for a variety of bird species. The spatial and temporal resolution of the source data, as other data quality metrics will determine whether composite data products are feasible or valuable to LIS MSP. This process may result in the identification of additional data gaps for avian species in LIS.

## E. Data management and maintenance processes

The D&I team should consider next steps that will ensure that data relevant to LIS MSP continues to be identified, evaluated, and integrated into the Gateway or other outward-facing planning materials. These next steps include refinements to the data evaluation process, as well as process-based options to increase efficiency and forward momentum. All of these options depend on continued engagement from the D&I team and the LIS MSP working group. The following sections outline considerations for future phases of this work. The reader is also advised to reference the D&I Final Report for next steps that were identified in that project which proceeded the project presented in this report. There are also additional next steps that are likely to be identified as work continues forward.

### i. Data quality

Although this project evaluated data usability and quality based on a number of criteria, there may be additional metrics that should be considered when deciding which datasets should be included LIS MSP

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<sup>15</sup> Sharp, R., Tallis, H.T., Ricketts, T., Guerry, A.D., Wood, S.A., Chaplin-Kramer, R., Nelson, E., Ennaanay, D., Wolny, S., Olwero, N., Vigerstol, K., Pennington, D., Mendoza, G., Aukema, J., Foster, J., Forrest, J., Cameron, D., Arkema, K., Lonsdorf, E., Kennedy, C., Verutes, G., Kim, C.K., Guannel, G., Papenfus, M., Toft, J., Marsik, M., Bernhardt, J., Griffin, R., Glowinski, K., Chaumont, N., Perelman, A., Lacayo, M. Mandle, L., Hamel, P., Vogl, A.L., Rogers, L., and Bierbower, W. (2015). InVEST +VERSION+ User's Guide. The Natural Capital Project, Stanford University, University of Minnesota, The Nature Conservancy, and World Wildlife Fund.

<sup>16</sup> Altman, I., Boumans, R., Roman, J., Kaufman, L. (2012). Multi-scale Integrated Model of Ecosystem Services (MIMES) for the Massachusetts Ocean (v 1.0). (Technical Document)

efforts. Specifically, there may need to be more work to determine whether a dataset is accurate or is generally considered to be reliable. The D&I team may consider instituting more specific thresholds for data timeliness, geographic extent, spatial and temporal resolution, and metadata components to ensure that only high quality datasets are used in the planning process. Metadata often contains specific information about positional accuracy, the accuracy and comprehensiveness of attribute data, completeness, consistency among dataset features, data provenance (e.g. data origin and subsequent processing steps) all of which can provide more details and context about data accuracy and reliability.

The high data quality and usability scores for datasets available as web services might also warrant additional consideration. Datasets that are available as web services only (i.e. not available as downloads) have limited utility in terms of analytics, as the data can only be viewed as is. Stability and performance of web services are also important considerations when integrating web services into a portal.

There may be obstacles to instituting higher standards of data quality. Some data quality metrics will be more applicable to certain datasets over others (i.e. timeliness, resolution), and it is possible that metadata and other documentation will not provide sufficient detail to evaluate certain data quality criteria. The D&I team will have to consider the pros and cons of eliminating data sets based on higher data quality standards. Stakeholder outreach may also be helpful in evaluating the reliability of specific data.

## ii. Data prioritization

For the purpose of this project, all datasets were considered relevant to LIS MSP; however, future phases of the project may want to evaluate priority data based on priority sectors in the planning process. This will involve working closely with the LIS MSP working group to ensure that dataset prioritization and development aligns with LIS MSP goals and objectives. Data may also need to be evaluated based on its level of complexity. Some datasets are relatively easy to interpret by the general public, while others require extensive subject matter expertise for interpretation. Future efforts might want to consider complexity and ease of interpretation when prioritizing datasets for use in MSP. Finally, while this project made an attempt to identify datasets that were completely outside of the scope of LIS MSP, the LIS Extent column in the Inventory might provide additional guidance for prioritizing datasets based on their extent and spatial comprehensiveness in LIS.

## iii. Inventory updates and maintenance

The D&I team may consider putting a process in place to make sure that the Inventory is periodically updated with new datasets and accurately reflects the content of datasets available through online portals and other sources. This process should also include steps for seeking out data that may not have been included in the Inventory or documented as upcoming data. This process may include casting a wider net to include datasets from sources that have not previously been considered in this effort. The D&I team will need to address whether that responsibility should be shared among group members, or whether resources will need to be obtained and allocated to assign that task to a staffer or outside contractor.

#### iv. Identification of other significant datasets

A key component of Inventory updates and maintenance is not only identifying new datasets from mapping portals and other sources of spatial data, but also to identify studies which may have a spatial data component (e.g. tables containing latitudes/longitudes), but which haven't been translated to map-based products and/or spatial datasets. The CT DEEP trawl survey is included in the Inventory as an example of a significant study which currently does not have readily accessible map-based data, but which contains spatial coordinates which could be translated into publically-accessible map-based and/or an ArcGIS compatible data.

#### v. Gateway integration

The D&I team should work with the Gateway team to develop and implement a data integration work flow, which would outline how data will be obtained, stored, and uploaded onto the Gateway. Considerations for this process will include data update frequency, data, symbology, and metadata storage and format, and functionality testing for newly-integrated datasets. The team may also want to consider whether data included for the purposes of LIS MSP should be tagged, displayed, or categorized differently in the Gateway so that it is easily accessible and searchable for LIS MSP efforts.

### F. Generating additional materials

While the significance of data and information is well-understood in the community of marine spatial planning practitioners, much of the language surrounding data and information can be highly technical and potentially inaccessible to the general public. As such, the D&I team may consider developing a graphically-driven project summary, a fact sheet, newsletter, or other easily digestible materials outlining project findings in laymen's terms and describing what spatial data can accomplish in the context of LIS MSP. As described in Section VI.C, an additional narrative summary describing what information is contained in the datasets and how much utility these may provide to planning efforts could be very useful to aid planners and potentially others interested in the planning process. Such a narrative could also help make practical the findings associated with additional work needed to make existing datasets usable and/or what data gaps most need to addressed. Such a narrative could make the content of existing data more understandable to stakeholders or the public at large and help to build awareness and understanding within a LIS MSP process.

### G. Summary of next steps

This project identified datasets which, based on quantitative scores for data quality and usability, can be integrated into the New York State Geographic Information Gateway or any other centralized source of data to be used for LIS MSP purposes. A short term next step is making these datasets publically available through this online portal, and developing a work flow to identify, evaluate, and integrate new and/or updated datasets as they become available.

This project also identified upcoming datasets, addressed data gaps, and provided a menu of options for creating integrated, synthetic and interpretive datasets. The D&I team, the Working Group at large and/or officials associated with the Blue Plan process may wish to determine if these, or other desired

data products should be further developed in the next phase of this project. This can be done in conjunction with process-based data management and maintenance next steps which will help refine criteria for data inclusion, and establish work flows for identifying, evaluating, and integrating relevant datasets. Next steps are summarized as follows:

- Datasets listed in Appendices C, D, & E can be integrated into the Gateway
- Dataset-specific next steps (identified in the Inventory and in Appendices D & E) should be implemented, where possible, or requested from data originators or providers
- Obtain upcoming datasets, as they become available, add them to the Inventory, apply evaluation criteria, and incorporate into the Gateway as appropriate
- Identify options or opportunities for addressing data gaps identified in this project, and consider options for a more formalized gap analysis
- Evaluate the feasibility and utility of the data usability advancement options presented in this project (see Section VI.D), and develop a work plan for completing that work
- Consider refining data quality and prioritization criteria in future phases of the project
- Establish work flows and procedures for maintaining the Inventory, which includes identifying additional or newly available datasets, applying evaluation criteria, and uploading relevant data into the Gateway
- Consider developing additional materials such as a narrative summary of the datasets to provide practical guidance for planners and context and awareness for the general public.

## Appendix A. Working Group Members

Brian Thompson	CT DEEP
Chantal Collier	The Nature Conservancy
Charles deQuillfeldt	NY DEC
Charles Witek	Coastal Conservation Association
Chris Clapp	The Nature Conservancy
Chris Squeri	Long Island Marine Trades Association
Christine O'Connell	Stoney Brook University
Daniel Martin	NOAA
David Blatt	CT DEEP
David Sutherland	The Nature Conservancy
Grant Westerson	Marine Surveyor, previously CT Marine Trades Assoc. rep
Jason Gunning	US Coast Guard
Jeff Herter	NY DOS; ex officio
Jen McCann	URI
Joe Atangan	US Navy
Julie Rose	NOAA Fisheries
Karen Chytalo	NY DEC
Katie Lund	NROC
Kevin O'Brien	CT DEEP
Leah Schmalz	Save the Sound
Mark Tedesco	EPA, Long Island Sound Study
Melissa Albino Hegeman	NY DEC
Nancy Balcom	CT Sea Grant
Nathan Frohling	The Nature Conservancy; Working Group Co-Chair
Nick Napoli	NROC
Philip Mikan	US Coast Guard
Riobart Breen	NY DOS; ex officio
Sylvain DeGuise	CT Sea Grant; Working Group Co-Chair
Syma Ebbin	CT Sea Grant
Tessa Getchis	CT Sea Grant
Tiffany Smythe	URI
Vacant	CT Marine Trades Association
William Wise	NY Sea Grant

## Appendix B: Metadata Template

**Dataset Originator:** Name the person responsible for the dataset, along with job title and affiliation, if possible

**Publication Date:** Provide the date that the data was published or made available, using the format YYYYMMDD

**Dataset Title:**

**Online Linkage:** The web address(es) where the dataset can be located either for download and/or as a web service

**Abstract:** Provide a description of the dataset which includes the following information, where applicable:

- Overview of content – general overview of which features and attributes are included
- Overview of methodology
- Geographic scope
- Time period and temporal resolution, if applicable
- Dataset caveats, considerations and/or limitations

**Dataset purpose:** Context for dataset and anticipated users

**Time period of content:** Indicate the time period that the dataset represents

**Dataset Status:** Indicate whether the dataset is “Complete”, “In Progress”, or “Planned”

**Update Frequency:** Indicate how often the dataset is updated. You may use specific time periods (i.e. annually, monthly) or more general terms (continually, as needed, irregularly). If no data update is anticipated, use the term “none planned”

**Theme Keywords:** Use both broad and specific terms to describe the dataset. The terms can be geographical (e.g. Long Island Sound), topical (e.g. surficial sediment), or can relate the data source or originator (e.g. USGS). Include at least one ISO Topic Category, [found here](#).

**Access Constraints:** Any restrictions or legal requirements to accessing the dataset

**Use Constraints:** Any restrictions or legal requirements for using the dataset (e.g. “Not for Navigation”)

**Point of Contact:** Individual or organization that can be contacted with questions regarding the dataset (include contact information such as email address where possible)

**Dataset Credit:** Identify additional individuals or organizations that should be recognized for their contributions to the dataset (e.g. contractors, study teams, source data providers)

**Data Quality Considerations:** Include any information on the following characteristics

**Attribute accuracy:** Describe any considerations when it comes to how true the attribute values are thought to be

**Completeness:** Describe whether there are any features that might be expected in this dataset, but which are not

**Positional accuracy:** Describe how accurate the locations can be expected to be, considering the data collection methodology or source

**Process Step:** List all of the processing steps used to transform raw data to the final data product. This may include geoprocessing steps (e.g. buffering), data quality checks (e.g. checking for topological errors), or attribute editing.

**Attributes:** For each of the attributes included in the dataset, provide a description or explanation of the attribute value. If applicable, provide units for any numerical value, explanations for what a null or empty value indicates, and any other information which will clarify the meaning of the attribute value. And description of how value was calculated, if applicable.

**Metadata reference:** Indicate the date that the metadata was completed, and the name and/or organization of the metadata author, along with contact information. In some cases, this will be the same as the metadata originator and/or point of contact.

## Appendix C: Usable Datasets

Table C1.. Datasets which are ready to be integrated into the New York State Geographic Information Gateway.  
Datasets that have been newly added to the Inventory are indicated with a star.

Dataset Name	Dataset Inventory Tab Source
2011 All Vessel Density from AIS	Northeast Ocean Data Portal
2011 Cargo Vessel Density from AIS	Northeast Ocean Data Portal
2011 Passenger Vessel Density from AIS	Northeast Ocean Data Portal
2011 Tanker Vessel Density from AIS	Northeast Ocean Data Portal
2011 Tug and Tow Vessel Density from AIS	Northeast Ocean Data Portal
2012 All AIS Vessel Density	Northeast Ocean Data Portal
2012 Cargo AIS Vessel Density	Northeast Ocean Data Portal
2012 Passenger AIS Vessel Density	Northeast Ocean Data Portal
2012 Tanker AIS Vessel Density	Northeast Ocean Data Portal
2012 Tug-Tow AIS Vessel Density	Northeast Ocean Data Portal
Anchorages	Northeast Ocean Data Portal
Block Island Renewable Energy Zone	Northeast Ocean Data Portal
Block Island Wind Farm Turbine Locations	Northeast Ocean Data Portal
Coastal Barrier Resource System	Northeast Ocean Data Portal
Coastal Maintained Channels	Northeast Ocean Data Portal
Counties	Northeast Ocean Data Portal
Danger Zone and Restricted Areas	Northeast Ocean Data Portal
Eelgrass Beds	Northeast Ocean Data Portal
HUC 6-12	Northeast Ocean Data Portal
Impaired Waters	Northeast Ocean Data Portal
Maximum Tidal Currents Speed m/s, January 2009	Northeast Ocean Data Portal
Multispecies (Groundfish) VMS point density 2006-2010	Northeast Ocean Data Portal
National Park Boundaries	Northeast Ocean Data Portal
New England Electrical Transmission Lines	Northeast Ocean Data Portal
New England Electrical Transmission Substations	Northeast Ocean Data Portal
No Discharge Zones	Northeast Ocean Data Portal
Ocean Disposal Sites	Northeast Ocean Data Portal
Ocean Observing Buoys and Stations	Northeast Ocean Data Portal
Offshore Tidal Hydrokinetic Projects	Northeast Ocean Data Portal
Population By County	Northeast Ocean Data Portal
Population By State	Northeast Ocean Data Portal
Recreational Boater Activities	Northeast Ocean Data Portal
Recreational Boater Routes	Northeast Ocean Data Portal
Recreational Boating Density	Northeast Ocean Data Portal
Safety, Security, and Regulated Zones	Northeast Ocean Data Portal

Dataset Name	Dataset Inventory Tab Source
Scallop VMS point density 2006-2010	Northeast Ocean Data Portal
Shellfish Management Areas	Northeast Ocean Data Portal
Shipping Fairways, Lanes and Zones	Northeast Ocean Data Portal
States	Northeast Ocean Data Portal
Submarine Cable Areas	Northeast Ocean Data Portal
Surf Clam/Quahog VMS point density 2006-2010	Northeast Ocean Data Portal
Total Maximum Daily Load	Northeast Ocean Data Portal
Waste Water Discharges	Northeast Ocean Data Portal
Submarine Pipeline Areas	Northeast Ocean Data Portal
2013 All Vessel Density*	Northeast Ocean Data Portal
2013 Cargo Vessel Density*	Northeast Ocean Data Portal
2013 Passenger Vessel Density*	Northeast Ocean Data Portal
2013 Tanker Vessel Density*	Northeast Ocean Data Portal
2013 Tug-Tow Vessel Density*	Northeast Ocean Data Portal
Beaches*	Northeast Ocean Data Portal
Boat Launches*	Northeast Ocean Data Portal
Chain Mat Modified Scallop Dredge Area*	Northeast Ocean Data Portal
Commercial Whale Watching Areas*	Northeast Ocean Data Portal
Distance Sailing Races*	Northeast Ocean Data Portal
Herring 2006 - 2010*	Northeast Ocean Data Portal
Herring 2011 - 2014*	Northeast Ocean Data Portal
Herring 2011 - 2014 (<4 knots)*	Northeast Ocean Data Portal
Herring Management Areas*	Northeast Ocean Data Portal
Individual Ocean Uses*	Northeast Ocean Data Portal
Lobster Management Areas*	Northeast Ocean Data Portal
Mackerel 2014*	Northeast Ocean Data Portal
Mackerel 2014 (<4 knots)*	Northeast Ocean Data Portal
Monkfish 2011 - 2014*	Northeast Ocean Data Portal
Monkfish 2011 - 2014 (<4 knots)*	Northeast Ocean Data Portal
Monkfish VMS point density 2006-2010*	Northeast Ocean Data Portal
Multispecies (Groundfish) 2011 - 2014 (<4 knots)*	Northeast Ocean Data Portal
Multispecies (Groundfish) VMS point density 2011 - 2014*	Northeast Ocean Data Portal
Recreational SCUBA Diving Areas*	Northeast Ocean Data Portal
Scallop 2011 - 2014*	Northeast Ocean Data Portal
Scallop 2011 - 2014 (<4 knots)*	Northeast Ocean Data Portal
Southern New England Regulated Mesh Area*	Northeast Ocean Data Portal
Squid 2014*	Northeast Ocean Data Portal

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>
Squid 2014 (<4 knots)*	Northeast Ocean Data Portal
Submerged Lands Act Boundary*	Northeast Ocean Data Portal
Surfclam/Ocean Quahog 2012 - 2014*	Northeast Ocean Data Portal
Surfclam/Ocean Quahog 2012 - 2014 (<4 knots)*	Northeast Ocean Data Portal
Undersea Feature Place Names*	Northeast Ocean Data Portal
NASCA Submarine Cables*	Northeast Ocean Data Portal
Protected and Open Space*	Northeast Ocean Data Portal
Shoreline	Northeast Ocean Data Portal
Secured Lands*	Northeast Ocean Data Portal
National Parks Service Boundaries*	Northeast Ocean Data Portal
National Register of Historic Places*	Northeast Ocean Data Portal
Submarine Cables	Marine Cadastre
Artificial Reefs	Marine Cadastre
National Marine Fisheries Service Regions	Marine Cadastre
National Park Service Regions	Marine Cadastre
US Army Corps of Engineers Civil Works Districts	Marine Cadastre
US Army Corps of Engineers Regulatory Boundary	Marine Cadastre
Atlantic Wildlife Survey Tracklines (2005-2012)	Marine Cadastre
Offshore wind resource potential	Marine Cadastre
Offshore wind technology depth zones	Marine Cadastre
Weather Radar Stations Federal	Marine Cadastre
Atlantic Wildlife Survey Study Areas (2005-2012)	Marine Cadastre
200NM EEZ and Maritime Boundaries	Marine Cadastre
Environmental Protection Agency Region Boundaries	Marine Cadastre
EFH Areas Protected from Fishing	Marine Cadastre
COLREGS Demarcation Lines	Marine Cadastre
Federal Emergency Management Agency Regions	Marine Cadastre
MPA Inventory - MPAs by Government Level	Marine Cadastre
Marine Hydrokinetic Projects	Marine Cadastre
Wrecks and Obstructions	Marine Cadastre
Gillnet, landings	NYS Geographic Information Gateway
Pot, landings	NYS Geographic Information Gateway
Rec Charter/Party Boat, landings	NYS Geographic Information Gateway
Seine, landings	NYS Geographic Information Gateway
Trawl, landings	NYS Geographic Information Gateway
National Pollution Discharge Elimination System NPDES	NYS Geographic Information Gateway
Sewage Treatment Plant Outfalls	NYS Geographic Information Gateway
Active Waste Generators	NYS Geographic Information Gateway
Coastal Energy Facilities	NYS Geographic Information Gateway
Petroleum Product Terminal	NYS Geographic Information Gateway

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>
Petroleum Ports	NYS Geographic Information Gateway
Coastal Risk Areas, preliminary - NYS Dept of State	NYS Geographic Information Gateway
Wetlands NWI - South Coast	NYS Geographic Information Gateway
CT Aquifer Protection Areas	LIS Inventory May 2011 Revised
CT DEEP Property	LIS Inventory May 2011 Revised
CT Hurricane Surge Inundation	LIS Inventory May 2011 Revised
CT Protected Open Space Mapping (POSM)	LIS Inventory May 2011 Revised
EPA Level III Ecoregions	LIS Inventory May 2011 Revised
National Wetland Inventory [R2]	LIS Inventory May 2011 Revised
CT Critical Habitats	LIS Inventory May 2011 Revised
CT Natural Diversity Database Areas	LIS Inventory May 2011 Revised
Shoreline	Other Data Inventory
Right Whale Seasonal Management Areas	Marine Cadastre
Significant Coastal Fish and Wildlife Boundaries	NY Spatial Data Inventory
NOAA Acoustic Mapping Data	Other Data Inventory/NOAA
Pilot Boarding Areas	Northeast Ocean Data Portal
Deep Sea Coral Habitat Suitability	Northeast Ocean Data Portal
Ocean Wave Resource Potential	Marine Cadastre
Tidal Stream Resource Potential (Mean Current)	Marine Cadastre
Tidal Stream Resource Potential (Mean Power Density)	Marine Cadastre
Digital Flood Insurance Rate Map	LIS Inventory May 2011 Revised

## Appendix D: Usable Datasets with Caveats

*Table D1. Datasets with minor caveats which can be integrated into the New York State Geographic Information Gateway. Datasets newly added to the Inventory have been indicated with a star.*

Dataset Name	Dataset Inventory Tab Source	Usability Score	Data Quality and Usability Notes	Possible Next Steps
Bird Habitat	Northeast Ocean Data Portal	0.3	Dataset may be out of date	Update dataset if/when new data become available
Bird Nest Sites	Northeast Ocean Data Portal	0.3	Dataset may be out of date	Update dataset if/when new data becomes available
Coastal Tribal Lands	Northeast Ocean Data Portal	0.3	Due to the age of the data, dataset no longer endorsed by the Bureau of Indian Affairs	Update dataset if/when new data becomes available
Marine Mammals Habitat	Northeast Ocean Data Portal	0.3	Dataset may be out of date	Update dataset if/when new data becomes available
Calanus Finmarchicus, Fall	Northeast Ocean Data Portal	0.6	Northeast Ocean Data Portal team is looking into acquiring updated data and more complete metadata	Update dataset if/when new data becomes available
Chlorophyll A, Fall mg/m3	Northeast Ocean Data Portal	0.9	Northeast Ocean Data Portal team is looking into acquiring updated data and more complete metadata	Update dataset if/when new data becomes available
Chlorophyll A, Spring mg/m3	Northeast Ocean Data Portal	0.9	Northeast Ocean Data Portal team is looking into acquiring updated data and more complete metadata	Update dataset if/when new data becomes available
Chlorophyll A, Summer mg/m3	Northeast Ocean Data Portal	0.9	Northeast Ocean Data Portal team is looking into acquiring updated data and more complete metadata	Update dataset if/when new data becomes available

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Usability Score</b>	<b>Data Quality and Usability Notes</b>	<b>Possible Next Steps</b>
Chlorophyll A, Winter mg/m3	Northeast Ocean Data Portal	0.9	Northeast Ocean Data Portal team is looking into acquiring updated data and more complete metadata	Update dataset if/when new data becomes available
Euphausiids, Fall	Northeast Ocean Data Portal	0.9	Northeast Ocean Data Portal team is looking into acquiring updated data and more complete metadata	Update dataset if/when new data becomes available
Gammarid Amphipods, Fall	Northeast Ocean Data Portal	0.9	Northeast Ocean Data Portal team is looking into acquiring updated data and more complete metadata	Update dataset if/when new data becomes available
Mysid Shrimp, Fall	Northeast Ocean Data Portal	0.9	Northeast Ocean Data Portal team is looking into acquiring updated data and more complete metadata	Update dataset if/when new data becomes available
Species Richness	Northeast Ocean Data Portal	0.9	Northeast Ocean Data Portal team is looking into acquiring updated data and more complete metadata	Update dataset if/when new data becomes available
Total Biomass kg	Northeast Ocean Data Portal	0.9	Northeast Ocean Data Portal team is looking into acquiring updated data and more complete metadata	Update dataset if/when new data becomes available
Recreational Diving	Northeast Ocean Data Portal	1.2	Service layer no longer available through NEODP. Layer files which symbolize data based on Recreational Boater Activities	Integrate web service if/when it becomes available

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Usability Score</b>	<b>Data Quality and Usability Notes</b>	<b>Possible Next Steps</b>
			data layer included in project deliverables folder	
Recreational Fishing	Northeast Ocean Data Portal	1.2	Service layer no longer available through NEODP, but SeaPlan can provide dataset and layer files	Integrate web service if/when it becomes available
Recreational Relaxing	Northeast Ocean Data Portal	1.2	Service layer no longer available through NEODP, but SeaPlan can provide dataset and layer files	Integrate web service if/when it becomes available
Recreational Swimming	Northeast Ocean Data Portal	1.2	Service layer no longer available through NEODP, but SeaPlan can provide dataset and layer files	Integrate web service if/when it becomes available
Recreational Target Fish Species	Northeast Ocean Data Portal	1.2	Service layer no longer available through NEODP, but SeaPlan can provide dataset and layer files	Integrate web service if/when it becomes available
Recreational Target Wildlife Viewing	Northeast Ocean Data Portal	1.2	Service layer no longer available through NEODP, but SeaPlan can provide dataset and layer files	Integrate web service if/when it becomes available
Recreational Wildlife Viewing	Northeast Ocean Data Portal	1.2	Service layer no longer available through NEODP, but SeaPlan can provide dataset and layer files	Integrate web service if/when it becomes available

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Usability Score</b>	<b>Data Quality and Usability Notes</b>	<b>Possible Next Steps</b>
Board and Paddle Events*	Northeast Ocean Data Portal	0.3	Dataset is known to be incomplete for the Long Island Sound Area, and locations of features are coastal only	Integrate updated data if/when they become available
Water Trails*	Northeast Ocean Data Portal	0.3	Dataset is known to be incomplete for the Long Island Sound Area, and locations of features are coastal only	Integrate updated data if/when they become available
Artificial Reefs	Mid-Atlantic Data Portal	0.4	Dataset is not available as a web service, but a .lyr file is downloadable to define symbology	Integrate web service if/when it becomes available
Offshore Discharge Flow	Mid-Atlantic Data Portal	0.2	Dataset only available as a tile service	Integrate web service if/when it becomes available
Port Commodity	Mid-Atlantic Data Portal	0.2	Dataset only available as a tile service	Integrate web service if/when it becomes available
Port Ownership	Mid-Atlantic Data Portal	0.2	Dataset only available as a tile service	Integrate web service if/when it becomes available
Port Commodity (Points)	Mid-Atlantic Data Portal	0.2	Dataset only available as a tile service	Integrate web service if/when it becomes available
Port Ownership (Points)	Mid-Atlantic Data Portal	0.2	Dataset only available as a tile service	Integrate web service if/when it becomes available
US Coast Guard Districts	Marine Cadastre	0.5	No metadata; Marine Cadastre is working on obtaining metadata from USCG	Obtain metadata from USCG if/when it becomes available

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Usability Score</b>	<b>Data Quality and Usability Notes</b>	<b>Possible Next Steps</b>
303d Water Segments	NYS Geographic Information Gateway	0.2	Data appear to be outdated	Consider using service from Northeast Ocean Data Portal
Zooplankton - predicted biomass*	NYS Geographic Information Gateway	0.3	Dataset may be out of date; more up to date data may be available through the Northeast Ocean Data Portal soon	Update dataset if/when new data becomes available
Sea Surface Temperature - Long Term Average*	NYS Geographic Information Gateway	0.3	Dataset may be out of date	Consider using FVCOM products from Northeast Ocean Data Portal when they become available
Water column stratification - Long Term Average*	NYS Geographic Information Gateway	0.3	Dataset may be out of date	Consider using FVCOM products from Northeast Ocean Data Portal when they become available
Turbidity - Long Term Average*	NYS Geographic Information Gateway	0.3	Dataset may be out of date	Update dataset if/when new data becomes available
Seabirds - predicted abundance	NYS Geographic Information Gateway	0.3	Dataset may be out of date	Update dataset if/when new data becomes available
Seabirds - predicted diversity	NYS Geographic Information Gateway	0.3	Dataset may be out of date	Update dataset if/when new data becomes available

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Usability Score</b>	<b>Data Quality and Usability Notes</b>	<b>Possible Next Steps</b>
Seabird Species Richness, annual	NYS Geographic Information Gateway	0.3	Dataset may be out of date	Update dataset if/when new data becomes available
Poverty Rate - New York counties, 2000 Census	NYS Geographic Information Gateway	0.3	Dataset may be out of date	Update dataset if/when new data becomes available
Poverty Rate - New York Census tracts, 2000 Census	NYS Geographic Information Gateway	0.3	Dataset may be out of date	Update dataset if/when new data becomes available
Unemployment Rate - New York Census tracts, 2000 Census	NYS Geographic Information Gateway	0.3	Dataset may be out of date	Update dataset if/when new data becomes available
CT 305b Assessed Estuary 2014	LIS Inventory May 2011 Revised	0.3	Data will soon be out of date	Identify location of new web service when 2016 data are released
CT Coastal Area	LIS Inventory May 2011 Revised	0.4	Dataset only available as a download; has lyr file for symbology	Integrate web service if/when it becomes available
CT Coastal Boundary	LIS Inventory May 2011 Revised	0.4	Dataset only available as a download; has lyr file for symbology	Integrate web service if/when it becomes available
CT Senate Districts	LIS Inventory May 2011 Revised	0.4	Dataset only available as a download; has lyr file for symbology	Integrate web service if/when it becomes available
LIS Submerged Cable & Pipeline Areas	LIS Inventory May 2011 Revised	0.4	Dataset only available as a download; has lyr file for symbology	Integrate web service if/when it becomes available
CT Migratory Waterfowl	LIS Inventory May 2011 Revised	1.2	Dataset may be out of date; only available as a download, but has .lyr file for symbology	Update data and integrate web service if/when they become available

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Usability Score</b>	<b>Data Quality and Usability Notes</b>	<b>Possible Next Steps</b>
Bathymetry	LISEA	0.4	Dataset only available as a download; has lyr file for symbology	Integrate web service if/when it becomes available
Integrated Portfolio	LISEA	0.4	Dataset only available as a download; has lyr file for symbology	Integrate web service if/when it becomes available
Hardbottom	LISEA	0.4	Dataset only available as a download; has lyr file for symbology	Integrate web service if/when it becomes available
Ecological Marine Unit	LISEA	0.4	Dataset only available as a download; has lyr file for symbology	Integrate web service if/when it becomes available
Seafloor Portfolio	LISEA	0.4	Dataset only available as a download; has lyr file for symbology	Integrate web service if/when it becomes available
Migratory Portfolio	LISEA	0.4	Dataset only available as a download; has lyr file for symbology	Integrate web service if/when it becomes available
Soft sediment	LISEA	0.4	Dataset only available as a download; has lyr file for symbology	Integrate web service if/when it becomes available
Seabed forms	LISEA	0.4	Dataset only available as a download; has lyr file for symbology	Consider using Seabed Forms web service which will be available through the Northeast Ocean Data Portal in early 2016
Fish Persistence	LISEA	0.4	Dataset only available as a download; has lyr file for symbology	Integrate web service if/when it becomes available

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Usability Score</b>	<b>Data Quality and Usability Notes</b>	<b>Possible Next Steps</b>
Fish Weighted Persistence	LISEA	0.4	Dataset only available as a download; has lyr file for symbology	Integrate web service if/when it becomes available
Historical Eelgrass	Northeast Ocean Data Portal	0.6	Various datasets available for download; no web services and no layer files available	Integrate web service if/when it becomes available

## Appendix E: Improved Datasets

*Table E1. Datasets to which improvements were made over the course of this project*

Dataset Name	Dataset Inventory Tab Source	Data Quality and Usability Notes	Original Data Usability Score	Improved Data Usability Score	Improvement Type	Possible next steps
Summer Flounder Landings	Mid-Atlantic Data Portal	Data available as downloadable kml file; no symbology included	0.6	0.4	Converted kml to feature class and assigned symbology	Integrate web service if/when it becomes available
2012 SeaBoss Cruise Sampling Transects	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC December 2012 Sampling Locations	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC December 2012 Transects	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC Fall 2012 Sampling Locations	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data	Integrate web service if/when it becomes available

Dataset Name	Dataset Inventory Tab Source	Data Quality and Usability Notes	Original	Improved	Improvement Type	Possible next steps
			Data Usability Score	Data Usability Score		
					originators	
LISMARC Fall 2012 Epifaunal Community Clusters	LIS Cable Mapping Study	Downloadable data; no symbolology; insufficient metadata	2.25	0.4	Assigned symbolology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC Fall 2012 Epifaunal Diversity	LIS Cable Mapping Study	Downloadable data; no symbolology; insufficient metadata	2.25	0.4	Assigned symbolology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC Fall 2012 Epifaunal Abundance	LIS Cable Mapping Study	Downloadable data; no symbolology; insufficient metadata	2.25	0.4	Assigned symbolology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC Fall 2012 Epifaunal Richness	LIS Cable Mapping Study	Downloadable data; no symbolology; insufficient metadata	2.25	0.4	Assigned symbolology and requested improved metadata from data originators	Integrate web service if/when it becomes available

Dataset Name	Dataset Inventory Tab Source	Data Quality and Usability Notes	Original Data Usability Score	Improved Data Usability Score	Improvement Type	Possible next steps
LISMARC 2013 Video Transect Tracks	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC May 2013 ROV Sampling Locations	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC May 2013 ROV Transects	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC May 2013 ROV Transect Endpoints	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC May 2013 Epifaunal Community Clusters	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available

Dataset Name	Dataset Inventory Tab Source	Data Quality and Usability Notes	Original Data Usability Score	Improved Data Usability Score	Improvement Type	Possible next steps
LISMARC May 2013 Epifaunal Diversity	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC May 2013 Epifaunal Percent Cover	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC May 2013 Epifaunal Richness	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
Eognition Acoustic Patches	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC Fall 2012 Infaunal Diversity (Blocks)	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available

Dataset Name	Dataset Inventory Tab Source	Data Quality and Usability Notes	Original Data Usability Score	Improved Data Usability Score	Improvement Type	Possible next steps
LISMARC Fall 2012 Infaunal Diversity (Points)	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC Fall 2012 Average Infaunal Diversity (Blocks)	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC Fall 2012 Sampling Blocks	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC Spring 2013 Infaunal Abundance and Diversity by Block	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC Spring 2013 Abundance and Diversity by Point	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available

Dataset Name	Dataset Inventory Tab Source	Data Quality and Usability Notes	Original Data Usability Score	Improved Data Usability Score	Improvement Type	Possible next steps
SOMAS 2013 Field Data	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
SOMAS 2013 Sampling Polygons	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LDEO Carbon, Hydrogen, Nitrogen Content	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LDEO Grab Chemistry	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LDEO Grab Density	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available

Dataset Name	Dataset Inventory Tab Source	Data Quality and Usability Notes	Original Data Usability Score	Improved Data Usability Score	Improvement Type	Possible next steps
LDEO Core Locations	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LDEO Grab Locations	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LDEO Grain Size	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LDEO Navigation Tracks	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LDEO Sedimentary Environment Polygons	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available

Dataset Name	Dataset Inventory Tab Source	Data Quality and Usability Notes	Original Data Usability Score	Improved Data Usability Score	Improvement Type	Possible next steps
LDEO Sediment Texture Polygons (Falk Codes)	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LDEO Sediment Texture Polygons (Shepard Code)	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC 2012 Carbon, Hydrogen and Nitrogen	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC 2012 Sediment	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
LISMARC 2013 Carbon, Hydrogen and Nitrogen	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available

Dataset Name	Dataset Inventory Tab Source	Data Quality and Usability Notes	Original Data Usability Score	Improved Data Usability Score	Improvement Type	Possible next steps
LISMARC 2013 Sediment	LIS Cable Mapping Study	Downloadable data; no symbology; insufficient metadata	2.25	0.4	Assigned symbology and requested improved metadata from data originators	Integrate web service if/when it becomes available
F.L. Parker benthic foraminiferal samples (1952)	LISRC	Datasets may be out of date; available for download, no .lyr files available	1.8	1.2	Assigned symbology	Update data and integrate web service if/when they become available
USGS benthic foraminiferal samples (1996 - 1997)	LISRC	Datasets may be out of date; available for download, no .lyr files available	1.8	1.2	Assigned symbology	Update data and integrate web service if/when they become available
Locations of sediment samples with Clostridium perfringens in LIS	LISRC	Datasets may be out of date; available for download, no .lyr files available	1.8	1.2	Assigned symbology	Update data and integrate web service if/when they become available
Long Island Sound benthic communities	LISRC	Datasets may be out of date; available for download, no .lyr files available	1.8	1.2	Assigned symbology	Update data and integrate web service if/when they become available
M.A. Buzas benthic foraminiferal samples (1965)	LISRC	Datasets may be out of date; available for download, no .lyr files available	1.8	1.2	Assigned symbology	Update data and integrate web service if/when they become

Dataset Name	Dataset Inventory Tab Source	Data Quality and Usability Notes	Original	Improved	Improvement Type	Possible next steps
			Data Usability Score	Data Usability Score		
						available
Sample locations and total number of species found at each station from Pellegrino and Hubbard (1983)	LISRC	Datasets may be out of date; available for download, no .lyr files available	1.8	1.2	Assigned symbology	Update data and integrate web service if/when they become available
Samples collected by H.L. Sanders (1956)	LISRC	Datasets may be out of date; available for download, no .lyr files available	1.8	1.2	Assigned symbology	Update data and integrate web service if/when they become available
Samples collected by P.L. McCall (1975)	LISRC	Datasets may be out of date; available for download, no .lyr files available	1.8	1.2	Assigned symbology	Update data and integrate web service if/when they become available
Samples collected by Pellegrino and Hubbard (1983)	LISRC	Datasets may be out of date; available for download, no .lyr files available	1.8	1.2	Assigned symbology	Update data and integrate web service if/when they become available
Samples collected by Reid, et al (1979)	LISRC	Datasets may be out of date; available for download, no .lyr files available	1.8	1.2	Assigned symbology	Update data and integrate web service if/when they become available

Dataset Name	Dataset Inventory Tab Source	Data Quality and Usability Notes	Original Data Usability Score	Improved Data Usability Score	Improvement Type	Possible next steps
Distribution of Total Organic Carbon (TOC) in Long Island Sound	LISRC	Datasets may be out of date; available for download, no .lyr files available	1.8	1.2	Assigned symbology	Update data and integrate web service if/when they become available
Long Island Sound metals sample distribution locations	LISRC	Datasets may be out of date; available for download, no .lyr files available	1.8	1.2	Assigned symbology	Update data and integrate web service if/when they become available
LISSEDDATA: Long Island Sound Surficial Sediment Data	LISRC	Datasets may be out of date; available for download, no .lyr files available	1.8	1.2	Assigned symbology	Update data and integrate web service if/when they become available
Thickness of Post Glacial Deposits	LISRC	Data available for download only; no .lyr files available	0.6	0.4	Assigned symbology	Integrate web service if/when it becomes available
Seismic Lines	LISRC	Data available for download only; no .lyr files available	0.6	0.4	Assigned symbology	Consider aggregating all seismic lines dataset into one composite project; integrate web service if/when it becomes available

Dataset Name	Dataset Inventory Tab Source	Data Quality and Usability Notes	Original	Improved	Improvement Type	Possible next steps
			Data Usability Score	Data Usability Score		
Geologic interpretation of the sidescan sonar mosaic of NOAA survey H11043 off Branford, Connecticut			0.6	0.4	Assigned symbology	Consider aggregating all seismic lines dataset into one composite project; integrate web service if/when it becomes available
Interpretation of the Distribution of Sedimentary Environments of the Sidescan sonar Mosaic of NOAA survey H11045			0.6	0.4	Assigned symbology	Consider aggregating all seismic lines dataset into one composite project; integrate web service if/when it becomes available

## Appendix F: Other datasets of interest not directly related to LIS MSP

*Table F1. Other datasets of interest*

Dataset Name	Dataset Inventory Tab Source	Dataset Usability Score	Data Quality and Usability Notes
Stewardship Locations	LIS Inventory Revised May 2011	9	Spatial data not available for download on online portal. Dataset is low priority as it only shows coastal locations
Important Bird Areas (CT)	LIS Inventory Revised May 2011	21	Data would need to be converted to ArcGIS-compatible format, metadata developed and symbology assigned; low priority since locations are land-based
Important Bird Areas (NY)	LIS Inventory Revised May 2011	21	Data would need to be converted to ArcGIS-compatible format, metadata developed and symbology assigned; low priority since locations are land-based
Breeding Bird Atlas	LIS Inventory Revised May 2011	9	Dataset may not be available in ArcGIS-compatible format; May be considered for composite data product depicting avian life in LIS.
Birds of the Western Hemisphere	LIS Inventory Revised May 2011	5.25	Data has been obtained, but requires permissions for use; May be considered for composite data product depicting avian life in LIS.
DEC Lands	LIS Inventory Revised May 2011	0.7	Data requires symbology assigned, but since it is land-based, it is low priority
Depth to The Marine Transgressive Surface	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources

Dataset Name	Dataset Inventory Tab Source	Dataset Usability Score	Data Quality and Usability Notes
Distribution of Surficial Sediments of NOAA H11044 Sidescan Sonar Mosaic in West-Central Long Island Sound	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Free-Air Gravity Anomalies in LIS and BIS	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Geologic Interpretation of the Acoustic Data Collected During National Oceanic and Atmospheric Administration (NOAA) Survey H11252	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Geologic Interpretation of the Acoustic Data Collected During National Oceanic and Atmospheric Administration (NOAA) Survey H11361	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Interpretation of NOAA H11044 Sidescan Sonar Data from West-Central Long Island Sound	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
interpretation of the distribution of sedimentary environments of the sidescan sonar mosaic of NOAA survey H11043	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Dataset Usability Score</b>	<b>Data Quality and Usability Notes</b>
Interpretation of the Fishers Island Sound Sidescan Sonar Mosaic Area	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Interpretation of the Hammonasset Sidescan Sonar Mosaic	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Interpretation of the Milford Sidescan Sonar Mosaic	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Interpretation of the New Haven Harbor Sidescan Sonar Mosaic Area	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Interpretation of the Niantic Bay Sidescan Sonar Mosaic Area	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Interpretation of the Norwalk Sidescan Sonar Mosaic	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources

Dataset Name	Dataset Inventory Tab Source	Dataset Usability Score	Data Quality and Usability Notes
Interpretation of the Roanoke sidescan sonar mosaic	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Interpretive Data Layer Showing the Framework Geology of NOAA Survey H11250	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Revised Geologic interpretation of the New London Sidescan Sonar Mosaic Area	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Sedimentary Environments of NOAA H11044 Sidescan Sonar Mosaic in West-Central Long Island Sound	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
surficial sediment distribution interpretation of the sidescan sonar mosaic of NOAA survey H11043	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Surficial Sediment Distribution Interpretation of the Sidescan Sonar Mosaic of NOAA Survey H11045 off Bridgeport, CT	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Dataset Usability Score</b>	<b>Data Quality and Usability Notes</b>
Surficial sediments of the Fishers Island Sound Sidescan Sonar Mosaic Area	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Surficial Sediments of the Hammonasset Sidescan Sonar Mosaic	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Surficial sediments of the Milford Sidescan Sonar Mosaic	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Surficial sediments of the New Haven Harbor Sidescan Sonar Mosaic Area	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Surficial sediments of the Niantic Bay Sidescan Sonar Mosaic Area	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Surficial sediments of the Norwalk Sidescan Sonar Mosaic	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Dataset Usability Score</b>	<b>Data Quality and Usability Notes</b>
Surficial Sediments of the Roanoke sidescan sonar mosaic	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
Interpretation of the sidescan sonar mosaic from the study area off New London, CT	LISRC	0.6	These datasets are somewhat dated and may be better represented by more current sources
National Hydrography Dataset Plus - V.2	Other Data Inventory	0.6	There are a number of datasets to sort through, and data may be better represented by other sources
NOAA Sea Level Rise Scenarios and mapping confidence	Other Data Inventory	0.6	This is a land-based dataset and outside the geographic scope of the Blue Plan
CT Photography	Other Data Inventory	2.4	These are index locations for photographs, and are not directly relevant to the Blue Plan
LIS Photography	Other Data Inventory	2.4	These are index locations for photographs, and are not directly relevant to the Blue Plan

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Dataset Usability Score</b>	<b>Data Quality and Usability Notes</b>
Coastal Erosion	Other Data Inventory	3.6	These are coastal datasets and outside the geographic scope of the Blue Plan
CT Coastal Orthophotos	Other Data Inventory	0.4	New ortho photography is likely to be forthcoming in 2016; likely could be used as a basemap
CT Coastal Access Sites	Other Data Inventory	1.2	This is a land-based dataset and outside the geographic scope of the Blue Plan
Sea Level Rise Scenarios	Other Data Inventory	7.2	These are land-based datasets outside the geographic scope of the Blue Plan
TNC Coastal Resilience Viewer	Other Data Inventory	7.2	These are land-based datasets outside the geographic scope of the Blue Plan
NOAA Nautical Charts	Other Data Inventory	0.5	This should be used as a basemap using NOAA web services

Dataset Name	Dataset Inventory Tab Source	Dataset Usability Score	Data Quality and Usability Notes
NYS Natural Heritage LIS Natural Communities	LIS Inventory Revised May 2011	0.875	Data cannot be publically distributed due to sensitive species location information; however, this datasets contains little to no information on marine life
Natural Heritage LIS Potential Significant Areas	LIS Inventory Revised May 2012	0.875	Data cannot be publically distributed due to sensitive species location information; however, this datasets contains little to no information on marine life
NYS Natural Heritage LIS Species	LIS Inventory Revised May 2013	0.875	Data cannot be publically distributed due to sensitive species location information; however, this datasets contains little to no information on marine life
Eastern Tiger Swallowtail ( <i>Papilio glaucus</i> )	LIS Inventory Revised May 2011	0.6	Data depicts a range that only covers land
South Shore Estuary of Long Island - Benthic Habitats Mapping 2002	LIS Inventory Revised May 2011	0.7	Data depicts estuarine area south of Long Island

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Dataset Usability Score</b>	<b>Data Quality and Usability Notes</b>
Westchester County Critical Environmental Areas	LIS Inventory Revised May 2011	0.7	Locations adjacent to LIS are land-based
Toxic Release Inventory System Sites	LIS Inventory Revised May 2011	4.2	All locations are land-based
Invasive Species -- Zebra Mussel Distribution	LIS Inventory Revised May 2011	0.7	No locations in LIS
Bird Conservation Areas	LIS Inventory Revised May 2011	1.05	All coastal and land-based locations
Historical Eelgrass	Northeast Ocean Data	0.2	4 datasets with features in LIS, but locations are coastal
Region 2 Pipelines	LIS Inventory Revised May 2011	1.2	Feature locations are on land
Infaunal Community Types Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; more detailed metadata has been requested from data originators
Invertebrate/Biogenic Feature Richness Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Amphipoda Tubes % Cover - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Bostrichobranchus % Cover - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Bostrichobranchus % Cover - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Dataset Usability Score</b>	<b>Data Quality and Usability Notes</b>
Corymorpha pendula % Cover - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Corymorpha pendula % Cover - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Crepidula fornicata % Cover - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Crepidula fornicata % Cover - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Diadumene leucloena % Cover - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Diadumene leucloena % Cover - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Amphipoda Tubes % Cover - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Dipatra cuprea % Cover - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Dataset Usability Score</b>	<b>Data Quality and Usability Notes</b>
Dipatra cuprea % Cover - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Habitat Forming Species Richness - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Habitat Forming Species Richness - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Habitat Forming Species/Biogenic Feature Richness - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Habitat Forming Species/Biogenic Feature Richness - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Habitat Forming Species/Biogenic Feature Shannon Diversity - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Habitat Forming Species/Biogenic Feature Shannon Diversity - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Hydroidolina/Cheilostomatidae % Cover - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Dataset Usability Score</b>	<b>Data Quality and Usability Notes</b>
Hydroidolina/Cheilostomatidae % Cover - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Astrangia poculata % Cover - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Infaunal Shannon Diversity Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from infaunal dataset in GDB; more detailed metadata has been requested from data originators
Infaunal Shannon Diversity Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from infaunal dataset in GDB; more detailed metadata has been requested from data originators
Infaunal Species Richness Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from infaunal dataset in GDB; more detailed metadata has been requested from data originators
Infaunal Species Richness Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from infaunal dataset in GDB; more detailed metadata has been requested from data originators
Infaunal Total Abundance Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from infaunal dataset in GDB; more detailed metadata has been requested from data originators
Infaunal Total Abundance Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from infaunal dataset in GDB; more detailed metadata has been requested from data originators

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Dataset Usability Score</b>	<b>Data Quality and Usability Notes</b>
Intact Shells % Cover - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Intact Shells % Cover - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Invertebrate Richness - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Invertebrate Richness - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Astrangia poculata % Cover - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Invertebrate/Biogenic Feature Richness - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Large Burrows % Cover - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Large Burrows % Cover - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Dataset Usability Score</b>	<b>Data Quality and Usability Notes</b>
Live Bivalves % Cover - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Live Bivalves % Cover - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Balanmorphia % Cover - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Mytilus edulis % Cover - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Mytilus edulis % Cover - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Porifera % Cover - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Porifera % Cover - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Seasonal Changes in Epifaunal Species Richness	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Dataset Usability Score</b>	<b>Data Quality and Usability Notes</b>
Seasonal Changes in Epifaunal Taxonomic Mean Shannon Diversity	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Seasonal Changes in Infaunal Fisher's Diversity	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from infaunal dataset in GDB; more detailed metadata has been requested from data originators
Seasonal Changes in Mean Infaunal Shannon Diversity	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from infaunal dataset in GDB; more detailed metadata has been requested from data originators
Seasonal Changes in Mean Infaunal Species Richness	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from infaunal dataset in GDB; more detailed metadata has been requested from data originators
Balanmorpha % Cover - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Seasonal Changes in Mean Infaunal Total Abundance	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from infaunal dataset in GDB; more detailed metadata has been requested from data originators
Shell Material % Cover - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Shell Material % Cover - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Dataset Usability Score</b>	<b>Data Quality and Usability Notes</b>
Station locations	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Biogenic Richness - Fall 2012	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Sampling Block Photos	LIS Cable Fund Mapping	1.2	May be of interest for supplementary data but likely not directly relevant for LIS MSP
Sampling Blocks	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP.
Biogenic Richness - Spring 2013	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from epifaunal dataset in GDB; more detailed metadata has been requested from data originators
Sediment Grain Size Composition	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from sediment dataset in GDB; more detailed metadata has been requested from data originators
Silt-Clay IDW	LIS Cable Fund Mapping	.6	Not currently believed to be directly relevant to LIS MSP; Can be derived from sediment dataset in GDB; more detailed metadata has been requested from data originators
Subbottom profile images	LIS Cable Fund Mapping	1.2	May be of interest for supplementary data but likely not directly relevant for LIS MSP
Sampling Block Photos	LIS Cable Fund Mapping	1.2	May be of interest for supplementary data but likely not directly relevant for LIS MSP
Sampling Block Video	LIS Cable Fund Mapping	1.2	May be of interest for supplementary data but likely not directly relevant for LIS MSP
Sediment Core description summaries	LIS Cable Fund Mapping	1.2	May be of interest for supplementary data but likely not directly relevant for LIS MSP

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Dataset Usability Score</b>	<b>Data Quality and Usability Notes</b>
Bottom Stress	LIS Cable Fund Mapping	1.8	Recommend using FVCOM products which cover greater LIS extent from NEODP
LIS Pilot Bathy Merge 1m	LIS Cable Fund Mapping	1.8	Not currently believed to be directly relevant to LIS MSP; will need to develop symbology and require more detailed metadata if required for future efforts
LIS Pilot Bathymetry Standard Deviation 1m	LIS Cable Fund Mapping	1.8	Not currently believed to be directly relevant to LIS MSP; will need to develop symbology and require more detailed metadata if required for future efforts
LIS Pilot Curvature 1m	LIS Cable Fund Mapping	1.8	Not currently believed to be directly relevant to LIS MSP; will need to develop symbology and require more detailed metadata if required for future efforts
LIS Pilot Integrated Backscatter & Sidescan merge 1m	LIS Cable Fund Mapping	1.8	Not currently believed to be directly relevant to LIS MSP; will need to develop symbology and require more detailed metadata if required for future efforts
LIS Pilot Integrated bathymetry merge 1m	LIS Cable Fund Mapping	1.8	Not currently believed to be directly relevant to LIS MSP; will need to develop symbology and require more detailed metadata if required for future efforts
LIS Pilot Mean Bathymetry 1m	LIS Cable Fund Mapping	1.8	Not currently believed to be directly relevant to LIS MSP; will need to develop symbology and require more detailed metadata if required for future efforts
LIS Pilot Plan Curvature 1m	LIS Cable Fund Mapping	1.8	Not currently believed to be directly relevant to LIS MSP; will need to develop symbology and require more detailed metadata if required for future efforts
LIS Pilot Principal Component Analysis 1m	LIS Cable Fund Mapping	1.8	Not currently believed to be directly relevant to LIS MSP; will need to develop symbology and require more detailed metadata if required for future efforts
LIS Pilot Profile Curvature 1m	LIS Cable Fund Mapping	1.8	Not currently believed to be directly relevant to LIS MSP; will need to develop symbology and require more detailed metadata if required for future efforts
LIS Pilot Rugosity 1m	LIS Cable Fund Mapping	1.8	Not currently believed to be directly relevant to LIS MSP; will need to develop symbology and require more detailed metadata if required for future efforts

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Dataset Usability Score</b>	<b>Data Quality and Usability Notes</b>
LIS Pilot Sidescan Merge 1m	LIS Cable Fund Mapping	1.8	Not currently believed to be directly relevant to LIS MSP; will need to develop symbology and require more detailed metadata if required for future efforts
LIS Pilot Slope 1m	LIS Cable Fund Mapping	1.8	Not currently believed to be directly relevant to LIS MSP; will need to develop symbology and require more detailed metadata if required for future efforts
LIS Pilot Slope of Slope 1m	LIS Cable Fund Mapping	1.8	Not currently believed to be directly relevant to LIS MSP; will need to develop symbology and require more detailed metadata if required for future efforts
Map of Maximum Bottom Stress - Tidal Currents	LIS Cable Fund Mapping	1.8	Recommend using FVCOM products which cover greater LIS extent from NEODP
Map of Mean Bottom Stress - Tidal Currents	LIS Cable Fund Mapping	1.8	Recommend using FVCOM products which cover greater LIS extent from NEODP
Map of Mean Bottom Stress - Tidal Currents & Waves	LIS Cable Fund Mapping	1.8	Recommend using FVCOM products which cover greater LIS extent from NEODP
Maps of Monthly Bottom Salinity Distributions	LIS Cable Fund Mapping	1.8	Recommend using FVCOM products which cover greater LIS extent from NEODP
Maps of Monthly Bottom Temperature Distributions	LIS Cable Fund Mapping	1.8	Recommend using FVCOM products which cover greater LIS extent from NEODP
Maps of Monthly Salinity Distributions	LIS Cable Fund Mapping	1.8	Recommend using FVCOM products which cover greater LIS extent from NEODP
Maps of Monthly Bottom Temperature Distributions	LIS Cable Fund Mapping	1.8	Recommend using FVCOM products which cover greater LIS extent from NEODP
Maps of Monthly Salinity Distributions	LIS Cable Fund Mapping	1.8	Recommend using FVCOM products which cover greater LIS extent from NEODP
Pilot Survey Extents	LIS Cable Fund Mapping	1.8	Not currently believed to be directly relevant to LIS MSP; will need to develop symbology and require more detailed metadata if required for future efforts

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Dataset Usability Score</b>	<b>Data Quality and Usability Notes</b>
XRF metal profiles	LIS Cable Fund Mapping	1.8	Not currently believed to be directly relevant to LIS MSP; will need to develop symbology and require more detailed metadata if required for future efforts

## Appendix G: Datasets not currently downloadable from public portals

*Table G1. Datasets which were identified in the Inventory but which are not currently available for download on public portals*

Dataset Name	Dataset Inventory Tab Source	Data Quality and Usability Notes
Marine Jurisdictions	Northeast Ocean Data Portal	A dataset called 200NM EEZ and Maritime Boundaries depicts similar information, although none of the boundaries cross LIS
All Gear Number of Trips 2000-2009	Northeast Ocean Data Portal	Replaced in portal with new higher resolution data
Bottom Trawl Number of Trips 2000-2009	Northeast Ocean Data Portal	Replaced in portal with new higher resolution data
Charter and Party Recreational Fishing Trips 2000 to 2009	Northeast Ocean Data Portal	Replaced in portal with new higher resolution data
Coastal Geographic Names	Northeast Ocean Data Portal	Replaced in portal with new higher resolution data
EPA-Regulated Facilities	Northeast Ocean Data Portal	Replaced in portal with new higher resolution data
Gill Nets Number of Trips 2000-2009	Northeast Ocean Data Portal	Replaced in portal with new higher resolution data
Long Lines Number of Trips 2000-2009	Northeast Ocean Data Portal	Replaced in portal with new higher resolution data
Midwater Trawl Number of Trips 2000-2009	Northeast Ocean Data Portal	Replaced in portal with new higher resolution data
Other Dredges Number of Trips 2000-2009	Northeast Ocean Data Portal	Replaced in portal with new higher resolution data

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Data Quality and Usability Notes</b>
Other Gear Number of Trips 2000-2009	Northeast Ocean Data Portal	Replaced in portal with new higher resolution data
Pots & Traps Number of Trips 2000-2009	Northeast Ocean Data Portal	Replaced in portal with new higher resolution data
Zooplankton, fall	NY Spatial Data Inventory	Replaced in portal with long term averages
Zooplankton, spring	NY Spatial Data Inventory	Replaced in portal with long term averages
Zooplankton, summer	NY Spatial Data Inventory	Replaced in portal with long term averages
Zooplankton, winter	NY Spatial Data Inventory	Replaced in portal with long term averages
Sea surface temperature, fall	NY Spatial Data Inventory	Replaced in portal with long term averages
Sea surface temperature, spring	NY Spatial Data Inventory	Replaced in portal with long term averages
Sea surface temperature, summer	NY Spatial Data Inventory	Replaced in portal with long term averages
Sea surface temperature, winter	NY Spatial Data Inventory	Replaced in portal with long term averages
Stratification, fall	NY Spatial Data Inventory	Replaced in portal with long term averages
Stratification, spring	NY Spatial Data Inventory	Replaced in portal with long term averages
Stratification, summer	NY Spatial Data Inventory	Replaced in portal with long term averages
Stratification, winter	NY Spatial Data Inventory	Replaced in portal with long term averages
Turbidity, fall	NY Spatial Data Inventory	Replaced in portal with long term averages
Turbidity, spring	NY Spatial Data Inventory	Replaced in portal with long term averages
Turbidity, summer	NY Spatial Data Inventory	Replaced in portal with long term averages
Turbidity, winter	NY Spatial Data Inventory	Replaced in portal with long term averages

<b>Dataset Name</b>	<b>Dataset Inventory Tab Source</b>	<b>Data Quality and Usability Notes</b>
Waterfowl areas (NY)	LIS Inventory May 2011 Revised	Dataset location not listed in original Inventory. Unclear whether these locations are land-based, coastal, or offshore.
Anadromous Fish Runs	LIS Inventory May 2011 Revised	Dataset location not listed in original Inventory.
Areas in Need of Waterfront Recreational Facilities	LIS Inventory May 2011 Revised	Dataset location not listed in original Inventory; data is low priority as locations are land-based
Boating Locations	LIS Inventory May 2011 Revised	Dataset location not listed in original Inventory; data is low priority as locations are land-based
Fishing Locations	LIS Inventory May 2011 Revised	Dataset location not listed in original Inventory; data is low priority as locations are land-based
Infaunal Community Types Spring 2013	LIS Cable Fund Mapping	Data to be uploaded soon
Subpatch Classification	LIS Cable Fund Mapping	If desired for future LIS MSP, will need to locate dataset and additional dataset details
Analysis areas	LIS Cable Fund Mapping	If desired for future LIS MSP, will need to locate dataset and additional dataset details