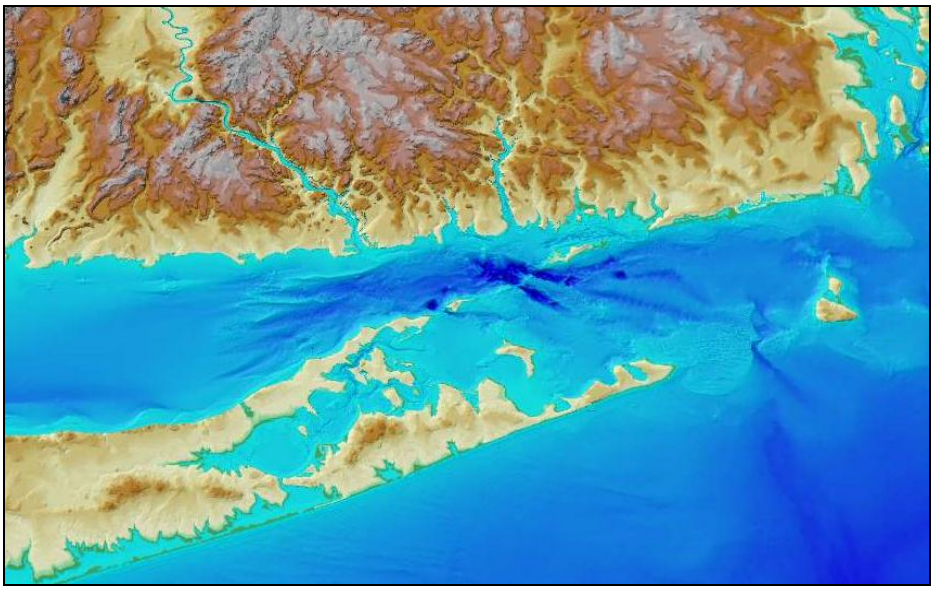
Appendix A-6

MINUTES OF COOPERATING AGENCY GROUP MEETING 1

Supplemental Environmental Impact Statement for the Designation of Dredged Material Disposal Sites in Eastern Long Island Sound, Connecticut and New York

Minutes of Cooperating Agency Meeting 1



Prepared for: **United States Environmental Protection Agency**

Sponsored by: **Connecticut Department of Transportation**

Prepared by: **Louis Berger**
with support from
University of Connecticut

January 2013

Eastern Long Island Sound – Supplemental EIS

Cooperating Meeting 01 – Minutes

TOPIC: **Preliminary Site Screening and Physical Oceanography Study Plan**

DATE OF MTG: January 8, 2013

LOCATION: CTDOT, 2800 Berlin Turnpike, Newington, CT

TIME: 10:00am to 2:27pm

PARTICIPANTS: **Cooperating Agencies**

- Joe Salvatore — Connecticut Department of Transportation
- Jeannie Brochi — US Environmental Protection Agency, Region 1
- Alicia Grimaldi — US Environmental Protection Agency, Region 1
- George Wisker — Conn. Dept. of Energy and Environmental Protection
- Cathy Rogers — US Army Corps of Engineers, New England District
- Mark Habel — US Army Corps of Engineers, New England District
- Nancy Brighton — US Army Corps of Engineers, New York District
- Diane Rusanowsky — NOAA/National Marine Fisheries Service
- Patricia Pechko — US Environmental Protection Agency, Region 2
- Jim Leary — New York State Department of State
- Kari Gathen — New York State Department of State
- Jennifer Street — New York State Department of State
- Jeff Willis — Rhode Island Coastal Resources Management Council

UConn Project Team (under contract to CTDOT)

- James O'Donnell — University of Connecticut
- Carlton Hunt — Battelle
- Lynn McLeod — Battelle
- Lisa Lefkovitz — Battelle
- Bernward Hay — The Louis Berger Group, Inc. *(Prepared minutes)*

SUBMITTED ON: January 15, 2013

The primary goal of the meeting was to review (1) the Zone of Siting Feasibility (ZSF), (2) preliminary site screening, and (3) the plan for the physical oceanographic study, in preparation for the Eastern Long Island Sound (ELIS) Supplemental Environmental Impact Statement (SEIS).

Presentations are provided as separate pdf files; individual *Slides* of these presentations are referenced below.

Introduction (Jeannie Brochi, USEPA)

Jeannie Brochi stated that this was the Cooperating Agency kickoff meeting (her presentation is attached as Appendix A):

- Ms. Brochi asked if other agency member representatives should be asked to be involved. As required under NEPA, letters were sent out in July asking agencies to participate as either a Cooperating Agency or Coordinating Agency. There are some agencies (Navy, Coast Guard) and five tribes that have not yet confirmed participation. Confirmed are the States of Connecticut (CT), New York (NY), and Rhode Island (RI); both divisions of the USACE; and NOAA NMFS.

- Being a Cooperating Agency allows for involvement in all major milestones, document reviews, and helps USEPA conduct the effort. Jeannie Brochi reviewed the EIS process *(Slide 5),* and introduced the USEPA website available for public communications *(Slide 6)*.

- Participants were asked to identify data gaps in the preliminary information presented at today's meeting. Feedback was requested by January 18, 2012, on the ZSF, the screening, and the planned physical oceanography study (sampling locations, data collected, etc.). Also, any relevant available information and data on resources in the ELIS were requested. The ZSF *(Slide 9)* for the SEIS has been expanded to encompass the eastern area of the Dredged Material Management Plan (DMMP), to be able to use its information and reports (the DMMP study area is specified in *Slide 8*).

- Aside from the DMMP, the SEIS will include information from the EIS for Central and Western LIS, the USACE DAMOS monitoring program, and USEPA data generated between 2007 and 2012 *(OSV Bold* cruises). The Dredging Needs report (2009) estimated that approximately 13.5 million cubic yards will need to be dredged by 2028 in LIS's harbors and channels; the report is one of the starting points for the SEIS.

- Projected completion dates are December 2014 for the Draft SEIS, December 2015 for the Final SEIS, and December 2016 for rule-making (if the SEIS recommends designation of one or more sites). December 2016 is also the date when the Cornfield Shoals and New London Disposal Sites will close.

Zone of Siting Feasibility and Preliminary Site Screening (Presentation by Lynn McLeod, Battelle)

Lynn McLeod explained the ZSF for the ELIS and the process used in Central and Western LIS site screening for candidate alternative dredged material disposal sites, adapted for Eastern LIS (her presentation is attached as Appendix B):

- Information from the original ZSF developed years ago for the entire LIS and the revised boundary used in the Western and Central EIS was used as a starting point for the ELIS *(Slide 2* shows its boundaries). The eastern boundary was expanded slightly to the east to include the DMMP boundary *(Slide 3)*.

- The objective of the screening *(Slide 4)* is as follows:
  - Identify areas within the revised ZSF acceptable for locating an open water disposal site designated under the Ocean Dumping Regulations, and
  - Identify specific alternative disposal site(s) within the acceptable area(s) for further evaluation in the SEIS.

- In general, the screening approach followed the Marine Protection, Research, and Sanctuaries Act (MPRSA) disposal site designation criteria, as outlined in *Slide 5* and in a handout on *Considerations in the Evaluation and Designation of Ocean Dredged Material Disposal Sites,* and on *Ocean Dumping References* used for the Central and Western LIS site screening (Tables 1 and 2, provided below).

- Screening criteria were prioritized into Tier 1 and Tier 2. Tier 1 criteria rule out areas that are unacceptable for open water disposal. Tier 2 criteria identify specific locations for alternative sites.

- *Tier 1 criterion – Sediment stability/instability (Slide 6):* Includes information such as bathymetry *(Slides 7;* depth contours are in meters). *Slide 8* shows ELIS bathymetry with depths of 18 meters and shallower 'blacked-out'; such depths were considered not suitable for potential disposal sites during the Central and Western LIS screening. Preliminary model estimates of the maximum bottom stresses due to tidal currents are shown in *Slide 9*; higher stresses (red) reflect higher sediment erosion potential. Data from the physical oceanography surveys will assist with this criterion.

- *Tier 1 criterion – Disposal feasibility (Slide 10):* Includes water quality perturbations and near-term fate; this issue will be worked on over the next six months.

- *Tier 1 criterion – Areas of conflicting uses (Slides 11 and 12):* Includes beaches and amenities, utilities, etc. The data layer presented requires updating. Any information from the Cooperating Agencies would be welcomed.

- *Tier 1 criterion – Shellfish and fishing (Slide 13 to 15):* Shellfish bed information was available for the CT coastline; the same type of information is requested for NY and RI. Fishing layers were obtained from the RI SAMP program.

- *Tier 1 criterion – Navigation (Slides 16 to 18):* The report entitled *U.S. Coast Guard Captain of the Port Long Island Sound Waterways Suitability Report for the Proposed Broadwater Liquefied Natural Gas Facility* provided data on ship traffic density and commercial vessel navigation (e.g., ferries).

- *Tier 1 criterion – Marine habitats and high dispersion potential (Slide 19):* Questions to consider include the following: Are gravel and hardbottom habitat (considered important marine habitat for the Central and Western LIS) also important for the ELIS? What type of site shall be considered for ELIS (containment and/or dispersive)? The sediment characteristics *(Slide 20)* provide an indication of the type of habitat that may exist. Sediment texture appears to correspond to shear stress *(Slide 21);* high shear stress results in coarser texture.

- *Tier 1 - Compilation of all Tier 1 screening criteria (Slide 22)* - The compiled map shows areas ruled out within the ELIS (preliminary).

- Tier 2 criteria *(Slides 23 to 25)* are designed to focus on specific alternative sites where impacts to key resources are minimized (such as archaeological resources, fish habitat, benthic community, shellfishing, eelgrass beds, etc.)

- *Tier 2 criterion – Historic disposal sites and Continental shelf (Slides 26 to 28):* During Central and Western LIS screening it was determined that 25 nautical miles (nm) (i.e., about a 10-12 hour round trip) was the maximum distance that dredgers could transport dredged material economically from dredging locations. The 200-m depth contour of the edge of the continental shelf is located outside of the 25 nm zone.

- *Tier 2 criterion – Prevailing currents (Slide 29):* Not considered for this screening yet.

- *Tiers 1 and 2 – Compilation of all screening information (Slide 30):* Ultimately, alternative areas require specific site boundaries based on depth, capacity for dredged material volumes, water quality criteria, buffer zones, etc. *(Slide 31).*

- Factors to be discussed in SEIS are shown in *Slide 32*.

- Next Steps *(Slide 33):*
  - Finalizing criteria for screening (minimum depth, bottom types to avoid; type of site [containment and/or dispersive]; site protection requirements).
  - Identifying and acquiring more recent or available data to use in the screening. Any data from Cooperating Agencies would be greatly appreciated.
  - Identifying data gaps and conducting studies to fill them.

Discussion of Preliminary Site Screening (facilitated by Carlton Hunt)

Discussion topics were as follows:

- **Process**: Carlton Hunt asked if everyone agreed with the process that is being followed, and explained that process meant the sequencing of the analysis. Kari Gathen stated that it was too early and more information and research was needed before agreeing to this process. Carlton Hunt and Jeannie Brochi agreed, and said that, for example, information is needed from NY and RI. Jeff Willis asked if the process has been used elsewhere. Carlton Hunt and Lynn McLeod explained that the process has been used in other locations such as the Central and Western LIS and RI.

- **Eastern boundary of ZSF:** Carlton Hunt asked if participants were in agreement with the location of the eastern ZSF boundary. Jeff Willis asked why the ZSF was expanded to the east. Jeannie Brochi stated that the boundary was expanded to be able to use DMMP data from dredging centers along the coast of western RI. Mark Habel added that the second factor was distance. Specifically, using a radius of 25 nm as the limiting distance for economically viable disposal from New London (one of the largest dredging centers in CT) implies that Block Island Sound needs to be included in the analysis. For that reason, the area is also part of the DMMP.

- **DMMP informing SEIS:** Jim Leary asked how the findings of the DMMP (required to be prepared as a condition for the Central and Western LIS site designation) will inform the SEIS. Kari Gathen added that the rules state to eliminate or reduce open-water dredged material disposal. She asked how the SEIS process equates with this rule, and if the DMMP has exhausted the search for all possible out-of-water alternatives. Jeannie Brochi responded that the USEPA is fully on board with 'reduce or eliminate' and DMMP findings will be incorporated into the SEIS process. Mark Habel stated that the DMMP, after several years of input from all the agencies, has looked at all the available not-in-water alternatives. A public draft of the DMMP probably requires another 18 months. However, after looking at the various reports and studies it is clear that, over the long term, dredged material disposal needs in the ELIS cannot be met by the combined capacity of all available not-in-water disposal alternatives. There are plenty of beaches in the ELIS that need sand, but the sediment predominantly being produced in the ELIS is silty. Joe Salvatore added that, for that reason, and given dredging needs and the strategic importance of Connecticut's facilities, the Governor of CT considered it very important to start and expedite the oceanographic study phases of the project.

  Jim Leary asked if the assessment of out-of-water alternatives investigated impediments such as local laws or other regulations; he raised the question to understand what laws could be changed to increase out-of-water disposal alternatives over the next 26 years. Mark Habel stated the DMMP work so far has looked at the total available capacity and has not yet screened out such impediments; this screening is likely going to reduce the out-of-water capacity so far considered. Jim Leary suggested that changes in policies may create new out-of-water opportunities and different paths, such as new remediation and treatment technologies, etc.

  Patricia Pechko reminded participants that the SEIS process is designed to determine the feasibility of designating a site, not to necessarily designate a site, and secondly, that if a site is designated it will not necessarily be used. The goal for the process discussed in this meeting was to determine if there *is* a suitable area for a site. Kari Gathen stated that she would like to see a companion effort; the State of CT should consider dredged material as an economic development opportunity to create new industries, reuse the material, and jobs and opportunities for people. Such an effort has been successful in NY Harbor. George Wisker stated that the CTDEEP embraces the LEAN concept; ongoing efforts include increasing the beneficial use of soil and sediment. This includes reviewing standards and other steps to make it easier for people to utilize dredged material. Jeannie Brochi asked if any of the cooperating State agencies would be interested in facilitating a review of impediments or opportunities (federal, state, local) in their States. Jeff Willis said that impediments were not an issue in RI, but rather education; RI had not dredged in over 30 years, so it took a long time to educate people about beneficial use alternatives, costs, and time to use such alternative vs. ocean disposal. Jeannie Brochi and Carlton Hunt suggested a parallel process to the site screening that could be added to the next Cooperating Agency meeting as an agenda item.

Patricia Pechko mentioned that the NY Harbor DMMP is a living document that is being reexamined every two years to look for opportunities and remove impediments. Nevertheless, there remains an open water disposal site.

- **Appropriate minimum water depth and other available exclusionary information:** Carlton Hunt asked if there were any State requirements that rule out certain areas for disposal. Jennifer Street said there are some requirements, such as significant coastal fish and wildlife habitats which are federal designated areas; NYSDOS will provide the information in electronic format to USEPA (Jeannie Brochi and Patricia Pechko). Also, NYSDOS will provide updated navigation information including metadata. Jeff Willis stated that the most recent RI data are already available to USEPA through the recent SAMP study. Jennifer Street mentioned that SeaGrant is moving forward with marine spatial planning, and data may be available; George Wisker will obtain the data once it becomes available. Mark Habel suggested reaching out to the Navy for additional navigation corridors out of Groton.

- **Haul distance (25 nm):** Carlton Hunt stated that 25 nm was used for the Central and Western site designation screening, and asked if there were any objections to use this distance. None were voiced.

- **Dispersive site:** Carlton Hunt asked if a dispersive site(s) should be considered for ELIS; dispersive sites are allowed under the regulations and the active Cornfield Shoals Disposal Site is considered a dispersive site. Jeannie Brochi added that dispersive sites have also been designated elsewhere in the country. Mark Habel added that there are dispersive sites along the south coast of Long Island. He also stated a threshold of 15% for fines in sediment for direct placement on beaches and nearshore bars has been used for a long time. A higher threshold for nearshore bar placement would open new opportunities for beneficial use; this will be considered for the DMMP.

- **Data gaps:** Carlton Hunt discussed the filling of some of the data gaps:
  - Sediment transport/erosion to determine the shear stress levels; this will be addressed by the physical oceanography study.
  - Living resources (shellfishing, fisheries, benthic organisms): Jennifer Street stated many data are available, including data in the New York State Atlas which is a mix of data from different agencies. Carlton Hunt offered to provide NYSDOS with a list of data needed for the screening. Diane Rusanowsky suggested including the Essential Fish Habitat layers; Julie Crocker or Daniel Palmer (NOAA in Gloucester) may have the data (including coordinates). Also, NOAA has listed federally Atlantic sturgeon in recent years which will need to be included in the analysis. Lynn McLeod agreed to send a list of potential screening layer types to NYDOS.

- **Alternative uses** (wind, coastal planning due to sea level rise, etc.): In response to comments on cumulative impacts, Diane Rusanowsky suggested considering hydrokinetic energy generators as a potential alternative use in the ELIS.

Potential areas for disposal sites (very preliminary): Carlton Hunt suggested considering four areas as a starting point for the discussion on specific areas for further study. One area is located to the north of Montauk Point (>20 m depth; sheltered; muddy bottom sediment). There are deeper holes south of Fishers Island (>50 m depth; within haul distances). The apparent high bottom shear stress areas within ELIS (assuming the site can be dispersive). The fourth area is closer to the Cornfields Shoals site at or near the former Niantic Disposal Site. This kind of discussion is designed to focus on where additional studies may be needed. Nancy Brighton asked if there are sites that may be too deep. Mark Habel responded that the most extensively used disposal site in Massachusetts is 330 feet deep, and placement within it has been very accurate. Only a few sites in ELIS come close to this depth.

The participants did not reach conclusions with respect to potential areas for further study pending presentation of the additional data layers to be provided by NYDOS and others. These updates and discussion will form the basis for the next Cooperating Agency meeting.

Physical Oceanography Study (Presentation by James O'Donnell, UConn)

James O'Donnell presented existing physical oceanographic data and the proposed study for the ELIS (see Appendix C):

- **Overview:** Bottom shear stress and water circulation which determine the erosion potential and fate of the sediment are key parameters for site designation. To consider all possible sites, reliable data are needed to force and test a model that can interpolate between the limited locations and times for which data are available *(Slide 2).*

- **Scientific background:** James O'Donnell explained the underlying science for sediment transport, stating in essence that resuspension of sediment particles from the sea floor is a function of sediment grain size and bottom force acting on the particles *(Slides 3 to 5).* The larger a particle, the larger the force needed to resuspend it. Or, stated differently, with increasing bottom stress, increasingly larger sediment particles are resuspended. Forces (and thus bottom stress) are strongest during storms when wind driven circulation and surface gravity waves can augment the effects of tidal and density driven flow *(Slide 6)*.

- **Data needs:** The data needed to assess bottom stress are summarized in *Slide 7*. The goal is to assess the stability of sediment at the sea floor for normal and extreme (storm) conditions. The plan is to use field observations to assess the validity of theoretical predictions at selected sites at a range of conditions, and then use the results of the model to compare all possible sites.

- **Available data:** There are three major recent studies with data for the ZSF *(Slide 8)*; James O'Donnell presented some of the data from these and a variety of other sources *(Slides 11 to 27).* Needed data include sea level, wind speed and direction, solar radiation, river discharge based on the extensive USGS network, water column temperature and salinity, currents, and waves. About 90% of the freshwater enters the LIS through the Connecticut River, Housatonic River, Thames River, and Quinnipiac River. About half of the freshwater enters the LIS in the spring (March to May; *Slide 16).*

  In summary *(Slide 29)*, seasonal variations in wind and wave patterns and river discharge are substantial. Missing data include the following:
  - No direct measurements of bottom stress data are available.
  - Wave data are only available at the Central LIS buoy.
  - No density variation data north-south in LIS.
  - No hydrography or current profile measurement in Block Island Sound or Rhode Island Sound.
  - Available information identified a windy period from January to March with big waves, and high discharge period from February to May, low wind and low river discharge period in the summer.

  Therefore, to evaluate the performance of a model, it should be tested over a period that encompasses the range of characteristic conditions that might be experienced.

  Kari Gathen asked about the bottom shear stress in the ELIS. James O'Donnell explained that there is evidence of high bottom stress in ELIS in the form of existing sand waves and the absence of lake sediments, but no direct measurements. Stress levels in the ELIS modeled so far are based on data for sea level and currents and have not been directly compared to measurements.

  Carlton Hunt stated that he is aware of another solar radiation data set from the Massachusetts Water Resources Authority; he will connect Jim O'Donnell with the data managers.

- **Proposal for observations** *(Slide 30):* The period October to March include frequent events of high winds from the Northeast (typically about 10 storms per winter). Winds are lighter from May to September. River flow is high from March to May. Considering also variations in currents and waves, three periods are targeted for monitoring (over a total period of six months):

- Windy, low flow (February to March)
- Windy, high flow (April to May)
- Calm, below average flow (June-July)

James O'Donnell plans to measure salinity and temperature variations (with CTDs, *Slide 34*), currents (with current meters), suspended sediment concentrations (with optical backscatter sensors), and bottom stress (with Acoustic Doppler Current Profilers). Measurements will be made at moored stations *(Slide 33)* and along cruise tracks (four times during the survey period) *(Slide 31)*.

The distribution of the maximum bottom stress magnitude *(Slide 32)* has been numerically modeled (using FVCOM, *Slide 35*) based on tides and sea level, as stated above. Planned mooring stations are superimposed on *Slide 32*. Preliminary tidally induced bottom shear stress distributions suggest that the New London Disposal Site is stable because of low stress and infrequent large amplitude waves, and the sediment is coarse enough to not be resuspended by higher stress events. Uncertainties (due to parameter choices) and the effects of infrequent events (hurricanes) can be estimated using the model and available measurements.

Steps to integrate the planned field measurements into the model consist of the following:

1. Use observed winds and river flow to drive the model and predict the salinity, temperature, current and waves, and bottom stress.
2. Compare to the new and archived observations and evaluate FVCOM performance in the ZSF.
3. Describe the uncertainties.
4. Simulate the behavior during extreme events. The output is maps of the evolution of bottom stress and circulation along with uncertainties in the estimates.

To predict the effect on natural and deposited sediment, stress and current distribution predictions will be used to drive the models STFATE and LTFATE. STFATE models sediment transport during disposal. LTFATE models long-term transport of resuspended sediment from disposal mounds.

Discussion of Physical Oceanography Presentation (facilitated by Carlton Hunt)

- **Summary:** George Wisker summarized Jim O'Donnell's physical oceanographic study as follows: The purpose of the study is to obtain data that are limited in the scope and time. Data are entered into models that are based on mathematical equations and models are run. These models are then tweaked to reflect the existing observation**s** to calibrate the model. The calibrated model can then be used to assess stress at potential alternative sites including conditions such as the recent Hurricane 'Sandy'.

- **Sediment characteristics and bottom stress:** Cathy Rogers asked to what extent sediment characteristics is an indication of bottom shear stress. James O'Donnell and Carlton Hunt responded that they are a good first indication of stress.

- **Model predictions:** Jim Leary asked if October to March is the period with frequent high winds, why the period between August and January is not studied. James O'Donnell responded that funding limits the study period; however, the period February to July is the period during which the highest variability in bottom stress occurs. Jim Leary asked further how the modeling will account for other types of conditions such as climate change effects (sea level rise, increase in frequency of storms, etc.). Carlton Hunt answered that once the model has been calibrated it can be used to determine bottom stress and depth of erosion for a variety of other conditions, such as these types of extreme events. Field station locations have been chosen in a manner to provide data for a range of stress conditions (higher stress as well as lower stress). James O'Donnell added that UConn's implementation of the physical oceanography model (FVCOM) is a state-of-the-art horizontal circulation model; however, this model does not resolve the details of the circulation around the disposal site. It is the role of STFATE and LTFATE to make refined predictions on the scale of the disposal sites.

- **Other uses of model predictions:** James O'Donnell stated that model allows for high-resolution wave forecasts, which also helps to develop strategies for storm conditions at beaches or exposed shoal areas, or for marsh replenishment projects.

- **Multiple storm events:** Kari Gathen asked if the models consider different periods of 'recovery' between storms; for example, what happens if several storms occur over a short period of time? James O'Donnell responded that the models are designed to cover a wide variety of conditions. Carlton Hunt added that this kind of issue was addressed in the Central and Western LIS EIS. As described therein, the benthic community typically recovers within a season or two after a storm or a sequence of storms.

- **Disposal site management:** Kari Gathen stated that there is a practice of capping in LIS and asked about the recovery period if capping material was removed during storms. Carlton Hunt stated that all material that is disposed in LIS is acceptable for ocean disposal; capping is a dredged material management activity. If sediment to be dredged does not pass the dredged material testing requirements, it cannot be disposed in the LIS. Joe Salvatore confirmed that the State of Connecticut is choosing to cap many federal as well as private projects even though *all* disposed sediment meets the open ocean water disposal. George Wisker mentioned that the water quality standards of the State of Connecticut specify to use Best Management Practices (BMPs), and capping is a BMP.

  Carlton Hunt added that the approach for dredged material management at a site will be included in the SEIS in the form of a SMMP (Site Management and Monitoring Plan). Kari Gathen asked if the model assesses conditions if the cap is washed away. Jeannie Brochi responded that when a site is designated, a SMMP is created and USACE is monitoring these sites through their DAMOS program. Thus, the agencies could determine to place material in certain areas subsequent to a storm to cover up areas that are to be capped. Carlton Hunt added that this type of discussion is important for site screening to determine how a site will be used, what type of material is to be placed, how stable the material shall be, under what conditions it will not be stable, etc. James O'Donnell added that the model can determine if design criteria for specific sites have been exceeded for specific storms, to guide subsequent actions.

- **Testing criteria:** Kari Gathen asked if there will be further study to determine if the open ocean disposal criteria are truly acceptable for a semi-enclosed waterbody such as LIS. Joe Salvatore replied that DAMOS has many years of data (including data collected after storms) and has not identified any concerns. Mark Habel stated that the model allows for the determination of erosion of a layer of sediment (measured in cm and mm) if exposed to a certain level of stress over a certain period of time. There are historic mounds capped decades ago; these mounds have consolidated and have been winnowed somewhat. The model will be able to determine what it would take to erode sediment from these mounds, for example. Carlton Hunt stated that reevaluating the testing criteria challenges the "Green Book" as well as the Ambro Amendment. Mark Habel stated that under the Ambro Amendment, the federal government will use the open ocean disposal requirements (technical and procedural). Jim Leary asked if there should not be some consideration about differences between placing material in an open ocean vs. more enclosed environment[1]. Mark Habel stated that one way to examine this issue would be to review CTDEEP's BMP approach to see if additional management steps might be considered, even though USEPA and USACE would not require them. Joe Salvatore added that every year, the USACE considers the list of dredging projects from CT and NY projects to

[1] For the record, Jim Leary stated at the end of the meeting that NYSDOS does not mean to imply they are backing away from the Ambro Amendment, or not applying open ocean criteria for the testing of sediment, but merely asked to consider potential impacts due to the specific physiographic setting of the LIS, outside of what is allowed under the law. Lisa Lefkovitz stated that these types of issues would be addressed in the SEIS.

determine the most suitable disposal sequence.

- **Design of study:** Carlton Hunt and Jeannie Brochi asked if there are weaknesses in the study setup (timing, frequency, location, measurement type), and if additional information was available for the selection of station locations. Jennifer Street asked if there would be monitoring in Peconic Bay. Jeannie Brochi added that the area was included in the ZSF because it is included in the DMMP study area. Mark Habel recommended not considering Peconic Bay [as a potential disposal site]. Regarding timing of the study, Mark Habel stated that dredging in LIS is restricted between October and April, thus the study should address potential STFATE conditions during the open disposal window (May to September). James O'Donnell stated that conditions for this window should be covered including stratification of the water column in LIS. Mark Habel asked if there should be corrections for mound elevations. James O'Donnell stated that this issue will be addressed by STFATE and LTFATE. Mark Habel stated that field stations were located mostly within high energy areas and asked if stations should be adjusted to get a greater range of energy conditions. James O'Donnell responded he will adjust the stations slightly to include some lower energy areas since containment sites would be located in low energy areas. Diane Rusanowsky suggested not placing stations in areas precluded for potential disposal due to resource concerns. James O'Donnell stated he will consider this, as long as it does not affect the confidence of the predictions of the model, since its goal for the model is to be equally reliable for measurement stations and locations in-between. Cathy Rogers asked if consideration of more lower-end energy conditions would be useful. James O'Donnell responded that if energy is too low it affects the resolution of the model; the approach has been to get a range of conditions biased toward worst-case scenario conditions.

Summary of Key Action Items

- Get State agencies together to identify impediments (e.g., policy) and opportunities for beneficial use. This includes finding out what each State is actively doing to encourage beneficial use.
- States might want to consider increases in thresholds for fines for beneficial use placement.
- Jennifer Street will provide additional GIS data layer on wildlife habitat as well as an ocean map, and the NYS Atlas.
- Jeff Willis will provide information on the Rhode Island process.
- Any other data that might be available: Lynn McLeod/Carlton Hunt stated a list with suggested input data will be prepared and circulated.
- Jeannie Brochi may reach out to agencies directly for some agenda items for future meetings.

Upcoming Schedule

Jeannie Brochi added that there will be additional public meetings as well as one or two more Cooperating Agency meetings in the spring. Data will be collected in the summer. Another public meeting as well as cooperating meetings will occur in this fall. Public outreach will probably occur in the fall using some of the available data.

The meeting was adjourned at 2:27pm.

Table 1. Required considerations in the evaluation and designation of ocean dredged material disposal sites (MPRSA 228.5 and 228.6).

MPRSA Section	MPRSA Regulation
228.5(a)	The dumping of dredged material into the ocean will be permitted only at sites or in areas selected to minimize the interference of disposal activities with other activities in the marine environment, particularly avoiding areas of existing fisheries or shellfisheries, and regions of heavy commercial or recreational navigation.
228.5(b)	Locations and boundaries of disposal sites will be so chosen that temporary perturbations in water quality or other environmental conditions during initial mixing caused by disposal operations anywhere within the site can be expected to be reduced to normal ambient seawater levels or to undetectable contaminant concentrations of effects before reaching any beach, shoreline, marine sanctuary, or known geographically limited fishery or shellfishery.
228.5(c)	If at any time during or after disposal site evaluation studies, it is determined that existing disposal sites presently approved on an interim basis for ocean dumping do not meet the criteria or site selection set forth in Section 228.5 through 228.6, the use of such sites will be terminated as soon as suitable alternate disposal sites can be designated.
228.5(d)	The sizes of ocean disposal sites will be limited in order to localize for identification and control any immediate adverse impacts and permit the implementation of effective monitoring and surveillance programs to prevent adverse long-range impacts. The size, configuration, and location of any disposal site will be determined as a part of the disposal site evaluation or designation, site study.
228.5(e)	USEPA will, wherever feasible, designate ocean dumping sites beyond the edge of the Continental shelf and other such sites that have been historically used.
228.6(a)(1)	Geographical position, depth of water, bottom topography and distance from coast;
228.6(a)(2)	Location in relation to breeding, spawning, nursery, feeding or passage areas of living resources in adult or juvenile phases;
228.6(a)(3)	Location in relation to beaches and other amenity areas;
228.6(a)(4)	Types and quantities of wastes (dredged material) proposed to be disposed of, and proposed methods of release, including methods of packaging the waste (dredged material), if any;
228.6(a)(5)	Feasibility of surveillance and monitoring;
228.6(a)(6)	Dispersal, horizontal transport and vertical mixing characteristics of the area, including prevailing current direction and velocity, if any;
228.6(a)(7)	Existence and effects of current and previous discharges and dumping in the area (including cumulative effects);
228.6(a)(8)	Interference with shipping, fishing, recreation, mineral extraction, desalination, fish and shellfish culture, areas of special scientific importance and other legitimate uses of the ocean;
228.6(a)(9)	The existing water quality and ecology of the site as determined by available data or by trend assessment or baseline surveys;
228.6(a)(10)	Potentiality for development or recruitment of nuisance species in the disposal site;
228.6(a)(11)	Existence at or in close proximity to the site of any significant natural or cultural features of historical importance.

Table 2. Ocean dumping reference table for the Western and Central LIS Disposal Site Designation EIS.

Ocean Dumping Regulation	Key Words and Phrases from 40 CFR 228	LIS Evaluation Factors (USEPA and USACE 1999)	Screening Tier
40 CFR 228.5(a-e): General Considerations for the Selection of Sites			
228.5(b)	Perturbations to the environment during initial mixing	Disposal Site Feasibility and Stability	1
228.5(e)	Designating historically used sites	Disposal Sites	1
228.5(a)	Interference with other activities: avoiding areas of existing fisheries or shellfisheries, and regions of heavy commercial or recreational navigation	Navigation considerations Existing Marine Habitats Commercial and Recreation Fisheries	1 1 1
228.5(d)	Limiting site size for monitoring and surveillance	Accessibility	2
228.5(c)	closure of interim ODMDSs	N/A	N/A
40 CFR 228.6(a)(1-11): Specific Considerations for Site Selection			
228.6(a)(3)	Location relative to beaches and amenities	N/A	1
228.6(a)(6)	Site dispersion, transport, and mixing characteristics	Disposal Mound Height Limit Disposal Site Feasibility and Stability Duration of Potential Adverse Impacts Site Characteristics	1 1 2 2
228.6(a)(8)	Interference with other uses	Site Use Conflicts Conservation Areas Economic Impacts	1 1 2
228.6(a)(1)	Geography, depth, topography, distance from coast	State Waters/Basins Site Characteristics	1 2
228.6(a)(2)	Location relative to living resources: breeding, spawning, nursery, feeding, or passage areas of living resources in adult or juvenile phases	Endangered Species	2
228.6(a)(9)	Existing water quality and ecology of site	Existing Habitat(s) at Site Recreational Uses Essential Fish Habitats	2 2 2
228.6(a)(4)	Types and quantities of wastes and disposal methods	Capacity and Area of Impact	2
228.6(a)(11)	Proximity to historical features	Cultural/Archaeological Resource Sites or Historic Districts Economic Impacts	2 2
		Site Protection Requirements	2

Appendix A: Presentation - Introduction

(Jeannie Brochi, USEPA)

Agenda

10:00 pm	Welcome/L*ogistics*/Objectives Jean Brochi, EPA Region 1
10:15 pm	ELIS ZSF/Site Screening Lynne McLeod/Carlton Hunt, Battelle
11:15 pm	Discussion
12:00 pm	Lunch Break
12:30 pm	Physical Oceanography Jim O'Donnell, UCONN
2:30 pm	Discussion
3:00 pm	Wrap Up/Next Steps, Adjourn

Cooperating Agency Meeting (#1)

Eastern Long Island Sound Supplemental Environmental Impact Statement (ELIS SEIS)

U.S. EPA Region 1
January 8, 2013

ELIS SEIS Process

- July 2012 – EPA requested agencies and tribes to participate as cooperating agencies.

- Cooperating Agency Status:

  - to ensure that all Federal agencies are actively considering designation of Federal and non-federal cooperating agencies in the preparation of analyses and documentation required by the National Environmental Policy Act (NEPA) participation.

ELIS SEIS PROCESS

- Agency representatives have responded from the following State agencies (CT, NY, and RI); Federal agencies (Corps NYD, Corps NED, USFWS, NMFS, Navy).
- EPA will continue to work with Tribes and other agencies.
- This is the first of several Cooperating Agency Meetings throughout this process.
- Cooperating Agency status does not interfere with agency representatives regulatory responsibilities.

ELIS SEIS Process

NOTICE OF INTENT

SCOPING

ZONE OF SITING FEASIBILITY (ZSF)

IDENTIFICATION OF ALTERNATIVES AND DATA NEEDS FOR EXISTING SITES

NEW SITES

SCREENING
PHASE I / PHASE II

SELECT CANDIDATE SITES

EXISTING SITES

ASSESS DATA NEEDS

COLLECT DATA

PREPARE DRAFT EIS

COMMENT PERIOD

PREPARE FINAL EIS

COMMENT PERIOD

ELIS SEIS Process

- EPA website revised: http://www.epa.gov/region1/eco/lisdreg/elis.html

- Email notification system, contact: ELIS@epa.gov if you would like to be added to the email distribution list.

ELIS SEIS Process

Objectives:

- Cooperating Agencies have until January 18, 2013 to comment on ZSF and site screening.
- EPA would like Cooperating Agencies input on the following:
- ZSF, areas to focus field work, Phys O. sample design, data gaps.
- Do agencies have additional data?

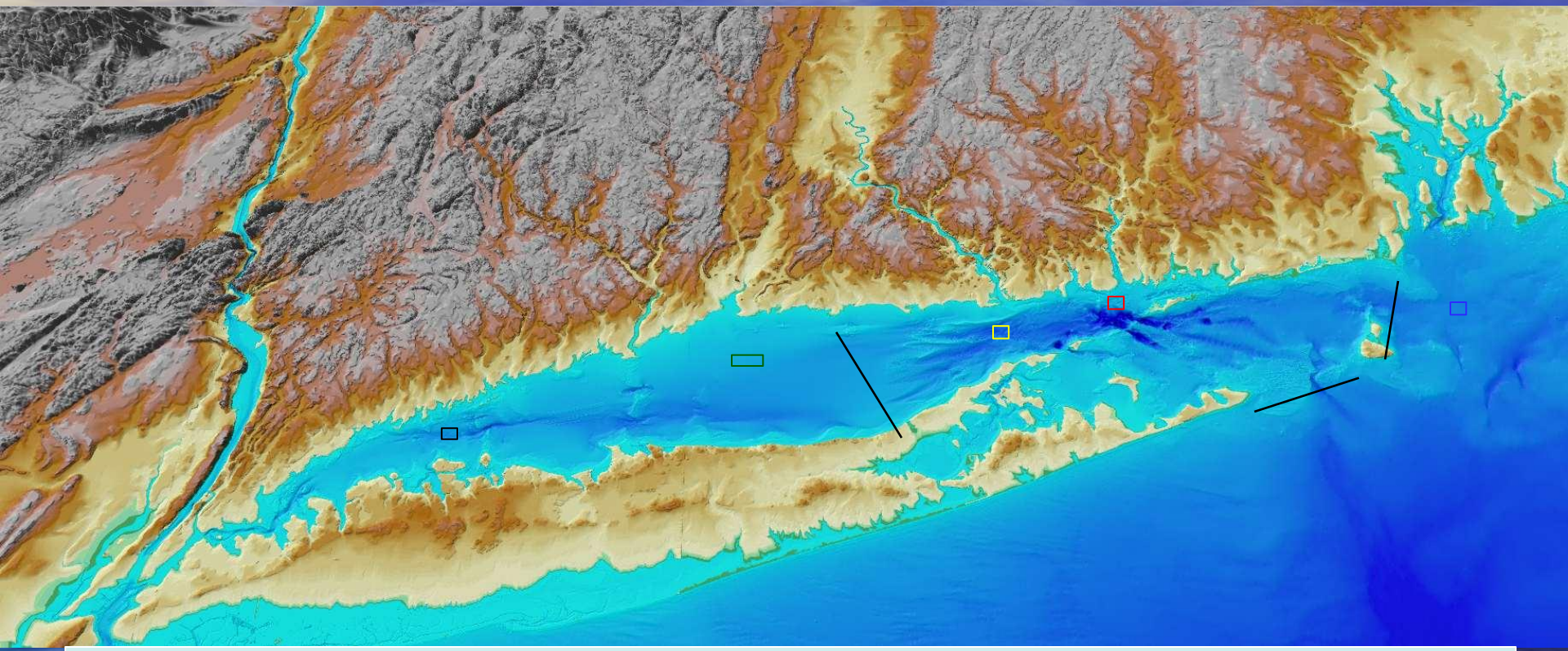
ELIS SEIS Process

LIS DMMP ZSF:

Western boundary at the Throgs Neck Bridge.

Eastern boundary is a line from Point Judith to Block Island to Montauk Point and then following the spine of the south fork moraine west to include all the waters of Gardner's Bay, Peconic Bay.

ELIS SEIS Process



Western Long Island Sound Disposal Site

Central Long Island Sound Disposal Site

Cornfield Shoals Disposal Site

New London Disposal Site

Rhode Island Sound Disposal Site

Zone of Siting Feasibility

ELIS SEIS Process

- July 2012 – EPA requested agencies and tribes to participate as cooperating agencies.

- Cooperating Agency Status:

  - to ensure that all Federal agencies are actively considering designation of Federal and non-federal cooperating agencies in the preparation of analyses and documentation required by the National Environmental Policy Act (NEPA) participation.

ELIS SEIS Process

Existing Data:

- Data collection for original LIS EIS included eastern LIS from 1999-2002.
- EPA conducted site monitoring surveys on OSV Bold in 2007, and 2009 - 2012.
- USACE DAMOS Monitoring:

NLDS – 10 surveys since 1990: bathy, physical oceanography, benthic biology, chemistry

CSDS – 3 surveys since 1990: bathy, sediment transport

RISDS – 4 surveys since 2000: bathy, benthic biology, lobster abundance, plume tracking

ELIS SEIS Process

Dredging Needs Report completed in October 2009:

- Determined that approximately 13.5 million cubic yards will be dredged from ELIS harbors and channels over the next 26 years (planning horizon to 2028)

Upland, Beneficial Use, and Sediment Dewatering Reports completed in 2009-2010:

- Determined that there are very few alternatives to open-water disposal sites in CT, and most of those are beach nourishment

Next Steps

- Additional public meetings in 2013
- Draft SEIS by December 2014
- Final SEIS by December 2015
- If SEIS recommends designation of one or more sites, publish final rulemaking by December 2016

Questions?

Appendix B: Presentation - Zone of Siting Feasibility and Preliminary Site Screening

(Lynn McLeod, Battelle)

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Eastern Long Island Sound Supplemental EIS (SEIS) Preliminary Zone of Siting Feasibility and GIS Screening for Candidate Alternative Dredged Material Disposal Sites

Interagency Meeting at CTDOT

January 8, 2013

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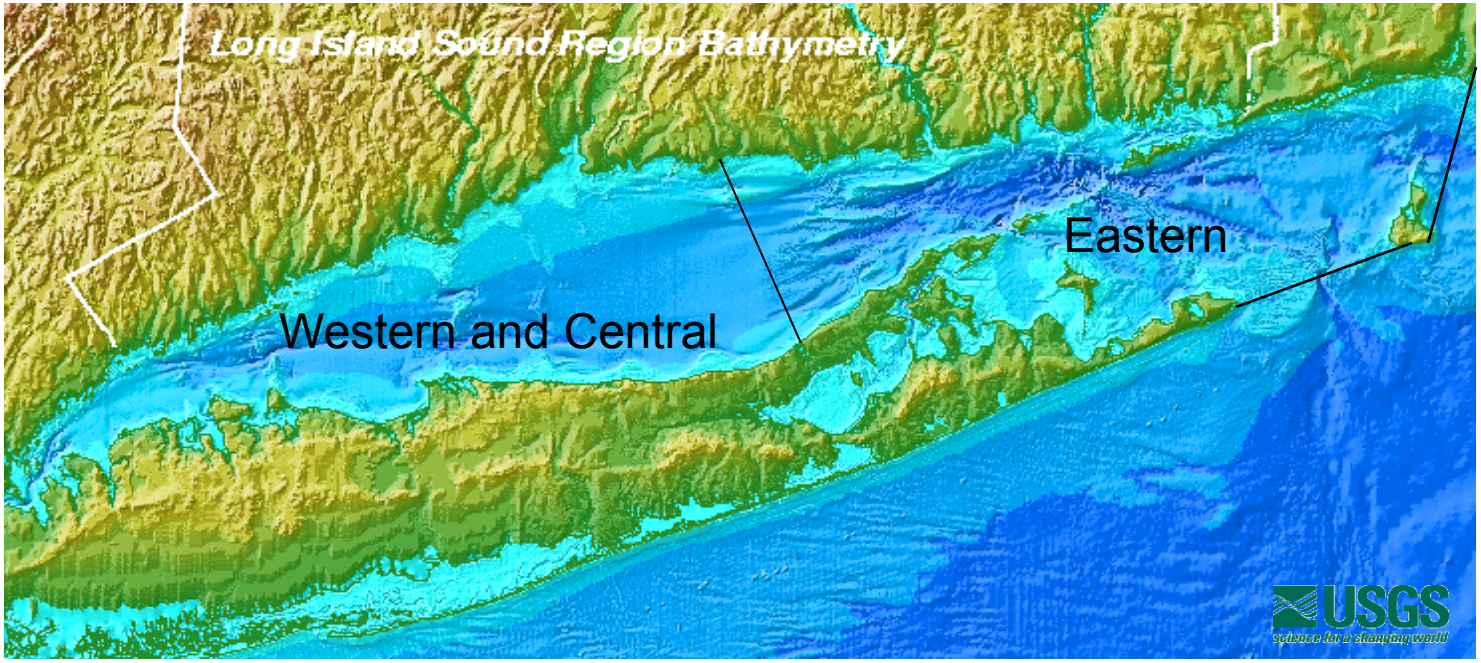
Zone of Siting Feasibility

- The SEIS will address the eastern region of LIS which was deferred during the earlier review of the western and central regions.
- It focuses on the remaining portion of the original ZSF that was not reviewed.



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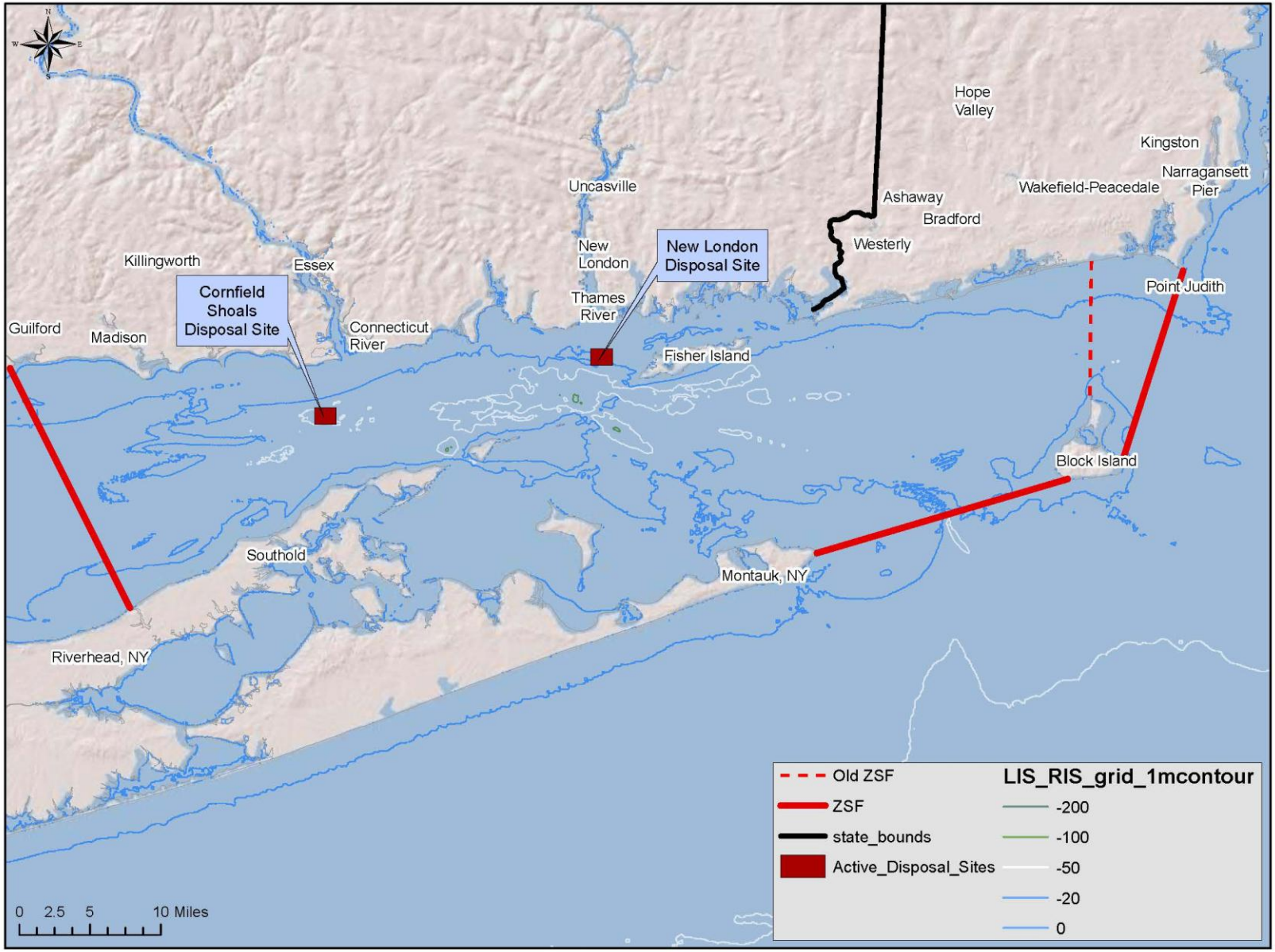
ZSF for Eastern LIS SEIS



Objectives of the Screening

- To identify areas within the revised ZSF acceptable for locating an open water disposal site designated under the Ocean Dumping Regulations
- To identify specific alternative disposal site(s) within the acceptable area(s) for further evaluation in the SEIS

Approach to Screening

- General Approach
  - Review Marine Protection, Research, and Sanctuaries Act of 1972 Criteria
    - 5 general (40 CFR 228.5) and 11 specific regulatory criteria (40 CFR 228.6) for ocean dredged material site designation.
  - Map previously defined LIS alternative dredged material site evaluation factors onto the ocean dumping regulation criteria
  - Prioritize the LIS factors into Tier 1 and Tier 2 screening levels
    - Tier 1 – rule out areas not acceptable for an open water disposal site
    - Tier 2 – identify specific locations for alternative site(s)

Approach to Screening

- Tier 1: Rule out areas based on the following
  - Sediment Stability/Instability – 228.5(b)
    - Bathymetry/Currents and Waves
    - Sediment Stability (e.g., Sheer Stress, Sediment Texture)
    - Data for this screening will be investigated as part of the physical oceanography work conducted by UCONN as part of this project
  - Disposal Feasibility - 228.5(b)
    - Water Quality Perturbations and Near Term Fate (i.e., STFATE)
    - Data for this screening will be investigated as part of the physical oceanography work conducted by UCONN as part of this project

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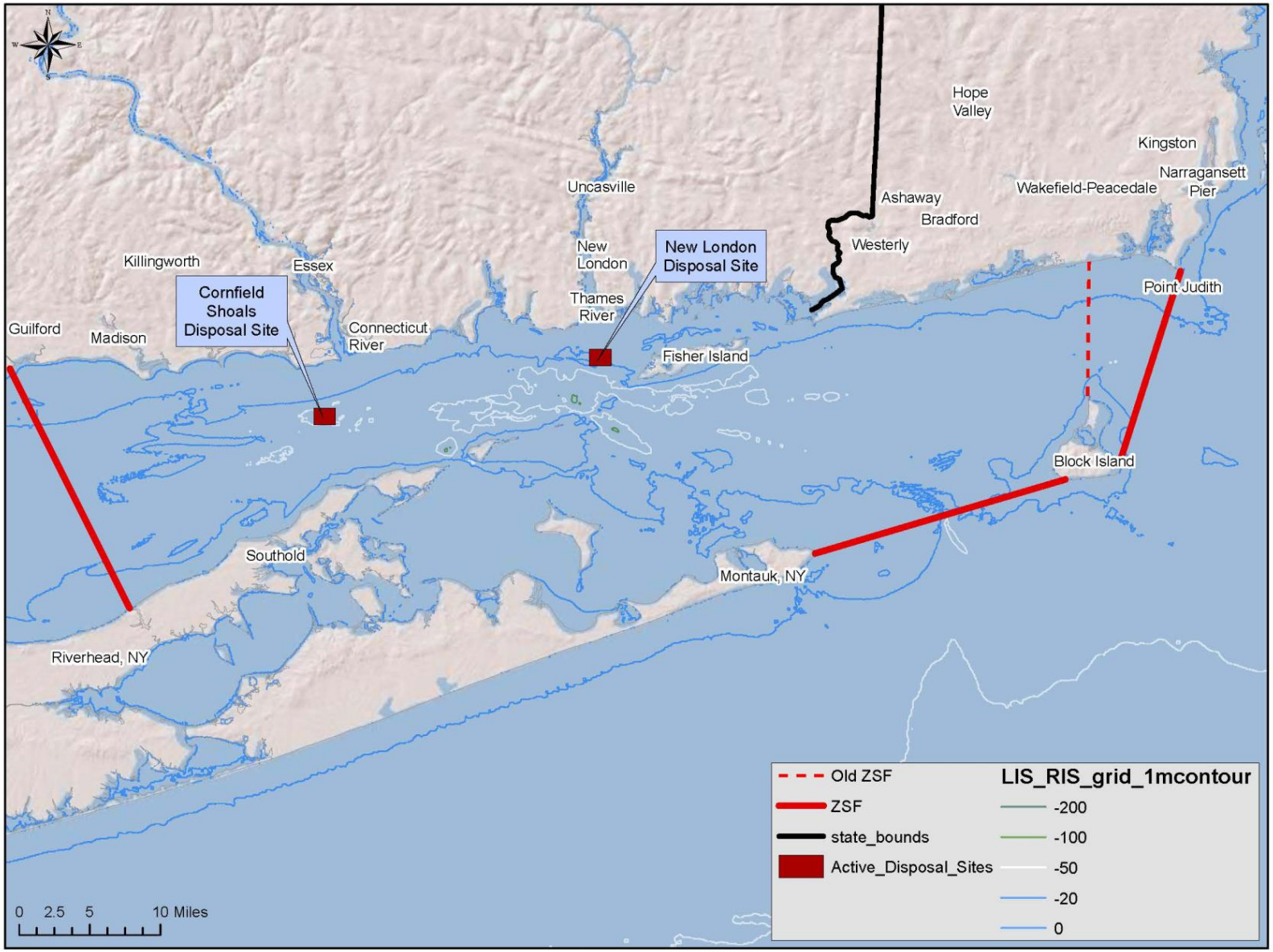
Sediment Stability/Instability - Bathymetry



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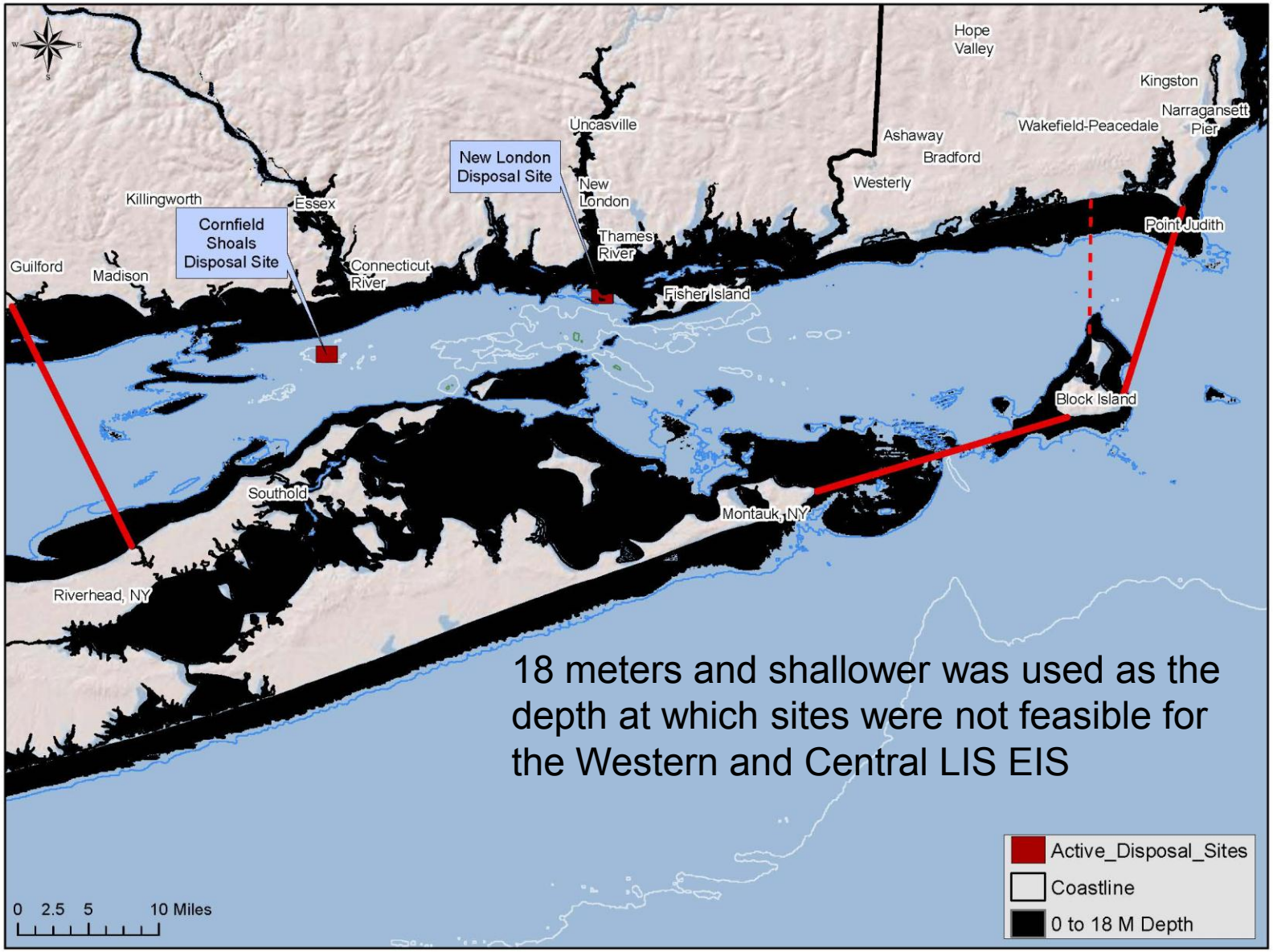
Sediment Stability/Instability - Bathymetry



18 meters and shallower was used as the depth at which sites were not feasible for the Western and Central LIS EIS

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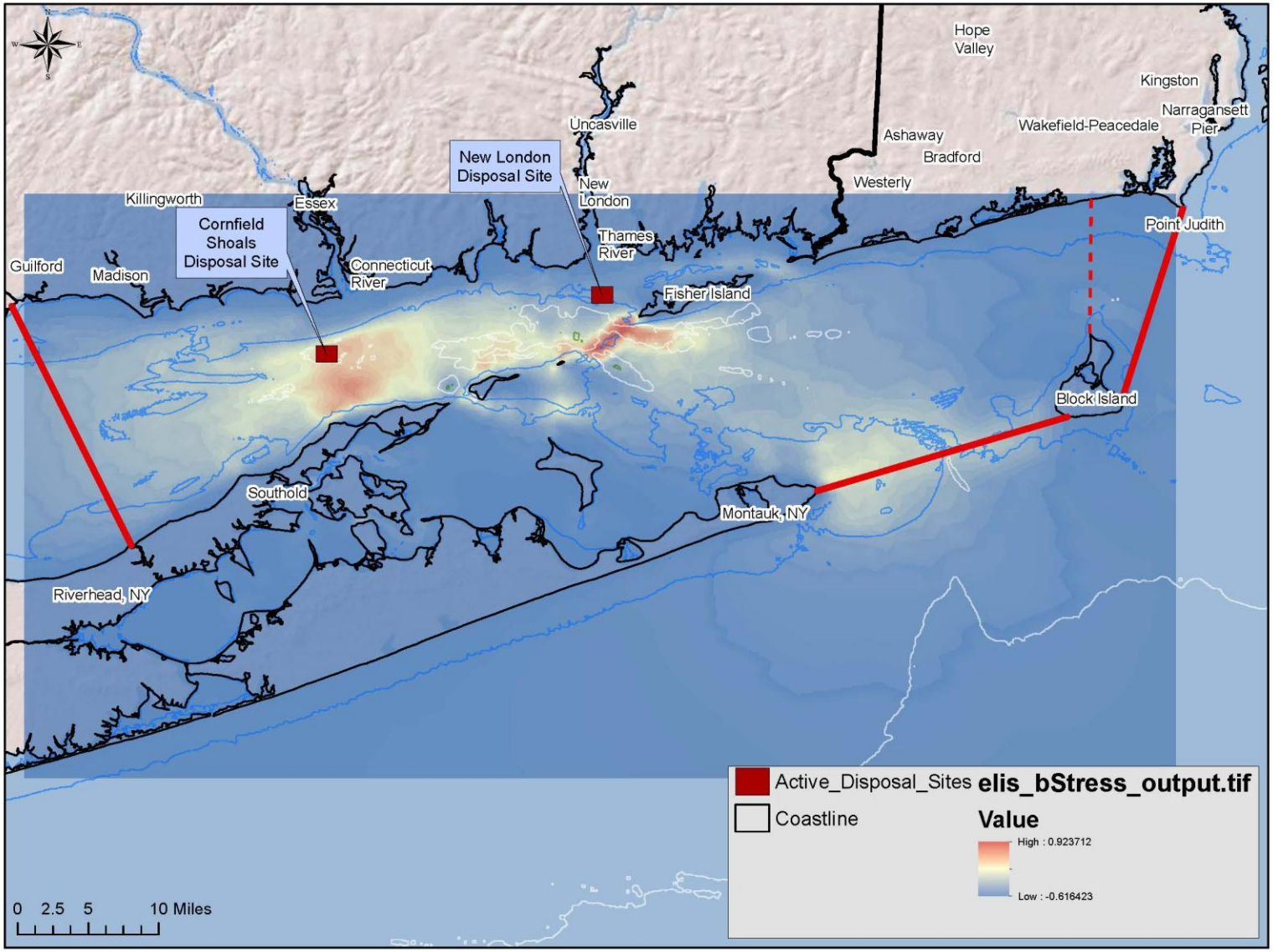
Sediment Stability/Instability– Tidal Driven Bottom Stresses

Preliminary Data; Considered minimal stress levels



Approach to Screening

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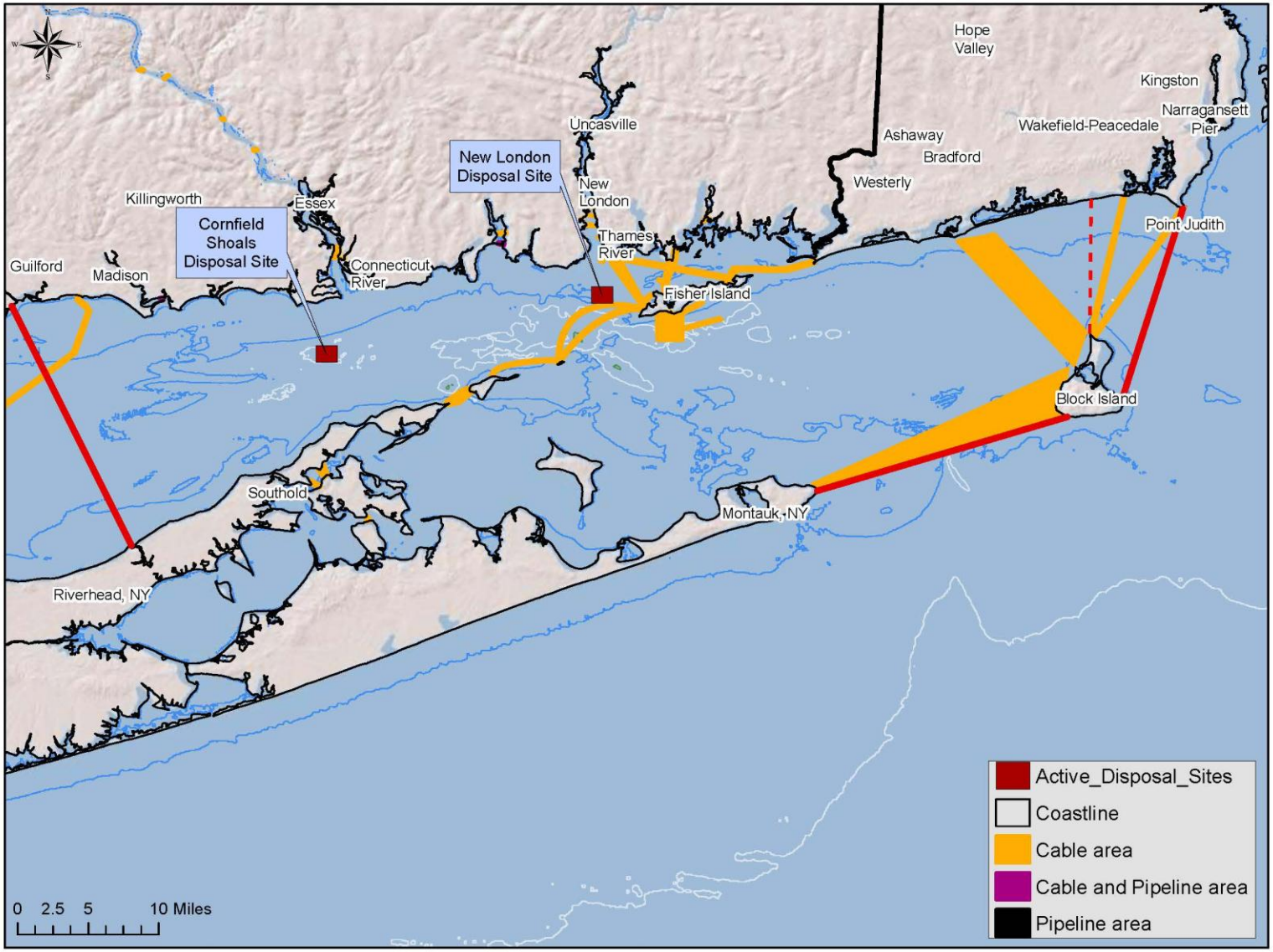
Approach to Screening

- Tier 1: Rule out areas based on the following
  - Areas with conflicting uses – 228.6(a)(8)
    - Beaches and amenities – 228.6(a)(3)
    - Utilities (pipelines, cable areas, etc)
    - Conservation areas (sanctuaries, wildlife refuges, national seashores, parks, fish havens, artificial reefs)
  - Shellfish and Fishing areas – 228.5(a)
  - Interference with Navigation – 228.5(a); 228.6(a)(8)
    - Submarines, Coast Guard vessels, large tankers, fishermen, etc.

Areas with Conflicting Uses – Cables and Pipelines
(Needs to be Updated)



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Approach to Screening

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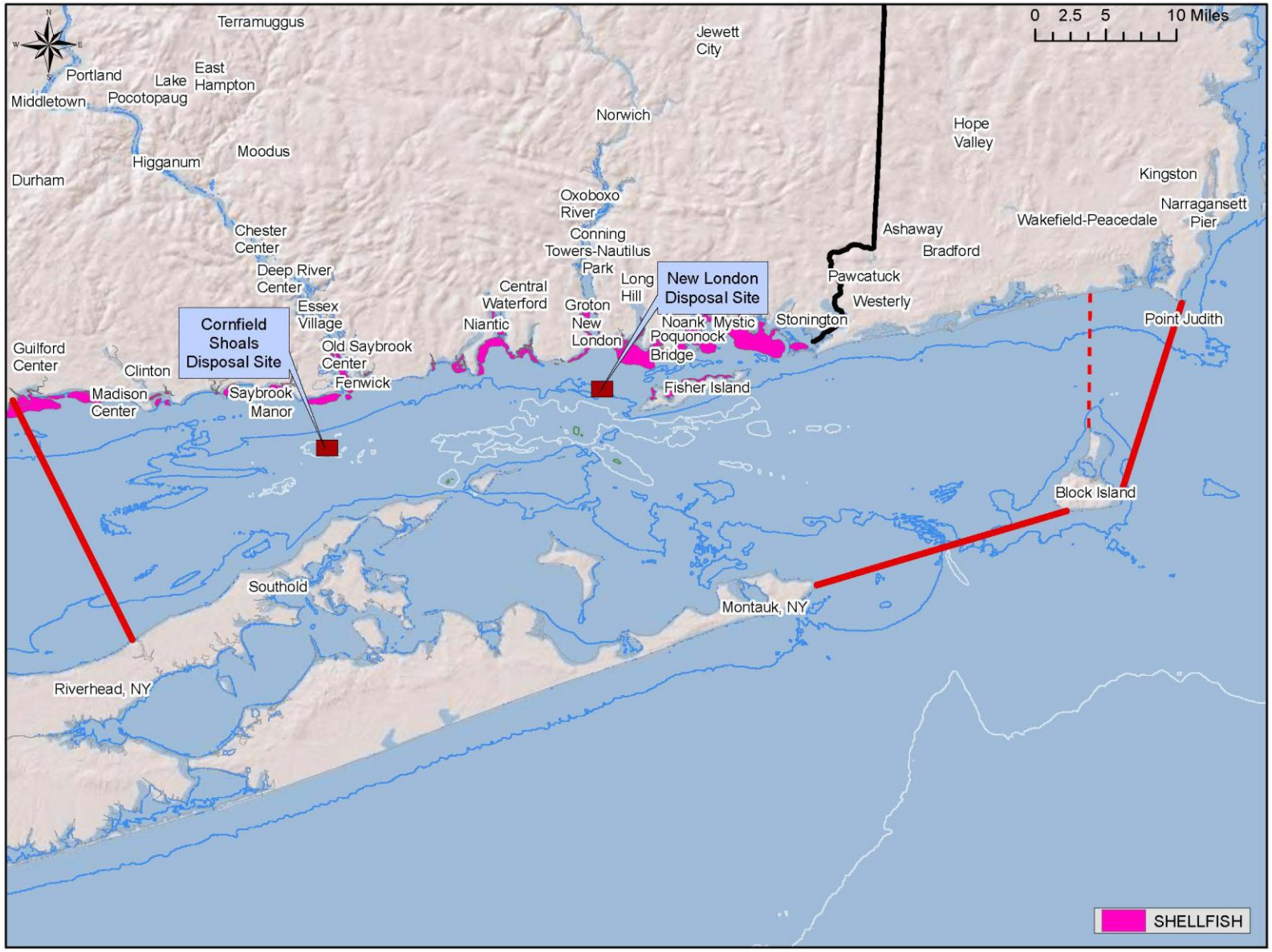
Shellfish Bed Locations -
(CT updated from CTDEEP, NY Data needed)



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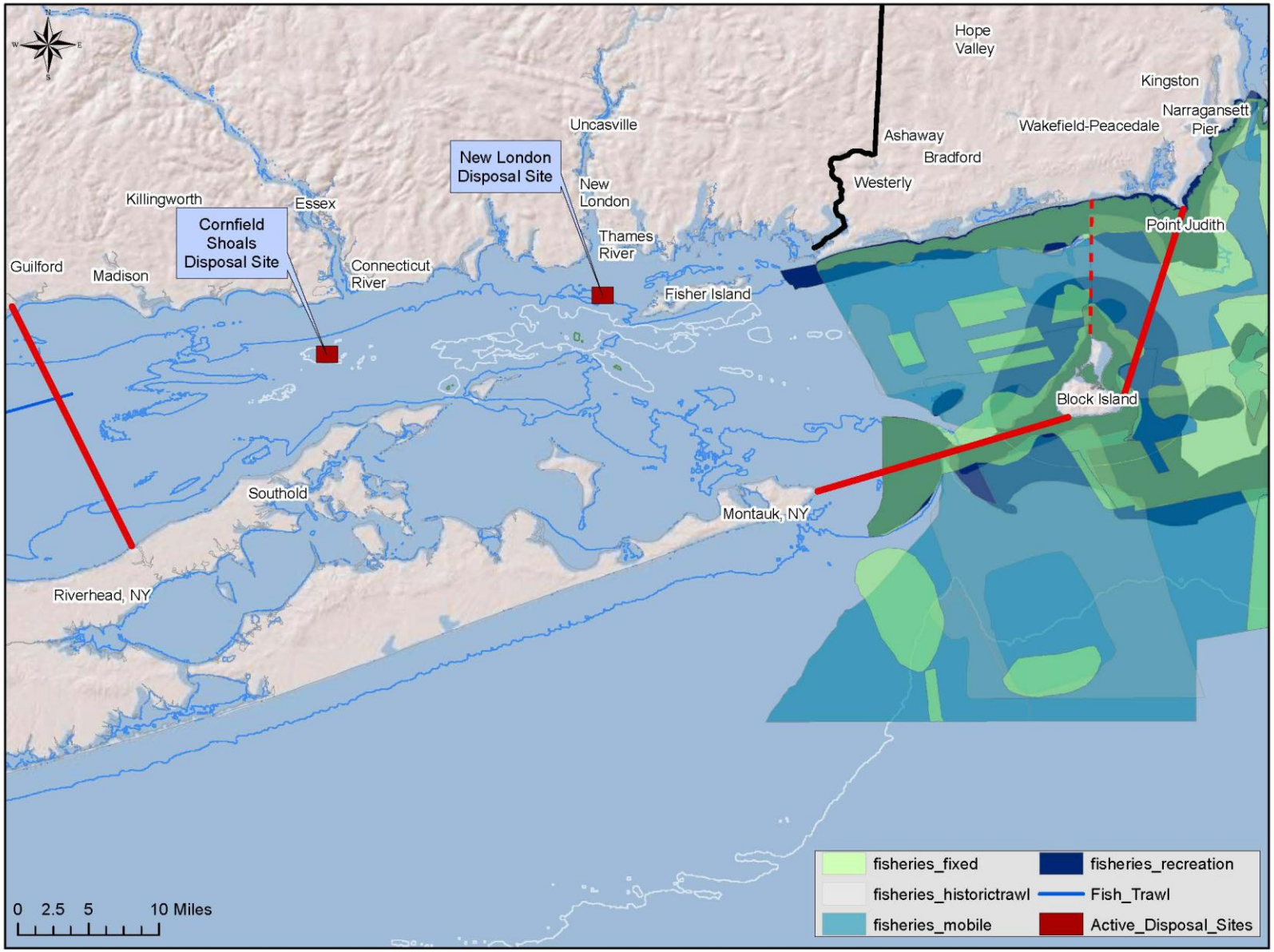
Fishing Areas
(RI updated ; CT & NY Data needed)



Approach to Screening

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    - Submarines, Coast Guard vessels, large tankers, fishermen, etc.

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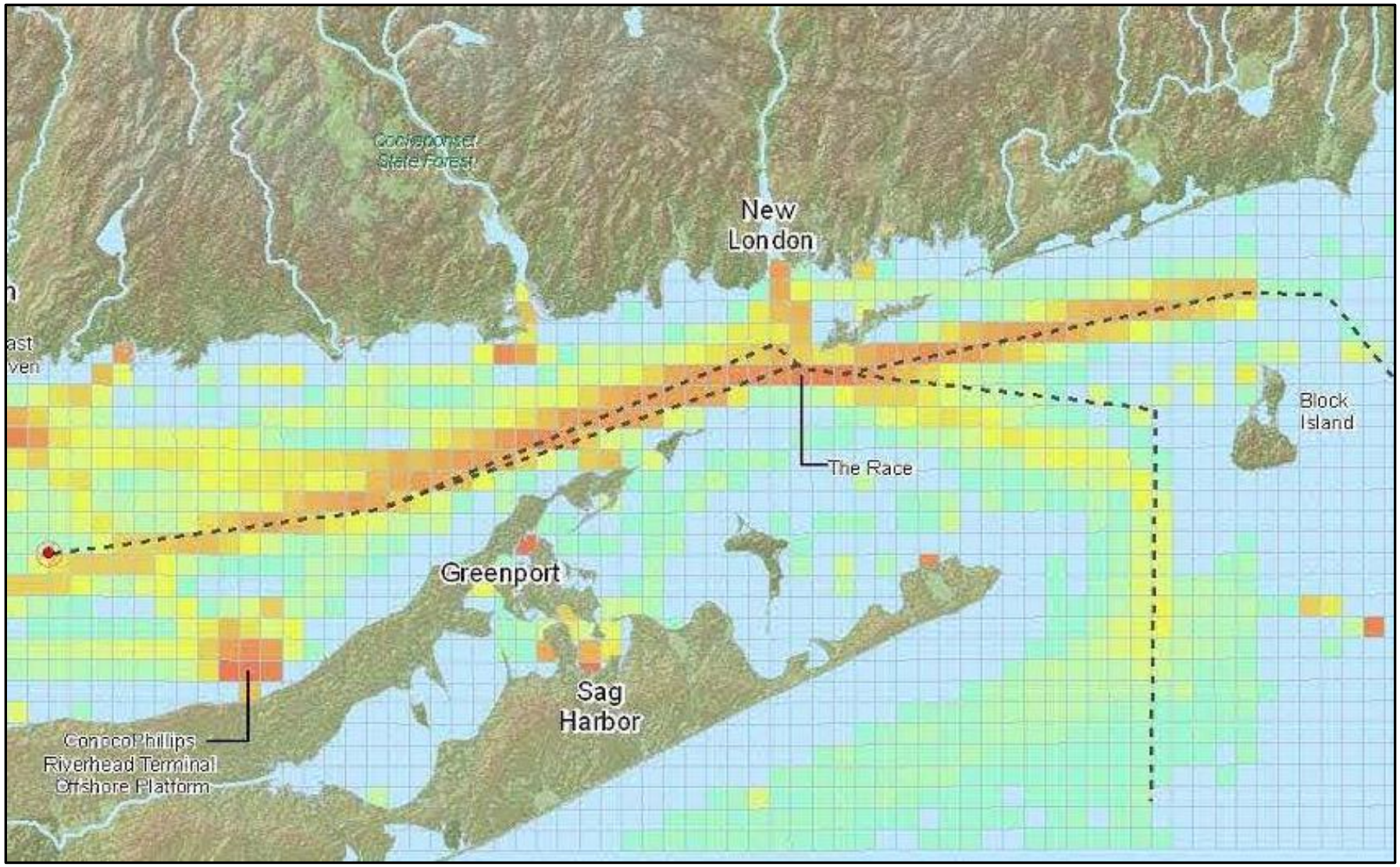
Ship Traffic Density (USCG Figure)



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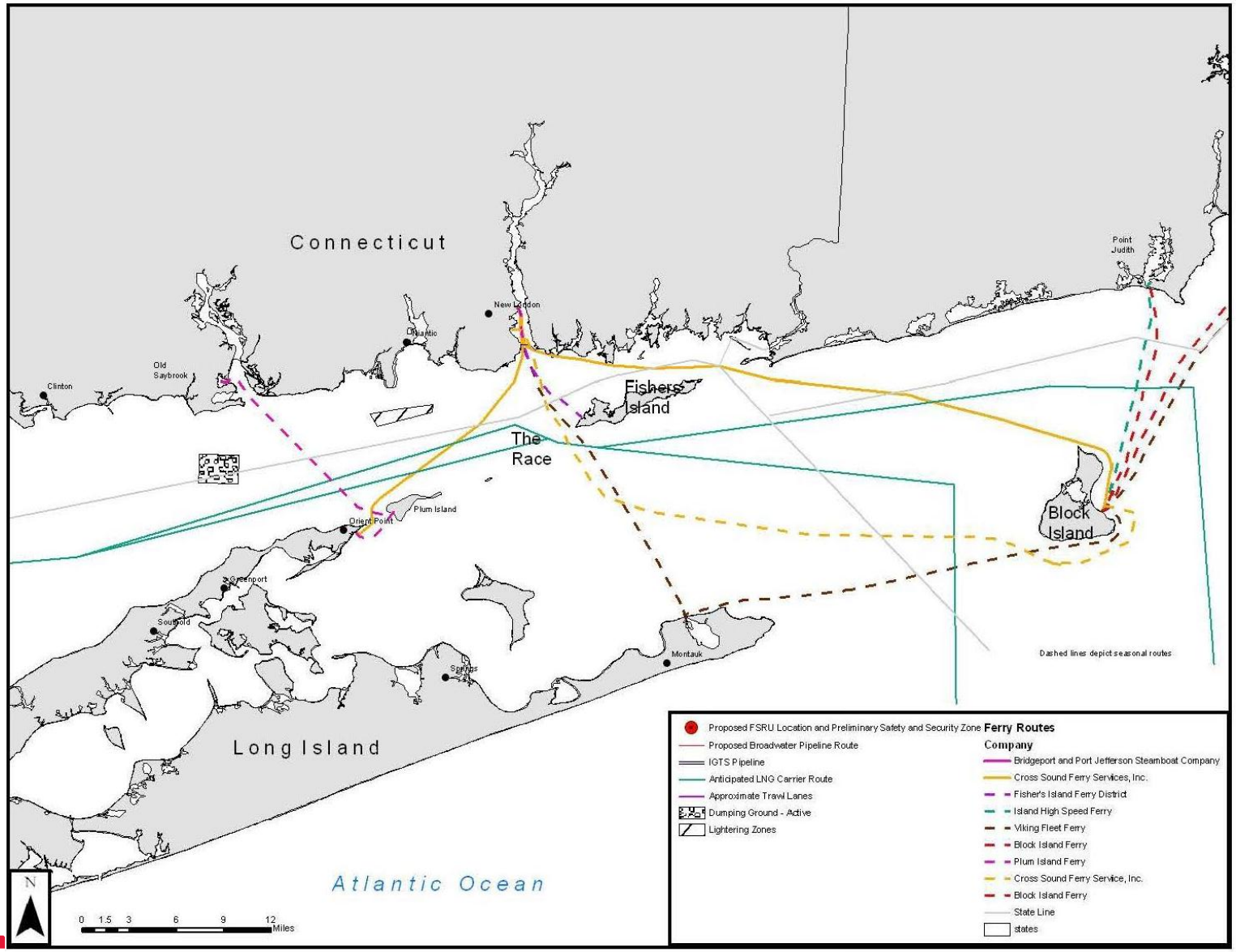
Commercial Vessel Navigation (USCG Figure)



Approach to Screening

- Tier 1: Rule out areas based on the following
  - Valuable marine habitats – 228.5(a)
    - Gravel and hardbottom areas were identified previously as important to maintain, are these still applicable?
  - Areas of high dispersion potential 228.6(a)(6)
    - Last time only containment sites were warranted. What type(s) of dredged material disposal site(s) are needed?
      - Containment – All materials remain at the location where they are placed
      - Dispersive – Materials are allowed to be moved off of the placement location through currents, etc.

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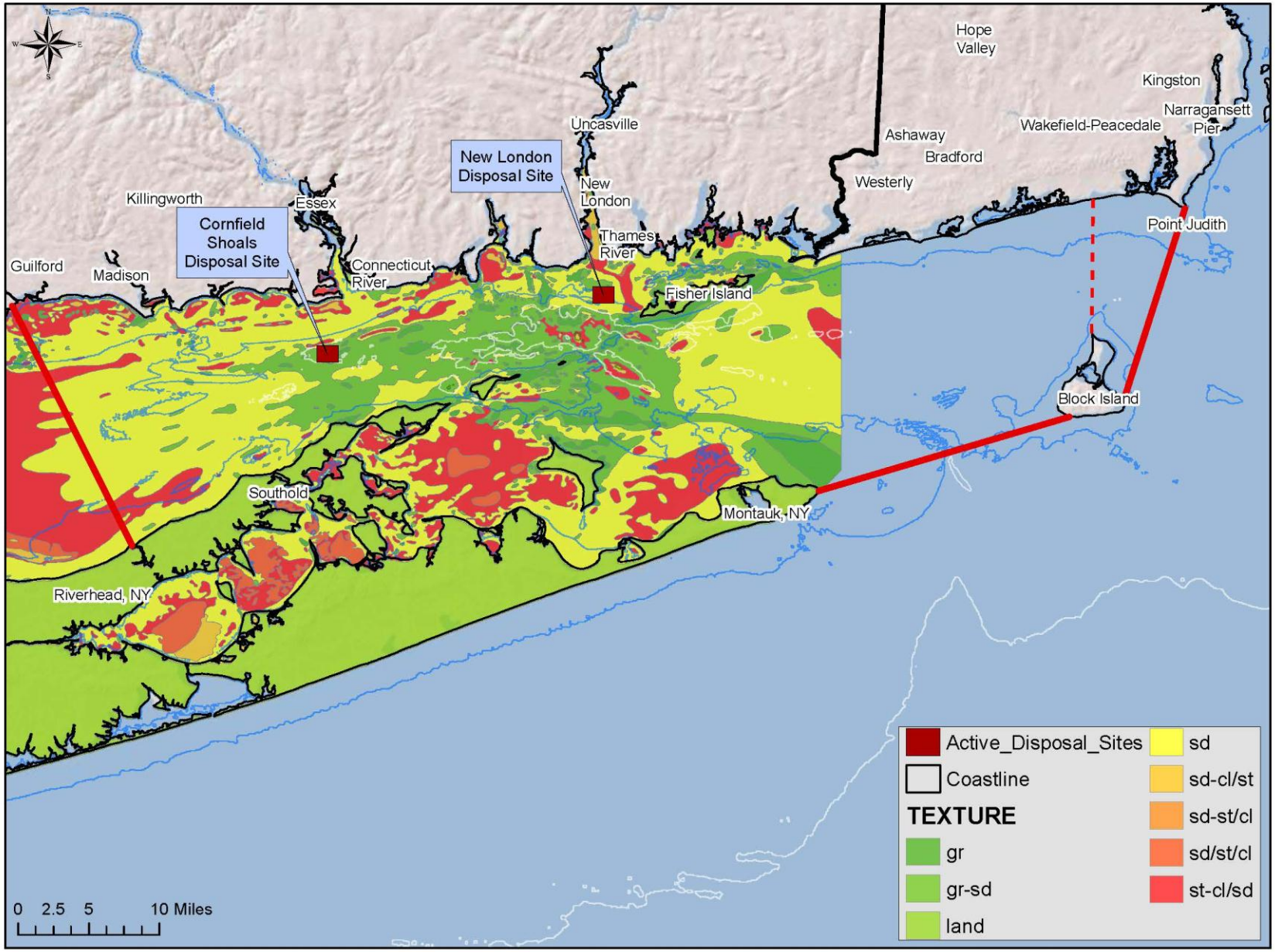
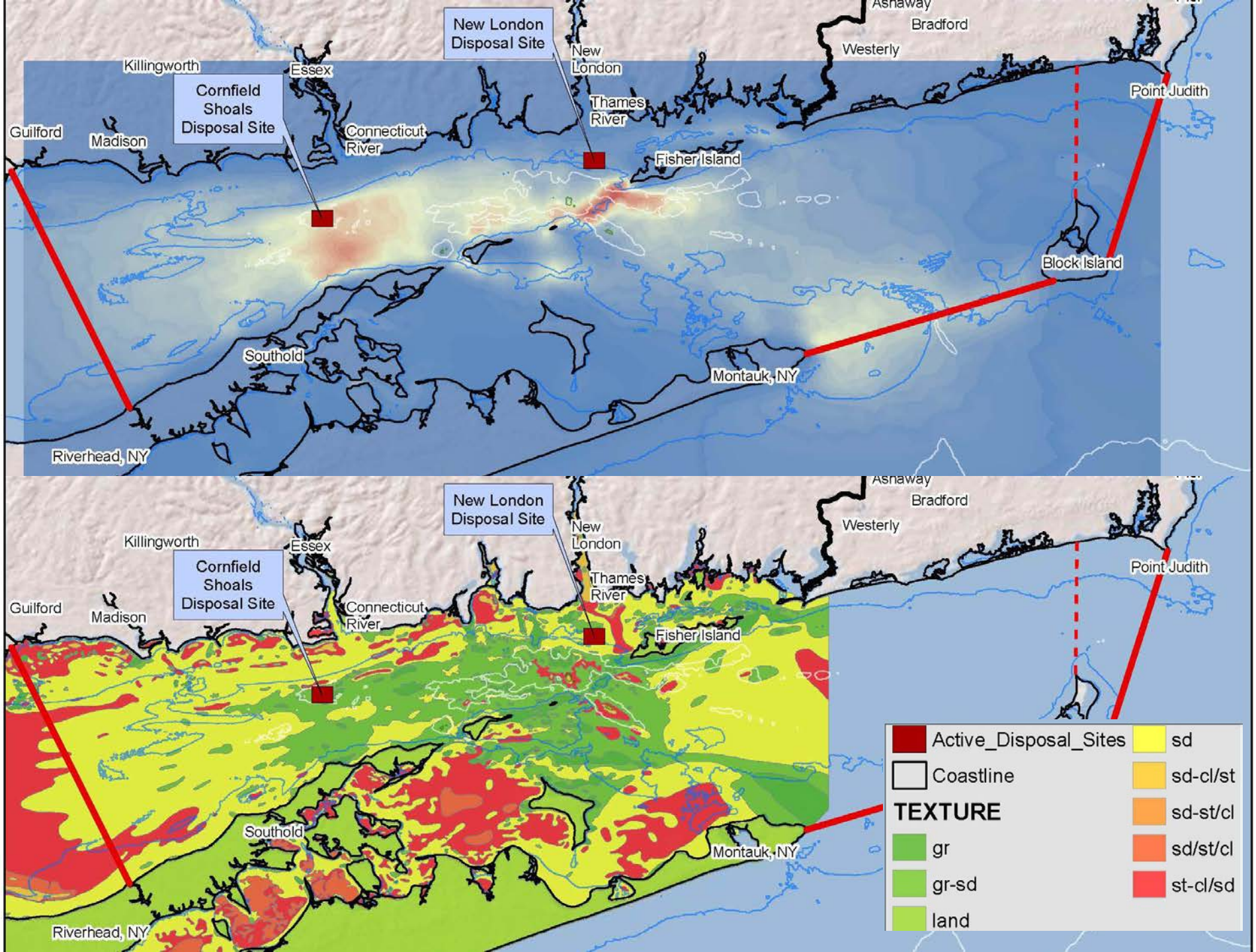
Sediment Characteristics




New London Disposal Site
Cornfield Shoals Disposal Site
Killingworth
Essex
New London
Ashaway
Bradford
Westerly
Point Judith
Thames River
Connecticut River
Guilford
Madison
Fisher Island
Block Island
Southold
Montauk, NY
Riverhead, NY
Active_Disposal_Sites
Coastline
TEXTURE
gr
gr-sd
land
sd
sd-cl/st
sd-st/cl
sd/st/cl
st-cl/sd

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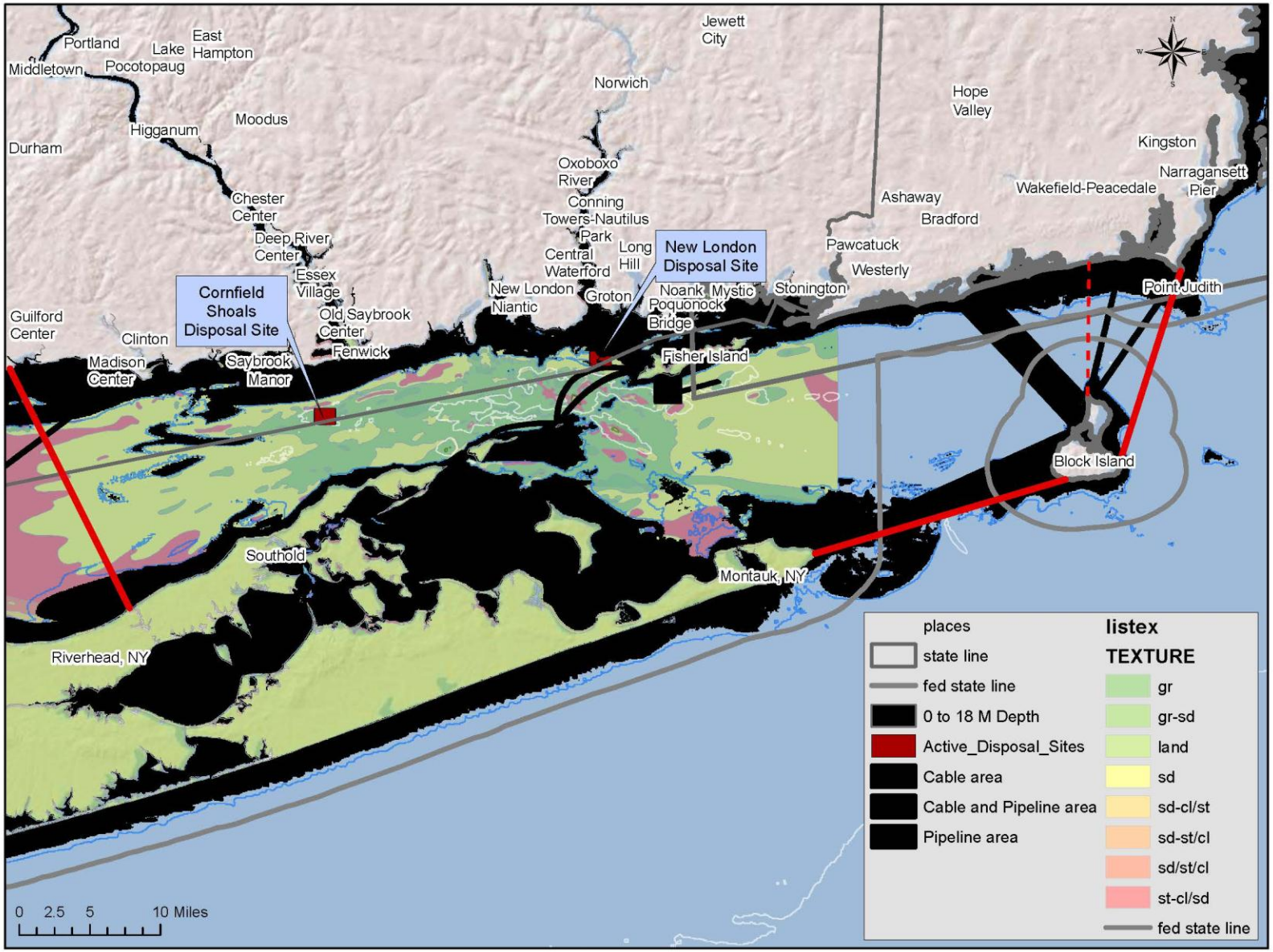
Approach to Screening
Tier 1 Type Screening Results



Approach to Screening

- Tier 2: Identify specific alternative site locations
  - Minimizing impact to
    - Archeological resources – 228.6(a)(11)
    - Fish habitats, fish concentrations – 228.5(a); 228.6(a)(8)
    - Living resources (breeding, spawning, nursery, feeding, passage) – 228.6(a)(2)
    - Benthic community – 228.6(a)(9)
    - Shellfisheries/fisheries resource areas – 228.6(a)(8)
  - Historic Disposal Sites and Continental Shelf – 228.5(e)
  - Preferred siting of areas were also based on a series of site characteristics (e.g., prevailing current direction and velocity, compatible sediment types) – 228.5(d); 228.6(a)(5); 228.6(a)(6)

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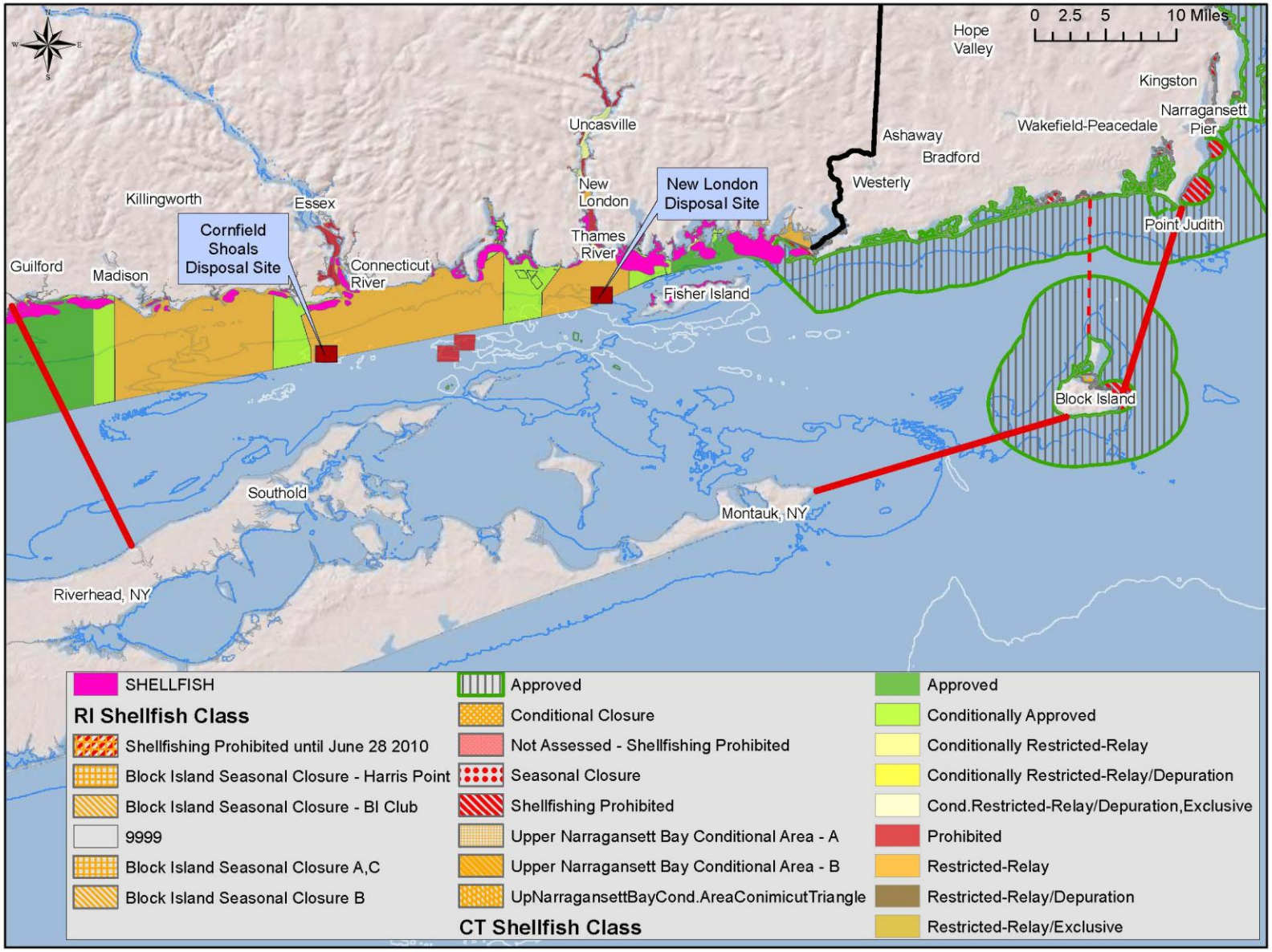
Minimizing Impact – Approved/ Prohibited Shellfish Areas



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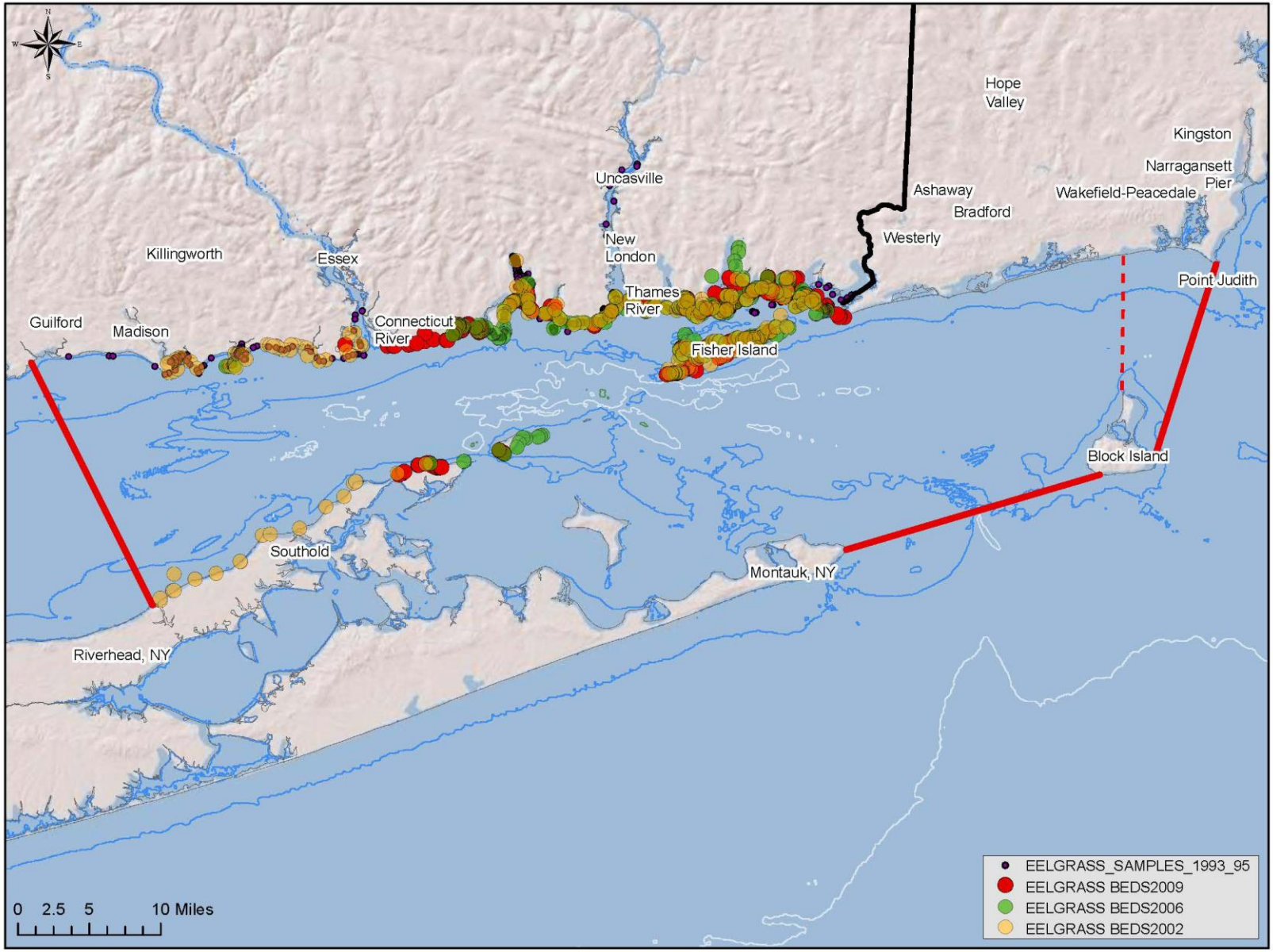
Minimizing Impact - Eelgrass Beds



Approach to Screening

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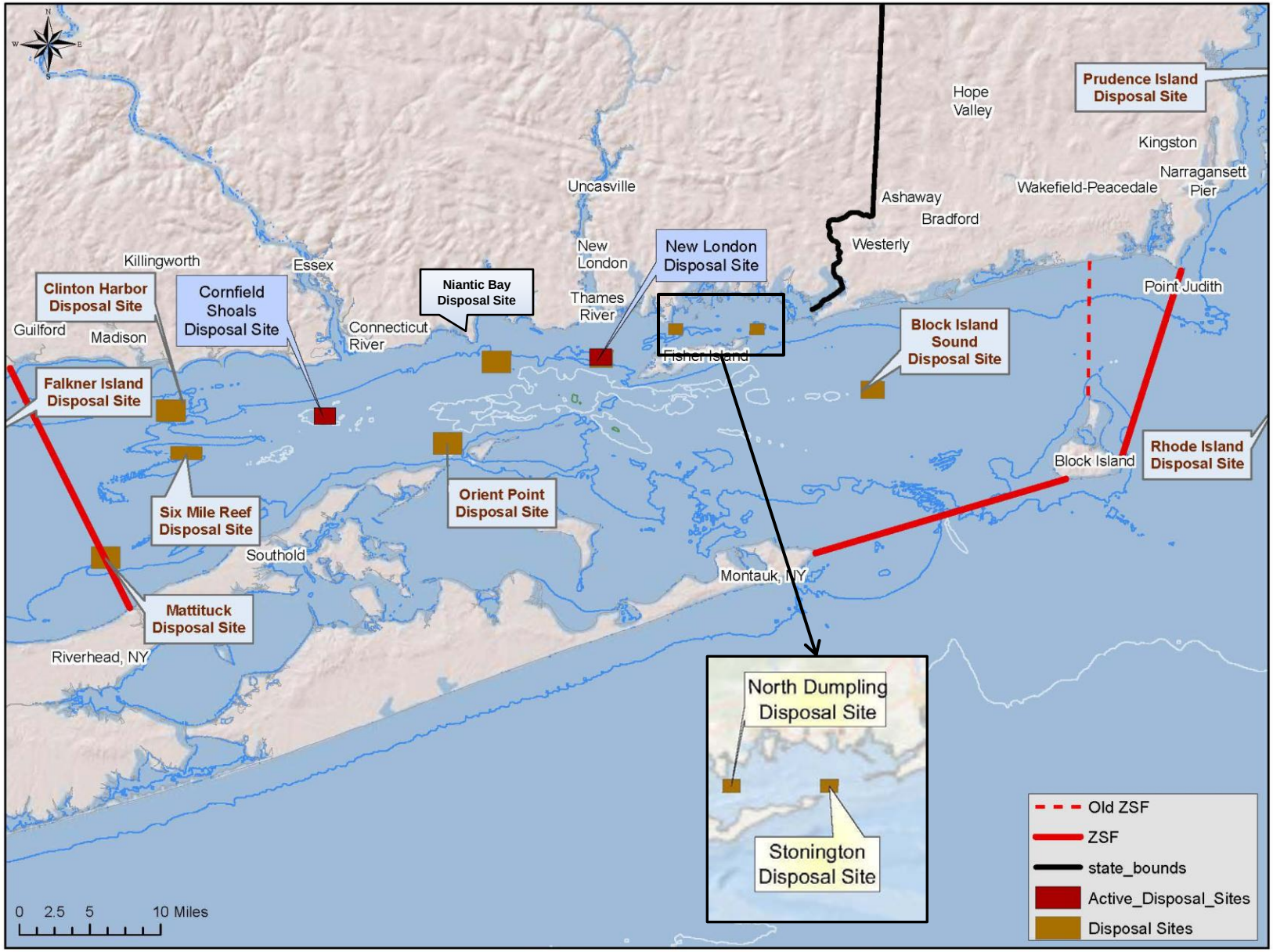
Historic and Active Disposal Sites



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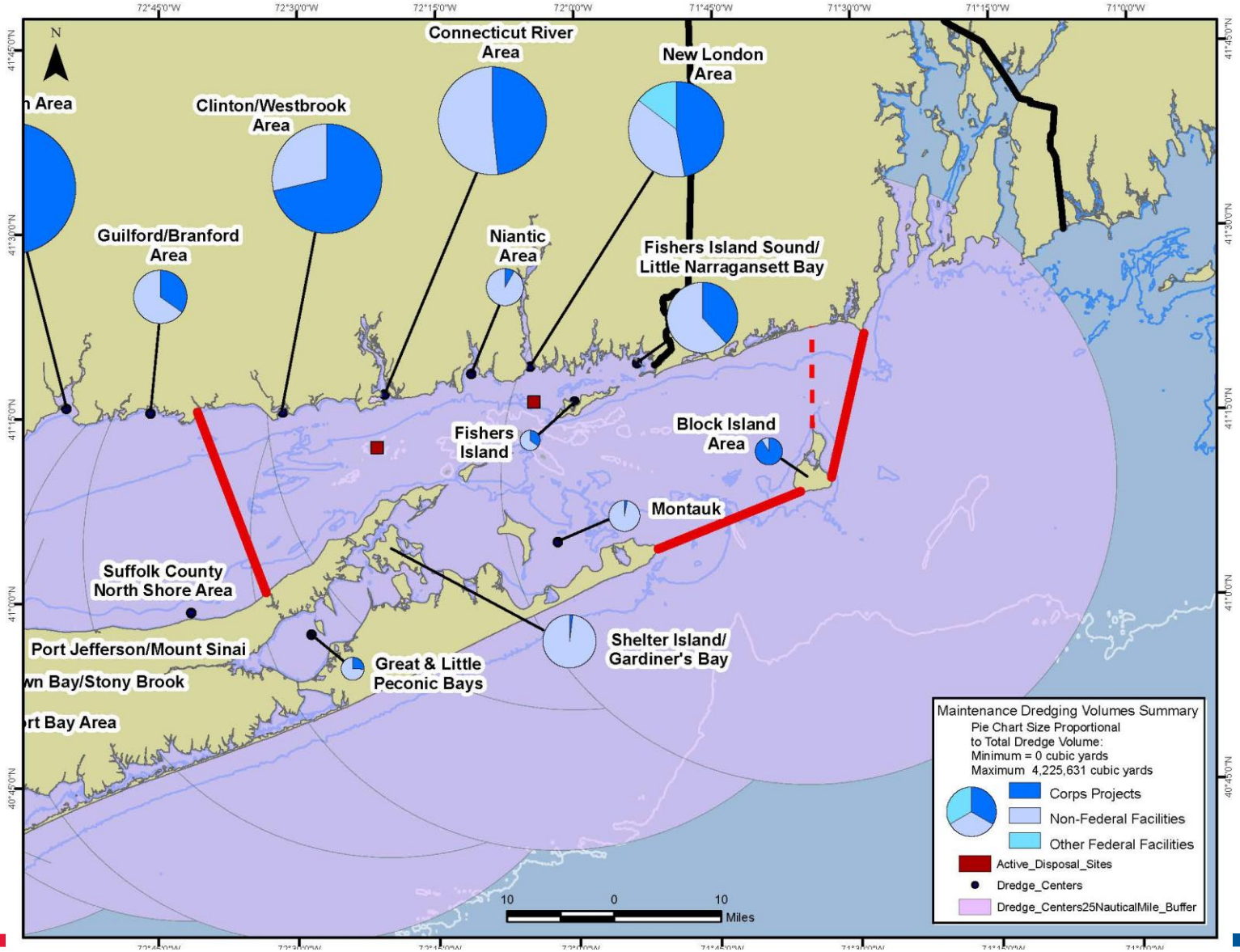
Continental Shelf and Areas within 25 nm of Dredging Centers



Approach to Screening

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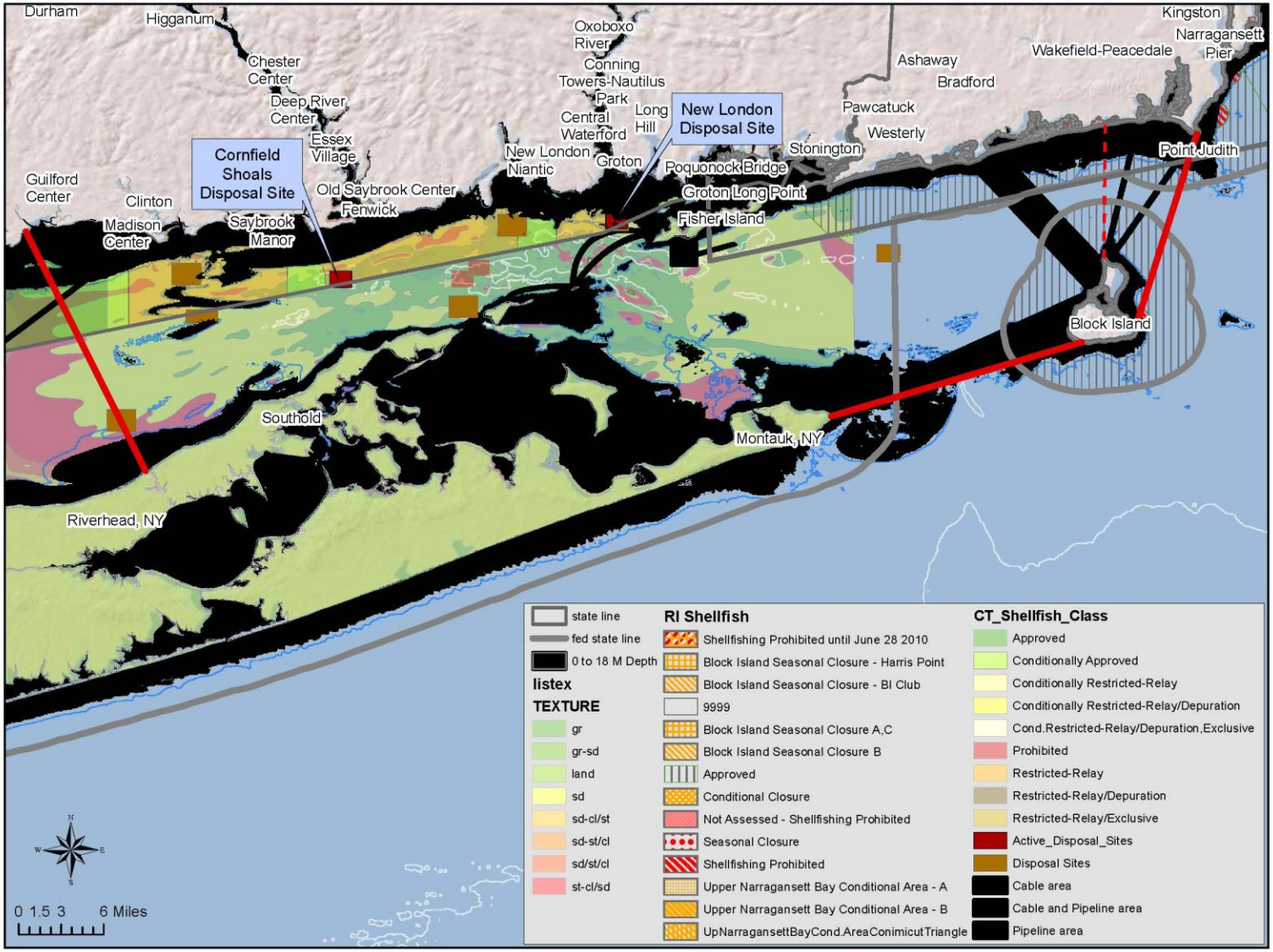
Approach to Screening
Tier 2: Preliminary Screening Results for Discussion Only



Tier 2 Alternative Site

- Several factors must be considering when assessing an area as an alternative site.
  - Site Boundaries – 228.5(d), 228.6(a)(4), 228.6(a)(5)
  - Buffer Zones – 228.5(b), 228.6(a)(6)
  - Reference areas for monitoring and testing – 228.6(a)(5)

Tier 2 Alternative Site(s)

- Factors to be discussed in the SEIS
  - Once alternative site(s) are selected
    - Tier 1 criteria will be addressed as appropriate in SEIS
    - Tier 2 criteria will be examined in detail in the SEIS
  - Additional SEIS siting considerations will include:
    - Existing water quality - 228.6(a)(9)
    - Nuisance Species - 228.6(a)(10)
    - Economic impacts - 228.6(a)(8)
    - Site protection requirements – Environmental consequences
      - 228.10 Evaluating disposal site impacts

Next Steps

- Finalized criteria that will be used to conduct the screening
  - Minimum depth
  - Bottom types to avoid
  - Containment, Dispersive, or Both
  - Site Protection Requirements
- Identify and acquire more recent or available data to use in the screening
- Identify data gaps and conduct studies to fill them
  - Sediment Stability/Instability
  - STFATE Modeling
  - Minimum Shear stress verification

Appendix C: Presentation - Physical Oceanography Study

(James O'Donnell, UConn)

College of Liberal Arts and Sciences
Marine Sciences

UCONN

Recent Physical Oceanography Data Update and Observation and Model Plans

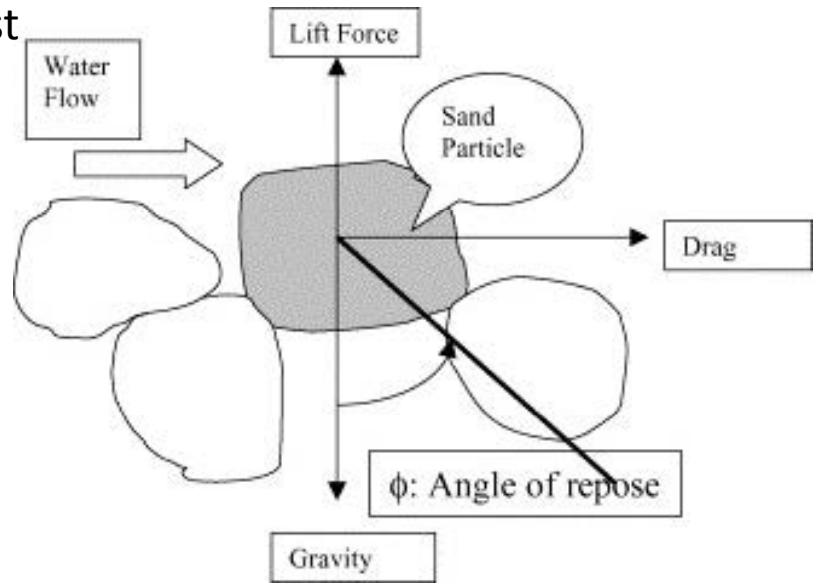
James O'Donnell
University of Connecticut

Overview

1. Introduction
2. Bottom Stress and circulation are central to the site designation process.
   a) Consideration of all possible sites is only possible if models are used to “interpolate” between the limited location and times data is available.
   b) A well tested model requires data for evaluation.
3. Summary of the data required to predict the range of circulation and bottom stresses expected throughout the ZSF.
4. Summary of data available
5. Observation Plan
6. Modeling plans

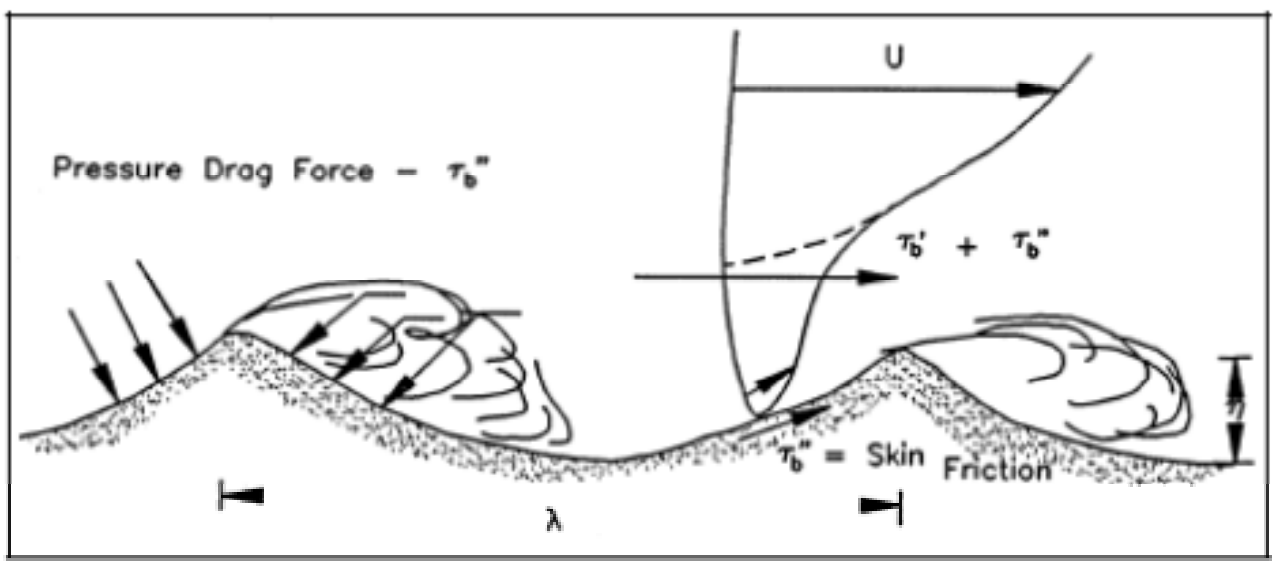
Physics of Sediment Transport

For sediment resuspension the lift force due to the flow around it must exceed the gravity force.



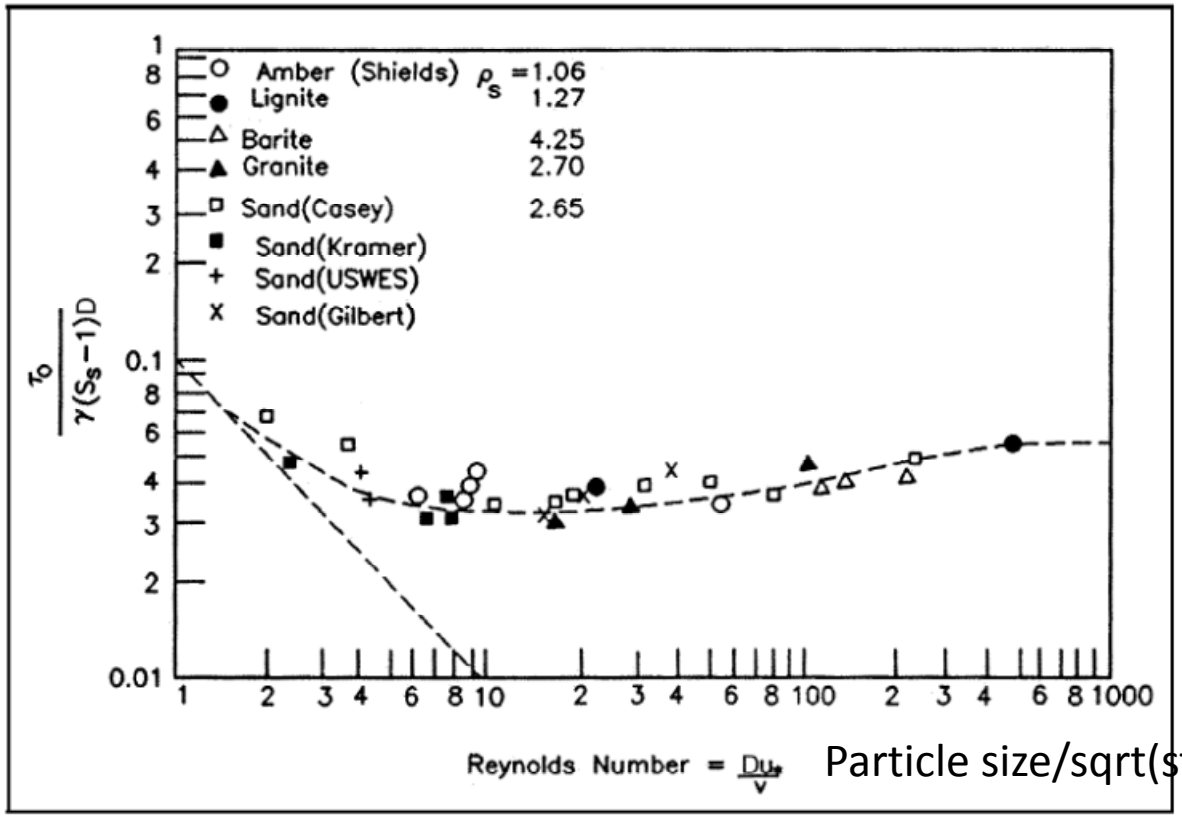
The lift and drag forces slow the water and this effective force per unit area is called the shear stress.

Bedforms have a similar effect on the flow… they slow it down.



Shields Curve

Stress



Particle size/sqrt(stress)

Figure III-6-7. Shields diagram for initiation of motion in steady turbulent flow (from Raudkivi (1967))

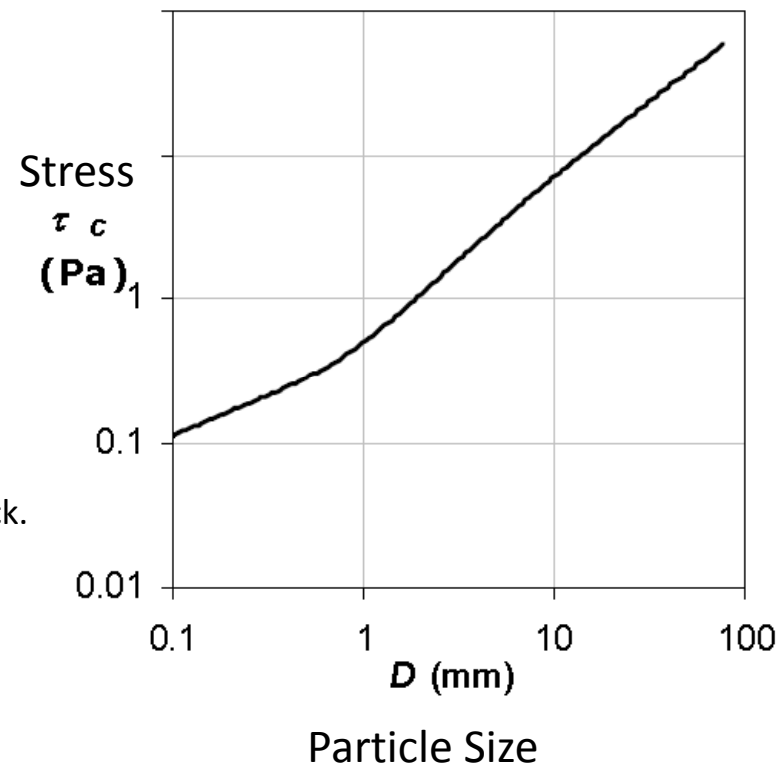
More simply

$$S^* = \frac{\sqrt{(s-1)gD^3}}{\mu/\rho} \text{ and } s = \frac{\rho_s}{\rho} \quad (2.65 \pm 5\%)$$

The trend on the diagram can be represented by the function

$$\tau_c^* = 0.105(S^*)^{-0.3} + 0.045\exp\left[-35(S^*)^{-0.59}\right]$$

From: Peter Wilcock, UC Berkeley
http://calm.geo.berkeley.edu/geomorph//wilcock/wilcock.html



Journal of Oceanography, Vol. 56, pp. 311 to 317, 2000

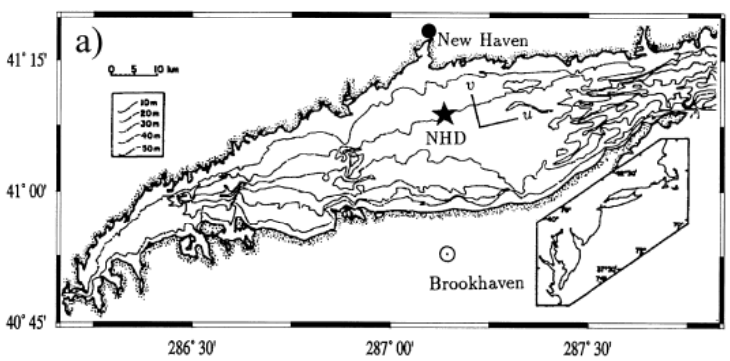
Storm Enhanced Bottom Shear Stress and Associated Sediment Entrainment in a Moderate Energetic Estuary

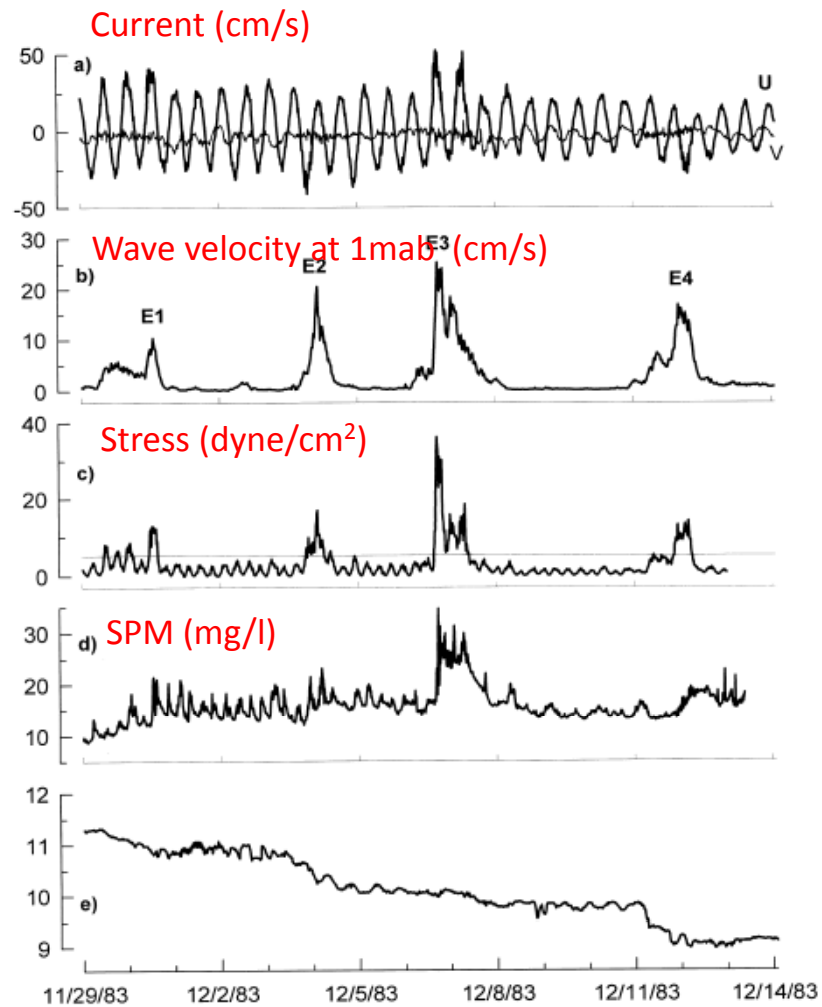
YuHuai Wang*, W. Frank Bohlen and James O'Donnell

Department of Marine Sciences, University of Connecticut, Groton, CT 06340, U.S.A.

(Received 3 April 1999; in revised form 1 September 1999; accepted 11 October 1999)

Several important mechanisms for storm-induced entrainment of estuarine cohe sediments are analyzed using field measurements collected in a moderately energ estuary, central Long Island Sound, U.S.A. The sediment concentration hydrographic data were obtained by an array of sensors mounted at 1 m above bottom. The bottom sediment in the study site composed mostly of silt and silty s: The study showed that the bottom shear stress, computed using a wave-current in action model, increased significantly during the episodic wind events. A la resuspension event was triggered by a frontal passage when strong wind-driven rents augmented the tidal currents. The timing of storm waves with respect to tidal phase also was a critical factor. Based on the changes of suspended sedin concentration, the bottom appeared to respond to the shear stress in two phases: tidal resuspension and the storm-induced erosion. During each tidal cycle, entr ment was associated with resuspension of high water content, loosely consolid: material. During episodic events, a thin layer of more consolidated bed below sediment-water interface was eroded by the enhanced bottom stress.





2. Summary of data needs – controlling factors.

1. Current in the ZSF controlled by tides, density variations and winds.
2. Bottom stress if determined by current and waves.
3. Waves are generated by wind.
4. We want to know the circulation and stress during normal conditions (for each season) and for extreme conditions.
5. We can only observe them all for selected interval and at a few places so we need a model to generalize the observations.

3. What is available ?

- Three great resources:

1. Woods Hole Group (2011). Long Island Sound Dredged Material Management Plan (DMMP) Phase 2 Literature Review Update June 2010, Prepared for U.S. Army Corp of Engineers, Contract No. W912WJ-09-D-0001-TO-0022

2. O'Donnell, J., R. E. Wilson, K. Lwiza, M. Whitney, W. F. Bohlen, D. Codiga, T. Fake, D. Fribance, M. Bowman, and J. Varekamp (2013). The Physical Oceanography of Long Island Sound. In *Long Island Sound: Prospects for the Urban Sea.* Latimer, J.S., Tedesco, M., Swanson, R.L., Yarish, C., Stacey, P., Garza, C. (Eds.), 2013 (Elsievier, In press).

3. Codiga, D. L. and David S. Ullman (2010). Characterizing the Physical Oceanography of Coastal Waters Off Rhode Island, Part 1: Literature Review, Available Observations, and A Representative Model Simulation (http://seagrant.gso.uri.edu/oceansamp/pdf/appendix/02-PhysOcPart1-OSAMP-CodigaUllman2010.pdf.)

- And our Task 2 report

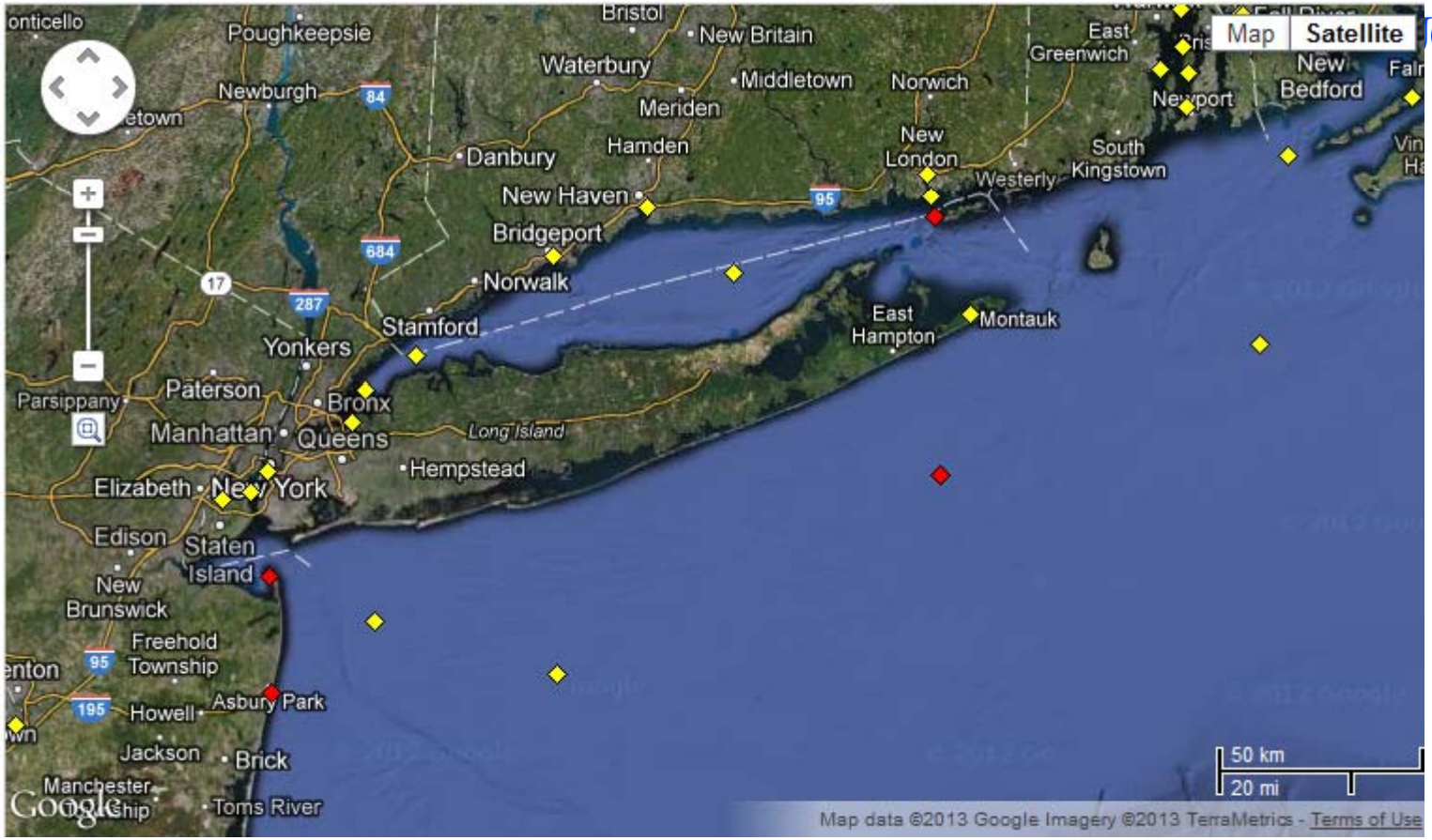
4. Summary of data needs – variables

1. Sea level at the edge of the shelf to force tides and the interior of the model domain to check it.
2. Wind over the ocean to force the circulation and waves.
3. Solar radiation to force temperature variations.
4. River discharge measurements to force variations in salinity.
5. Salinity and temperature measurements at boundaries to prescribe conditions and in the interior to check predictions.
6. Current measurements to evaluate the model predictions
7. Wave measurements to evaluate the model predictions
8. Bottom stress measurements to evaluate the model prediction

Sea Level

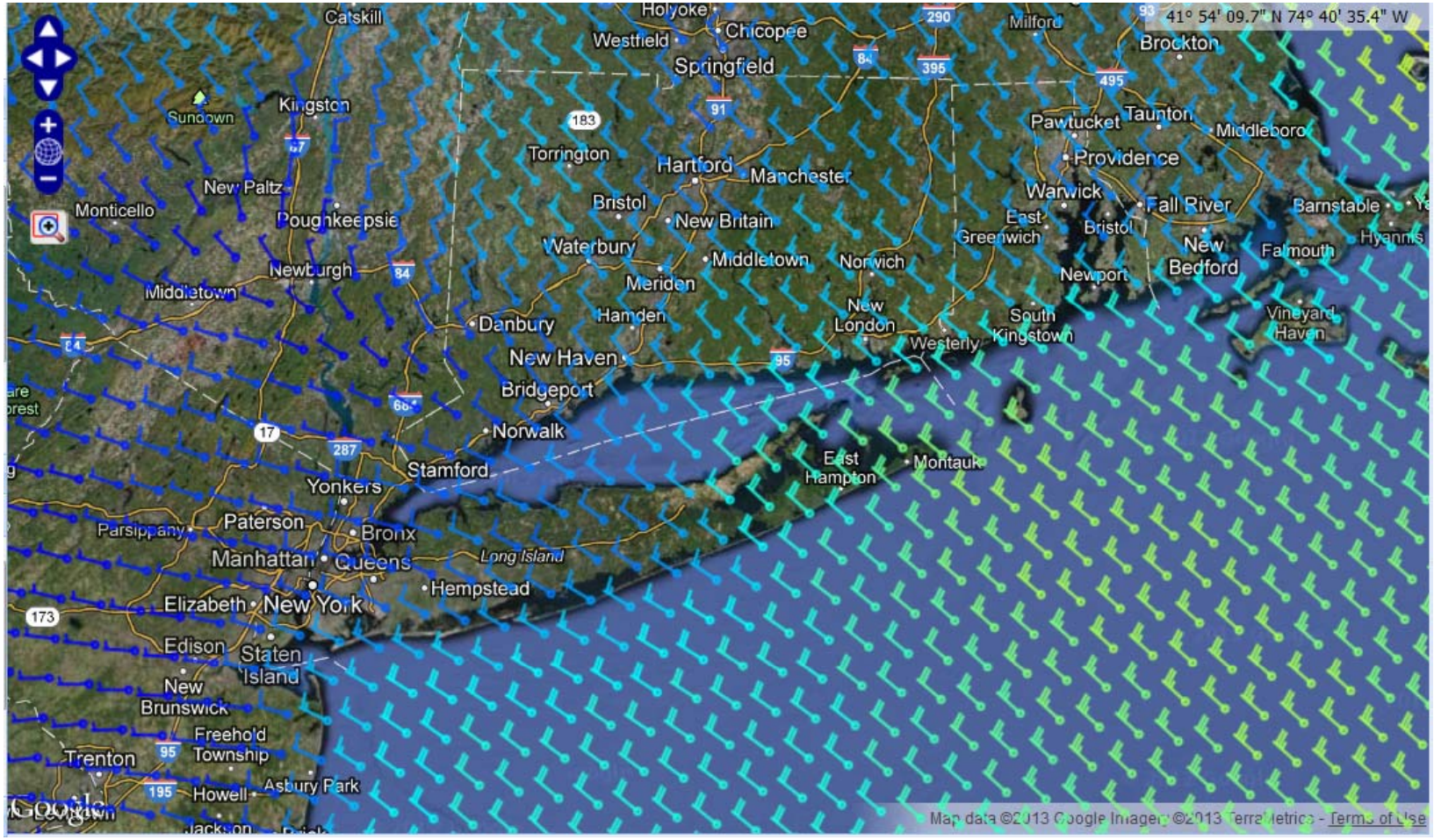
http://tidesandcurrents.noaa.gov/geo.shtml?location=Bridgeport

Wind-data



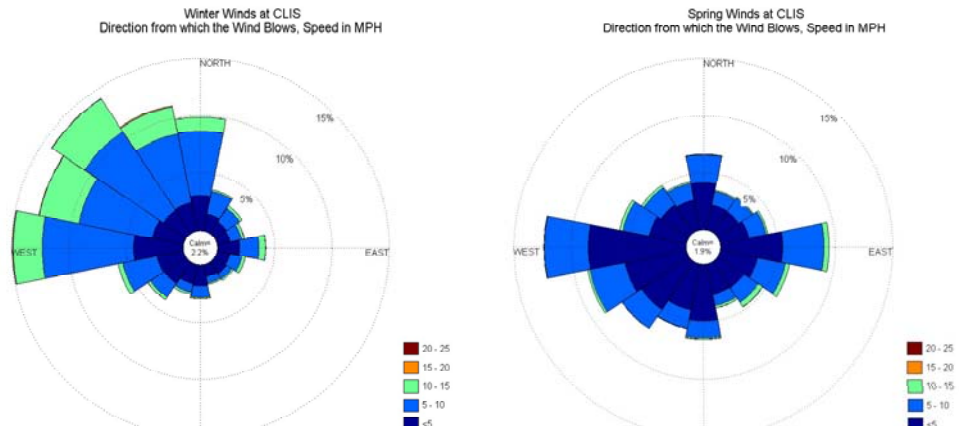
http://www.ndbc.noaa.gov/

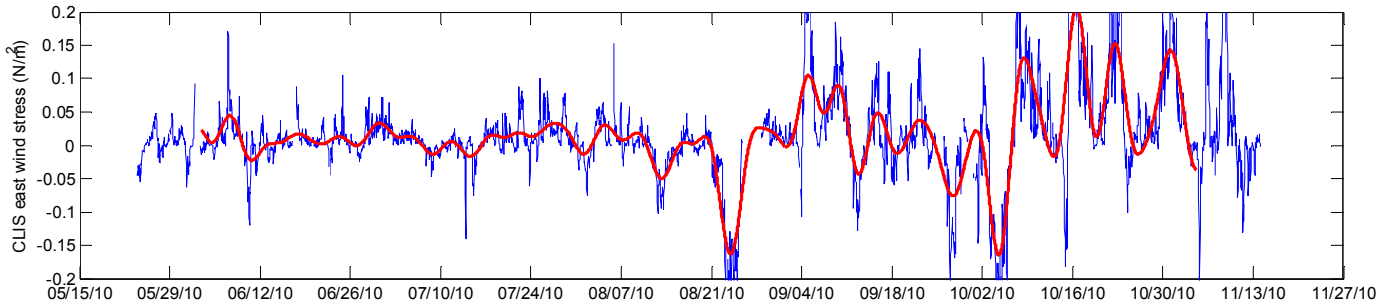
Wind- Analyses

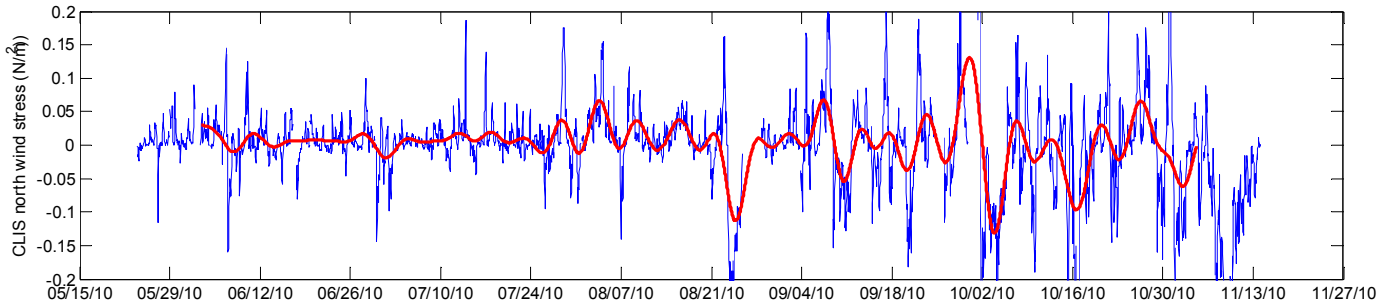


Forecast from http://www.nco.ncep.noaa.gov/pmb/nwprod/analysis/
Viewer: http://maracoos.org

Seasonal variation in Wind



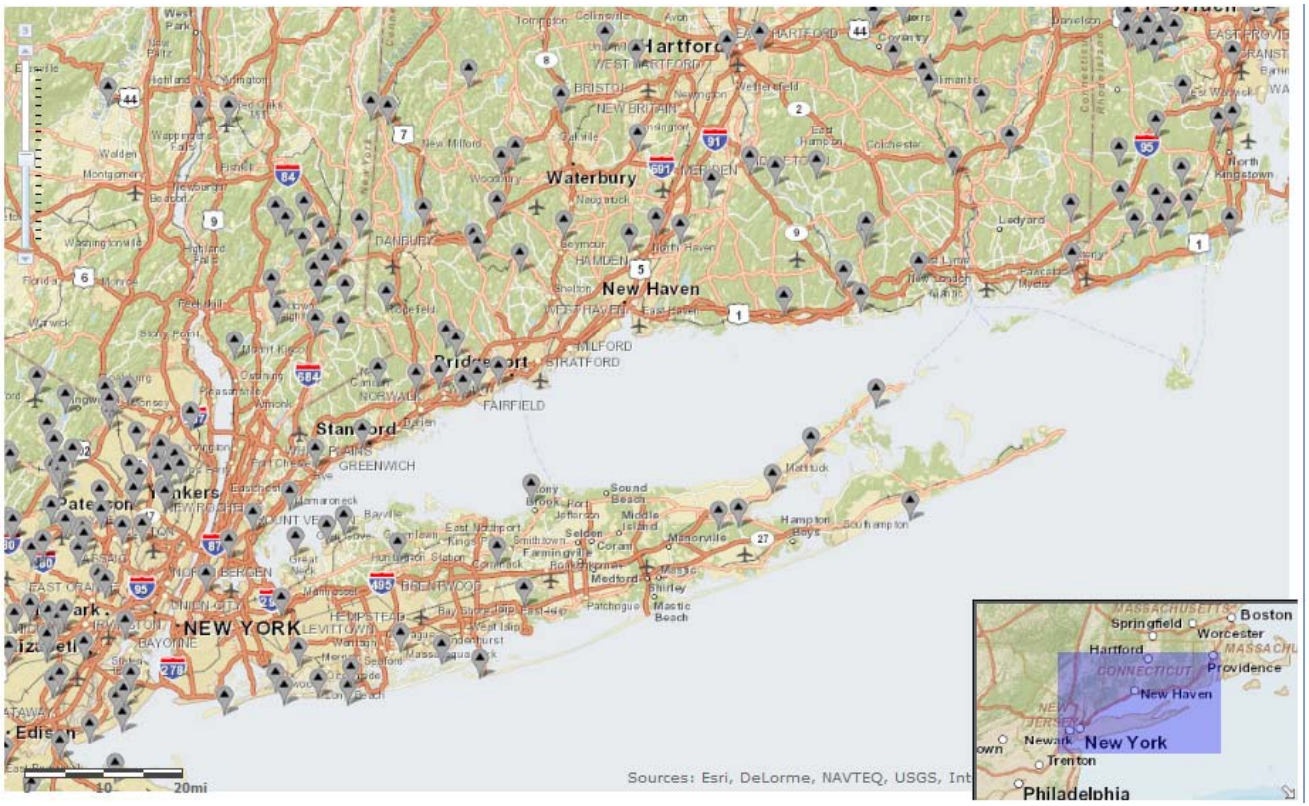




Radiation

DATA

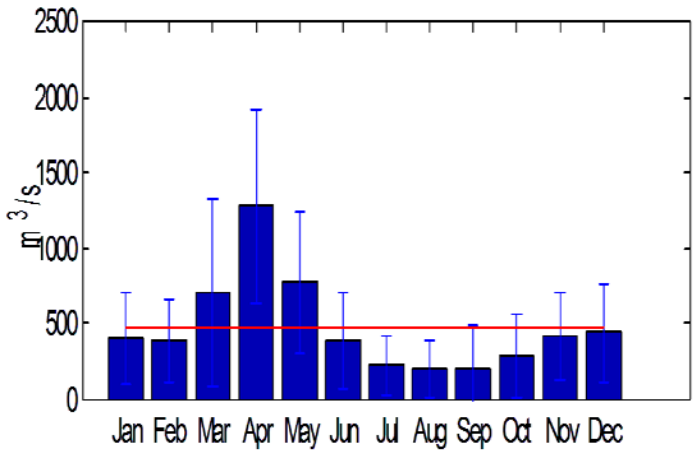
River Discharge (water level)

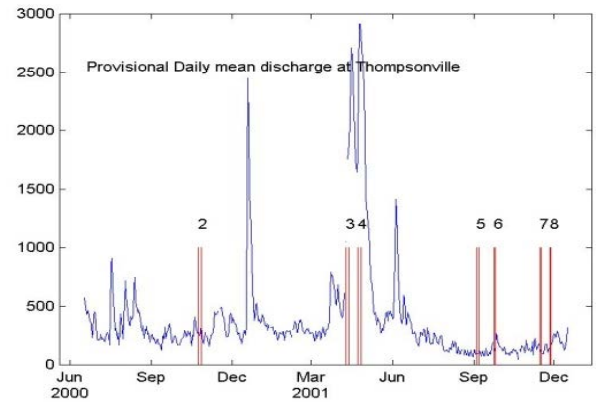


http://maps.waterdata.usgs.gov/mapper/index.html?state=ct

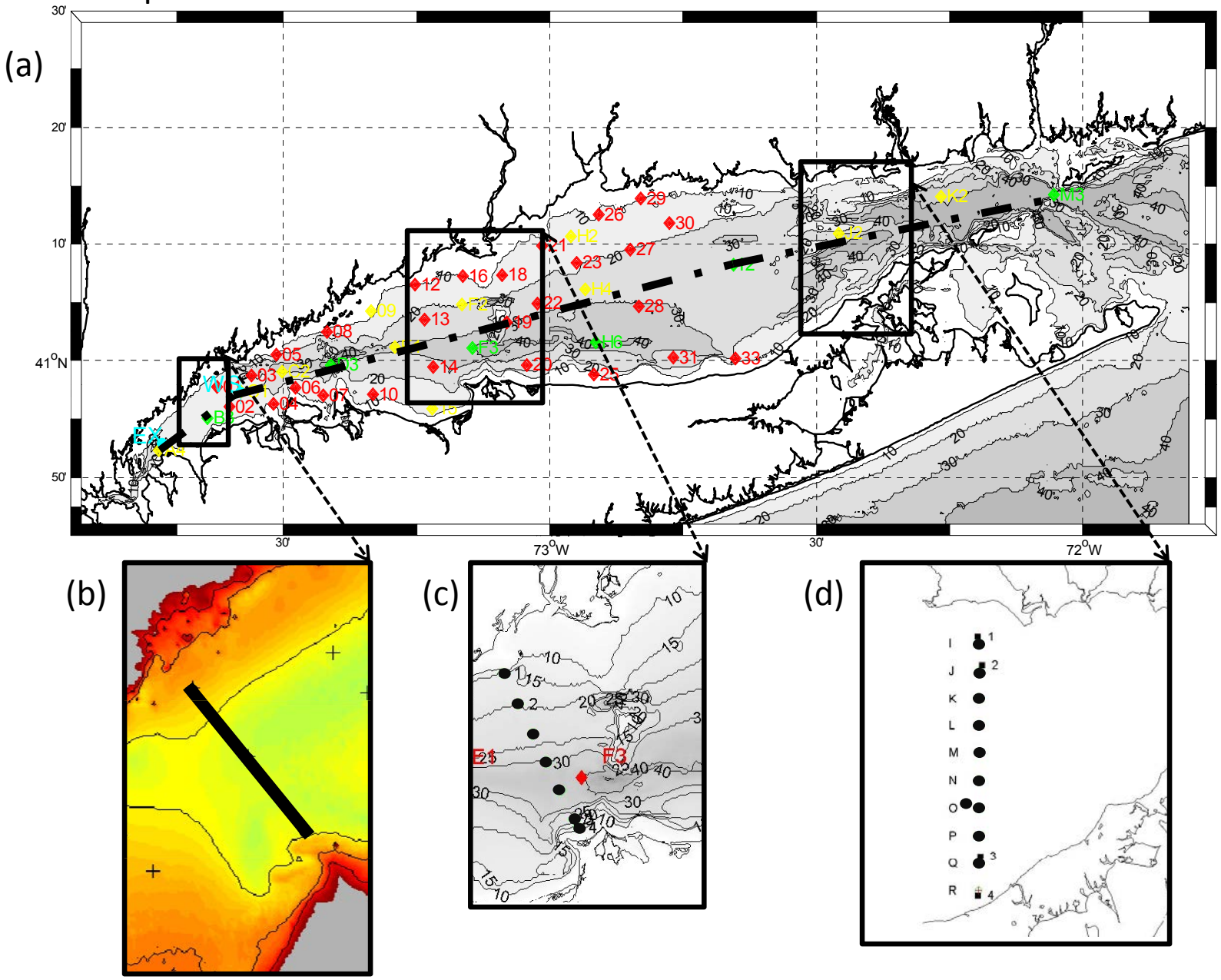
USGS maintains a large network if level/flow gauges. Most freshwater arrives through a few (~10) source and we will focus effort on these.

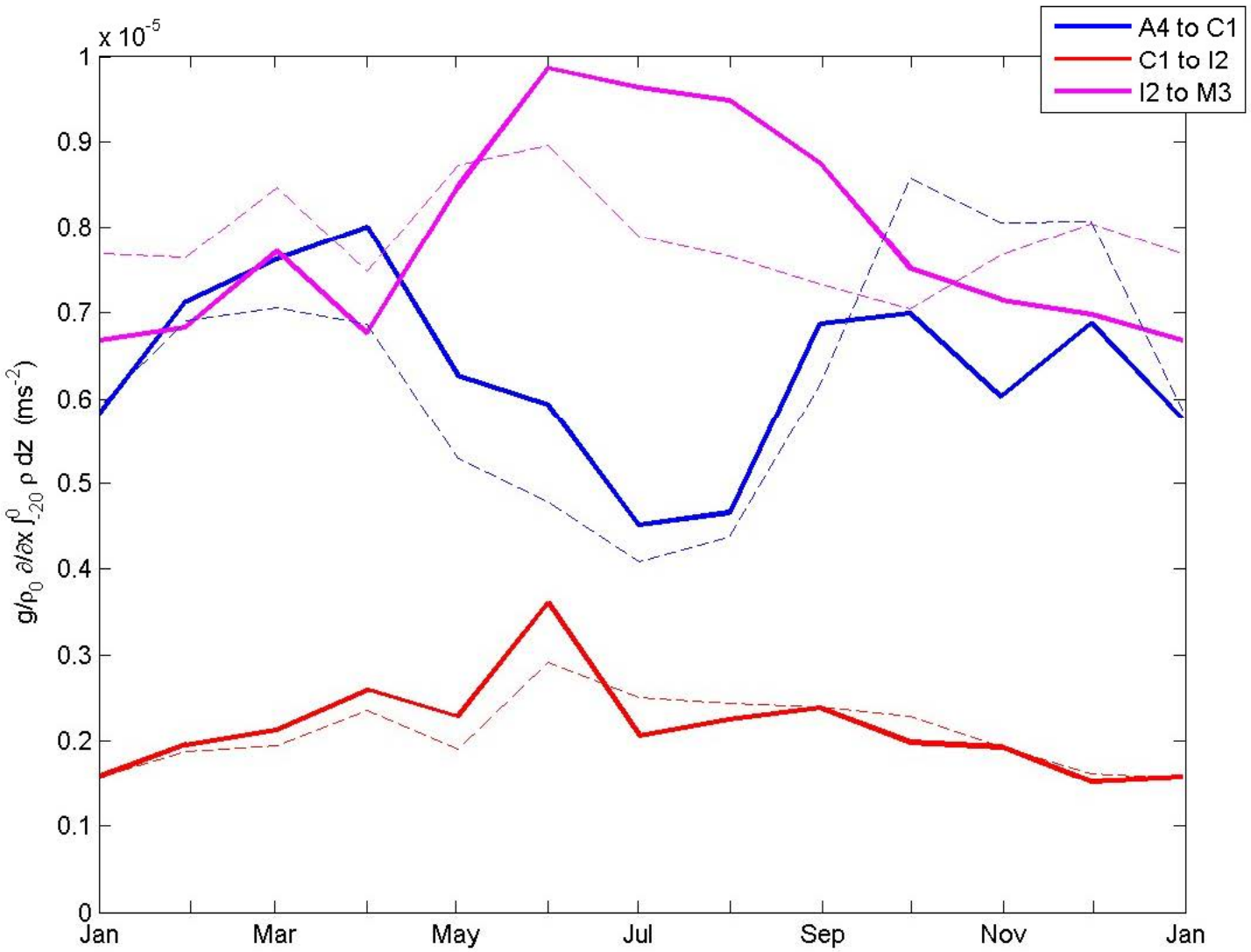
Seasonal Variability in River Discharge





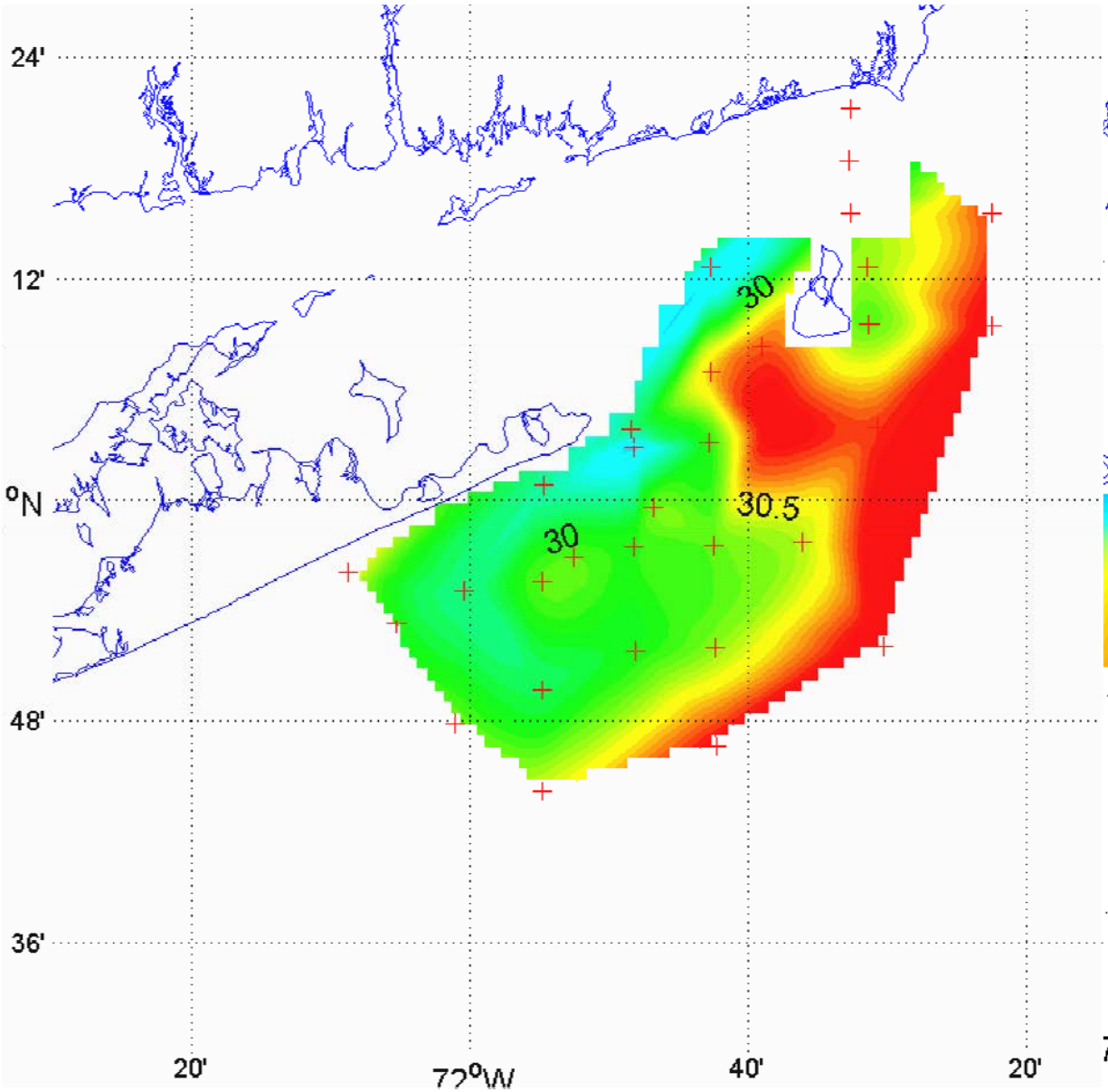
Salinity & temperature
-ship Profiles from CTDEP. LISICOS & RESLIS



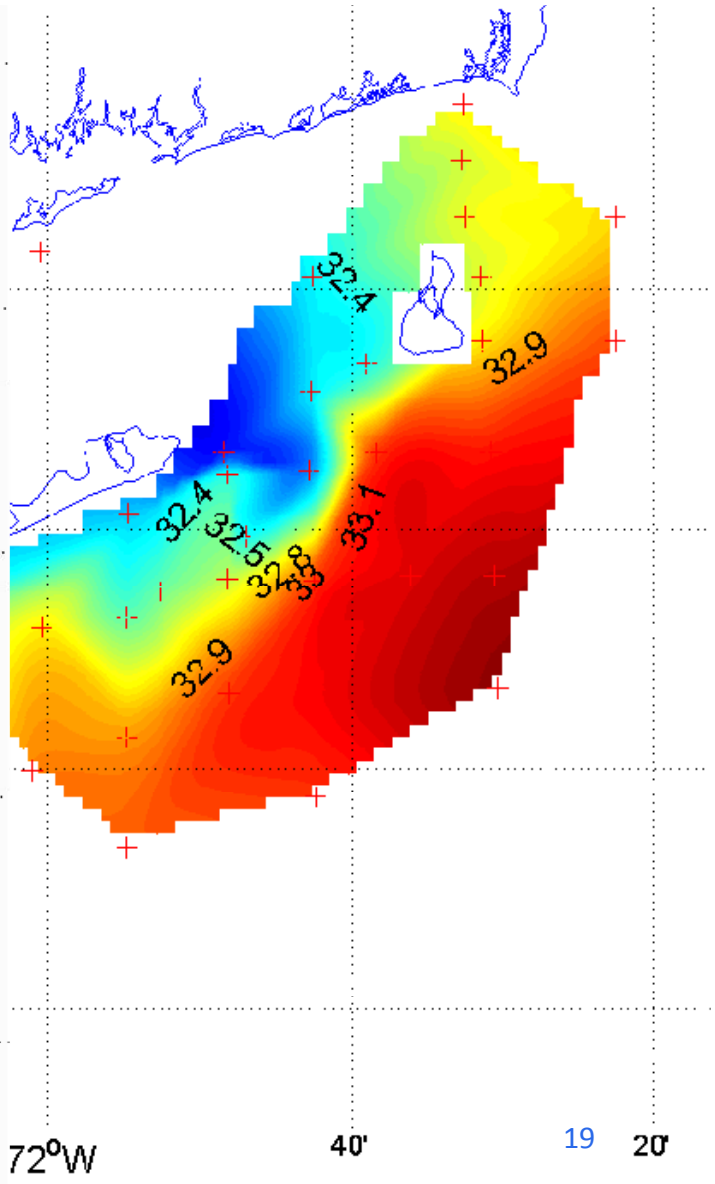

x 10^-5
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
g/ρ0 ∂/∂x ∫-20^0 ρ dz (ms^-2)
Jan
Mar
May
Jul
Sep
Nov
Jan
A4 to C1
C1 to I2
I2 to M3

Salinity & temperature
Ship Profiles – FRONT program

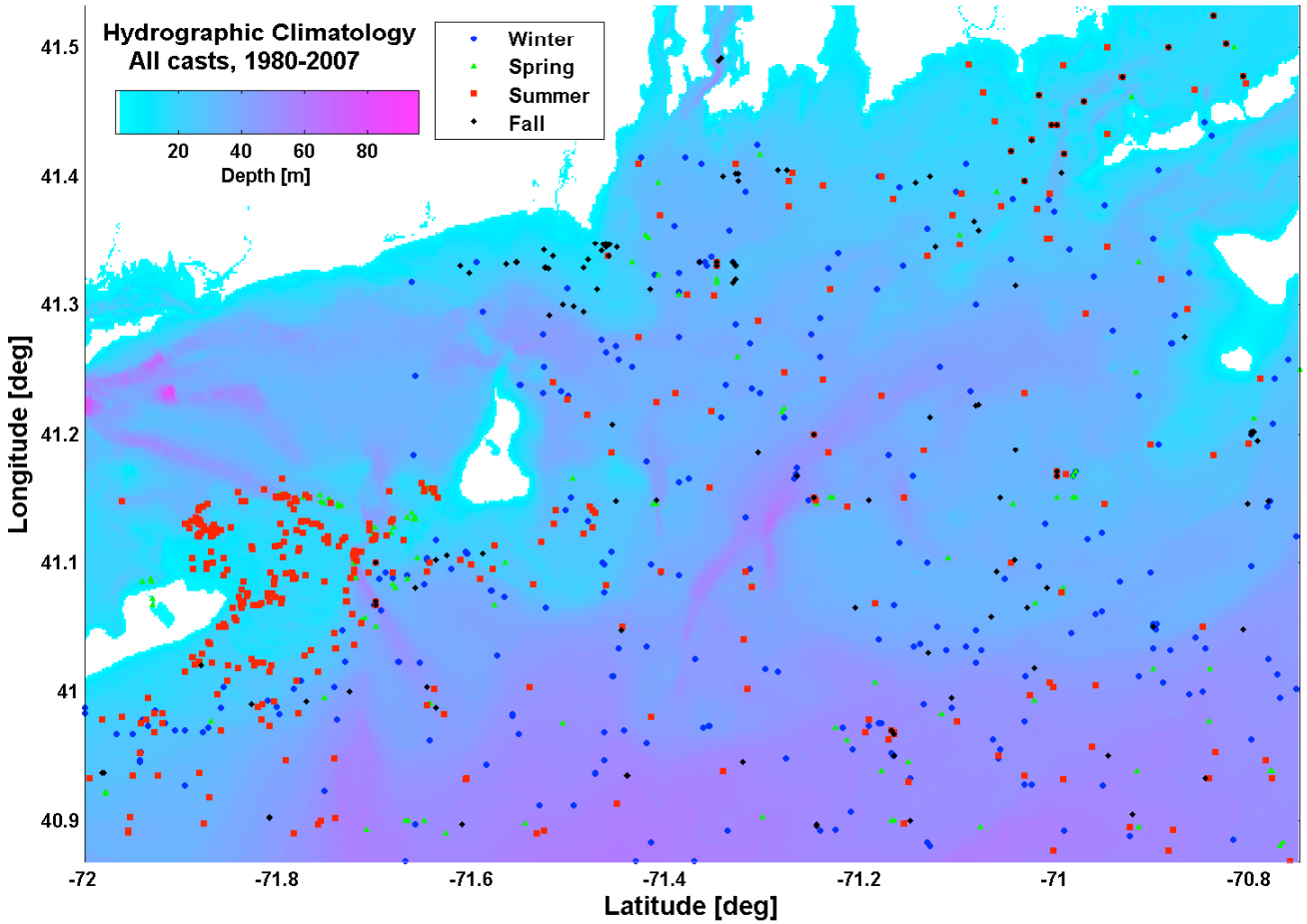
JNS4: April 23-25, 2001

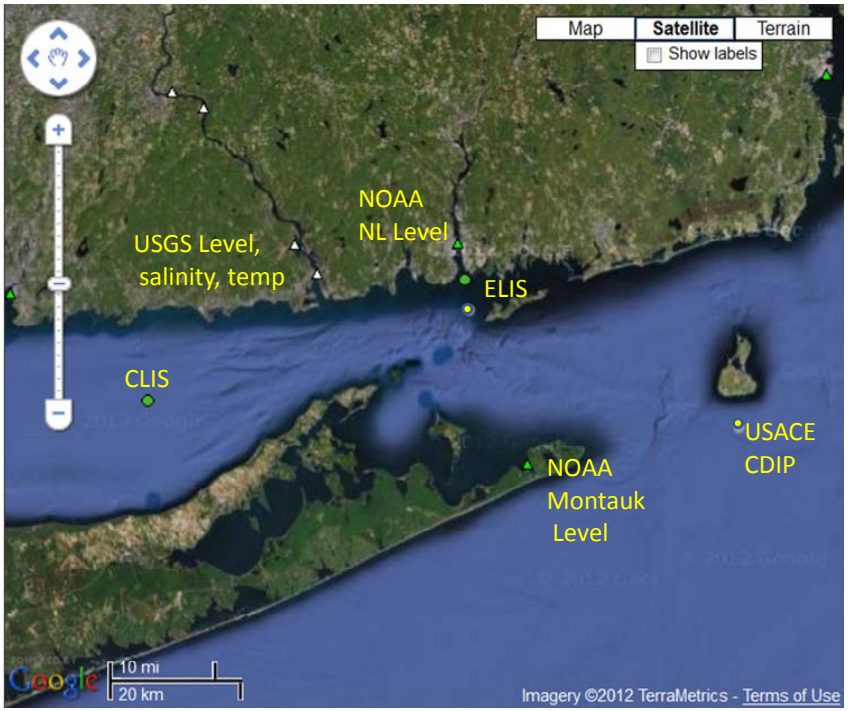


JNS8: Nov 26-27 2001



From Codiga and Ullman, 2011: Characterizing the Physical Oceanography of Coastal Waters Off Rhode Island, Part 1: Literature Review, Available Observations, and A Representative Model Simulation





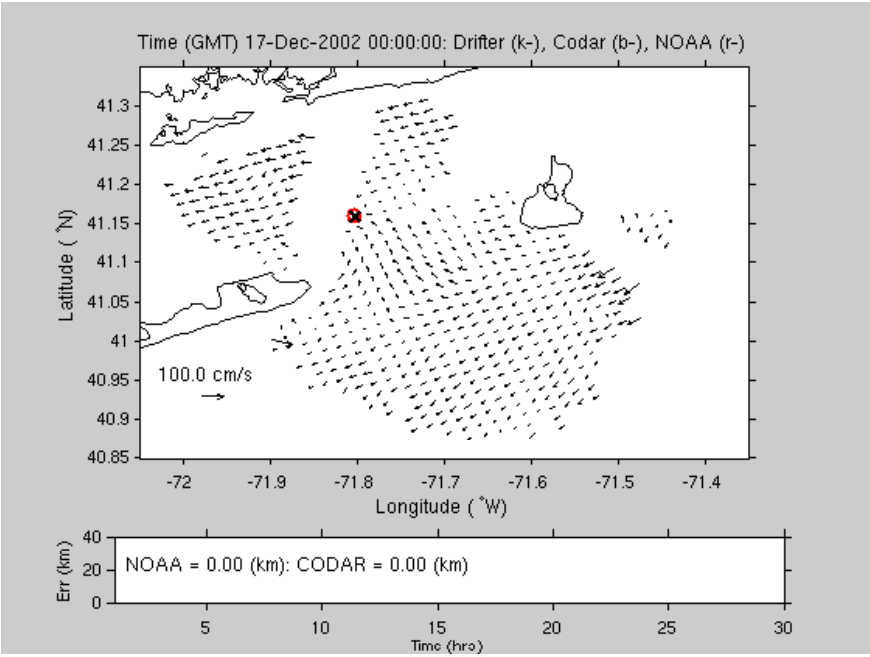
Salinity & temperature, from Buoys.

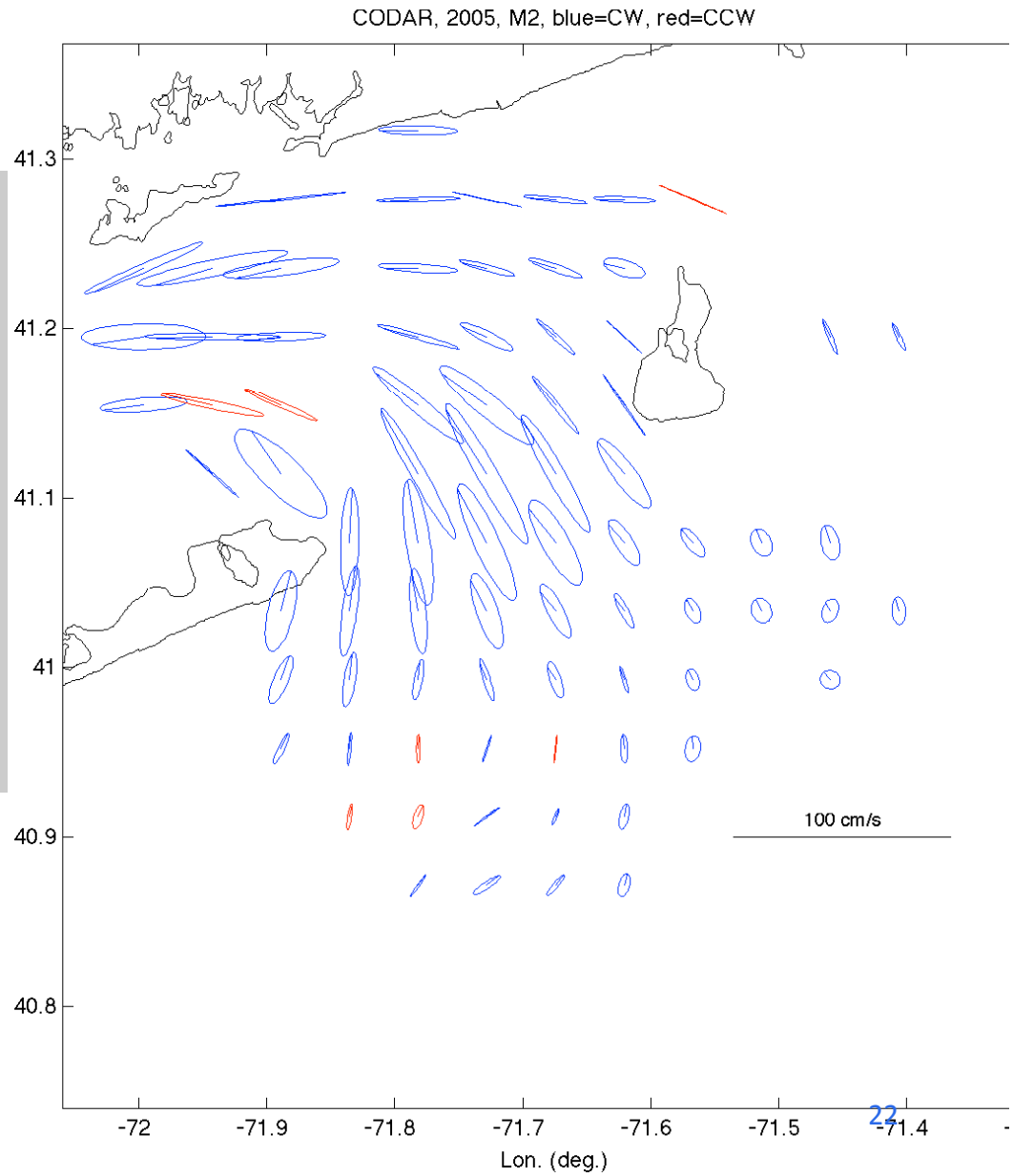
UCONN

S-salinity, **T**-temperature, **DO**-dissolved oxygen (membrane sensor), O-dissolved oxygen (optical sensor), CH-chlorophyll (RFU only)

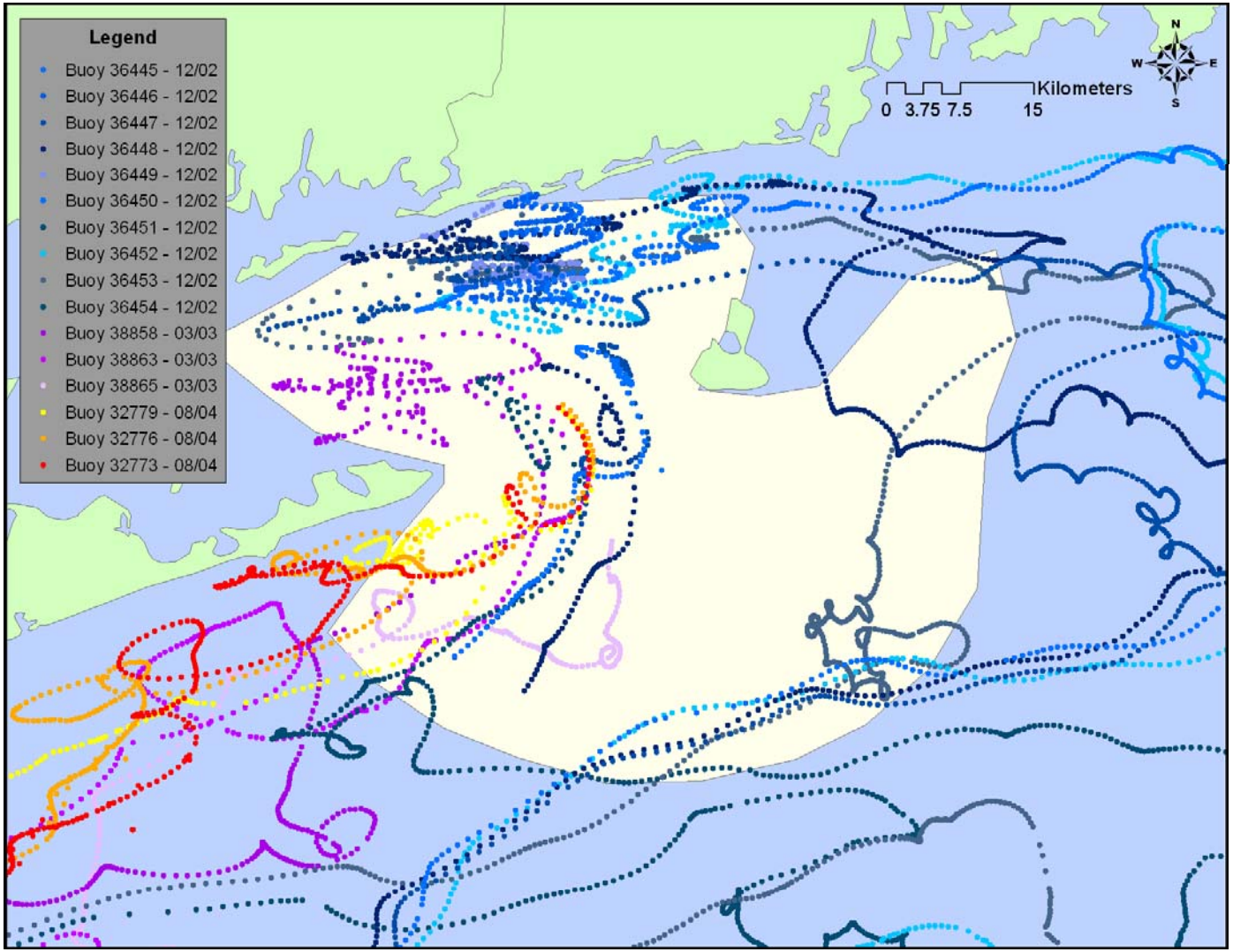
	CLIS Water			ELIS water		
Year	SFC	MID	BTM	SFC	MID	BTM
2012	S,T,CH,O	---	---		---	---
2011	S,T,CH,O	---	---		---	---
2010	S,T,CH,O	---	---	S,T,DO	---	---
2009	S,T,CH,O	---	---	S,T,DO	---	---
2008	S,T,DO	---	---	S,T,DO	---	---
2007	S,T,DO	---	---	S,T,DO	---	---
2006	S,T,DO	---	---	S,T,DO	---	---
2005	S,T,DO	S,T,DO	S,T,DO	S,T,DO	---	S,T,DO
2004	S,T,DO	S,T,DO	S,T,DO	S,T,DO	---	S,T,DO
2003	S,T,DO	S,T,DO	S,T,DO	S,T,DO	---	S,T,DO
2002	S,T,DO	S,T,DO	S,T,DO	S,T,DO	---	S,T,DO
2001	---	---	---	S,T,DO	---	S,T,DO
2000	---	---	---	S,T,DO	---	S,T,DO
1999	---	---	---	S,T,DO	---	---

Currents: HF RADAR Vectors in BIS 2002 - 2012





Currents: Lagrangian Drifter Data from BIS



GPS Drifter Tracks

Dec 2002

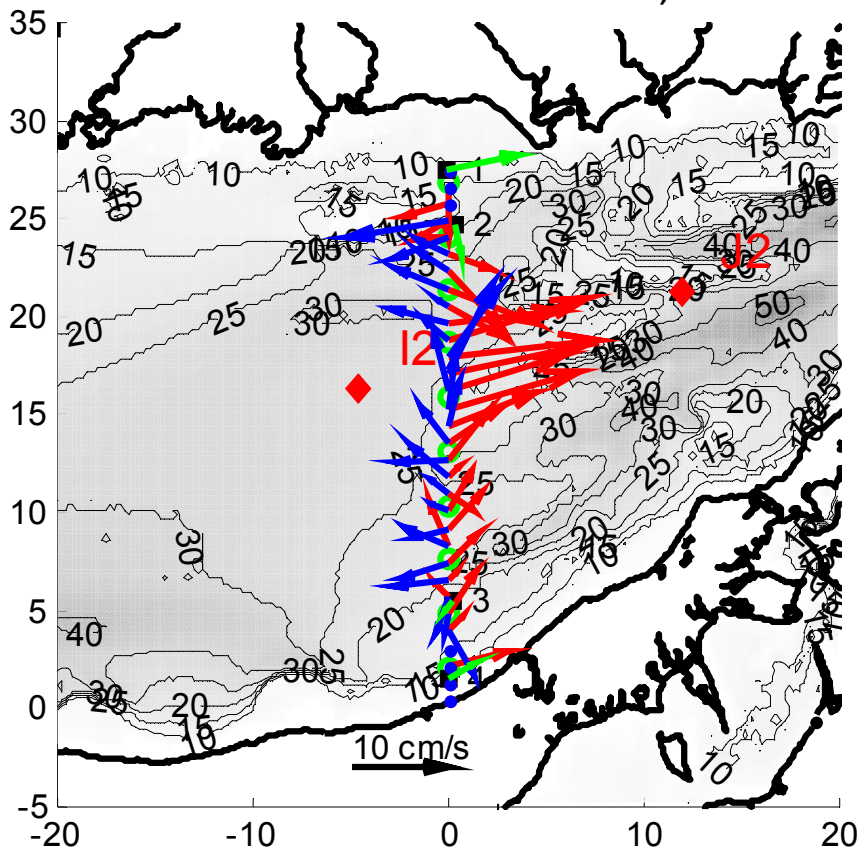
March 2003

August 2004

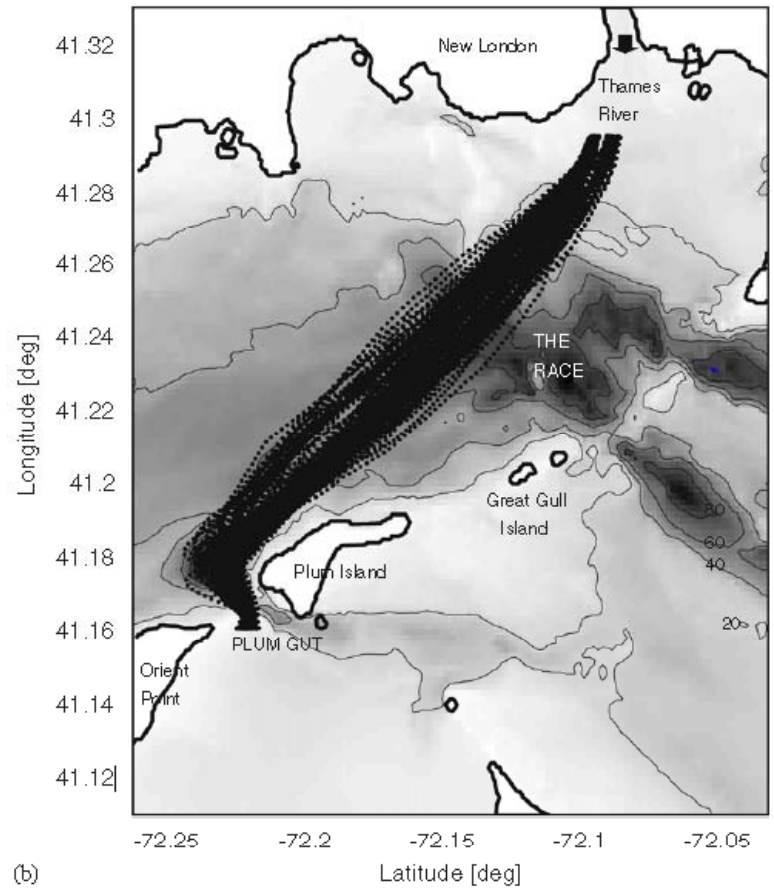
White region represents where CODAR observations are obtained more than 10% of the time

Currents from Ship Surveys: RESLIS and NL-OP Ferrry

From 'Donnell & Bohlen, 2003

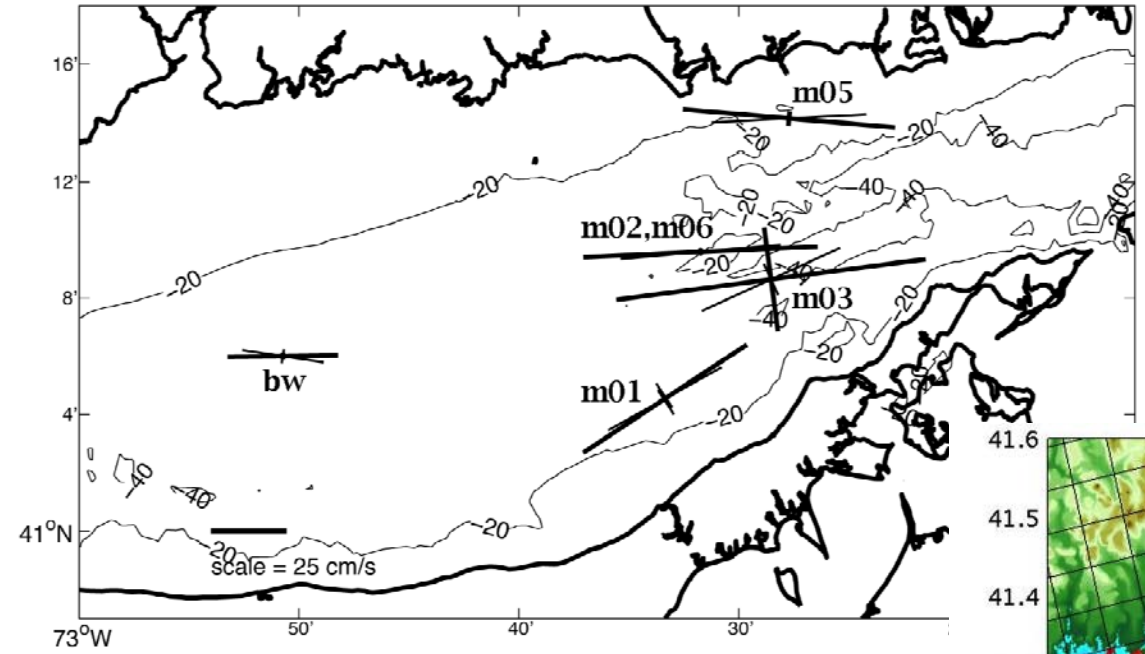


From Codiga & Aurin, (2007)

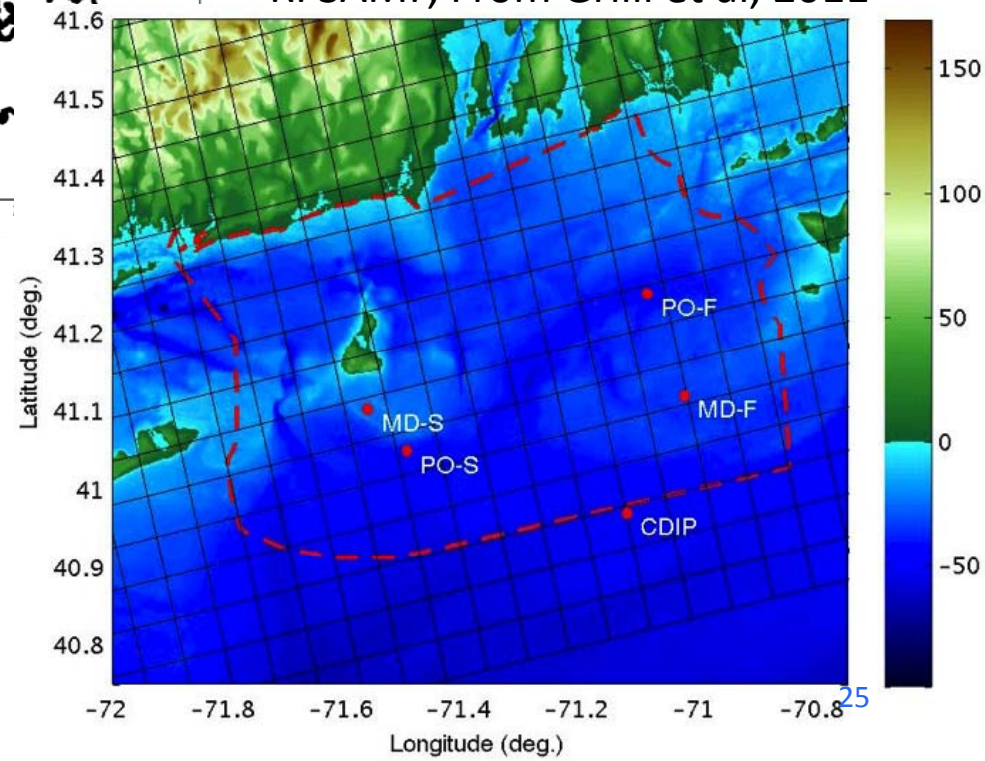


Currents from Moorings

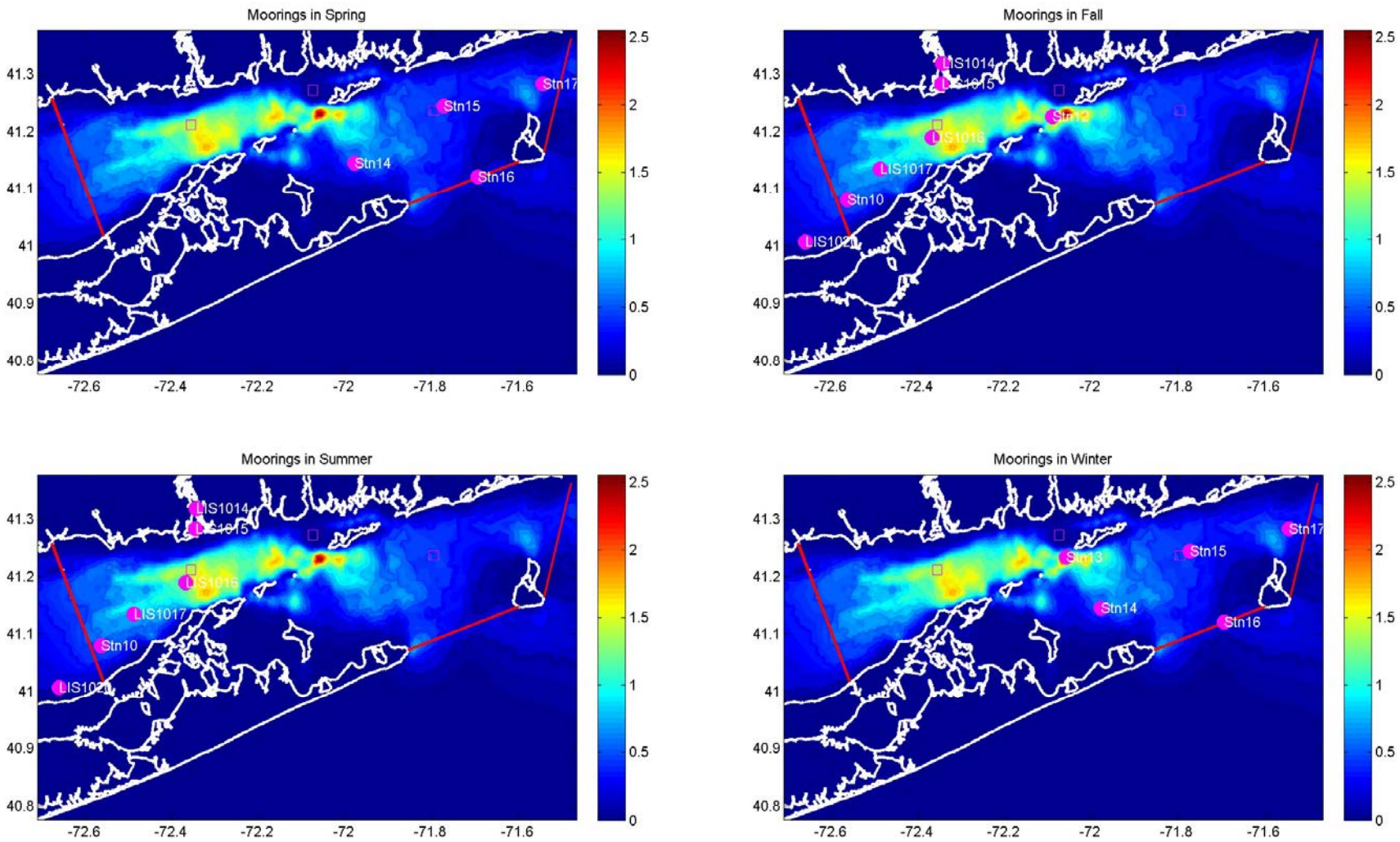
LISICOS, From Bennett et al. 2010



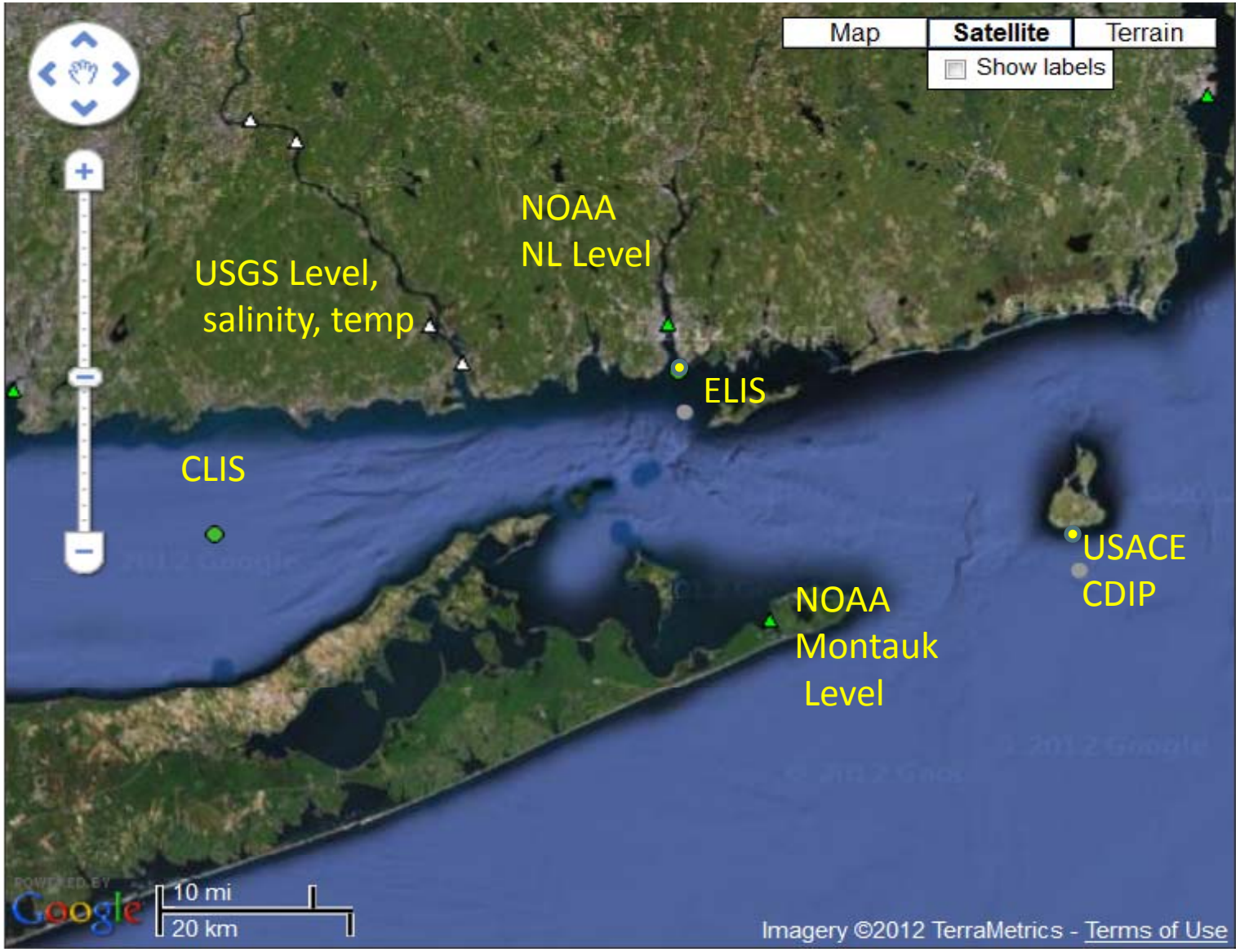
RI SAMP, From Grilli et al, 2011



NOAA Current Meters 1988-89 & 2010



Waves


Map
Satellite
Terrain
Show labels
NOAA
NL Level
USGS Level,
salinity, temp
ELIS
CLIS
USACE
CDIP
NOAA
Montauk
Level
10 mi
20 km
Imagery ©2012 TerraMetrics - Terms of Use

Bottom Stress – no measurements

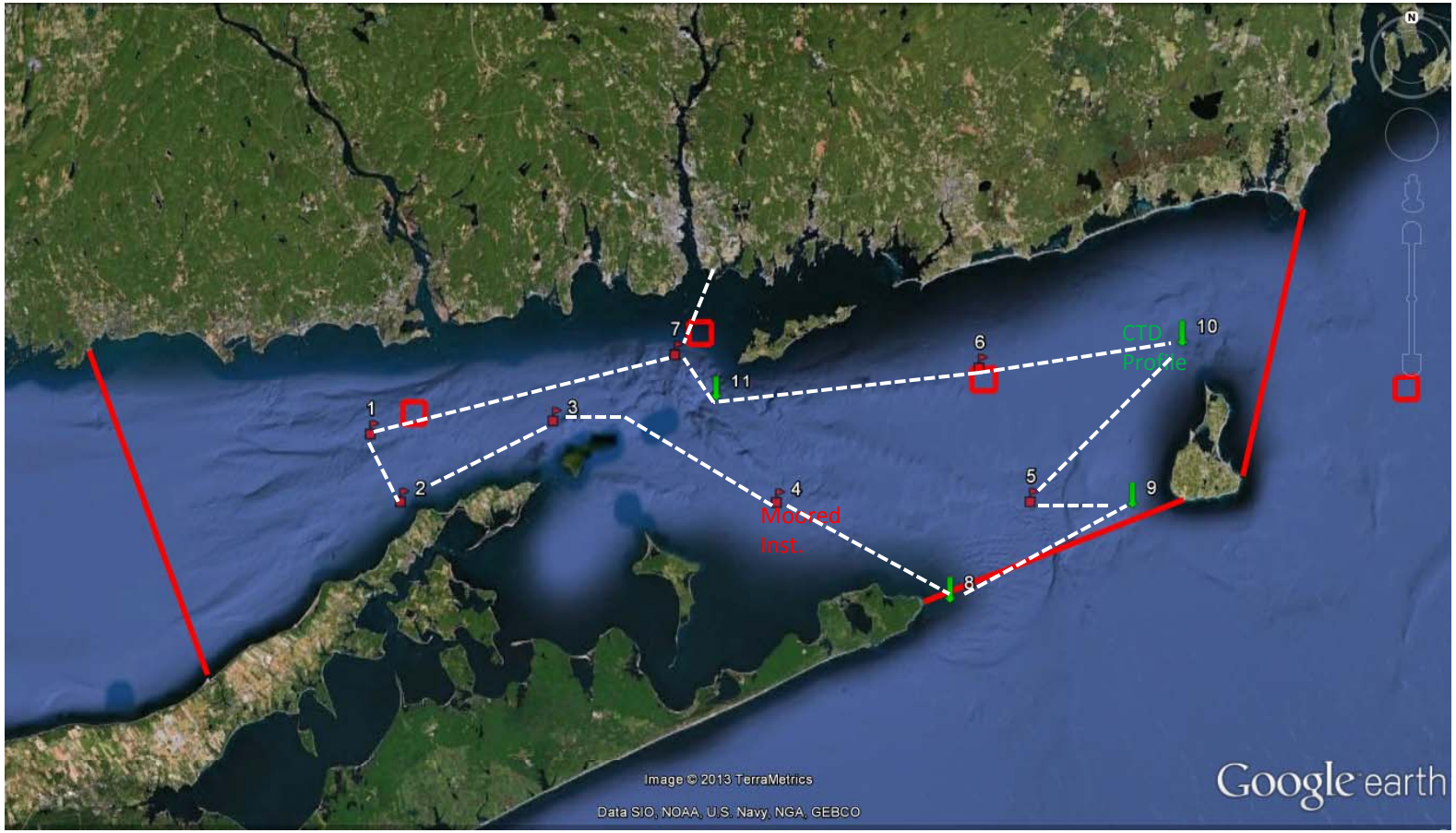
Summary

- No Stress
- Waves only at CLIS buoy ZSF
- No North-Sound variation in density in LIS
- No hydrography or current profile measurements in BS-RIS
- Seasonal variations in wind & wave and river discharge are substantial.

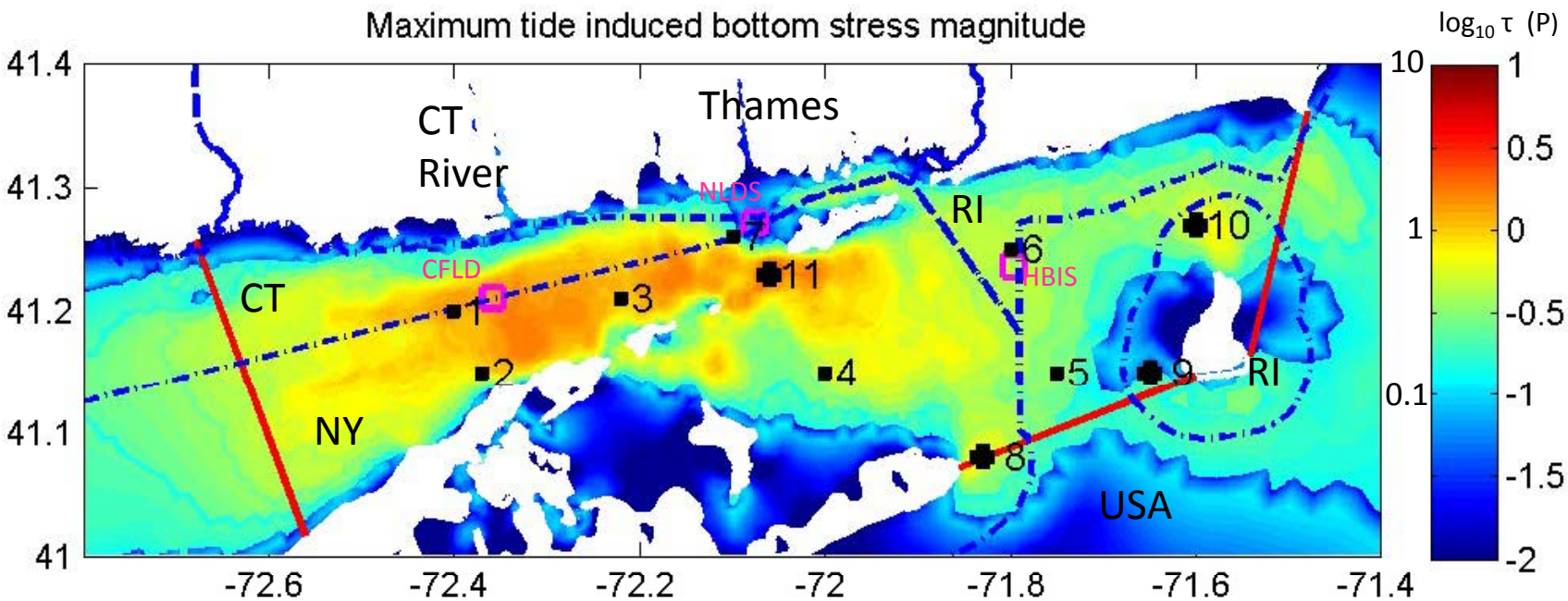
5. Proposal for Observations

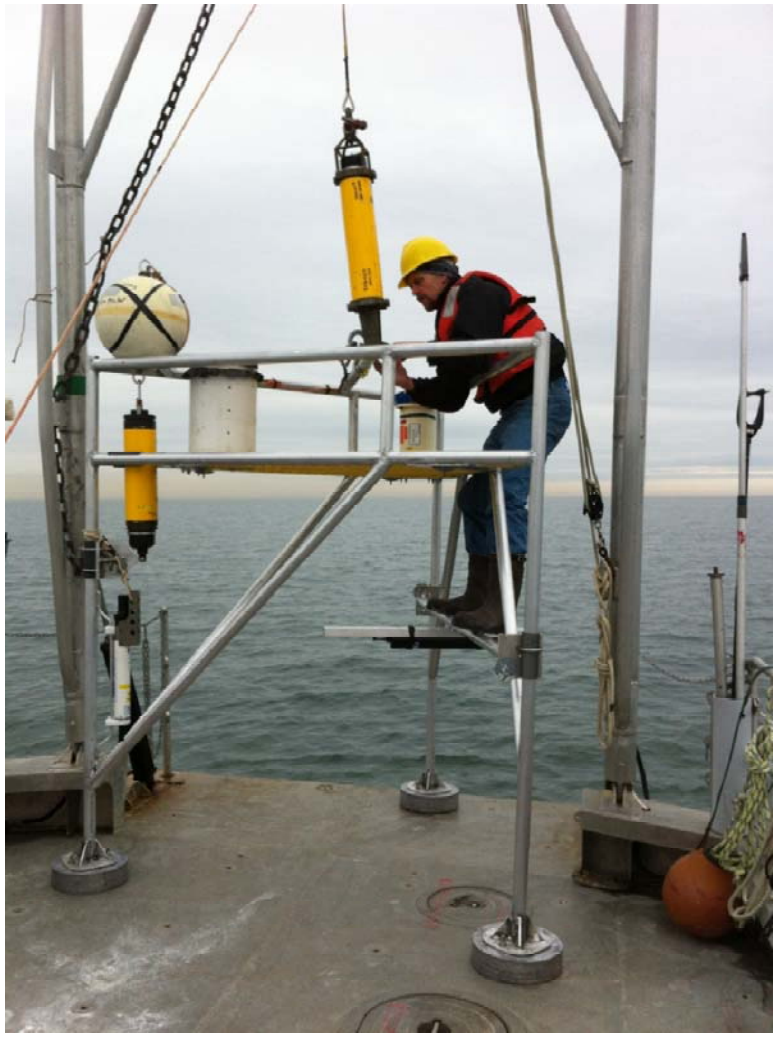
- October-March have frequent high winds from NE
- Wind forcing is less in May-Sept
- River Flow is high Mar-May and below average the rest of the year
- Need current, wave and stress measurement in a range of locations in each forcing regime.
  - Windy, low flow (Feb-March)
  - Windy High Flow (April-May)
  - Calm, below average flow (June-July)

Stations, ZSF and Disposal Sites



Stations, ZSF and Disposal Sites on preliminary stress estimate





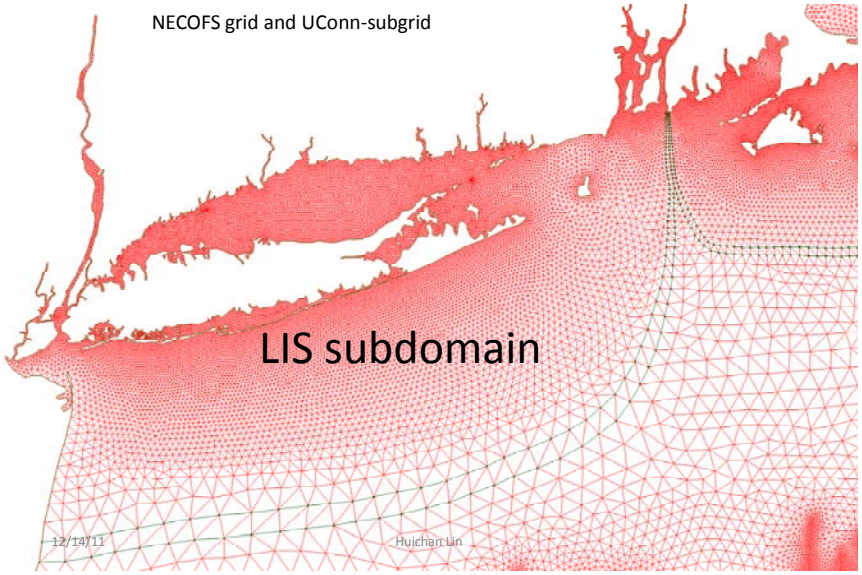
Bottom Instrumentation

1. Upward looking RDI ADCP to measure profile (1-0.5m resolution) of current and wave statistics
2. Downward looking Nortek ADCP with 5cm resolution bottom to 75cm to measure stress and acoustic backscatter intensity
3. CTD to measure salinity, temperature and bottom pressure
4. Optical backscatter at .2 and .8 m to infer SPM concentrations

Profiling Instrumentation

1. Hull mounted ADCP to survey current patterns
2. CTD to measure salinity, temperature and pressure
3. OBS 3+, optical backscatter to infer SPM concentrations
4. Water sampler for SPM concentration calibrations
5. LISST-100 to measure particle size spectra
6. AC9 Optical absorption spectra for discriminating organic and inorganic material

Model - FVCOM



Outer domain simulated by UMass Operationally through NOAA funding

This is a well established code and has been implemented in LIS already.

It is nested inside the UMass Dartmouth Regional Model.

FVCOM will be used to simulate the circulation and wave height and period distributions.

Challenges are to get hydrography variability correct in the ZSF domain and wave model implemented and assessed.

Integration of Model and Data

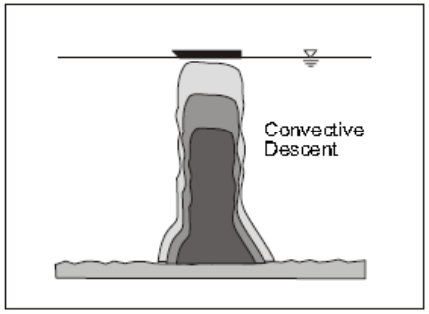
- Use observed winds and river flows to drive model and predict the salinity, temperature, current and waves, and bottom stress.
- Compare to the new and archived observations and evaluate FVCOM performance in LIS.
- Describe the uncertainties.
- Simulate the behavior under extreme events

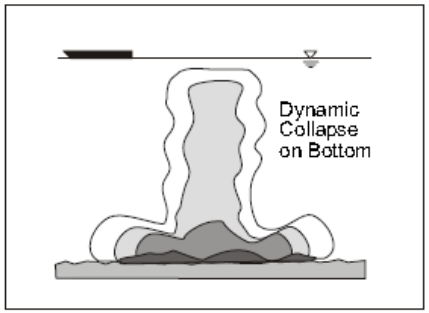
Analyses

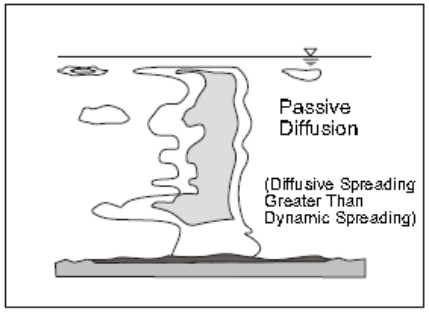
- Observations and model predictions will be used to describe the distributions of current and stress for site screening.
- When sites are being considered there reults will be used to drive the STFATE and LTFATE models.

Models STFATE- LTFATE

- STFATE – Near field transport during disposal operations
- FVCOM will provide currents, waves and shear for STFATE studies at sites under consideration







LTFATE

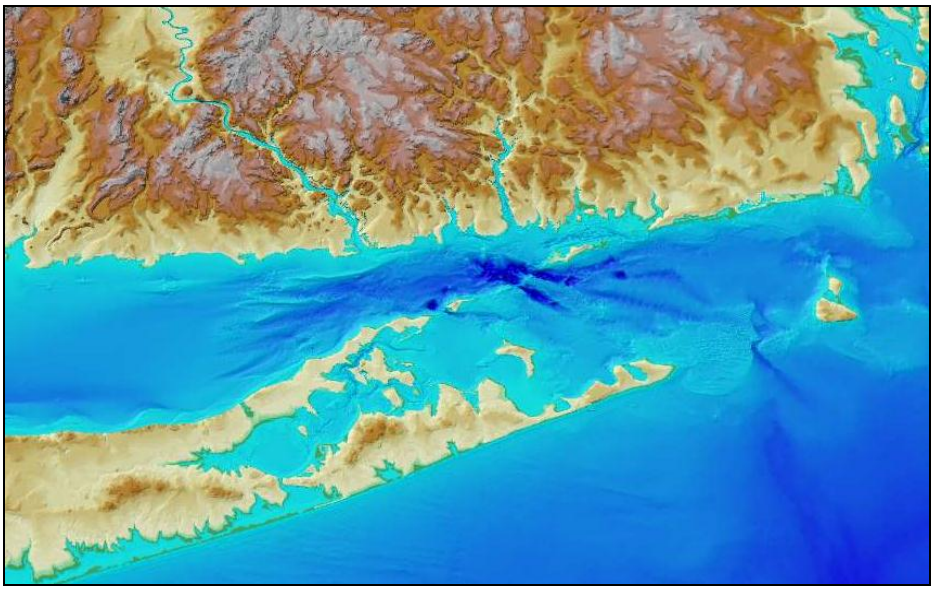
- LTFATE simulates the long term transport of resuspended materials from disposal mound. This requires regional current patterns, and waves forecasts from FVCOM. We will simulate the effects of historic events at alternative sites

Appendix A-7

MINUTES OF COOPERATING AGENCY GROUP MEETING 2

Supplemental Environmental Impact Statement for the Designation of Dredged Material Disposal Sites in Eastern Long Island Sound, Connecticut and New York

Minutes of Cooperating Agency Meeting 2



Prepared for: **United States Environmental Protection Agency**

Sponsored by: **Connecticut Department of Transportation**

Prepared by: **Louis Berger**
with support from
University of Connecticut

May 2013

Eastern Long Island Sound – Supplemental EIS

Cooperating Meeting 02 – Minutes

TOPIC:	**Site Screening and Physical Oceanography Study Update**
DATE OF MTG:	May 20, 2013
LOCATION:	Webinar
TIME:	10:00am to 1:30pm
PARTICIPANTS:	**Cooperating Agencies**

• Connecticut Department of Transportation CTDOT):	Joe Salvatore
• US Environmental Protection Agency, Region 1:	Jeannie Brochi Mel Cote Alicia Grimaldi
• Conn. Dept. of Energy and Environmental Protection:	George Wisker
• US Army Corps of Engineers, New England District:	Cathy Rogers Mark Habel Michael Keegan Steven Wolf Tom Fredette
• US Army Corps of Engineers, New York District:	Nancy Brighton
• NOAA/National Marine Fisheries Service:	Diane Rusanowsky
• US Environmental Protection Agency, Region 2:	Patricia Pechko
• New York State Department of State:	Jim Leary Kari Gathen Jennifer Street Jessica Leary
• New York State Dept. of Environmental Conservation:	Charles de Quillfeldt

University of Connecticut (UConn) Project Team (under contract to CTDOT)

• University of Connecticut:	James O'Donnell Walter Bohlen
• The Louis Berger Group, Inc. *(Prepared minutes):*	Bernward Hay Amy Atamian

SUBMITTED ON: June 10, 2013

The primary goal of the meeting was to provide (1) an update on the site screening, and (2) an update of the physical oceanographic study, in preparation for the Eastern Long Island Sound (ELIS) Supplemental Environmental Impact Statement (SEIS).

Introduction (Jeannie Brochi, USEPA)

Jeannie Brochi stated that this Cooperating Agency meeting was a follow-up to the first Cooperating Agency meeting, held on January 8, 2013. She further stated that two documents were provided for review and comment by Cooperating Agency members; the documents consisted of the minutes of the first meeting in January, and the report of the first two Public Scoping Meetings.

The objective of this meeting was to identify open water sites to be investigated further as potential disposal sites for dredged material. Ms. Brochi requested input on alternative sites that are being considered. Further, she asked for feedback on data collected so far and for additional relevant information and data that agency members knew about.

Updated Site Screening (Presentation by Bernward Hay, The Louis Berger Group, Inc.)

Bernward Hay noted that this presentation was an extension of the presentation provided by Battelle during the first Cooperating Agency meeting in January. The expanded presentation also included data and information provided by the Rhode Island Coastal Resources Management Council (RICRMC) and the NYSDOS. The presentation consisted of two parts:

- Presentation of screening layers based on an expanded data set
- Discussion of potential alternative sites

Key points of the presentation were as follows (his presentation is attached as Appendix B):

- *Slides 2 and 3 – Zone of Siting Feasibility (ZSF):* Consisting of the Eastern Long Island Sound (ELIS) and Block Island Sound (BIS).

- *Tier 1 criteria – Sediment stability/instability (Slides 7 to 13):* New information was added from a multibeam survey conducted by the National Oceanographic and Atmospheric Administration (NOAA) and the U.S. Geological Survey (USGS) over the last decade. This information is available for the much of the ELIS, and is currently being processed by the USGS for the BIS. It provides detailed information about the bottom topography of the area. Additional sediment texture information is also available for the entire ZSF from the USGS data base. Areas of high bottom stress (as a result of tidal currents and roughness of the substrate) generally coincide with areas of coarser sediment texture.

- *Tier 1 criteria – Areas of Conflicting Use (Slides 14 to 16):* The ZSF contains cable corridors, and installed cables. There are no pipelines in the open waters of the ZSF. Vessel density data *(Slide 15)* show the preferred commercial vessel traffic along the long axes of the ELIS and BIS. (The density grid was created using tracklines that were generated from the 2009 United States Automatic Identification System Database; the data grids represent only 339 days in 2009.) The recreational boating traffic occurs closer to shore, and between harbors in Connecticut and New York, as expected. The layer for Conservation Areas *(Slide 16)* is still being developed; additional data are being sought from cooperating agencies.

- *Tier 1 criteria – Biological Resources (Tier 17 to 18):* Shellfish bed data for Connecticut are based on currently available data in the CTDEEP database; data are still needed for Rhode Island and New York. Similarly, fishing area information so far is only available for Rhode Island. CTDEEP has been conducting trawl surveys in Long Island Sound. The data is being evaluated for appropriate incorporation into the screening layers.

- *Tier 2 criteria – Biological Resources (Slides 22 to 23):* Eelgrass bed information has been added for New York and Rhode Island. Frank Bohlen stated that the information for Connecticut requires refinement; he will provide a report with updated information. Shellfish zoning information is still being sought for New York. Jennifer Street stated that zoning information is available in New York State's database.

- *Tier 2 criterion – Active and Historic Sites (Slide 24):* The Marine Protection, Research, and Sanctuaries Act (MPRSA) states that, wherever feasible, USEPA will designate open-water dredged material disposal sites that have been used historically. There are two active and five historic sites within the ZSF in water depths greater than 18 m (60 feet). This depth was used in the Central/Western Long Island Sound EIS as a screening layer due to the potential resuspension of sediment in shallower waters.

- *Tier 2 criterion – Archaeological and Cultural Resources (Slide 25):* The data were obtained from NOAA's database and distinguish ship wrecks and 'obstructions'. There are four shipwrecks/obstructions located within the historic Clinton Harbor Disposal Site.

- *Alternative Energy (Slides 29 to 32):* The information was obtained from the U.S. Department of Energy. The 'Wind Power Classification' within the ZSF is comparatively low, indicating low wind energy potential relative to other offshore locations nearby. Similarly, the 'Wave Power Density' (a measure for wave energy potential) is low compared to the open ocean. The 'Kinetic Power Density' (a measure for tidal energy potential), is highest in the 'Race', but overall the tidal energy potential within the ZSF is small relative to the area south of Cape Cod.

- *Dredging needs for the Long Island Sound area for a 20-year horizon* (from DMMP, 2009, Dredging Needs report): The greatest dredging needs exist in Connecticut. Transportation costs increase with increasing travel distance from a dredging center. In addition, larger waves in Block Island Sound and the open ocean increase the environmental risk through 'short dumps'. MPRSA states that the USEPA will designate ocean dumping sites beyond the edge of the Continental shelf, wherever feasible. However, due to the broad shelf along the eastern United States, the distance from the Connecticut coast to the edge of the Continental Shelf (200 m depth) is approximately 80 nautical miles.

Comments made at the end of the first part:

- Charles deQuillfeldt stated that the Plum Gut and the Race are important recreational fishing areas. Bernward Hay stated that there is fishing data available through CTDEEP's trawl surveys that is currently being reviewed.

The second part of the presentation focused on potential alternative sites. Bernward Hay discussed key issues for consideration in the selection *(Slide 33),* and presented an overview of eleven potential sites selected based on the initial screening. These sites include the following:

Eastern Long Island Sound (Slide 34):

1. Cornfield Shoal Disposal Site *(active site)*
2. Six Mile Reef Disposal Site *(historic site)*
3. Clinton Harbor Disposal Site *(historic site)*
4. Orient Point Disposal Site *(historic site)*
5. Niantic Bay Disposal Site *(historic site)*
6. New London Disposal Site *(active site)*

Block Island Sound (Slide 35):

7. Deep Hole south of Fishers Island – West *(new site)*

8. Deep Hole south of Fishers Island – East *(new site)*
9. Deep Hole south of Fishers Island – Center *(new site)*
10. Block Island Sound Disposal Site *(historic site)*
11. Area north of Montauk *(new site)*

Bernward Hay then discussed each site in more detail, based on relevant available information *(Slides 36 to 60)*. (Information on bathymetry, sediment texture, key morphological features, etc. is included on the slides.) A preliminary assessment for each site included identifying relative advantages (+), relative disadvantages (-), neutral (o), and missing data (?). He concluded with a slide that summarized these factors *(Slide 61)*. This slide was designed to start the discussion for comparing sites.

Comments after the presentation consisted of the following:

- Kari Garhen stated that she appreciated the incremental process of going through the data, but thought that it was premature to identify any site on such limited data. She was concerned that there appeared to be a conclusion made about biological habitats in the area without recognizing other activities or available data such as toxicity levels, or cumulative impacts from previous dumping. She noted that the New London Disposal Site was given a' plus' for biological resources [on the summary table - *Slide 61*], although there was no acknowledgement of the historical use of this site and the level of toxicity present there. She also questioned the ability to draw any conclusion on mound stability in the absence of any recognition that there may be disagreement historically as to whether or not material that has been disposed at the site can still be accounted for, located, and documented to this date. Therefore, she questioned the neutrality symbol [o] used for historical disposal sites, as she believed the conclusion was premature. She also questioned the perception that open water disposal sites (OWDS) needed to be in close proximity to dredging centers, and asked how this compared to other USEPA Regions nationwide, and asked further if there was an expectation that OWDS needed to be within 5 nautical miles (nm) from dredging centers. She believed that distance to dredging centers should not be on the summary table without having a better understanding of why this should be a factor for site selection. She further stated that she was not sure how conclusions regarding biological data were made. Specifically, New York has Significant Coastal Fish and Wildlife Habitats, and none of them were included on the maps, which she thought was needed considering that sediment moves around and could impact such areas. The web link for this information was provided by Jennifer Street.

- Jean Brochi responded that the current information was based on best available information. Existing data is being reviewed and incorporated, so that additional data needed for this process can be identified.

- Diane Rusanowsky stated the Northeast Region National Marine Fisheries Service is preparing a GIS-based vehicle for expressing Essential Fish Habitat (EFH) that might be helpful. The contact is David Stevenson. She noted that the data in nearshore areas is not as detailed. The U.S. Fish and Wildlife Service (USFWS) has a similar habitat designation program that was prepared for certain New England and Rhode Island coastal areas that could be added as overlays. Peter Foster is working on a project that consists of a review of a number of different uses and current data (including fish survey data) for NY and CT; he is putting this information into GIS format.

- Charles deQuillfeldt stated that the Long Island Sound Study (LISS) has various stewardship sites identified both along the CT and NY shoreline (including Plum Island and a number of other sites). There might be GIS maps available to be obtained from the LISS website.

- Mel Cote, in response to Kari Garhen's comments, stated that there was no set distance between dredging centers and disposal sites. There is a wide range nationwide (from a few miles up to perhaps

50 miles), but the vast majority of disposal sites are within 5 to 10 miles from shore. He will provide a link with the coastal disposal sites in all USEPA regions. It shows that Region 1 has fewer disposal sites than most regions and they are spread further apart, but, overall, Region 1 is not an anomaly.

- Kari Garhen asked if these sites were actively used. Mel Cote responded that they vary considerably in term of use.

- Bernward Hay asked if any one of the eleven identified site for the ELIS SEIS could be taken of the list at this time for specific environmental or other reasons. Charles deQuillfeldt stated that the Orient Point and Montauk sites will be of concern because of fishing, recreational boating, and reaction from the public to those sites. Mel Cote noted that most dredged material disposal activity occurs between October and March, thus avoiding the season of heavy recreational use.

- Jean Brochi stated that the preliminary summary information will be revisited, other data will be reviewed, and data gaps will be identified. It will include habitat and biological resources, fisheries, as well as archaeological and cultural resources. The USEPA will reach out to tribes to identify culturally significant areas. Another issue will be mound stability; physical oceanographic data will be available in about a month for preliminary review. Ms. Brochi stated further that the SEIS process pertains to the open-water portion of the project area; the dredging need was established by the DMMP project. The USEPA will also review a no-action alternative and other alternatives. She further stated that the slides of today's presentations will be made available in pdf format. She asked for comments and recommendations.

Break for lunch between approximately 12:00pm and 12:30pm.

After lunch, Jim O'Donnell presented an update of his physical oceanography study "Observation and Model Plan and Status (Appendix C). The overview included the scientific background, modeling approach, and field observation plan.

The meeting was adjourned at approximately 1:30pm.

Appendix A: Invitation and Agenda
(Jeannie Brochi, USEPA)

From: Brochi, Jean [mailto:Brochi.Jean@epa.gov]
Sent: Thursday, May 16, 2013 4:31 PM
To: Jennifer.Street@dos.ny.gov; dgoulet@crmc.ri.gov; jwillis@crmc.ri.gov; george.wisker@ct.gov; joseph.salvatore@ct.gov; mark.l.habel@usace.army.mil; Nancy.J.Brighton@usace.army.mil; Catherine.J.Rogers@usace.army.mil; Lou.chiarella@NOAA.gov; diane.rusanowsky@noaa.gov; dxmcreyn@gw.dec.state.ny.us; Benjamin.J.Duarte@uscg.mil
Cc: Pechko, Patricia; Pabst, Douglas; Grimaldi, Alicia; Pechko, Patricia; Pabst, Douglas; Cote, Mel; Hamjian, Lynne; Grimaldi, Alicia; Hay, Bernward; O'donnell, James (james.odonnell@uconn.edu); Atamian, Amy; Bohlen, Walter (walter.bohlen@uconn.edu); Jennifer.Street@dos.ny.gov; dgoulet@crmc.ri.gov; jwillis@crmc.ri.gov; george.wisker@ct.gov; joseph.salvatore@ct.gov; mark.l.habel@usace.army.mil; Herter, Jeff (DOS); Nancy.J.Brighton@usace.army.mil; Catherine.J.Rogers@usace.army.mil; Lou.chiarella@NOAA.gov; diane.rusanowsky@noaa.gov; dxmcreyn@gw.dec.state.ny.us; Benjamin.J.Duarte@uscg.mil
Subject: FW: MONDAY MAY 20th 10-2 WEBINAR LIS SEIS Cooperating Agency Meeting #2

Hello,

On Monday, May 20th, EPA will host the 2nd Cooperating Agency meeting for the LIS SEIS.
The agenda and some handouts are attached to this email. I have also attached the public scoping report document for your review. Please provide comments by June3rd.

The objective of the meeting is to discuss the site screening process, review available data in GIS, and recommend open water locations for further investigation. Thank you for your assistance.

You may join the webinar by clicking on the following link:

Invited By:	**Jean Brochi (Brochi.Jean@epa.gov)**
Where:	**https://epa.connectsolutions.com/r4r7l6bifb3/**
When:	**05/20/2013 9:45 AM - 2:45 PM**
Time Zone:	**(GMT-05:00) Eastern Time (US and Canada)**

The call in number is:

```
     with a start date and time of 05/20/2013 10:00 AM
     and a ending date and time of 05/20/2013 02:30 PM

Dial-In Number:     (617) 918-2823

Password:            355003
```

May 20, 2013 – CT DOT, WEBINAR (Adobe Connect)

ELIS SEIS Cooperating Agency Meeting #2

Agenda

10:00 am	Introductions/Objectives Jean Brochi, EPA
10:15 am	Physical Oceanographic Study Jim O'Donnell, UCONN
10:30 am	ELIS SEIS Site Screening Bernward Hay, LBG
12:00 pm	Break
12: 30 pm	ELIS SEIS Site Screening (continued)
1:00 pm	Discussion
2:00 pm	Wrap Up/Next Steps (Factsheet, Public Scoping Report, Public Scoping Meetings)

Appendix B: Presentation - Site Screening

(Bernward Hay, Louis Berger Group, Inc.)

Eastern Long Island Sound Supplemental EIS (SEIS):

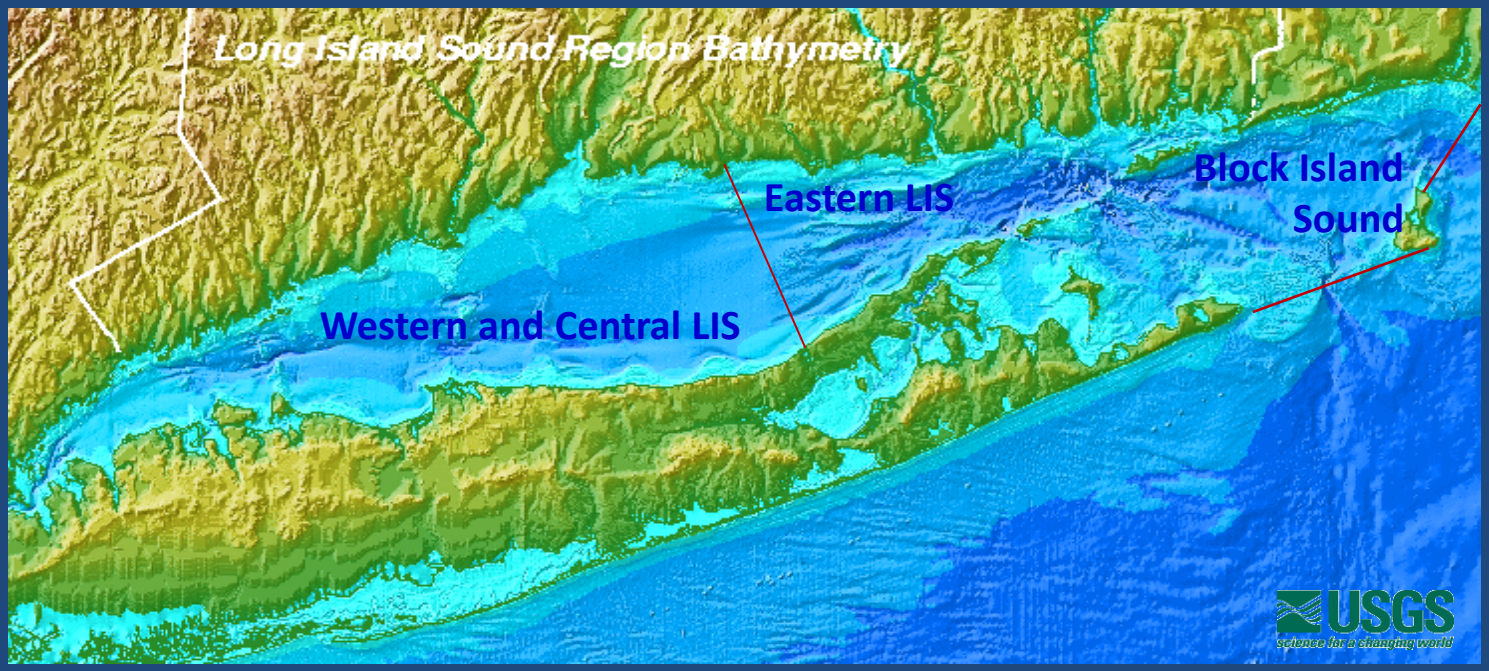
GIS Screening for Potential Alternative Dredged Material Disposal Sites

Cooperating Agency Meeting 2

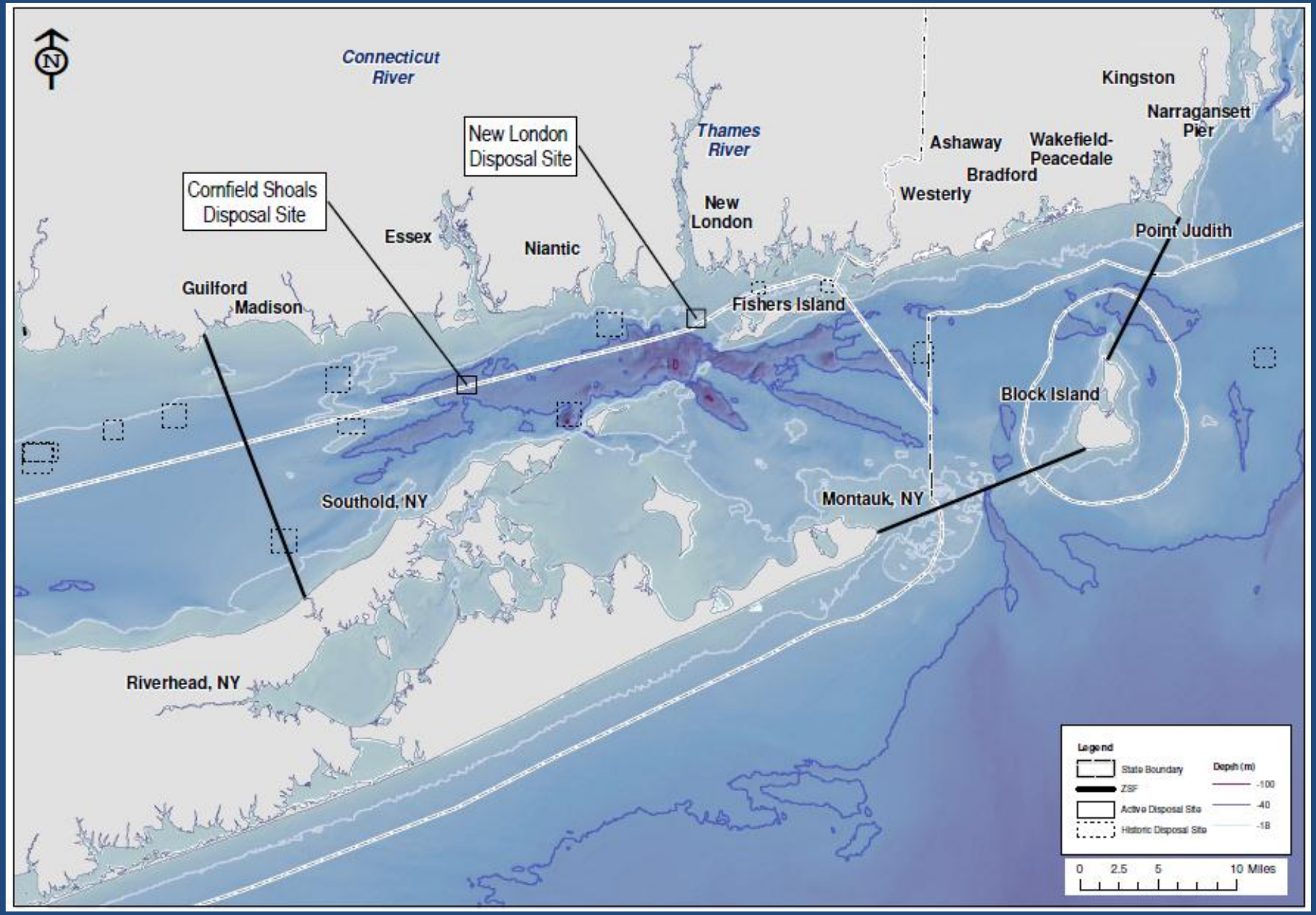
May 20, 2013

Zone of Siting Feasibility

- SEIS will address the eastern region of Long Island Sound, and Block Island Sound



Zone of Siting Feasibility



Screening Objective

Identify….

- Areas within the ZSF acceptable for locating an open water disposal site designated under the Ocean Dumping Regulations

- Specific alternative disposal site(s) within the acceptable area(s) for further evaluation in the SEIS

General Approach to Screening

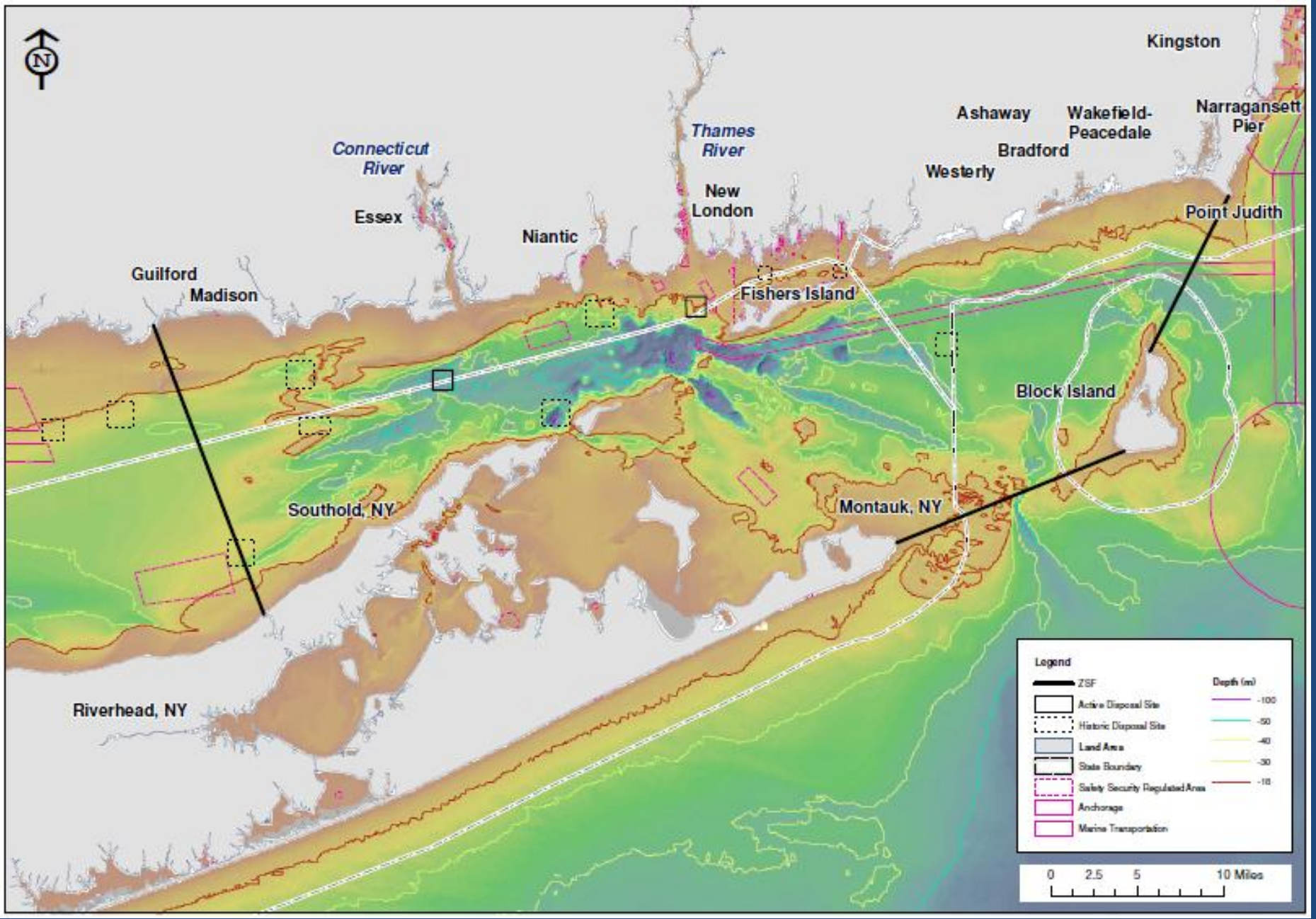
- Marine Protection, Research, and Sanctuaries Act (1972): Criteria or ocean dredged material site designation
  - 5 general criteria (40 CFR 228.5)
  - 11 specific criteria (40 CFR 228.6)

- Screening levels
  - Tier 1 – Evaluate sites
  - Tier 2 – Further investigate recommended sites

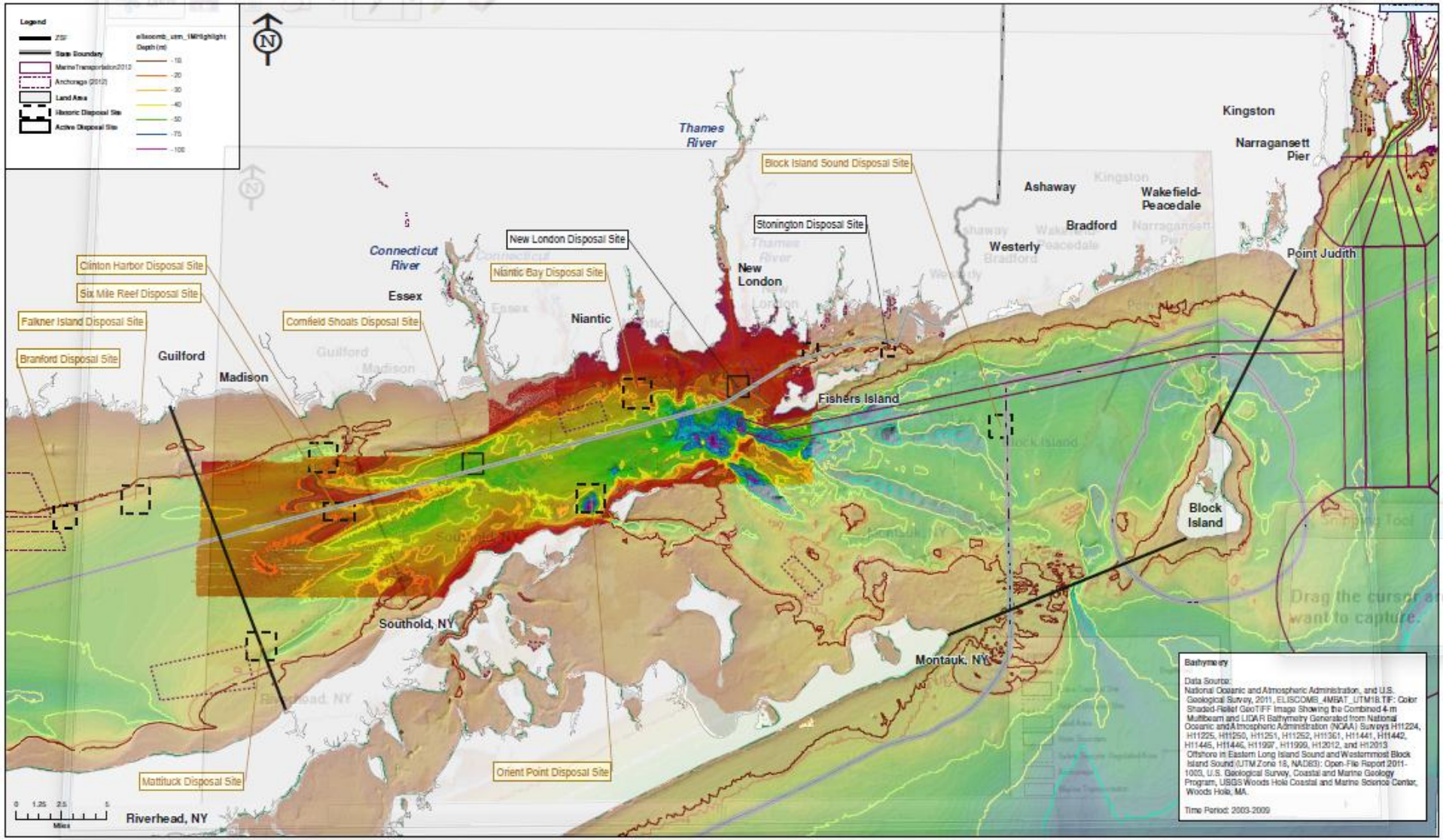
Tier 1 and 2 Screening Criteria

- Sediment Stability/Instability
  - Bathymetry
  - Currents and Waves; Bottom Stress
  - Sediment Texture (resuspension potential; habitat proxy)
- Areas of Conflicting Uses
  - Infrastructure (cables, pipelines)
  - Navigation (shipping lanes, anchoring areas)
  - Conservation Areas (sanctuaries, wildlife refuges, National Seashores, parks, artificial reefs)
- Biological Resources
  - Shellfish Beds
  - Benthic Community
  - Fish Habitat, Fish Concentrations, and Fishing Areas
  - Breeding, Spawning, Nursery, Feeding, and Passage Areas

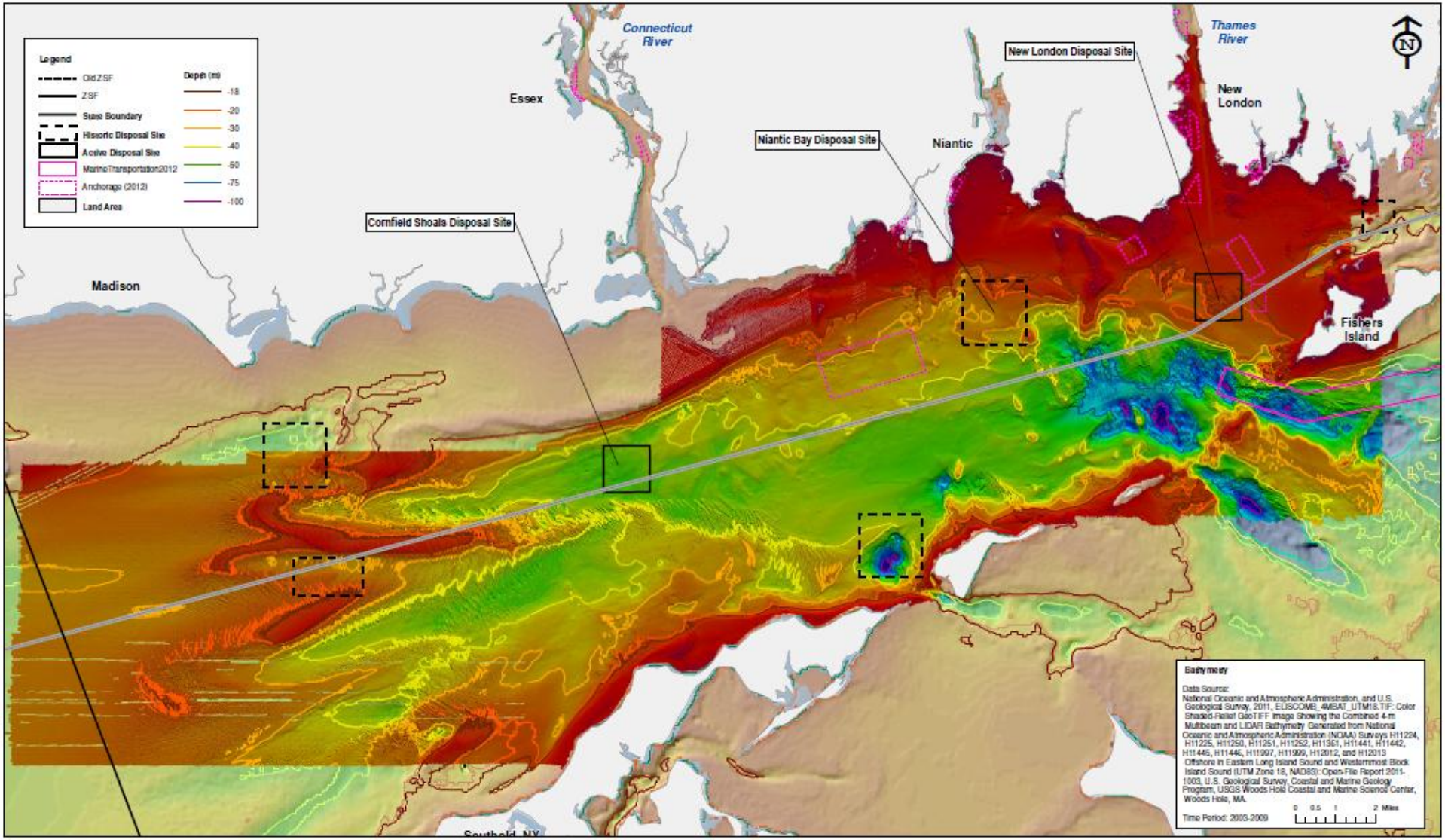
Tier 1: Bathymetry (ZSF)



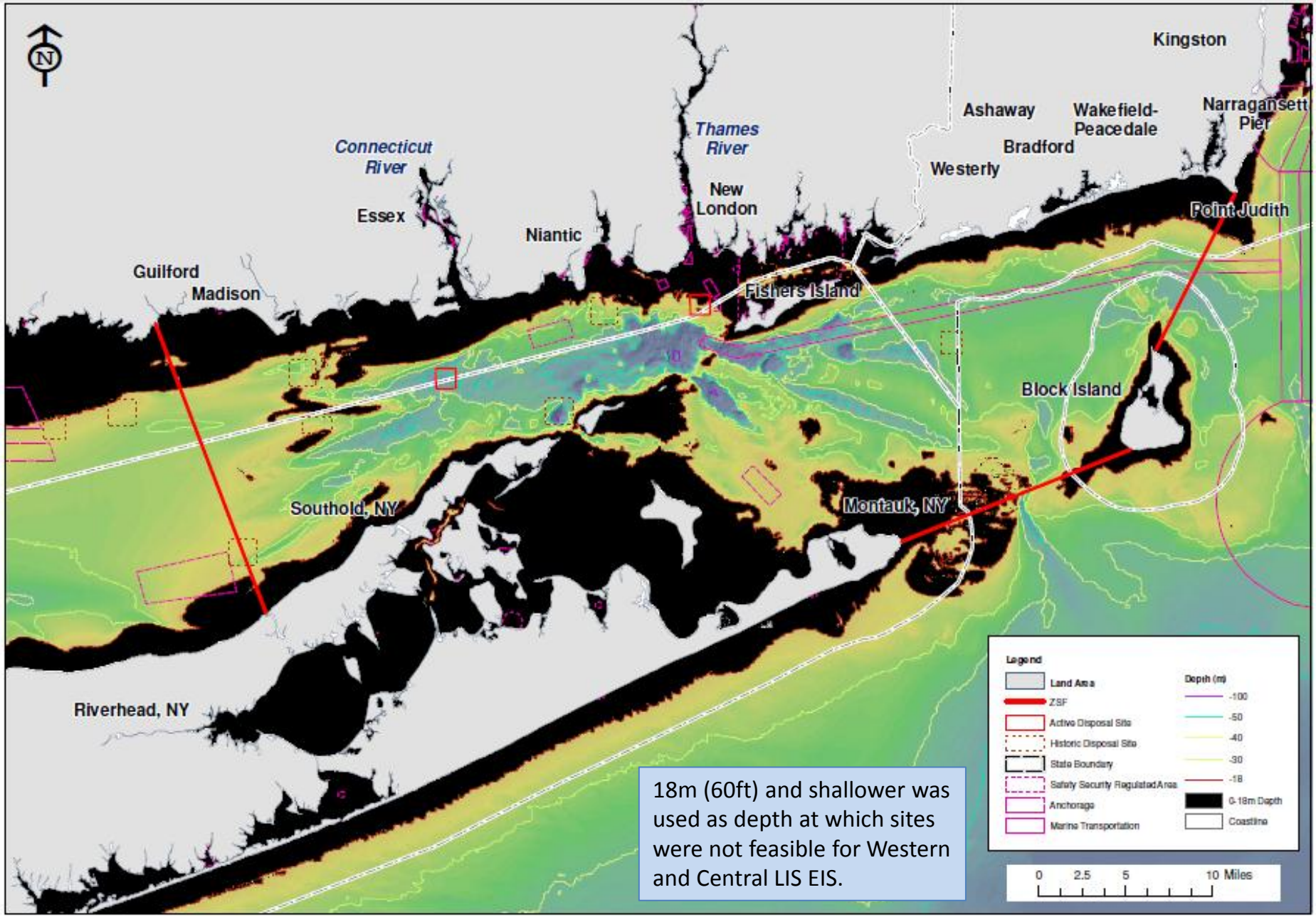
Tier 1: Bathymetry (ZSF)



Tier 1: Bathymetry (Eastern LIS)

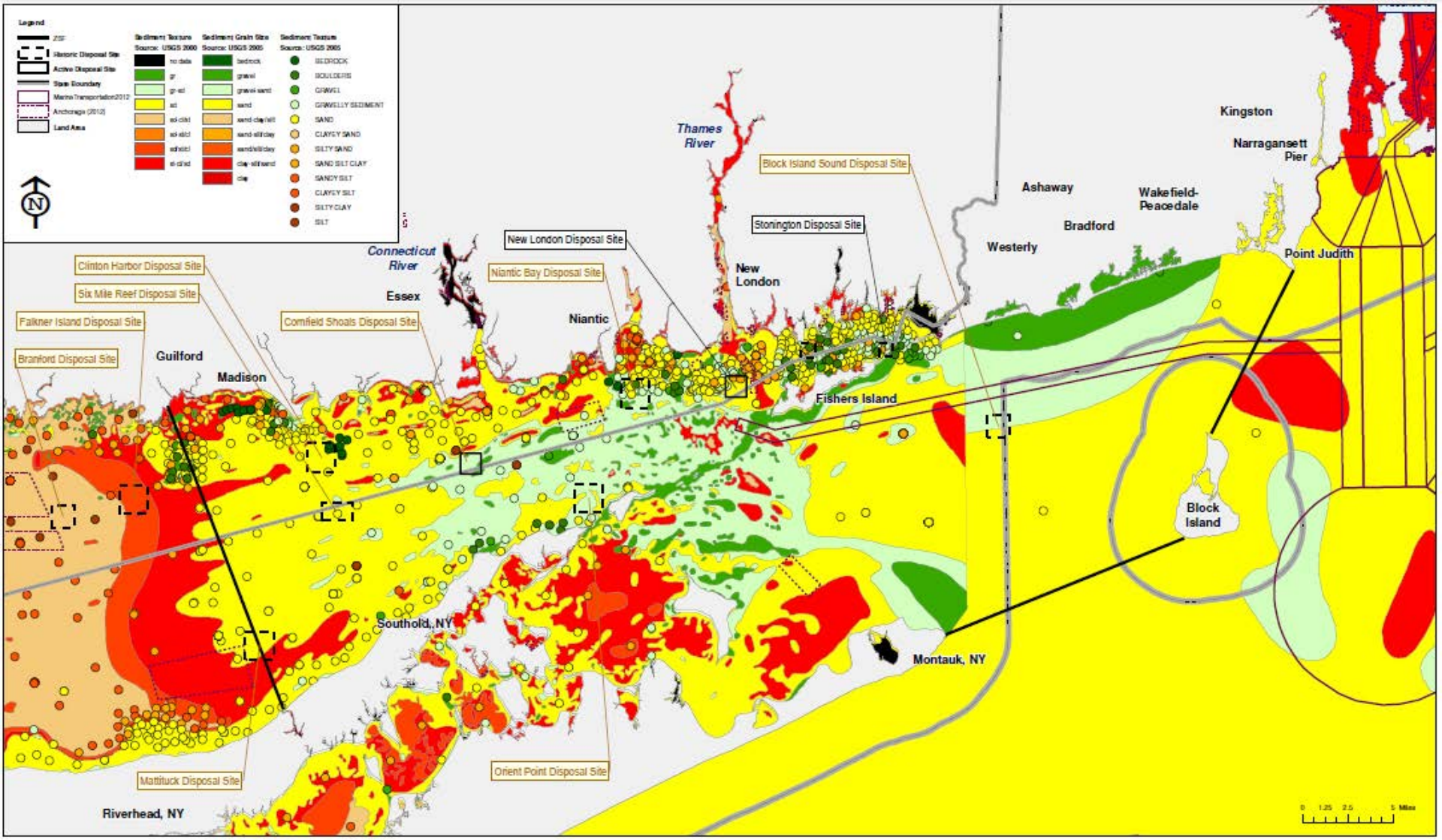


Tier 1: Bathymetry (>18 m)

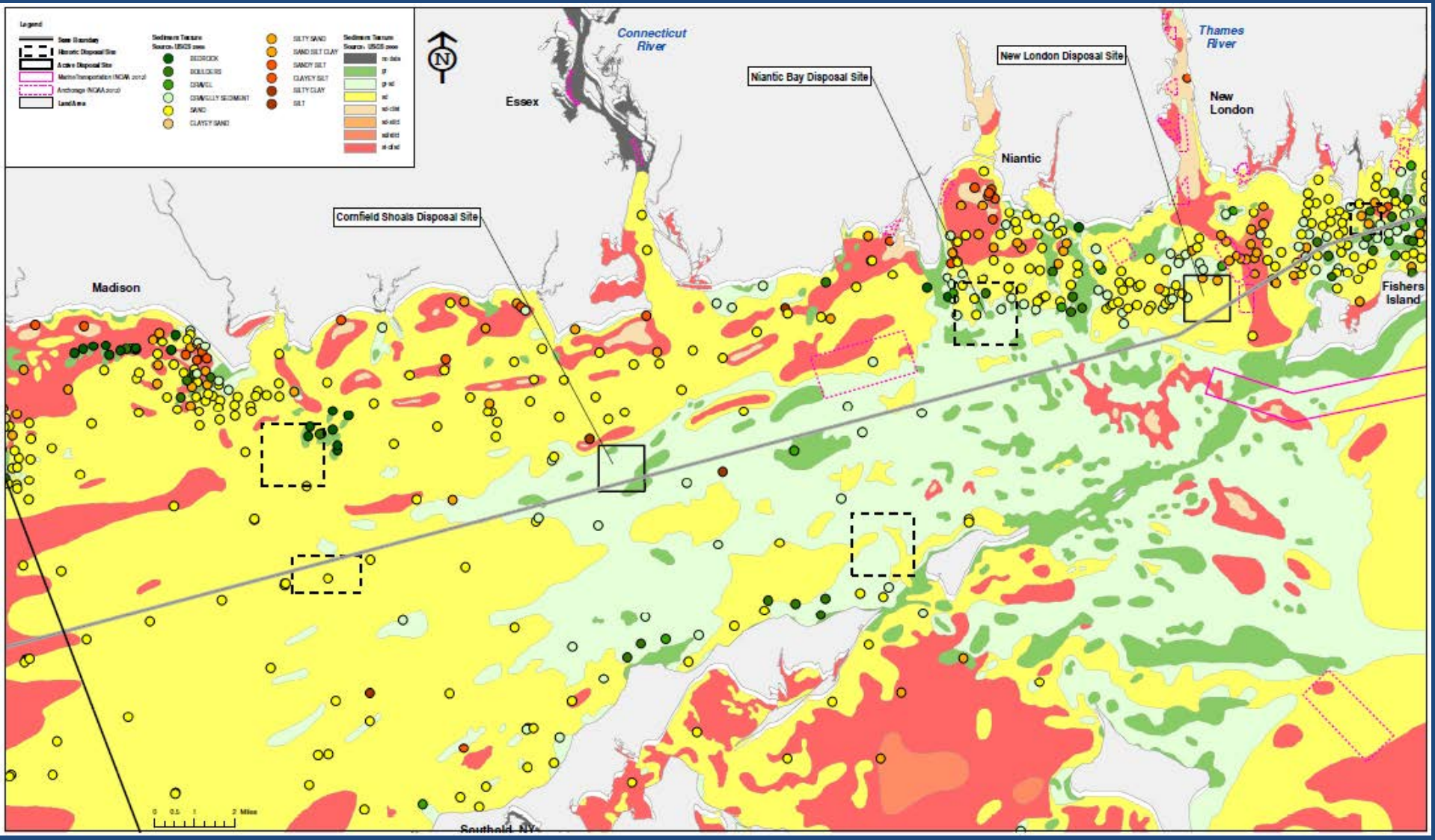


18m (60ft) and shallower was used as depth at which sites were not feasible for Western and Central LIS EIS.

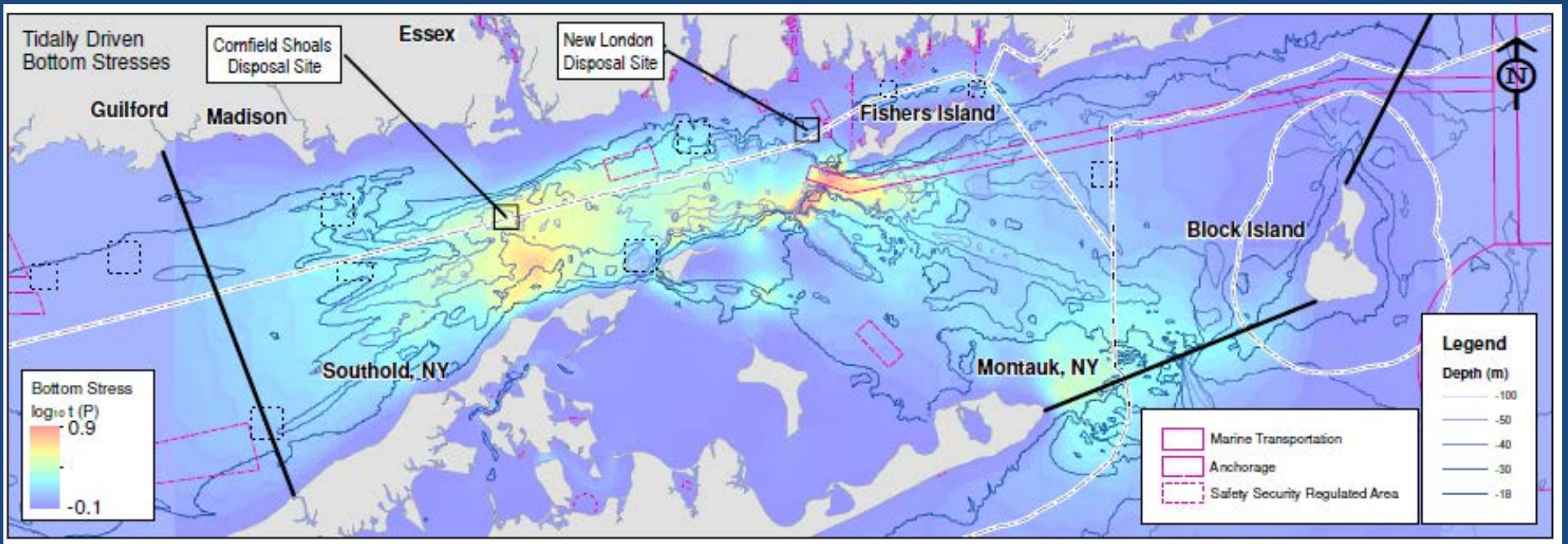
Tier 1: Sediment Characteristics (ZSF)

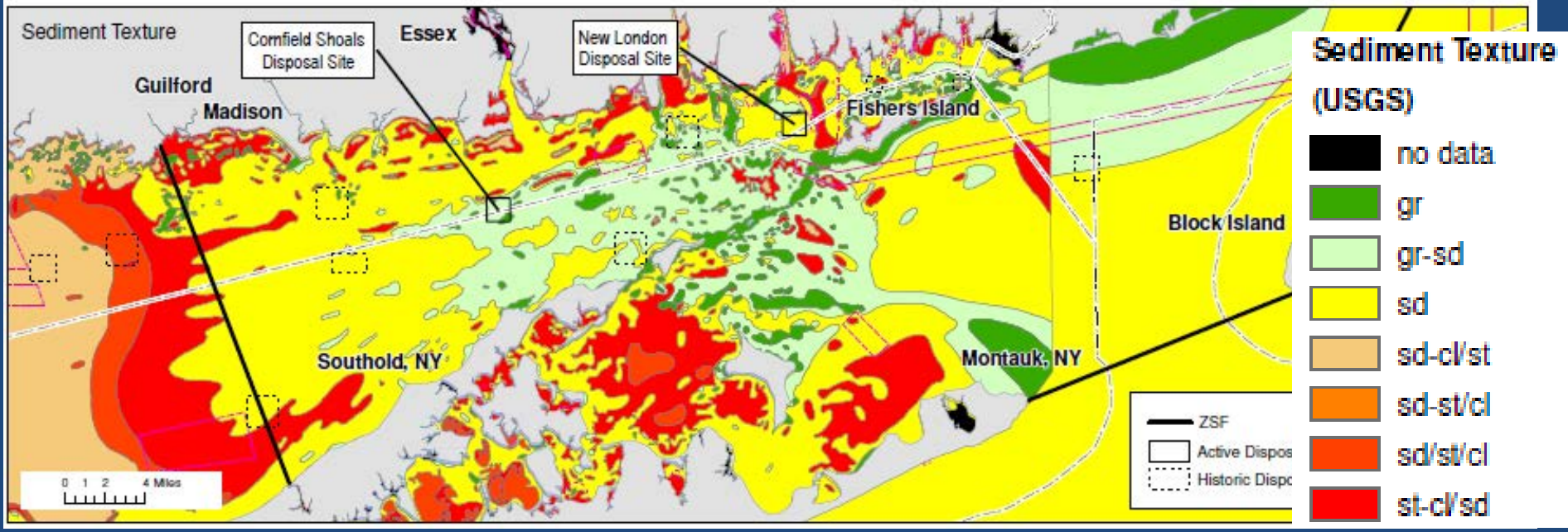


Tier 1: Sediment Characteristics (ELIS)

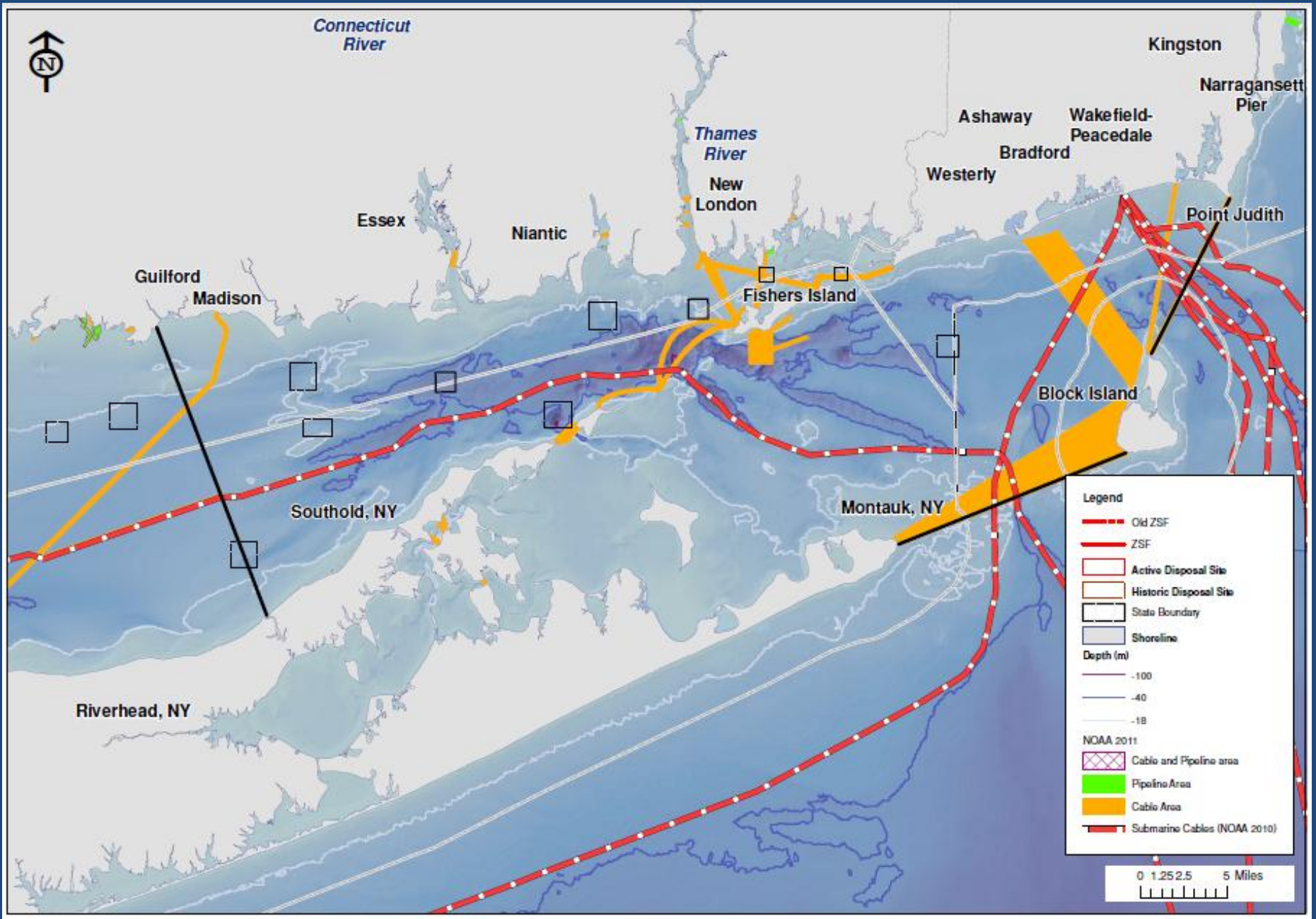


Tidally-Driven Bottom Stress and Sediment

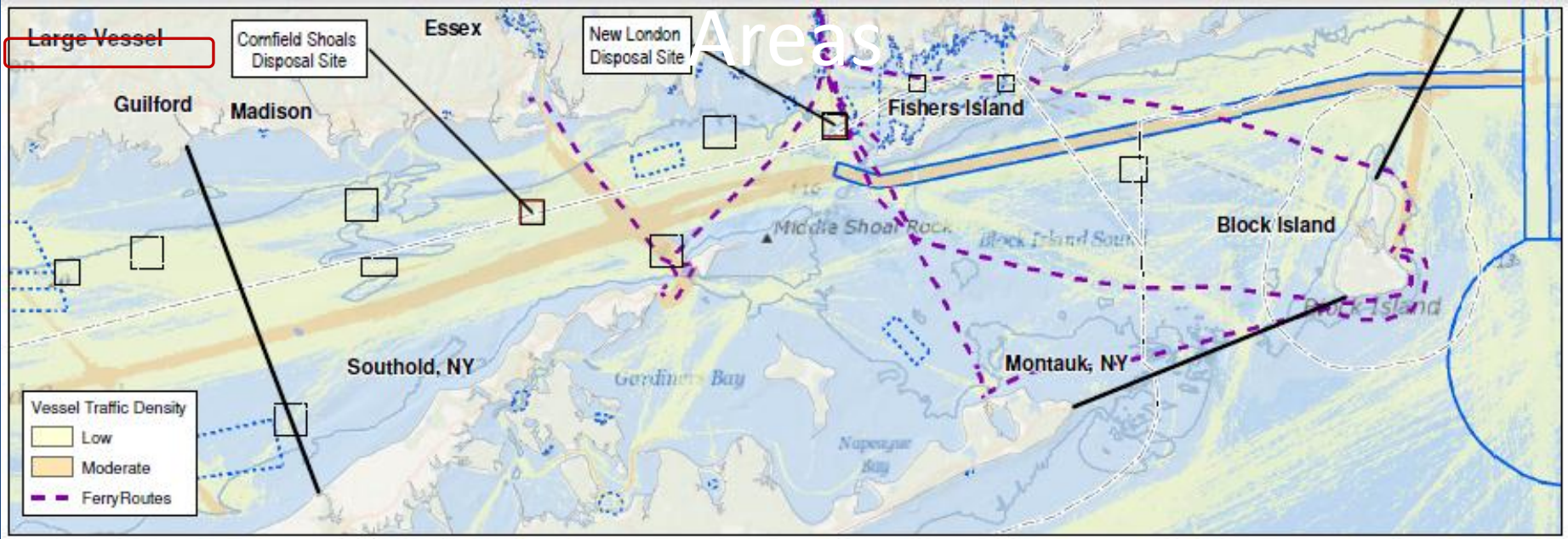


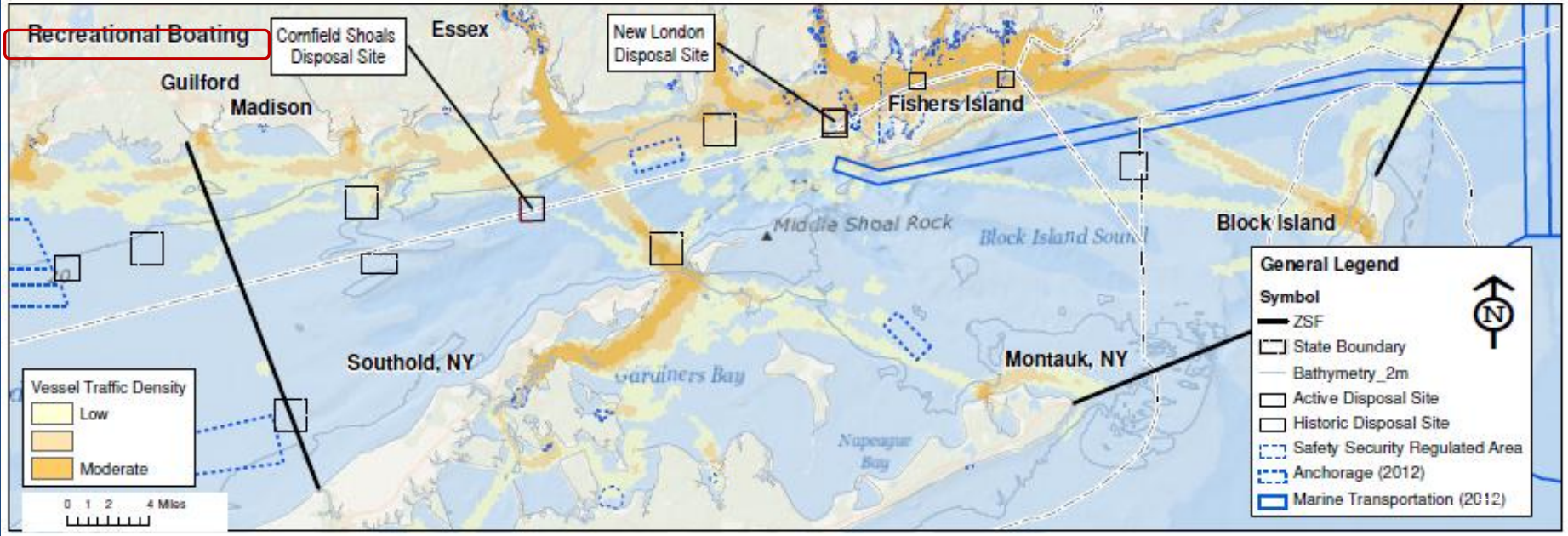


Tier 1: Cables and Pipelines



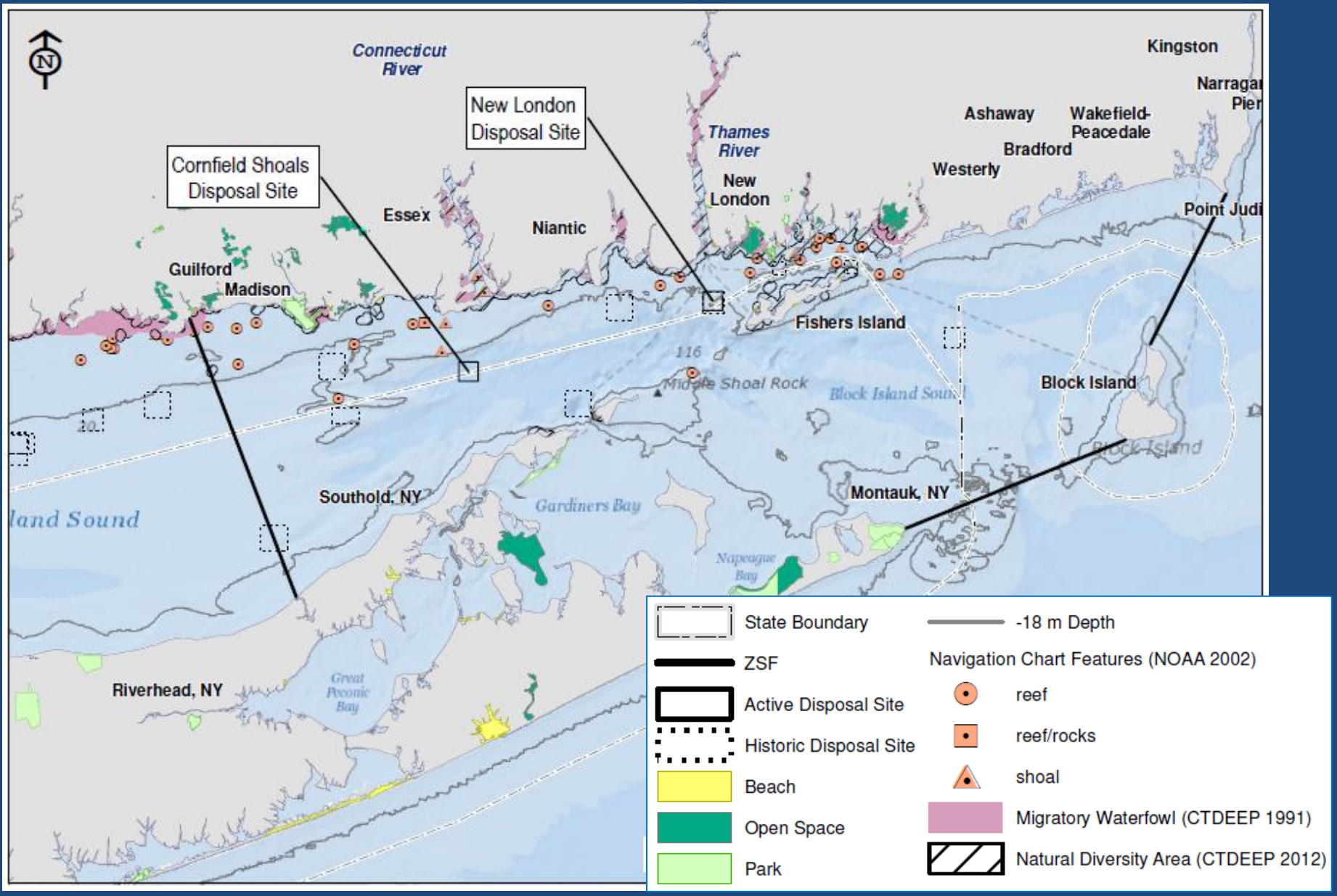
Tier 1: Vessel Traffic Density, Anchoring Areas



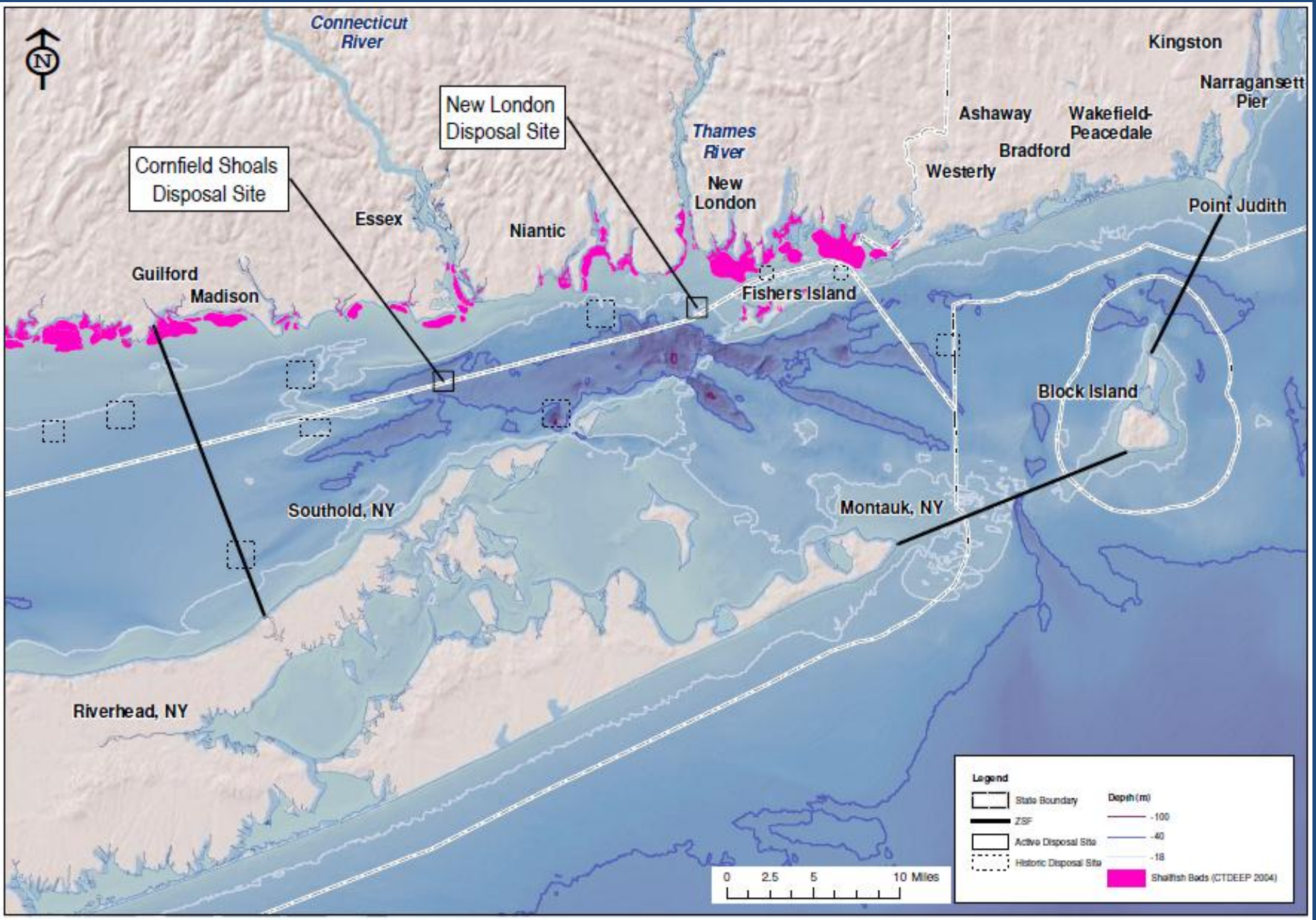


Tier 1: Conservation Areas (More data needed)

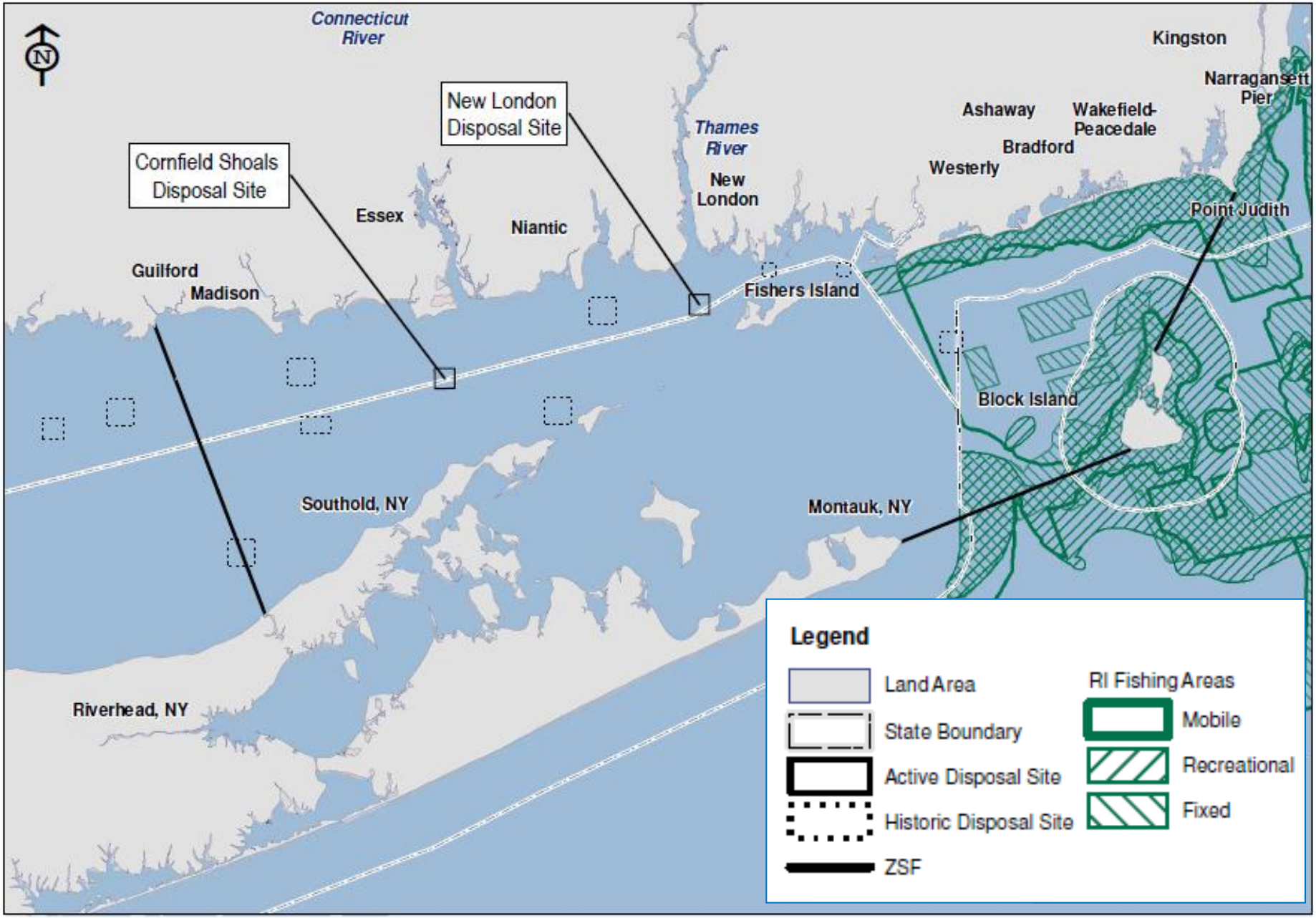
(sanctuaries, wildlife refuges, national seashores, parks, artificial reefs, etc.)



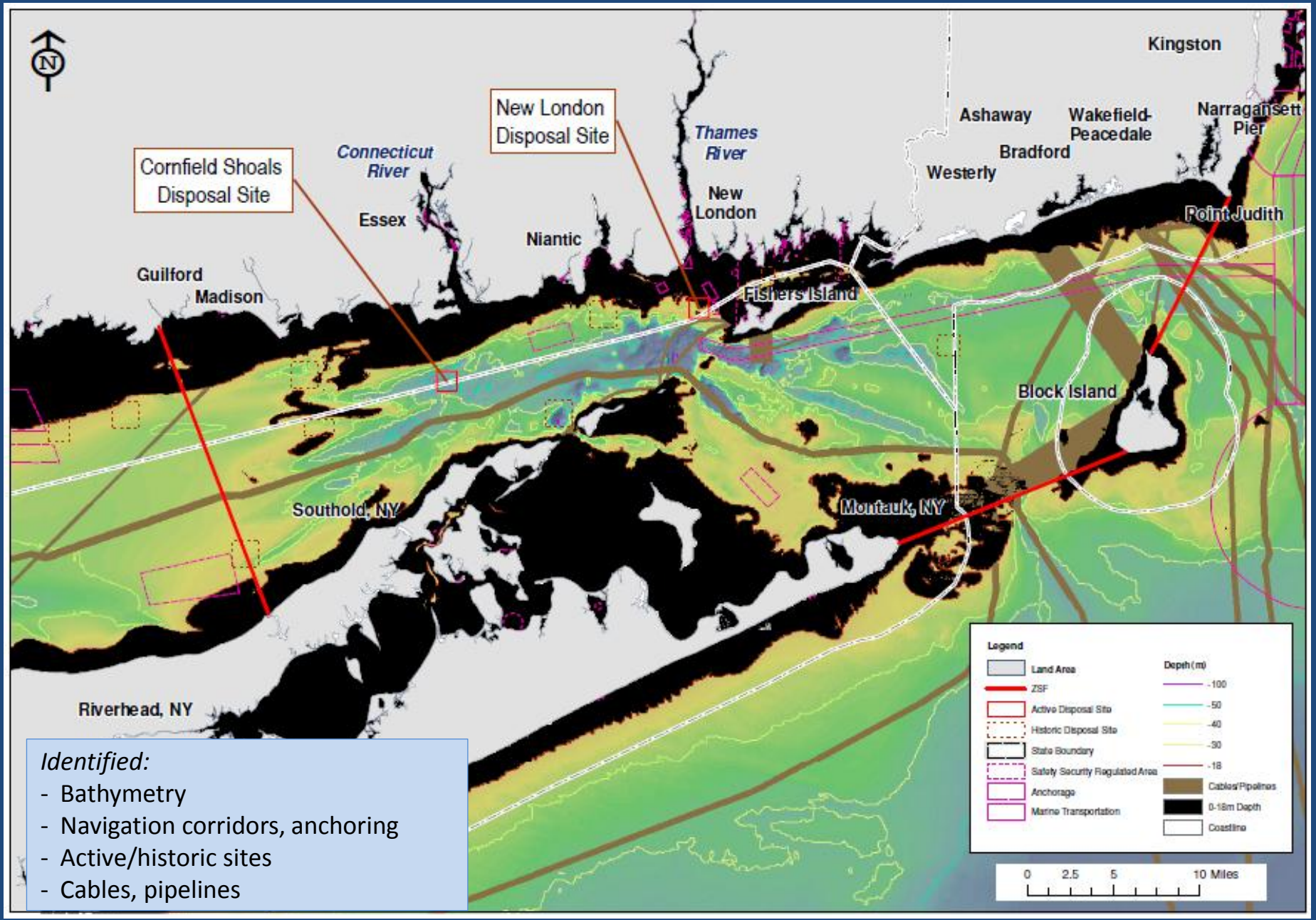
Tier 1: Shellfish Beds (NY+RI Data needed)



Tier 1: Fishing Areas (additional data needed)



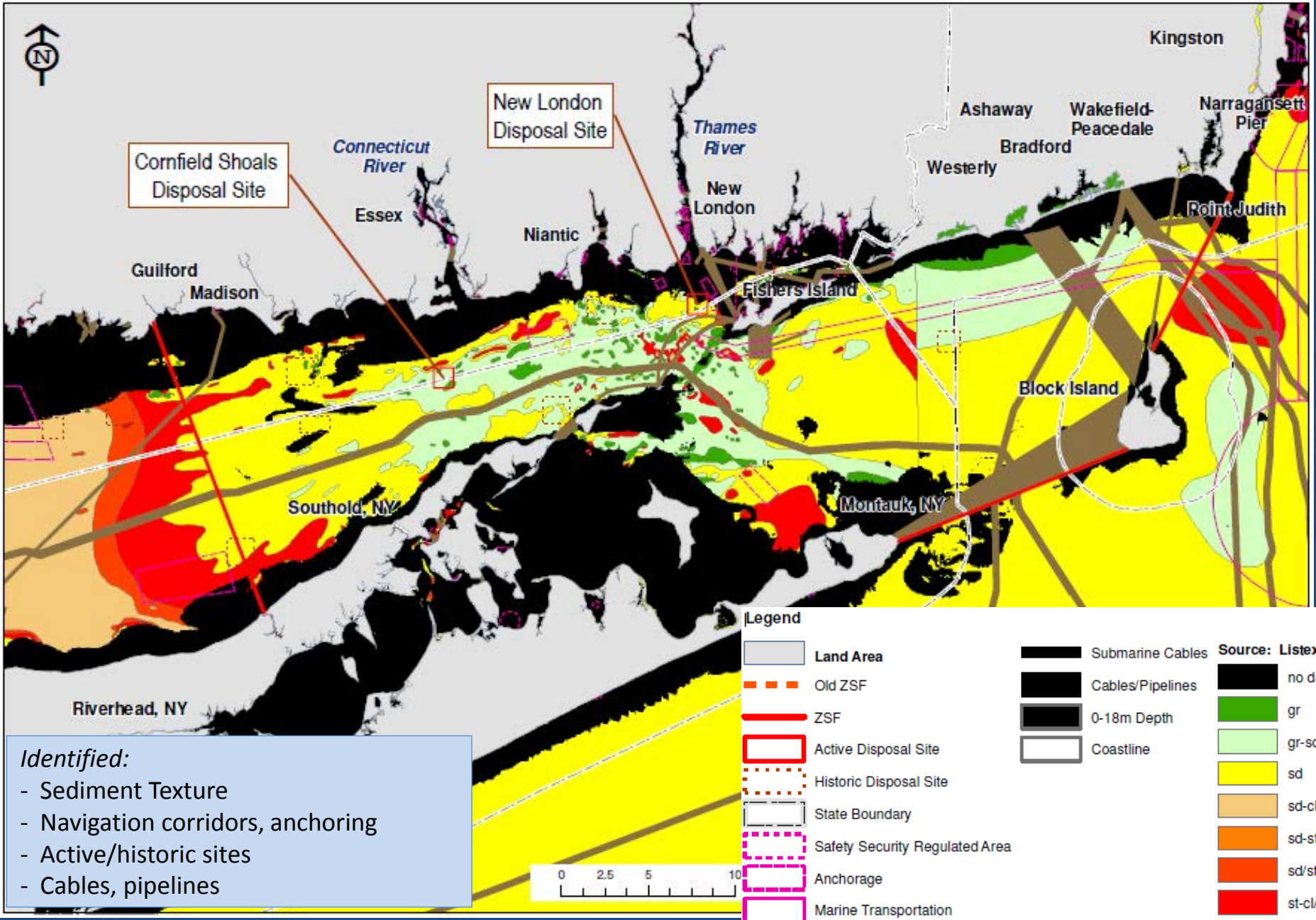
Tier 1 Overlay 1: Base - Bathymetry



Identified:

- Bathymetry
- Navigation corridors, anchoring
- Active/historic sites
- Cables, pipelines

Tier 1 Overlay 2: Base - Sediment Texture

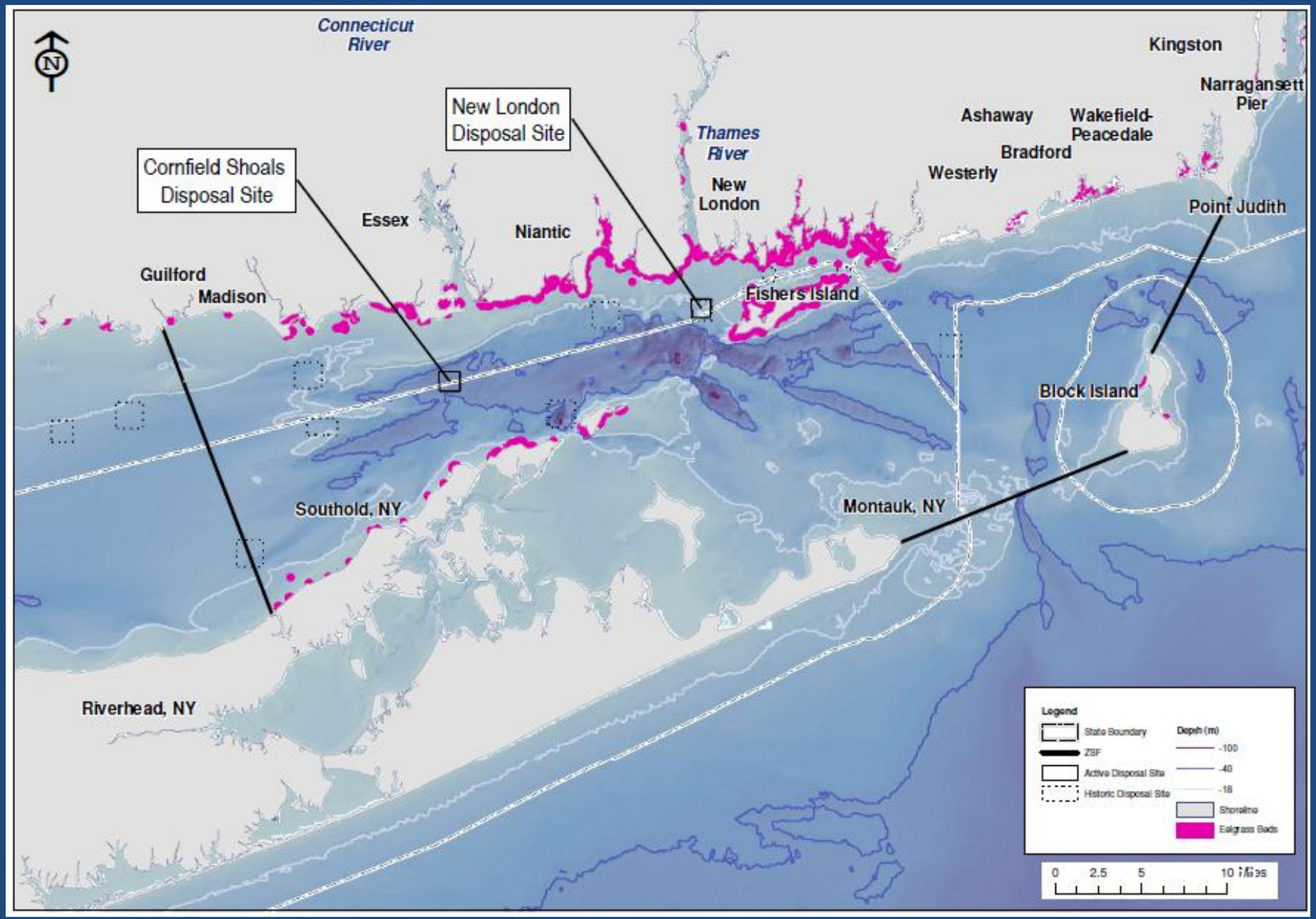


Identified:
- Sediment Texture
- Navigation corridors, anchoring
- Active/historic sites
- Cables, pipelines

Tier 2: Key Screening Criteria

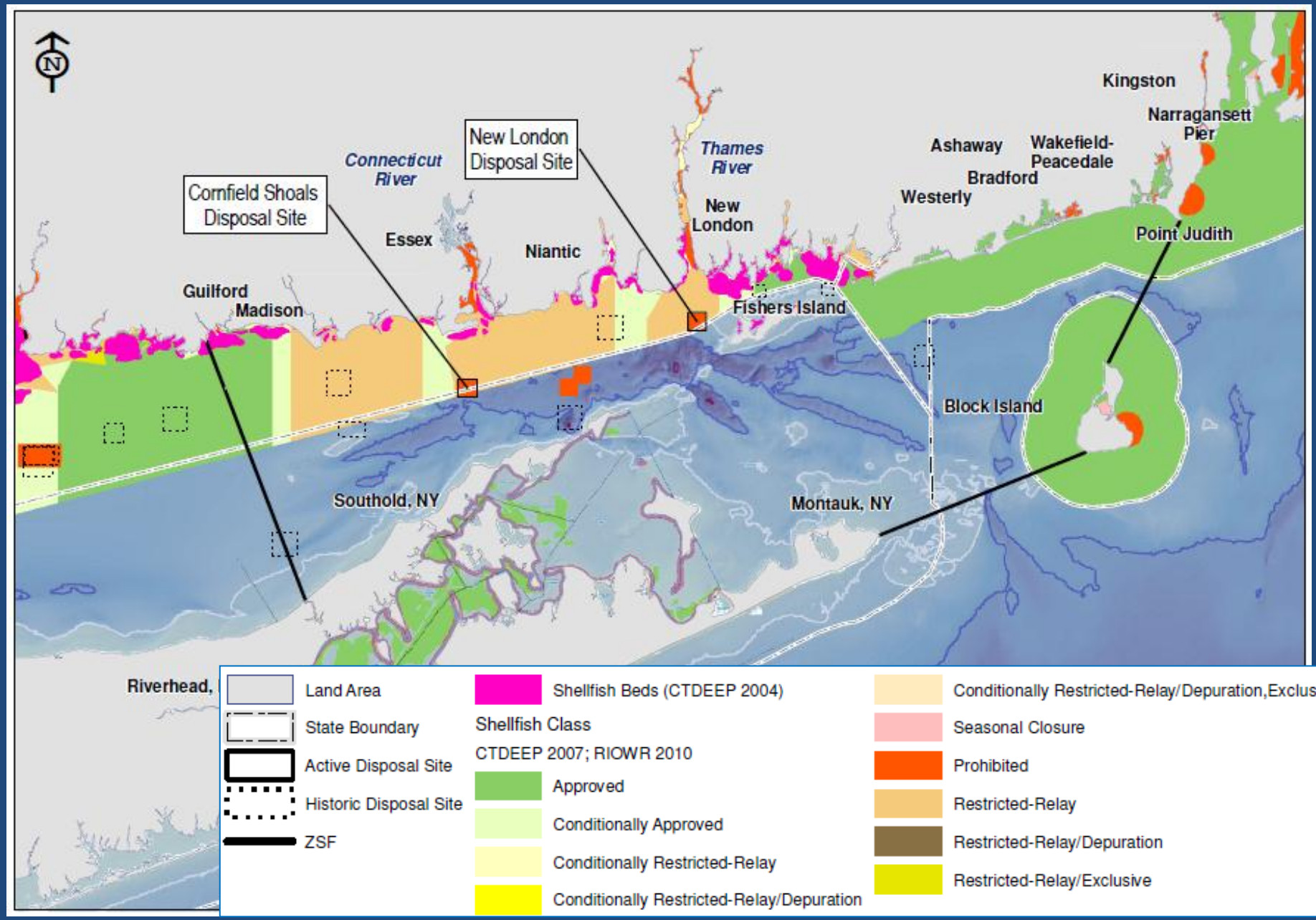
- Biological Resources
  - Eelgrass Beds
  - Shellfish Zoning
  - Essential Fish Habitat
- Active/Historic Disposal Site vs. New Sites
- Historic and Cultural Resources
- Recreation
  - Recreational Navigation
  - Proximity to Beaches

Tier 2: Eelgrass Beds

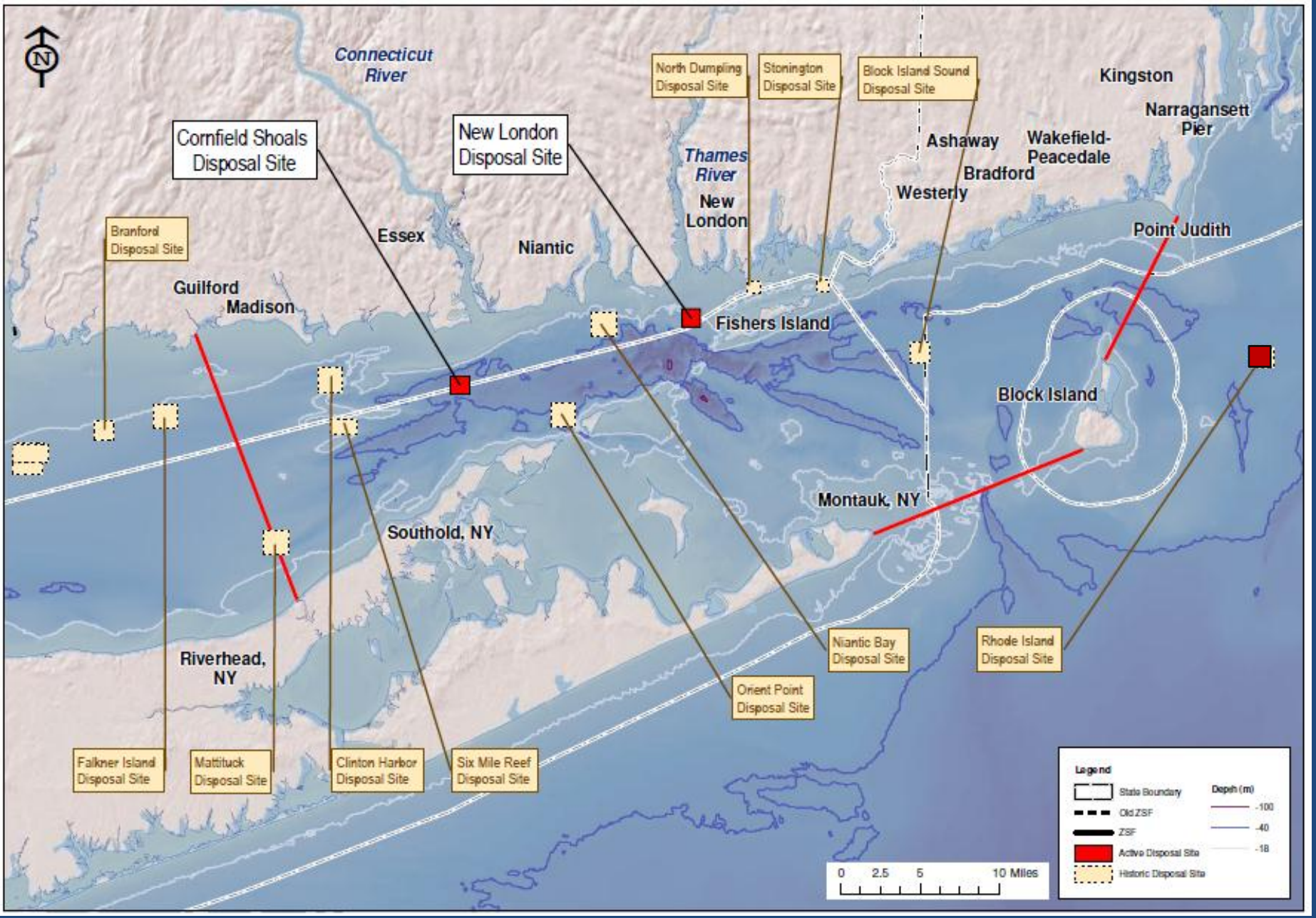


Tier 2: Approved/ Prohibited Shellfish Areas

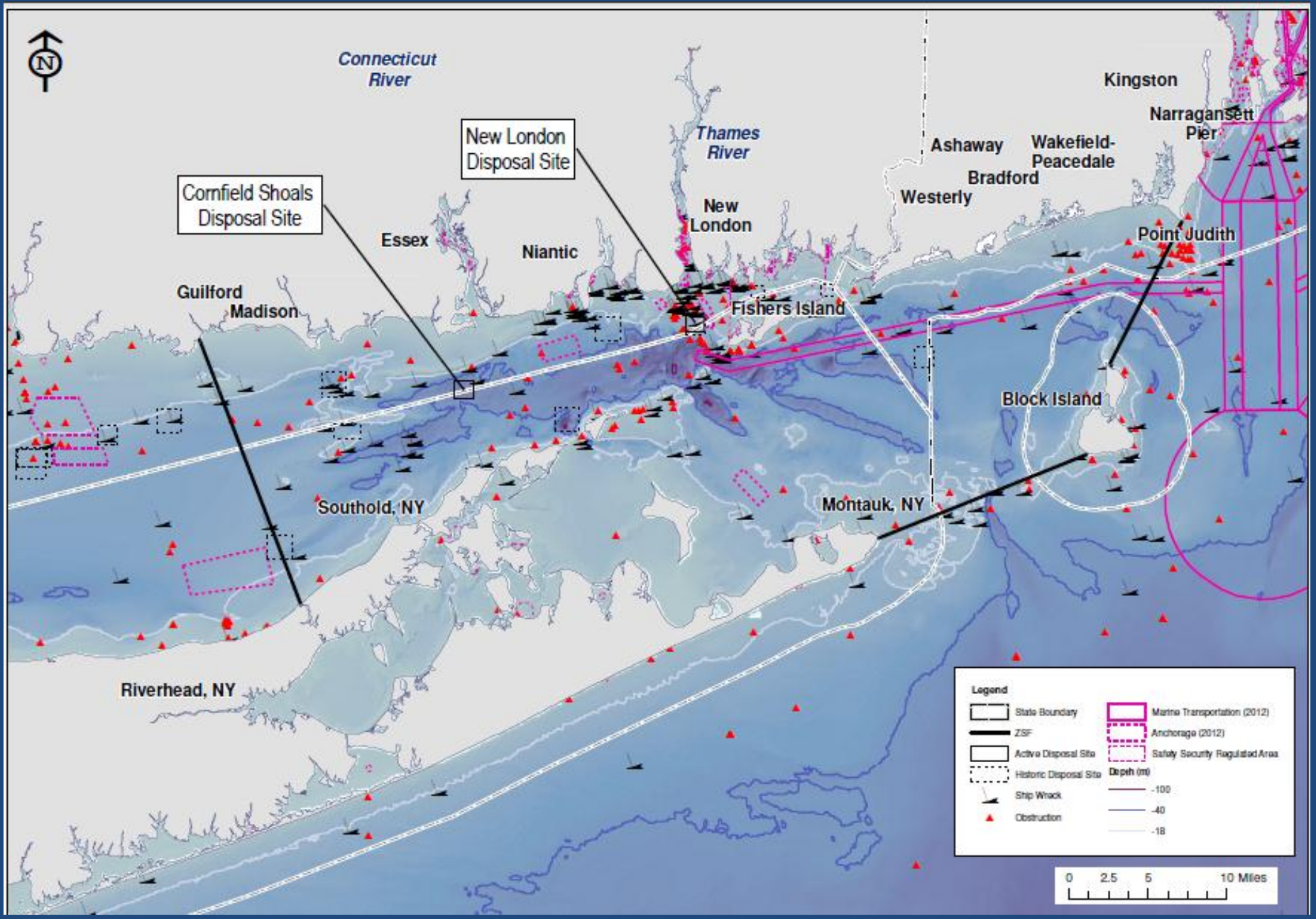
(additional NY data needed)



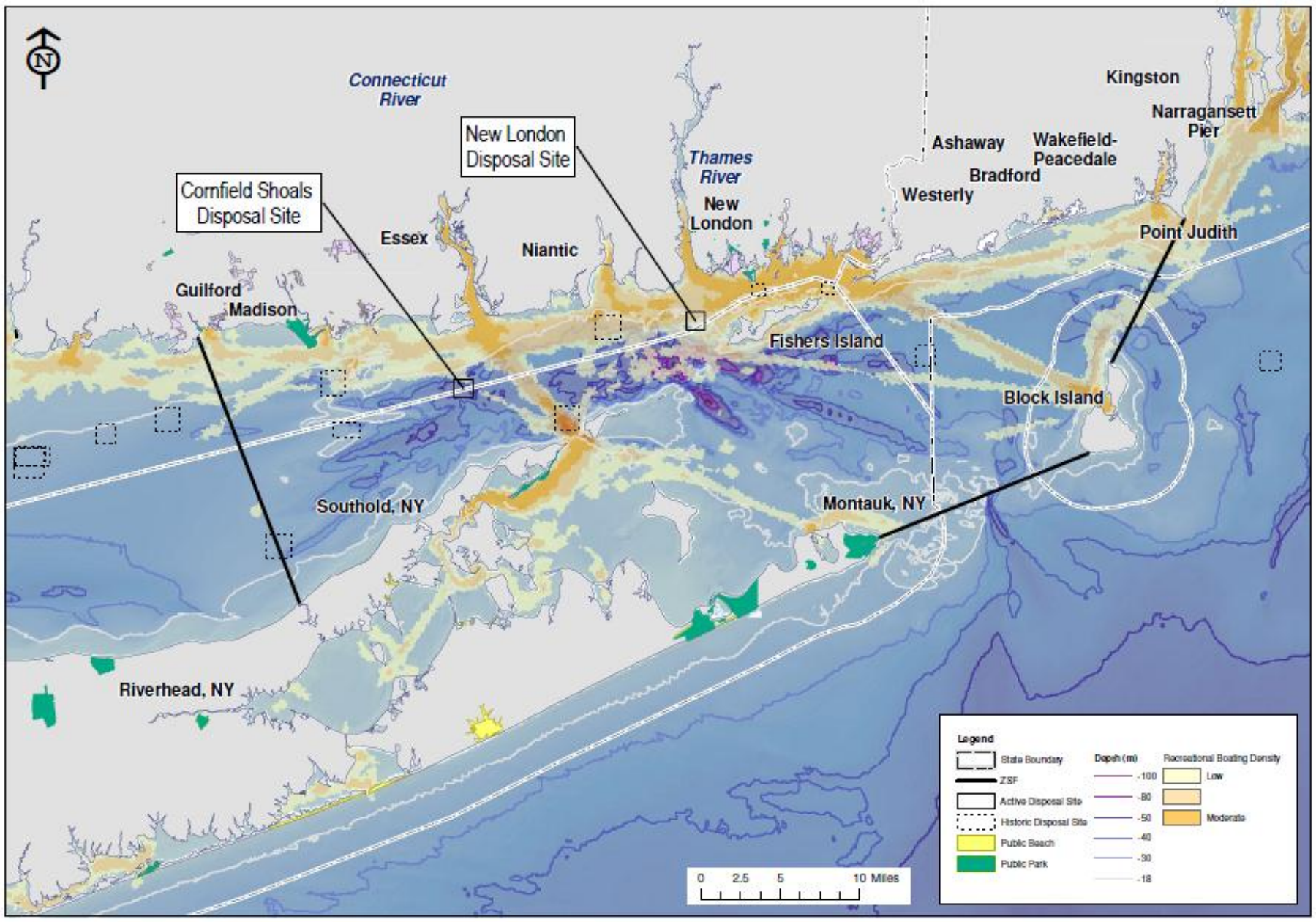
Tier 2: Active and Historic Disposal Sites



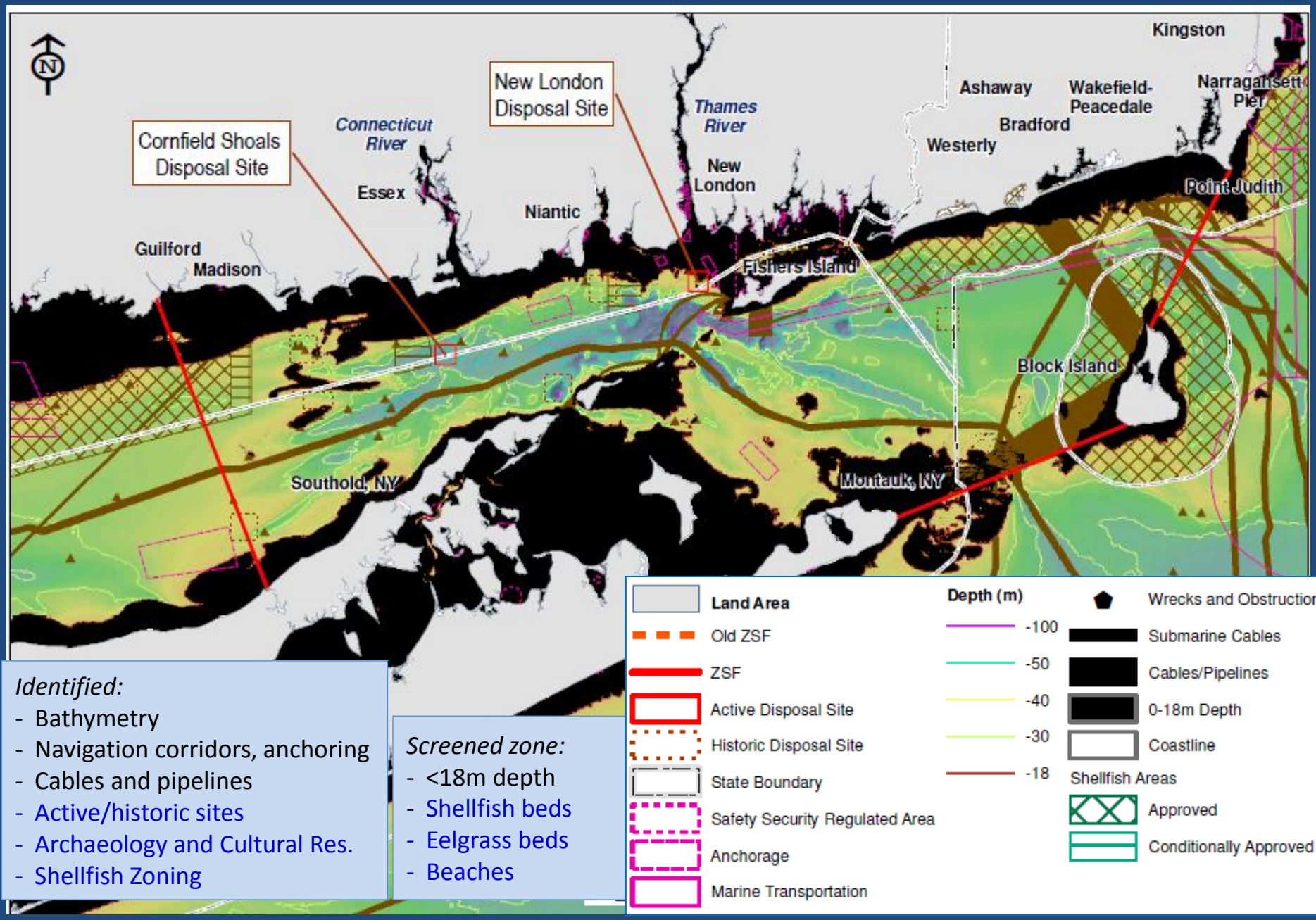
Tier 2: Archaeological and Cultural Resources



Tier 2: Recreational Areas and Navigation



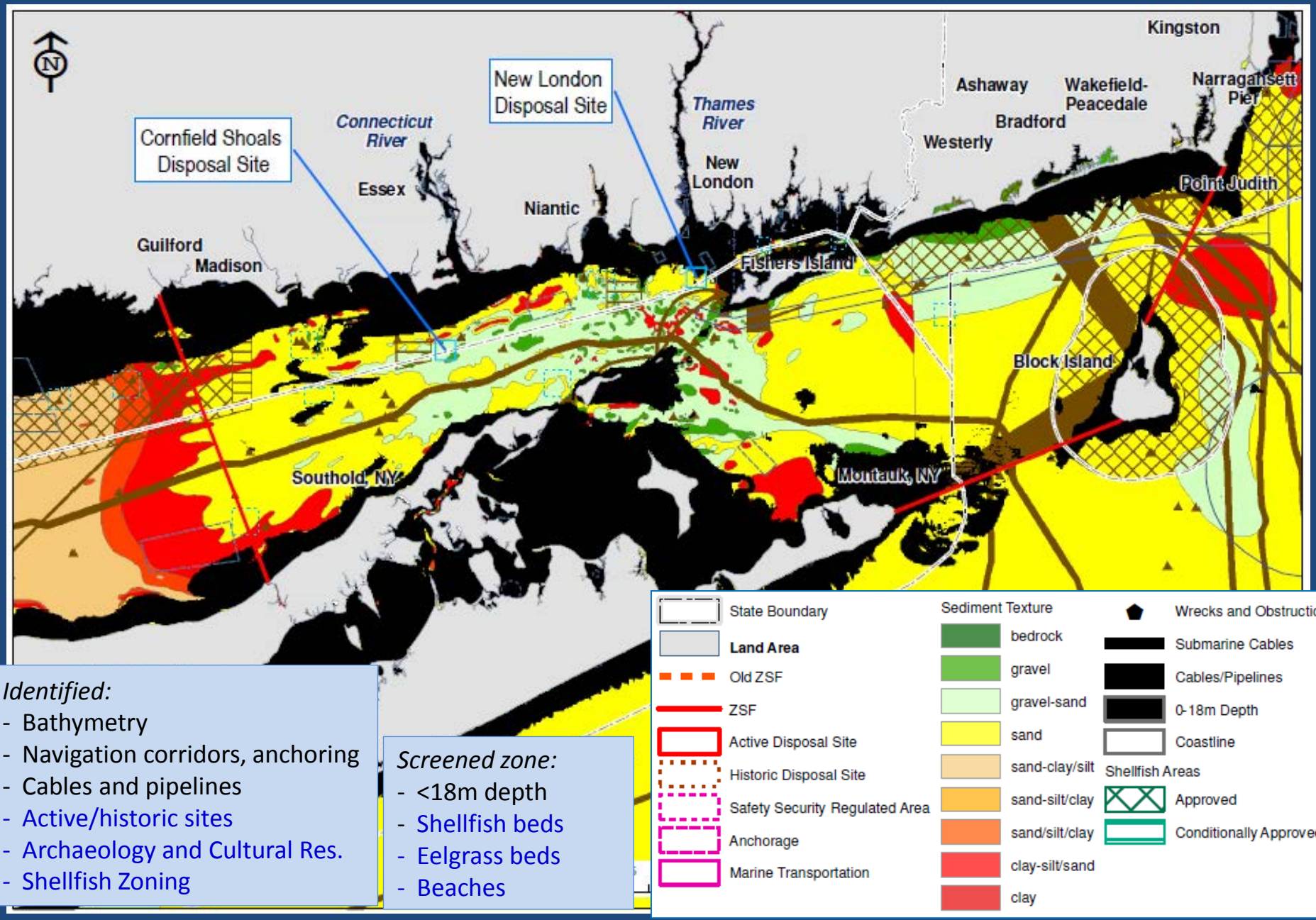
Tier 2 Overlay 1: Base - Bathymetry



Identified:
- Bathymetry
- Navigation corridors, anchoring
- Cables and pipelines
- Active/historic sites
- Archaeology and Cultural Res.
- Shellfish Zoning

Screened zone:
- <18m depth
- Shellfish beds
- Eelgrass beds
- Beaches

Tier 2 Overlay 2: Base - Sediment Texture



Identified:
- Bathymetry
- Navigation corridors, anchoring
- Cables and pipelines
- Active/historic sites
- Archaeology and Cultural Res.
- Shellfish Zoning

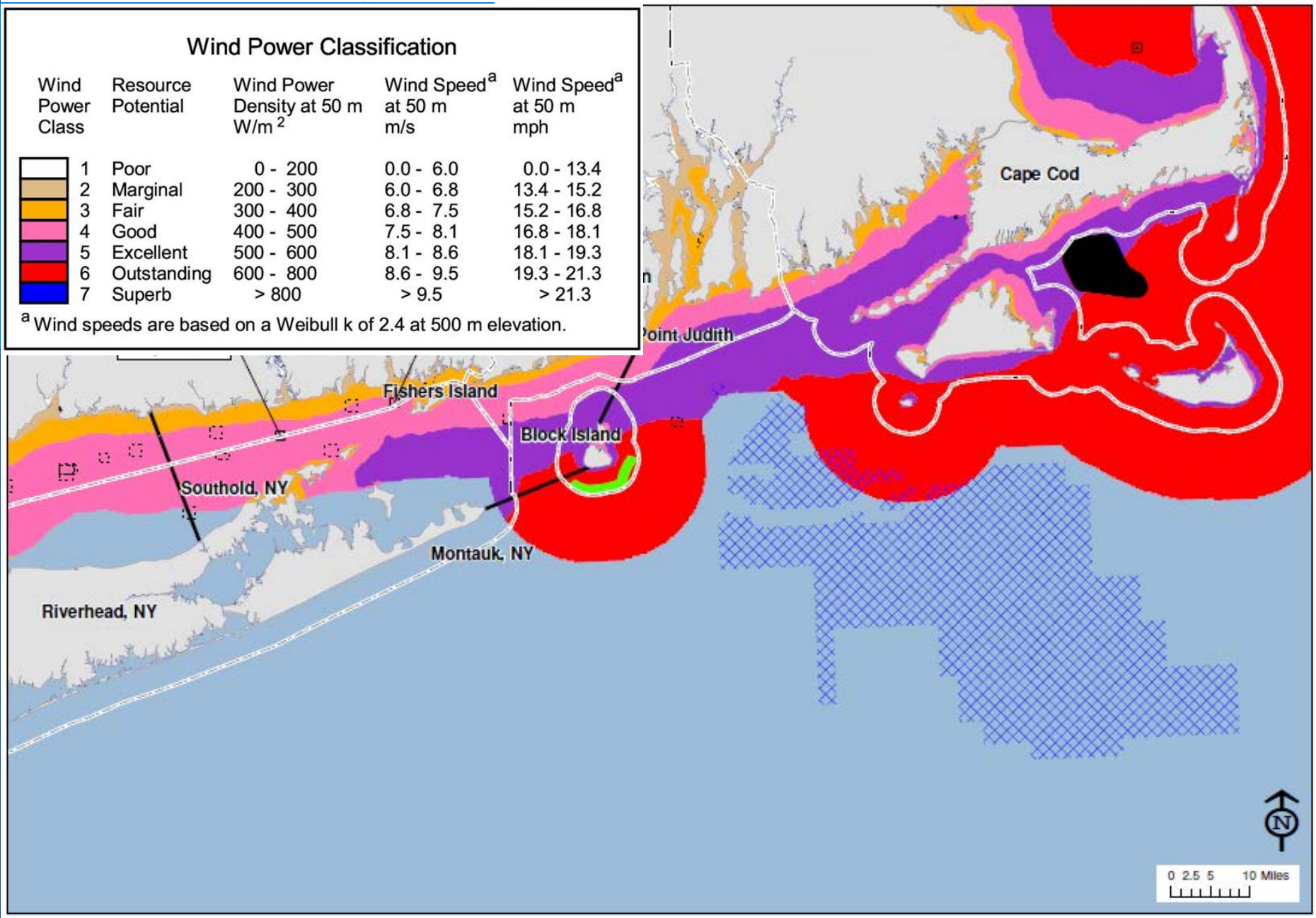
Screened zone:
- <18m depth
- Shellfish beds
- Eelgrass beds
- Beaches

Alternative Energy – Wind

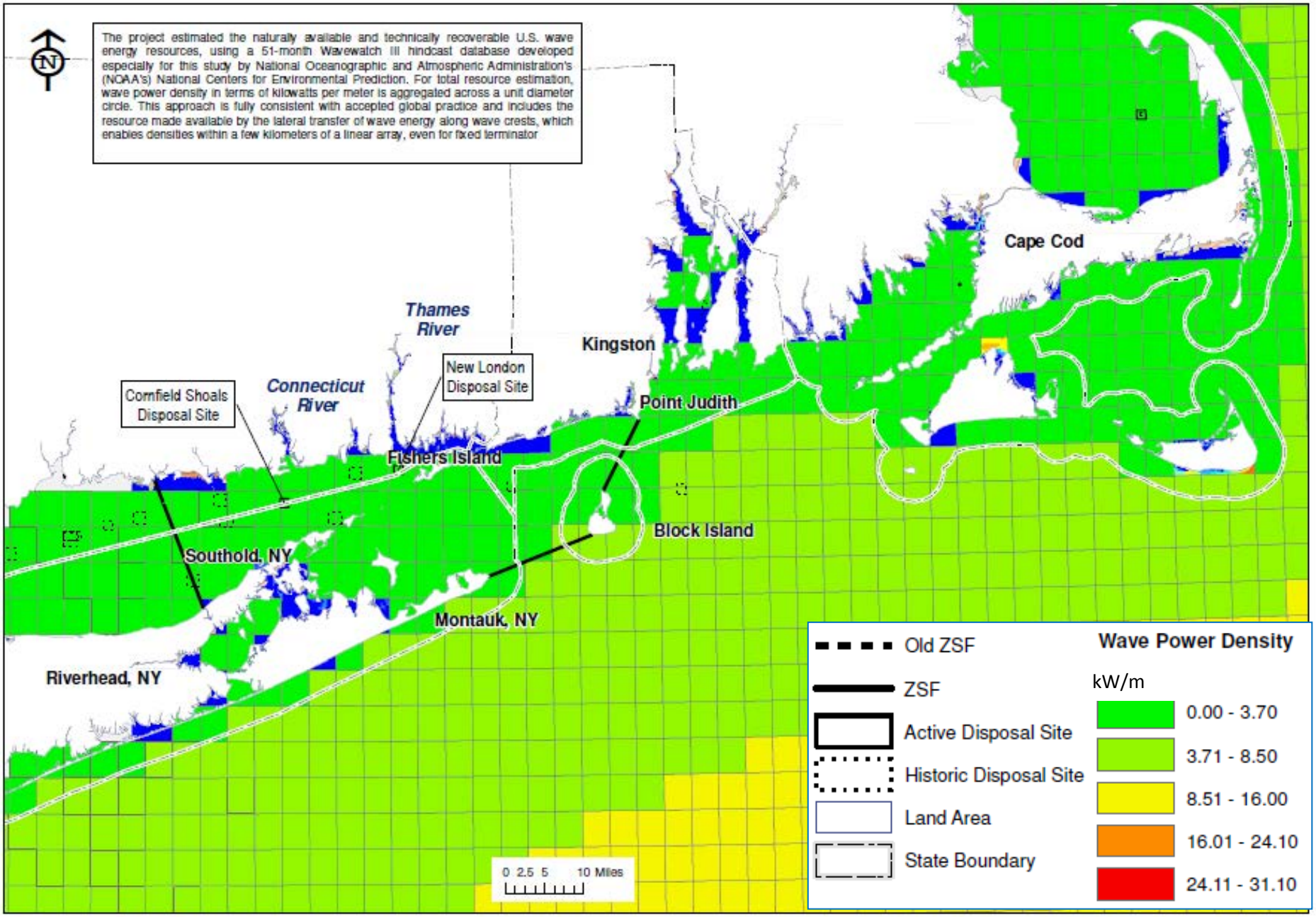
Wind Power Classification

Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m 2	Wind Speed[a] at 50 m m/s	Wind Speed[a] at 50 m mph
1	Poor	0 - 200	0.0 - 6.0	0.0 - 13.4
2	Marginal	200 - 300	6.0 - 6.8	13.4 - 15.2
3	Fair	300 - 400	6.8 - 7.5	15.2 - 16.8
4	Good	400 - 500	7.5 - 8.1	16.8 - 18.1
5	Excellent	500 - 600	8.1 - 8.6	18.1 - 19.3
6	Outstanding	600 - 800	8.6 - 9.5	19.3 - 21.3
7	Superb	> 800	> 9.5	> 21.3

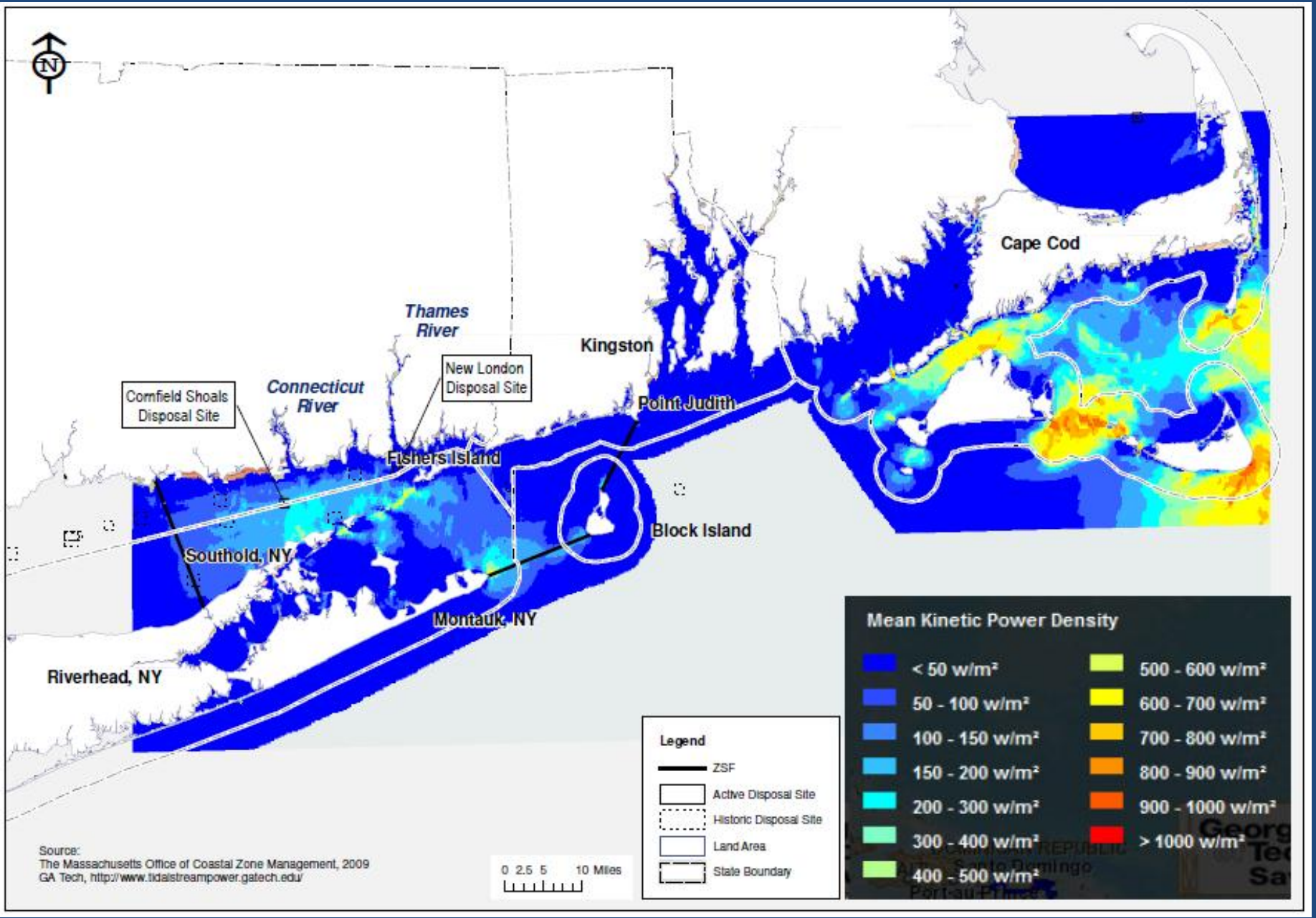
[a] Wind speeds are based on a Weibull k of 2.4 at 500 m elevation.



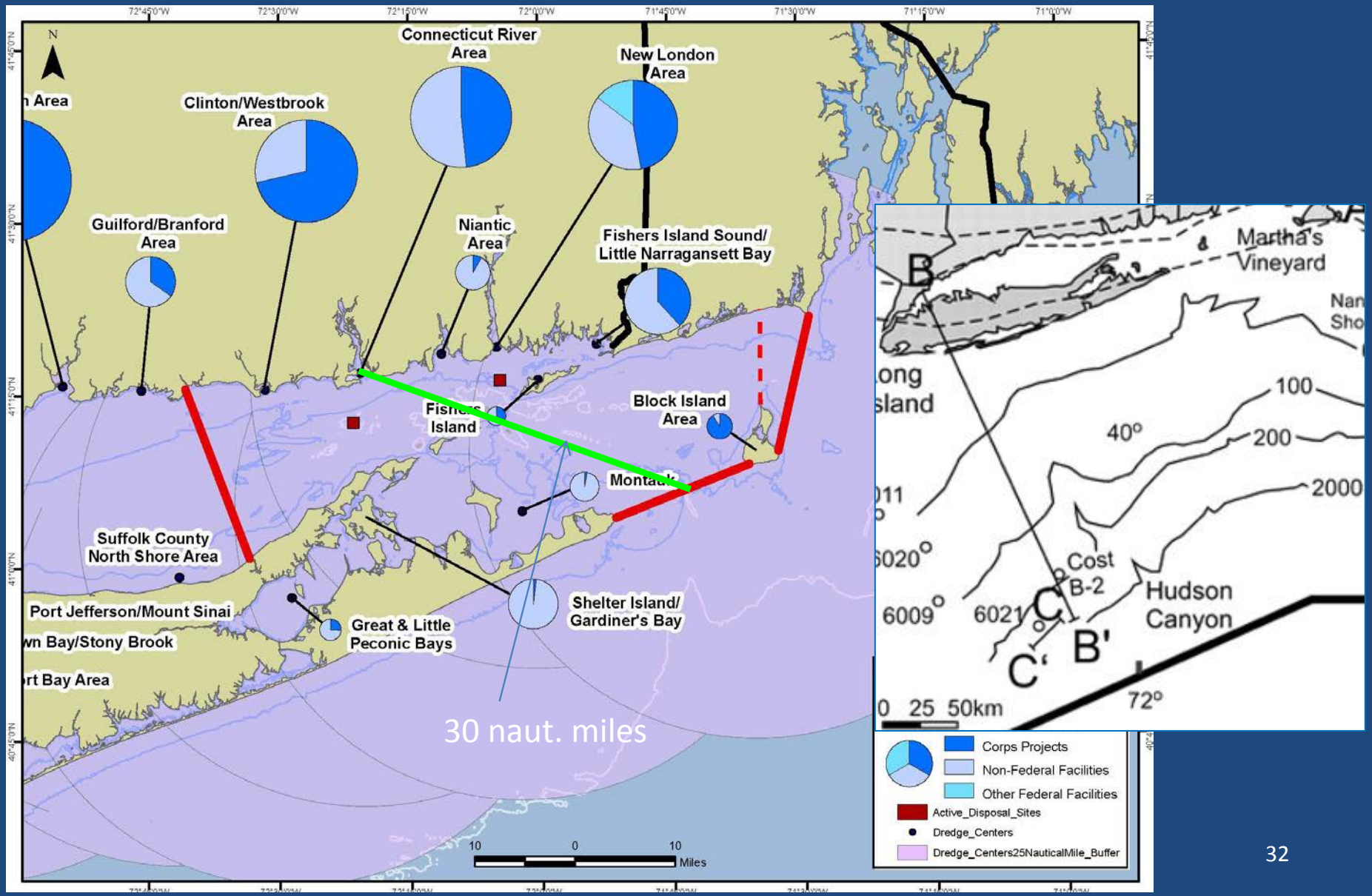
Alternative Energy – Wave



Alternative Energy – Tidal



Continental Shelf and Areas within 25 nm of Dredging Centers

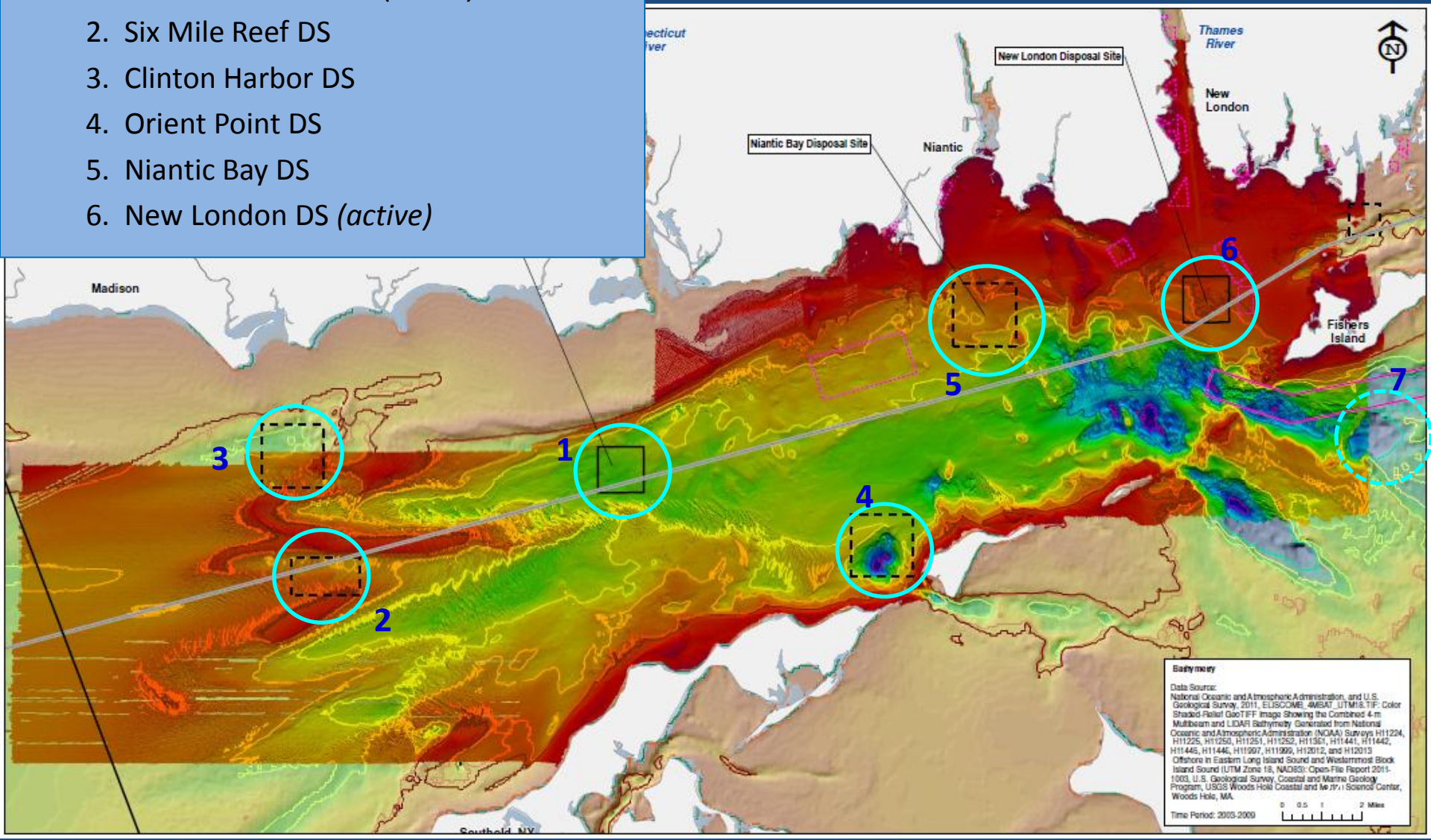


Alternative Site Discussion

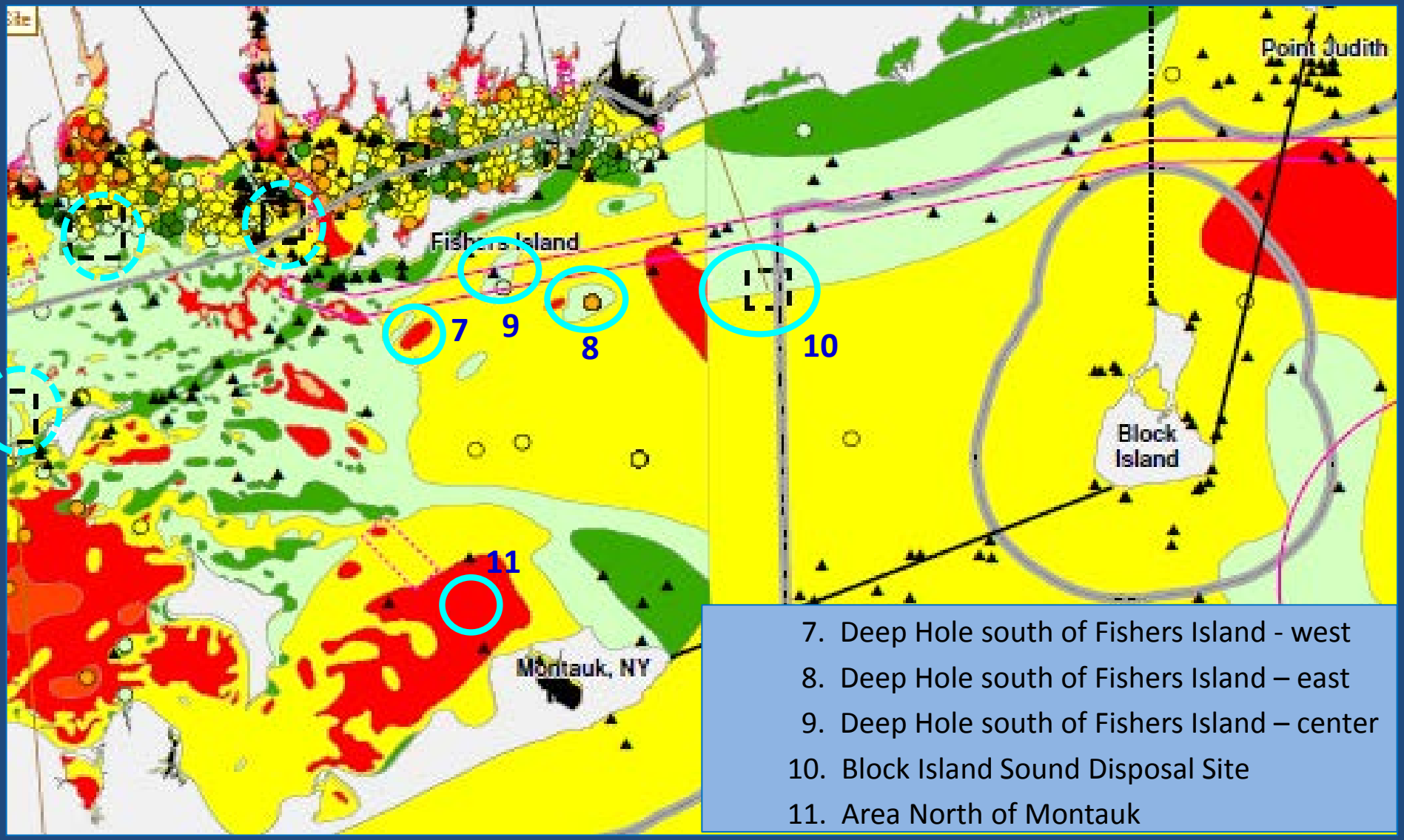
- Site Characteristics
- Valuable Marine Habitats
  - Gravel and hardbottom areas were identified previously as important to maintain
- Conservation Areas
- Economy, Safety, and Environment
- Active/Historic vs New Disposal Areas

Alternative Site Discussion: Eastern Long Island Sound

1. Cornfield Shoals DS (*active)*
2. Six Mile Reef DS
3. Clinton Harbor DS
4. Orient Point DS
5. Niantic Bay DS
6. New London DS *(active)*



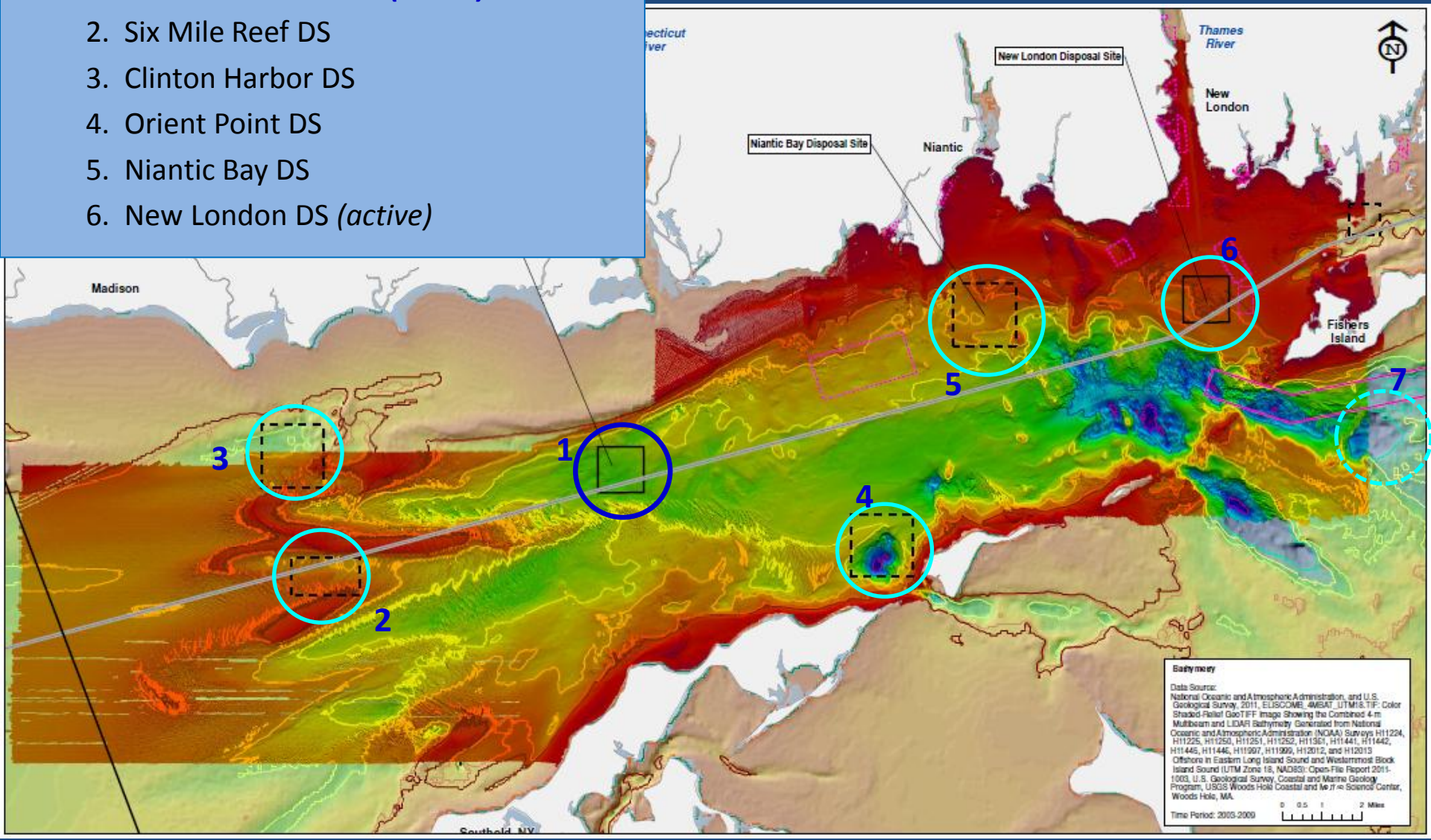
Alternative Site Discussion: Block Island Sound



7. Deep Hole south of Fishers Island - west
8. Deep Hole south of Fishers Island – east
9. Deep Hole south of Fishers Island – center
10. Block Island Sound Disposal Site
11. Area North of Montauk

Alternative Site Discussion: Eastern Long Island Sound *(cont.)*

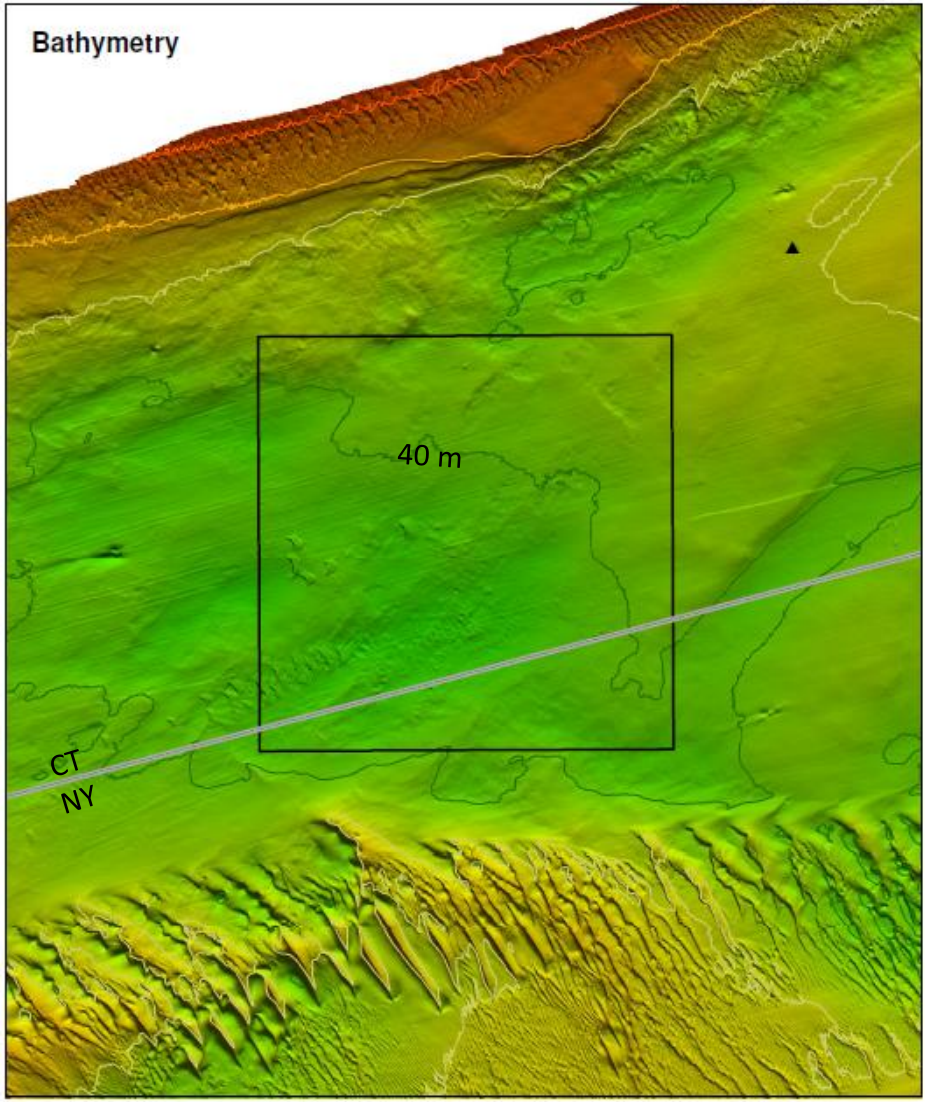
1. **Cornfield Shoals DS (*active*)**
2. Six Mile Reef DS
3. Clinton Harbor DS
4. Orient Point DS
5. Niantic Bay DS
6. New London DS *(active)*

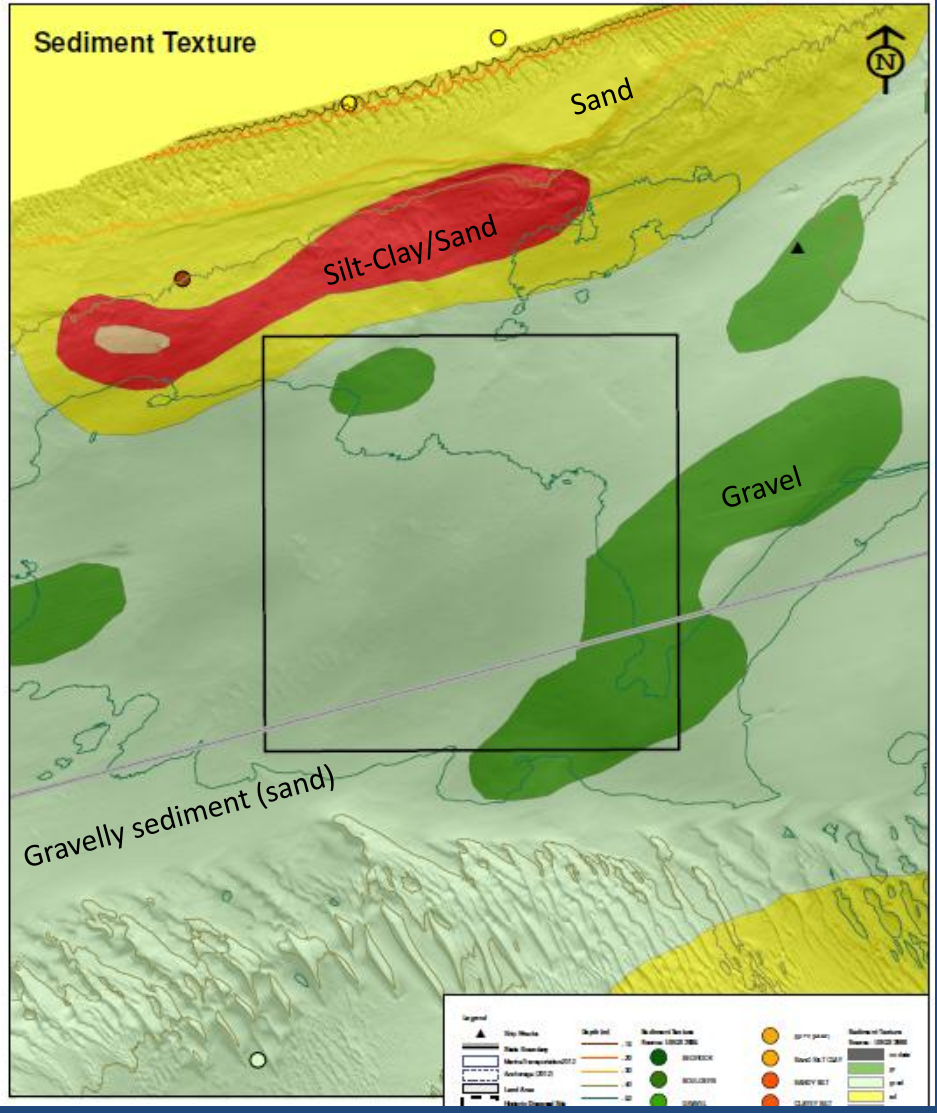


1. Cornfield Shoals Disposal Site

+ Deep area (150 ft)
+ Long Sand Shoal to north
+ Near dredging centers
+ Active site

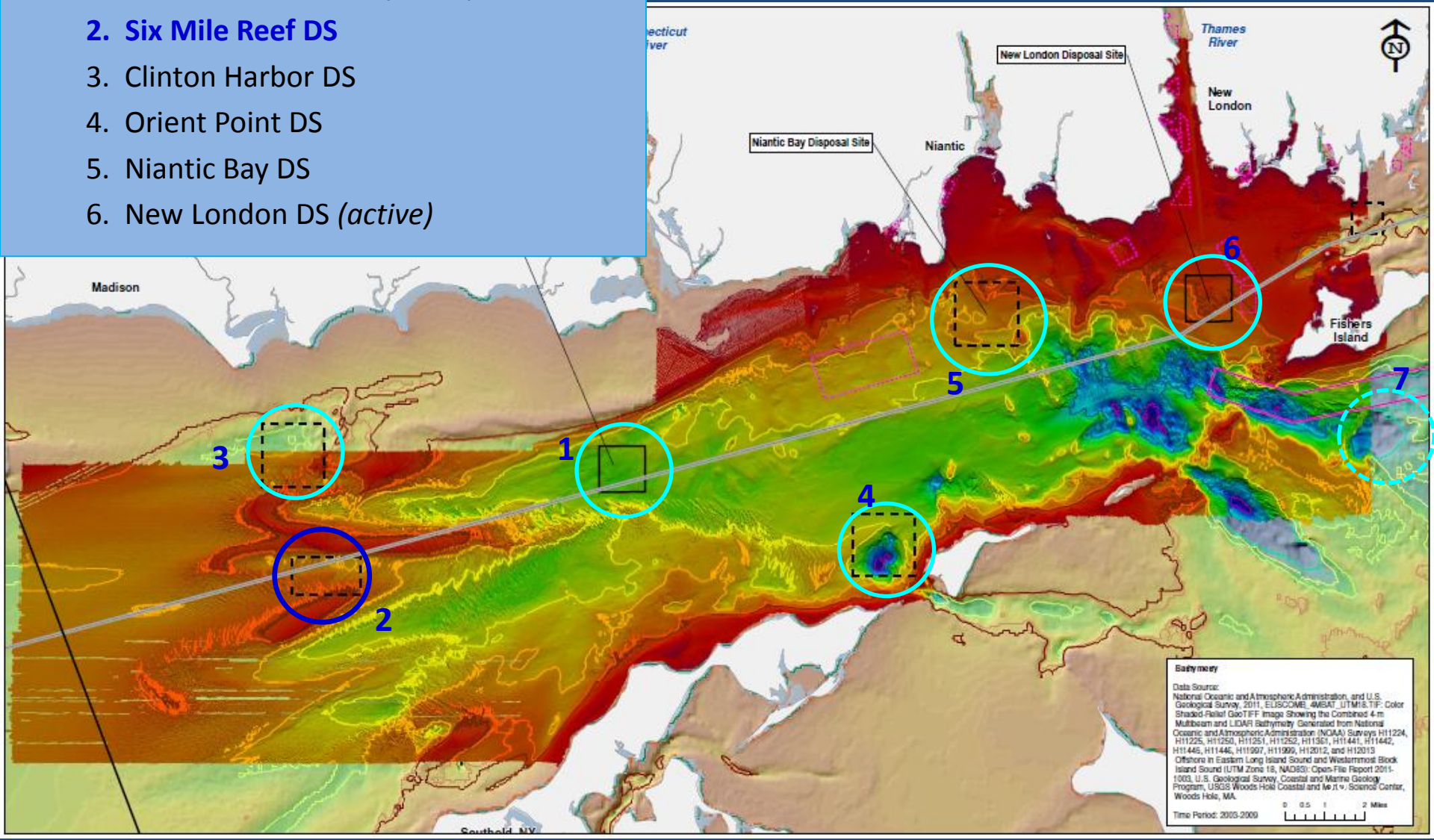
o Zoned for restricted shellfishing (CT)
- Gravelly sand
o Transport direction WSW-ENE





Alternative Site Discussion: Eastern Long Island Sound *(cont.)*

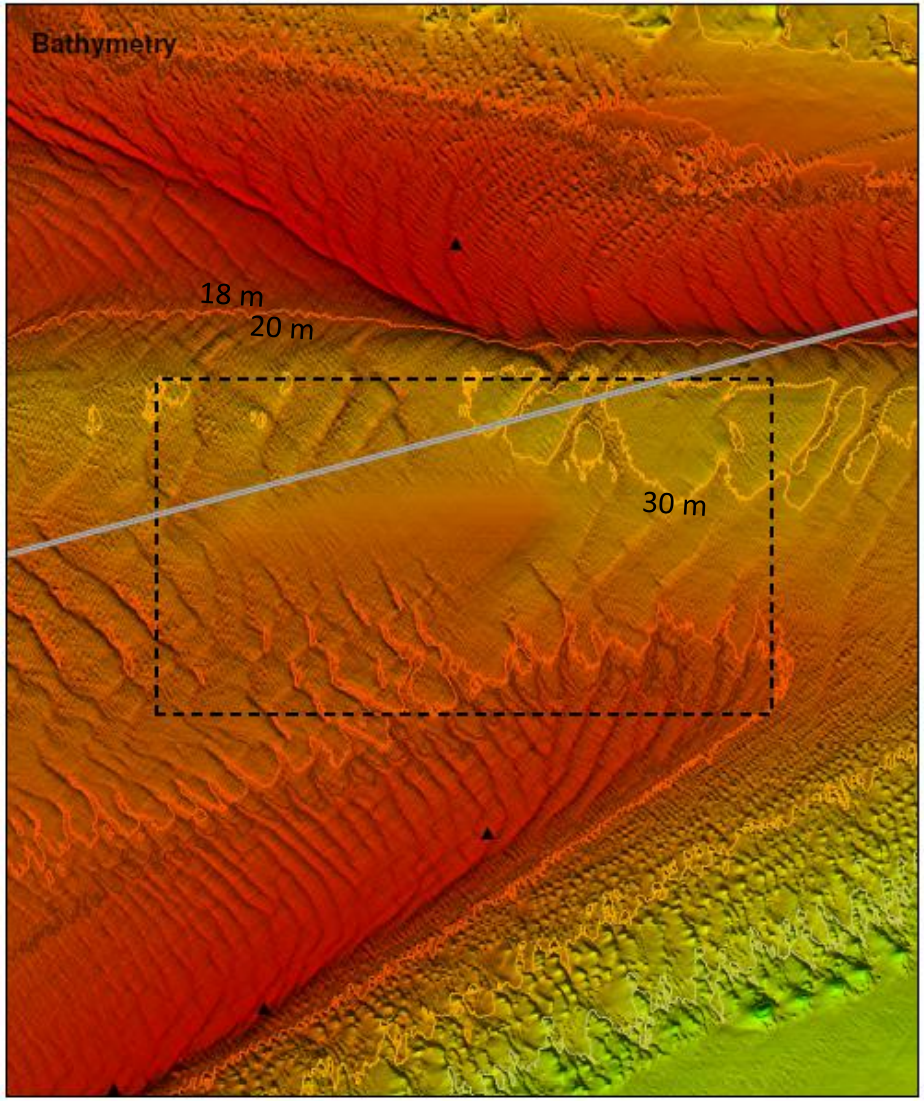
1. Cornfield Shoals DS (*active)*
2. **Six Mile Reef DS**
3. Clinton Harbor DS
4. Orient Point DS
5. Niantic Bay DS
6. New London DS *(active)*

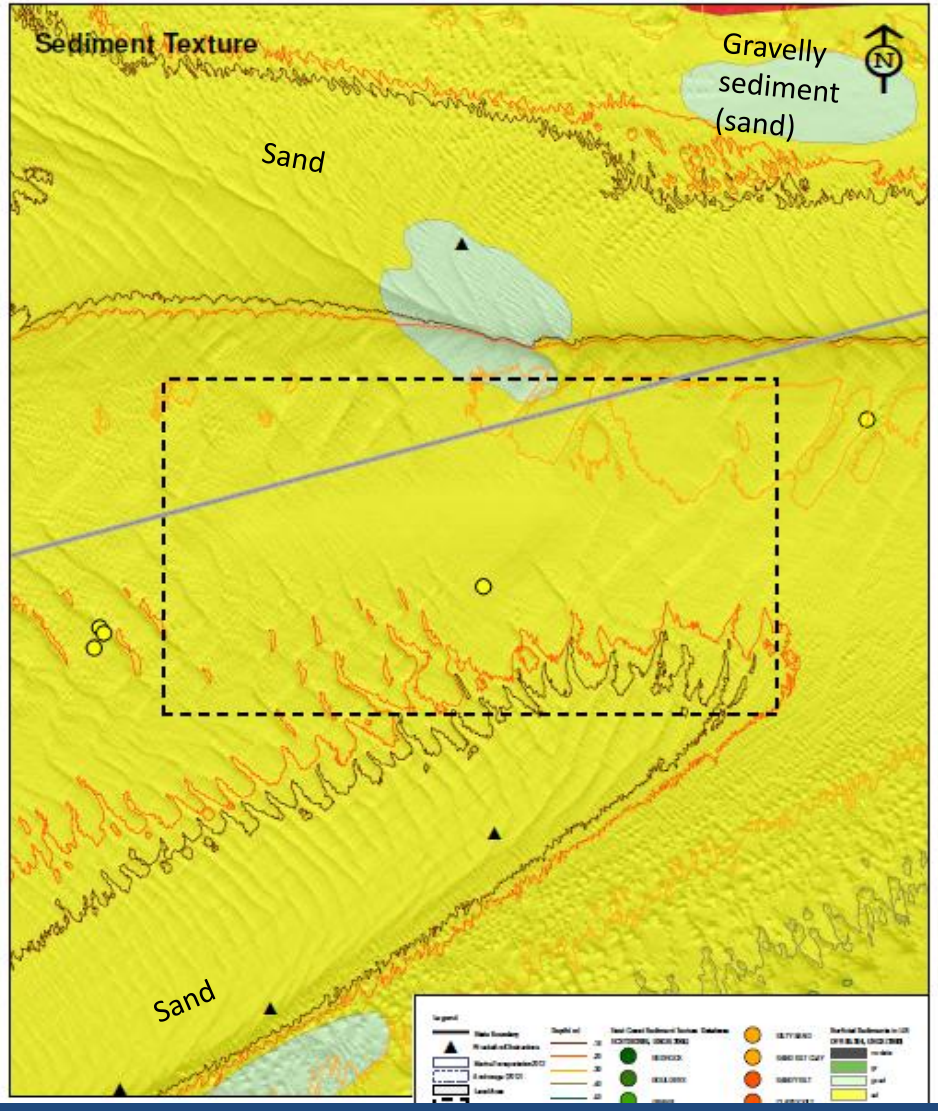


2. Six Mile Reef Disposal Site

- o Shallow (62-110 ft; 19-35 m)
- \- Sand waves
- \+ Near dredging centers (Clinton: 6 nm)

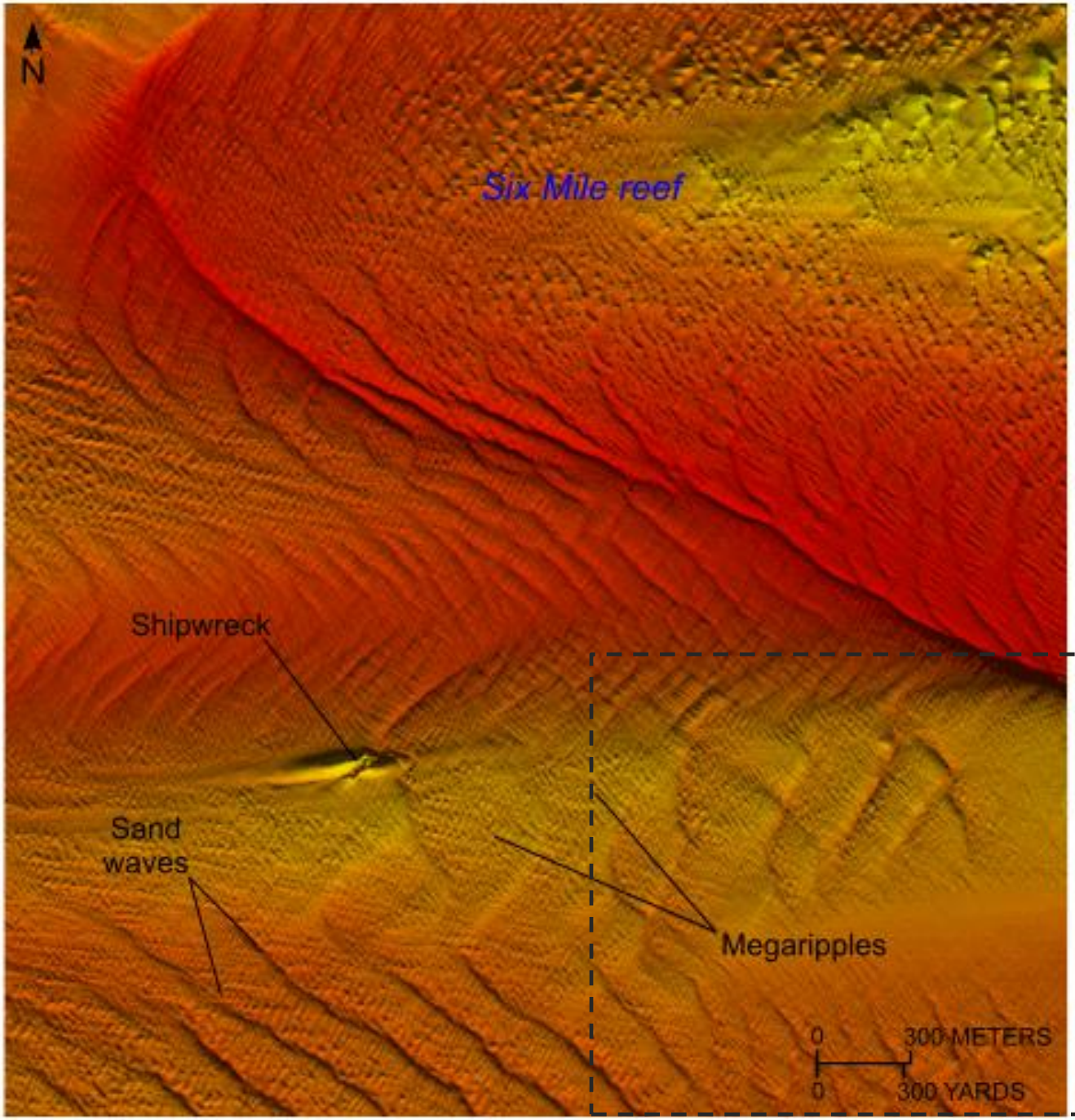
- o Historic site
- o 3.5 mi east of approved shellfishing zone (CT)
- \- Currents move in W-E direction





Six Mile Reef

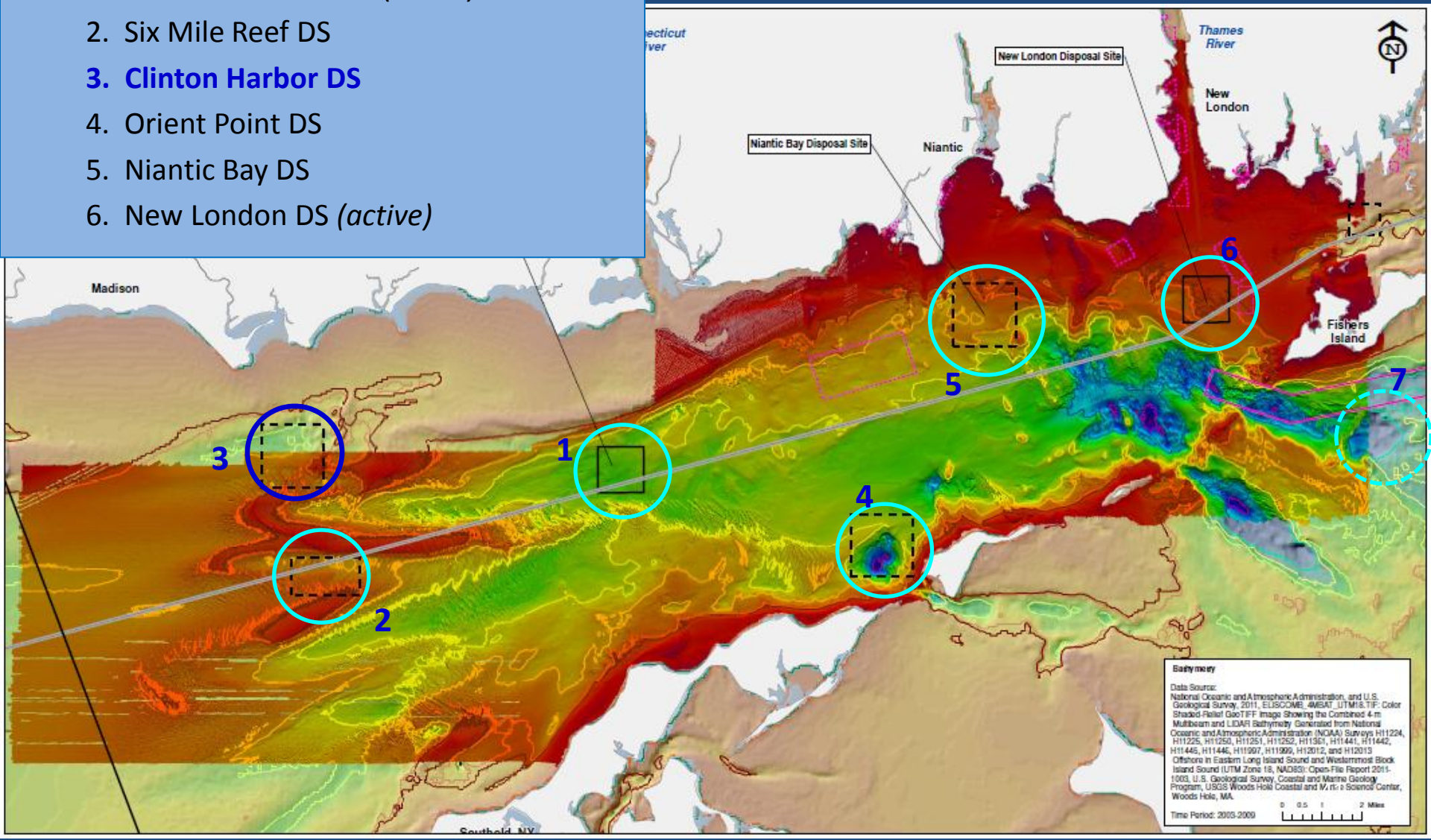
(Close-up)



http://pubs.usgs.gov/of/2011/1003/html/figures.html

Alternative Site Discussion: Eastern Long Island Sound *(cont.)*

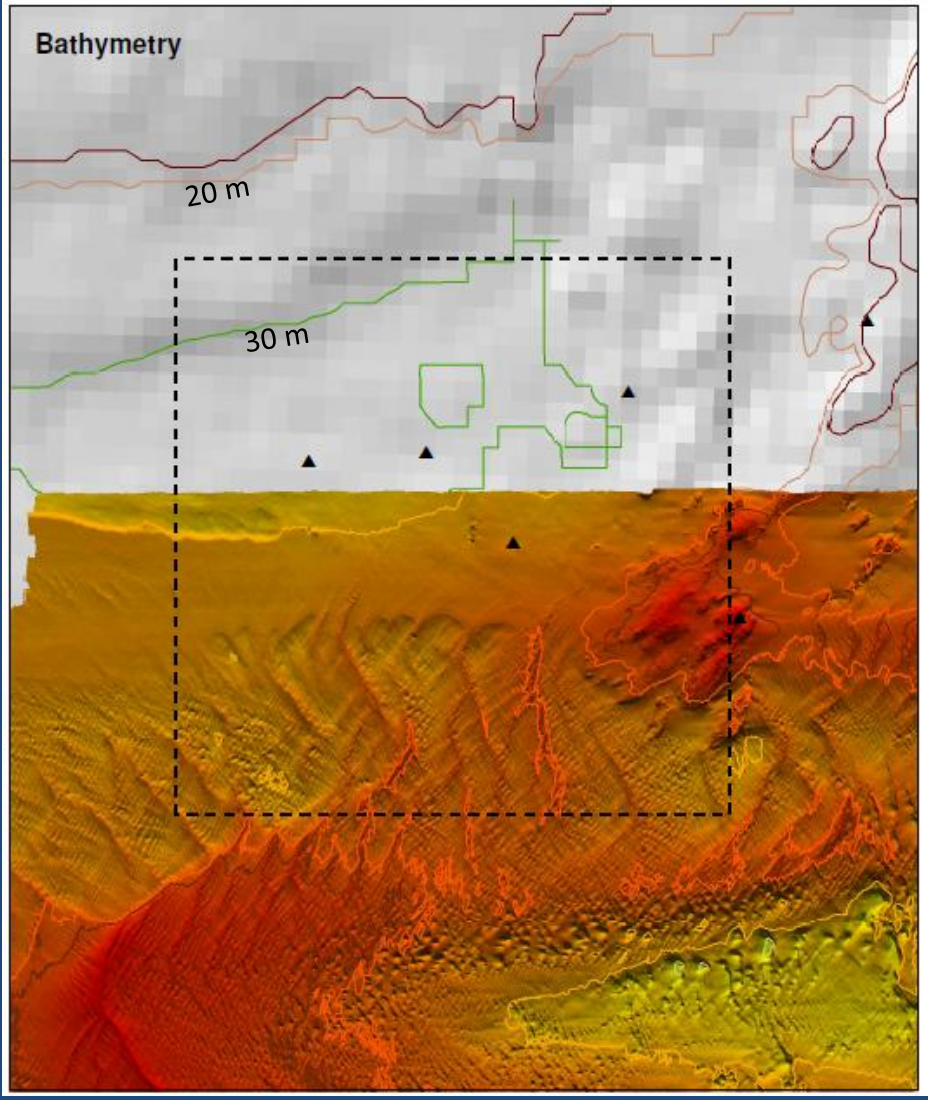
1. Cornfield Shoals DS (*active)*
2. Six Mile Reef DS
3. **Clinton Harbor DS**
4. Orient Point DS
5. Niantic Bay DS
6. New London DS *(active)*

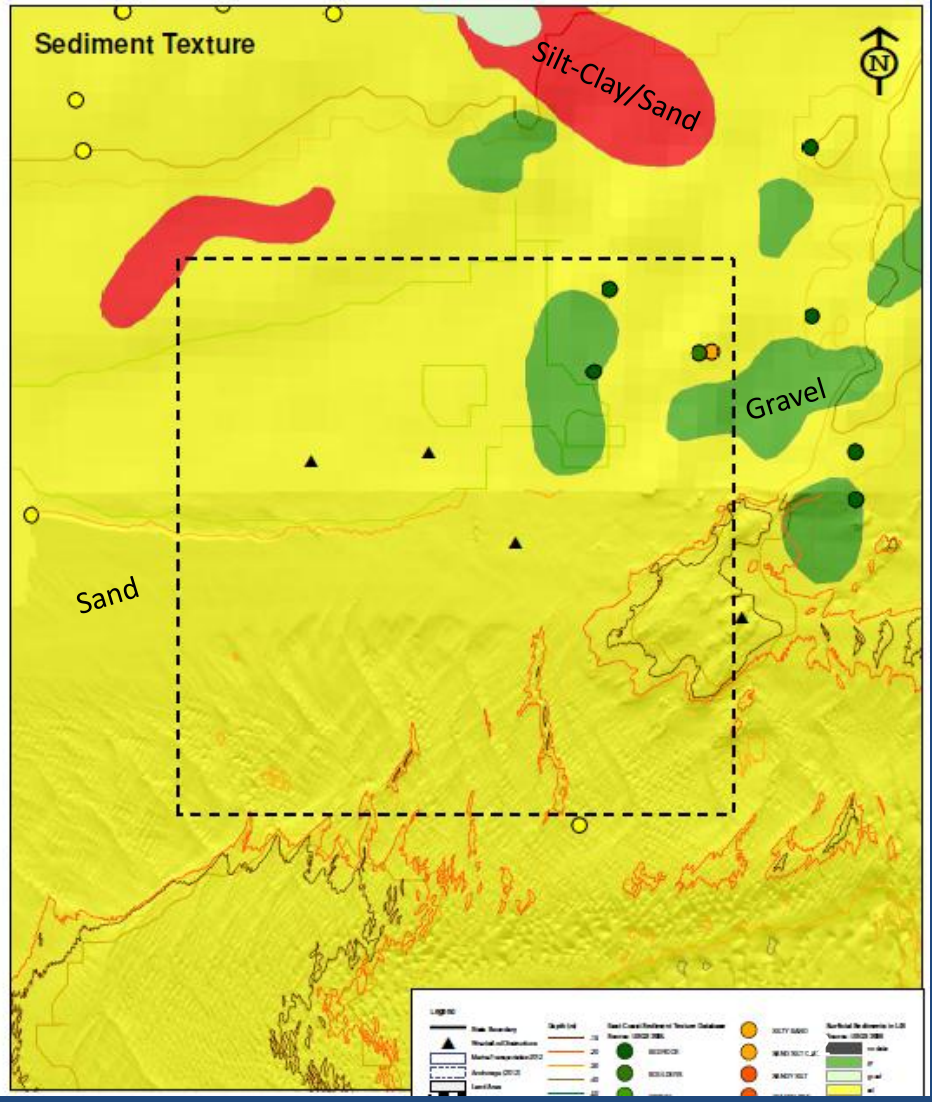


3. Clinton Harbor Disposal Site

- o Shallow depth: (up to 110 ft; 35 m)
- \- Sand
- \+ Near dredging centers (Clinton: 3 nm)
- o Historic site

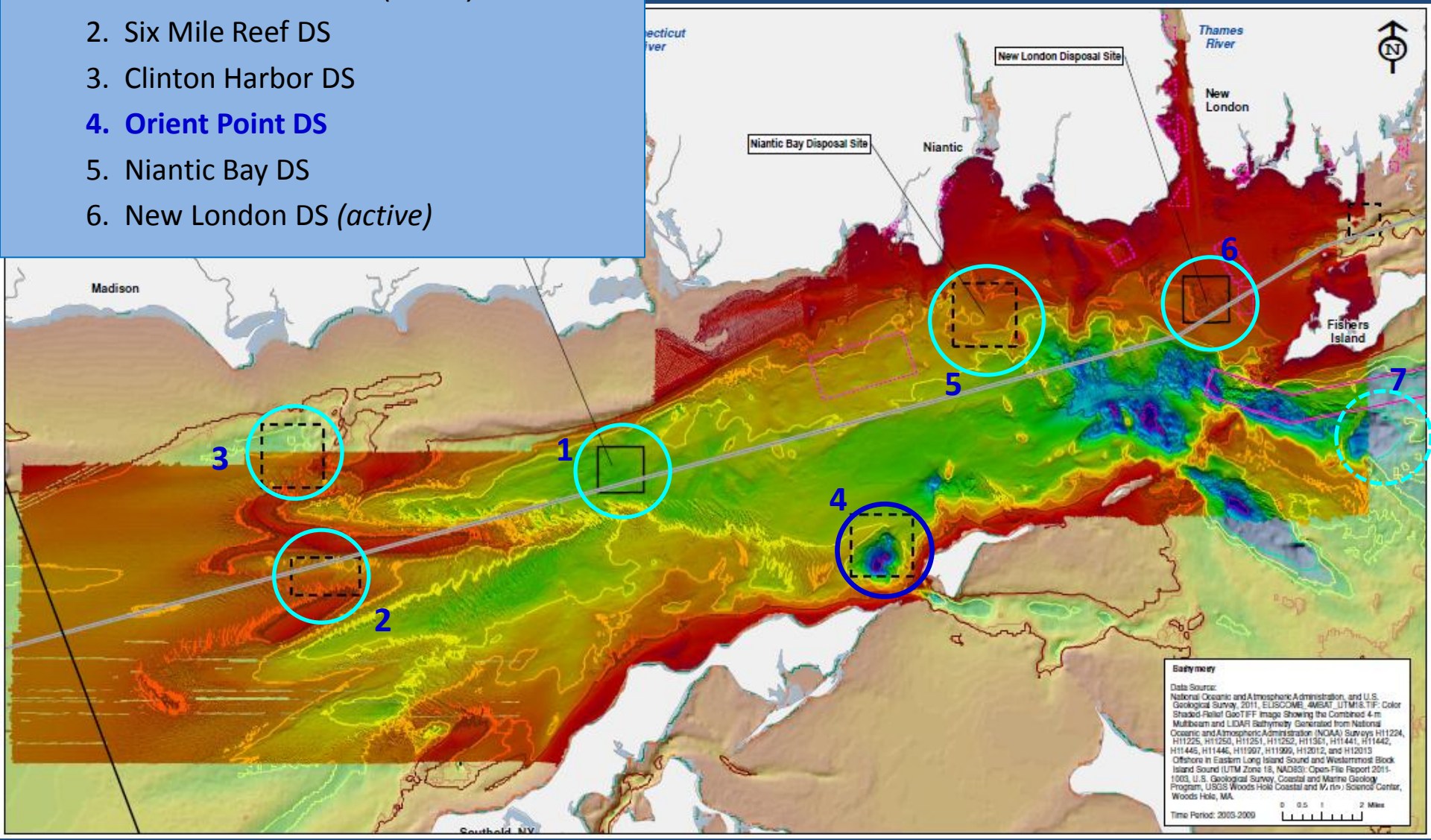
- \- Close to shore (1.5 nm)
- o 3 mi east of approved shellfishing zone (CT)
- ? Biological resources (gravel and rocky areas in NE)
- ? Archaeological resources (4 wrecks)





Alternative Site Discussion: Eastern Long Island Sound *(cont.)*

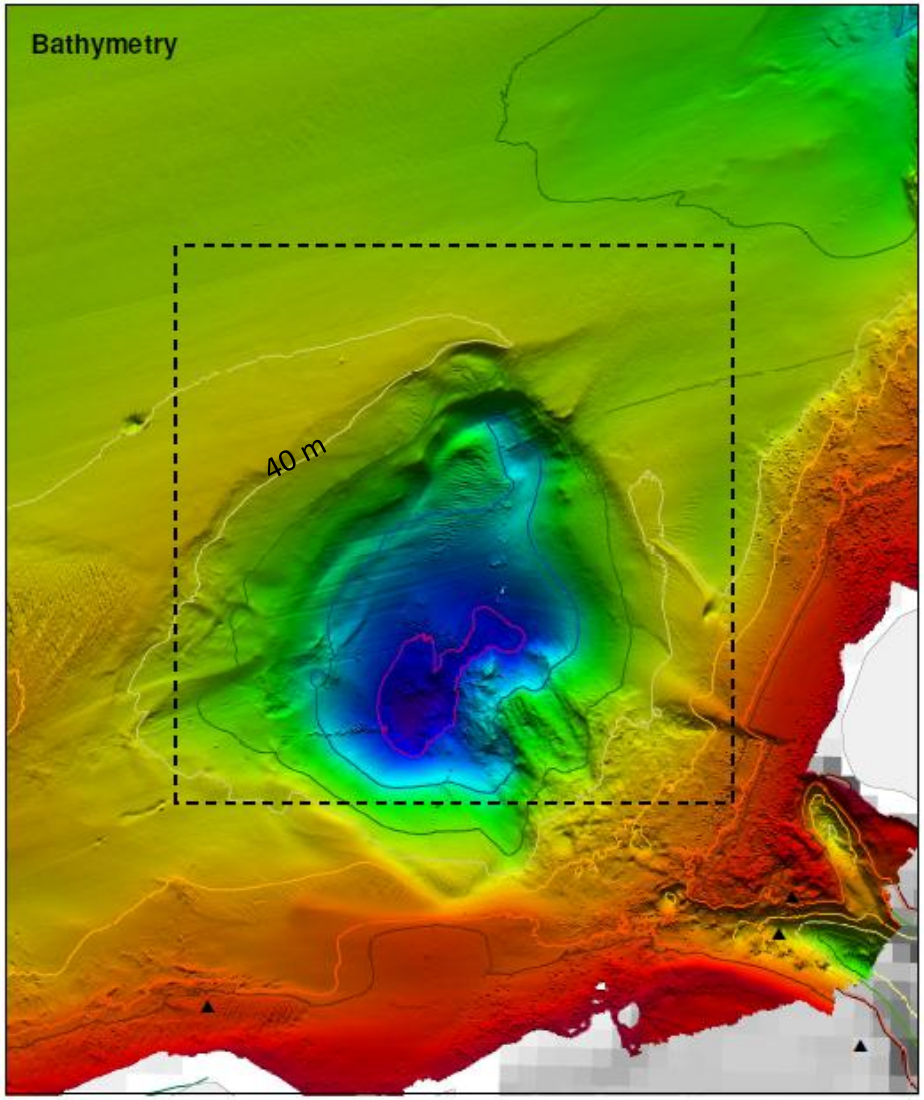
1. Cornfield Shoals DS (*active)*
2. Six Mile Reef DS
3. Clinton Harbor DS
4. **Orient Point DS**
5. Niantic Bay DS
6. New London DS *(active)*

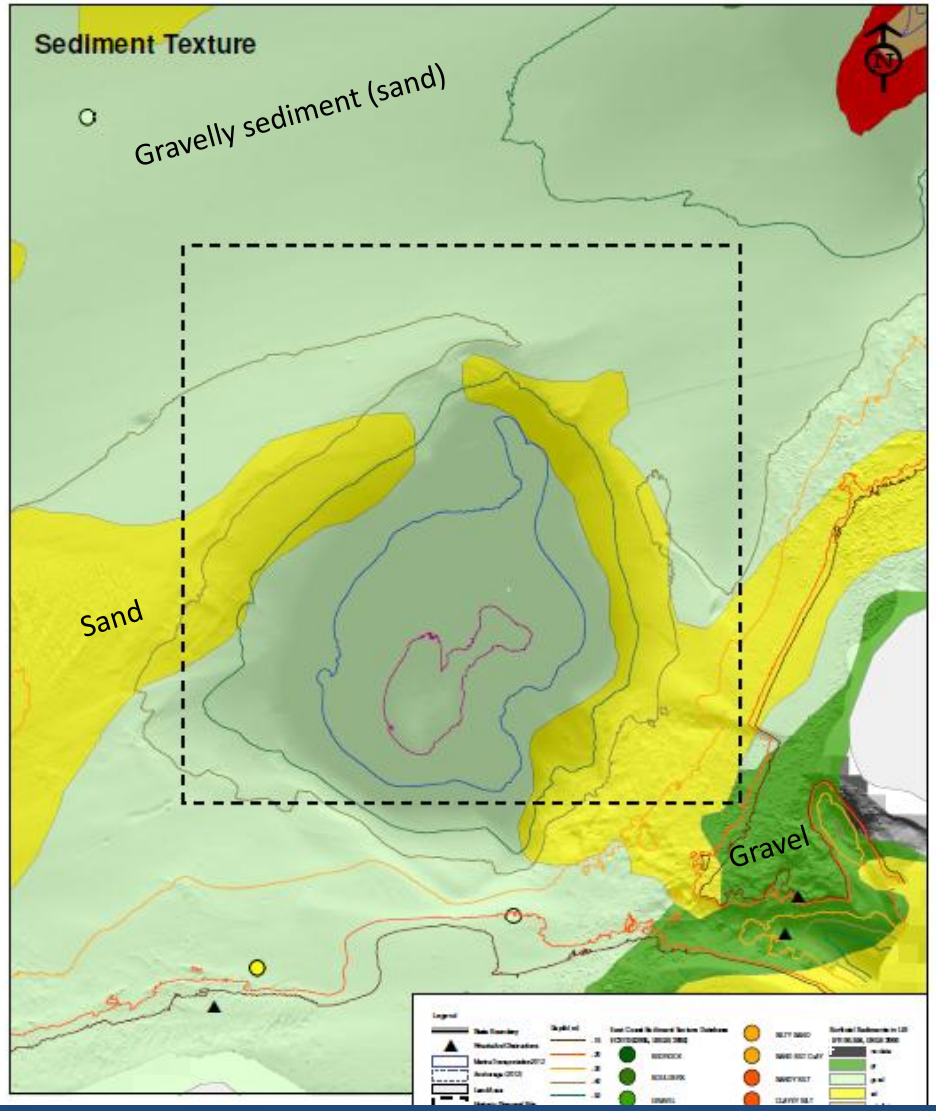


4. Orient Point Disposal Site

+ Deep depression (300 ft; 100m)
o Medium distance to dredging centers
  (CT River: 8 mi; NL: 15 mi)
o Historic site

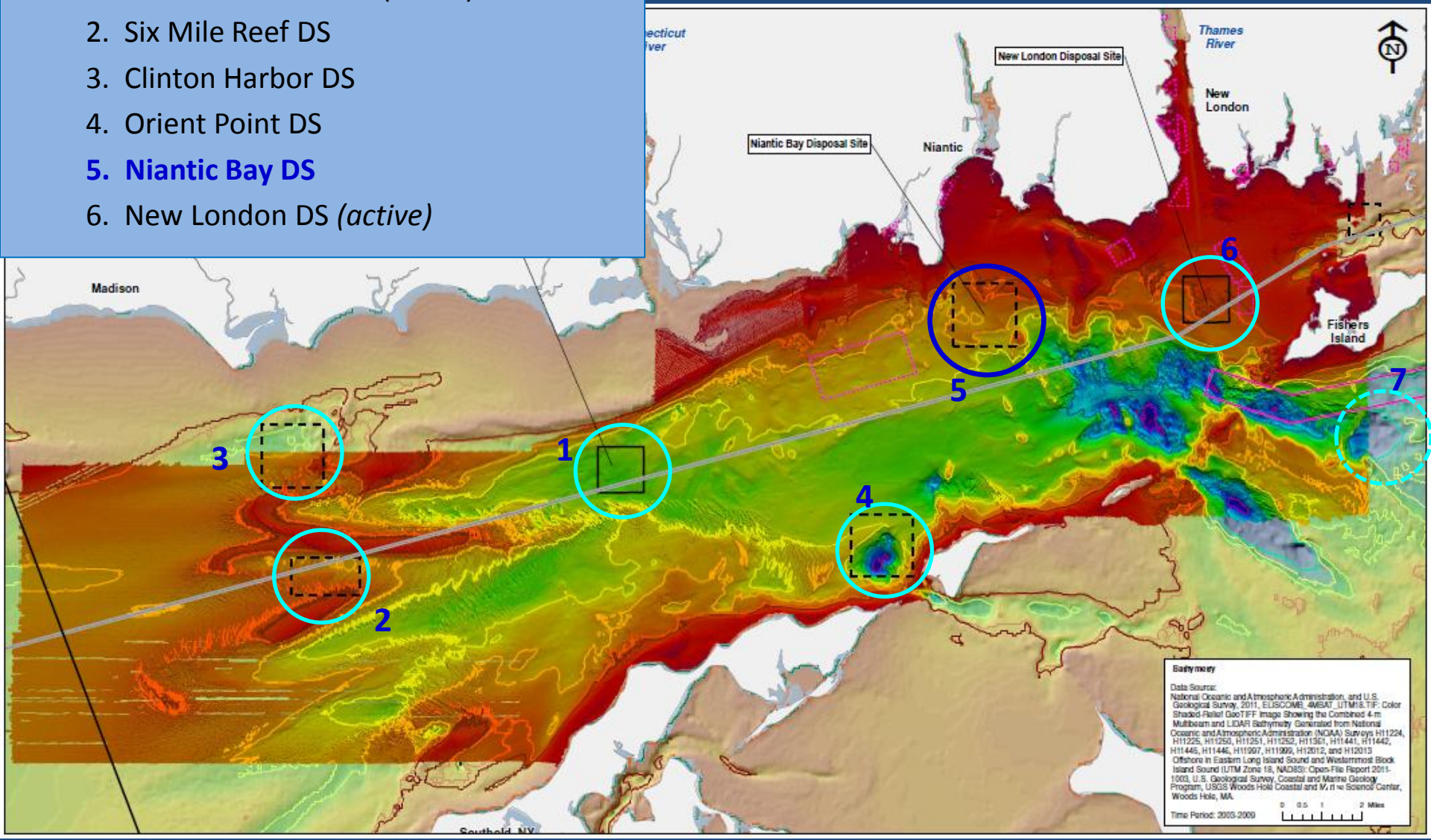
? Shellfish resources
- Gravelly sand
? Transport into Gardiners Bay (outgoing tide?)
- Navigation (Ferry traffic to Orient Point)





Alternative Site Discussion: Eastern Long Island Sound *(cont.)*

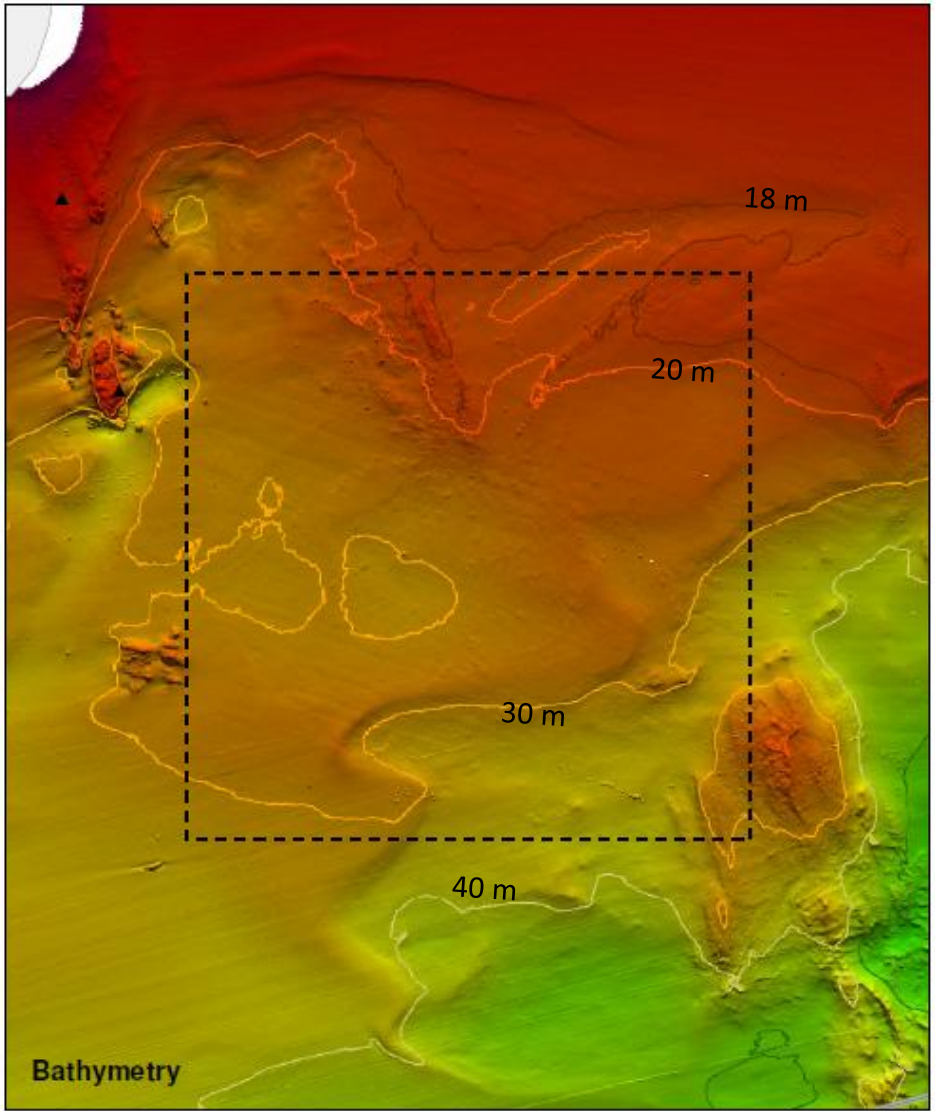
1. Cornfield Shoals DS (*active)*
2. Six Mile Reef DS
3. Clinton Harbor DS
4. Orient Point DS
5. **Niantic Bay DS**
6. New London DS *(active)*

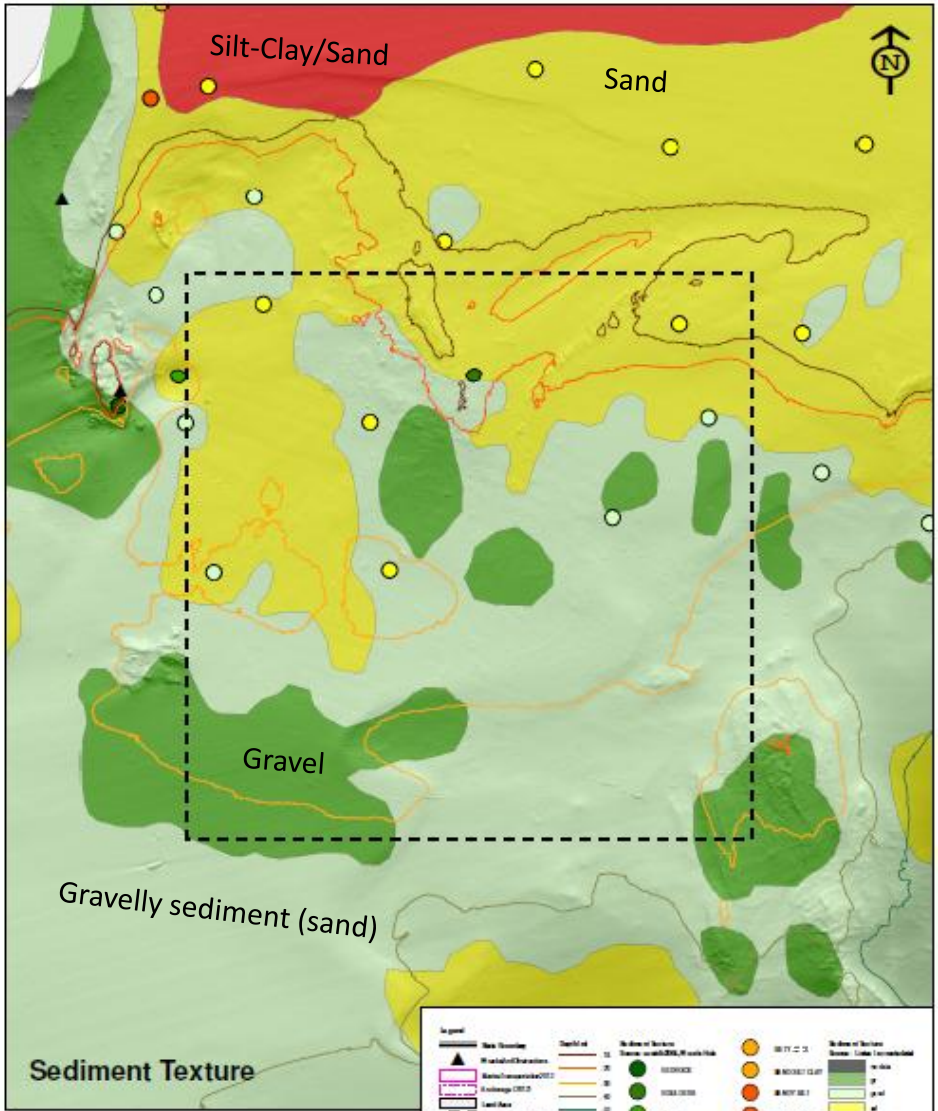


5. Niantic Bay Disposal Site

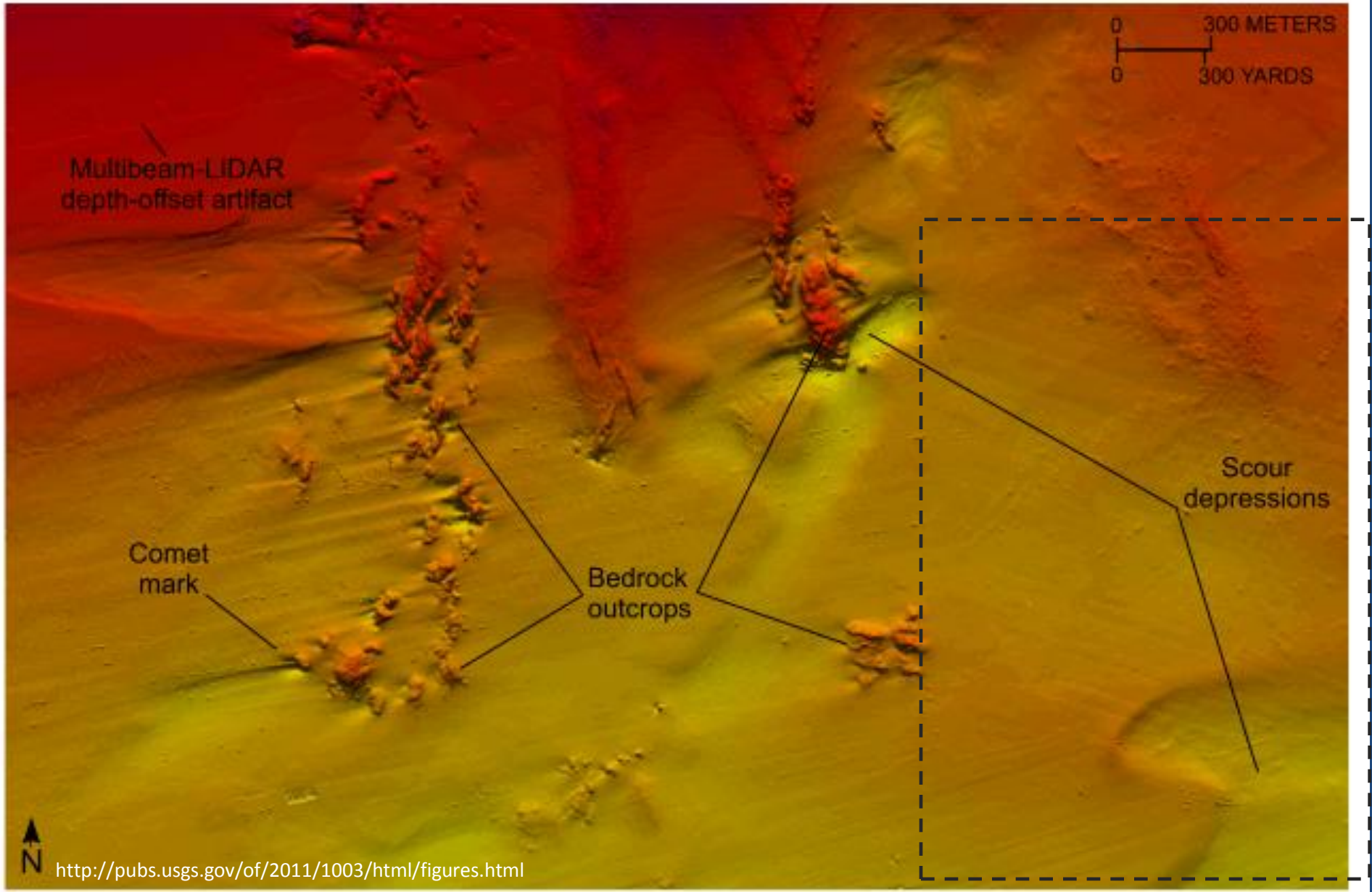
+ Deep area (up to 130 ft; 40m)
+ Near dredging centers
o Outside rocky areas
o Historic site

o Zoned for restricted shellfishing/cond. approved (CT)
-/? Sand; gravelly sand
o Transport direction WSW-ENE





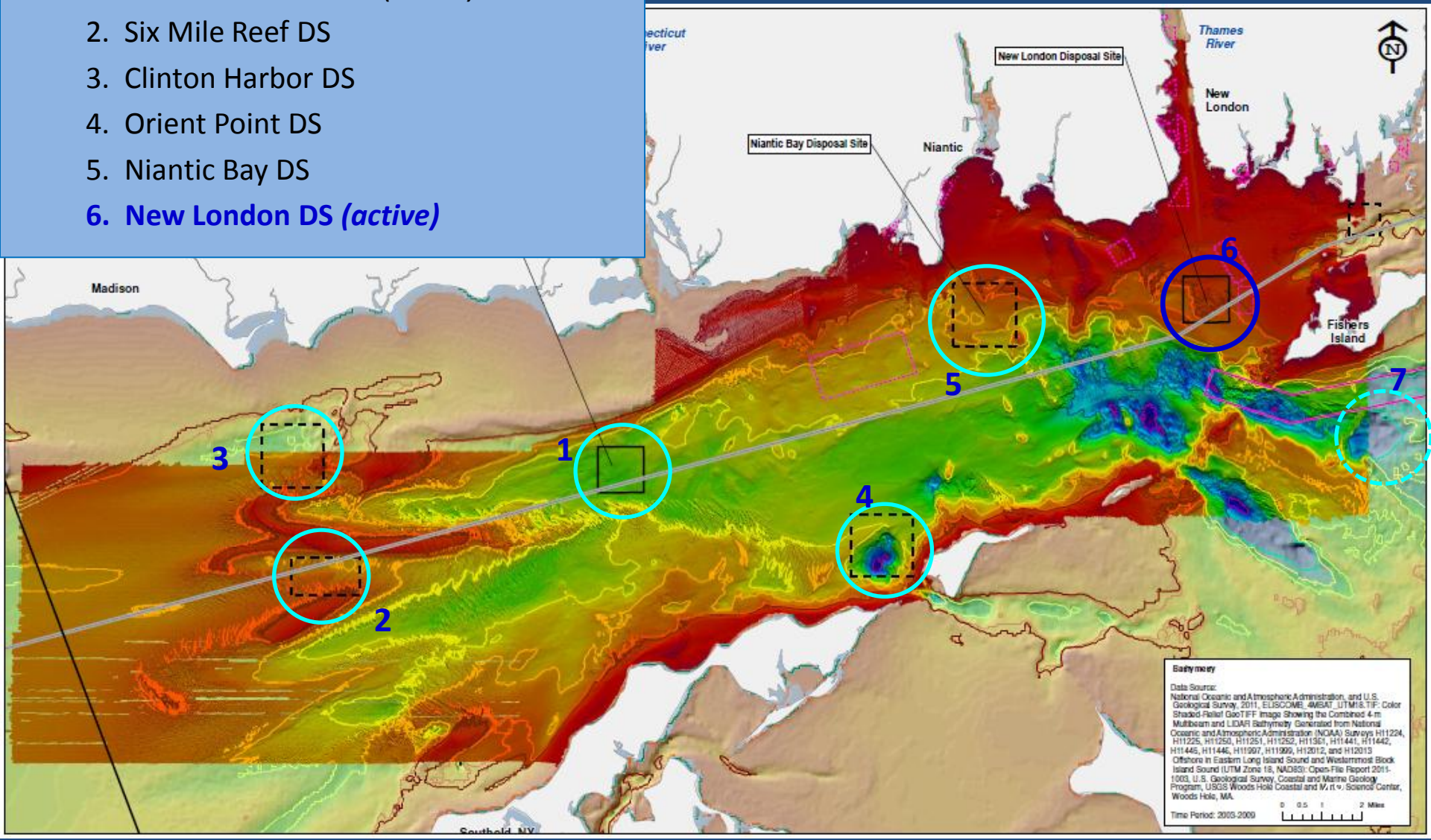
Area around Niantic Bay Disposal Site (Close-up)



http://pubs.usgs.gov/of/2011/1003/html/figures.html

Alternative Site Discussion: Eastern Long Island Sound *(cont.)*

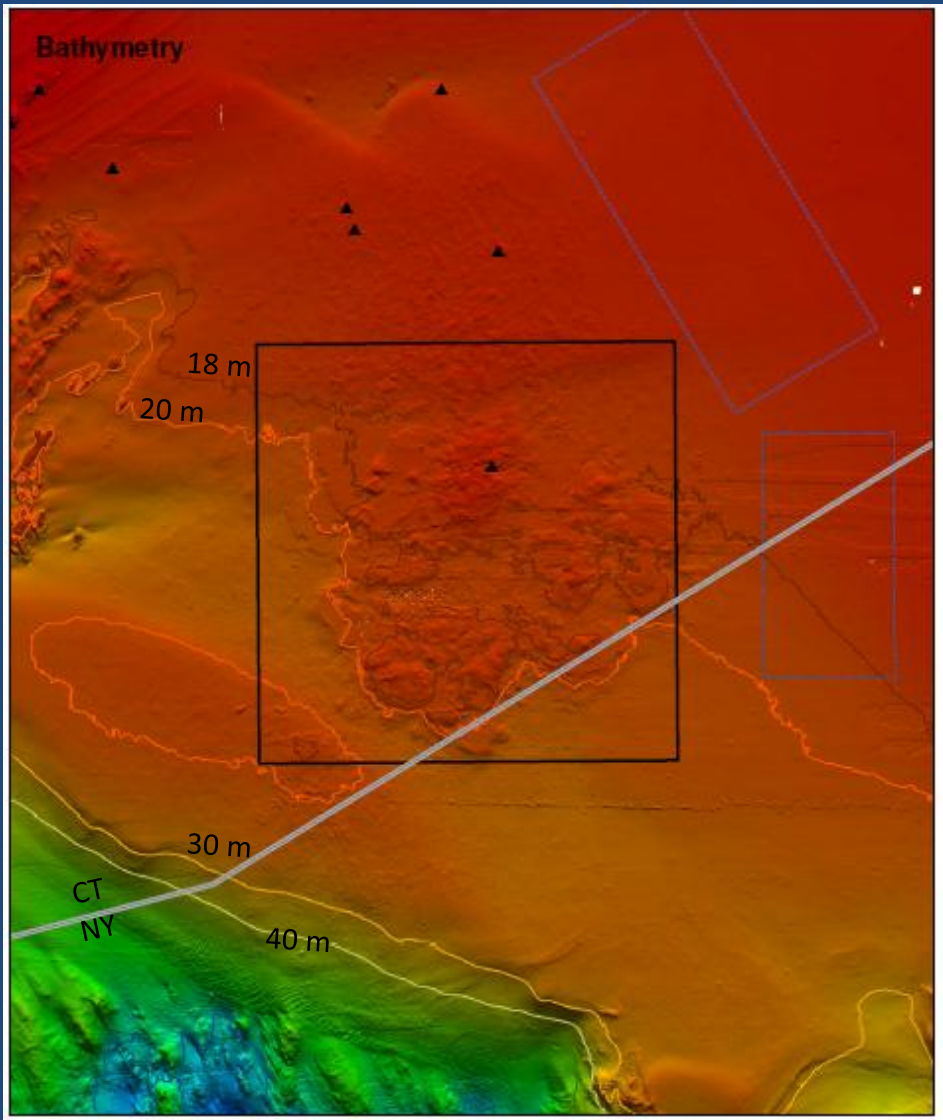
1. Cornfield Shoals DS (*active)*
2. Six Mile Reef DS
3. Clinton Harbor DS
4. Orient Point DS
5. Niantic Bay DS
6. **New London DS *(active)***

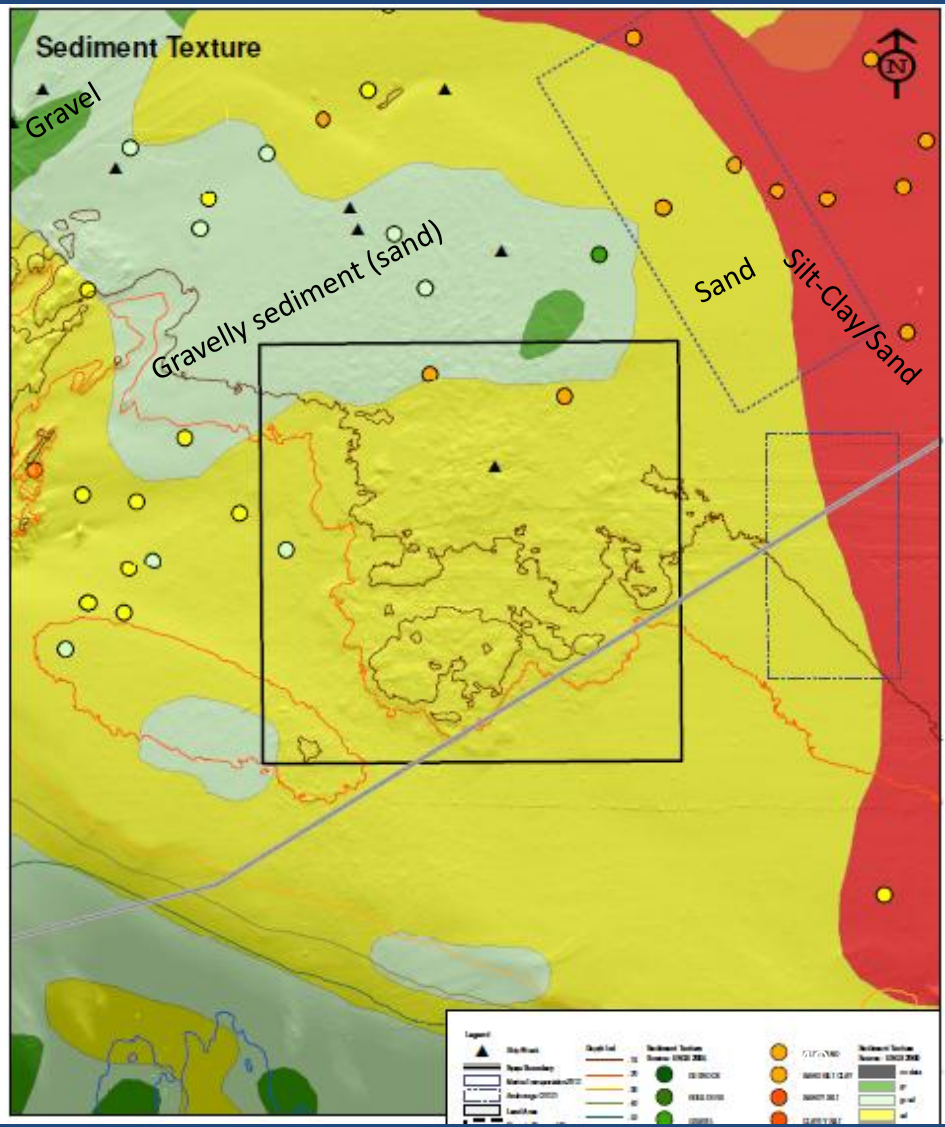


6. New London Disposal Site

-/o Shallow (up to 50-70 ft; 15-21 m)
+ Near dredging centers (NL: 5 nm)
+ Located away from rocky areas
+ Active site

o Zoned for restricted shellfishing (CT)
+ Fine grained sediment
- Navigation zone
? Cable corridor (active cable?)

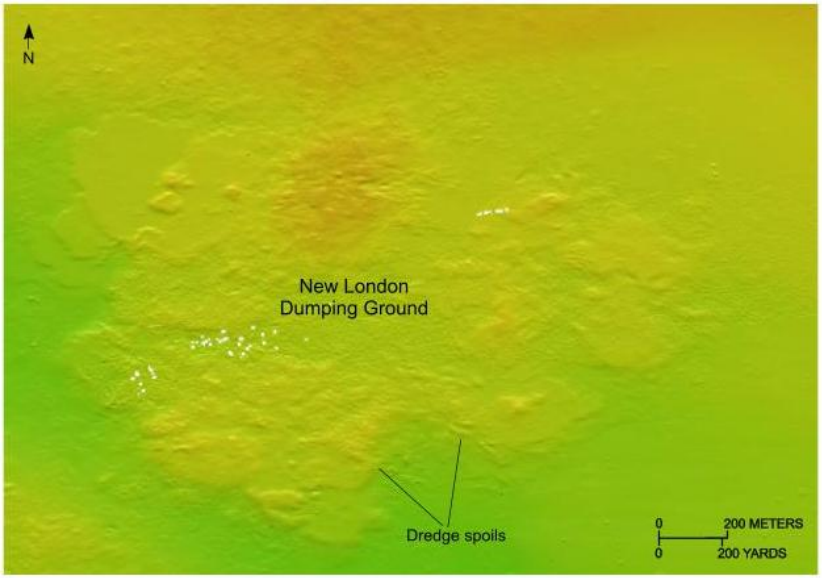


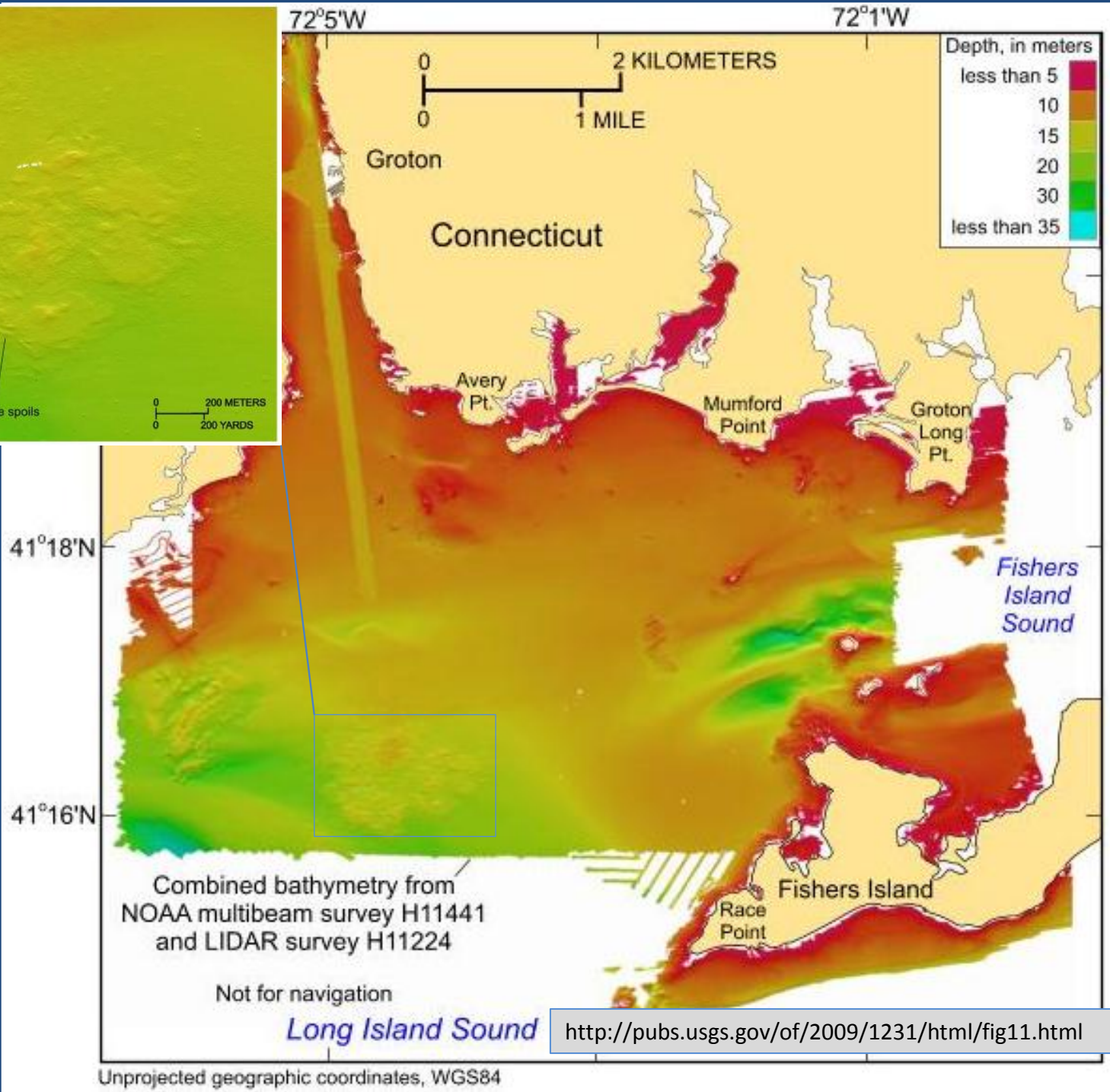


New London Disposal Site

Bathymetry

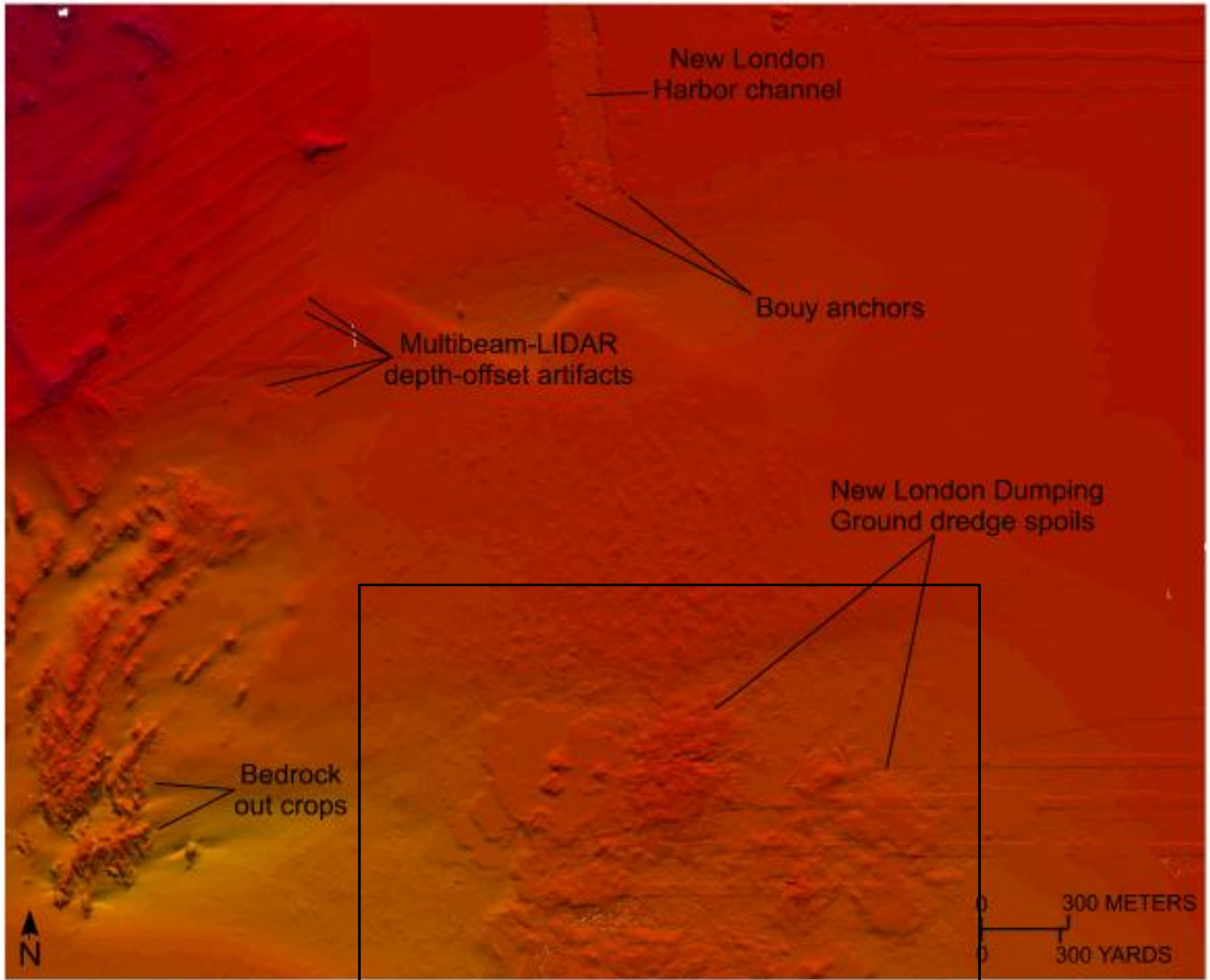
NOAA Multibeam and LIDAR survey)





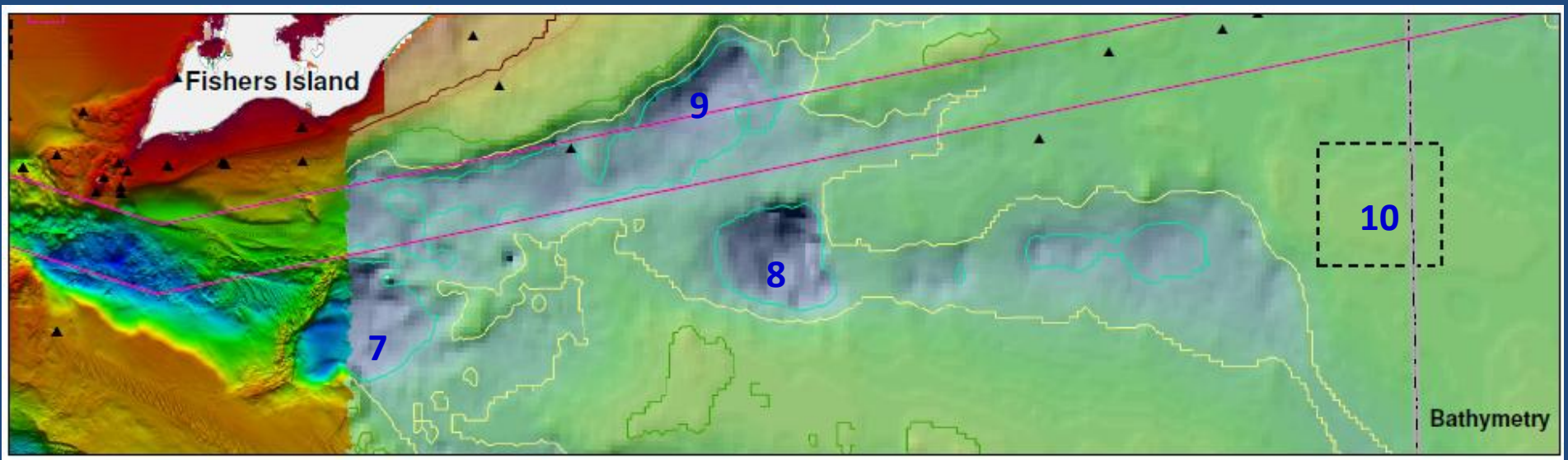
http://pubs.usgs.gov/of/2009/1231/html/fig11.html

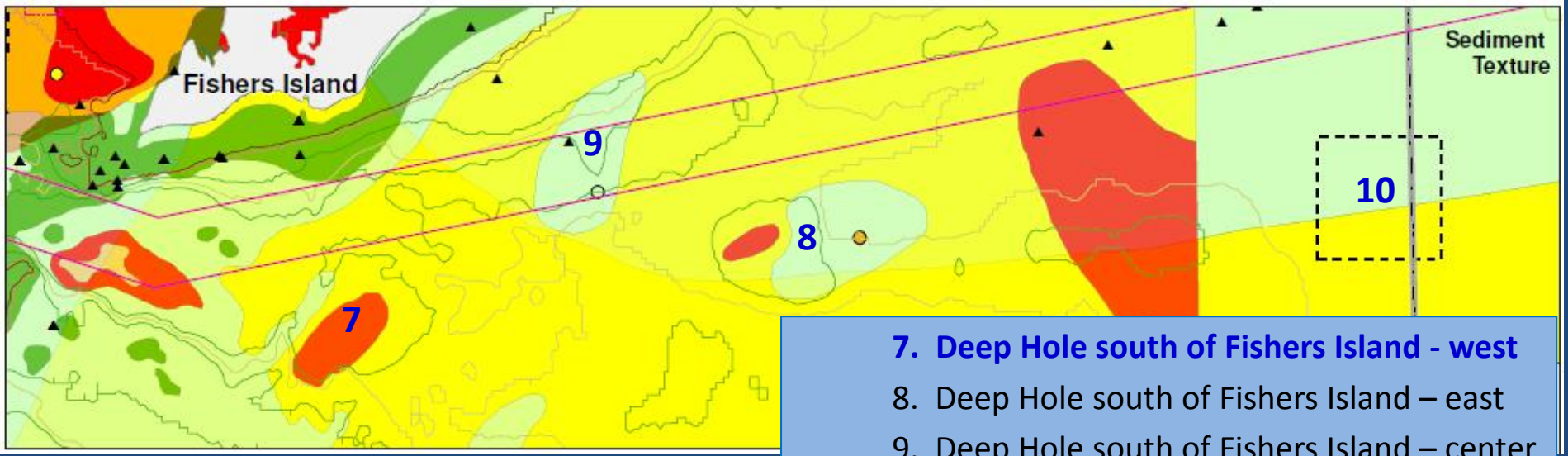
Area around New London DS (close-up)



http://pubs.usgs.gov/of/2011/1003/html/figures.html

7-10. Block Island Sound



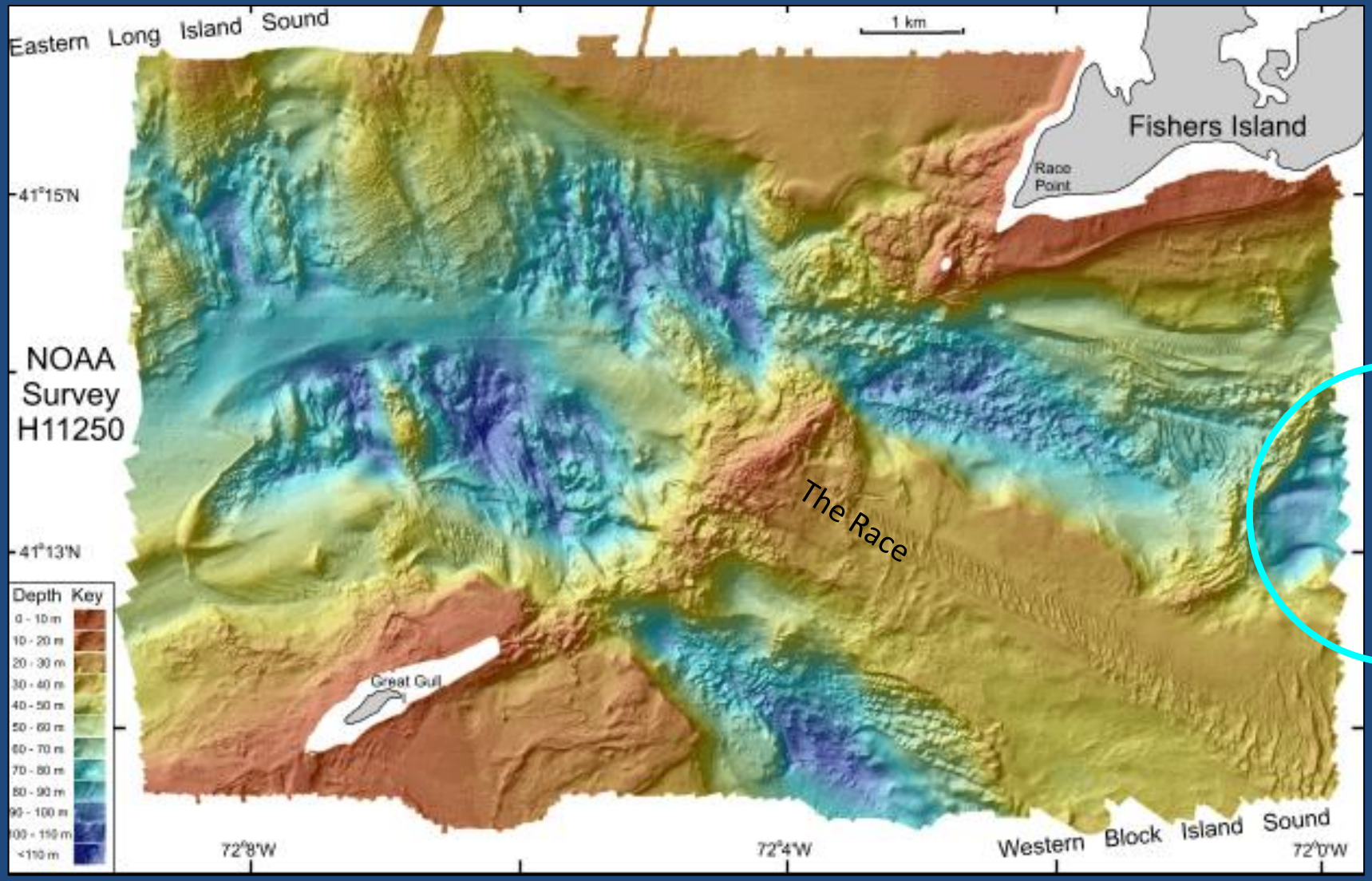


7. **Deep Hole south of Fishers Island - west**
8. Deep Hole south of Fishers Island – east
9. Deep Hole south of Fishers Island – center
10. Block Island Sound Disposal Site

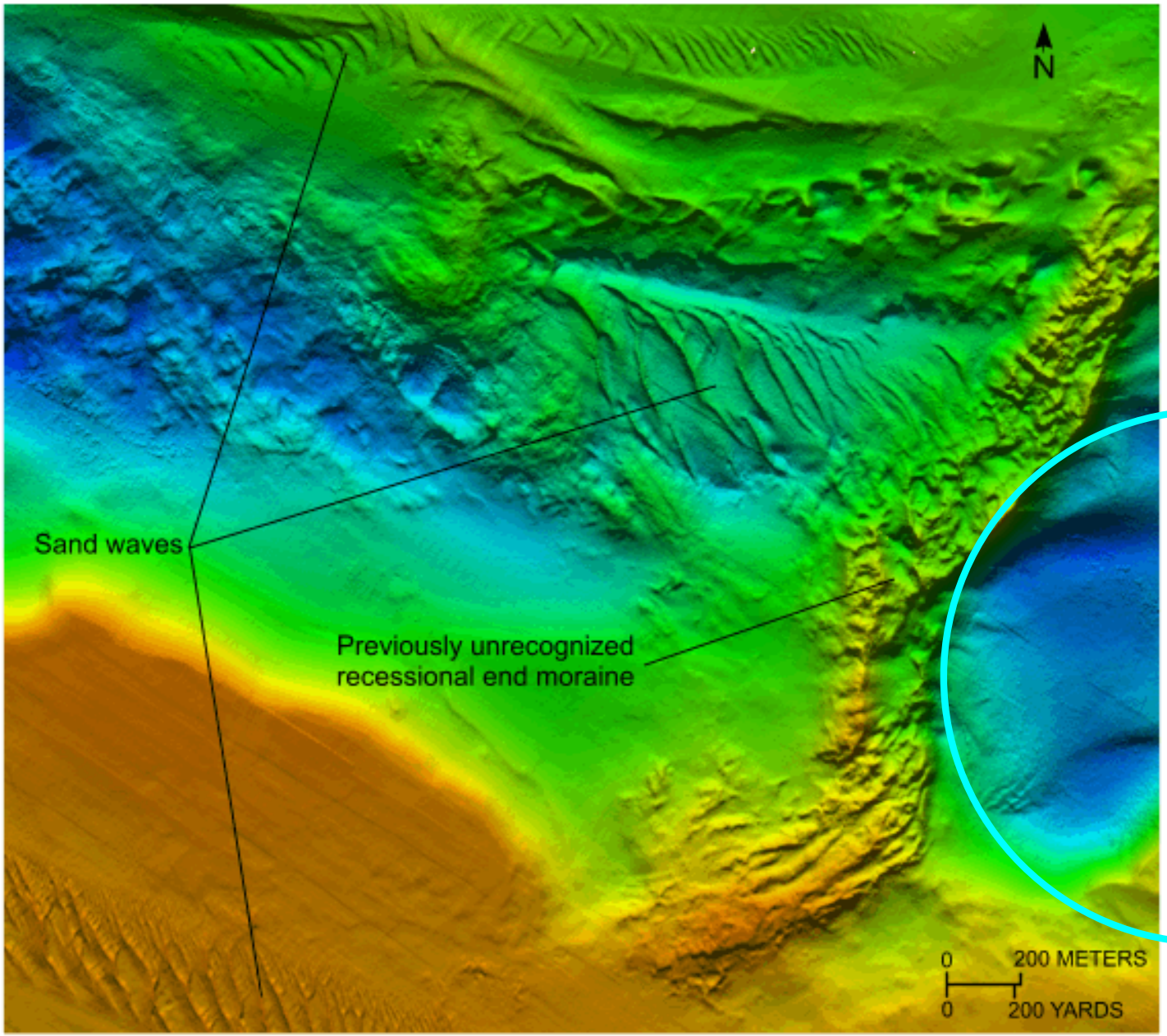
7. Deep Hole south of Fishers Island - west

+ Deep depression (270 ft; 90m)
o Medium distance to dredging centers (NL: 9 nm)
- New site
o Navigation area

-/? Dispersive (Silt/clay: likely Pleistocene deposits)
? Biological resources
? Tidal energy potential



Deep Hole south of Fishers Island – west (close-up)

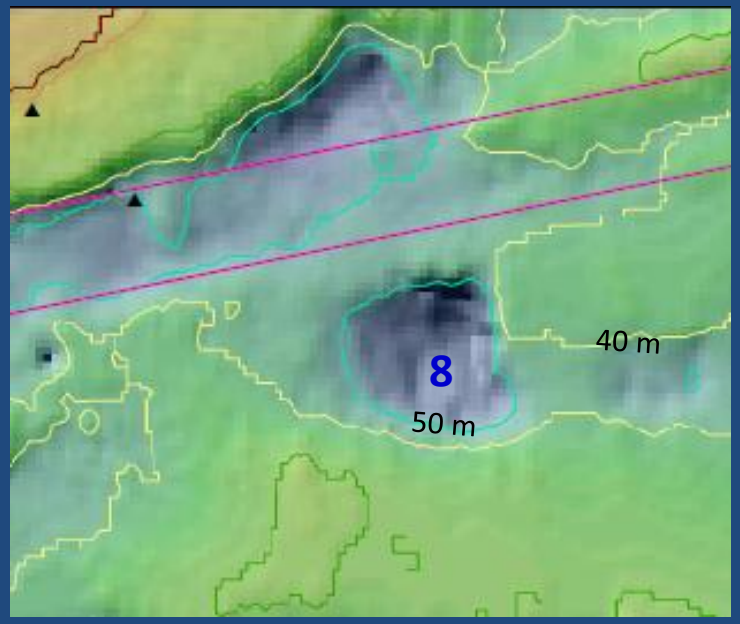


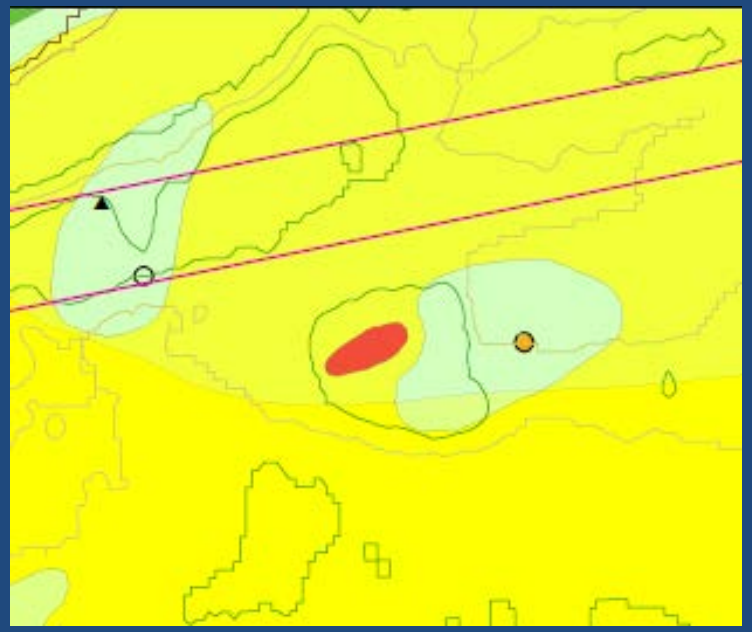
http://pubs.usgs.gov/of/2011/1003/html/figures.html

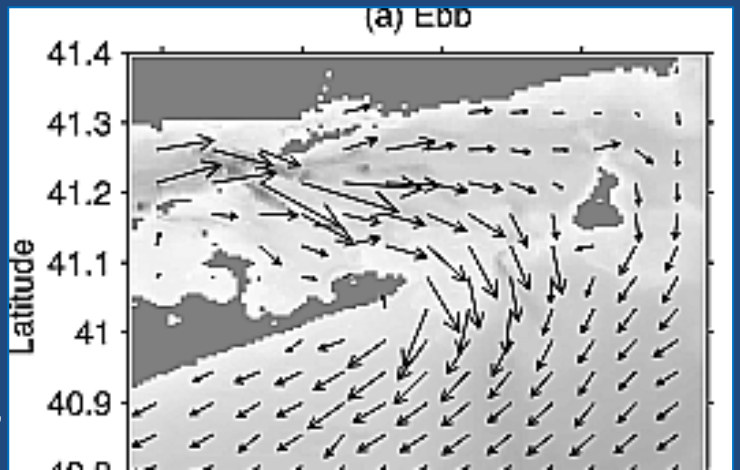
8. Deep Hole south of Fishers Island - east

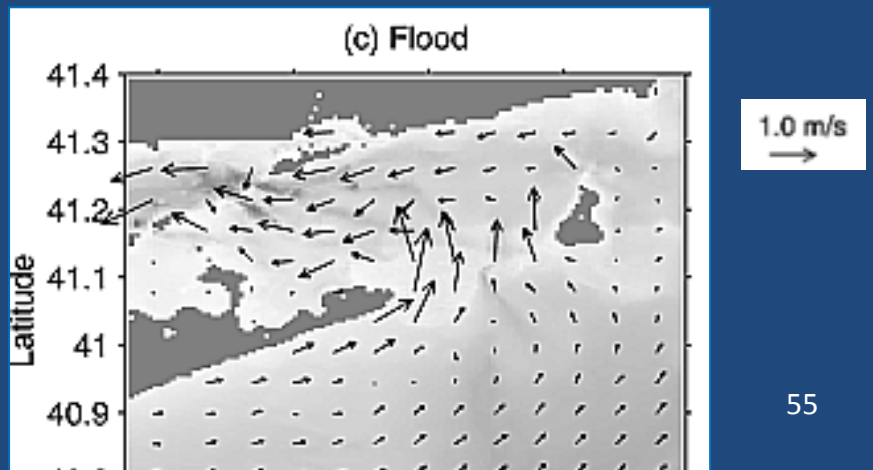
+ Deep depression (325ft; 100m)
-/o Long distance to dredging centers
(NL: 12 mi; CT River: 19 mi)
- New site

-/? Gravelly sand (silt/clay: Pleistocene deposits?)
? Biological resources
- Higher waves in Block Isl. Sound (barge transport)
- Dredge material management (depth/slope)







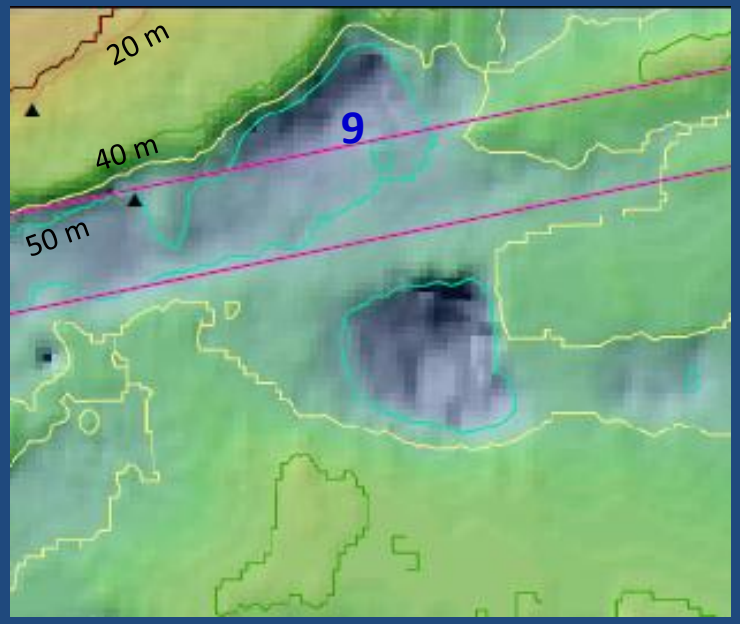


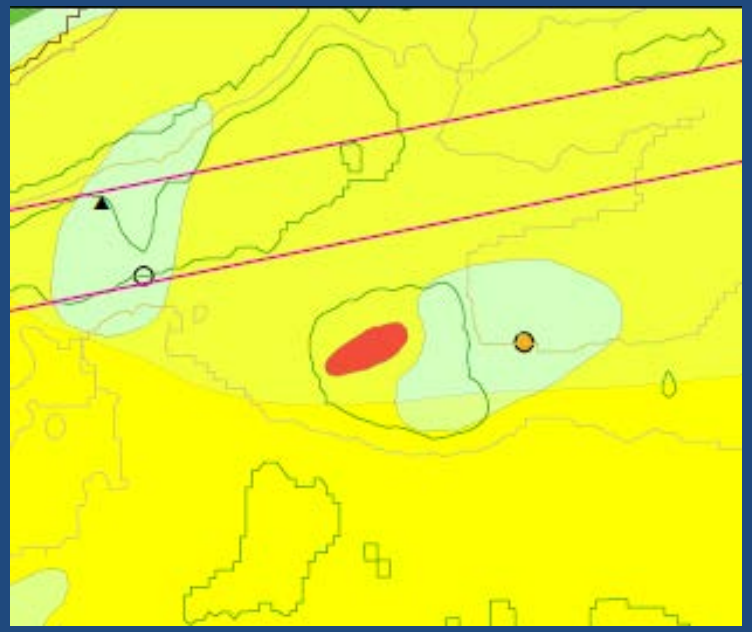
J. Geophys. Res.: Oceans, v. 109, 2004

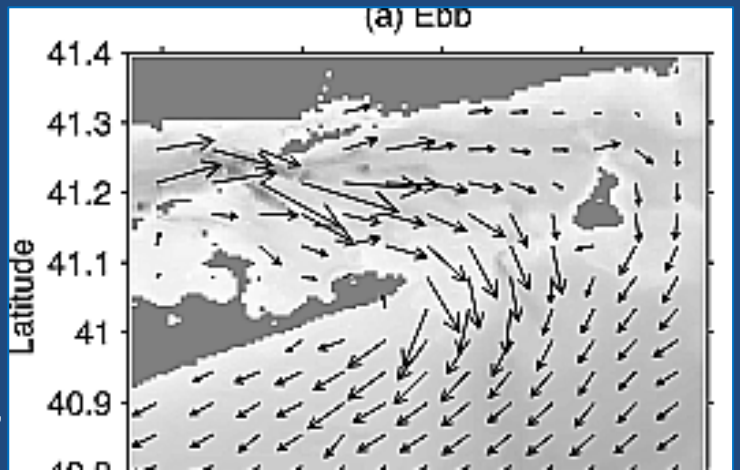
9. Deep Hole south of Fishers Island - center

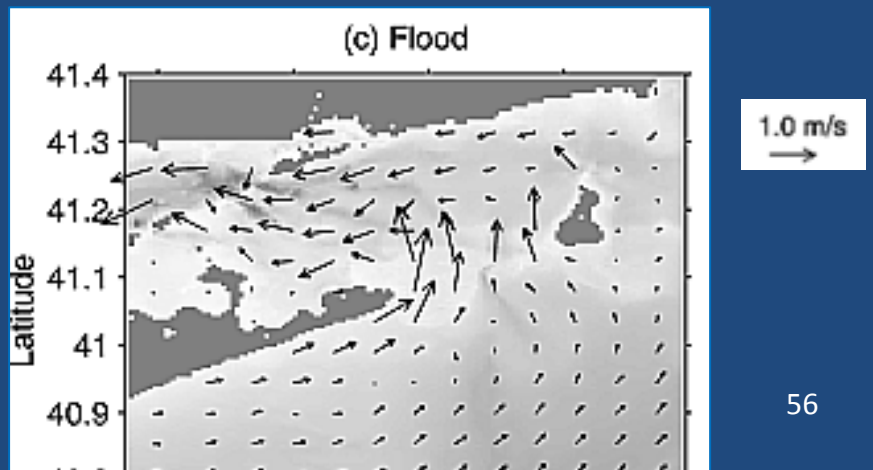
+ Deep depression (up to 241ft; 80m)
-/o Long distance to dredging centers
(NL: 12 mi; CT River: 19 mi)
- New site

- Sand /gravelly sand
? Biological resources
- Higher waves in Block Isl. Sound (barge transport)
- Within recommended navigation zone



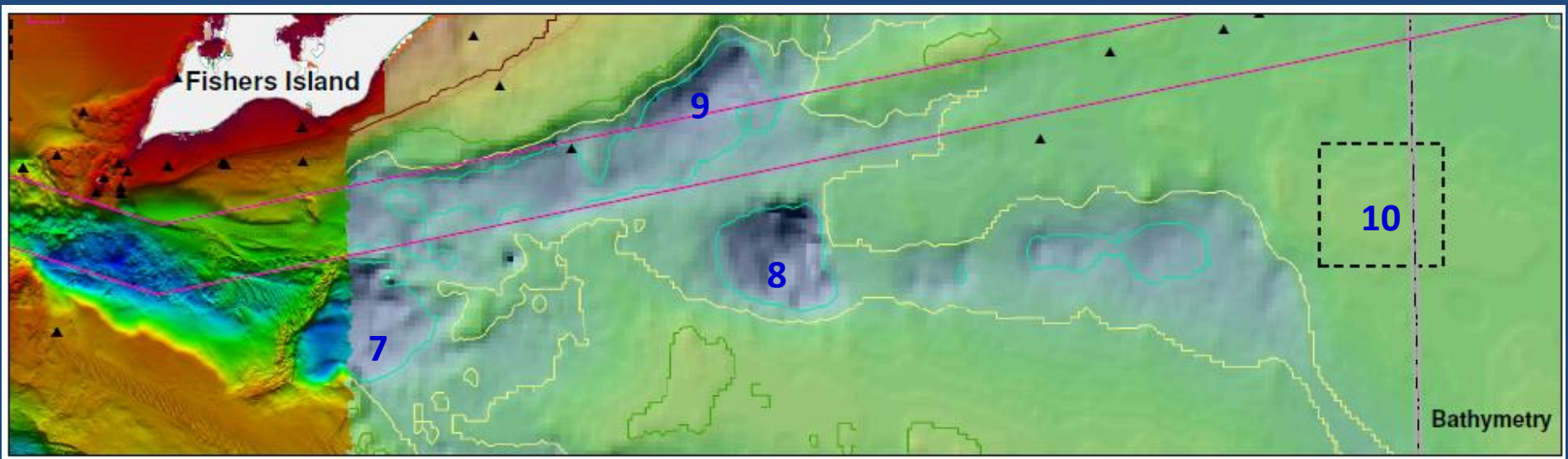


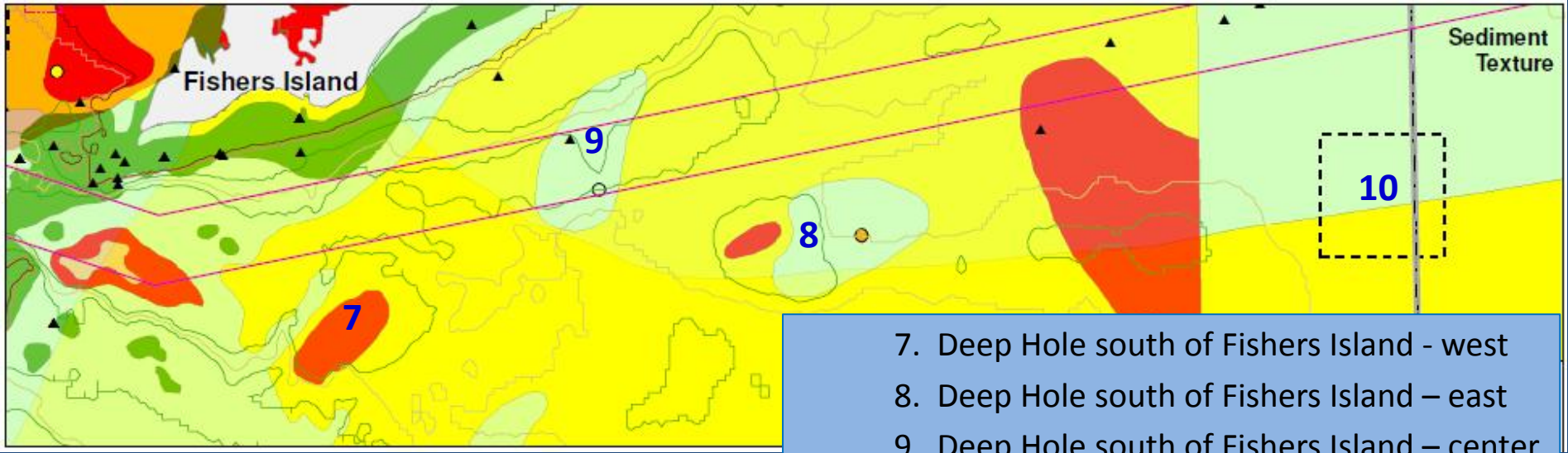




J. Geophys. Res.: Oceans, v. 109, 2004

7-10. Block Island Sound *(cont.)*



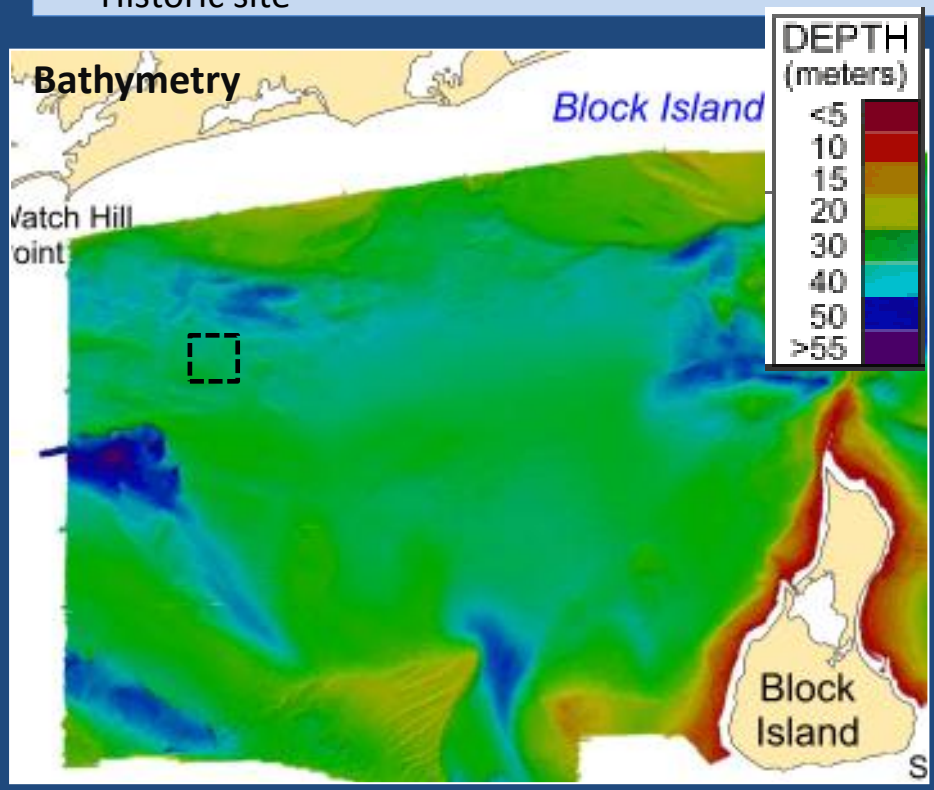


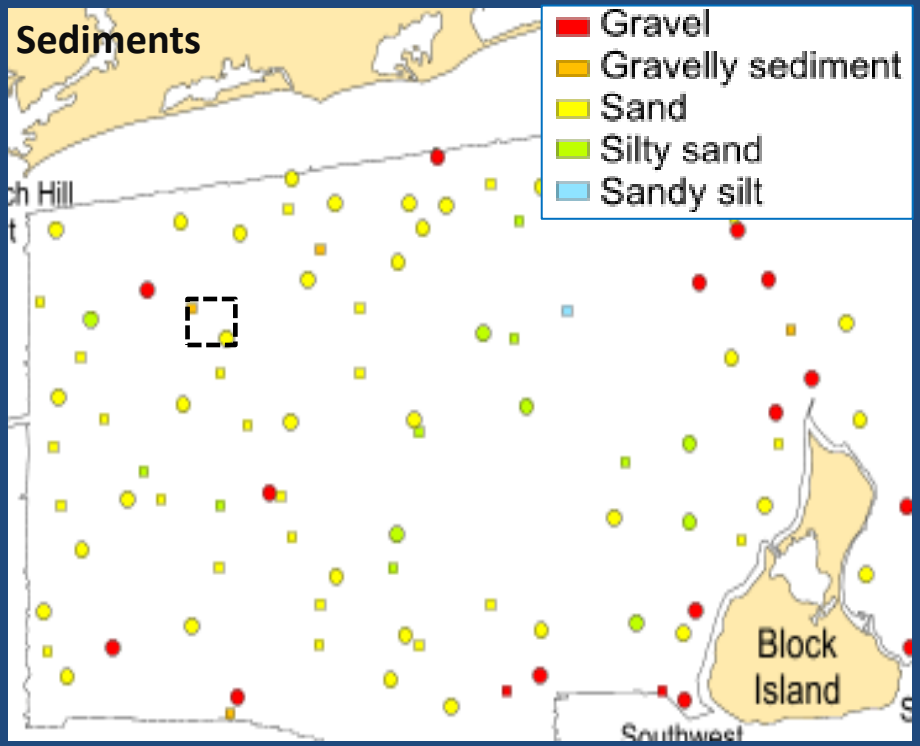
7. Deep Hole south of Fishers Island - west
8. Deep Hole south of Fishers Island – east
9. Deep Hole south of Fishers Island – center
10. **Block Island Sound Disposal Site**

10. Block Island Sound Disposal Site

+ Deep (110 ft; 35 m)
- Long distance to dredging centers
  (NL: 18nm; CT River: 25 nm)
- Historic site

-/? Sand
? Biological resources





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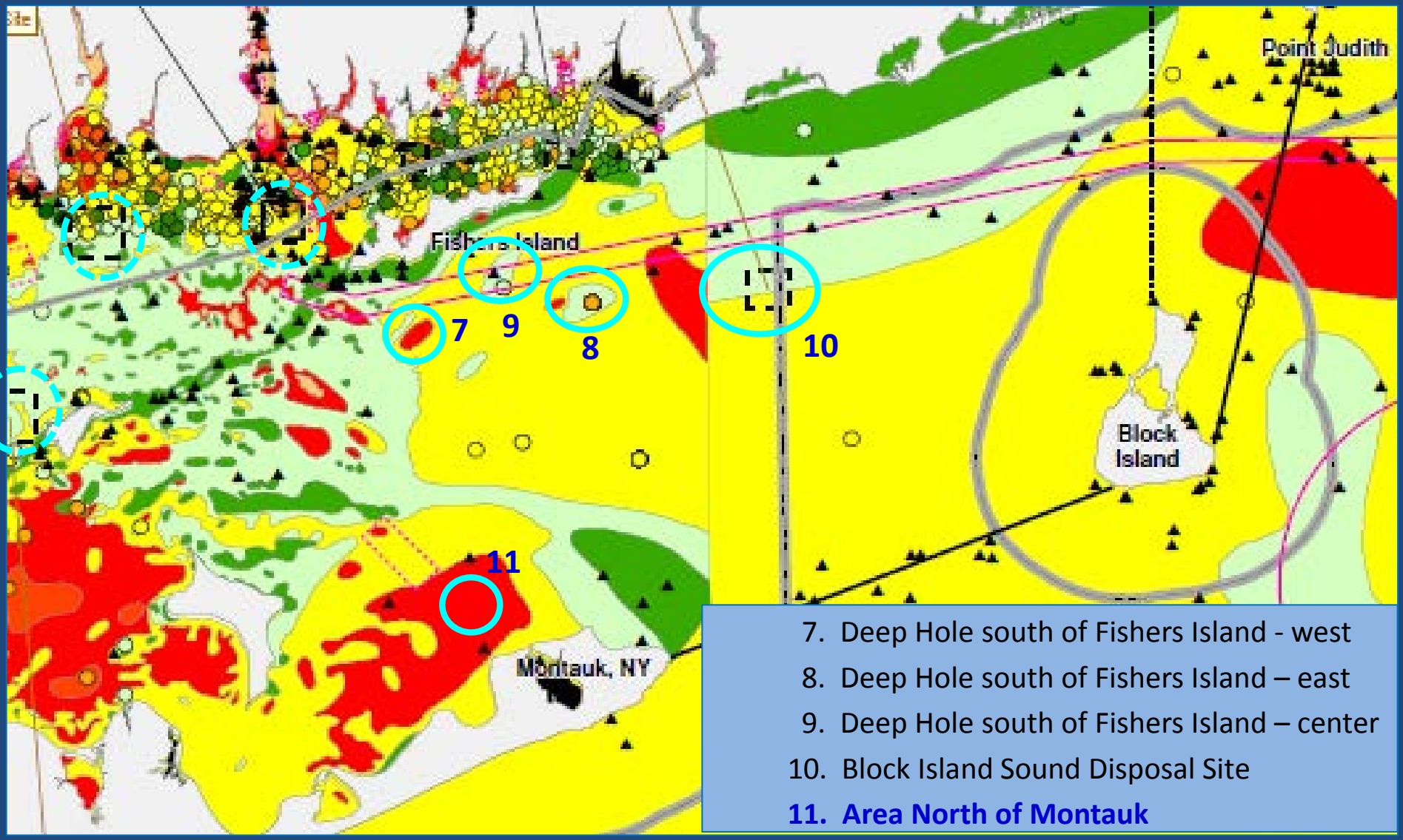
Alternative Site Discussion: Block Island Sound *(cont.)*

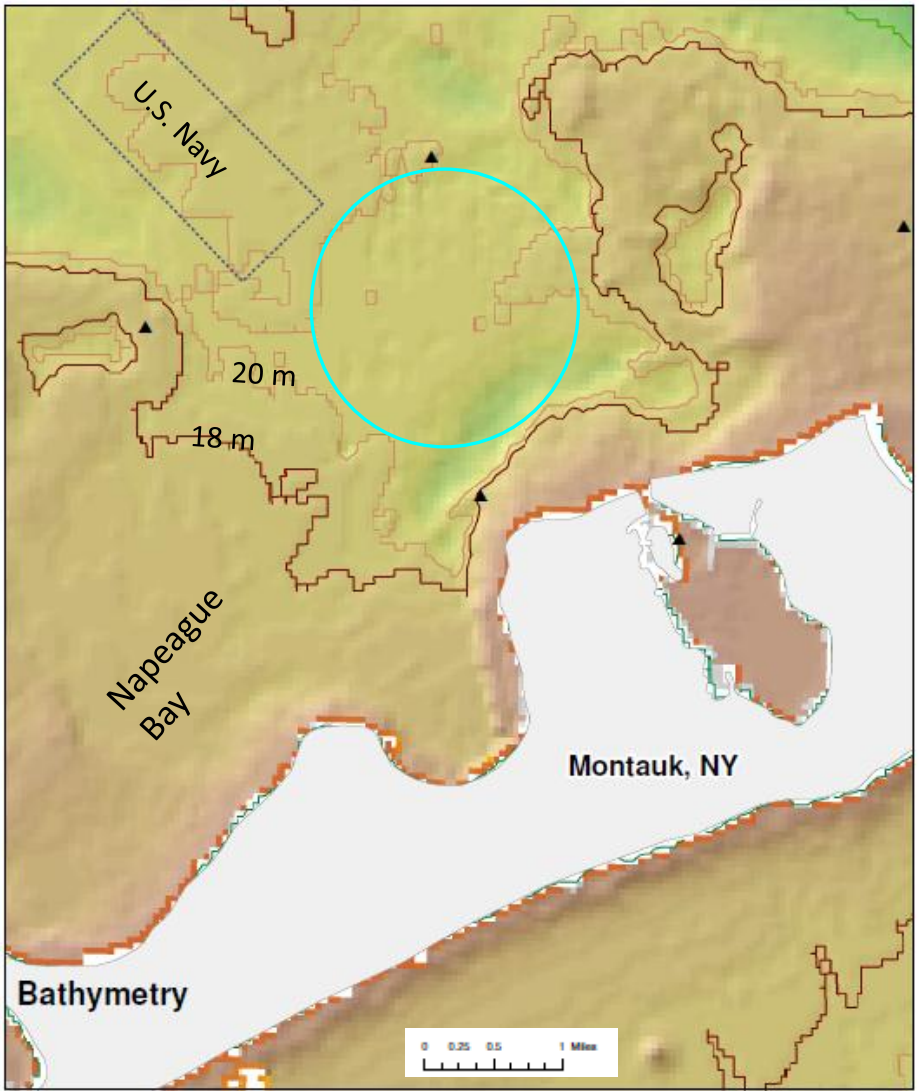


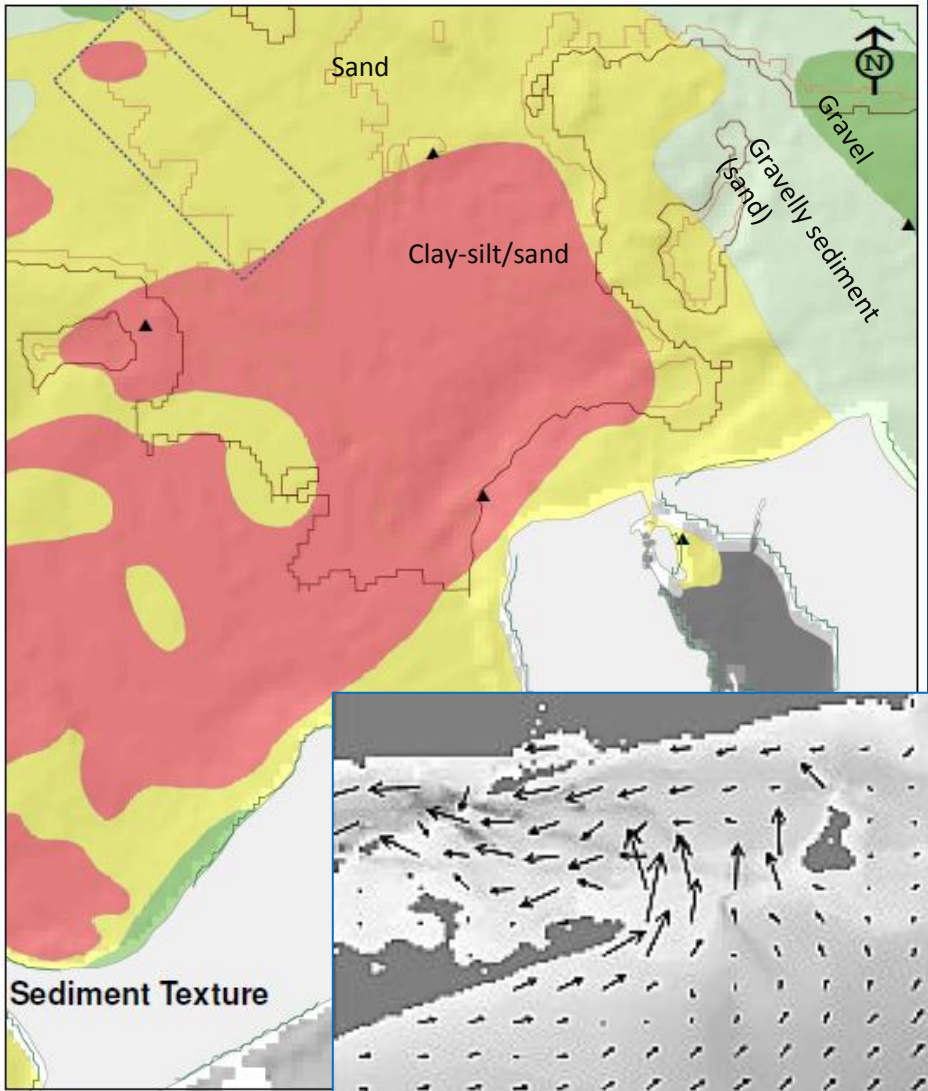
7. Deep Hole south of Fishers Island - west
8. Deep Hole south of Fishers Island – east
9. Deep Hole south of Fishers Island – center
10. Block Island Sound Disposal Site
11. **Area North of Montauk**

11. Area north of Montauk

- o Shallow (60-80 ft; 18-24 m)
- \- Long distance to dredging centers
  (NL: 16 nm; CT River: 21 nm)
- \- New site

- o Restricted U.S. Navy submarine anchorage
- +/? Containment (silt-clay/sand)
- ? Biological resources
- \- Close to shore (beaches; houses)





Alternative Site Discussion – Summary

	Eastern Long Island Sound						Block Island Sound				
	1	2	3	4	5	6	7	8	9	10	11
Sites	Cornfield Shoals Disposal Site	Six Mile Reef Disposal Site	Clinton Harbor Disposal Site	Niantic Bay Disposal Site	Orient Point Disposal Site	New London Disposal Site	Deep Hole south of Fishers Island - west	Deep Hole south of Fishers Island - east	Deep Hole south of Fishers Island - center	Block Island Sound Disposal Site	Area north of Montauk
Site Characteristics - Depth	+	-	o	+	+	-	+	+	+	o	-
Site Characteristics - Bottom Topography/Sediment Type	-	-	-	-/?	-	+	-	-/?	-/?	-/?	+/?
Distance to Dredging Centers	+	o	+	+	o	+	o	-	-	-	-
Active/Historic/New Disposal Site	+	o	o	o	o	+	-	-	-	-	-
Distance to Beaches areas	o	o	o	o	o	o	-	-	-	o	-
Distance to Commercial and Recreational Fisheries	o	o *1*	o *1*	o	o	o	o	o	o	o	?
Habitat /Biological Resources	o	o/?	?	o	?	+	?	?	?	?	?
Distance to Shellfish Beds	o	o *1*	o *1*	o	o	o	o	o	o	o	?
Distance to existing Habitat /Biological Resources	o	o/?	?	o	?	+	?	?	?	?	?
Disposal Site Managem. (mound stability, capacity, sed. type)	o	o	o	o	o	o	o	o	o	o	o
Historic and Cultural Resources			wrecks								
Navigation Considerations (anchorage, shipping lanes)						*2*			*2*		*2*
Distance to Conservation Area (Marine Sanctuary, preserve)					?					?	?
Other Use Conflicts (cables, pipelines)						cable?					
Other		morphology					barge transport - larger waves				

1 Approx. 3 miles east of *Approved* shellfishing zone.
2 Anchorage or vessel lane areas nearby

+ Relative Advantage
- Relative Disadvantage

o Neutral
? Need more data for screening

Appendix C: Presentation - Physical Oceanography Study Update
(James O'Donnell, UConn)

College of Liberal Arts and Sciences
Marine Sciences

UCONN

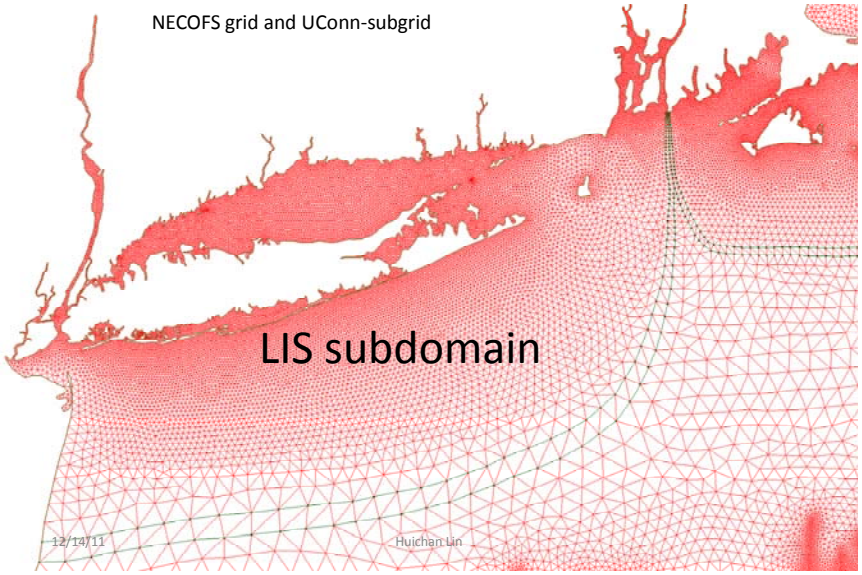
Observation and Model Plans and Status

James O'Donnell
University of Connecticut

Overview

1. Introduction
2. Bottom Stress and circulation are central to the site designation process.
   a) Consideration of all possible sites is only possible if models are used to “interpolate” between the limited location and times data is available using a model.
   b) Development and evaluation of model requires data.
3. Model
4. Summary of the data required to predict the range of circulation and bottom stresses expected throughout the ZSF.
5. Observation Plan

Model - FVCOM



Outer domain simulated by UMass Operationally through NOAA funding

This is a well established code and has been implemented in LIS already.

It is nested inside the UMass Dartmouth Regional Model.

FVCOM will be used to simulate the circulation and wave height and period distributions, and bottom stress.

Challenges are to get hydrography variability correct in the ZSF domain and wave model implemented and assessed.

Integration of Model and Data

UCONN

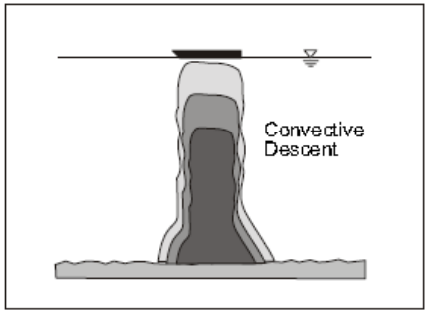
- Use observed winds and river flows to drive model and predict the salinity, temperature, current and waves, and bottom stress.
- Compare to the new and archived observations and evaluate FVCOM performance in LIS.
- Describe the uncertainties.
- Simulate the behavior under extreme events

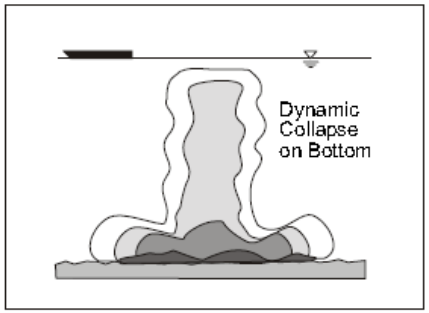
Analyses

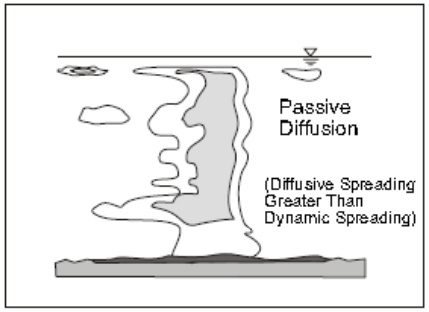
- Observations and model predictions will be used to describe the distributions of current and stress for site screening.
- Uncertainties will be based on model-data comparisons
- When sites are being considered there results will be used to drive the STFATE and LTFATE models.
- Uncertainties will be propagated by mulitple simulations.

Models STFATE- LTFATE

- STFATE – Near field transport during disposal operations
- FVCOM will provide currents, waves and shear for STFATE studies at sites under consideration
- Multiple simulations will define areas of potential impacts







LTFATE

- LTFATE simulates the long term transport of resuspended materials from disposal mound. This requires regional current patterns, and waves forecasts from FVCOM. We will simulate the effects of historic events at alternative sites

2. Summary of data needs – controlling factors.

1. Current in the ZSF controlled by tides, density variations and winds.
2. Bottom stress if determined by current and waves.
3. Waves are generated by wind.
4. We want to know the circulation and stress during normal conditions (for each season) and for extreme conditions.
5. We can only observe them all for selected interval and at a few places so we need a model to generalize the observations.

3. What is available ?

- Three great resources:

1. Woods Hole Group (201). Long Island Sound Dredged Material Management Plan (DMMP) Phase 2 Literature Review Update June 2010, Prepared for U.S. Army Corp of Engineers, Contract No. W912WJ-09-D-0001-TO-0022

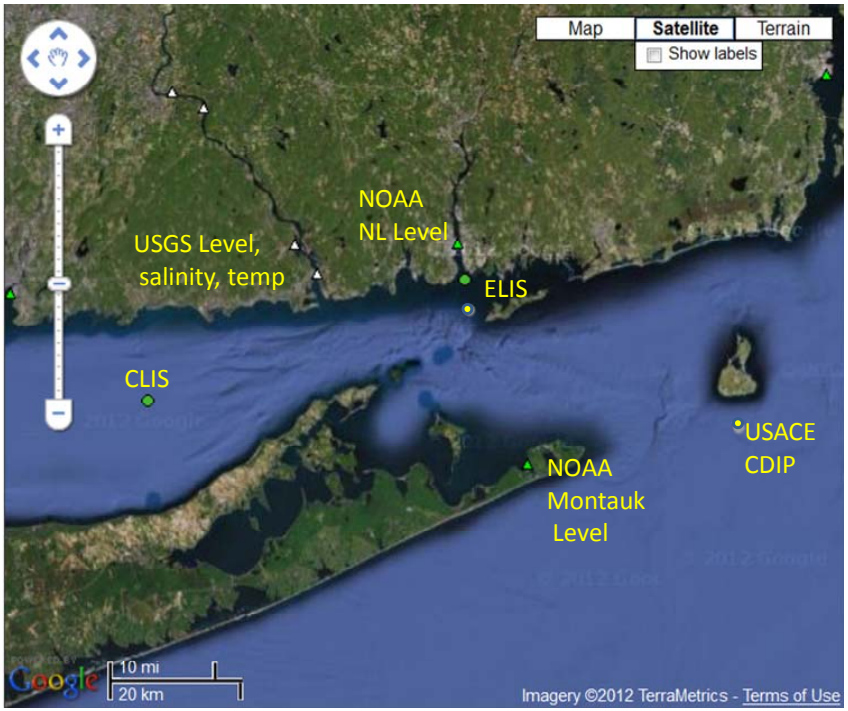
2. O'Donnell, J., R. E. Wilson, K. Lwiza, M. Whitney, W. F. Bohlen, D. Codiga, T. Fake, D. Fribance, M. Bowman, and J. Varekamp (2013). The Physical Oceanography of Long Island Sound. In *Long Island Sound: Prospects for the Urban Sea.* Latimer, J.S., Tedesco, M., Swanson, R.L., Yarish, C., Stacey, P., Garza, C. (Eds.), 2013 (Elsievier, In press).

3. Codiga, D. L. and David S. Ullman (2010). Characterizing the Physical Oceanography of Coastal Waters Off Rhode Island, Part 1: Literature Review, Available Observations, and A Representative Model Simulation (http://seagrant.gso.uri.edu/oceansamp/pdf/appendix/02-PhysOcPart1-OSAMP-CodigaUllman2010.pdf.)

- And our Task 2 report

4. Summary of data needs – variables

1. Sea level at the edge of the shelf to force tides and the interior of the model domain to check it.
2. Wind over the ocean to force the circulation and waves.
3. Solar radiation to force temperature variations.
4. River discharge measurements to force variations in salinity.
5. Salinity and temperature measurements at boundaries to prescribe conditions and in the interior to check predictions.
6. Current measurements to evaluate the model predictions
7. Wave measurements to evaluate the model predictions
8. Bottom stress measurements to evaluate the model prediction



Salinity & temperature, from Buoys.

UCONN

S-salinity, **T**-temperature, **DO**-dissolved oxygen (membrane sensor), O-dissolved oxygen (optical sensor), CH-chlorophyll (RFU only)

	CLIS Water			ELIS water		
Year	SFC	MID	BTM	SFC	MID	BTM
2012	S,T,CH,O	---	---		---	---
2011	S,T,CH,O	---	---		---	---
2010	S,T,CH,O	---	---	S,T,DO	---	---
2009	S,T,CH,O	---	---	S,T,DO	---	---
2008	S,T,DO	---	---	S,T,DO	---	---
2007	S,T,DO	---	---	S,T,DO	---	---
2006	S,T,DO	---	---	S,T,DO	---	---
2005	S,T,DO	S,T,DO	S,T,DO	S,T,DO	---	S,T,DO
2004	S,T,DO	S,T,DO	S,T,DO	S,T,DO	---	S,T,DO
2003	S,T,DO	S,T,DO	S,T,DO	S,T,DO	---	S,T,DO
2002	S,T,DO	S,T,DO	S,T,DO	S,T,DO	---	S,T,DO
2001	---	---	---	S,T,DO	---	S,T,DO
2000	---	---	---	S,T,DO	---	S,T,DO
1999	---	---	---	S,T,DO	---	---

Data Gap Summary

- No Stress
- Waves only at CLIS buoy ZSF
- No North-Sound variation in density in LIS
- No hydrography or current profile measurements in BS-RIS
- Seasonal variations in wind & wave and river discharge are substantial.

5. Proposal for Observations

- October-March have frequent high winds from NE
- Wind forcing is less in May-Sept
- River Flow is high Mar-May and below average the rest of the year
- Need current, wave and stress measurement in a range of locations in each forcing regime.
  - Windy, low flow (March + Nov-Dec)
  - Windy High Flow (April-May)
  - Calm, below average flow (June-July)

Station	Latitude (degrees north)	Longitude (degrees west)
1	41.2000	72.4000
2	41.1500	72.3700
3	41.2583	72.2422
4	41.1500	72.0000
5	41.1500	71.7500
6	41.2500	71.8000
7	41.2600	72.1000

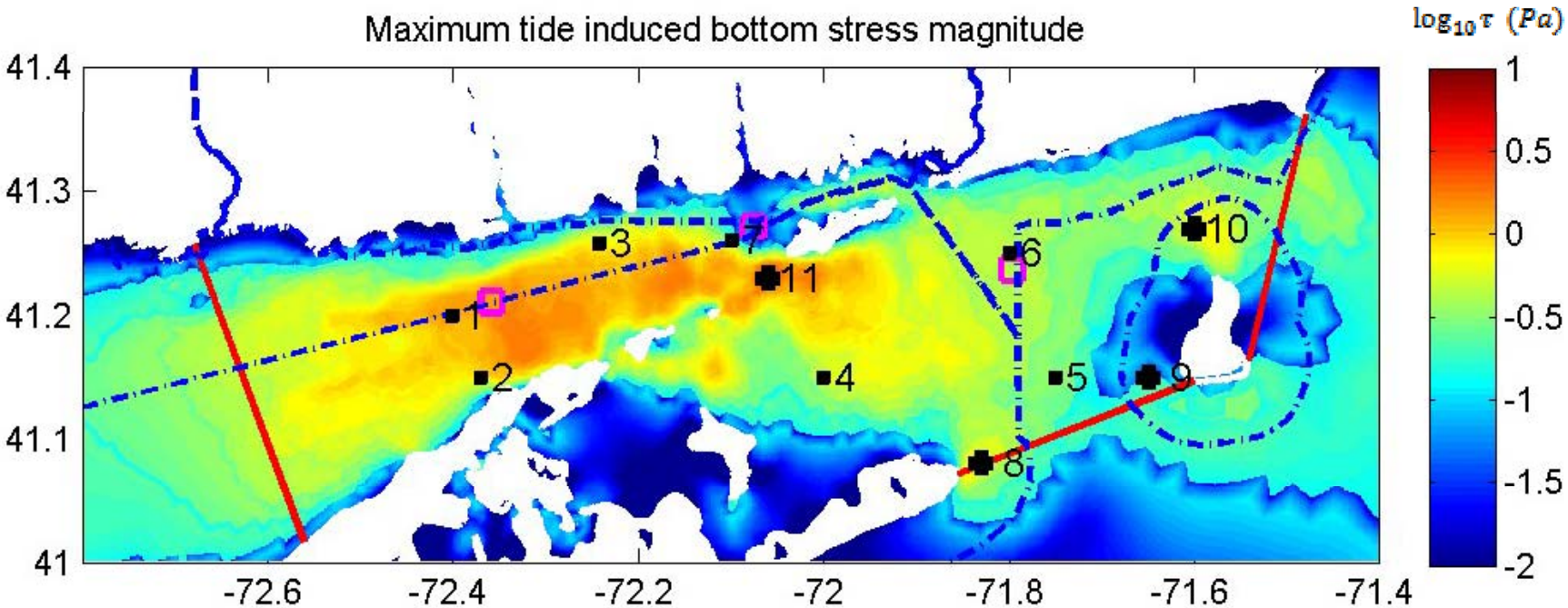
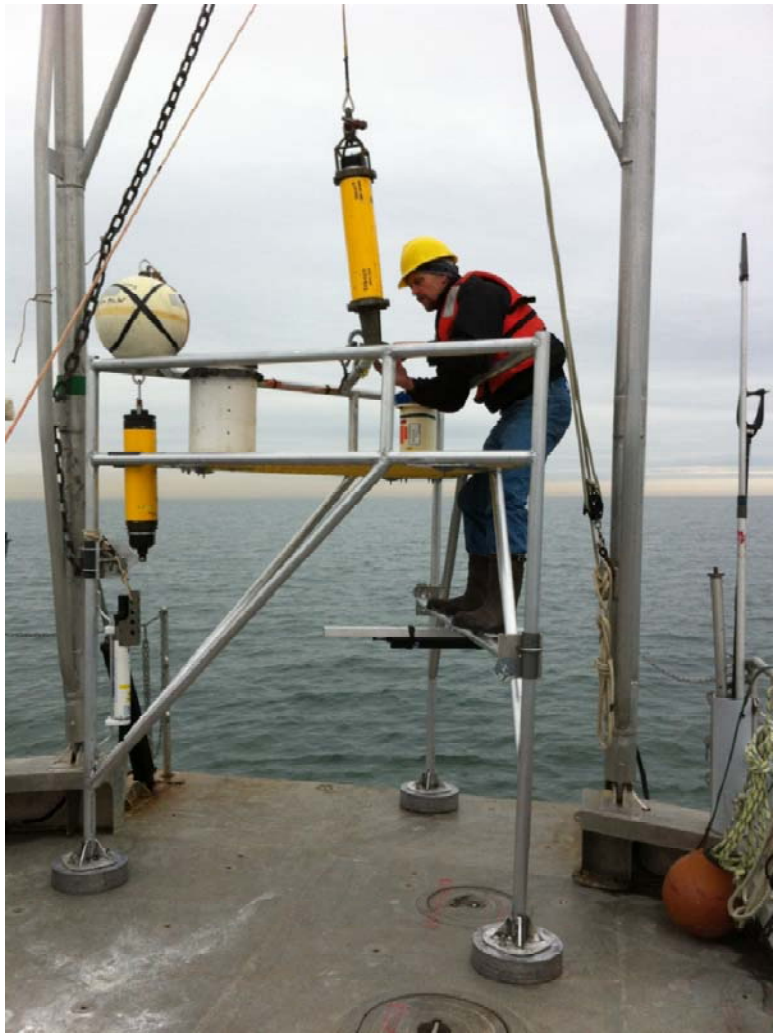


Figure 5. A map of the eastern end of LIS and the Block Island Sound with colors showing preliminary estimates of the distribution of the maximum bottom stress (N/m^2) produced by tidal currents alone. The red lines show the boundaries of the zone of siting feasibility (ZSF). The black squares show the proposed locations of moored current measurements. The open magenta squares indicate the location of existing or historical dredge material disposal sites.



Bottom Instrumentation

1. Upward looking RDI ADCP to measure profile (1-0.5m resolution) of current and wave statistics
2. Downward looking Nortek ADCP with 5cm resolution bottom to 75cm to measure stress and acoustic backscatter intensity
3. CTD to measure salinity, temperature and bottom pressure
4. Optical backscatter at .2 and .8 m to infer SPM concentrations

Profiling Instrumentation

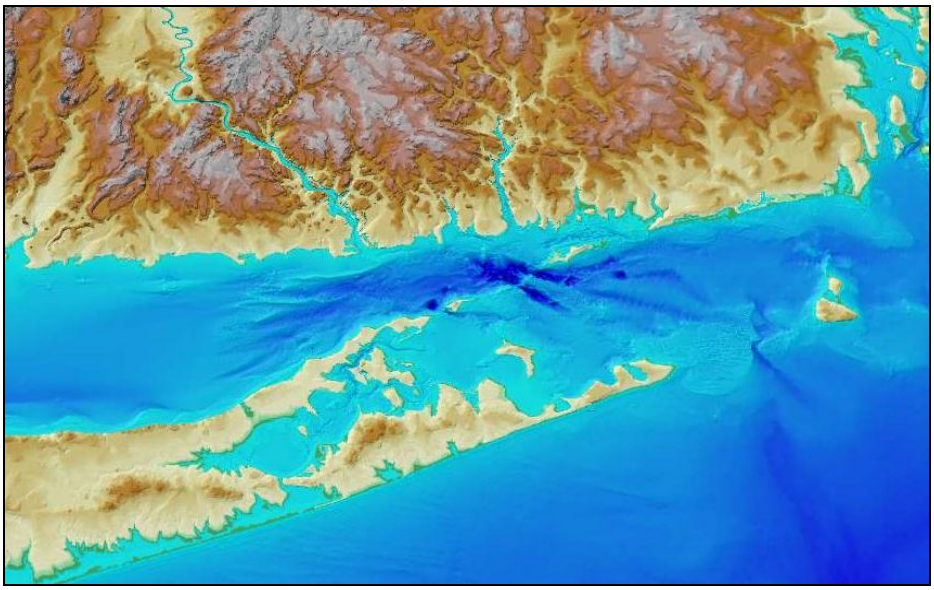
1. Hull mounted ADCP to survey current patterns
2. CTD to measure salinity, temperature and pressure
3. OBS 3+, optical backscatter to infer SPM concentrations
4. Water sampler for SPM concentration calibrations
5. LISST-100 to measure particle size spectra
6. AC9 Optical absorption spectra for discriminating organic and inorganic material

Appendix A-8

MINUTES OF COOPERATING AGENCY GROUP MEETING 3

Supplemental Environmental Impact Statement for the Designation of Dredged Material Disposal Sites in Eastern Long Island Sound, Connecticut and New York

Minutes of Cooperating Agency Meeting 3



Prepared for: **United States Environmental Protection Agency**

Sponsored by: **Connecticut Department of Transportation**

Prepared by: **Louis Berger**
with support from
University of Connecticut

June 2013

Eastern Long Island Sound – Supplemental EIS

Cooperating Meeting 03 – Minutes

TOPIC: **Site Screening - Second Update**

DATE OF MTG: June 18, 2013

LOCATION: Webinar

TIME: 1:30pm to 2:35pm

PARTICIPANTS: **Cooperating Agencies**

- Connecticut Department of Transportation CTDOT): Joe Salvatore
- US Environmental Protection Agency, Region 1: Jeannie Brochi
- Conn. Dept. of Energy and Environmental Protection: George Wisker
- US Army Corps of Engineers, New England District: Cathy Rogers, Mark Habel, Tom Fredette
- US Army Corps of Engineers, New York District: Nancy Brighton
- US Environmental Protection Agency, Region 2: Patricia Pechko
- New York State Department of State: Jim Leary, Kari Gathen, Jennifer Street
- New York Department of Environmental Conservation: Charles deQuillfeldt

University of Connecticut (UConn) Project Team (under contract to CTDOT)

- University of Connecticut: James O'Donnell
- The Louis Berger Group, Inc. *(Prepared minutes):* Amy Atamian, Len Warner (at 2:00pm)

SUBMITTED ON: August 5, 2013

The primary goal of the meeting (see agenda in Appendix A) was to review comments made on the presentation of Cooperating Agency Meeting 2 on May 20, 2013, and to discuss the upcoming public meetings.

Specifically, the USEPA received comments from NYSDOS, USACE New England District, and USEPA Region 2 on the initial screening presentation made during Cooperating Agency Meeting 2. Comments and questions pertained to the following issues:

- Commercial and fishing data: More data needed.
- Legend and presentation format (color, font size, etc.)
- The summary sheet was a bit confusing. (It was meant to be a tool to summarize the GIS layers and their use.)
- Tier 1 and 2 screening approach

- 18 meter black-out contour, especially at the New London Disposal Site and the use of sediment texture data.
- Request to add significant fish and coastal wildlife habitat and deepwater coral sites
- Baseline chemical characterization of sediment

Jean Brochi asked if there were additional comments and questions. There were none.

In response to the comments received, revisions were made to Slides 16-18 and 23-27 of the original presentation. Jean Brochi summarized the key changes made; Amy Atamian discussed details. Key changes include the following (revised slides are included in Appendix B):

- *Slide 16 - Conservation Areas:* Deep water corals: Two points were available in the NOAA data base. The New York State significant habitat data layer was added. Some data from Rhode Island for refuges and preserves were added. Local Waterfront Revitalization Plan: Zones were added.

- *Slide 17 - Shellfish beds:* Now shows 2009 shellfish bed locations which include a few beds from the north shore of Long Island. Also now included is 1994 shellfish information for Rhode Island. Additional available data for Gardiners Bay and Peconic Bay (Suffolk County Aquaculture Leasing Program) still needed to be added.

  Amy Atamian asked about any additional available data for New York's north shore of Long Island Sound (LIS). Charles deQuillfeldt stated that any active leases in Long Island Sound are west of the Eastern Long Island Sound (ELIS) study area (Debbie Barnes from NYSDEC may have some information; 631-444-0483). He also stated that no surveys are available (as far as he knows) that show locations of shellfish beds.

- *Slide 18 - Fishing Area:* Relevant information on fishing areas for New York and Connecticut waters is still lacking.

  Charles deQuillfeldt mentioned that NYSDEC does not have spatial information either; commercial harvesters may have some information. A question was asked if this data could be obtained from the Atlantic States Marine Fisheries Commission (ASMFC) or the Fishery Management Council. Charles deQuillfeldt stated that this is unlikely but he will check into it. A lot of the commercial harvesters cannot use nets in Long Island Sound. Amy Atamian stated that there was an area east of Gardiners Island that was classified for multiple use commercial fishing. Charles deQuillfeldt stated that this area would not extend eastwards beyond a line from Orient Point (or Plum Island) to Montauk, as Suffolk County does not have leasing rights in Block Island Sound (BIS).

- *Slide 23 - Approved/ Prohibited Shellfish Areas:* The Rhode Island data set was updated with 2013 data that were recently posted on the web. Also, now shows areas in Gardiners and Peconic Bay that are part of the leasing program.

  Charles deQuillfeldt stated that information on closed shellfishing areas for New York State is available in 6NYCRR Part 41 which has maps of approved and prohibited shellfishing areas. He also stated that some prohibited locations were missing on the slide, such as one at Plum Island and another one by Greenport around the sewage treatment plant outfall. He further stated that the regulations only list permanent closures, not temporary closures.

- *Slide 24 - Active and historic disposal sites:* The Rhode Island Sound disposal site was updated to 'active'.

- *Slide 25 - Archaeological and cultural resources:* The previously used data set from the Northeast Ocean Data Portal was updated to the current NOAA's Automated Wreck and Obstruction Information System (AWOIS). Data from the archaeological study performed in 2010 for the DMMP are not included as the study was only in nearshore areas and GIS data are not available.

- *Slide 26 - Recreational areas and navigation:* Parks and beach locations were added from a DMMP study. Amy Atamian will check on the data for the New York State data layer for parks. Charles deQuillfeldt suggested adding the Long Island Sound Stewardship sites to this slide, available from the Long Island Sound Study website. Jennifer Street stated that she will provide information on municipal, county-level park areas (including beaches) to be added.

- *Slide 27- Overlay 1 Base – Bathymetry:* Not yet updated. NOAA archaeological data need to be checked.

Jean Brochi then discussed a draft of the presentation and the agenda for the Public Meetings on June 25 (NY) and 26 (CT): Bernward Hay will start the meeting. Jean Brochi will give a project update, followed by site screening overview. Then the meeting will be opened up for discussion and next steps. Comments will not be specifically requested as it is an informational meeting.

Jean Brochi then reviewed the draft presentation[1] for the meeting. Key elements of the presentation consisted of the following:

- Overview of applicable regulations for dredged material disposal
- EPA's role in dredging and dredged material management
- Reminder of the active dredged material disposal sites
- History leading up to the SEIS
- Zone of Siting Feasibility, focused on ELIS
- Update on activities (Notice of Intent; comments received; public scoping document; data gap analysis and literature search is ongoing; physical oceanography study is ongoing; initial screening of sites from January to June; additional screening with data collection from June through August; etc.)
- Approach to screening: Tier 1 and Tier 2 will be confusing, thus the approach will focus instead on MPRSA criteria. The evaluation will include GIS layers and data located through the literature search.
- Examples of screening criteria (based on MPRSA)
- Would like to share that there are six areas in ELIS and five areas in BIS that could be considered for potential disposal sites.
- Plans to ask the Public for any additional existing information or data, if known.
- Discussion of historic sites, as documented by the USACE.
- Bathymetry for ZSF.

Kari Gathen asked about the difference between a cable area and a submarine cable. Amy Atamian stated that 'cable areas' are areas delineated on the NOAA charts and they could be 500 feet on either side of the actual cables location within these areas; submarine cables are also shown as linear features like that on the NOAA charts.

Tom Fredette asked about the alignment of a submarine cable crossing the Rhode Island Sound Disposal Site. Amy Atamian stated she would review the adequacy of the spatial resolution on the original data layer.

[1] Note: The final version of the presentation is available in the Public Scoping Meeting Report for the meetings.

A comment was made about being more consistent with the color palette throughout the various slides.

Jean Brochi then asked if there were any objections to using the slide with the dredging centers in the public meeting presentation. There were none. Mark Habel suggested editing the 25-mile circles.

Jean Brochi listed 'next steps' to include the following:

- Focus on additional data to fill data gaps, especially for sediment, biological resources, and fisheries
- Gather additional cultural resources data
- Conduct the physical oceanography study with preliminary data to be presented at another Cooperating Agency meeting in late summer or early fall
- Focus current data collection efforts on priority areas in the ELIS around the active sites, but also continue efforts to locate more data for other sites
- Hold another public meeting in late fall (perhaps late October or November) and congressional meetings and briefings.

Jean Brochi asked for suggestions of other information that should be presented. There were none. She stated that the final agenda and presentation would be provided to the Cooperating Agency members prior to the public meetings.

Jean Brochi also anticipates the following upcoming requests for input by the Cooperating Agencies:

- In 2005, the EPA sent out a lobster survey to lobster fishermen. Some of the questions could be asked differently or converted into a multiple-choice format. Input will be sought also from the USACE about lessons learned during some of the surveys conducted for the DMMP.
- Review of preliminary data from the physical oceanography study.

Jean Brochi will also be reaching out to tribes to obtain relevant information.

The meeting was adjourned at approximately 2:35pm.

APPENDICES

Appendix A: Invitation and Agenda (Jeannie Brochi, USEPA)

From: Brochi, Jean [mailto:Brochi.Jean@epa.gov]
Sent: Friday, June 14, 2013 2:14 PM
To: Pechko, Patricia; Pabst, Douglas; Grimaldi, Alicia; Cote, Mel; Hamjian, Lynne; Hay, Bernward; O'donnell, James (james.odonnell@uconn.edu); Atamian, Amy; Bohlen, Walter (walter.bohlen@uconn.edu); Jennifer.Street@dos.ny.gov; dgoulet@crmc.ri.gov; jwillis@crmc.ri.gov; george.wisker@ct.gov; joseph.salvatore@ct.gov; mark.l.habel@usace.army.mil; Herter, Jeff (DOS); Nancy.J.Brighton@usace.army.mil; Catherine.J.Rogers@usace.army.mil; Lou.chiarella@NOAA.gov; diane.rusanowsky@noaa.gov; dxmcreyn@gw.dec.state.ny.us; Benjamin.J.Duarte@uscg.mil
Cc: kari.gathen@dos.ny.gov; james.leary@dos.ny.gov
Subject: LIS SEIS COOPERATING AGENCY MEETING #3

Hello,

This is a reminder that EPA is hosting a **Cooperating Agency Webinar** next **Tuesday, June 18th from 1:30-3:30pm**

1) Agenda (also see attached)/to be discussed:

- comments from Cooperating agencies on May 20th presentation
- changes made to the May 20th presentation
- the presentation for the public meeting
- the agenda for the public meeting
- logistics for the public meeting

2) Link to Webinar: Meeting Name: LIS SEIS COOPERATING AGENCY MEETING #3
Invited By: Jean Brochi (Brochi.Jean@epa.gov)
When: 06/18/2013 1:30 PM – 3:30 PM
To join the meeting:
https://epa.connectsolutions.com/r10ifmi57ix/

3) Audio Conference: Dial-In Number: (617)918-2822, Password: 255664

Please feel free to contact me if you have any questions.
Regards,
Jeannie

June 18, 2013 – EPA Webinar -ELIS SEIS
Cooperating Agency Meeting #3

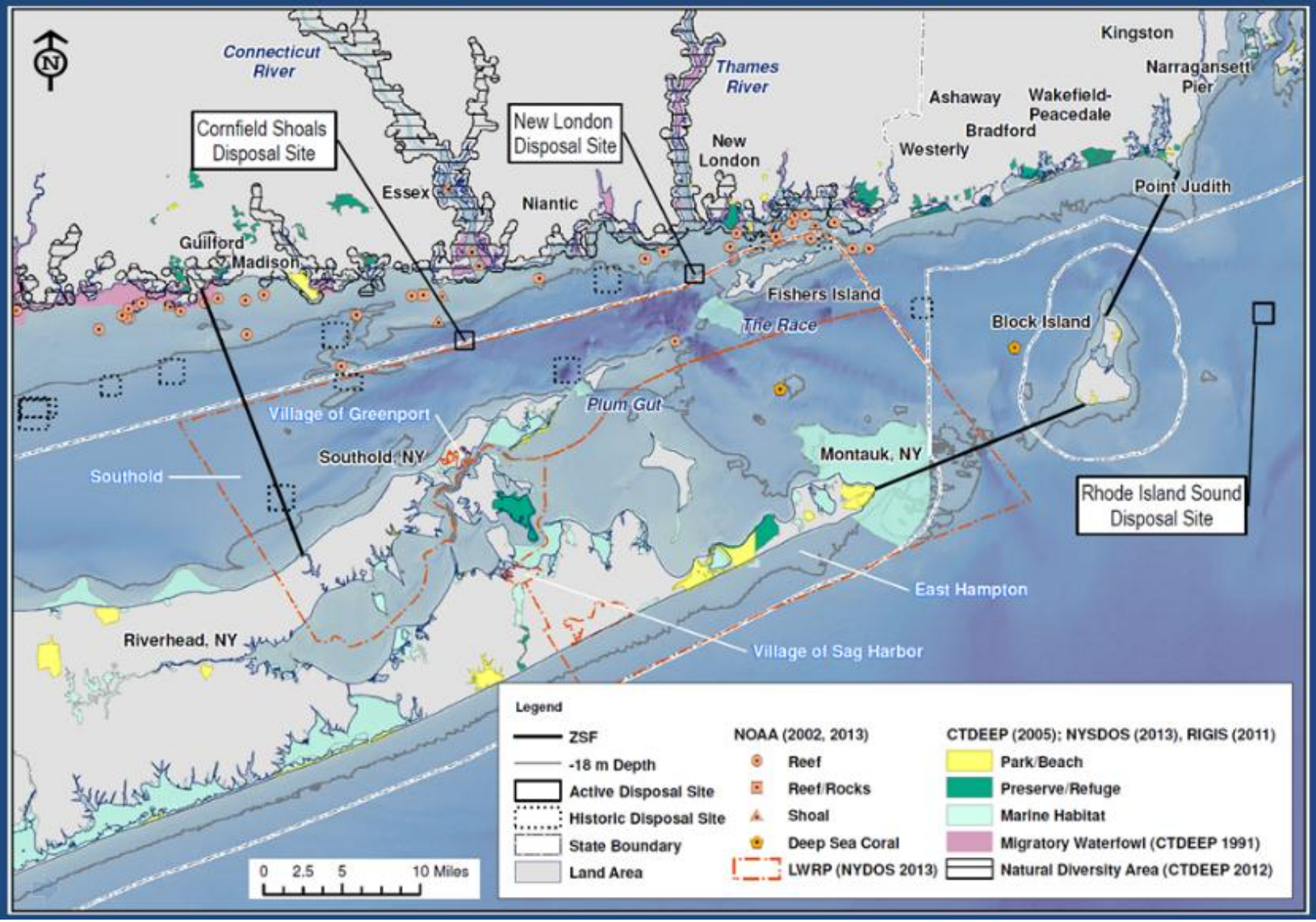
Agenda

1:30 pm	Introductions/Objectives Jean Brochi, EPA
1:35 pm	Comments from Cooperating Agencies on the May 20th Screening presentation Jean Brochi, EPA
1:45 pm	Revisions to the May 20th Screening presentation Jean Brochi, EPA and Amy Atamian, LBG
2:00 pm	Agenda for the upcoming public meetings
2:05 pm	Review the presentation for the public meetings
2:30 pm	Next Steps – logistics for public meetings and other comments or discussion points
3:30 pm	Adjourn

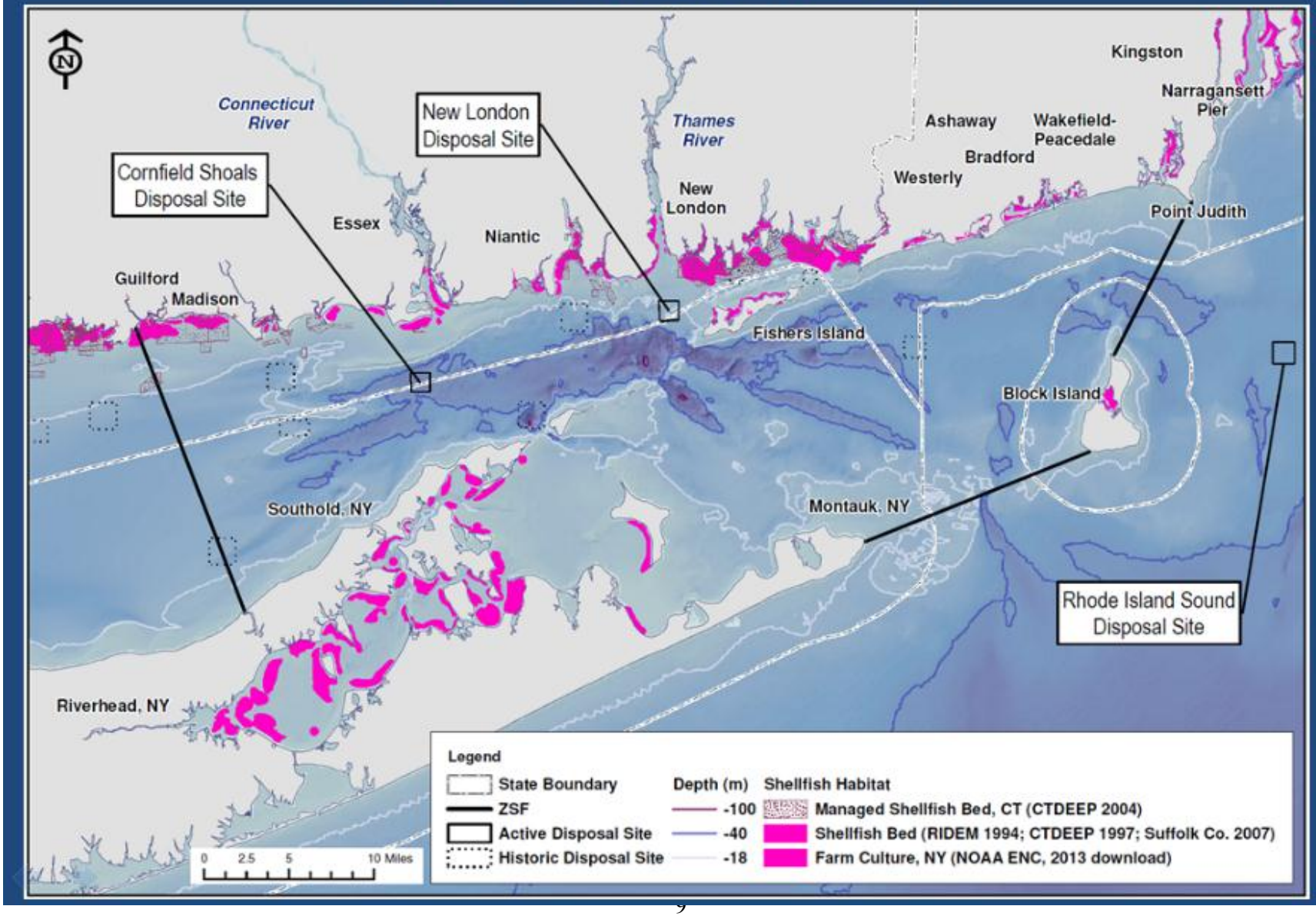
Appendix B: Updated Site Screening Slides (Amy Atamian, The Louis Berger Group, Inc.)

Conservation Areas

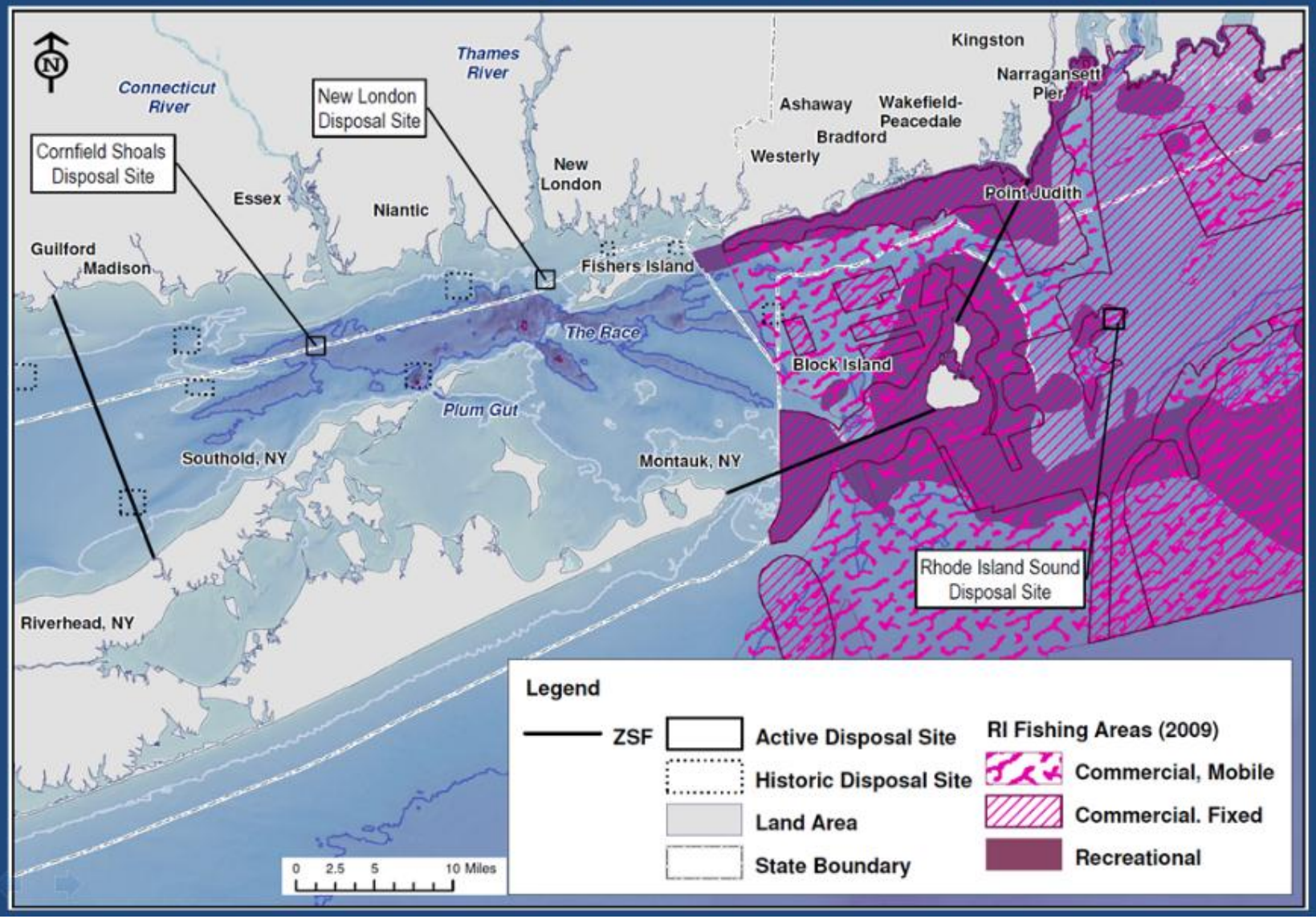
(sanctuaries, wildlife refuges, national seashores, parks, artificial reefs, etc.)



Tier 1: Shellfish Beds

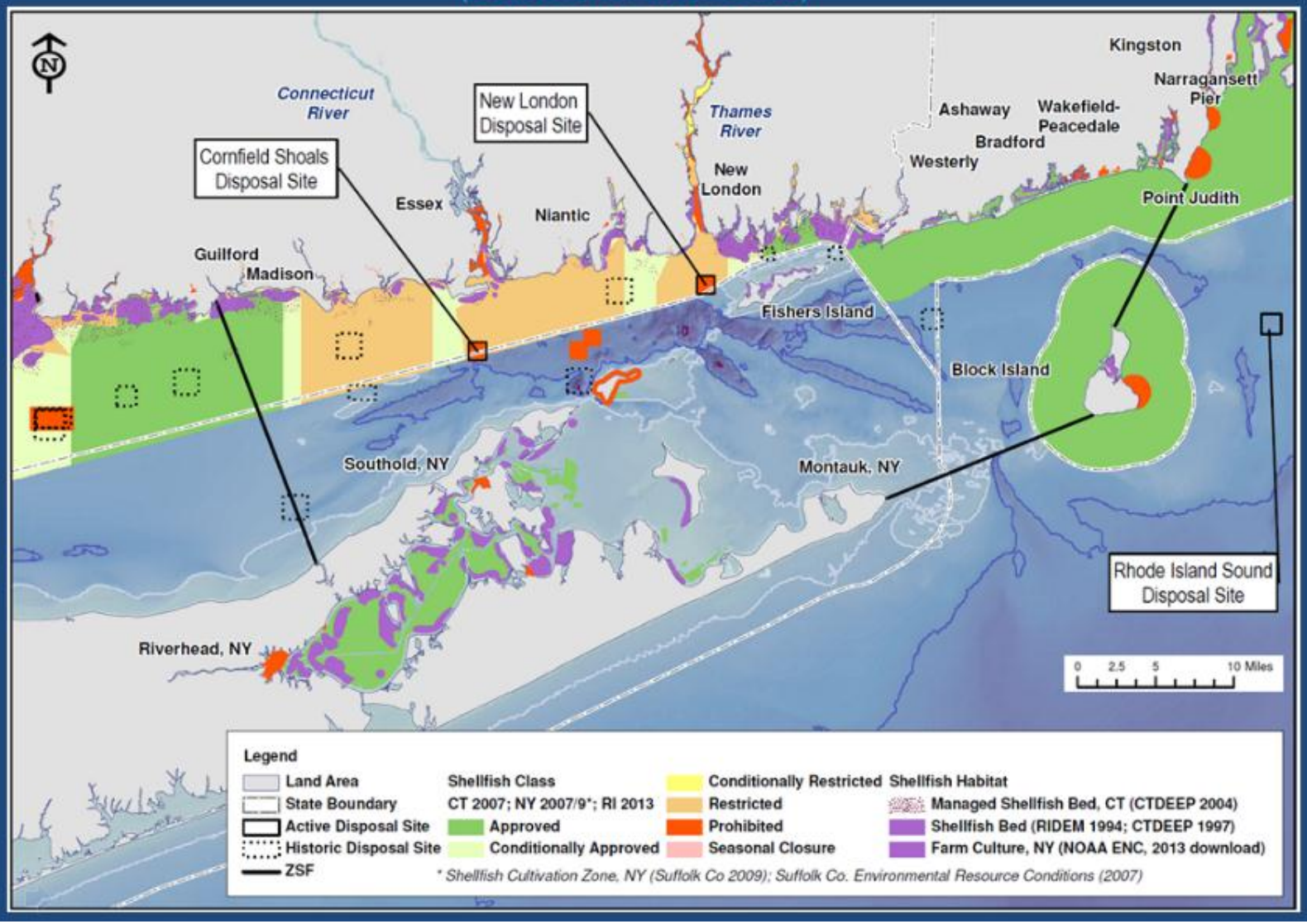


Tier 1: Fishing Areas (additional data needed)

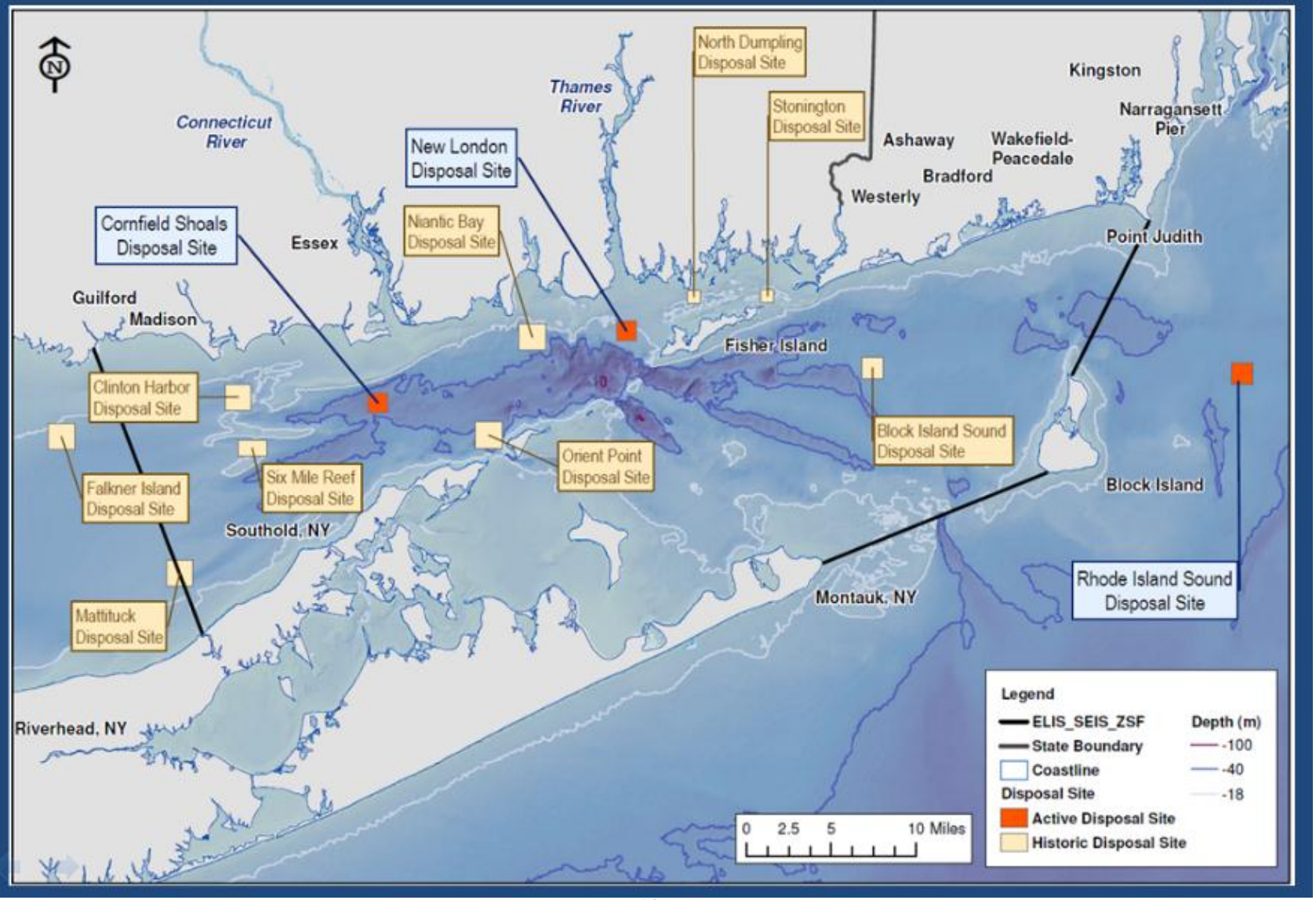


Tier 2: Approved/ Prohibited Shellfish Areas

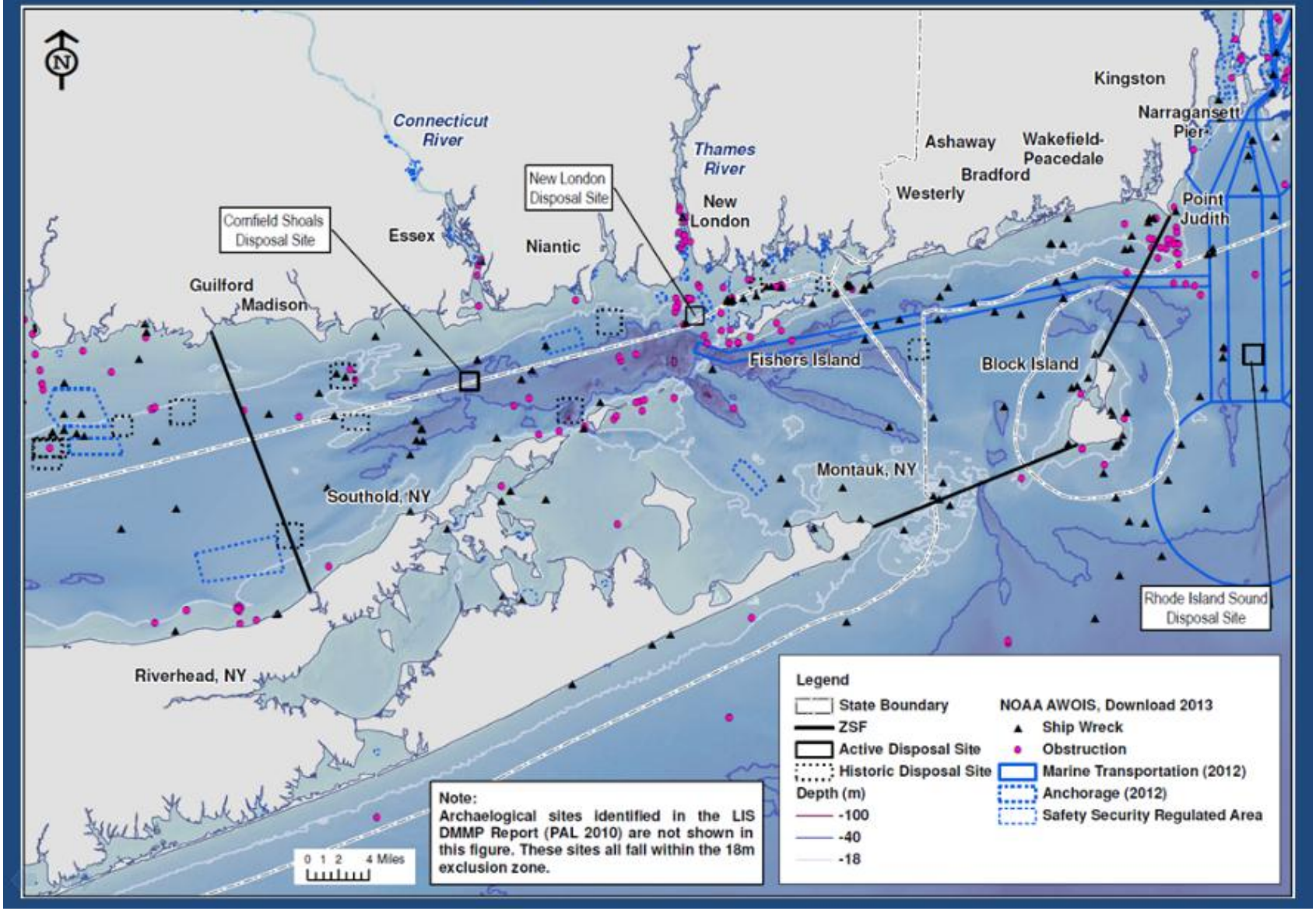
(additional NY data needed)



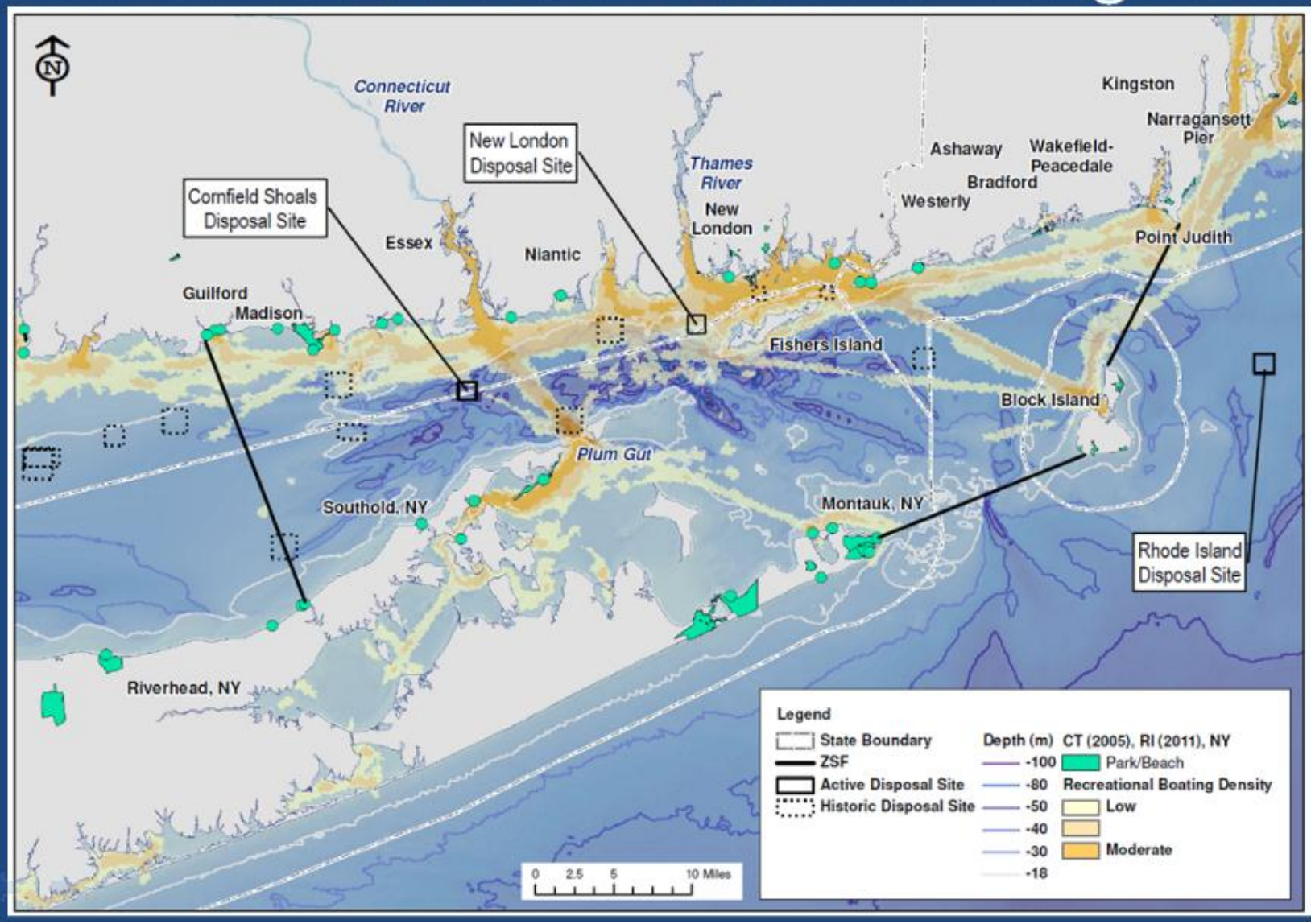
Tier 2: Active and Historic Disposal Sites



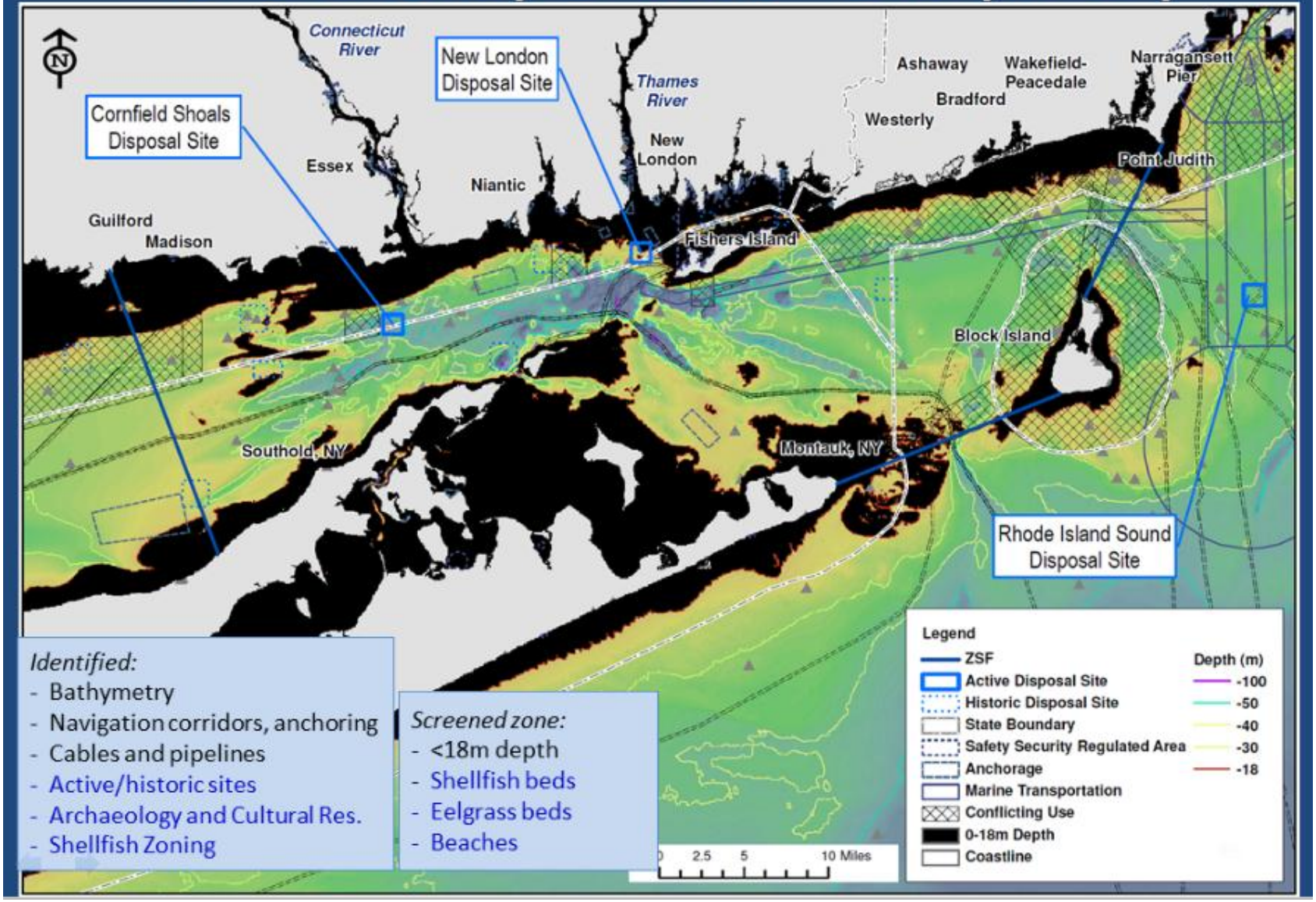
Tier 2: Archaeological and Cultural Resources



Tier 2: Recreational Areas and Navigation



Tier 2 Overlay 1: Base - Bathymetry



Identified:
- Bathymetry
- Navigation corridors, anchoring
- Cables and pipelines
- Active/historic sites
- Archaeology and Cultural Res.
- Shellfish Zoning

Screened zone:
- <18m depth
- Shellfish beds
- Eelgrass beds
- Beaches

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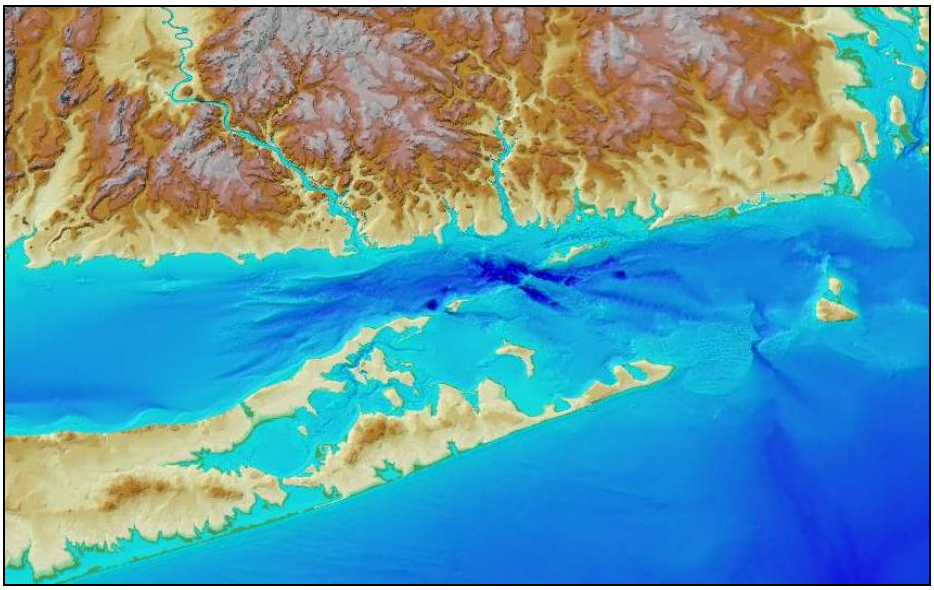
Appendix A-9

MINUTES OF COOPERATING AGENCY GROUP MEETING 4

Supplemental Environmental Impact Statement for the Designation of Dredged Material Disposal Sites in Eastern Long Island Sound, Connecticut and New York

Minutes of Cooperating Agency Meeting 4



Prepared for: **United States Environmental Protection Agency**

Sponsored by: **Connecticut Department of Transportation**

Prepared by: **Louis Berger**
with support from
University of Connecticut

September 2014

Eastern Long Island Sound – Supplemental EIS

Cooperating Meeting 04 – Minutes

TOPIC:	**Physical Oceanography Study**
DATE OF MTG:	September 5, 2014
LOCATION:	Webinar
TIME:	10:00am to 11:15am
PARTICIPANTS:	**Cooperating Agencies**

- Connecticut Department of Transportation CTDOT): Joe Salvatore
- US Environmental Protection Agency, Region 1: Jeannie Brochi
- US Army Corps of Engineers, New England District: Todd Randall
- US Environmental Protection Agency, Region 2: Patricia Pechko
- New York State Department of State: Kari Gathen, Liz Podowski, Jennifer Street, Michael Zimmerman
- New York Department of Environmental Conservation: Charles deQuillfeldt, Dawn McReynolds

University of Connecticut (UCONN) Project Team (under contract to CTDOT)

- University of Connecticut: James O'Donnell
- Louis Berger *(Prepared minutes):* Bernward Hay

SUBMITTED ON: September 11, 2014

The purpose of the meeting was to present the results of Physical Oceanography (PO) Study in preparation for the Eastern Long Island Sound (ELIS) region Supplemental Environmental Impact Statement (SEIS). The study was conducted by the University of Connecticut (UCONN) with support from Louis Berger; it was prepared for the U.S. Environmental Protection Agency (USEPA), and sponsored by the Connecticut Department of Transportation (CTDOT).

Jean Brochi introduced the meeting, stating that the presentation will be a summary of what is available in both the PO Field Data Report and the Model Report which was distributed to the Cooperating Agencies on August 22, 2014. She asked that clarifying questions on the reports or presentation could be asked at the end of the presentation. Written comments or questions could also be sent to her after review of documents. Charles deQuillfeldt stated that the Field Data Report could not be downloaded as NYSDEC's computer system currently has problems. Jean Brochi stated that would send a CD with the report.

James O'Donnell then presented the details of the study, consisting of the following components:

- Objective of the PO study
- Model overview

- Model calibration
- Evaluation of model simulations
- Analysis of results
- Summary of findings

The presentation is attached in Appendix 1: it followed the Field Data Report and Modeling Report prepared for this study (please refer to the appendix and the reports for details).

Questions after the presentation were as follows:

- Dawn McReynolds asked about the data recovery for currents and suspended sediment near the seafloor at the seven moored stations, which collected half or less data of the data targeted (*Slide 10 in Appendix 1)*. She asked if the data recovered were sufficient to guarantee the 90% variance of the model.

  James O'Donnell responded that he needed a minimum of 75 days of data at each station for the model; this was achieved by the field program. During Campaign 1 (spring), the data return was lower compared to other campaigns, with Station DOT3 achieving less than 25 days of data. However, there is no degradation in the model because of that. The available data was sufficient to discriminate areas of high and low stress. The field program captured several storms; more than three in eastern Long Island Sound and more than two in Block Island Sound. This outcome is better than expected. Normally instruments deployed in these waters are even more affected by fishing activities than what was experienced during this study. Some instrument loss was anticipated when the field program was designed.

- Patricia Pechko asked if the conditions during the three campaigns (spring, summer, winter) were typical for these seasons.

  James O'Donnell stated that he considers them 'typical'. The study captured a fairly wide sample of conditions. In fact, the study observed that the *maximum* bottom stresses that occurred during the three seasons did not differ all that much. In other words, winter storms may have similar wind speeds as summer storms, although the frequency of storms may be less in the summer. However, due to the length of the field program, several good summer storms were captured.

- Michael Zimmerman inquired about the correlation between predicted and observed data which were very strong *(Slide 20 in Appendix 1),* asking if a standard error was determined and model results were adjusted accordingly.

  James O'Donnell responded that there were no adjustments to the data or the model as they are independent.

  Michael followed up asking if the difference between the model and the field data was considered in the subsequent modeling.

  James O'Donnell responded the correlation between model and field data was not used to adjust any model results.

- Patricia Pechko asked if Superstorm Sandy was a worst-case scenario, or if one of the more recent hurricanes would be a better example for worst-case conditions. In other words, why was Sandy selected as a worst-case storm?

  James O'Donnell responded that a 100-year long record of bottom stress or currents does not exist which would allow evaluating the severity of conditions during Sandy; in addition, there were no current velocity measurements during Sandy either. However, data are available for sea level and wind speeds *(Slides 27 and 28 in Appendix 1)* that allow an assessment of the severity

of Sandy. The maximum sea level correlates with the maximum current velocities during a storm. In New London, the return period of sea level rise as a result of storm surge (based on a record of 70 years) is approximately 2 meters (m) *(Slide 29 in Appendix 1).* The peak surge in New London during Sandy was 2 m *(Slide 28),* thus implying that it can be considered a 100-year storm.

James O'Donnell did the same analysis for Hurricane Irene which had a storm surge of 1.6 m, making it approximately a 20-year storm. While the impacts from hurricanes may be greater economically, current velocities in Long Island Sound are affected by storm surge. Part of the reason for the high storm surge in Long Island Sound during Sandy was not maximum wind speed (Sandy dropped to a' tropical storm' category), but rather the fact that the still high wind speeds during Sandy lasted for several days pushing the sea level continuously higher and resulting in severe flooding in the western part of Long Island Sound. After the storm, all the water accumulated in the Sound flowed out in the eastern part of the Sound.

Jean Brochi stated that the estimated schedule for the Draft SEIS at this time is December 2014 or January 2015. However, she stated further that there was a request during the last Cooperating Agency meeting to allow for more time for review of documents, which EPA will accommodate for future documents with a minimum of three weeks.

The webinar was adjourned at approximately 11:15am.

APPENDIX 1: Presentation by Dr. James O'Donnell (University of Connecticut):
Physical Oceanography of Eastern Long Island Sound Region

Supplemental EnvironmentalImpactSt atement forthe Designation ofDr edged Material Disposal Site(s)inE asternL ongI sland Sound, Connecticut andN ew York

Physical Oceanography of Eastern Long Island Sound Region

Prepared for: U.S. Environmental Protection Agency

Sponsored by: Connecticut Department of Transportation

Prepared by: University of Connecticut

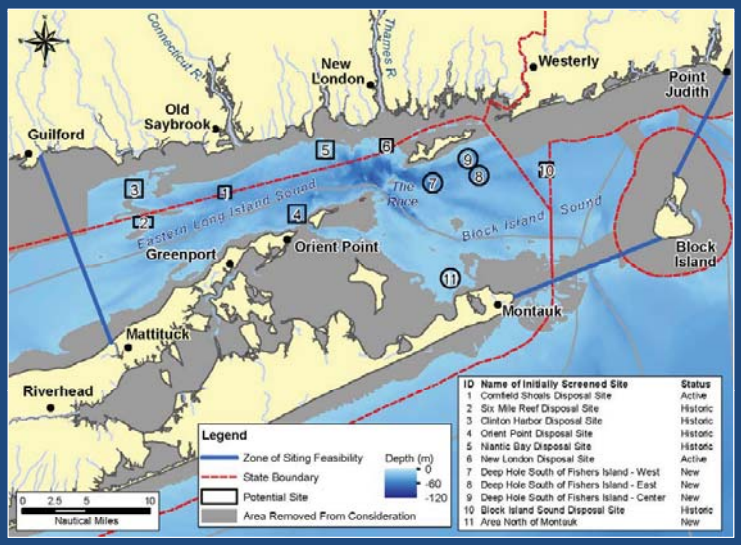
with support from: Louis Berger

Cooperating Agency Meeting 4 (Sept. 5, 2014)

Objective ofPOStudy

Supportev aluationandselectionofpot entialdr edgedma terial disposal siteswithintheZ oneofSiting Feasibility (ZSF)

- Describedis tributionof maximum bottom stress magnitudes expectedintheZSF including'Su perstorm Sandy' conditions **(a 100-year storm)**
- Characterizecir culation inthe ZSFt o support assessmentof potentialo ffs ite effects
- Acquireph ysical oceanography data to supportfutur e modeling of sediment transport at potentialdr edgedma terial disposal sites



Zone of Siting Feasibility (ZSF). Initial screening identified (1) areas not suitable for locating dredged material disposal sites due to various constraints (gray zone), and (2) 11 sites for further investigation as potential disposal sites; these sites include two active and five historic disposal sites, and six 'new' sites not previously used for dredged material disposal. The background represents water depth.

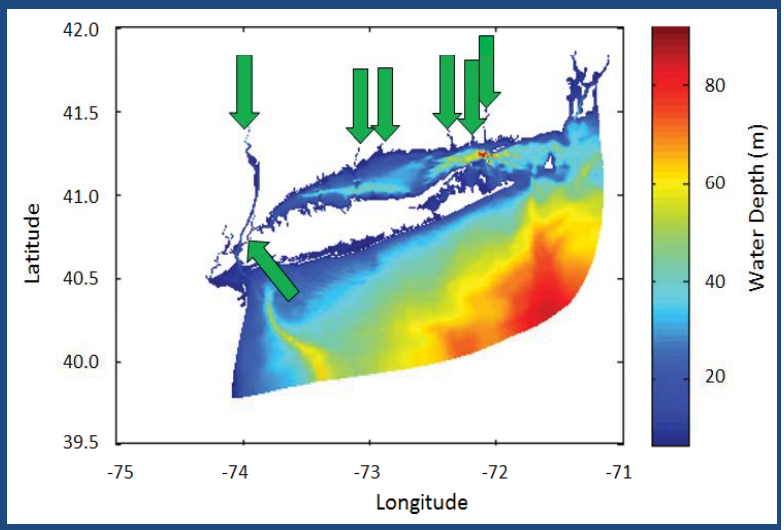
Outline

1. Model: *Configure and test*
2. Calibration: *Use available data*
3. Evaluation ofSimula tions
   - Field Program: *Collect data (currents and stress etc.) at a set of stations that are expected to exhibit a wide range of conditions*
   - ModelP erformance: *Evaluate predictions of model with new data*
4. Analysis
5. Summary

1.Model

FVCOM:

- Forcedb y Tides and NECOFS
- Observed Riverflow andwind
- Climatology for surface heat exchange
- Climatology forinitial conditions



Bathymetry of the LIS model subdomain with the locations of freshwater sources (green arrows; from left to right: Hudson River, New York City wastewater treatment plants , Housatonic River, Quinnipiac River, Connecticut River, Niantic River, and Thames River).

1.Model *(cont.)*

An Unstructured Grid, Finite-Volume, Three-Dimensional, Primitive Equations Ocean Model: Application to Coastal Ocean and Estuaries

CHANGSHENG CHEN AND HEDONG LIU

School for Marine Science and Technology, University of Massachusetts–Dartmouth, New Bedford, Massachusetts

ROBERT C. BEARDSLEY

Department of Physical Oceanography, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts

ConservationofMomen tum: Reynolds AverageNa vier StokesE quation

$$\frac{\partial u}{\partial t} + u\frac{\partial u}{\partial x} + v\frac{\partial u}{\partial y} + w\frac{\partial u}{\partial z} - fv = -\frac{1}{\rho_o}\frac{\partial P}{\partial x} + \frac{\partial}{\partial z}\left(K_m\frac{\partial u}{\partial z}\right) + F_u,$$

Atthe seafloor

$$K_m\left(\frac{\partial u}{\partial z}, \frac{\partial v}{\partial z}\right) = \frac{1}{\rho_o}(\tau_{bx}, \tau_{by}),$$

where the stressispar ameterizedas

$$(\tau_{bx}, \tau_{by}) = C_d\sqrt{u^2 + v^2}(u, v)$$

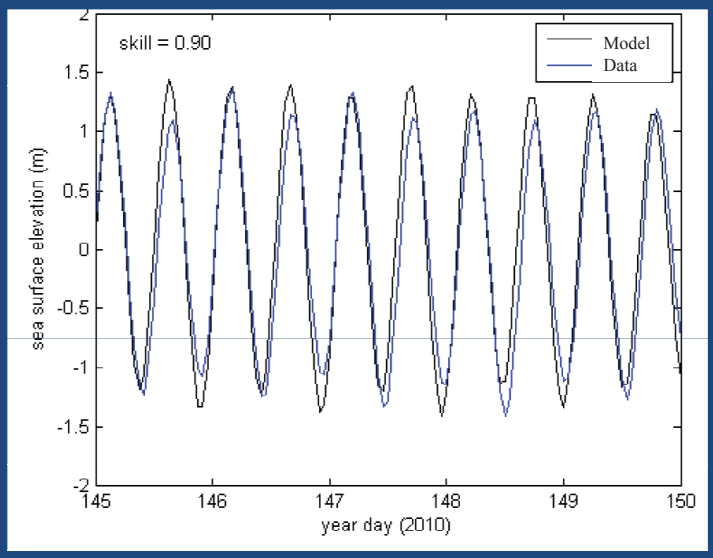
andthe dragc oefficient iswrit tenint erms of the roughness at the seafloor as

$$C_d = \max\left[\frac{k^2}{\ln\left(\frac{z_{ab}}{z_o}\right)^2}, 0.0025\right], \qquad (2.14)$$

where $k = 0.4$ is the von Kármán's constant and z_o is the bottom roughness parameter.

2.Calibr ation

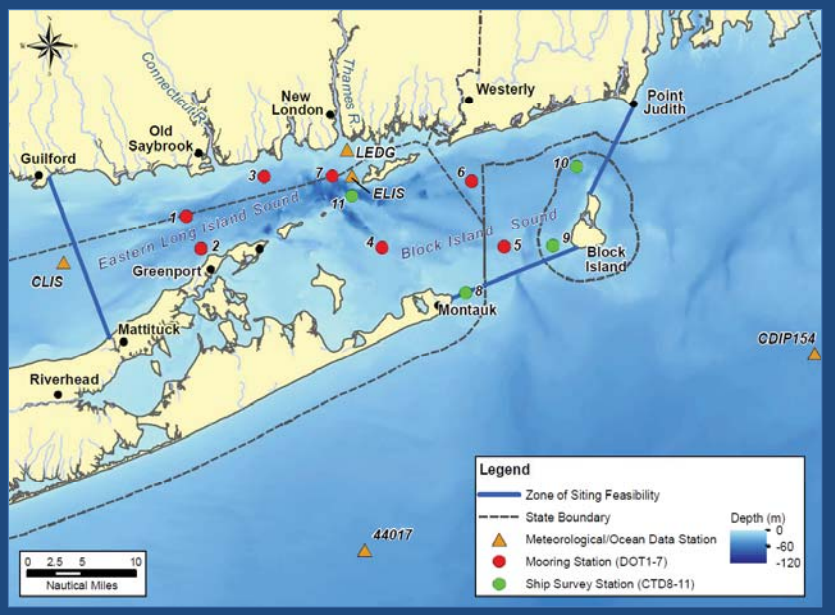
- Setz $_0$ =0.001 mt o optimizethe simulation ofthe sea levela t Bridgeport for 2010
- Determine theSkill (variance in data explained/variance in data) tobe90%



Comparison of tidal heights at the NOAA Bridgeport tidal height gauge (BDR, blue) compared to those predicted by the FVCOM model (black) after iteratively calibrating the model using the 2010 NOAA data . Note that year day 1 is January 1, 2010.

3.E valuation– Field Program

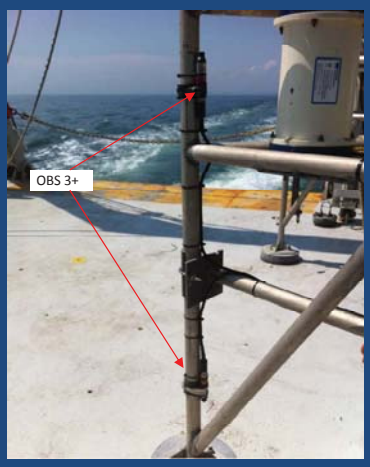
- Deploy instruments on 7bot tomtripods for 3 two-month observation campaigns to observes pring,f all andwin ter
- Conduct 6 cruises with water column measurements atthe 7tri pods tations and 4additional stations



Survey stations in the ZSF, as well as meteorological/ocean stations. The background represents water depth.

3.E valuation– Field Program *(cont.)*

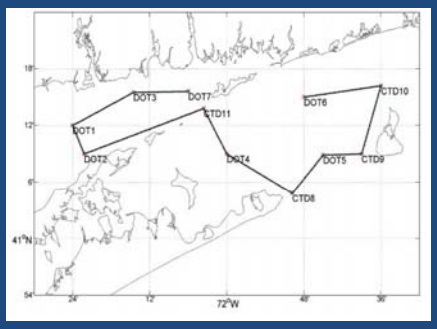
- UpwardlookingRDI ADCPf or water column currents and waves
- Downward looking NortekADCPf ors tress
- 2op tical backscatter (OBS3+) forsuspended sediment concentration
- SeaBird CTD (SBE SMP37)f orsalinity and temperature



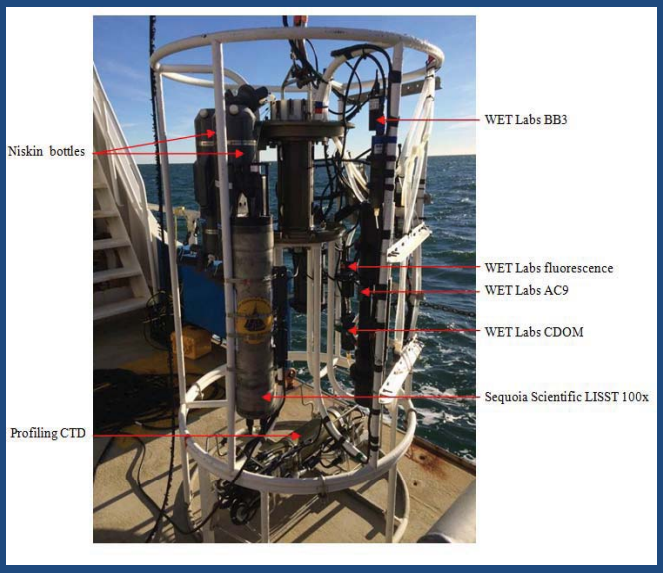
Left: Location of instruments in moored tripod frame
Right: Close-up of the OBS3+ mounts

3.E valuation– Field Program *(cont.)*

- CTDf ort emperature andsalinity
- Water sampler and optical instrumentsf orfutur esedimen t transport modeling

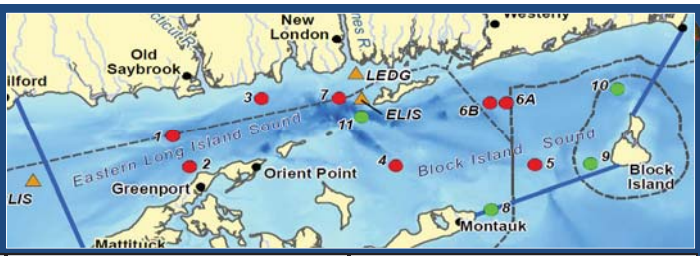


Example of a cruise track for ship surveys. The track varied for each cruise due to weather conditions and sea state.



Rosette sampler, equipped with a profiling CTD, Niskin bottles, and various optical sensors and particle analyzers.

Moored Stations D ata Recovery

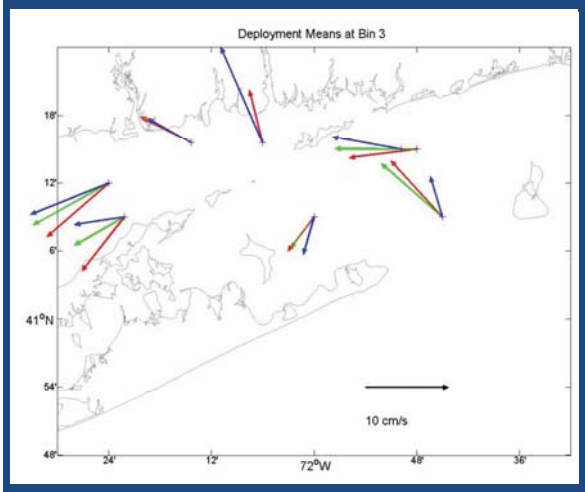


Para-meters	Temperature and Salinity near the Seafloor				Currents and Suspended Sediment near the Seafloor				Waves and Currents in the Water Column			
Sensor	*CTD (SBE SMP37)*				*Nortek ADCP & OBS3+ sensor*				*RDI ADCP*			
Mooring Stn	Campaign 1	Campaign 2	Campaign 3	Total	Campaign 1	Campaign 2	Campaign 3	Total	Campaign 1	Campaign 2	Campaign 3	Total
	days				days				days			
DOT1	66	58	57	181	25	29	54	108	66	58	57	181
DOT2	66	58	57	181	25	27	54	106	66	58	57	181
DOT3	66	58	57	181	24	32	53	110	0	58	57	115
DOT4	66	58	57	181	27	34	56	117	66	58	57	181
DOT5	66	58	57	181	27	30	57	114	66	58	57	181
DOT6 A/B	66	58	43	167	25	16	44	86	28	16	43	87
DOT7	49	58	57	164	28	34	27	89	0	58	57	115
Max Days	*66*	*58*	*57*	*181*	*66*	*58*	*57*	*181*	*66*	*58*	*57*	*181*

Full or near-full data (>90%)
About half or more data (45 - 90%)
About one quarter or more data (22.5 - 45%)
No data

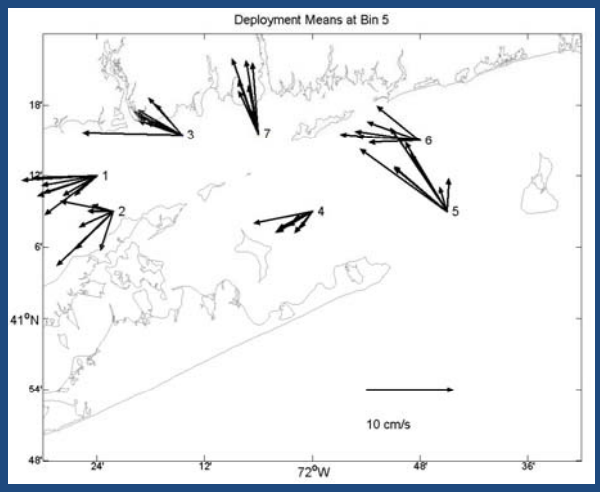
3.E valuation– Field Program *(cont.)*

RDIADCPmeansa t~3m fromseafloor



Mean currents at Bin 3 of the RDI ADCP measurements during Campaigns 1 (green), 2 (red), and 3 (blue).

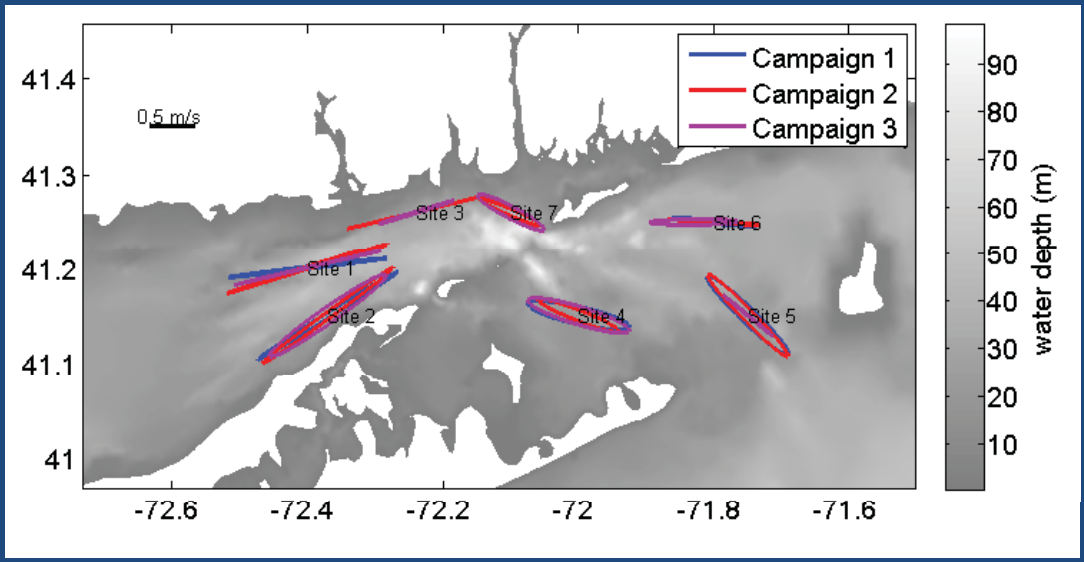
NortekADCPmeansa t~0.6mfr omseafloor



Mean velocity vectors at each moored station from the Nortek ADCP near the seafloor. The velocity scale is shown on graphic.

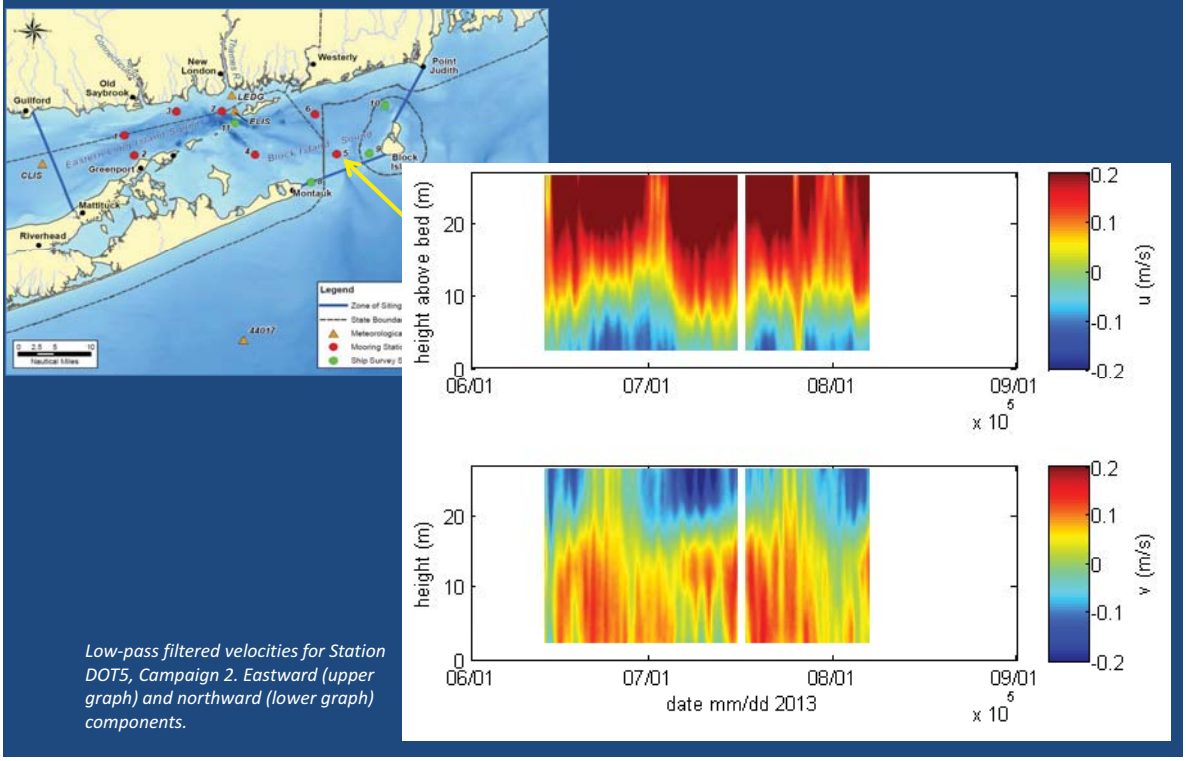
3.E valuation– Field Program *(cont.)*

M2 TidalCons tituents



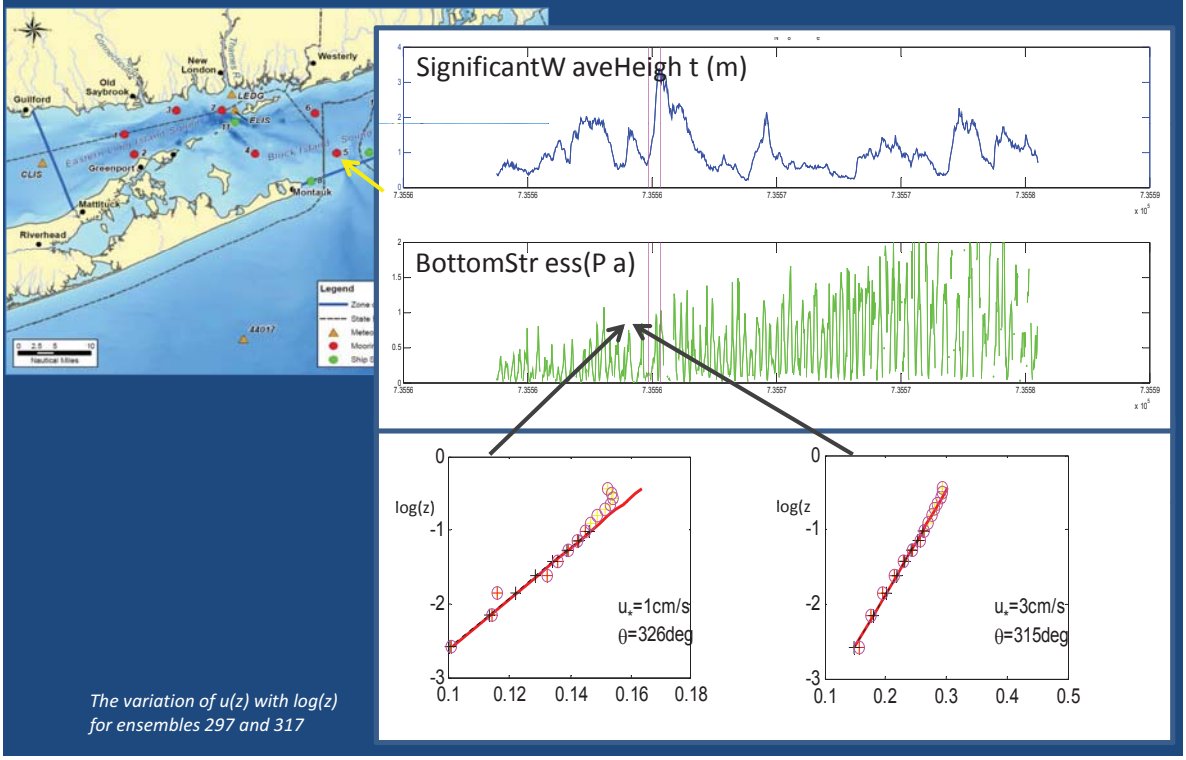
M2 ellipses for depth-average velocities from RDI ADCP measurements from the three campaigns (colors) and for FVCOM model (black) at all seven DOT stations. The grey shading represents mean water depth.

3.E valuation– Field Program *(cont.)*



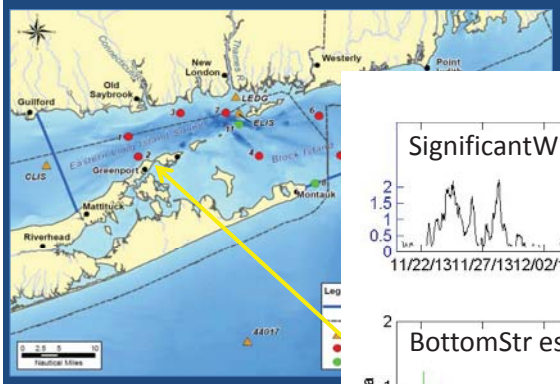
Low-pass filtered velocities for Station DOT5, Campaign 2. Eastward (upper graph) and northward (lower graph) components.

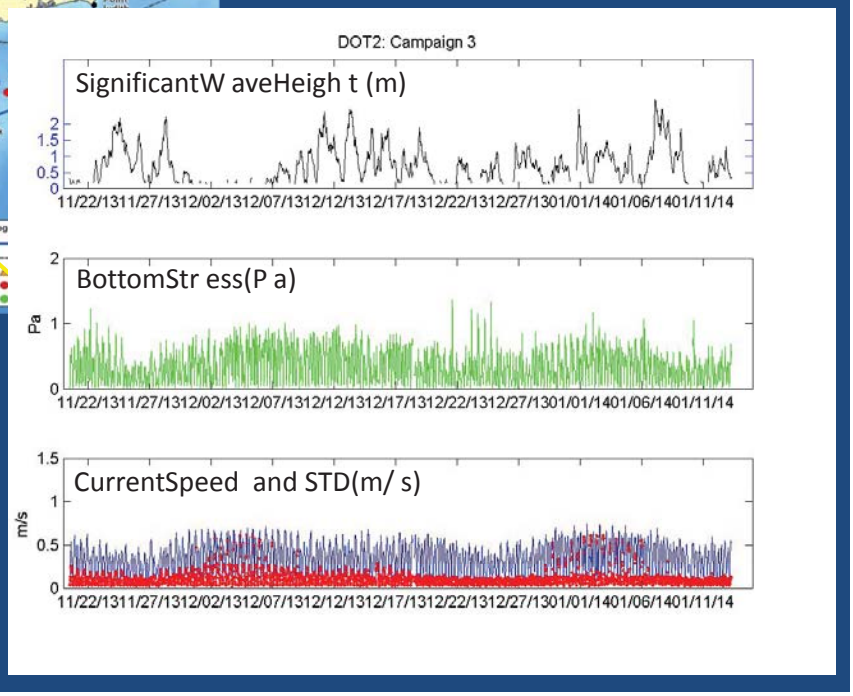
3.E valuation– Field Program *(cont.)*



The variation of u(z) with log(z) for ensembles 297 and 317

3.E valuation– Field Program *(cont.)*

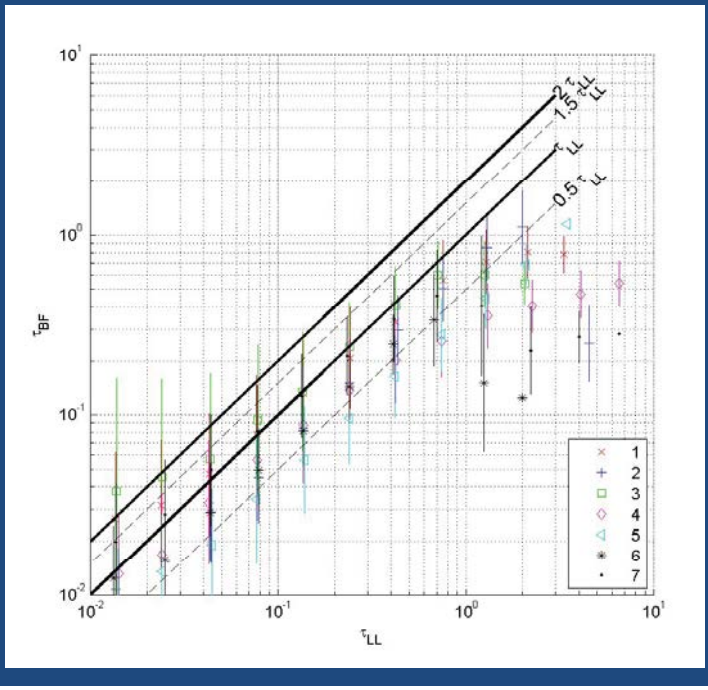




Characteristics at Station DOT2 during Campaign 3:
Top: Significant wave height (in m).
Middle: Stress.
Bottom: Standard deviation of velocity estimates within the ensemble (red line) and the ensemble means (blue line).

3.E valuation– Performance

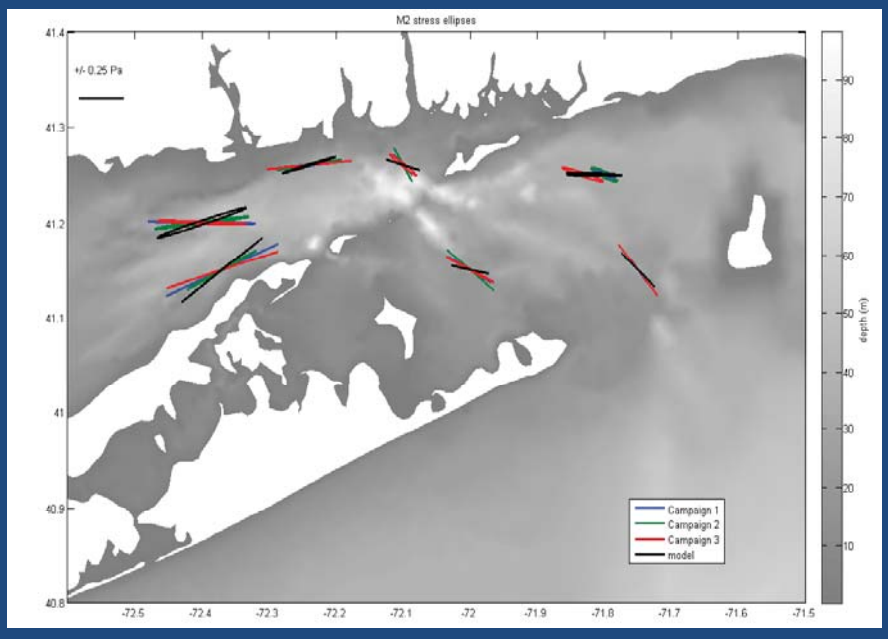
Measurements supportt heuse ofC $_d$ =0.0025.



Summary of stress magnitude measurements using the log law and the bulk formula with C_d=0.0025. To suppress the noise inherent in turbulent quantities, measurements were bin-averaged. The key shows the stations numbers.

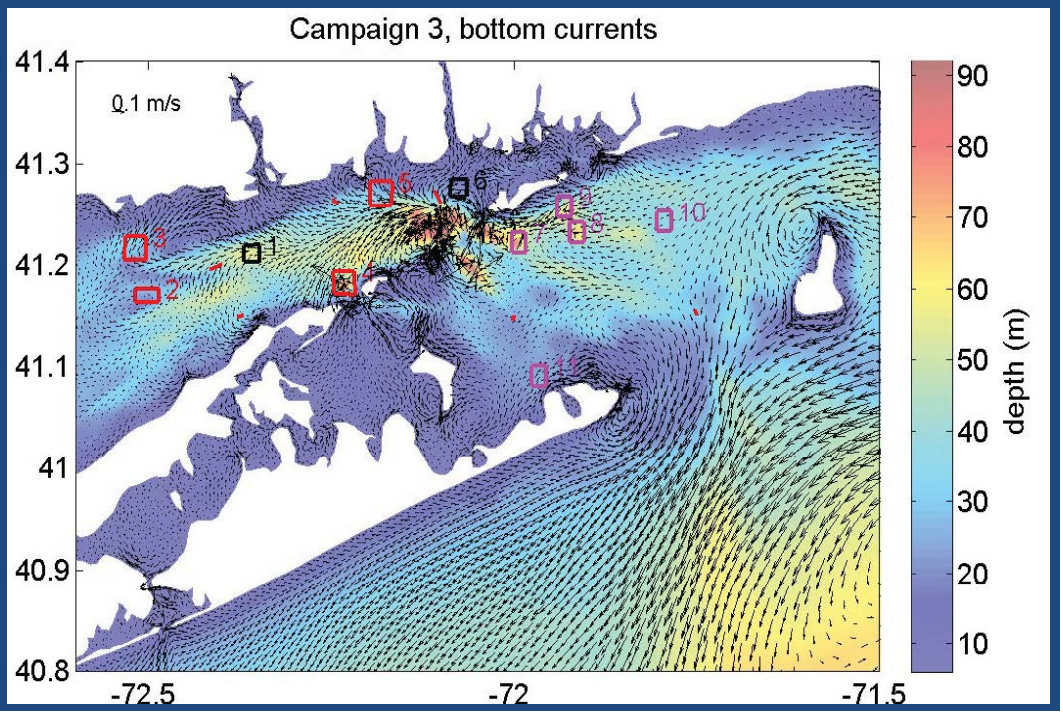
3.E valuation– Performance *(cont.)*

Stressduet o tidesinda ta(c olor) andmodel(black) areinagr eement

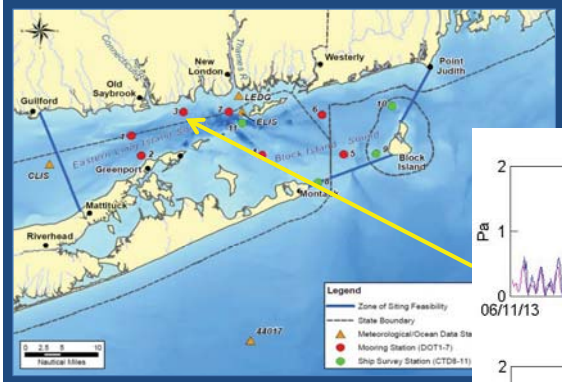


3.E valuation– Performance *(cont.)*

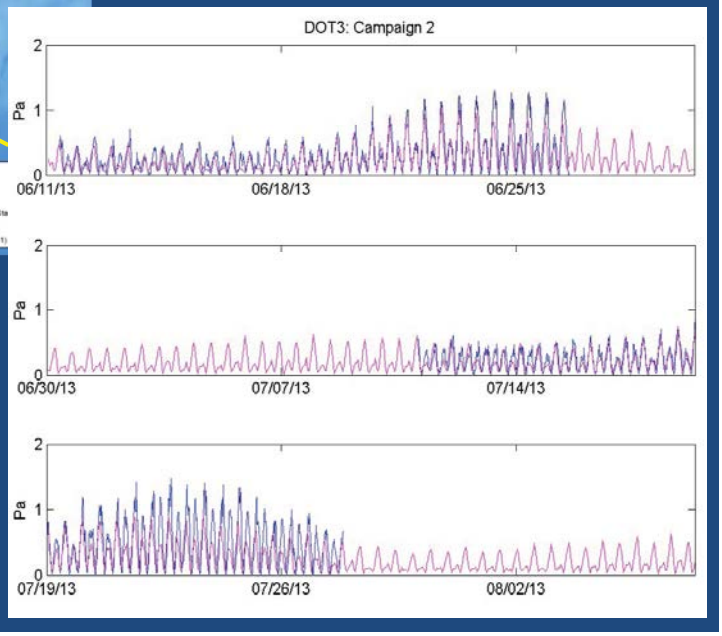
Modelg ets mean flowpa ttern correct



3.E valuation– Performance *(cont.)*



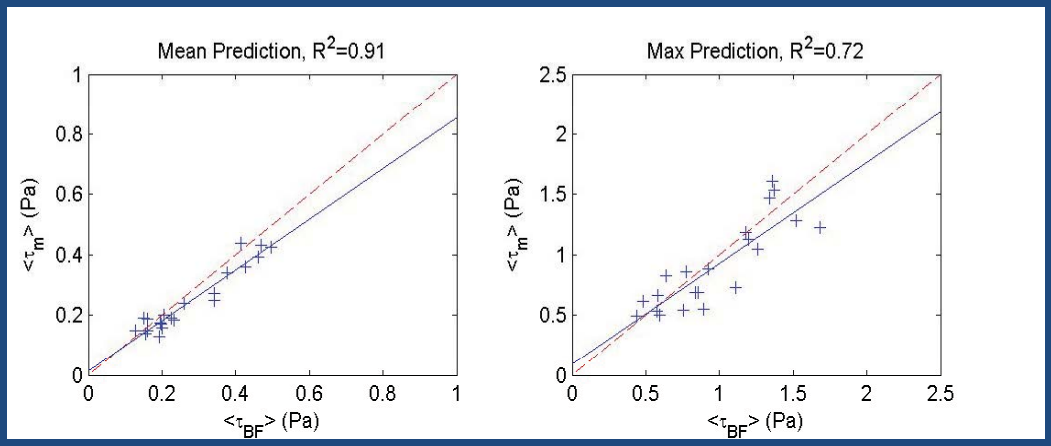
Modelsimula tions reproducetidal andthe springneapv ariations onob serveds tress



Model-predicted bottom stress at Station DOT3 during Campaign 2 in the summer of 2013 (magenta line). The blue line shows the measured stress using the bulk formula.

3.E valuation– Performance *(cont.)*

- Modeland observationsagr ee onthe campaign meanandma ximums tressmagnitudes.
- Modelc an effectively discriminatebe tween placeswher e the maximummeasur ed stressesar elar ge (>1 Pa)andthose where they aresmaller (<1Pa).



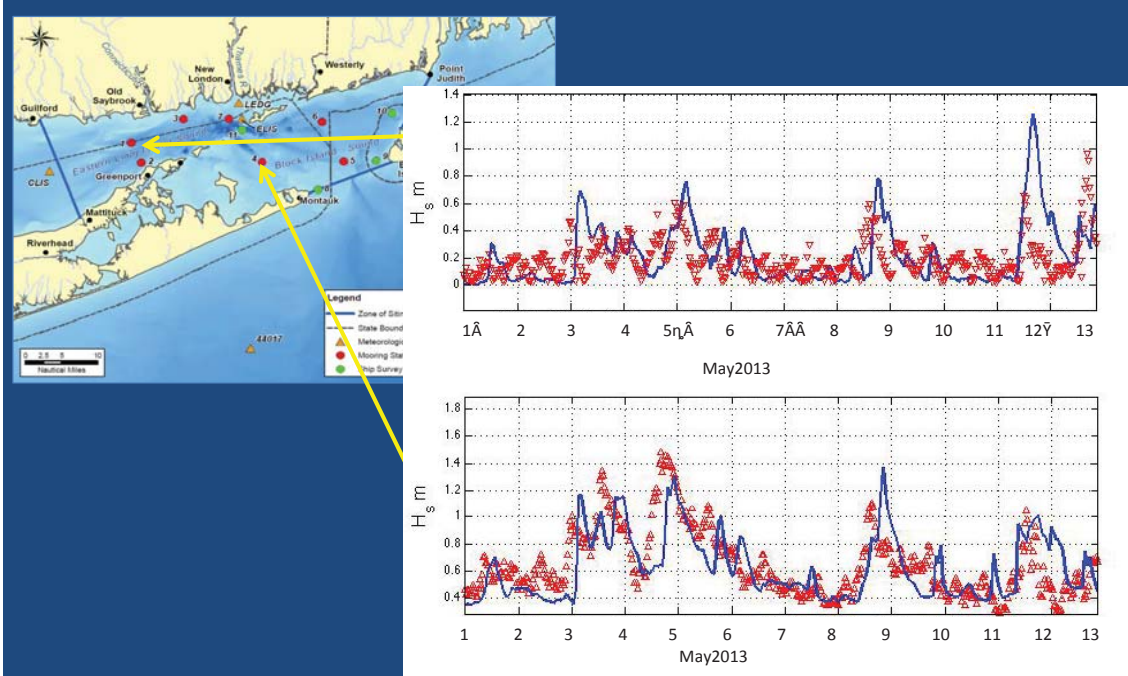
Left: Comparisonofmodel predicted bottom stress magnitudes and meanbot tom stress observedduring the three campaigns. Points would all lie on the red dashed line if the model and data were in perfect agreement. The blue solid line shows the ordinary leastsquar esr egressionlinewhichhasac orrelationc oefficientof0.91.
Right: Comparisonofthepr edicted and observedma ximum stress magnitudes. Thec orrelationc oefficientw as 0.72.

3.E valuation– Performance *(cont.)*

Modelsimula tions reproducetidal and spring-neap variations on observeds tress

Station	Model Stress (Pa)		Observation Stress Magnitude					
	Mean	Max	Mean	Max	Correlation	Lag (hrs)	RMSE*	MAE**
Campaign 1								
DOT1	0.36	1.18	0.43	1.18	0.87	0.33	0.18	0.13
DOT2	0.43	1.28	0.50	1.52	0.85	0.33	0.24	0.16
DOT3	0.24	0.88	0.26	0.92	0.92	0.33	0.10	0.07
DOT4	0.17	0.50	0.20	0.60	0.89	0.38	0.07	0.05
DOT5	0.19	0.82	0.16	0.64	0.47	0.38	0.16	0.12
DOT6	0.15	0.49	0.13	0.44	0.86	0.31	0.06	0.05
DOT7	0.14	0.69	0.16	0.84	0.65	0.67	0.12	0.08
Campaign 2								
DOT1	0.44	1.61	0.41	1.36	0.82	0.36	0.18	0.14
DOT2	0.39	1.22	0.46	1.68	0.67	0.67	0.28	0.20
DOT3	0.27	1.04	0.34	1.26	0.89	0.59	0.16	0.11
DOT4	0.19	0.55	0.23	0.89	0.83	0.76	0.12	0.09
DOT5	0.19	0.73	0.23	1.11	0.52	0.62	0.19	0.14
DOT6	0.19	0.62	0.15	0.48	0.84	0.42	0.08	0.06
DOT7	0.16	0.69	0.20	0.86	0.63	0.31	0.14	0.10
Campaign 3								
DOT1	0.34	1.47	0.38	1.34	0.79	0.84	0.19	0.13
DOT2	0.43	1.53	0.47	1.37	0.72	1.00	0.26	0.19
DOT3	0.25	1.12	0.34	1.20	0.83	0.50	0.17	0.11
DOT4	0.17	0.66	0.20	0.58	0.81	0.76	0.09	0.06
DOT5	0.20	0.86	0.21	0.77	0.65	2.19	0.14	0.10
DOT6	0.15	0.53	0.16	0.58	0.66	0.16	0.09	0.06
DOT7	0.13	0.54	0.19	0.75	0.68	0.50	0.16	0.11

3.E valuation– Performance *(cont.)*



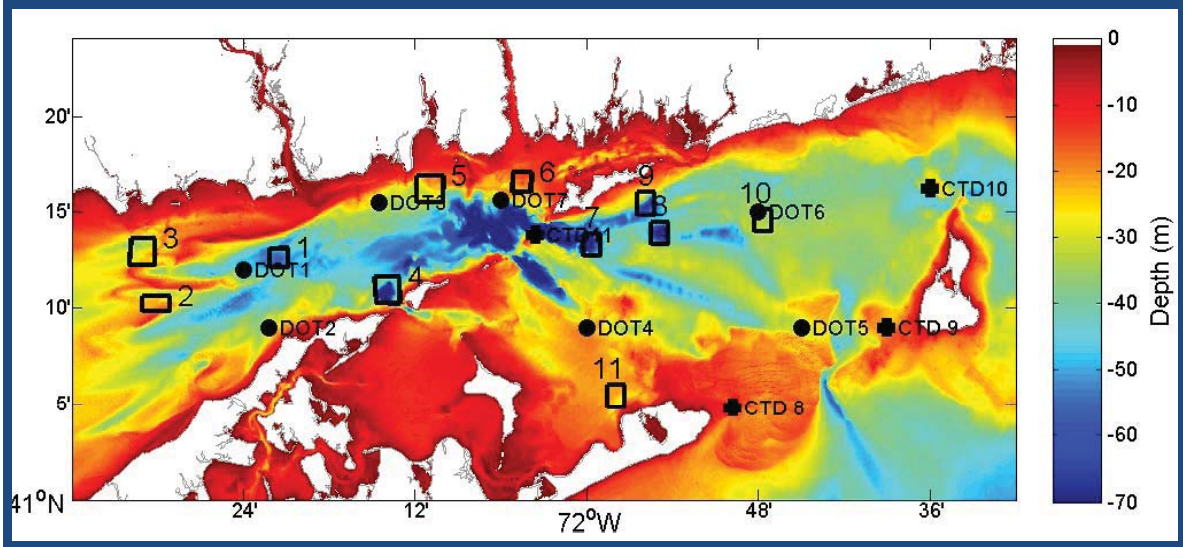
Comparison of model and observed significant wave height at Stations DOT1 (upper panel) and DOT4 (lower panel) during May 2013.

4.Analy sis

- Find maximum bottom stress magnitude at eachpoin t intheZSFinthethr eeCampaigns
- Compare values atsit esiden tified inthe screening process
- Simulate period of a severe storm (Superstorm Sandy) and comparema ximum stress magnitudes

4.Analy sis *(cont.)*

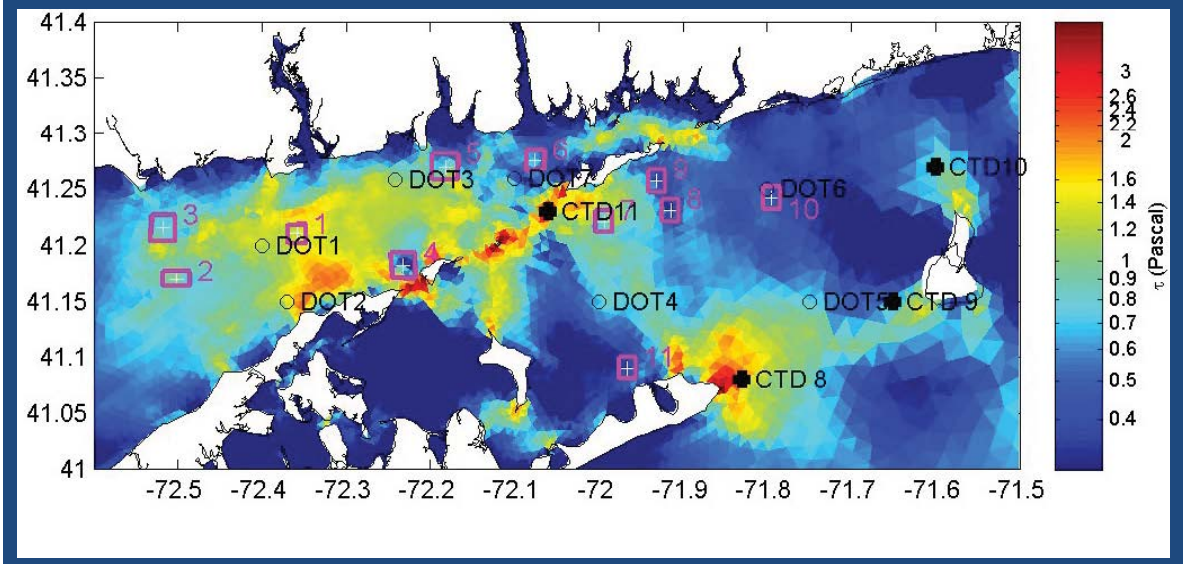
Bathymetry andloc ations ofpot ential sites



Water depth and 11 potentialdr edged material disposal sites (openbo xes) as identified during theinitial screening process. Sites1 and 6 are the activedisposal sites (CSDS and NLDS,r espectively). Thesev enmooring stations ('DOT')ar eiden tified by full circles; thef our additional ship survey stations ('CTD')ar e identified by crosses.

4.Analy sis *(cont.)*

- Spatial differences aremuch largerthanseasonalv ariations
- StressishighinmuchofZSF

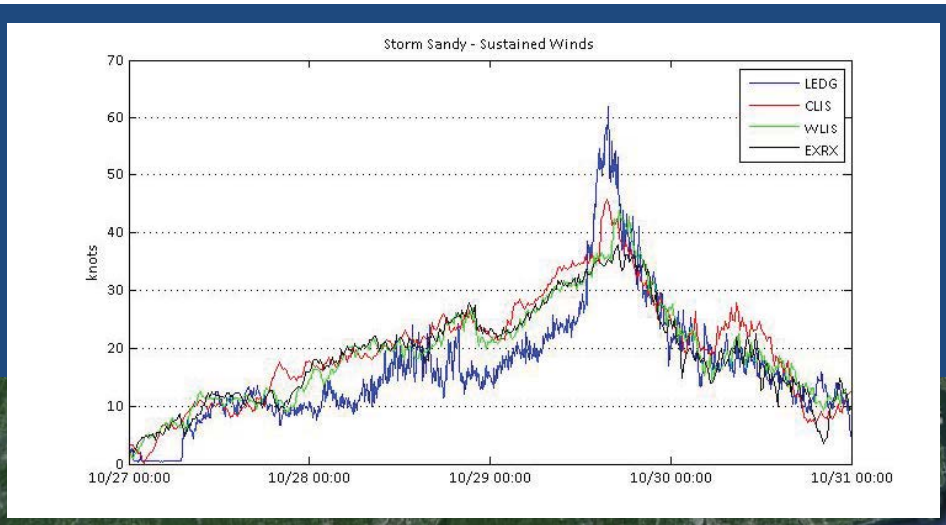


Maximum bottom stress during Campaign 3 (November 20, 2013, to January 16, 2014) for storm conditions (i.e., due to the principal tidal current constituents and the seasonal mean flow, as well as wind).

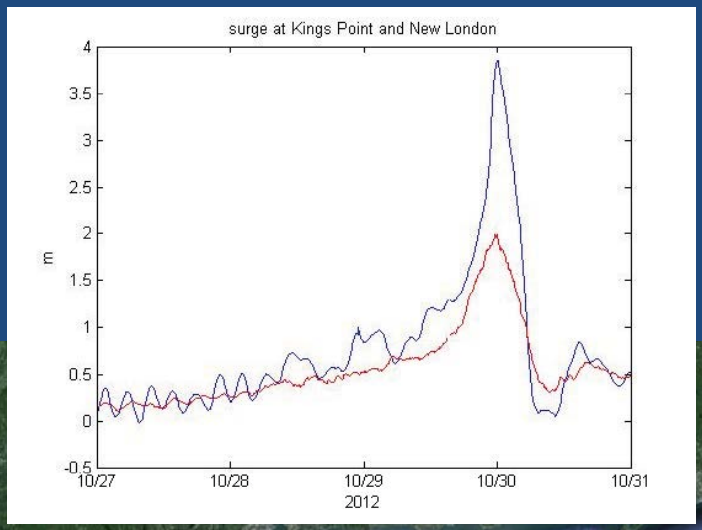
4.Analy sis *(cont.)*

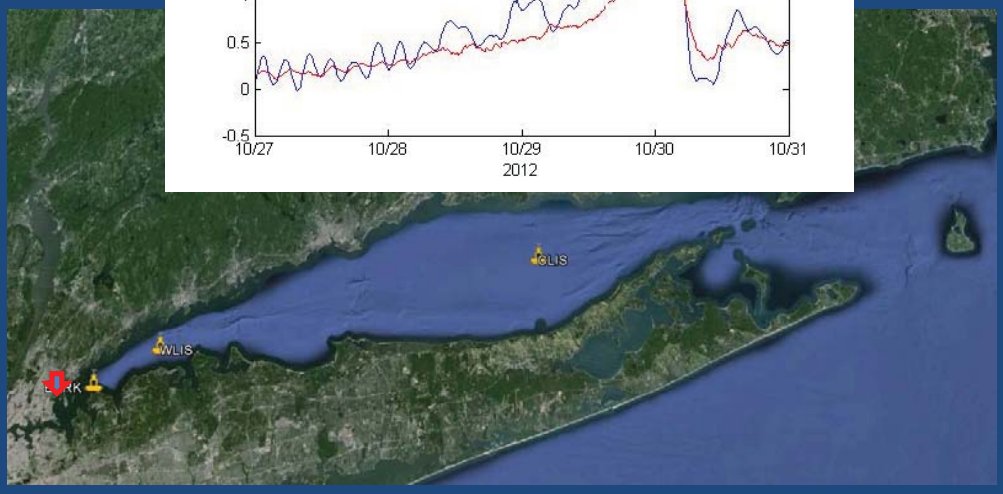
MaximumBot tomStr ess (Pa)duringSt orm Conditions atP otentialDr edgedMa terialDisposalSit es

Potential Disposal Site			Maximum Bottom Stress (Pa)			Change in Maximum Bottom Stress during Storm Conditions relative to Fair-weather Conditions		
			1. (spring)	2. (summer)	3. (winter)	1. (spring)	2.(summer)	3. (winter)
ELIS	1	Cornfield Shoals Disposal Site	1.17	1.31	1.24	-7%	-8%	-5%
	2	SixMile ReefDisposa l Site	0.92	1.09	1.00	7%	6%	-8%
	3	Clinton Harbor Disposal Site	0.72	0.71	0.81	6%	14%	1%
	4	Orient Point Disposal Site	0.52	0.61	0.48	61%	21%	7%
	5	Niantic Bay Disposal Site	0.73	0.97	0.84	-8%	19%	-2%
	6	New London Disposal Site	0.60	0.70	0.69	33%	31%	29%
BIS	7	Fishers Islandw est	0.79	0.91	0.86	5%	8%	17%
	8	Fishers Islandea st	0.49	0.51	0.39	12%	5%	-9%
	9	Fishers Islandcen ter	0.39	0.50	0.38	20%	36%	15%
	10	Block Island Sound Disposal Site	0.49	0.63	0.44	6%	9%	12%
	11	NorthofMon tauk	0.31	0.31	0.34	0%	5%	7%

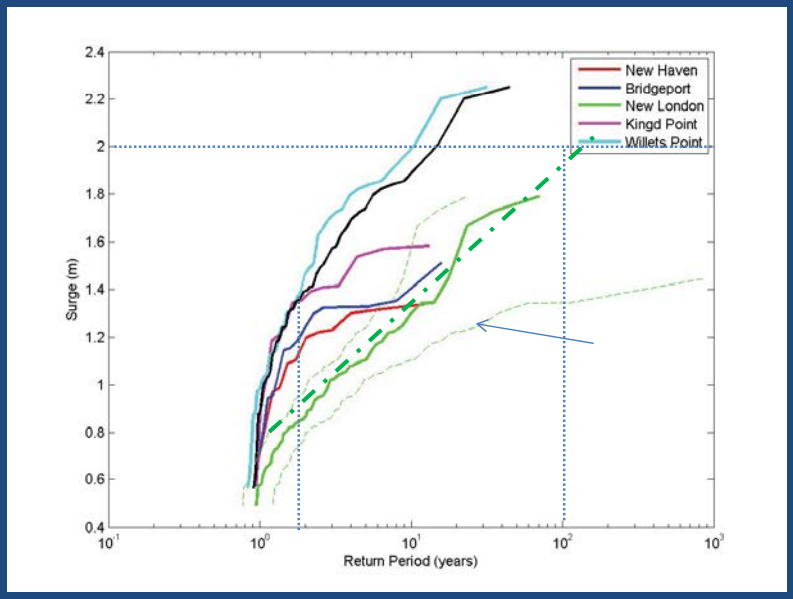

Storm Sandy - Sustained Winds
knots
LEDG
CLIS
WLIS
EXRX
0
10
20
30
40
50
60
70
10/27 00:00
10/28 00:00
10/29 00:00
10/30 00:00
10/31 00:00

LEDG
CLIS
WLIS


surge at Kings Point and New London
m
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
10/27
10/28
10/29
10/30
10/31
2012


CLIS
WLIS

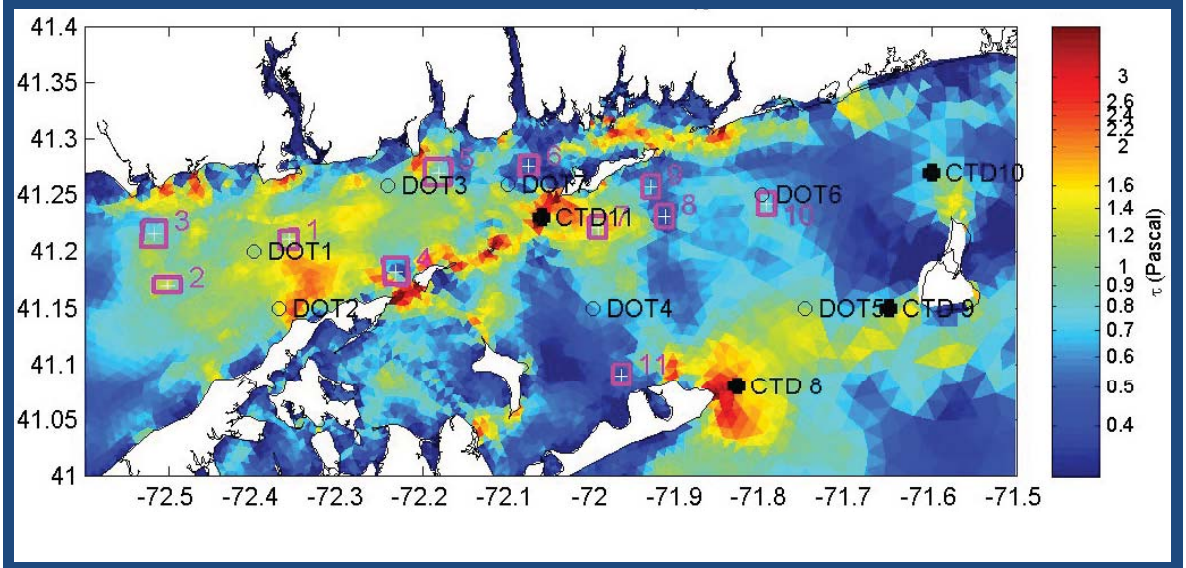
Using NOAA Sea Level data to 2012



Sandysur ger eturnperiodis ~100y earsa tNewLondon

4.Analy sis *(cont.)*

Superstorm Sandy created higherma ximum bottoms tresses insomear eas and lowers tresses inotherar eas



Maximum bottom stress simulated for the period October 28 to 31, 2012 when Superstorm Sandy passed over New England.

4.Analy sis *(cont.)*

Potential Disposal Site			Superstorm Sandy Conditions		
			Bottom Stress (Pa)	Change in Bottom Stress in 'Sandy' relative to Fair-weather Conditions in Campaign 3	Change in Bottom Stress in 'Sandy' relative to Storm Conditions in Campaign 3
ELIS	1	Cornfield Shoals Disposal Site	1.16	11%	6%
	2	Six Mile Reef Disposal Site	1.26	16%	25%
	3	ClintonHarbor Disposal Site	0.87	9%	8%
	4	OrientP ointDisposalSit e	0.53	17%	9%
	5	NianticBa y DisposalSit e	0.99	16%	19%
	6	NewLondon DisposalSit e	0.48	10%	30%
BIS	7	Fishers Islandw est	1.17	58%	35%
	8	Fishers Islandeas t	0.46	5%	16%
	9	Fishers Island-center	0.55	69%	47%
	10	BlockIslandSoundDisposalSit e	0.73	49%	68%
	11	North ofMon tauk	0.39	6%	14%

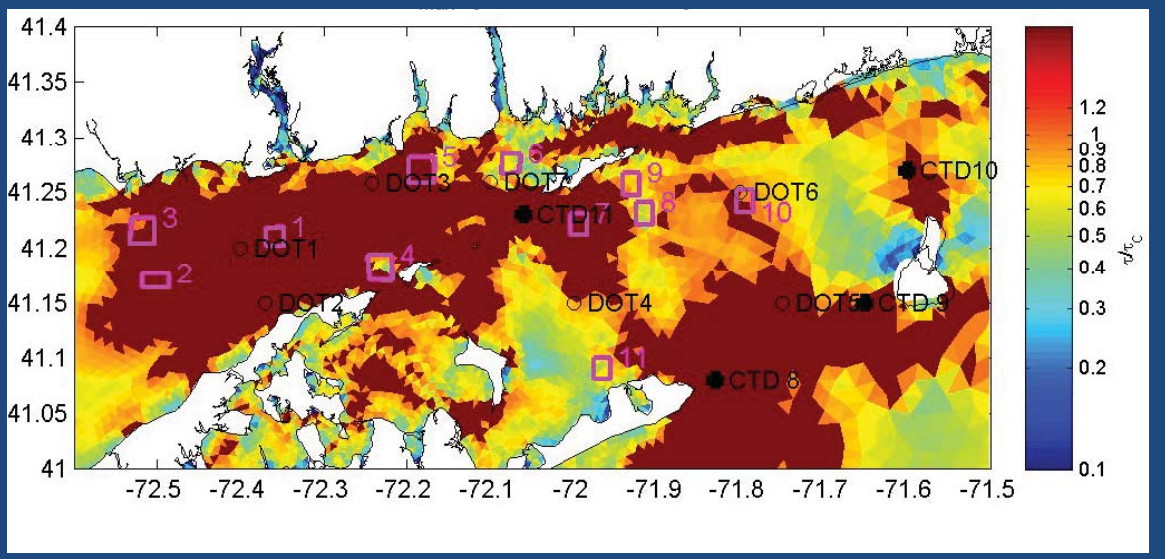
4.Analy sis *(cont.)*

StressT hreshold forEr osiononSea floor:

- Defineda s the levelo fs tressa tw hich dredged material inadisposal areawillbemobiliz ed
- Depends upon sediment grain size,fr action of clay, volume fraction, levelc ohesiveness
- Basedonar eviewofthelit erature, wechoose 0.75 Pa as the design threshold

4.Analy sis *(cont.)*

Brown areas show values ofma ximum bottoms tressgr eater than threshold.



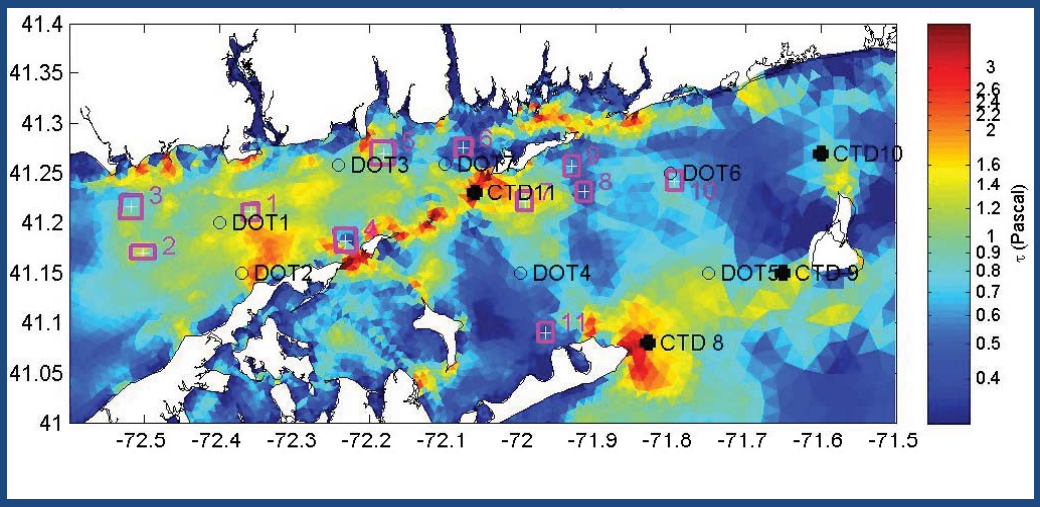
Areas with maximum bottom stress exceeding the 0.75 Pa threshold during the simulation of Superstorm Sandy (screened as a uniform brown layer). Areas with bottom stress below 0.75 Pa are scaled (see color key on the right).

4.Analy sis *(cont.)*

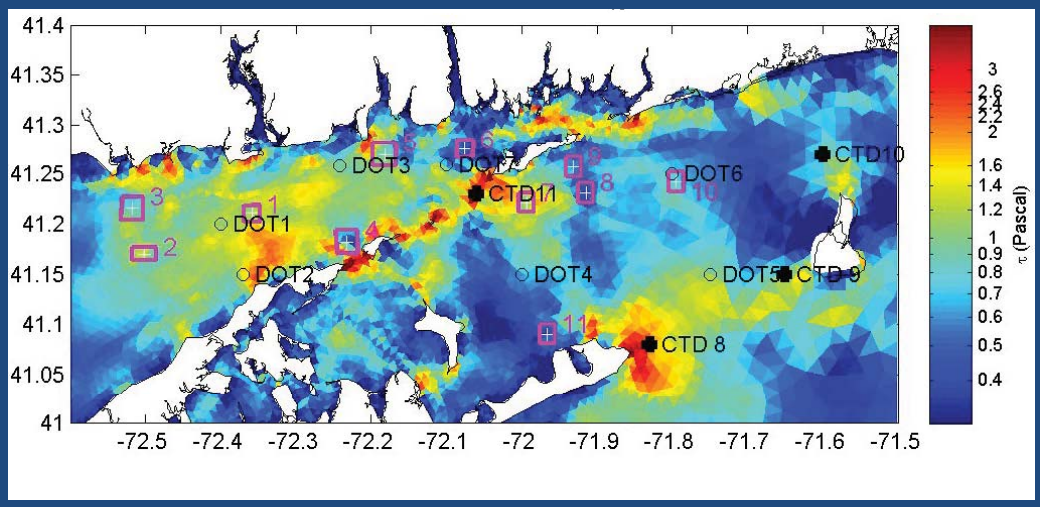
ComparisonofMa ximum BottomStr ess (Pa) forP otential DredgedMa terial Disposal Sites inthesimula tions ofthethr ee Observation Campaigns andSuper storm Sandy.

Potential Disposal Site				Maximum Stress in Simulations (Pa)	
ELIS	BIS	No.	Site Name	Group	Highest Value
●		1	CornfieldShoals DisposalSit e	>1	1.31
●		2	Six MileR eef Disposal Site		1.26
	●	7	FishersIslandw est Disposal Site		1.17
●		5	Niantic Bay Disposal Site	0.751.0	0.99
●		3	ClintonHarborDisposalSit e		0.87
	●	10	BlockIsland Sound Disposal Site	<0.75	0.73
●		6	NewLondonDisposalSit e		0.69
	●	9	FishersIslandcen ter		0.55
●		4	OrientP oint DisposalSit e		0.53
	●	8	FishersIslandeas t		0.46
	●	11	Northof Montauk		0.39

5.Summary

- Modelr esultse xplainmeasur ed bottoms tressv ariations inspace andtimewitherr ors thatar esub stantiallylessthanthe differences between the maximums tressesa tthe 7 fieldsit es.
- **Site 6 (New London DS)** isthe onlysit einE asternLong IslandSound withma ximum bottoms tressbelow the 0.75P athr eshold.
- 

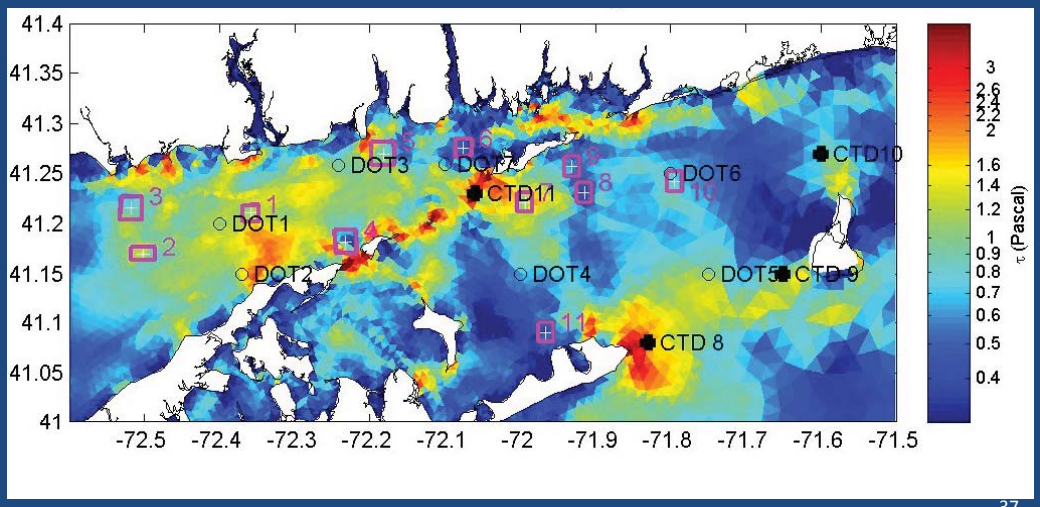
- **Sites 8, 9 and 11 (Fishers Island center and east, and North of Montauk)** in BlockIsland Soundshowma ximum bottoms tress below0.75P athr eshold.



5.Summary

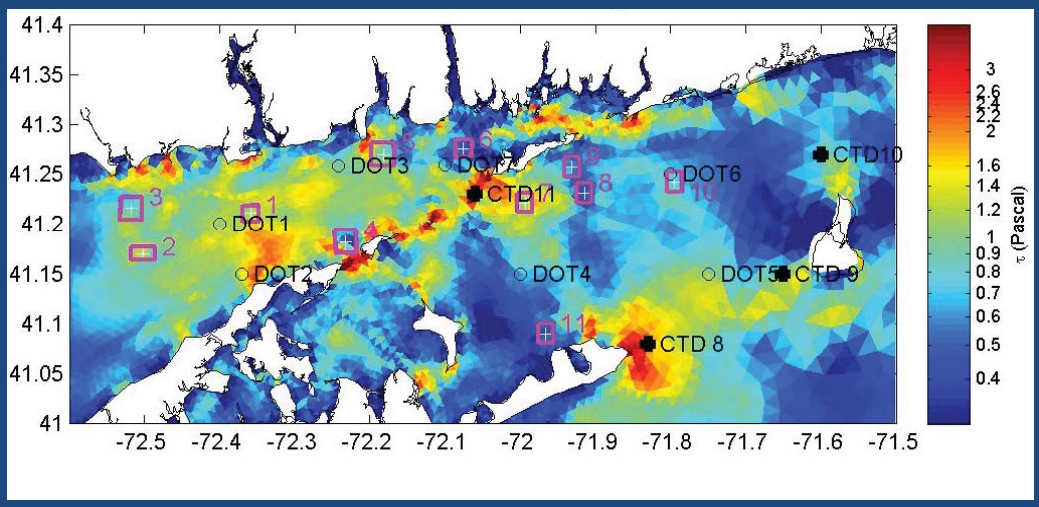
Sites 4 and 10 (Orient Point DS and Block Island Sound DS) show maximum stress below the 0.75P athr eshold atthe center of the site,butha vev aluesine xcess of 0.75P awithin the boundary.

Sites 5 and 3 (Niantic Bay and Clinton Harbor) showma ximums tressese xceeding 0.75P abutlessthan1P a.

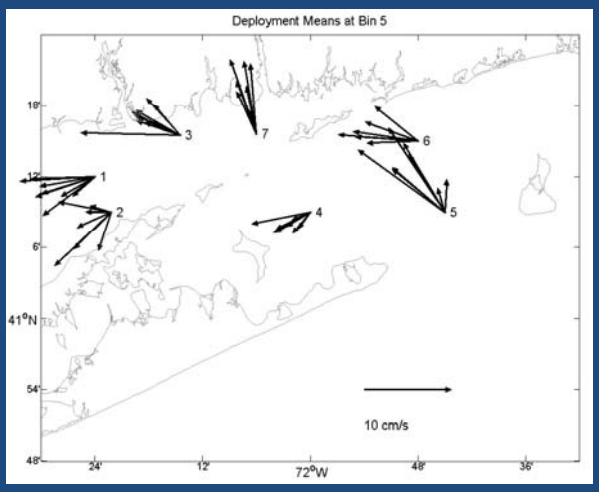


5.Summary

Sites 1, 2, and 7 (Cornfield Shoals, Six Mile Reef, and Fishers Island - west) have high maximum stresses.



5. Summary



Mean Flow is westward at all sites

Appendix A-10

TRIBAL CONSULTATION LETTERS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

July 15, 2015

Rodney Butler, Chairman
Mashantucket Pequot Tribal Office
Indiantown Road, P.O. Box 3060
Mashantucket, CT 06339-3060

Dear Chairman Butler:

The United States Environmental Protection Agency (EPA-Region 1) will release a draft Supplemental Environmental Impact Statement (SEIS) for the potential designation of long-term dredged material disposal sites for use in eastern Long Island Sound. Through this effort, we have an extensive public involvement program which includes the participation of federal, state, local government representatives serving as Cooperating Agencies.

The purpose of this letter is to inform you of the release of a draft SEIS for eastern Long Island Sound and to gauge your interest in government-to-government consultation, per the *EPA Policy on Consultation and Coordination with Indian Tribes*, prior to the final decision and rulemaking to be issued by EPA Region 1.

If you would like to discuss this further or wish to engage in government-to-government consultation, please contact Jean Brochi at 617-918-1536 by July 31, 2015. If we do not receive a response from you by this date, we will assume that you do not wish to pursue consultation on this matter and EPA Region 1 will move forward with its decision.

Sincerely,

Lynne A. Hamzy for

Ken Moraff, Director
Office of Ecosystem Protection

Cc: Tribal Environmental Director
Tribal Historic Preservation Officer (THPO)
Michael Stover, EPA R1 Tribal coordinator
Grant Jonathon, EPA R2 Tribal coordinator
Patricia Pechko, EPA R2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

July 15, 2015

Kevin Brown, Tribal Chairman
Mohegan Tribal Office
13 Crow Hill Road
Uncasville, CT 06382

Dear Tribal Chairman Brown:

The United States Environmental Protection Agency (EPA-Region 1) will release a draft Supplemental Environmental Impact Statement (SEIS) for the potential designation of long-term dredged material disposal sites for use in eastern Long Island Sound. Through this effort, we have an extensive public involvement program which includes the participation of federal, state, local government representatives serving as Cooperating Agencies.

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Sincerely,

Ken Moraff, Director
Office of Ecosystem Protection

Cc: Tribal Environmental Director
Tribal Historic Preservation Officer (THPO)
Michael Stover, EPA R1 Tribal coordinator
Grant Jonathon, EPA R2 Tribal coordinator
Patricia Pechko, EPA R2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

July 15, 2015

Matthew Thomas, Chief
Narragansett Indian Tribe
P.O. Box 268
Charlestown, RI 02813

Dear Chief Thomas:

The United States Environmental Protection Agency (EPA-Region 1) will release a draft Supplemental Environmental Impact Statement (SEIS) for the potential designation of long-term dredged material disposal sites for use in eastern Long Island Sound. Through this effort, we have an extensive public involvement program which includes the participation of federal, state, local government representatives serving as Cooperating Agencies.

The purpose of this letter is to inform you of the release of a draft SEIS for eastern Long Island Sound and to gauge your interest in government-to-government consultation, per the *EPA Policy on Consultation and Coordination with Indian Tribes*, prior to the final decision and rulemaking to be issued by EPA Region 1.

If you would like to discuss this further or wish to engage in government-to-government consultation, please contact Jean Brochi at 617-918-1536 by July 31, 2015. If we do not receive a response from you by this date, we will assume that you do not wish to pursue consultation on this matter and EPA Region 1 will move forward with its decision.

Sincerely,

Lynne A. Hamilton

Ken Moraff, Director for
Office of Ecosystem Protection

Cc: Tribal Environmental Director
Tribal Historic Preservation Officer (THPO)
Michael Stover, EPA R1 Tribal coordinator
Grant Jonathon, EPA R2 Tribal coordinator
Patricia Pechko, EPA R2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

July 15, 2015

Bryan Polite, Chairman
Shinnecock Indian Nation Tribal Office
P.O. Box 5006
Southampton, NY 11969

Dear Chairman Polite:

The United States Environmental Protection Agency (EPA-Region 1) will release a draft Supplemental Environmental Impact Statement (SEIS) for the potential designation of long-term dredged material disposal sites for use in eastern Long Island Sound. Through this effort, we have an extensive public involvement program which includes the participation of federal, state, local government representatives serving as Cooperating Agencies.

The purpose of this letter is to inform you of the release of a draft SEIS for eastern Long Island Sound and to gauge your interest in government-to-government consultation, per the *EPA Policy on Consultation and Coordination with Indian Tribes*, prior to the final decision and rulemaking to be issued by EPA Region 1.

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Sincerely,

Lynne A. Hamm for
Ken Moraff, Director
Office of Ecosystem Protection

Cc: Tribal Environmental Director
Tribal Historic Preservation Officer (THPO)
Michael Stover, EPA R1 Tribal coordinator
Grant Jonathon, EPA R2 Tribal coordinator
Patricia Pechko, EPA R2

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Appendix A-11

ESSENTIAL FISH HABITAT AND SECTION OF THE ENDANGERED SPECIES ACT COORDINATION

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ESSENTIAL FISH HABITAT COORDINATION
WITH
NATIONAL MARINE FISHERIES SERVICES

- **Letter from USEPA**
- **Response from NMFS**

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I (NEW ENGLAND)
FIVE POST OFFICE SQUARE – SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

June 30, 2016

Mr. Lou Chiarella
Assistant Regional Administrator
Habitat Conservation Division
NOAA National Marine Fisheries Service
Greater Atlantic Region Fisheries Office
55 Great Republic Drive
Gloucester, MA 01930-2276

RE: Essential Fish Habitat coordination for Eastern Dredged Material Disposal Site

Dear Mr. Chiarella:

The New England Regional Office of the United States Environmental Protection Agency (EPA) has proposed designation of the Eastern Long Island Sound Dredged Material Disposal site (ELDS) in a draft rule issued on April 27, 2016 (81 FR 24748). The Eastern site encompasses 50 % of the existing New London disposal site. The New London disposal site has been used for over 40 years and was selected by the US Army Corps of Engineers (USACE). In addition to the draft rule, EPA provided a Supplemental Environmental Impact Statement (SEIS) for public review. The SEIS is referred to as a supplemental document because it builds on data collected for the Central and Western site designation finalized in 2005.

This letter serves to initiate consultation with NOAA Fisheries pursuant to section 305 (b)(2) of the Magnuson-Stevens Act for potential impacts to designated essential fish habitat (EFH) of the usage of the ELDS Dredged Material disposal site because of the listing of a new species of Atlantic sturgeon on February 6, 2012 (77 FR 5880 and 77 FR 5914). The sites are not currently designated or proposed "critical habitat" in accordance with provisions of the Endangered Species Act {87 Stat. 884 as amended; 16 U.S.C. 1531 et seq.).

We have reviewed the effects on all listed species and essential fish habitat, including Atlantic sturgeon, of the ongoing use of central and western as designated disposal sites pursuant to the Marine Protection, Research, and Sanctuaries Act (MPRSA). The ELDS site is primarily located in Connecticut waters in Long Island Sound. However, the southeast corner is located in New York waters but will be revised in the final designation. The site will be completely in Connecticut waters at that time. The designation of dredged material disposal sites does not authorize disposal. Disposal is

authorized by federal permit issued by the USACE for dredge and fill. As part of the regulatory authority, the USACE will be coordinating with your office on individual projects/permits.

We have made the determination that the proposed activity may affect, but is not likely to adversely affect, any species listed as threatened or endangered or essential fish habitat in Long Island Sound. The primary species are located in NMFS jurisdiction since the disposal site is located in the waters of Long Island Sound. No take or exemption is expected from this action. If there is a take of a species, enforcement will take place through the permit process with coordination with the USACE.

Description of Action/Project:
The USACE originally selected the New London site for short term use of dredged material disposal. According to the USACE authorization, the site should have remained open for ten years. The NLDS is located in the eastern part of the eastern Long Island Sound region and has been used for dredged material disposal since 1955 (SAIC, 2001b). This active open-water dredged material disposal site was previously selected by the USACE using their site selection authority under MPRSA 103(b), 33 U.S.C. 1413(b). The statute limits the use of USACE-selected sites to two five-year periods, 33 U.S.C. 1413(b), but Congress extended the period of use of the NLDS by five additional years by Public Law on December 23, 2011 (PL-112-74, Title I, Sec 116).

On April 27, 2016, EPA issued a draft rulemaking and Supplemental Environmental Impact Statement (SEIS). EPA will publish the final rulemaking in the fall of 2016 which will designate one disposal site in eastern Long Island Sound, (ELDS). For all disposal activities in Long Island Sound there are several time of year restrictions but the primary dredging window is restricted to June 1 through September 30th.

Additional Coordination:
EPA is also coordinating with the US Fish and Wildlife service pursuant to the Fish and Wildlife Coordination Act.

At the designated disposal sites, for disposal to occur, a permit authorizing disposal will be provided to an applicant by the USACE. In authorizing permits in accordance with Section 404 of the CWA and MPRSA. The USACE will conduct threatened and endangered species consultations with the NMFS and USFWS during preparation of project-specific NEPA evaluations.

Dredged Material:
Periodic dredging ensures safe navigation and marine commerce in Connecticut, New York, and western Rhode Island rivers, harbors, and coastal areas. Dredged material has been generated from the harbors and rivers of the Long Island Sound study area for nearly 150 years to develop and keep navigation channels open for commerce and recreation.

In 2015, the USACE evaluated the dredging needs in the Long Island Sound region. The 2015 dredging needs evaluation estimated that nearly 52.9 million cubic yards (MCY) of dredged material will be generated over the 30-year period from maintenance and improvement projects.

There are currently two actively used and current disposal sites in the eastern region of the sound which include Cornfield Shoals and New London. The rulemaking is focused on designating the ELDS (which means the CSDS will be closed and the rest of the New London site will be closed). Therefore, this analysis of effect is for this site only.

Eastern Long Island Sound dredged material disposal site (ELDS)

The Eastern Long Island Sound Disposal Site (ELDS) is located to the south of the mouth of Thames River estuary, approximately halfway between Connecticut and New York. The ELDS encompasses approximately the western half of the existing New London Disposal Site (NLDS), along with Sites NL-Wa and NL-Wb, which are adjacent areas immediately to the west of the NLDS (*see* DSEIS, Figure 3-9). The dimensions of the ELDS, which combines these three areas, are 1 x 2 nautical miles (nmi), for a total size of 2 square nautical miles (nmi^2). The closest upland points to the ELDS are Goshen Point, Connecticut, approximately 1.2 nmi (2.2 km) to the north, and Fishers Island, New York, approximately 1.4 nmi (2.6 km) to the southeast. The following are descriptions of the three areas that together would comprise the ELDS.

New London Disposal Site

The center of the NLDS is located 3.1 nmi (5.4 km) south of Eastern Point in Groton, Connecticut. The site has an area of 1 nmi^2 (3.4 km^2) centered at 41°16.306' N, 72°04.571' W (NAD83); corner coordinates are presented in Table 3-8. Water depths in the site range from approximately 46 to 79 feet (14 to 24 m). Most of the site is located within Connecticut waters, while a small portion in the southeastern corner of the site is located in New York state waters. However, this rule proposes to include only the western half of the NLDS, which would exclude the portion of the site that is in New York waters.

Approximately 5.4 mcy (4.1 million m^3) were disposed at the NLDS between 1955 and 1976. A total of approximately 3.5 mcy (2.6 million m^3) of dredged material have been placed at this location since it was formally selected in 1982. The dredged materials mounds on the seafloor result in an uneven seafloor within the site; the dredged material deposits can rise as much as 16 to 20 feet (5 to 6 m) above the surrounding seafloor.

The USGS mapped the sediment at the NLDS as predominantly sand, while sediments in the northernmost part of the site were mapped as gravelly. NUSC (1979) described the sediment at the site as generally fine sand. Much of the surface sediment at the site consists of placed dredged material. Sediment sampled by the DAMOS program at locations approximately 0.5 nmi (1 km) to the east and west of the NLDS consisted of silt/clay and very fine silty sand, which may reflect pre-disposal sediment textures at the NLDS.

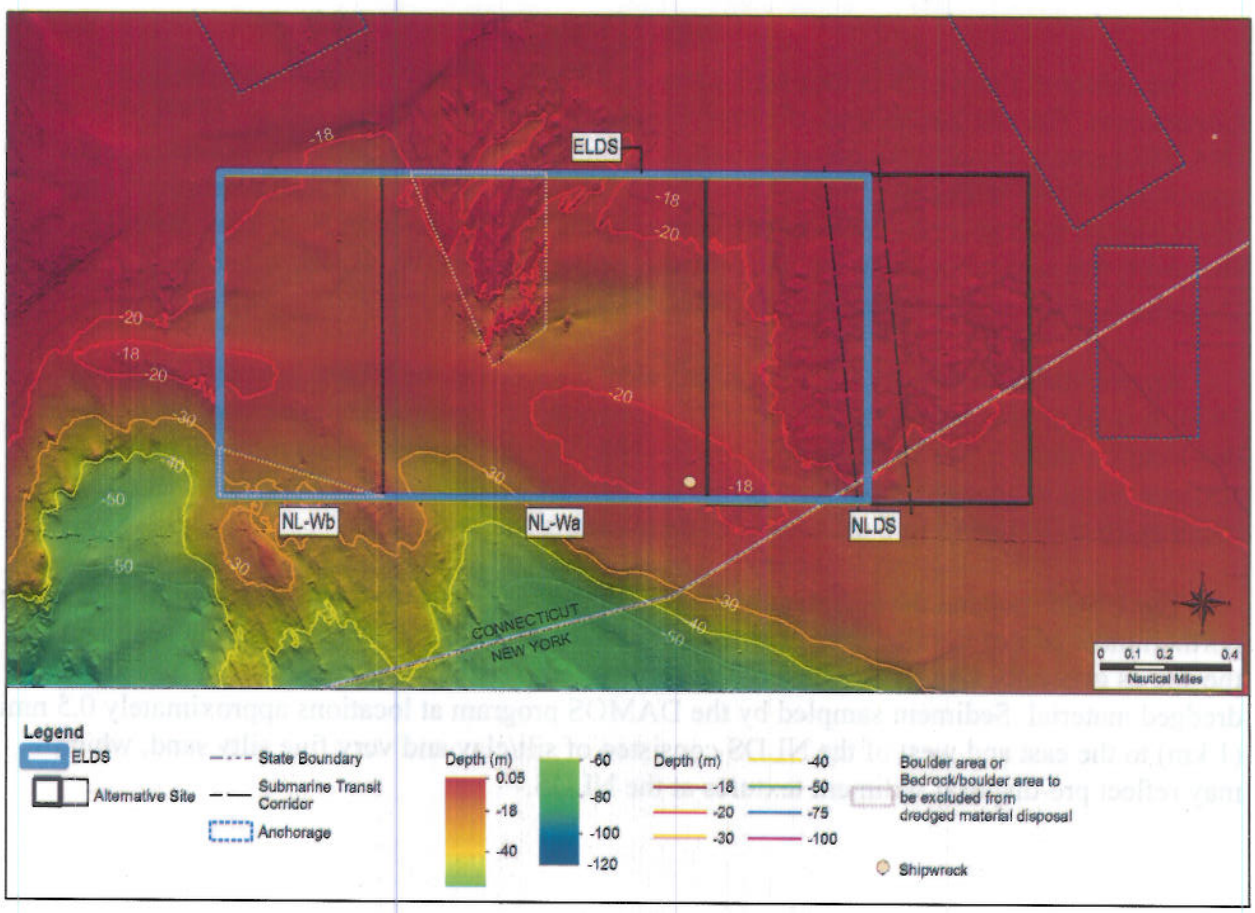
Site NL-Wa

Site NL-Wa is immediately to the west of the NLDS and also has an area of 1 nmi^2 (3.4 km^2). Water depths range from approximately 45 feet (14 m) in the north, to 100 feet (30 m) in the south. The site consists of mostly sandy areas, but also an area of boulders and rocks in the northern part of the site (WHG, 2014). This boulder area may be a lag deposit of a glacial moraine. The water depth in parts of the boulder area is shallower than 59 feet (18 m).

Site NL-Wb

Site NL-Wb is immediately to the west of Site NL-Wa and has an area of 0.5 nmi^2 (1.7 km^2). Water depths across the site range from approximately 59 feet (18 m) in the north, to 95 feet (28 m) in the south. The site consists of an extension of the sandy areas of Site NL-Wa. The southwestern corner of Site NL-Wb contains an area of bedrock and boulders; this area is an extension of a larger area with a similar substrate further to the south. The bedrock appears as parallel ridges of dipping, layered rock that can be correlated to bedrock on shore. The bedrock area within Site NL-Wb also contains some sand waves. Bartlett Reef is located approximately 0.5 nmi (0.9 km) to the west of the western boundary of the site.

Figure 1: ELDS
(Source: ELDS SEIS)



Endangered or Threatened Fish

Two endangered fish may be located in the vicinity of ELDS, the shortnose sturgeon (Acipenser brevirostrum) and the Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus). The original SMMP identified the shortnose sturgeon as federally endangered as well as endangered in both CT and NY (see Table 1). The Atlantic sturgeon was listed as "threatened in inland waters" for the state of Connecticut in the prior SMMP and is now a federally protected endangered species. Sturgeon are not expected to be impacted by disposal activities as they are highly mobile species.

Table 1. Endangered or Threatened Species Summary

Summary of Changes since 2005
Red knot (not expected to be in area)
8 marine mammals and reptiles (unchanged)
2 endangered fish (added)
14 birds (1 is on the endangered list)

The Atlantic sturgeon is an anadromous species that lives up to 60 years, reaching lengths up to 14 feet (4 meters) and weighing over 800 pounds (363 kilograms). Long Island Sound may be an important feeding or resting area on-the-way to and from spawning areas in the Hudson River for Atlantic Sturgeon.

Shortnose sturgeon occur in the lower Connecticut River from the Holyoke Pool to Long. Unlike other anadromous species such as salmon and shad, shortnose sturgeon do not appear to make long-distance offshore migrations. Shortnose sturgeon may utilize portions of Long Island Sound since it is known to spawn in the Connecticut River. Shortnose sturgeon have not been observed in Long Island Sound during the annual Connecticut Department of Energy and Environmental Protection (CTDEEP) fish trawls since 1984. NMFS has identified the range of Shortnose sturgeon to include the Connecticut River and the Housatonic River as shown in Figure 3.

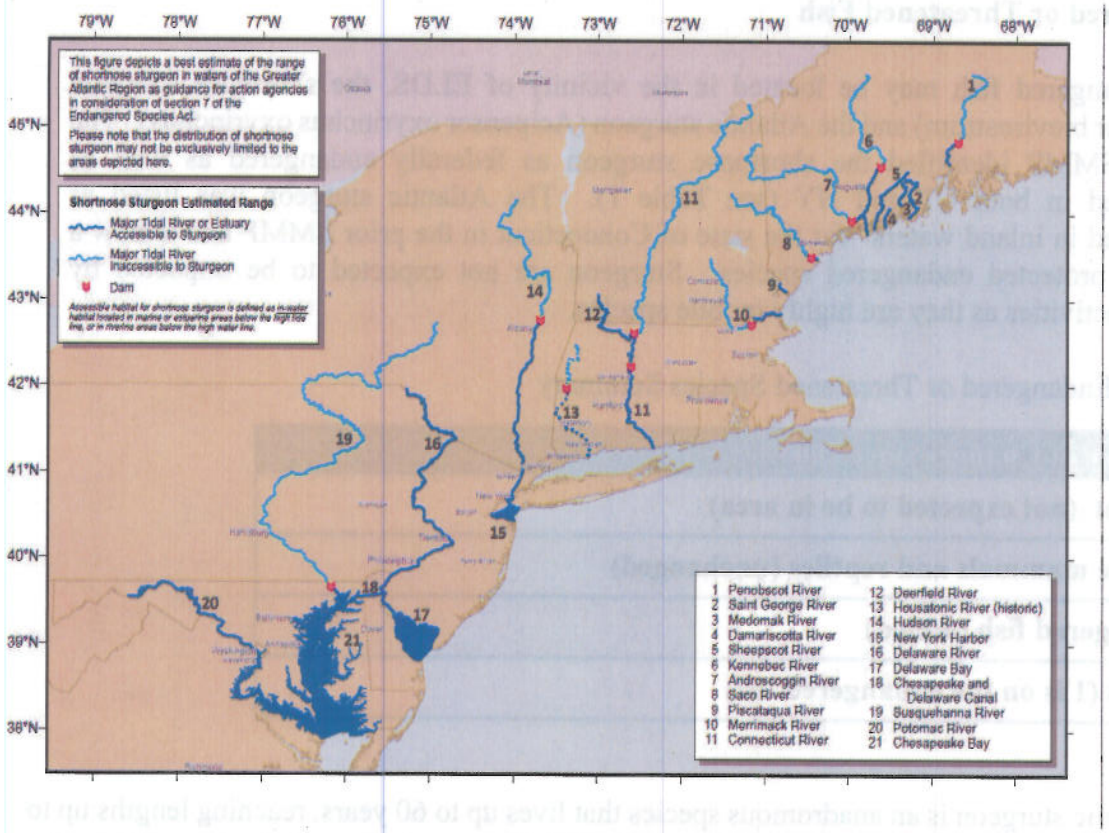


Figure 3: Estimated Range of Shortnose Sturgeon (Source: NMFS)

Endangered and Threatened Reptiles

Sea turtles are the only endangered reptile species noted in the Long Island Sound area (see Figure 4). Sea turtles are highly migratory and are often found throughout the world's oceans (NOAA, 1995). Pursuant to Section 7 of the Endangered Species Act, EPA requested input from NMFS, U.S. Fish and Wildlife Service (USFWS), CTDEEP, and NYSDEC on the identification of Threatened and Endangered Species in Long Island Sound and the assessment noted the four species of sea turtles may be found seasonally in the waters off of Long Island May 1 to November 15 (See Table 2).

Table 2: Endangered marine mammals and reptiles for Connecticut and New York

Species	Federal Status	CT Status	NY Status
Humpback whale (Megaptera novaeangliae)	Endangered	NA*	Endangered
Fin whale (Balaenoptera physalus)	Endangered	NA*	Endangered
Right whale (Eubalaena glacialis)	Endangered	NA*	Endangered

Kemp's ridley sea turtle (Lepidochelys kempii)	Endangered	Endangered	Endangered
Loggerhead sea turtle (Caretta caretta)	Threatened	Threatened	Threatened
Leatherback sea turtle (Dermochelys coriacea	Endangered	Endangered	Endangered
Green sea turtle (Chelonia mydas)	Threatened	Threatened	Threatened
Hawksbill sea turtle (Eretmochelys imbricata)	Endangered	NA*	Endangered

NA – not listed *previously listed as endangered.
CT list accessed 12/29/15, effective 8/5/15
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Use of Long Island Sound by turtles appears related to the availability of prey, annual migration patterns, and age. The coastal waters of New York provide an important habitat for juvenile Kemp's ridley, green, and loggerhead turtles and adult-sized leatherbacks. Hawksbill turtles are only an incidental visitor to Long Island Sound, therefore Long Island Sound is not considered important habitat to the Hawksbill turtle.

The sea turtles in northeastern nearshore waters are typically small juveniles with the most abundant being the federally threatened loggerhead *(Caretta caretta)* followed by the federally endangered Kemp's ridley *(Lepidochelys kempi)*. Loggerhead turtles were found to be relatively abundant off the Northeast (from near Nova Scotia, Canada to Cape Hatteras, North Carolina). From November to March in 1985 through 1988, 130 cold-stunned turtles were collected along the Long Island shoreline, including 97 Kemp's ridleys. The waters of Long Island Sound have also been found to be warm enough to support federally endangered green sea turtles *(Chelonia mydas)* from June through October. The three species of chelonid turtles found in the Northeast remain very briefly in open ocean waters, spending most of their time during the summer months in harbors and estuarine waters. Federally endangered leatherback sea turtles *(Dermochelys coriacea)* may be found in the waters of Long Island Sound during the warmer months as well.

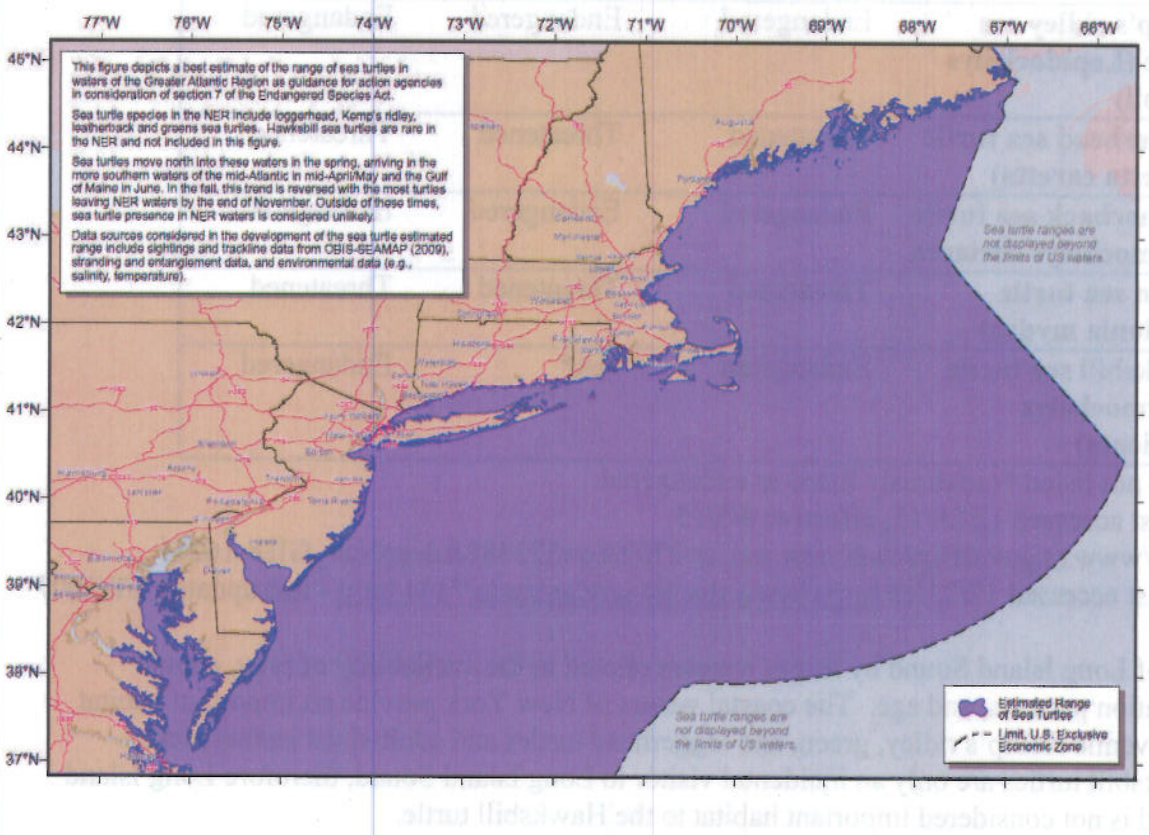

Figure 4: Estimated Range of Sea Turtles (Source: NMFS)

Endangered and Threatened Mammals

Federally endangered North Atlantic right whales *(Eubalaena glacialis),* humpback whales *(Megaptera novaeangliae),* and fin whales *(Balaenoptera physalus)* may all also be found seasonally in Northeast waters. North Atlantic right whales have been documented in the Sound nearshore waters of New York from January through September. Humpback whales feed during the spring, summer, and fall over a range that encompasses the eastern coast of the United States. Atlantic whales are common in waters of the United States Exclusive Economic Zone, principally offshore from Cape Hatteras northward (see Figure 5). While these whale species are not considered residents of Long Island Sound, it is possible that transients may enter the area during seasonal migrations.

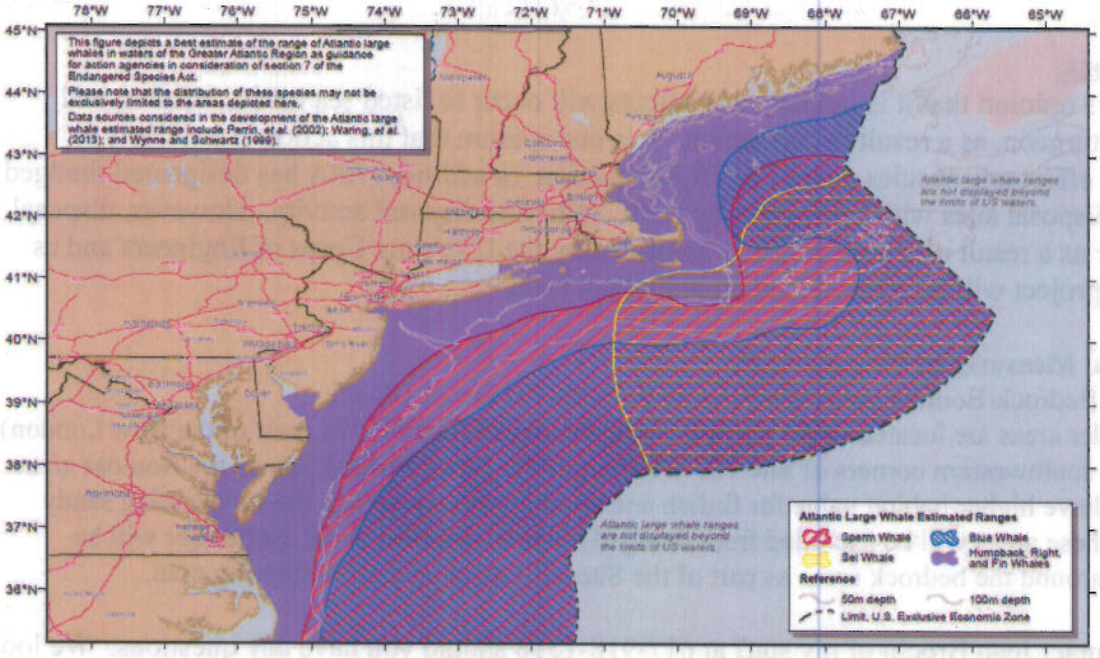

Figure 5: Estimated Range of Atlantic Whales (Source: NMFS)

Table 3 - Endangered birds for Connecticut and New York

Name	Classification	Season uses LIS	Federal status	CT State status	NY state status	Offshore/open water use
Common tern (Sterna hirundo)	Colonial waterbird	Spring-early fall	-	Special concern*	Threatened	Occasional
Least tern (Sterna antillum)	Colonial waterbird	Spring-summer	-	Threatened	Threatened	Occasional
Roseate tern (Sterna dougallii)	Colonial waterbird	Spring-early fall	Endangered	Endangered	Endangered	Occasional
Common loon (Gavia immer)	Pelagic	Winter	-	Special concern*	Special concern	Occasional

*Updated since last SMMP.
CT list accessed 12/29/15, effective 8/5/15.
http://www.ct.gov/dEep/cwp/view.asp?a=2702&q=323488&deepNav_GID=1628
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Conclusions:

It is EPA's opinion that it is unlikely any effects will occur to listed sea turtles, whales, and Atlantic sturgeon, as a result of this action. It is our opinion that this action is not likely to adversely effect any species under NMFS jurisdiction. In addition, EPA has designated dredged material disposal sites which does not, by itself, authorize disposal activity. However, disposal will occur as a result of a project that is permitted by the US Army Corps of Engineers and as such, the project will be reviewed on an individual basis.

Additional Measures in Management

There are Bedrock/Boulder areas identified in the SEIS for the ELDS site.
The Boulder areas are located in the north-central portions of Site NL-Wa (part of the New London) and in the southwestern corners of Site NL-Wb (part of the New London). Since the Boulder areas are likely have higher habitat value for finfish and benthic organisms than the surrounding sandy bottoms, these areas will be excluded from dredged material disposal. A 50 foot buffer will be managed around the bedrock areas as part of the Site Management and Monitoring plan.

Please contact Jean Brochi of my staff at 617-918-1536 should you have any questions. We look forward to receiving your response.

Sincerely,

Regina Lyons, Manager
Ocean and Coastal Protection Unit

Cc: Mike Johnson, NOAA Fisheries - Habitat Conservation
Chris Vaccaro, NOAA Fisheries - Protected Resources Division
Mark Murray-Brown, NOAA Fisheries – Protected Resources Division
Chris Boelke- NOAA Fisheries - Protected Resources Division
Steven Mars, USFWS, NYD
David Stillwell, USFWS, NYD
Glenn Smith, USFWS, Northeast, Region 5

References:

EPA, 2016. Draft Supplemental Environmental Impact Statement. U.S. Environmental Protection Agency. April 2016.

EPA, 2005. Final Environmental Impact Statement for the Designation of Dredged Material Disposal Sites in Central and Western Long Island Sound, Connecticut and New York, U.S. Environmental Protection Agency. April 2004. Report + appendices

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

AUG 12 2016

Ms. Regina Lyons
Manager, Ocean and Coastal Protection Unit
US EPA, Region 1
Five Post Office Square, Suite 100
Boston, MA 02109-3912

RE: Essential Fish Habitat consultation for Eastern Long Island Sound Dredged Material Disposal Site

Dear Ms. Lyons:

We have reviewed your request for Essential Fish Habitat (EFH) consultation for the Eastern Long Island Sound Dredged Material Disposal Site (ELDS) and revised Effects Analysis for EFH. We concur with your determination that by excluding the boulder areas located in the south and northwest corners of the proposed disposal site, and with the incorporation of your specific management practices that include a 200 foot buffer zone from the boulder areas, the proposed designation will result in no more than minimal adverse impacts to designated EFH.

If you have questions or need additional information, please contact Alison Verkade (alison.verkade@noaa.gov/ 978-281-9266) in the Habitat Conservation Division.

Sincerely,

Christopher Boelke
New England Field Office Supervisor
For Habitat Conservation

cc: Jean Brochi, EPA
Zach Jylkka, PRD
Tom Nies, NEFMC
Chris Moore, MAFMC
Lisa Havel, ASMFC

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ENDANGERED SPECIES ACT COORDINATION
WITH
NATIONAL MARINE FISHERIES SERVICES

- **Letter from USEPA**
- **Response from NMFS**

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I (NEW ENGLAND)
FIVE POST OFFICE SQUARE – SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

June 30, 2016

Mrs. Kimberly Damon-Randall
Protected Resources Division
NOAA National Marine Fisheries Service
Greater Atlantic Regional Fisheries Office
55 Great Republic Drive
Gloucester, MA 01930-2276

Attn: Mrs. Kimberly Damon-Randall

Re: Eastern Long Island Sound Site Designation

Dear Mrs. Damon-Randall,

The New England Regional Office of the United States Environmental Protection Agency (EPA) has proposed designation of the Eastern Long Island Sound Dredged Material Disposal site (ELDS) in a draft rule issued on April 27, 2016 (81 FR 24748). The Eastern site encompasses 50 % of the existing New London disposal site. The New London disposal site has been used for over 40 years and was selected by the US Army Corps of Engineers (USACE). In addition to the draft rule, EPA provided a Supplemental Environmental Impact Statement (SEIS) for public review. The SEIS is referred to as a supplemental document because it builds on data collected for the Central and Western site designation finalized in 2005.

EPA is requesting initiation of consultation under the expedited process pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended, on the use of the ELDS Dredged Material disposal site. We are specifically interested in your comments because of the listing of a new species of Atlantic sturgeon on February 6, 2012 (77 FR 5880 and 77 FR 5914). We understand that a request for consultation using the expedited process will take less than 30 days to receive a response from your office. For this initiation of consultation, we have reviewed the effects on all listed species, including Atlantic sturgeon, of the ongoing use of ELDS designated disposal site pursuant to the Marine Protection, Research, and Sanctuaries Act (MPRSA) and site management and monitoring plan (which are revised every ten years). The ELDS site is primarily located in Connecticut waters in Long Island Sound. However, the southeast corner is located in New York waters but will be revised in the final designation. The site will be completely in Connecticut waters at that time. The designation of dredged material disposal sites does not authorize disposal. Disposal is authorized by federal permit issued by the USACE for dredge

and fill. As part of the regulatory authority, the USACE will be coordinating with your office on individual projects/permits.

We have made the determination that the proposed activity may affect, but is not likely to adversely affect, any species listed as threatened or endangered and by NMFS under the ESA of 1973, as amended. No take or exemption is expected from this action. If there is a take of a species, enforcement will take place through the permit process with coordination with the USACE.

Description of Action/Project:
The USACE originally selected the New London site for short term use of dredged material disposal. According to the USACE authorization, the site should have remained open for ten years. The NLDS is located in the eastern part of the eastern Long Island Sound region and has been used for dredged material disposal since 1955 (SAIC, 2001b). This active open-water dredged material disposal site was previously selected by the USACE using their site selection authority under MPRSA 103(b), 33 U.S.C. 1413(b). The statute limits the use of USACE-selected sites to two five-year periods, 33 U.S.C. 1413(b), but Congress extended the period of use of the NLDS by five additional years by Public Law on December 23, 2011 (PL-112-74, Title I, Sec 116).

On April 27, 2016, EPA issued a draft rulemaking and Supplemental Environmental Impact Statement (SEIS). EPA will publish the final rulemaking in the fall of 2016 which will designate one disposal site in eastern Long Island Sound, (ELDS). For all disposal activities in Long Island Sound there are several time of year restrictions but the primary dredging window is restricted to June 1 through September 30th.

Additional Coordination:
EPA is also coordinating with the US Fish and Wildlife service pursuant to the Fish and Wildlife Coordination Act.

At the designated disposal sites, for disposal to occur, a permit authorizing disposal will be provided to an applicant by the USACE. In authorizing permits in accordance with Section 404 of the CWA and MPRSA. The USACE will conduct threatened and endangered species consultations with the NMFS and USFWS during preparation of project-specific NEPA evaluations.

Dredged Material:
Periodic dredging ensures safe navigation and marine commerce in Connecticut, New York, and western Rhode Island rivers, harbors, and coastal areas. Dredged material has been generated from the harbors and rivers of the Long Island Sound study area for nearly 150 years to develop and keep navigation channels open for commerce and recreation.

In 2015, the USACE evaluated the dredging needs in the Long Island Sound region. The 2015 dredging needs evaluation estimated that nearly 52.9 million cubic yards (MCY) of dredged material will be generated over the 30-year period from maintenance and improvement projects.

There are currently two actively used and current disposal sites in the eastern region of the sound which include Cornfield Shoals and New London. The rulemaking is focused on designating the ELDS (which means the CSDS will be closed and the rest of the New London site will be closed). Therefore, this analysis of effect is for this site only.

Eastern Long Island Sound dredged material disposal site (ELDS)

The Eastern Long Island Sound Disposal Site (ELDS,) is located to the south of the mouth of Thames River estuary, approximately halfway between Connecticut and New York. The ELDS encompasses approximately the western half of the existing New London Disposal Site (NLDS), along with Sites NL-Wa and NL-Wb, which are adjacent areas immediately to the west of the NLDS (*see* DSEIS, Figure 3-9). The dimensions of the ELDS, which combines these three areas, are 1 x 2 nautical miles (nmi), for a total size of 2 square nautical miles (nmi^2). The closest upland points to the ELDS are Goshen Point, Connecticut, approximately 1.2 nmi (2.2 km) to the north, and Fishers Island, New York, approximately 1.4 nmi (2.6 km) to the southeast. The following are descriptions of the three areas that together would comprise the ELDS.

New London Disposal Site

The center of the NLDS is located 3.1 nmi (5.4 km) south of Eastern Point in Groton, Connecticut. The site has an area of 1 nmi^2 (3.4 km^2) centered at 41°16.306' N, 72°04.571' W (NAD83); corner coordinates are presented in Table 3-8. Water depths in the site range from approximately 46 to 79 feet (14 to 24 m). Most of the site is located within Connecticut waters, while a small portion in the southeastern corner of the site is located in New York state waters. However, this rule proposes to include only the western half of the NLDS, which would exclude the portion of the site that is in New York waters.

Approximately 5.4 mcy (4.1 million m^3) were disposed at the NLDS between 1955 and 1976. A total of approximately 3.5 mcy (2.6 million m^3) of dredged material have been placed at this location since it was formally selected in 1982. The dredged materials mounds on the seafloor result in an uneven seafloor within the site; the dredged material deposits can rise as much as 16 to 20 feet (5 to 6 m) above the surrounding seafloor.

The USGS mapped the sediment at the NLDS as predominantly sand, while sediments in the northernmost part of the site were mapped as gravelly. NUSC (1979) described the sediment at the site as generally fine sand. Much of the surface sediment at the site consists of placed dredged material. Sediment sampled by the DAMOS program at locations approximately 0.5 nmi (1 km) to the east and west of the NLDS consisted of silt/clay and very fine silty sand, which may reflect pre-disposal sediment textures at the NLDS.

Site NL-Wa

Site NL-Wa is immediately to the west of the NLDS and also has an area of 1 nmi^2 (3.4 km^2). Water depths range from approximately 45 feet (14 m) in the north, to 100 feet (30 m) in the south. The site consists of mostly sandy areas, but also an area of boulders and rocks in the

northern part of the site (WHG, 2014). This boulder area may be a lag deposit of a glacial moraine. The water depth in parts of the boulder area is shallower than 59 feet (18 m).

Site NL-Wb

Site NL-Wb is immediately to the west of Site NL-Wa and has an area of 0.5 nmi^2 (1.7 km^2). Water depths across the site range from approximately 59 feet (18 m) in the north, to 95 feet (28 m) in the south. The site consists of an extension of the sandy areas of Site NL-Wa. The southwestern corner of Site NL-Wb contains an area of bedrock and boulders; this area is an extension of a larger area with a similar substrate further to the south. The bedrock appears as parallel ridges of dipping, layered rock that can be correlated to bedrock on shore. The bedrock area within Site NL-Wb also contains some sand waves. Bartlett Reef is located approximately 0.5 nmi (0.9 km) to the west of the western boundary of the site.

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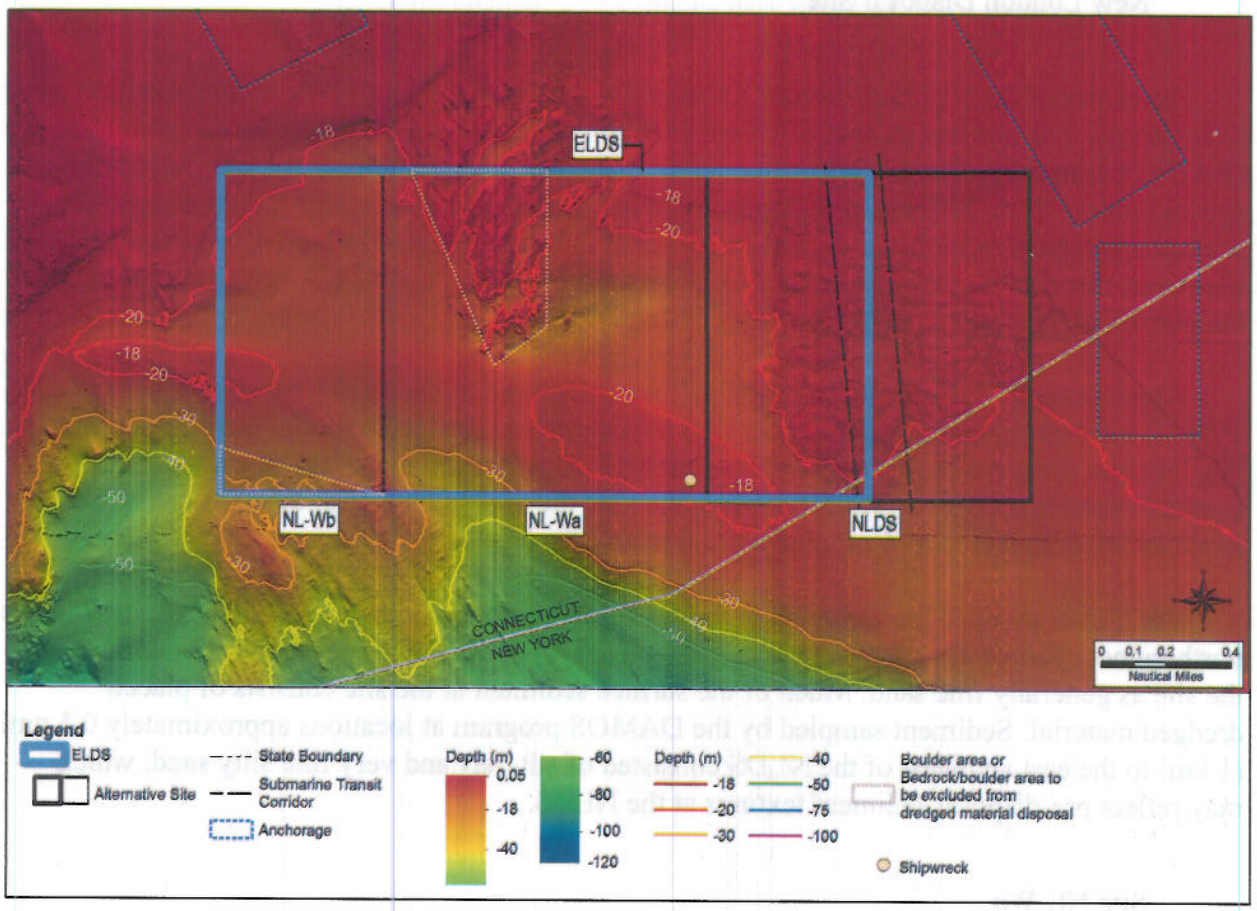

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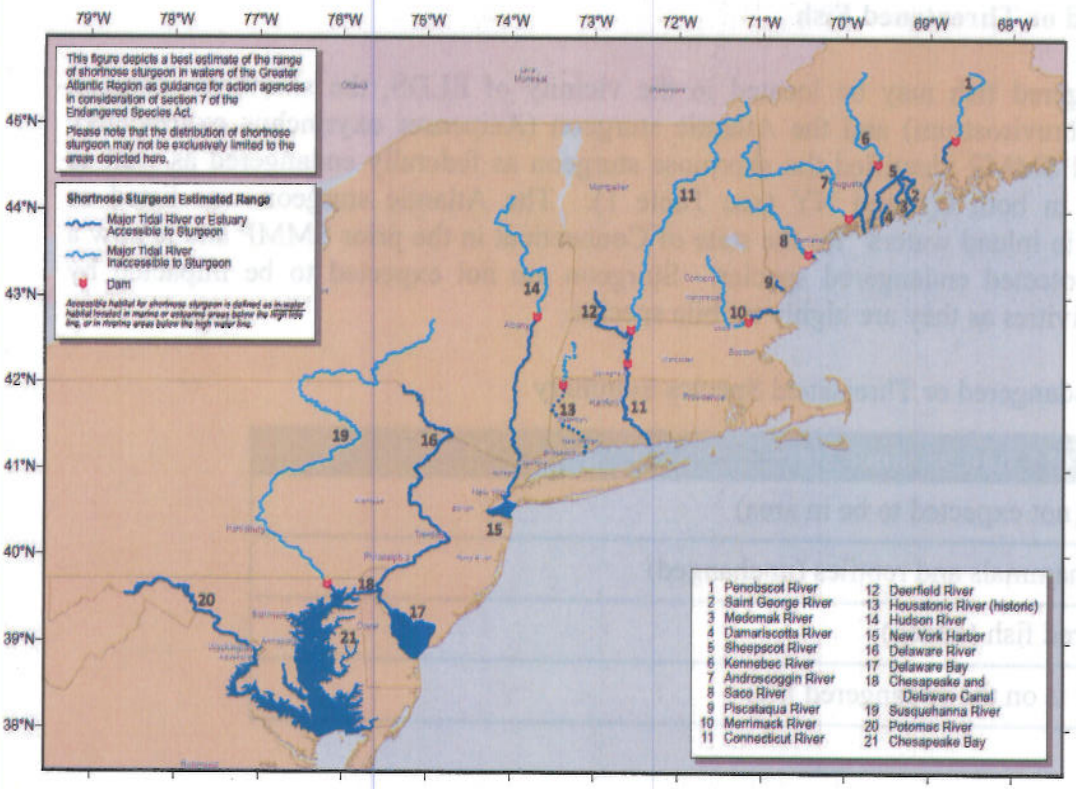

Figure 3: Estimated Range of Shortnose Sturgeon (Source: NMFS)

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Sea turtles are the only endangered reptile species noted in the Long Island Sound area (see Figure 4). Sea turtles are highly migratory and are often found throughout the world's oceans (NOAA, 1995). Pursuant to Section 7 of the Endangered Species Act, EPA requested input from NMFS, U.S. Fish and Wildlife Service (USFWS), CTDEEP, and NYSDEC on the identification of Threatened and Endangered Species in Long Island Sound and the assessment noted the four species of sea turtles may be found seasonally in the waters off of Long Island May 1 to November 15 (See Table 2).

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Kemp's ridley sea turtle (Lepidochelys kempii)	Endangered	Endangered	Endangered
Loggerhead sea turtle (Caretta caretta)	Threatened	Threatened	Threatened
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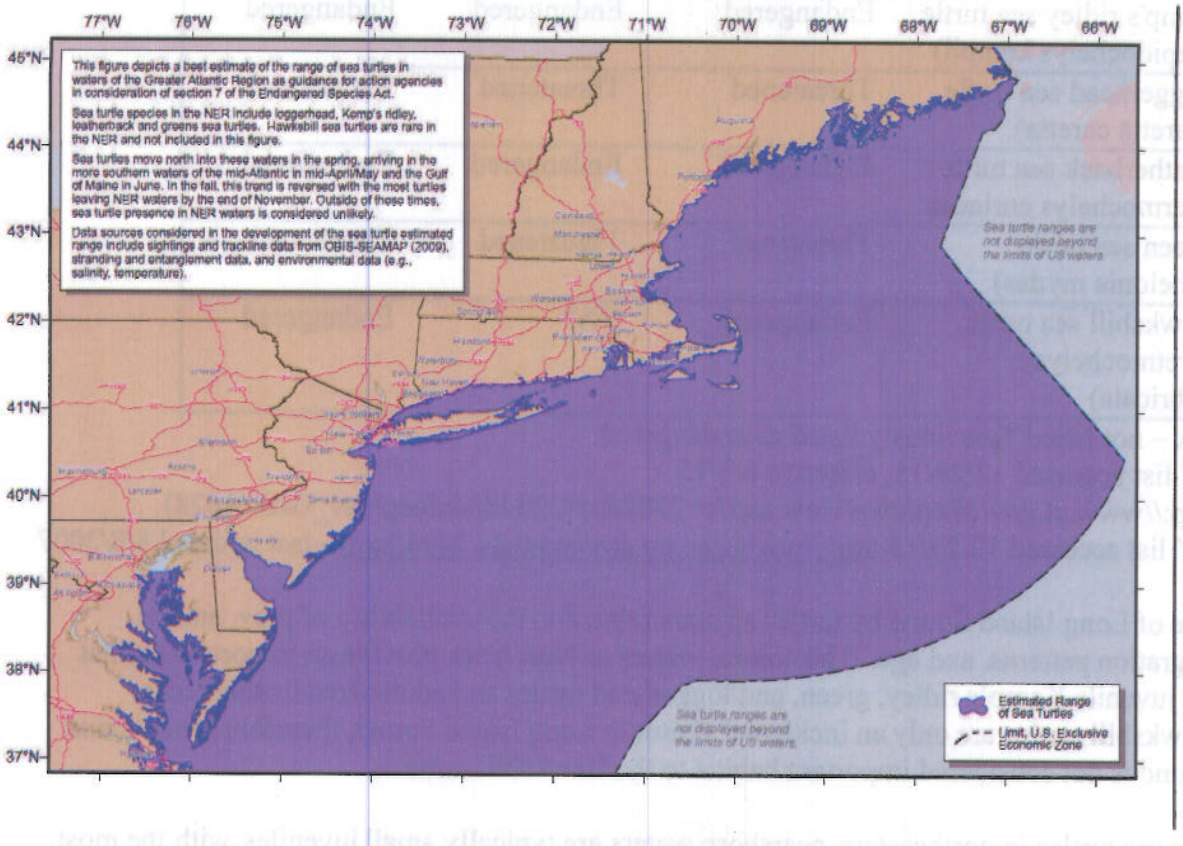

Figure 4: Estimated Range of Sea Turtles (Source: NMFS)

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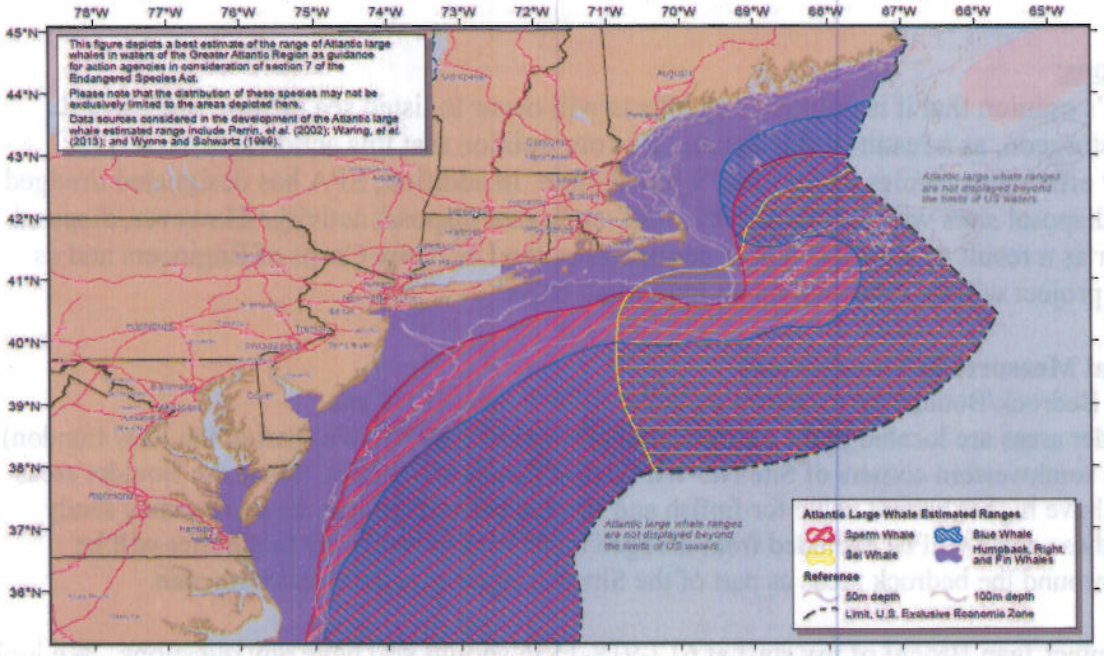

Figure 5: Estimated Range of Atlantic Whales (Source: NMFS)

Table 3 - Endangered birds for Connecticut and New York

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Sincerely,

Regina Lyons, Manager
Ocean and Coastal Protection Unit

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Chris Boelke- NOAA Fisheries - Protected Resources Division
Steven Mars, USFWS, NYD
David Stillwell, USFWS, NYD
Glenn Smith, USFWS, Northeast, Region 5

References:

EPA, 2016. Draft Supplemental Environmental Impact Statement. U.S. Environmental Proection Agency. April 2016

EPA, 2004. Final Environmental Impact Statement for the Designation of Dredged Material Disposal Sites in Central and Western Long Island Sound, Connecticut and New York, U.S. Environmental Protection Agency. April 2004. Report + appendices

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

AUG 12 2016

Regina Lyons
Ocean and Coastal Protection Unit
US EPA
Five Post Office Square, Suite 100
Boston, MA 02109-3912

Re: New Designation of the Eastern Long Island Sound (ELDS) Disposal Site

Dear Ms. Lyons:

We have completed our consultation under section 7 of the Endangered Species Act (ESA) in response to your letter dated June 30, 2016, and your final revised effects analysis received on August 8, 2016, regarding the above-referenced proposed project. We reviewed the action agency's consultation materials and have determined that the newly proposed site designation constitutes a new action even though the new disposal site will include all or portions of existing disposal areas in eastern Long Island Sound. Based on our knowledge, expertise, and the action agency's materials, we concur with the action agency's conclusion that the proposed action is not likely to adversely affect the ESA-listed species under our jurisdiction and will have no effect on critical habitat since the action does not overlap with any proposed/designation critical habitat under our jurisdiction. Therefore, no further consultation pursuant to section 7 of the ESA is required.

We agree with the rationale you provided to support your determination that the proposed action is not likely to adversely affect ESA listed species. Specifically, we have determined that your project description and the description of the action area provide sufficient information. We clarify your point that you are restricting disposal operations at the site to the time of year (TOY) window analyzed in your document, and that your analysis does not apply to dredging activities under the Army Corps of Engineers' (ACOE) jurisdiction. Additionally, we clarify that your description of the action area applies to the extent of the underwater effects of disposal activities and not those of dredging activities. We agree with your description of listed species, life stages, and behaviors in the action area. We agree that the effects, which you analyzed, constitute all of the direct and indirect effects of the action and that there are no interrelated or interdependent activities related to disposal site designation or disposal activities that may result in adverse effects to any of the species analyzed in your analysis. Additionally, we agree with your application of the terms "insignificant" and "discountable" to each of the effects you analyzed, and with your analysis of aggregate effects of ongoing disposal activities at the site, and how the

addition of incremental disposal activities, to the baseline, if in compliance with the parameters set forth in your site designation and management plan, are "not likely to adversely affect" listed species individually, or in aggregate. Finally, we agree that you based your determinations on the best available scientific and commercial data available.

Reinitiation of consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered in the consultation; (b) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this consultation; or (c) If a new species is listed or critical habitat designated that may be affected by the identified action. No take is anticipated or exempted. If there is any incidental take of a listed species, reinitiation would be required. Should you have any questions about this correspondence please contact Chris Vaccaro at 978-281-9167 or by email (Christine.Vaccaro@noaa.gov). For questions related to Essential Fish Habitat please contact Allison Verkade with our Habitat Conservation Division at (978) 281-9266 or at Allison.verkade@noaa.gov.

Sincerely,

Kimberly B. Damon-Randall
Assistant Regional Administrator
for Protected Resources

EC: Vaccaro, PRD, Verkade, HCD, Boelke, HCD
Brochi, EPA
PCTS: NER-2016-13551

File Code: H:\ H:\Section 7 Team\Section 7\Non-Fisheries\EPA\Informal\2016\Eastern Long Island Disposal Site\Response

ESSENTIAL FISH HABITAT COORDINATION WITH U.S. FISH AND WILDLIFE SERVICE

- **Letter from USEPA**
- **Response from USFWS**

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I (NEW ENGLAND)
FIVE POST OFFICE SQUARE – SUITE 100
BOSTON, MASSACHUSETTS 02109-3912

June 30, 2016

Maria Tur, Endangered Species Coordinator
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301

RE: Endangered Species Act Coordination

Dear Ms. Tur,

The New England Regional Office of the United States Environmental Protection Agency (EPA) has proposed designation of the Eastern Long Island Sound Dredged Material Disposal site (ELDS) in a draft rule issued on April 27, 2016 (81 FR 24748).

EPA is requesting consultation by your agency and the National Marine Fisheries Service (contacted in a separate letter) pursuant to the Fish and Wildlife Coordination Act, Section 7 of the Endangered Species Act (ESA) of 1973, as amended to ensure that the designation of dredged material disposal sites will not jeopardize the continued existence of endangered and threatened species under the jurisdiction of the of the U.S. Fish and Wildlife Service (FWS).

For this consultation, we have reviewed the effects on all listed species and habitat on your website and have evaluated alternatives to the ELDS site as part of the Supplemental Environmental Impact Statement (SEIS) pursuant to the Marine Protection, Research, and Sanctuaries Act (MPRSA).

The ELDS site is primarily located in Connecticut waters in Long Island Sound. However, the southeast corner is located in New York waters but will be revised in the final designation. The designation of dredged material disposal sites does not authorize disposal. Disposal is authorized by federal permit issued by the USACE for dredge and fill. As part of the regulatory authority, the USACE will be coordinating with your office on individual projects/permits.

Periodic dredging ensures safe navigation and marine commerce in Connecticut, New York, and western Rhode Island rivers, harbors, and coastal areas. Dredged material has been generated

from the harbors and rivers of the Long Island Sound study area for nearly 150 years to develop and keep navigation channels open for commerce and recreation.

In 2015, the USACE evaluated the dredging needs in the Long Island Sound region. The 2015 dredging needs evaluation estimated that nearly 52.9 million cubic yards (MCY) of dredged material will be generated over the 30-year period from maintenance and improvement projects.

There are currently two actively used disposal sites in the eastern region of the sound which include Cornfield Shoals and New London. The rulemaking is focused on designating the ELDS (which means the CSDS will be closed and the rest of the New London site will be closed). Therefore, this analysis of effect is for this site only.

Eastern Long Island Sound dredged material disposal site (ELDS)

The Eastern Long Island Sound Disposal Site (ELDS) is located to the south of the mouth of Thames River estuary, approximately halfway between Connecticut and New York. The ELDS encompasses approximately the western half of the existing New London Disposal Site (NLDS), along with Sites NL-Wa and NL-Wb, which are adjacent areas immediately to the west of the NLDS (*see* DSEIS, Figure 3-9). The dimensions of the ELDS, which combines these three areas, are 1 x 2 nautical miles (nmi), for a total size of 2 square nautical miles (nmi^2). The closest upland points to the ELDS are Goshen Point, Connecticut, approximately 1.2 nmi (2.2 km) to the north, and Fishers Island, New York, approximately 1.4 nmi (2.6 km) to the southeast. The following are descriptions of the three areas that together would comprise the ELDS.

New London Disposal Site

The center of the NLDS is located 3.1 nmi (5.4 km) south of Eastern Point in Groton, Connecticut. The site has an area of 1 nmi^2 (3.4 km^2) centered at 41°16.306' N, 72°04.571' W (NAD83); corner coordinates are presented in Table 3-8. Water depths in the site range from approximately 46 to 79 feet (14 to 24 m). Most of the site is located within Connecticut waters, while a small portion in the southeastern corner of the site is located in New York state waters. However, this rule proposes to include only the western half of the NLDS, which would exclude the portion of the site that is in New York waters.

Approximately 5.4 mcy (4.1 million m^3) were disposed at the NLDS between 1955 and 1976. A total of approximately 3.5 mcy (2.6 million m^3) of dredged material have been placed at this location since it was formally selected in 1982. The dredged materials mounds on the seafloor result in an uneven seafloor within the site; the dredged material deposits can rise as much as 16 to 20 feet (5 to 6 m) above the surrounding seafloor.

The USGS mapped the sediment at the NLDS as predominantly sand, while sediments in the northernmost part of the site were mapped as gravelly. NUSC (1979) described the sediment at the site as generally fine sand. Much of the surface sediment at the site consists of placed dredged material. Sediment sampled by the DAMOS program at locations approximately 0.5 nmi (1 km) to the east and west of the NLDS consisted of silt/clay and very fine silty sand, which may reflect pre-disposal sediment textures at the NLDS.

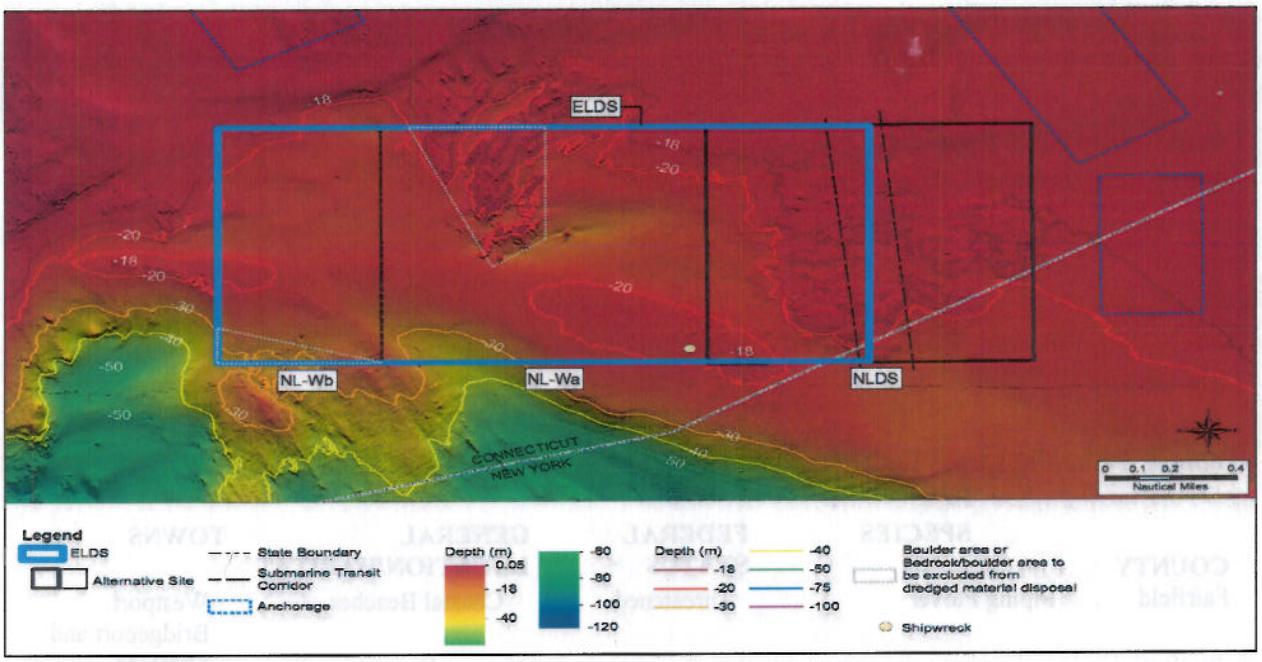
Site NL-Wa

Site NL-Wa is immediately to the west of the NLDS and also has an area of 1 nmi^2 (3.4 km^2). Water depths range from approximately 45 feet (14 m) in the north, to 100 feet (30 m) in the south. The site consists of mostly sandy areas, but also an area of boulders and rocks in the northern part of the site (WHG, 2014). This boulder area may be a lag deposit of a glacial moraine. The water depth in parts of the boulder area is shallower than 59 feet (18 m).

Site NL-Wb

Site NL-Wb is immediately to the west of Site NL-Wa and has an area of 0.5 nmi^2 (1.7 km^2). Water depths across the site range from approximately 59 feet (18 m) in the north, to 95 feet (28 m) in the south. The site consists of an extension of the sandy areas of Site NL-Wa. The southwestern corner of Site NL-Wb contains an area of bedrock and boulders; this area is an extension of a larger area with a similar substrate further to the south. The bedrock appears as parallel ridges of dipping, layered rock that can be correlated to bedrock on shore. The bedrock area within Site NL-Wb also contains some sand waves. Bartlett Reef is located approximately 0.5 nmi (0.9 km) to the west of the western boundary of the site.

Figure 1: ELDS
(Source: ELDS SEIS)



According to your website[1], the species in Connecticut are listed below in Tables 1 and 2.

[1]:https://www.fws.gov/newengland/pdfs/CT%20species%20by%20town.pdf – Updated 2/6/2016

Table 1: National USFWS Species list

Animals 9 listings

Status	Species/Listing Name
T	Bat, Northern long-eared (*Myotis septentrionalis*)
T	Knot, red (*Calidris canutus rufa*)
T	Plover, piping except Great Lakes watershed (*Charadrius melodus*)
E	Sea turtle, hawksbill Entire (*Eretmochelys imbricata*)
E	Sea turtle, leatherback Entire (*Dermochelys coriacea*)
E	Tern, roseate northeast U.S. nesting pop. (*Sterna dougallii dougallii*)
T	Tiger beetle, Puritan Entire (*Cicindela puritana*)
T	Turtle, bog (=Muhlenberg) northern (*Clemmys muhlenbergii*)
E	Wedgemussel, dwarf Entire (*Alasmidonta heterodon*)

Plants 2 listings

Status	Species/Listing Name
E	Gerardia, sandplain (*Agalinis acuta*)
T	Pogonia, small whorled (*Isotria medeoloides*)

Table 2: Federally Listed Endangered and Threated Species in Connecticut

COUNTY	SPECIES	FEDERAL STATUS	GENERAL LOCATION/HABITAT	TOWNS
Fairfield	Piping Plover	Threatened	Coastal Beaches	Westport, Bridgeport and Stratford
	Roseate Tern	Endangered	Coastal beaches, Islands and the Atlantic Ocean	Westport and Stratford
	Bog Turtle	Threatened	Wetlands	Ridgefield and Danbury.

	Red knot1	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Hartford	Dwarf wedge mussel	Endangered	Farmington and Podunk Rivers, Muddy Brook, Philo Brook, Stony Brook	South Windsor, East Granby, Suffield, Simsbury, Avon and Bloomfield.
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Litchfield	Small whorled Pogonia	Threatened	Forests with somewhat poorly drained soils and/or a seasonally high water table	Sharon.
	Bog Turtle	Threatened	Wetlands	Sharon and Salisbury.
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
Middlesex	Roseate Tern	Endangered	Coastal beaches, islands and the Atlantic Ocean	Westbrook and New London.
	Piping Plover	Threatened	Coastal Beaches	Clinton, Westbrook, Old Saybrook.
	Puritan Tiger Beetle	Threatened	Sandy beaches along the Connecticut River	Cromwell, Portland
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide
New Haven	Bog Turtle	Threatened	Wetlands	Southbury
	Piping Plover	Threatened	Coastal Beaches	Milford, Madison and West Haven
	Roseate Tern	Endangered	Coastal beaches, Islands and the Atlantic Ocean	Branford, Guilford and Madison
	Indiana Bat	Endangered	Mines, Caves	
	Red knot1	Threatened	Coastal Beaches and Rocky Shores, sand and mud flats	Coastal towns
	Northern Long-eared Bat	Threatened Final 4(d) Rule	Winter- mines and caves, Summer – wide variety of forested habitats	Statewide

Of the species listed, sea turtles are the only species likely to be found offshore at a disposal site. Use of Long Island Sound by turtles appears related to the availability of prey, annual migration patterns, and age. The coastal waters of New York provide an important habitat for juvenile Kemp's ridley, green, and loggerhead turtles and adult-sized leatherbacks. Hawksbill turtles are only an incidental visitor to Long Island Sound, therefore Long Island Sound is not considered important habitat to the Hawksbill turtle.

The sea turtles in northeastern nearshore waters are typically small juveniles with the most abundant being the federally threatened loggerhead *(Caretta caretta)* followed by the federally endangered Kemp's ridley *(Lepidochelys kempi)*. Loggerhead turtles were found to be relatively abundant off the Northeast (from near Nova Scotia, Canada to Cape Hatteras, North Carolina). From November to March in 1985 through 1988, 130 cold-stunned turtles were collected along the Long Island shoreline, including 97 Kemp's ridleys. The waters of Long Island Sound have also been found to be warm enough to support federally endangered green sea turtles *(Chelonia mydas)* from June through October. The three species of chelonid turtles found in the Northeast remain very briefly in open ocean waters, spending most of their time during the summer months in harbors and estuarine waters. Federally endangered leatherback sea turtles *(Dermochelys coriacea)* may be found in the waters of Long Island Sound during the warmer months as well.

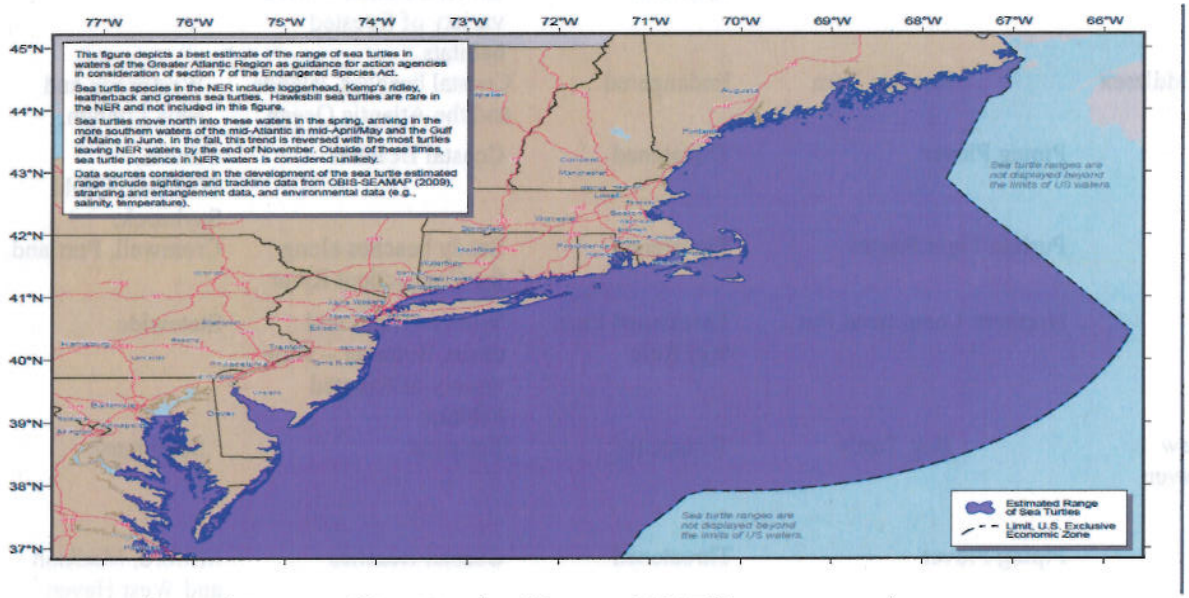


Figure 2: Estimated Range of Sea Turtles (Source: NMFS)

Conclusions

It is EPA's opinion that it is unlikely any effects will occur to listed sea turtles as a result of this action. It is our opinion that this action is not likely to adversely affect any species under USFWS jurisdiction. In addition, no take will result from this action. EPA has designated dredged material disposal sites which does not, by itself, authorize disposal activity. However, disposal will occur as a result of a project that is permitted by the US Army Corps of Engineers and as such, the project will be reviewed on an individual basis.

Additional Measures in Management

There are Bedrock/Boulder areas identified in the SEIS for the ELDS site.
The Boulder areas are located in the north-central portions of Site NL-Wa (part of the New London) and in the southwestern corners of Site NL-Wb (part of the New London). Since the Boulder areas are likely have higher habitat value for finfish and benthic organisms than the surrounding sandy bottoms, these areas will be excluded from dredged material disposal. A 50 foot buffer will be managed around the bedrock areas as part of the Site Management and Monitoring plan.

Please contact Jean Brochi of my staff at 617-918-1536 should you have any questions. We look forward to receiving your response within 30 days.

Sincerely,

Regina Lyons, Manager
Ocean and Coastal Protection Unit

Cc: Steven Mars, USFWS, NYD
David Stillwell, USFWS, NYD
Glenn Smith, USFWS, Northeast, Region 5

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From: vonOettingen, Susi [mailto:susi_vonoettingen@fws.gov]
Sent: Thursday, August 11, 2016 3:23 PM
To: Brochi, Jean <Brochi.Jean@epa.gov>
Subject: No effect determination for Eastern Long Island Disposal area

Hi Jean,

I agree that the Eastern Long Island Sound Dredged Material Disposal site designation will have no effect on federally listed species under the jurisdiction of the U.S. Fish and Wildlife Service. I believe that any effects from activities associated with the disposal of dredged material at this location will be consulted individually under section 7 of the ESA.

Endangered roseate terns may traverse the area, but it is unlikely that they would consistently forage in that disposal area since their prey (sand lance and other small fish) are generally found in shallower waters.

Further consultation with this office under section 7 is not necessary unless there is new information relative to listed species presence or there are changes to the project.

Please contact me via email or at the number below if you need further assistance.

Susi von Oettingen

****
Susi von Oettingen
Endangered Species Biologist
New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301
(W) 603-223-2541 ext. 6418
Please note my new extension.

www.fws.gov/newengland

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Appendix A-12

COASTAL ZONE MANAGEMENT CONSISTENCY DETERMINATION

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COASTAL ZONE MANAGEMENT CONSISTENCY DETERMINATION - CONNECTICUT

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

July 29, 2016

Brian P. Thompson, Director
Office of Long Island Sound Programs
Department of Energy & Environmental Protection
State of Connecticut
79 Elm Street
Hartford, CT 06106-5127

Re: EPA Region 1's Federal CZMA Consistency Determination for Proposed Designation of the Eastern Long Island Sound Dredged Material Disposal Site

Dear Mr. Thompson:

The New England Office of the United States Environmental Protection Agency (EPA, Region 1 or the Region) is proposing to designate a dredged material disposal site for the eastern region of Long Island Sound pursuant to Sections 102(c) and 106(f) of the Marine Protection, Research and Sanctuaries Act (MPRSA). 33 U.S.C. §§ 1412(c) and 1416(f). *See also* 40 C.F.R. § 228.4(e). On April 27, 2016, EPA published a Proposed Rule notifying the public of this proposed action and seeking public review and comment. 81 Fed. Reg. 24748 - 244767 (April 27, 2016). EPA also simultaneously published for public review and comment a Draft Supplemental Environmental Impact Statement (DSEIS) that evaluated the proposed action and various possible alternatives to it.

EPA has determined that its proposed action would be consistent to the maximum extent practicable with the enforceable policies of Connecticut's Coastal Management Program (CT CMP). Therefore, together with this letter, EPA is submitting its consistency determination to the Connecticut Department of Energy & Environmental Protection (CT DEEP) pursuant to Section 307(c)(l)(C) of the Federal Coastal Zone Management Act (CZMA). 16 U.S.C. § 1456(c)(l)(C). EPA is also providing a Coastal Management Consistency Review Form for Federal Activities and has previously provided copies of the Proposed Rule and the DSEIS.

Specifically, EPA is proposing to designate a site offshore of New London, CT. The site is referred to as the "Eastern Long Island Sound Dredged Material Disposal Site" (ELDS). While identifying designation of the ELDS as its preferred alternative, EPA also indicated that two other alternatives, the Niantic Bay Disposal Site (NBDS) and the Cornfield Shoals Disposal Site (CSDS), or portions thereof, could also potentially be

designated in addition to, or instead of, the ELDS. EPA invited public comment on the option of designating one or both of these sites. EPA also has proposed that the same site use restrictions governing use of the Central Long Island Sound and Western Long Island Sound dredged material disposal sites also be applied to the site or sites designated in the eastern region of the Sound. *See* 81 Fed. Reg. 44220 (July 7, 2016) (Final Rule) (amended site use restrictions for the CLDS and WLDS).

On December 22, 2015, EPA sent your office a letter indicating the Region's intent to review our proposed action to determine its consistency with the CT CMP and seeking guidance regarding which of the enforceable policies of the CT CMP should be considered. On January 15, 2016, you sent a reply letter providing the requested guidance. EPA 1 appreciates your assistance.

EPA has completed its evaluation and, as stated above, has determined that its proposed action, as well as the primary alternatives under consideration, would be fully consistent with the enforceable policies of the CT CMP. The Region's determination is supported by the above-cited Federal Register notice, DSEIS and other materials referenced in the consistency determination.

The waters of Long Island Sound are precious natural resources that provide immeasurable benefits to the people of our Nation, including residents of the States of Connecticut and New York. These waters also provide invaluable habitat for aquatic life, a wonderful aesthetic and recreational resource, and a crucial engine for the region's economy. Maintaining the navigability of these waters is also important to our national security planning. All of these purposes and functions must be served in our collective stewardship of Long Island Sound. As the CT CMP recognizes, dredging is needed at times to ensure safe navigation and adequate mooring space for recreational, commercial and military vessels. At the same time, it is critical that dredging and dredged material management be conducted in an environmentally sound manner. EPA Region 1 believes that its proposed action correctly balances this multitude of interests.

In developing this proposal, EPA has taken into account the input of the CT DEEP, other federal and state agencies, and members of the interested public. We look forward to receiving and considering public comments on the Proposed Rule and the DSEIS. When considering the proposed action, it is important to remember that EPA designation of a disposal site does not authorize either any dredging or the placement of any particular dredged material at the designated disposal site. It just makes the designated site available as a potential management option for use in appropriate circumstances. Any proposal to place dredged material at a site in the waters of Long Island Sound will be subject to a case-specific permitting review. Placement at a disposal site can only be authorized if (a) the sediments are analyzed and found suitable for marine disposal after physical, chemical and biological testing, and (b) there are no practicable alternatives to such marine disposal.

EPA Region 1 requests that CT DEEP provide a written concurrence with the attached CZMA consistency determination within 60 days of receipt of this letter.

If you have any questions regarding this letter, your staff may call Mel Cote, chief of the Surface Water Branch at (617) 918-1553 and/or your legal counsel may call Senior Assistant Regional Counsel Mark Stein at (617) 918-1077. Thank you for your continued cooperation in this important effort.

Sincerely,

Kenneth Moraff, Director
Office of Ecosystem Protection

Enclosure

cc (by email):
David Kaiser, NOAA
Mark Habel, USACE
Kathleen Moser, NY DEC
Jeffrey Zappieri, NY DOS
Grover Fugate, RI CRMC

Connecticut Department of
Energy & Environmental Protection
Bureau of Water Protection & Land Reuse
Office of Long Island Sound Programs

Coastal Management Consistency Review Form for Federal Activities

Use of this form, although not mandatory, will facilitate coastal consistency review analysis by the Federal agency and result in submission of sufficient information for comprehensive review by the Department of Energy and Environmental Protection (DEEP) Office of Long Island Sound Programs (OLISP). It is anticipated that submittal of a completed form with indicated supplemental materials will, in most instances, eliminate the need for further information. The form should be used in conjunction with the *Reference Guide to Coastal Policies and Definitions* (DEEP-OLISP-GUID-200). The *Instructions and Guidance for Completing the Federal Coastal Consistency Review Form for Federal Activities* (DEEP-OLISP-INST-300) explains how to complete this form and provides several critical definitions and pertinent guidance. Once completed, please submit this form with the appropriate supporting documentation to: CT DEEP-OLISP, 79 Elm Street, Hartford, CT 06106-5127. For further information or assistance in completing this form, please contact us at the address above or by phone at 860-424-3034.

Part I: Federal Agency and Contact Identification

Agency Name: **United States Environmental Protection Agency, Region 1**

Mailing Address: **5 Post Office Square, Suite 100**

City/Town: **Boston** State: **MA** Zip Code: **02109-3912**

Business Phone: **617-918-1536** ext. Fax: **617-918-0036**

Agency Contact: **Ms. Jean Brochi** Title: **Biologist**

E-Mail: **brochi.jean@epa.gov**

Identification of Primary Contact for correspondence if other than Agency Contact noted above:

Company Name:

Mailing Address:

City/Town: State: Zip Code:

Business Phone: ext. Fax:

Contact Person: Title:

E-Mail:

Part II: Review Type and Project Title

Type of Review (check one):

☐ Federal Development Project ☐ Negative Determination

☒ Other Federal agency activity (specify general type): **Designation of ocean disposal site for dredgted material.**

Project Title or Other Identification:

Proposed designation of one or more ocean disposal sites for dredged material in the eastern region of Long Island Sound.

Part III: Other DEEP Involvement with the Project

Is any component of this activity directly regulated by DEEP separate from the Federal Coastal Consistency Process (e.g., 401 Water Quality Certification)? ☐ Yes ☒ No

If yes, list below all DEEP permits, certifications, or other authorizations being pursued for this activity, and describe the regulated activity/ies:

☐ Check if additional sheets are attached to this page

Has any other unit of the DEEP been contacted regarding this activity? ☐ Yes ☒ No

If yes, please identify other Departmental contacts:

☐ Check if additional sheets are attached to this page

Part IV: Detailed Project Information

1. Description of Proposed Activity

   Describe the proposed federal activity including its purpose and all related actions. For site-specific activities, such actions might include: site clearing, grading, demolition, and other site preparations; percentage of increase or decrease in impervious cover from existing conditions resulting from the activity; phasing, timing, and method of proposed construction; and new uses and changes from existing uses. For site-specific activities proposed at waterfront sites, provide detailed information regarding any water-dependent uses proposed. For non-site specific activities, include a complete description of the proposed activity and its purpose.

   EPA is proposing to designate one or more marine disposal sites for dredged material in the eastern region of Long Island Sound. As described in a Federal Register Notice and a Draft Supplemental Environmental Impact Statement, EPA proposed designation of the Eastern Long Island Sound Disposal Site (ELDS) offshore of New London, CT. (EPA previously provided these records to CT DEEP.) EPA has also considered possible designation of alternative areas referred to as the Niantic Bay Disposal Site (NBDS) and/or the Cornfield Shoals Disposal Site (CSDS), respectively. While not proposing to designate the NBDS or CSDS at this time, EPA has requested comments that address these options. The site or sites would be designated pursuant to 33 U.S.C. 1412(c) and 1416(f), and 40 C.F.R. 228.4(e). Existing EPA regulations restrict use of these sites so that, among other things, placement of dredged material at the sites is prohibited unless the material satisfies EPA's sediment quality criteria, see 40 C.F.R. Part 227, Subpart B, and unless there is no practicable alternative to such marine placement of the material. See 40 C.F.R. Part 227, Subpart B; 40 C.F.R. 227.16(b). EPA also proposes to apply the same site use restrictions to the eastern Long Island Sound site (or sites) as are used for the Central and Western Long Island Sound Disposal Sites. See 40 C.F.R. 228.15(b)(4) and (b)(5). Designating a site in the eastern region of Long Island Sound will make available an open-water disposal site as an to provide an option for dredged material management when other options are not practicable and available. Ultimately, the overarching purpose of the site use restrictions is to reduce or eliminate the disposal of dredged material into Long Island Sound wherever practicable. (Together with this Form, EPA has also provided CT DEEP with a separate Determination of Consistency with the CT CMP.)

   ☒ Check if additional sheets are attached to this page

Part IV: Detailed Project Information (cont.)

2. Is the Project Site-Specific?

   ☒ Yes Please continue with Part IV and fill out all subsequent parts of the form.

   ☐ No Skip to Part V: Identification of Applicable Enforceable Policies

3. Location Information

   a. Project Address, Location, or Affected Area: **Waters in the eastern region of Long Island Sound**

   City/Town: State: **CT** Zip Code:

   b. Agency's interest in property, if any:

   ☐ fee simple ☐ option ☐ lessee ☐ easement ☒ not applicable

   ☐ other (specify):

   c. Is the activity proposed at a waterfront site (includes tidal wetlands frontage) or within coastal, tidal or navigable waters? ☒ Yes ☐ No

   If yes, name the affected coastal, tidal or navigable waters:

   Long Island Sound

   d. If off-site effects on coastal uses and/or resources are anticipated, identify the address or location(s) of such effects and attach a map (8 ½" x 11" format) indicating this area:

   No direct effects. Only insignficant indirect effects are anticipated at the disposal sites themselves, and possibly at dredging sites or along transit routes from dredging sites to the disposal sites. The proposed disposal site is the ELDS, with the NBDS and CSDS being considered as potential site alternatives instead of, or in addition to, the ELDS. The location of each of the three sites is specified at 81 Fed. Reg. 24751-24753 (April 27, 2016). The affected natural resources are discussed and depicted on a map in EPA's Federal Register notice for the Propsoed Rule and the DSEIS.

   ☒ Check if additional sheets are attached to this page

   ☐ Check here to indicate map is enclosed.

   e. If the Federal project is site specific, identify and describe the existing land use on and adjacent to the site of the proposed activity and any anticipated location(s) of off-site effects on coastal resources or uses. Clearly differentiate between the descriptions of on-site and off-site areas. Include any existing structures and significant features at either location.

   Any on-site effects would happen at the ELDS (or the NBDS or CSDS, if designated). The location of the sites is identified above. Any off-site effects would be at yet-to-be specified dredging sites and along transit routes from the dredging sites to the disposal sites.

   ☒ Check if additional sheets are attached to this page

   f. Indicate the area of the project site: **The ELDS is 2 square nautical miles in area.** ☐ acres or ☐ square feet

   g. Indicate the area of any anticipated off-site effects: **N/A**

   ☐ acres or ☐ square feet or ☐ other units (specify units):

Part IV: Detailed Project Information (cont.)

4. Project Plans

If the proposed Federal activity is a "Federal Development Project", or other site specific activity, please provide project plans in 8 ½" x 11" format that clearly and accurately depict the following items, and check the appropriate boxes to indicate that the information is included in this review package:

- ☒ Project location
- ☒ Existing and proposed conditions, including buildings and grading
- ☒ Coastal resources on and contiguous to the site
- ☒ High Tide Line [as defined in CGS § 22a-359(c)], Mean High Water, and Mean Low Water elevations and contours (for parcels abutting coastal waters and/or tidal wetlands only)
- ☐ Soil erosion and sediment controls
- ☐ Stormwater management measures
- ☒ Ownership and type of use on adjacent properties
- ☒ Reference datum (i.e., National Geodetic Vertical Datum, Mean Sea Level, etc.)

If a Spill Prevention, Control, and Containment Plan (SPCC) has been developed for this site, please provide a copy in the review package and check here to indicate its inclusion ☐

Part V: Identification of the Applicable Enforceable Policies

In this Part, there are four tables which should be completed by checking the appropriate boxes in each. Table 1: *Coastal Resources and Associated Enforceable Policies*, is to identify on-site, adjacent, and/or potentially affected State-statutorily defined coastal resources. Table 2: *Coastal Uses and Associated Enforceable Policies*, is to identify existing and proposed State-statutorily defined coastal uses potentially affected by the project. Table 3a: *Potential Adverse Impacts on Coastal Resources* and Table 3b: *Potential Adverse Impacts on Water-dependent Uses and Opportunities* is to identify State-statutorily-defined adverse impacts.

Table 1

Coastal Resources and Associated Enforceable Policies	On-site	Adjacent	Affected by the proposed Federal activity**
General Coastal Resources* - Definition: CGS § 22a-93(7) Policy: CGS § 22a-92(a)(2)	☒	☒	☒
Beaches & Dunes - Definition: CGS § 22a-93(7)(C) Policies: CGS §§ 22a-92(b)(2)(C) and 22a-92(c)(1)(K)	☐	☐	☐
Bluffs & Escarpments - Definition: CGS § 22a-93(7)(A) Policy: CGS § 22a-92(b)(2)(A)	☐	☐	☐
Coastal Hazard Area - Definition: CGS § 22a-93(7)(H); Policies: CGS §§ 22a-92(a)(2), 22a-92(a)(5), 22a-92(b)(2)(F), 22a-92(b)(2)(J), 22a-92(c)(1)(K), and 22a-92(c)(2)(B)	☐	☐	☐
Coastal Waters, Estuarine Embayments, Nearshore Waters, Offshore Waters - Definitions: CGS §§ 22a-93(5), 22a-93(7)(G), 22a-93(7)(K), and 22a-93(7)(L); Policies: CGS §§ 22a-92(a)(2) and 22a-92(c)(2)(A)	☒	☒	☒
Developed Shorefront - Definition: CGS § 22a-93(7)(I); Policy: CGS § 22a-92(b)(2)(G)	☐	☐	☐
Freshwater Wetlands and Watercourses - Definition: CGS § 22a-93(7)(F) Policy: CGS § 22a-92(a)(2)	☐	☐	☐
Intertidal Flats - Definition: CGS § 22a-93(7)(D) Policies: CGS § 22a-92(b)(2)(D) and 22a-92(c)(1)(K)	☐	☐	☐
Islands - Definition: CGS § 22a-93(7)(J) Policy: CGS § 22a-92(b)(2)(H)	☐	☐	☐
Rocky Shorefront - Definition: CGS § 22a-93(7)(B) Policy: CGS § 22a-92(b)(2)(B)	☐	☐	☐
Shellfish Concentration Areas - Definition: CGS § 22a-93(7)(N) Policy: CGS § 22a-92(c)(1)(I)	☐	☐	☐
Shorelands - Definition: CGS § 22a-93(7)(M) Policy: CGS § 22a-92(b)(2)(I)	☐	☐	☐
Tidal Wetlands - Definition: CGS § 22a-93(7)(E) Policies: CGS §§ 22a-92(a)(2), 22a-92(b)(2)(E), and 22a-92(c)(1)(B)	☐	☐	☐

* The General Coastal Resource Policy is applicable to all proposed activities within Connecticut's coastal boundary and coastal area.
** The coastal resources affected by the project can be on-site, adjacent, or further removed from the project site.

Table 2

	Coastal Uses and Associated Enforceable Policies
☒	General Development* - CGS §§ 22a-92(a)(1), 22a-92(a)(4), and 22a-92(a)(9)
☒	Boating - CGS § 22a-92(b)(1)(G), 22a-92(b)(1)(H), and 22a-92(b)(1)(I)
☒	Coastal Recreation and Access - CGS §§ 22a-92(a)(2), 22a-92(a)(6), 22a-92(c)(1)(J), and 22a-92(c)(1)(K)
☐	Coastal Structures and Filling - CGS § 22a-92(a)(2), 22a-92(b)(1)(D), 22a-92(c)(1)(B), 22a-92(c)(1)(K), and 22a-92(c)(2)(B)
☐	Cultural Resources – CGS § 22a-92(b)(1)(J)
☐	Dams, Dikes and Reservoirs - CGS § 22a-92(a)(2)
☒	Dredging and Navigation - CGS §§ 22a-92(a)(2), 22a-92(c)(1)(C), 22a-92(c)(1)(D), and 22a-92(c)(1)(E)
☐	Energy Facilities - CGS §§ 16-50g and 16-50p(a)
☒	Fisheries - CGS § 22a-92(c)(1)(I)
☐	Flooding and Erosion - CGS § 22a-92(a)(5)
☐	Fuel, Chemicals and Hazardous Materials - CGS §§ 22a-92(a)(2), 22a-92(b)(1)(C), 22a-92(b)(1)(E) and 22a-92(c)(1)(A)
☒	Facilities and Resources which are in the National Interest - Definition CGS § 22a-93(14) - Policy CGS 22a-92(a)(10)
☒	Intergovernmental Coordination - CGS § 22a-92(a)(9)
☐	Open Space and Agricultural Lands - CGS § 22a-92(a)(2)
☒	Ports and Harbors – CGS § 22a-92(b)(1)(C)
☐	Sewer and Water Lines - CGS § 22a-92(b)(1)(B)
☐	Solid Waste - CGS § 22a-92(a)(2)
☒	Transportation - CGS §§ 22a-92(b)(1)(F), 22a-92(c)(1)(F), 22a-92(c)(1)(G), and 22a-92(c)(1)(H)
☒	Water-dependent Uses** - Definition CGS § 22a-93(16) - Policies CGS §§ 22a-92(a)(3) and 22a-92(b)(1)(A)

* The General Development Policy is applicable to all proposed activities within Connecticut's coastal boundary and coastal area.

** The Water-Dependent Uses Policies are applicable to all activities proposed at waterfront sites, including those sites with only tidal wetlands frontage.

Identification of State Statutorily Defined Potential Adverse Impacts

In Tables 3a and 3b, identify the adverse impact categories that apply to the proposed Federal activity. The "Applicable" column **must be checked** if the proposed activity has the **potential** to generate any of the State-statutorily defined adverse impacts, even if the activity is designed to avoid such impacts. Also indicate, by checking the appropriate boxes, whether the potential adverse impacts have been avoided or minimized and whether any resource compensation is proposed.

Table 3a

Potential Adverse Impacts on Coastal Resources	Applicable	Impacts Are Avoided	Impacts Are Minimized	Compensation Is Proposed	Not Applicable
Characteristics and Functions of Resources - CGS § 22a-93(15)(H)	☒	☐	☒	☐	☐
Coastal Flooding - CGS § 22a-93(15)(E)	☐	☐	☐	☐	☒
Coastal Waters Circulation Patterns - CGS § 22a-93(15)(B)	☐	☐	☐	☐	☒
Drainage Patterns - CGS § 22a-93(15)(D)	☐	☐	☐	☐	☒
Patterns of Shoreline Erosion and Accretion - CGS § 22a-93(15)(C)	☐	☐	☐	☐	☒
Visual Quality - CGS § 22a-93(15)(F)	☐	☐	☐	☐	☒
Water Quality - CGS § 22a-93(15)(A)	☒	☐	☒	☐	☐
Wildlife, Finfish, Shellfish Habitat - CGS § 22a-93(15)(G)	☒	☐	☒	☐	☐

Table 3b

Potential Adverse Impacts on Water-dependent Uses and Opportunities	Applicable	Impacts Are Avoided	Impacts Are Minimized	Compensation Is Proposed	Not Applicable
Locating a non-water-dependent use at a site physically suited for, or planned for location of, a water-dependent use - CGS § 22a-93(17)	☐	☐	☐	☐	☒
Replacing an existing water-dependent use with a non-water-dependent use - CGS § 22a-93(17)	☐	☐	☐	☐	☒
Siting a non-water-dependent use which would substantially reduce or inhibit existing public access to marine or tidal waters - CGS § 22a-93(17)	☐	☐	☐	☐	☒

Part VI: Consistency Analysis

Explain how the proposed activity is consistent with all of the applicable enforceable policies identified in Part V, why any remaining adverse impacts resulting from the proposed activity or use have not been mitigated, and why the project as proposed is consistent with the enforceable policies of Connecticut's Coastal Management Program. If an adverse impact **may** result from the proposed Federal activity, describe what project design features may be used to eliminate, minimize, or mitigate the potential for adverse impacts. For proposed Federal Development Projects, please describe the stormwater best management practices that will be utilized. Such systems should be designed to meet the guidance provided in the accompanying instructions.

EPA's consistency analysis is spelled out in a separate Federal Consistency Determination which has been submitted to CT DEEP together with this form.

☒ Check if additional sheets are attached to this page

Part VII: Level of Consistency and Identification of Legal Authority that Prohibits Full Consistency, if Applicable

Federal regulations allow Federal activities to be less than fully consistent with a State's enforceable policies **only** if "full consistency is prohibited by existing law applicable to the Federal Agency" [15 CFR 930.32]. Please check the appropriate box below to indicate the activities degree of consistency.

☒ Project is *fully* consistent with Connecticut's enforceable policies

☐ Project is *not fully* consistent with Connecticut's enforceable policies, but is consistent to the maximum extent practicable

If the proposed Federal Activity described in this form is not *fully* consistent with Connecticut's enforceable policies, but only consistent to the maximum extent practicable, in accordance with 15 CFR 930.32, please identify and describe the statutory provisions, legislative history, or other legal authority which limits the federal agency's discretion to comply fully with Connecticut's Coastal Management Program. Please attach additional pages if necessary. Attach copies of the relevant statutory provisions, legislative history, or other legal authority cited.

☒ Check if additional sheets are attached to this page

Part VIII: Coastal Zone Management Act Consistency Statement

Note: This Part *must* be completed for all submissions

In this Statement "Federal Agency" means:

The United States Environmental Protection Agency, Region 1.

and "the project" means:

The proposed designation of an open-water dredged material disposal site for the eastern region of Long Island Sound.

This document provides the State of Connecticut Coastal Management Program with the required Consistency Determination under CZMA Section 307(c)(1) [or (2)] and 15 CFR Part 930, Subpart C, for the project described in this *Coastal Mangement Consistency Review Form for Federal Activities*. This determination is provided by the Federal Agency identified above. The information in this Consistency Determination is provided pursuant to 15 CFR Section 930.39. The Federal Agency has determined that the project affects the land or water uses or natural resources of Connecticut as described above. Based on the information, data, and analysis included in the *Coastal Mangement Consistency Review Form for Federal Activities* for the project, the Federal Agency has determined that the proposed activity is consistent to the maximum extent practicable with the enforceable policies of the Connecticut Coastal Management Program as evaluated in this form.

Pursuant to 15 CFR Section 930.41, the Connecticut Coastal Management Program has 60 days from receipt of this form in which to concur with or object to this Consistency Determination, or to request an extension under 15 CFR Section 930.41(b).

Part IX: Certifying Signatures

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief."

Signature of Certifier	7/29/16 Date
Ken Moraff Name of Certifier (print or type)	Director, Office of Ecosystem Protection, EPA Region 1 Title (if applicable)
Signature of Preparer	7/29/16 Date
Mark A. Stein Name of Preparer (print or type)	Senior Assistant Regional Counsel Title (if applicable)

EPA Region 1 Determination of Federal Action's Consistency with Enforceable Policies of Connecticut's Coastal Zone Management Program (July 29, 2016)

I. EPA's Proposed Action

Over time, the movement and accretion of silt and sand in the waters of Long Island Sound, and rivers tributary to the Sound, leads to the buildup of sediment on the bottom of these waters. This buildup can interfere with navigation and the berthing and docking of vessels. This, in turn, can threaten public safety and interfere with marine commerce and recreation. It can even impact national defense-related activities due to the need for adequate navigation channels and berthing areas for the U.S. Navy and Coast Guard vessels that use these waters. Therefore, it is periodically necessary to dredge Long Island Sound's navigational channels, port and docking areas, marinas, tributary rivers and other areas requiring vessel access. The need for dredging is not unique to Long Island Sound; it is a necessity for waterways all over the Nation. When dredging occurs, there is, of course, a concomitant need to manage the dredged sediments appropriately.

To help manage these dredged sediments in an environmentally sound way, the New England Office (Region 1 or the Region) of the United States Environmental Protection Agency (EPA) is proposing to designate a dredged material disposal site in the eastern region of Long Island Sound under Sections 102(c) and 106(f) of the Marine Protection, Research, and Sanctuaries Act (MPRSA). 33 U.S.C. §§ 1412(c) and 1416(f). *See also* 40 C.F.R. § 228.4(e). The proposed site would be named the Eastern Long Island Sound Disposal Site (ELDS).

On April 27, 2016, EPA Region 1 published a Proposed Rule in the Federal Register informing the public of the proposed designation of the ELDS and seeking public comment on the proposal. 81 Fed. Reg. 24748-24767 (April 27, 2016) (EPA's April 2016 Proposed Rule). EPA's April 2016 Proposed Rule also sought comment on two site designation alternatives – the Niantic Bay Disposal Site (NBDS) and the Cornfield Shoals Disposal Site (CSDS). *See* 81 Fed. Reg. 24748, 24749. On April 27, 2016, EPA also released for public review and comment a Draft Supplemental Environmental Impact Statement (DSEIS) under the National Environmental Policy Act (NEPA). The DSEIS explains EPA's proposed designation of the ELDS and describes and evaluates possible alternative courses of action, including designation of the NBDS and/or the CSDS, or pursuit of one of the so-called "no action" alternative(s). (EPA's April 2016 DSEIS).

EPA has determined that its proposed action will be consistent to the maximum extent practicable with the enforceable policies of the State of Connecticut's federally approved coastal management program (CT CMP). This determination is based on the analyses presented and referenced herein, including the analyses in the above-referenced Federal Register notice and DSEIS. Therefore, pursuant to Section 307(c)(1)(C) of the federal Coastal Zone Management Act (CZMA). 16 U.S.C. § 1456(c)(1)(C), EPA is providing this consistency determination to the Connecticut Department of Energy & Environmental Protection (CT DEEP), which administers

the state's coastal zone management program.[1]

Designating the ELDS (or another site or sites) would make a dredged material disposal site available, if needed, for the management of *suitable* dredged material from the eastern region of Long Island Sound. Dredged material is only suitable for placement at a site designated by EPA under the MPRSA if it has satisfied the rigorous sediment quality criteria of EPA's regulations under the MPRSA. *See* 40 C.F.R. Part 227. Thus, even if the proposed designation of the ELDS (or another site or sites) is finalized, any specific proposal to place dredged material at the site will still have to go through a separate, case-specific review and authorization process. *See* 33 U.S.C. § 1413; 40 C.F.R. Part 227.

The proposed ELDS is not an entirely new disposal site; rather, it includes a *portion* of the existing New London Disposal Site (NLDS) and then extends westward to include another area adjacent to the NLDS. As proposed, the site is almost entirely in Connecticut waters, but a tiny portion of the southeastern corner of the site extends into New York waters. While the ELDS includes a part of the existing NLDS, site use restrictions are proposed for the ELDS that go beyond the restrictions currently applied to the NLDS. The proposed restrictions incorporate the same standards and procedures that apply to the Central and Western Long Island Sound dredged material disposal sites (CLDS and WLDS, respectively). *See* 81 Fed. Reg. 24763 – 24767 (proposed 40 C.F.R. §§ 228.15(b)(4)(vi) and 228.15(b)(6)(vi)); 81 Fed. Reg. 44220 – 44230 (July 7, 2016) (Final Rule for CLDS and WLDS). These restrictions are based on the Long Island Sound Dredged Material Management Plan (LIS DMMP) and are intended to protect the waters of Long Island Sound and strengthen the existing process for determining whether practicable alternatives to open-water disposal are available for managing dredged material. They are also intended, thereby, to help over time to reduce or eliminate open-water dredged material disposal in the Sound. EPA would expect to apply the same restrictions to any other site or sites that might be designated instead of, or in addition to, the ELDS.

Finally, while EPA is proposing to designate the ELDS, it also assessed alternative disposal sites. These alternatives are discussed in the Proposed Rule and the DSEIS and, as stated above, EPA expressly sought public comment on the NBDS and the CSDS. EPA explained that one or both of these sites could conceivably be designated together with, or instead of, the ELDS. *See* 81 Fed. Reg. 24748, 24749, 24751-24753, 24762; EPA's April 2016 Draft SEIS, pp. 5-99 to 5-101. EPA has determined that designation of one or both of these alternative sites would also be consistent with the CT CMP.

II. Background

[1] EPA has also determined that its proposed action will be consistent to the maximum extent practicable with the enforceable policies of the federally approved coastal zone management programs for the states' of New York and Rhode Island. Accordingly, EPA has also provided consistency determinations to the New York Department of State (NY DOS) and the Rhode Island Coastal Resources Management Council (RI CRMC), which, respectively, administer their state's coastal zone management programs. *See* 15 C.F.R. § 930.36(e)(1). Copies of these determinations have been, or will be, provided to CT DEEP.

1. Law Applicable to Dredged Material Disposal Site Designations

The MPRSA is the primary federal law governing EPA Region 1's proposed designation of the ELDS. MPRSA § 102(c), 33 U.S.C. § 1412(c), authorizes EPA to designate ocean disposal sites for dredged material. Such designations are subject to, among other things, the requirements of MPRSA § 102(c) and EPA regulations promulgated at 40 C.F.R. §§ 228.4, 228.5 and 228.6.

Dredged material disposal into waters *landward* of the baseline from which the territorial sea is measured (baseline) is regulated under CWA § 404, 33 U.S.C. § 1344, while the MPRSA generally only applies to disposal into waters *seaward* of the baseline – i.e., "ocean waters" under the statute. *See* 33 U.S.C. § 1402(b). The waters of Long Island Sound lie *landward* of the baseline. Despite this fact, however, both legal regimes apply to dredged material disposal in the Sound. This is because MPRSA § 106(f), 33 U.S.C. § 1416(f), specifically dictates that, in addition to other provisions of law, the requirements of the MPRSA apply to dredged material disposal in Long Island Sound from either (a) federal projects or (b) non-federal projects involving more than 25,000 cubic yards of material.[2] MPRSA § 106(f) makes Long Island Sound the only water body lying landward of the baseline for which dredged material disposal is subject to the MPRSA's requirements for sediment quality, sediment testing, disposal site designations, and site management and monitoring.

Under MPRSA §§ 103(a) – (e), 33 U.S.C. §§ 1413(a) – (e), each proposed project involving the ocean disposal of dredged material must be separately authorized by the U.S. Army Corps of Engineers (USACE), subject to EPA review and concurrence, as well as various other types of federal and state review (*e.g.*, Endangered Species Act [ESA] consultation; essential fish habitat (EFH) coordination under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA); federal consistency review under the CZMA; and water quality review under Clean Water Act (CWA) § 401, 33 U.S.C. § 1341). As mentioned above, before the dredged material can be deemed "suitable" for placement at an approved site, it is subjected to a variety of testing protocols (*e.g.*, chemistry, toxicity, and bioaccumulation) and suitability for open-water disposal is determined based on whether the material satisfies criteria related to its physical characteristics, toxicity, bioaccumulation potential, and water quality effects. *See, e.g.,* 40 C.F.R. §§ 227.5 and 227.6. Material that does not satisfy these criteria is deemed "unsuitable" for open-water disposal and cannot be placed into waters subject to the MPRSA.[3]

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[2] Non-federal dredged material disposal projects involving 25,000 cubic yards of material or less are, instead, regulated under Section 404 of the Clean Water Act (CWA). *See* 40 C.F.R. § 230.2(b).

[3] This prohibition is subject to the narrow waiver provision of MPRSA § 103(d), but to EPA Region 1's knowledge, this waiver process has never been used. Additional restrictions on any use of the waiver process have been applied to the CLDS and the WLDS and are proposed for the ELDS. *See* 40 C.F.R. § 228.15(b)(4)(vi)(K) (disposal of dredged materials at the sites under a waiver not allowed unless 30 days prior to requesting the waiver, the New England or New York District of the USACE provides written notice to the Governors of Connecticut and New York and the North Atlantic Division of the USACE).

In addition, dredged material cannot be authorized for open-water disposal under the MPRSA unless there is a need for such open-water disposal. This means that it must have been determined that there is no other practicable alternative for managing the dredged material that would have less adverse environmental effects or risks. *See, e.g.,* 40 C.F.R. §§ 227.1(b), 227.2(a)(1) and 227.16.

Thus, designation of a disposal site under the MPRSA does not actually authorize any specific material to be placed at the site. It only makes the site available as a possible management option for dredged material that has been determined to be suitable for open-water disposal and for which it has been determined that no environmentally preferable, practicable alternative means of managing the material is available.

Finally, MPRSA § 102(c)(3), 33 U.S.C. § 1412(c)(3), requires that EPA and the USACE develop detailed Site Management and Monitoring Plans (SMMPs) for all dredged material disposal sites designated under the statute. If monitoring or other information indicates unacceptable adverse impacts to the marine environment from use of a site, then EPA could, as appropriate, modify the conditions under which the site may be used or close the site. *See* MPRSA § 102(c)(2) and (3); 40 C.F.R. §§ 228.3(a), 228.7, 228.8, 228.11.

2. Designation of the Central and Western Long Island Sound Disposal Sites

While EPA is currently proposing to designate the ELDS as an open-water disposal site for dredged material to serve the eastern region of Long Island Sound, this proposed action is closely related to EPA's prior designation of the CLDS and WLDS disposal sites to serve the central and western regions of the Sound. While this CZMA determination supports the proposed designation of the ELDS, a detailed description of the process leading to designation of the CLDS and WLDS is provided here to help place the proposed ELDS designation in the larger context of dredged material management for all of Long Island Sound. In addition, a detailed description of the site use restrictions applicable to the CLDS and WLDS sites, and the process by which they were developed, is provided because EPA is proposing to adopt the same site use restrictions for the ELDS. To understand the restrictions, it is helpful to understand their genesis. Following this discussion of the designation of the CLDS and WLDS, EPA directly addresses the proposed designation of the ELDS.

In 2005, EPA designated the CLDS and WLDS under the MPRSA for potential use for the placement of suitable dredged material. *See* 70 Fed. Reg. 32498-32520 (June 3, 2005) (Final Rule) (EPA's 2005 Final Rule). In designating the CLDS and WLDS, EPA applied the MPRSA's site designation criteria. *See* 40 C.F.R. §§ 228.4, 228.5 and 228.6. EPA's designation of the CLDS and WLDS also satisfied the requirements of other federal laws, such as the ESA, MSFCMA, CZMA, and CWA. (The CZMA issues will be discussed in greater detail below.)

In addition, EPA evaluated whether or not to designate the CLDS and WLDS under the

requirements of the National Environmental Policy Act (NEPA).[4] EPA published its Final Environmental Impact Statement in support of the site designations in March 2004 (2004 FEIS for CLDS and WLDS). EPA's evaluations and site designations did not address the eastern portion of Long Island Sound, noting that supplemental work would be done at a later time to consider the eastern region. *See* 70 Fed. Reg. 32509 (discussing EPA's Notice of Intent explaining its plan for addressing the different regions of the Sound).

As part of the regulatory process for the proposed site designations, EPA determined that the proposed designations would be consistent to the maximum extent practicable with the enforceable policies of Connecticut's and New York's coastal zone management programs. Although both the CLDS and WLDS are located in Connecticut waters, it was possible that designating the sites could also affect New York's coastal resources. On January 22, 2004, EPA submitted to the Connecticut Department of Environmental Protection (CT DEP) its determination that the proposed site designations would be consistent to the maximum extent practicable with the enforceable policies of the Connecticut's CMP. *See* 15 C.F.R. § 930.36(e)(1). Letter from Linda M. Murphy, EPA, to Charles H. Evans, CT DEP (Jan. 22, 2004). Connecticut concurred with EPA's determination, finding EPA's proposed action to be "fully consistent" with the enforceable policies of Connecticut's CMP. Letter from Arthur J. Rocque, Jr., CT DEP, to Linda M. Murphy, EPA (April 5, 2004).

On March 4, 2004, EPA sent its determination with regard to the NY CMP to the New York Department of State (NY DOS) (EPA's 2004 CZMA Consistency Determination).[5] On June 3, 2004, NY DOS sent EPA a letter formally objecting to EPA's determination concerning the NY CMP (NY DOS's 2004 CZMA Consistency Objection). NY DOS argued both that EPA had provided insufficient information to support a consistency determination and that, based on the information provided, the site designations were inconsistent with the enforceable polices of the NY CMP. NY DOS also argued that EPA's proposed site designations would be inconsistent with certain requirements of the MPRSA.

EPA reviewed and considered NY DOS's 2004 CZMA Consistency Objection, but ultimately disagreed with its arguments and conclusions.[6] EPA maintained that the site designations, as

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[4] EPA disposal site designation evaluations under the MPRSA are "functionally equivalent" to NEPA reviews and, as a result, are not as a matter of law subject to NEPA analysis requirements. Nevertheless, as a matter of policy, EPA voluntarily uses NEPA procedures when evaluating the potential designation of ocean dumping sites. *See* 63 Fed. Reg. 58045 (October 29, 1998) (Notice of Policy and Procedures for Voluntary Preparation of National Environmental Policy Act Documents). While EPA voluntarily uses NEPA review procedures in conducting MPRSA disposal site designation evaluations, EPA has also explained that "[t]he voluntary preparation of these documents in no way legally subjects the Agency to NEPA's requirements." 63 Fed. Reg. 58046.

[5] In the case of Long Island Sound, the state's Long Island Sound Coastal Management Program and certain Local Waterfront Revitalization Programs were evaluated as integral parts of the state's CMP.

[6] *See, e.g.,* Memorandum, from Mel Cote, et al., to File. "Responses to Issues Raised in New York Department of State's June 3, 2004, Letter Objecting Under the Coastal Zone Management Act to Proposed Dredged Material

proposed, were consistent to the maximum extent practicable with the enforceable policies of the NY CMP. In an effort to avoid litigation over the disagreement, however, and in recognition of the federal and state agencies' shared commitment to protecting Long Island Sound's natural resources consistent with applicable law, the interested agencies – including EPA, USACE, the National Oceanic and Atmospheric Administration (NOAA), NY DOS, the New York Department of Environmental Conservation (NY DEC), and the CT DEP[7] – engaged in lengthy negotiations to determine whether there was a way to address NY DOS's concerns under the CZMA while allowing the dredged material disposal site designations to proceed.

In the end, the agencies agreed that EPA would complete the disposal site designations but address NY DOS's concerns by placing a number of restrictions on site use. With these restrictions included as part of the site designations, NY DOS withdrew its objection to EPA's CZMA consistency determination by letter dated May 13, 2005. Although EPA maintained that its site designations as originally proposed would have satisfied the CZMA and all other applicable laws, it nevertheless agreed to include the negotiated site use restrictions so that the designations could proceed without litigation. *See* 70 Fed. Reg. 32511.

The restrictions on use of the CLDS and WLDS were included as part of EPA's 2005 Final Rule and were spelled out in the original versions of 40 C.F.R. §§ 228.15(b)(4) and (5). 70 Fed. Reg. 32518-32520. Some of these restrictions merely reiterated certain generally applicable requirements of the MPRSA regulations (e.g., that no material may be placed at the sites unless it satisfies the sediment quality criteria of 40 C.F.R. Part 227, Subpart B). Other of the restrictions were crafted specifically for the CLDS and WLDS, but were the type of restrictions typically created for any designated ocean disposal site for dredged material (*e.g.*, providing specific coordinates to identify the boundaries of the disposal site; only allowing placement at the site of material dredged from waters in the general vicinity of the site). Still other restrictions were adopted that were unique to the CLDS and WLDS. For example, long-term use of the sites was conditioned on, among other things, USACE's completion of a regional Dredged Material Management Plan for Long Island Sound (DMMP) that would assess regional dredging needs and sediment management options and would recommend standards and procedures for achieving the goal of reducing or eliminating dredged material disposal in the Sound. In addition, the restrictions required EPA, upon completion of the DMMP, to modify the site use restrictions consistent with the procedures and standards recommended in the DMMP for reducing or eliminating open-water disposal of dredged material in the Sound. *See* 70 Fed. Reg. 32518-32519 (June 3, 2005) (40 C.F.R. §§ 228.15(b)(4)(vi)(C) and (G)). Taken together, the site use restrictions were intended both to support the goal of reducing or eliminating the placement of

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Disposal Site Designations by EPA Region I" (May 19, 2005) (EPA 2005 CZMA Responses); 70 Fed. Reg. 32511 ("EPA continues to hold the view that the site designations without the additional restrictions would still be consistent with the enforceable policies of New York's CMP."). EPA incorporates the EPA 2005 CZMA Responses herein by reference and has previously provided a copy of it to NY DOS.

[7] CT DEP has since been renamed and reconfigured as the Connecticut Department of Energy & Environmental Protection (CT DEEP).

dredged material at sites in the waters of Long Island Sound and to ensure that when the sites are used, they are used appropriately.

The USACE was the lead agency responsible for developing the DMMP for Long Island Sound, but the USACE coordinated its effort with EPA, NOAA, agencies from New York and Connecticut, and other stakeholders. The USACE also prepared a Programmatic EIS (PEIS) under NEPA in support of the DMMP. Building off the information in EPA's 2004 site designation EIS, the DMMP developed detailed estimates of dredging and dredged material management needs, investigated and identified possible alternatives to open-water disposal for managing dredged material, and considered and identified procedures and standards for future dredged material disposal in order to reduce or eliminate the placement of dredged material at disposal sites in the waters of Long Island Sound.

On January 11, 2016, the USACE completed the final DMMP and supporting Final PEIS. This was the culmination of a lengthy public review and comment process in which public comments were taken on a draft of the DMMP and a Draft PEIS. EPA was a cooperating agency in the preparation of the PEIS for the DMMP. CT DEEP has already received copies of the DMMP and the associated draft and final PEISs, but these records can also be found online from the USACE's Long Island Sound DMMP website at: http://www.nae.usace.army.mil/Missions/ProjectsTopics/LongIslandSoundDMMP.aspx. The DMMP and the PEIS are a part of the information supporting this consistency determination.

Within 60 days of the DMMP's completion, EPA was required to propose amendments to the CLDS and WLDS site designation regulations to incorporate procedures and standards consistent with those recommended in the DMMP. *See* 40 C.F.R. §§ 228.15(b)(vi)(C) and (G). Accordingly, on February 10, 2016, EPA proposed amendments to the site designation regulations. 81 Fed. Reg. 7055 – 7063 (February 10, 2016) (EPA's February 2016 Proposed Rule). EPA's proposed rule is also part of the information supporting this consistency determination and is available on EPA's website at http://www.nae.usace.army.mil/Missions/Projects-Topics/Long-Island-Sound-DMMP/. Also on February 10, 2016, EPA Region 1 submitted to NY DOS its determination that its proposed action would be consistent to the maximum extent practicable with the enforceable policies of the NY CMP.

As per the requirements of EPA's 2005 Final Rule, EPA's February 2016 Proposed Rule proposed procedures and standards to govern use of the sites and/or practicable alternatives to the sites. In some cases, requirements from the existing regulations were retained, while in other cases new requirements were proposed. In all cases, the amendments were designed to be consistent with the recommendations of the DMMP, though in some respects they could be viewed to be stricter than the recommendations of the DMMP. (The regulations expressly allowed "stricter" amendments. *See* 40 C.F.R. § 228.15(b)(4)(vi)(C) (footnote 1)). Collectively, the proposed amendments to the regulations were developed to serve the goal of reducing or eliminating the open-water disposal of dredged material in the waters of Long Island Sound.

In response to the DMMP, on March 4, 2016, NY DOS submitted a "petition" to EPA pursuant to 40 C.F.R. §§ 228.15(b)(4)(vi)(C) and (G) arguing that the procedures and standards recommended in the DMMP were insufficient and calling on EPA to adopt different or additional ones in its final regulatory amendments. While NY DOS's petition (at pp. 5-6) acknowledged that EPA had already proposed regulatory amendments, it did not comment on EPA's February 2016 Proposed Rule directly. The state also stated that it reserved the right to petition EPA again if it deemed EPA's proposed regulatory amendments inadequate.

On March 25, 2016, NY DOS submitted its comments on the February 2016 Proposed Rule to EPA.[8] NY DOS called for revisions to the proposed amendments that would, among other things, "establish additional procedures and standards that will result in clear, staged reductions in open water disposal of dredge material over time." EPA discussed the issues with NY DOS, as well as with USACE, CT DEEP, NY DEC and others, in an effort to determine whether the regulatory amendments could be adjusted in a manner that all parties would find acceptable.

Following these discussions, on April 25, 2016, NY DOS issued EPA a "Conditioned Concurrence" letter under the CZMA (NY DOS Conditioned Concurrence). As the NY DOS Conditioned Concurrence explained, NY DOS did not concur with EPA's determination that its proposed regulatory amendments were, *as is*, consistent to the maximum extent practicable with New York's CMP. NY DOS did, however, propose (at pp. 6-7) conditions that "... if accepted and included in the EPA amended rule for the CLDS and WLDS site designations, would provide for this conditional concurrence to be considered as a concurrence." NY DOS further stated that "[i]f the conditions are not accepted and fully implemented, this conditional concurrence shall be treated as an objection." *Id.*

The conditions specified in the NY DOS Conditioned Concurrence were consistent with the terms of the discussions among the parties. EPA then made adjustments to the regulatory amendments consistent with these conditions and based on EPA's consideration of all the public comments submitted on the February 2016 Proposed Rule. As a result, EPA indicated that it considered the Conditioned Concurrence to be a *concurrence*. EPA issued its Final Rule on July 7, 2016 (EPA's July 7, 2016 Final Rule). 81 Fed. Reg. 44220 – 44230 (July 7, 2016) (Final Rule). On July 18, 2016, NY DOS sent EPA a letter indicating that the requirements of the Final Rule satisfied the conditions in the NY DOS Conditioned Concurrence.

EPA's final site designation regulations for the CLDS and WLDS, as amended, and as published in EPA's July 2016 Final Rule, are summarized below. Again, we describe them in some detail here because EPA is proposing to apply these same restrictions to the ELDS (or any alternative site that may be designated in the eastern region of the Sound).

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[8] Including NY DOS's comments, EPA received a total of 119 individual sets of comments on the proposed rule from federal and state agencies, municipalities, elected officials, and members of the public. The comments represented a wide range of views, some supporting the proposed amendments, others requesting revisions to them, and still others calling for a prohibition on all open-water placement of dredged material in Long Island Sound.

1. The regulations specify the location, size and depth of the designated disposal sites (*see* 81 Fed. Reg. 44229 (new 40 C.F.R. §§ 228.15(b)(4)(i) – (iii) and 228.15(b)(5)(i) – (iii)));
2. The regulations specify that the designated sites are only for the placement of dredged material (*see* 40 C.F.R. §§ 228.15(b)(4)(iv) and 228.15(b)(5)(iv)).
3. The regulations specify that, consistent with MPRSA § 106(f), the designations and restrictions for these sites apply only for material from federal projects, including USACE projects, and private projects involving more than 25,000 cubic yards of material (*see* 81 Fed. Reg. 44229 (new 40 C.F.R. §§ 228.15(b)(4)(vi) and 228.15(b)(5)(vi))).
4. The regulations limit disposal at these sites to dredged material from Long Island Sound and its vicinity (*see* 40 C.F.R. §§ 228.15(b)(4)(vi)(A) and 228.15(b)(5)(vi)).
5. The regulations specify that "the goal of these conditions is to reduce or eliminate open-water disposal of dredged material in Long Island Sound" (*see* 81 Fed. Reg. 44229 (new 40 C.F.R. §§ 228.15(b)(4)(vi) and 228.15(b)(5)(vi))).
6. The regulations specify that disposal must comply with the terms of the most recent approved SMMP for each site (*see* 40 C.F.R. §§ 228.15(b)(4)(vi)(B) and 228.15(b)(5)(vi)).
7. The regulations limit disposal to dredged material that complies with the Ocean Dumping Regulations (*e.g.*, sediment quality criteria) (*see* 81 Fed. Reg. 44229 (redesignating 40 C.F.R. § 228.15(b)(4)(vi)(J) as 228.15(b)(4)(vi)(H) and new 40 C.F.R. §§ 228.15(b)(4)(vi)(C)(3)(i) and 228.15(b)(5)(vi))).
8. The regulations prohibit disposal during specified weather conditions that would create a heightened risk of dredged material spillage during transit (*see* 81 Fed. Reg. 44229 (redesignating 40 C.F.R. §§ 228.15(b)(4)(vi)(L) as 40 C.F.R. § 228.15(b)(4)(vi)(J)).
9. The regulations prohibit disposal under a waiver of requirements by EPA under 33 U.S.C. § 1413(d) unless, among other things, the USACE first gives 30 days advanced notice to the Governors of Connecticut and New York that it will be seeking a waiver (*see* 81 Fed. Reg. 44229 (redesignating 40 C.F.R. §§ 228.15(b)(4)(vi)(K) as 40 C.F.R. § 228.15(b)(4)(vi)(I) and 228.15(b)(5)(vi))).
10. The regulations specify that they do not preclude EPA from designating other dredged material disposal sites, or amending the existing designations, as long as any such action is carried out through a separate rulemaking in accordance with applicable law. The regulations further specify that they neither restrict EPA's authorities under the MPRSA and the implementing regulations, nor restrict EPA's authority to amend the implementing regulations. (*See* 81 Fed. Reg. 44229 (redesignating 40 C.F.R. § 228.15(b)(4)(vi)(N) as 40 C.F.R. § 228.15(b)(4)(vi)(K))).
11. The regulations build on the Regional Dredging Team (RDT) process specified in 40 C.F.R. §§ 228.15(b)(4)(vi)(I), footnote 3 and 228.15(b)(5)(vi) of the 2005 Final Rule, and allow placement of dredged material at the designated sites only if, after full consideration of recommendations provided by the RDT, the USACE

finds (and the EPA does not object), based on a fully documented analysis (*see* 81 Fed. Reg. 44229 (40 C.F.R. § 228.15(b)(4)(vi)(C)), that for a given dredging project:

a. There are no practicable alternatives (as defined in 40 CFR 227.16(b)) to open-water disposal in Long Island Sound, and that any available practicable alternative to open water disposal will be fully utilized for the maximum volume of dredged material practicable (*see* 81 Fed. Reg. 44229 (40 C.F.R. §§ 228.15(b)(4)(vi)(C)(1) and 228.15(b)(4)(vi));

b. Determinations relating to practicable alternatives will recognize that any alternative to open-water disposal may add additional costs (*see* 81 Fed. Reg. 44229 (40 C.F.R. §§ 228.15(b)(4)(vi)(C)(2) and 228.15(b)(4)(vi));

c. Disposal of dredged material at the designated sites pursuant to this paragraph (b)(4) shall not be allowed to the extent that a practicable alternative is available (*see* 81 Fed. Reg. 44229 (40 C.F.R. §§ 228.15(b)(4)(vi)(C)(2) and 228.15(b)(4)(vi)); and

d. The following standards for different dredged material types have been appropriately considered (*see* 81 Fed. Reg. 44229 (40 C.F.R. §§ 228.15(b)(4)(vi)(C)(3)(i) – (iii) and 228.15(b)(4)(vi)):

(1) *Unsuitable Materials.* As already mentioned above, open-water disposal shall be limited to dredged sediments that comply with the Ocean Dumping Regulations;

(2) *Suitable sandy material.* Suitable coarse-grained material, which generally may include up to 20 percent fines when used for direct beach placement, or up to 40 percent fines when used for nearshore bar/berm nourishment, should be used for beach or nearshore bar/berm nourishment or other beneficial use whenever practicable. If no other alternative is determined to be practicable, suitable course-grained material may be placed at the designated sites.

(3) *Suitable fine-grained material.* This material typically has greater than 20 to 40 percent fine content and, therefore, is not typically considered appropriate for beach or nearshore placement, but has been determined to be suitable for open-water placement by testing and analysis. Materials dredged from upper river channels in the Connecticut, Housatonic and Thames Rivers should, whenever possible, be disposed of at existing Confined Open Water sites, on-shore, or through in-river placement. Other beneficial uses such as marsh creation, should be examined and used whenever practicable. If no other alternative is determined to be practicable, suitable fine-grained material may be placed at the designated sites.

12. The regulations call for contaminant source reduction efforts to control sediment entering waterways so as to reduce the need for maintenance dredging of harbor features and facilities by reducing shoaling rates. The regulations indicate that federal, state and local agencies tasked with regulating discharges into the watershed should continue to exercise their authorities under various statutes and regulations in a continuing effort to reduce the flow of sediments into state waterways and harbors. (*See* 81 Fed. Reg. 44229 (40 C.F.R. §§ 228.15(b)(4)(vi)(D) and 228.15(b)(5)(vi))).

13. The regulations again build on the RDT process created by 40 C.F.R. §§ 228.15(b)(4)(vi)(I), footnote 3 and 228.15(b)(5)(vi) of the 2005 Final Rule. The new restrictions both continue the RDT *and* create a "Steering Committee" to work in concert with the RDT. As stated in the new regulations, the Steering Committee will:

> … consist[ ] of high-level representatives from the states of Connecticut and New York, EPA, USACE, and, as appropriate, other federal and state agencies. The Steering Committee will provide policy-level direction to the Long Island Sound Regional Dredging Team (LIS RDT) and facilitate high-level collaboration among the agencies critical to promoting the development and use of beneficial alternatives for dredged material. State participation on the LIS RDT and Steering Committee is voluntary. The Steering Committee is charged with: establishing a baseline for the volume and percentage of dredged material being beneficially used and placed at the open-water sites; establishing a reasonable and practicable series of stepped objectives, including timeframes, to increase the percentage of beneficially used material while reducing the percentage and amount being disposed in open water, and while recognizing that the amounts of dredged material generated by the dredging program will naturally fluctuate from year to year; and developing accurate methods to track the placement of dredged material, with due consideration for annual fluctuations. The stepped objectives should incorporate an adaptive management approach while aiming for continuous improvement. When tracking progress the Steering Committee should recognize that exceptional circumstances may result in delays in meeting an

objective. Exceptional circumstances should be infrequent, irregular, and unpredictable. It is expected that each of the member agencies will commit the necessary resources to support the LIS RDT and Steering Committee's work, including the collection of data necessary to support establishing the baseline and tracking and reporting on the future disposition of dredged material. The Steering Committee may utilize the LIS RDT, as appropriate, to carry out the tasks assigned to it. The Steering Committee, with the support of the LIS RDT, will guide a concerted effort to encourage greater use of beneficial use alternatives, including piloting alternatives, identifying possible resources, and eliminating regulatory barriers, as appropriate.

81 Fed. Reg. 44229 – 44230 (40 C.F.R. § 228.15(b)(4)(vi)(E)).

14. The regulations specify with regard to the RDT (*see* 81 Fed. Reg. 44230. (40 C.F.R. §§ 228.15(b)(4)(vi)(F)(1) - (4) and 228.15(b)(5)(vi))) that:

a. The goal of the Long Island Sound Regional Dredging Team (LIS RDT), working in cooperation with, and support of, the Steering Committee, is to reduce or eliminate wherever practicable the open-water disposal of dredged material.

b. The RDT will review dredging projects and make recommendations as described in paragraph (vi)(C) above. The RDT will report to the USACE on its review of dredging projects within 30 days of receipt of project information. Project proponents should consult with the RDT early in the development of those projects, to ensure that alternatives to open-water placement are fully considered.

c. The RDT will also assist the Steering Committee in: establishing a baseline for the volume and percentage of dredged material being beneficially used and placed at the open water sites; establishing a reasonable and practicable series of stepped objectives, including timeframes, to increase the percentage of beneficially used material while reducing the percentage and amount being disposed in open water, recognizing that the volume of dredged material generated by the dredging program will naturally fluctuate from year to year; and developing accurate methods to track and report on the placement of dredged material, with due consideration for annual fluctuations.

d. The RDT will, in coordination with the Steering Committee, serve as a forum for: continuing exploration of new beneficial use alternatives to open-water disposal; matching the availability of beneficial use alternatives with dredging projects; exploring cost-sharing opportunities;

and promoting opportunities for beneficial use of clean, parent marine sediments often generated in the development of CAD cells.

e. The RDT will assist USACE and EPA in continuing long-term efforts to monitor dredging impacts in Long Island Sound, including supporting USACE's DAMOS (Disposal Area Monitoring System) program and related efforts to study the long-term impacts of open-water placement of dredged material.

f. The geographic scope of the RDT includes all of Long Island Sound and adjacent waters landward of the seaward boundary of the territorial sea (three-mile limit) or, in other words, from Throgs Neck to a line three miles seaward of the baseline across western Block Island Sound.

g. The RDT shall be comprised of representatives from the states of Connecticut and New York, EPA, USACE, and, as appropriate, other federal and state agencies, as appropriate. As previously noted, state participation on the RDT is voluntary.

h. Specific details regarding the RDT's structure (e.g., chair, committees, working groups) and process shall be determined by the RDT and may be revised as necessary to best accomplish the team's purpose.

15. The regulations provide that if the volume of open-water disposal of dredged material, as measured in 2026, has not declined or been maintained over the prior ten years, then any party may petition EPA to do a rulemaking to amend the restrictions on the use of the sites. (*See* 81 Fed. Reg. 44230 (40 C.F.R. § 228.15(b)(4)(vi)(G) and 40 C.F.R. § 228.15(b)(5)(vi))).

While the DMMP and associated PEIS identified potential alternatives to open-water disposal for some amount of dredged material from the waters of Long Island Sound, these reports make clear that the alternatives to open-water disposal (*e.g.,* beneficial use alternatives, upland and confined in-water disposal) do not provide sufficient capacity, either individually or collectively, to handle the full amount of material expected to be dredged from the central, western and eastern regions of Long Island Sound. In light of this, and other factors, EPA decided that it should finalize the designation of the CLDS and WLDS and propose designation of the ELDS. Ultimately, decisions about whether particular dredged material can and should be disposed of at the CLDS or WLDS (or any other site), or whether there is a practicable alternative for handling it in another way (e.g., upland disposal or beneficial reuse, such as beach nourishment), will need to be made on a fact-specific, case-by-case basis taking into account both the specific dredged material and the range of available management options.

That said, the procedures and standards in the regulatory amendments are well designed to minimize the amount of material to be disposed of at the CLDS and WLDS (or any other site). Building on the requirements of the MPRSA and the legal restrictions in the regulations (*e.g.*, prohibiting the disposal of material that does not satisfy the MPRSA sediment quality criteria or for which a practicable alternative to open-water disposal is available), and consistent with the standards and procedures recommended in the DMMP, the regulatory amendments will help promote the identification and use of alternative methods of managing dredged material.

Moreover, the new and enhanced procedures will bolster the regulatory footing for a collaborative state and federal inter-agency process geared to minimizing open-water disposal of dredged material.

III. Proposed Designation of the Eastern Long Island Sound Disposal Site (ELDS)

As stated above, Region 1 is now proposing to designate the ELDS to provide a dredged material disposal site in the eastern region of Long Island Sound under Sections 102(c) and 106(f) of the MPRSA. 33 U.S.C. §§ 1412(c) and 1416(f). *See also* 40 C.F.R. § 228.4(e). EPA's April 2016 Proposed Rule informed the public of the proposed action and invited public review and comment on it. 81 Fed. Reg. 24748-24767 (April 27, 2016). EPA simultaneously published, and sought public review and comment on, a DSEIS under the National Environmental Policy Act that explains EPA's proposed action, assesses the possible environmental effects of the proposed action, and assesses possible alternative courses of action, including "no action" alternatives or designation of other alternative sites. EPA's April 2016 DSEIS. CT DEEP has received copies of both EPA's April 2016 Proposed Rule and EPA's April 2016 DSEIS.

The newly constituted ELDS is in the eastern portion of the eastern region of Long Island Sound. The site lies south of the mouth of the Thames River, approximately halfway between Connecticut and New York. *See* 81 Fed. Reg. 24751-24752 (citing EPA's April 2016 DSEIS, Figure 3–9). The closest upland points to the ELDS are Goshen Point, Connecticut, approximately 1.2 nautical miles (nmi) (2.2 km) to the north, and Fishers Island, New York, approximately 1.4 nmi (2.6 km) to the southeast. *Id.* The dimensions of the ELDS, as proposed, would be 1 × 2 nmi, for a total area of 2 nmi^2. As proposed, the site is almost entirely in Connecticut waters, but a tiny portion of the southeastern corner of the site extends into New York waters. For the final site designation, EPA is planning to redraw the boundary so that the site is entirely within Connecticut waters, with the southeastern corner lying near, but not crossing, the boundary with New York waters.

As also explained above, EPA is not proposing an entirely new disposal site; rather, the proposed ELDS includes only a *portion* of the existing New London Disposal Site (NLDS). Specifically, the ELDS includes approximately the western half of the NLDS, as well as an adjacent area farther west of the NLDS boundary. The ELDS does not include the eastern half of the current NLDS. *See* EPA's April 2016 DSEIS, Fig. 5-6.

The current authorization for the NLDS expires on December 23, 2016. Therefore, unless the ELDS, or some other site in the eastern region of the Sound, is designated, as of December 23, 2016, no open-water disposal site will be available in the eastern region of the Sound, even for suitable dredged material for which there is no practicable alternative method of management available. As explained in EPA's April 2016 Proposed Rule:

> [t]he NLDS … [is an] active open-water dredged material disposal site [and] was previously selected by the USACE using their site selection authority under MPRSA 103(b), 33 U.S.C. 1413(b). The statute limits the use of USACE-selected

sites to two five-year periods, 33 U.S.C. 1413(b), but Congress extended the period of use of the NLDS by five additional years by Public Law on December 23, 2011 (Pub. L. 112–74, Title I, Sec 116).

81 Fed. Reg. 24752. Moreover, as indicated in EPA's April 2016 Proposed Rule:

> EPA determined, based on the evaluation of projected dredging needs over a 30-year planning horizon and alternatives to open-water disposal conducted for the USACE's DMMP, that there are dredging and dredged material disposal/handling needs that exceed the available disposal/handling capacity in the eastern region of Long Island Sound . . ..

81 Fed. Reg. 24749. More specifically, with regard to the estimated dredging needs:

> ...dredging in eastern Long Island Sound is projected to generate approximately 22.6 million cubic yards (mcy) of dredged material over the next 30 years, including 17.9 mcy from Connecticut ports and harbors and 4.7 mcy from ports and harbors in New York. Of the total amount of 22.6 mcy, approximately 13.5 mcy are projected to be fine-grained sediment that meets MPRSA and CWA standards for aquatic disposal (i.e., "suitable" material), and 9.1 mcy are projected to be coarse-grained sand that also meets MPRSA and CWA standards for aquatic disposal (i.e., also "suitable" material).

81 Fed. Reg. 24750. With respect to the capacity of other alternatives, EPA explained that:

> [t]he combined capacity of the CLDS and WLDS is approximately 40 mcy, which is enough to handle the 27 mcy from [the central and western regions of Long Island Sound]. Those sites, however, neither have the capacity nor were intended also to meet the dredging needs of the eastern Long Island Sound region, which, as stated above, has been estimated to be approximately 22.6 mcy of suitable material (which, when added to the 27 mcy of suitable material from the central and western regions, amounts to a total of 49.6 mcy of suitable material from all of Long Island Sound). Furthermore, the distances from mouth of the Connecticut River to the CLDS and WLDS are 29.9 nmi and 58.4 nmi, respectively. Thus, both sites are outside the ZSF for the eastern Long Island Sound Region and for the reasons discussed above, neither would be a viable long-term solution for dredged material from the eastern Long Island Sound region, even if the CLDS could conceivably be used for material from the eastern Sound in an emergency situation.

81 Fed. Reg. 24750. EPA also further explained that:

> [t]he DMMP also included a detailed assessment of alternatives to open-water disposal and determined that, while all the sand generated in this region should be able to be used beneficially to nourish beaches, there are not practicable alternatives to open-water disposal with sufficient capacity to handle the projected volume of fine-grained sediment.

81 Fed. Reg. 24750. In sum, based on the information in the DMMP and EPA's April 2016 DSEIS, the potential alternatives to open-water disposal that have been identified to date do not have sufficient capacity to handle the volume of dredged material predicted to be generated from the eastern region of Long Island Sound. *See* EPA's April 2016 DSEIS, pp. 2-4 to 2-8; pp. 3-6 to 3-15, 3-20, 3-35, 5-24. *See also* EPA's April 2016 Proposed Rule, 81 Fed. Reg. 24750.

Thus, not having an appropriate open-water disposal site in the eastern part of the Sound would be problematic for five primary reasons:

- necessary dredging could be blocked or delayed, potentially threatening the safety of, and otherwise hampering, recreational, commercial, and military navigation;
- the USACE might be forced to use its site selection authority to specify a new sites for shorter-term use, which could over time lead to a proliferation of disposal areas in the eastern part of Long Island Sound, which would be contrary to Congress's preference for concentrating any placement of dredged material at EPA-designated sites, as indicated by MPRSA § 103(b), 33 U.S.C. § 1413(b) (the USACE "shall, to the maximum extent feasible, utilize the recommended sites designated by the Administrator…" for dredged material disposal);
- Site Management and Monitoring Plans (SMMPs) enhance the management of disposal sites and are developed under the requirements of MPRSA § 102(c)(3), 33 U.S.C. § 1412(c)(3), for EPA-designated sites, but not for USACE -selected sites;
- relying on short-term site selections would maximize the resource demands on regulatory agencies and the public because it would necessitate undertaking site selection procedures and associated reviews under NEPA and other laws every time another site selection was needed; and
- dredged material might need to be hauled longer distances for placement at open-water sites outside the eastern region of the Sound, which would be more costly, use more energy, generate greater air emissions from dredged material transportation vessels, and generally increase the risk of vessel accidents due to the greater distances being travelled. *See* 81 Fed. Reg. 24749 (detailing distances from Saybrook Outer Bars at the mouth of the Connecticut River to the nearest designated dredged material disposal sites in other parts of Long Island Sound); EPA's April 2016 DSEIS, p. 5-18.

Designation of the ELDS (or an alternative site) by EPA would provide an open-water disposal option in the eastern region of Long Island Sound to address these concerns. Designation of a disposal site would not, however, by itself authorize disposal of any particular dredged material at the site. Designation would only make the site available to receive the dredged material *if* no environmentally preferable, practicable alternative for managing the material is available, and *if* the sediments are analyzed and found suitable for open-water disposal. *See* 40 CFR 227.1(b), 227.2 and 227.3; 40 CFR part 227, subparts B and C.

As discussed in both EPA's April 2016 DSEIS and EPA's April 2016 Proposed Rule, Region 1

Connecticut Department
of
ENERGY &
ENVIRONMENTAL
PROTECTION

September 26, 2016

Kenneth Moraff, Director
Office of Ecosystem Protection
U.S. Environmental Protection Agency
New England Regional Office
5 Post Office Square, Suite 100
Boston, MA 02109–3912

RE: **Federal Consistency Concurrence Determination**-Proposed designation of the Eastern Long Island Sound Dredged Material Disposal Site (ELDS);

Dear Mr. Moraff:

This Office has reviewed your request for federal consistency concurrence for a proposed action to designate a dredged material disposal site for the eastern region of Long Island Sound, located offshore from New London, in the State of Connecticut as shown in materials received by this Office on July 29, 2016. Our review was conducted pursuant to section 307(c)(I) of the Coastal Zone Management Act of 1972, as amended, and Subpart C of 15 Code of Federal Regulations (CFR), Part 930.

The EPA has determined that an open water disposal site is necessary in eastern Long Island Sound because there are no disposal sites currently designated for long-term use, dredged sediment management needs exceed the current available capacity of alternative management options, and EPA regulations require site designation for any long-term dredged material disposal. The Supplemental Environmental Impact Statement (SEIS) documented the existing physical, chemical, environmental, and socioeconomic conditions of three final alternatives and evaluated them against the listed factors in the relevant federal regulations, then identified the ELDS alternative as the preferred site. We support the EPA recommendation to designate ELDS and agree that it is the best choice.

As discussed above, we concur with your determination that the designation as proposed is consistent with Connecticut's federally approved Coastal Management Program and will be conducted in a manner consistent with that program.

Thank you for coordinating with this Office for our review. Should you have any questions regarding this or any other coastal management matter, please contact Ms. Kristal Kallenberg in the Office of Long Island Sound Programs at (860) 424-3760 or Kristal.Kallenberg@ct.gov.

Yours truly,

Betsey C. Wingfield, Bureau Chief
Bureau of Water Protection and Land Reuse

cc (via email):

David Kaiser, NOAA
Mark Habel, USACE
Kathleen Moser, NYDEC
Jeffrey Zappieri, NYDOS
Grover Fugate, RI CRMC

COASTAL ZONE MANAGEMENT CONSISTENCY DETERMINATION – NEW YORK STATE

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

July 20, 2016

Mr. Jeffrey Zappieri, Chief
Consistency Review
Office of Planning and Development
Department of State
State of New York
One Commerce Plaza
99 Washington Avenue
Albany, NY 12231-0001

Re: EPA Region 1 Federal CZMA Consistency Determination for the Proposed Designation of an Eastern Long Island Sound Dredged Material Disposal Site; **DOS File No. F-2016-0116 (DA)**

Dear Mr. Zappieri:

The New England Office of the United States Environmental Protection Agency ("EPA Region 1") is proposing to designate a dredged material disposal site in the eastern region of Long Island Sound under Sections 102(c) and 106(f) of the Marine Protection, Research and Sanctuaries Act ("MPRSA"). 33 U.S.C. §§ 1412(c) and 1416(f). *See also* 40 C.F.R. §§ 228.4(e). The proposed site would be known as the Eastern Long Island Sound Disposal Site or "ELDS." EPA published a proposed rule in the Federal Register on April 27, 2016, in order to formally propose designation of the ELDS, inform the public of the proposed action and seek public review and comment on it. 81 Fed. Reg. 24748-24767 (April 27, 2016). In addition to proposing designation of the ELDS, EPA's April 2016 Proposed Rule also identified and sought comment on two additional dredged material disposal site alternatives – the Niantic Bay Disposal Site (NBDS) and the Cornfield Shoals Disposal Site (CSDS). *See* 81 Fed. Reg. 24748, 24749. EPA explained that the NBDS and CSDS both satisfied MPRSA site designation criteria and could potentially be designated as either a substitute for, or a complement to, the ELDS.

EPA's proposal calls for the same site use restrictions applied to dredged material disposal sites in the central and western regions of Long Island Sound to be applied to the ELDS (or an alternative site). *See* 81 Fed. Reg. 44229-44230 (July 7, 2016) (40 C.F.R. §§ 228.15(b)(4) and 228.15(b)(5)); 81 Fed. Reg. 24767 (proposed 40 C.F.R. § 228.15(b)(6)). Consistent with the terms of 40 C.F.R. § 228.15(b)(4)(vi), the purpose of the site use restrictions is to reduce or eliminate the disposal of dredged material in the waters of Long Island Sound.

EPA Region 1 has determined that designation of the ELDS (and/or the NBDS or CSDS), would be consistent to the maximum extent practicable with the enforceable policies of the State of New York's Coastal Zone Management Program ("NY CMP"), as refined for local conditions by the Long Island Sound CMP ("LIS CMP") and certain Local Waterfront Revitalization Programs ("LWRPs"). With this letter, EPA Region 1 submits its determination to the New York Department of State ("NY DOS") pursuant to Section 307(c)(1)(C) of the Federal Coastal Zone Management Act ("CZMA"). 16 U.S.C. § 1456(c)(1)(C). This determination is supported by the above-cited Federal Register notice and other materials referenced in the consistency determination.

EPA Region 1 has been working on dredged material management issues in Long Island Sound with NY DOS and other interested agencies and members of the public for some time. On December 22, 2015, EPA sent NY DOS a letter reiterating its intent to propose designation of an eastern Long Island Sound disposal site and requesting information concerning New York's CMP. NY DOS provided such information with letters dated January 5, 2016, and January 15, 2016. EPA appreciates this assistance from NY DOS.

The waters of Long Island Sound are a precious natural resource providing immeasurable benefits to the people of our Nation, including residents of the States of New York and Connecticut. These waters provide invaluable habitat for aquatic life and a wonderful aesthetic and recreational resource to the public. They are also a crucial engine for the region's economy and an important factor in our national security planning. Our collective stewardship of Long Island Sound must serve all of these purposes and functions. As the LIS CMP and various LWRPs recognize, dredging is needed to ensure safe navigation and adequate mooring space for recreational and commercial vessels. It is critical, however, that dredging, and the management of dredged material, be conducted in an environmentally sound manner.

EPA Region 1 believes that it has developed a proposed site designation rule that gets the balance right in serving the multitude of interests mentioned above while also protecting the environment of Long Island Sound. As stated above, the proposed site designation regulations are intended to support the goal of reducing or eliminating the disposal of dredged material in the waters of Long Island Sound. In developing these regulations, EPA has taken into account the input of the NY DOS, other federal and state agencies, and members of the interested public. We look forward to receiving and considering public comments on the proposed site designation regulations.

It is important to remember that designation of a disposal site does not authorize any particular dredged material to be placed at the site. It merely makes the site available as a potential management option for use in appropriate circumstances. Any proposal to place dredged material in the waters of Long Island Sound will be subject to a case-specific permitting review. Placement at the disposal sites can only be authorized if the sediments are deemed suitable for marine disposal – after physical, chemical and biological testing

– and no practicable alternatives to marine disposal are available. These requirements are expressly stated in the regulations. The regulations also include standards and procedures intended to reduce or eliminate dredged material disposal in the waters of Long Island Sound wherever practicable.

EPA Region 1 requests that NY DOS provide a written concurrence with the attached CZMA consistency determination within 60 days of receipt of this letter, as specified by National Oceanic and Atmospheric Administration regulations. We appreciate NY DOS's prior agreement to expedite its response to EPA's determination.

Thank you for your continued cooperation in this important effort. If you have any questions regarding this letter, your staff may call Mel Coté, chief of the Surface Water Branch at (617) 918-1553 and/or your legal counsel may call Senior Assistant Regional Counsel Mark Stein at (617) 918-1077.

Sincerely,

Kenneth Moraff, Director
Office of Ecosystem Protection

cc (by email): David Kaiser, NOAA
Mark Habel, USACE
Kathleen Moser, NYS DEC
Brian Thompson, CT DEEP

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SECRETARY OF STATE

October 3, 2016

Mr. Kenneth Moraff
Director, Office of Ecosystem Protection
U.S. Environmental Protection Agency, Region 1
5 Post Office Square, Suite 100
Boston, Massachusetts 02109-3912

Re: F-2016-0638 DA - U.S. EPA - Designation of One or More Open-Water Disposal Sites – Eastern Long Island Sound (ELDS).
Objection to Consistency Determination – CORRECTED VERSION

Dear Mr. Moraff:

The Department of State (DOS) has completed its evaluation of the U.S. Environmental Protection Agency's (EPA) consistency determination for the proposed rule to designate one or more dredged material disposal sites in eastern Long Island Sound.[1] Pursuant to 15 C.F.R. § 930.41(a), and based on the information that has been provided, DOS objects to EPA's consistency determination on the grounds that the proposed action is not consistent to the maximum extent practicable with the enforceable policies of the Long Island Sound Coastal Management Program (LIS CMP) and the Town of Southold Local Waterfront Revitalization Program (LWRP), each of which is a component of the New York State Coastal Management Program (CMP). EPA's Proposed Rule designating permanent open water disposal sites in eastern Long Island Sound is inconsistent with LIS CMP and Southold LWRP Policies # 5 (water quality), # 6 (ecosystem protection), # 8 (hazardous waste management), # 10 (water-dependent uses) and # 11 (living marine resources).

Executive Summary

Long Island Sound is a valuable resource treasured by millions of New Yorkers. The health and robustness of its ecosystems and cleanliness of its waters dearly matter to the communities along its coast and beyond. In the past few decades, laws and regulations have been tightened to protect the nation and the Sound from pollution. New uses and alternatives for disposal of dredged sediments in open waters have been identified. Federal, State, and local governments have spent billions of taxpayer dollars to help restore this vital waterway. Much progress has been made and much work still needs to be done. New York's commitment to reducing open water disposal of dredged sediments has been unwavering.

[1] Hereinafter referred to as the "Proposed Rule."

Governor Andrew Cuomo recently said:

> The EPA's plan to establish a new disposal site not only poses a major threat to this ecologically vital habitat, but impedes our progress in ending open water dumping in Long Island's waters once and for all. This state is committed to ensuring the Sound remains a viable source of economic and tourist activity and we will continue to take any action necessary to preserve this precious jewel for generations to come.

Through the Coastal Zone Management Act (CZMA) New York has authority to review EPA's action to ensure that it is consistent with the federally approved policies that have been established for Long Island Sound, known as the Long Island Sound Coastal Management Plan (LIS CMP). In addition to the LIS CMP, New York is bound by the terms of the CZMA to represent the Town of Southold in this determination, as they have developed a local waterfront revitalization plan, the Southold LWRP which has been formally approved and incorporated into New York's Coastal Management Program.

New York has for many years actively participated in the process that preceded EPA's latest action and has expressed concerns every step of the way, as detailed in this document. Through laying out the history of New York's involvement with the actions that have led up to this rulemaking, we will show that New York's position on this issue has been steadfast and clear, and that EPA has failed to address many of the State's and the Town of Southold's concerns. These concerns are summarized as follows:

Issues with Testing and Site Monitoring
EPA and the Army Corps of Engineers (the Corps) currently use inadequate and outdated testing methodologies and analytical approaches that do not accurately determine the toxicity levels of dredged sediments. For example, instead of testing separate areas of a dredge site to determine where "hot spots" of contamination are located, they regularly composite or mix their sediment samples together in order to achieve testing results that show the material is suitable for open-water disposal. In addition, they neglect to show sub-lethal and long-term effects on fish and shellfish. Given the types of contamination proven to exist in some of the priority dredge areas, and the current testing and monitoring protocols, it is impossible to guarantee the protection of water quality. Therefore, the designation is inconsistent for water quality (policy #5), the Long Island Sound ecosystem (policy #6), and living marine resources (policy #11).

Site Specific Geography
The eastern part of Long Island Sound is a dynamic location characterized by strong currents, vulnerability to ecological stressors, and a net western movement of sediments. These factors make Eastern Long Island Sound the wrong place to designate a dredged material disposal site and therefore the designation is inconsistent with the Long Island Sound CMP policies for water quality (policy #5), the Long Island Sound ecosystem (policy #6), hazardous waste management (policy #8), and living marine resources (policy #11).

Lack of Consistent Alternatives Analysis
New York's coastal policies set a clear preference for reducing and recycling dredged material. Using clean, coarse dredged material to increase coastal resiliency and compatible sediments for marsh and wetland restoration accomplishes multiple benefits. Yet, EPA disqualified appropriate alternative management strategies on the basis of cost and then used the lack of alternatives as a basis for site designation. This makes EPA's proposed designation inconsistent with the CMP policy for solid waste management (policy #8).

Inappropriate Use of Cost as a Factor for Designation
EPA argues that it proposes to designate ELDS in order to make the most cost-effective method of dredge material disposal available to the Eastern Long Island Sound region. However, they did not utilize full-cost accounting approaches that include the costs of environmental harm. Simultaneously, EPA concluded that there are no beneficial reuse options that meet the long-term disposal need and ruled out other sites within the Zone of Siting Feasibility. This suggests that EPA is inappropriately placing cost-savings over environmental responsibility and stewardship, constitutes an improper use of cost as a justification under the CZMA, and is inconsistent with the Long Island Sound CMP policies for water quality (policy #5), the Long Island Sound Ecosystem (policy #6), hazardous waste management (policy #8), and living marine resources (policy #11).

Inadequate Cumulative Impacts Analysis
EPA failed to thoroughly analyze the effects of legacy contamination in the sediments of Long Island Sound, as well as the possible effects of having three dump sites within the semi-enclosed waters of Long Island Sound all operating at the same time. Furthermore, they did not consider the effects of climate change, rising water temperature, or increasing acidification on the bioavailability of contaminants in sediments. Without a thorough and accurate cumulative impacts analysis, New York is compelled to find the EPA proposal inconsistent with the protection of water quality (policy #5), the Long Island Sound Ecosystem (policy #6), and living marine resources (policy #11)

Finally, EPA's proposed designation of one or more disposal sites in eastern Long Island Sound (EPA Proposed Rule) is inconsistent with the massive public investment and policies – including their own mandates - aimed at restoring and protecting Long Island Sound. The EPA Proposed Rule is also inconsistent with EPA's own goal, required in regulation, of reducing or eliminating open water disposal of dredged material in Long Island Sound. Further, this proposal to establish additional disposal sites immediately follows EPA's 2016 Amended Final Rule that designated two open water sites for the disposal of dredged material in the Central and Western regions of Long Island Sound. The EPA Proposed Rule fails to establish the need for additional disposal sites and undermines the goal of reducing and eliminating open water disposal Long Island Sound.

Subject of the Review

On July 20, 2016, DOS received EPA's consistency determination (EPA Determination) asserting that the EPA Proposed Rule is consistent to the maximum extent practicable with New York's enforceable coastal policies. The receipt of the EPA Determination initiated the consistency review period for DOS to either concur with or object to the consistency determination, which is due on or before October 3, 2016.[2]

In this rulemaking, EPA proposes to designate at least one, and possibly up to three, open water disposal sites in eastern LIS for the receipt of dredged material. EPA has identified three alternatives: (1) the newly configured and re-named Eastern Long Island Sound Disposal Site (ELDS), previously named New London Disposal Site (NLDS); (2) the reconfigured historic

[2] The original decision date was September 18, 2016. By letter dated September 16, 2016, DOS notified the EPA that, pursuant to 15 C.F.R. 930.41(b), DOS was taking a fifteen (15) day extension of time to allow DOS to further review the matter

Niantic Bay Disposal Site (NBDS); and (3) the Cornfield Shoals Disposal Site (CSDS). EPA has indicated that ELDS is the preferred alternative, but that CSDS and NBDS are also being considered instead of, or in addition to ELDS.[3]

Open Water Sites Description

EPA has chosen ELDS as its preferred alternative and increased its area 100% from the 1 square nautical mile (nmi^2) area of NLDS to 2.0 nmi^2. EPA did so "[i]n order to accommodate the dredged material disposal needs for the eastern Long Island Sound region over for the next 30 years (which includes 13.5 million cy [10.3 million m3] of fine-grained material…) . . . the recommended New London Alternative includes the area of the active NLDS as well as two areas immediately to the west (referred to as "Site NL-Wa" and "Site NL-Wb")".[4] EPA has expanded the site to allow for even greater amounts of dredged material to be dumped over the next 30 years.[5] The NBDS site was also expanded[6] and CSDS, a dispersive site, remains unchanged in area.[7]

<u>Statutory Framework</u>

The CZMA authorizes a coastal state to review certain activities directly undertaken by a federal agency to ensure their consistency with the enforceable policies of the state's CMP.

Under the CZMA, "each Federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs." (16 USC § 1456 (c)(1)(A)). The CZMA regulations define the

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[3] See EPA Proposed Rule at: 81 FR 24748 [April 27, 2016]. According to the Federal Register Notice: "EPA is not currently recommending the NBDS and CSDS as preferred alternatives, but [invited] public comments on the option of designating one or both of these sites instead of, or as a complement to, ELDS." https://www.federalregister.gov/articles/2016/04/27/2016-09603/ocean-disposal-designation-of-a-dredged-material-disposal-site-in-eastern-region-of-long-island

[4] See Draft Supplemental Environmental Impact Statement (DSEIS), at p. 3-29. See also DSEIS Appendix I at p. 2.

> The ELDS site encompasses 50% of the western portion of the existing New London Disposal Site (NLDS), along with an adjacent area immediately west of the NLDS (*i.e.,* Sites NL-Wa and NL-Wb). The ELDS (western portion) is located to the south of the mouth of Thames River estuary. It has a total area of 2.0 nmi2 (8.6 km2). The closest upland points to the alternative site are Goshen Point, Connecticut, approximately 1.2 nautical miles (nmi), or 2.2 kilometers (km), to the north, and Fishers Island, New York, 1.4 nmi (2.6 km) to the southeast. DSEIS at p. 3-29.

[5] See 81 FR 24751. "The capacity of the ELDS is approximately 27 million cy..., which would be sufficient to meet the dredging needs of the eastern Long Island Sound region for the next 30 years and beyond."

[6] See DSEIS at p. 3-34, sec. 3.4.3.2. The NBDS includes the historical area 1.8 nmi^2 and the extended site of NB-E with an area of 1.0 nmi^2 for a total area of 2.8 nmi^2.

> The Niantic Bay Alternative is located to the south of Niantic Bay, between the Connecticut and Thames Rivers (Figure 3-9). It consists of the historic NBDS and Site NB-E immediately to the east. The northern edge of the alternative site is located approximately 0.6 nmi (1.1 km) from Black Point (southwestern corner of Niantic Bay) and 1.6 nmi (3.0 km) from Millstone (southeastern corner of Niantic Bay). The site is located entirely within Connecticut waters.

[7] See DSEIS at p. 3-34, sec. 3.4.3.3.

> The Cornfield Shoals Alternative consists entirely of the active CSDS, located in a central location of eastern Long Island Sound, approximately 3.3 nmi (6.1 km) south of Cornfield Point in Old Saybrook, Connecticut (Figure 3-10). The site has an area of 1 nmi2 (3.4 km2) centered at 41°12.686' N, 72°21.491' W (NAD83); corner coordinates are included in Table 3-8. The water depth is approximately 150 feet (46 m). The larger portion of the site is located within Connecticut waters with the remainder of the site located in New York State waters.

phrase "consistent to the maximum extent practicable" to mean "fully consistent with the enforceable policies of management programs unless full consistency is prohibited by existing law applicable to the Federal agency".[8]

The CZMA authorizes "interstate consistency" review where a federal action occurring in one state will affect uses or resources of another state's coastal zone.[9] Since 2006, DOS has exercised its interstate consistency review authority over 15 C.F.R. 930 subpart C, D, and F federal agency activities in the Connecticut state waters of LIS to the -20 foot bathymetric contour closest to the Connecticut shoreline. Within this area, DOS is authorized to review the consistency of all direct federal agency actions as well as federal permit actions involving dredged material disposal in LIS.

In 1972, Congress passed Title I of the Marine Protection, Research, and Sanctuaries Act (MPRSA), commonly referred to as the "Ocean Dumping Act" (ODA), to "prevent or strictly limit the dumping in ocean waters of any material which would adversely affect human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities."[10] The ODA authorizes the EPA Administrator to designate sites where ocean disposal may be permitted. In 1980, Congress amended the ODA to subject the dumping of dredged material in Long Island Sound by federal agencies, or by private parties dumping more than 25,000 cubic yards of dredged material, to the site selection, site designation. and environmental testing criteria of the ODA (known as the "Ambro Amendment"), making the waters of Long Island Sound the only area inside the nation's territorial sea in which the ODA applies.[11]

For designation of ocean disposal sites in the Sound, the ODA site selection criteria apply. The ODA § 102 site designation process requires that EPA demonstrate compliance with four general criteria in 40 C.F.R. § 228.5 and eleven specific criteria in 40 C.F.R. § 228.6. An evaluation of each of these criteria is a necessary component of the site evaluation process prior to an EPA site designation and the development of a site management plan.

In 2001, the LIS CMP was incorporated into the State's federally approved CMP. The LIS CMP policies are the enforceable policies for consistency review of federal activities that may affect the coastal resources and land and water uses of Long Island Sound.

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[8] (15 C.F.R. § 930.32(a)(1)). EPA has not identified an existing law that would legally prohibit it from being fully consistent with the NYS enforceable coastal policies.

[9] See Letter March 28, 2016 from John King, Chief, Coastal Programs Division, National Oceanic and Atmospheric Administration (NOAA) to George Stafford, Director, Division of Coastal Resources. "Based on our review of your Submission, we concur that the changes to Table 2 and the addition of Table 2A are RPCs [routine program changes] to Uses Subject to Management and Coordination, Public Involvement and the National Interest, and OCRM approves the incorporation of these tables into the NYSCMP. Table 2A, Interstate Activities, was developed in accordance with 15 C.F.R. part 930, subpart I." See 15 C.F.R. Part 930 Subpart I "Consistency of Federal Activities Having Interstate Coastal Effects".

[10] 33 U.S.C. § 1401(b).

[11] 33 U.S.C. § l416(f). Congressional history confirms that the ODA was made applicable to Long Island Sound to afford greater protection to the marine environment from open water disposal than was otherwise available under the Clean Water Act. Congress' intention was to afford Long Island Sound "equal or greater protection from polluted dredged spoils [as that afforded to] open ocean waters." 126 Cong.Rec. H34063 (Dec. 13, 1980) (remarks of Rep. Ambro).

The Town of Southold has prepared a local waterfront revitalization program, which has been incorporated into the State's federally-approved CMP.[12] The Southold LWRP encompasses the entire town, including its waters in Long Island Sound as well as natural, public, and developed waterfront resources. The Southold LWRP's enforceable coastal policies guide federal and state agencies in their decision-making responsibilities for activities affecting the town's coastal resources.

Introduction to Long Island Sound: An Estuary of National Significance

Long Island Sound is one of the largest estuaries along the Atlantic coast of the United States and has historically been one of the most productive estuarine waters in the world. In 1987, the U. S. Congress designated Long Island Sound as an Estuary of National Significance.[13] The Long Island Sound region is also one of the most densely populated areas in North America; about 23 million people live in the Sound's watershed.[14] Today the Sound continues to provide valuable breeding, nesting and feeding habitats for myriad aquatic, avian and terrestrial species and supports a regional economy based in part on fishing and shellfishing, shipping, recreational boating, tourism and other coastal recreation, and water dependent industries, augmented by a much reduced commercial fishing industry, that benefits coastal communities in New York, Connecticut and Rhode Island. For these reasons, the health, robustness and resilience of the Long Island Sound ecosystem is of paramount importance to New York State.

Long Island Sound Physical Geography

Long Island Sound is a 110-mile-long, semi-enclosed, tidal estuary at the interstate boundaries of New York, Connecticut, and Rhode Island. It is hydrologically connected to the Atlantic Ocean

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[12] The Town of Southold prepared and adopted an LWRP which was approved by NYS Secretary of State, Randy Daniels and concurred with by the U.S. Office of Ocean and Coastal Resource Management on November 2, 2005. The LWRP was later amended by the Town; those amendments were approved by NY Secretary of State Cesar Perales and concurred with by the U.S. Office of Ocean and Coastal Resource Management on July 24, 2014. The LWRP was prepared in accordance with Executive Law Article 42 and 19 NYCRR Parts 601 and 603.

[13] See P.L. 100-4 § 317. NATIONAL ESTUARY PROGRAM

(a) PURPOSES AND POLICIES.-

(1) FINDINGS.-Congress finds and declares that-

(A) the Nation's estuaries are of great importance for fish and wildlife resources and recreation and economic opportunity;

(B) maintaining the health and ecological integrity of these estuaries is in the national interest;

(C) increasing coastal population, development, and other direct and indirect uses of these estuaries threaten their health and ecological integrity;

(D) long-term planning and management will contribute to the continued productivity of these areas, and will maximize their utility to the Nation; and

(E) better coordination among Federal and State programs affecting estuaries will increase the effectiveness and efficiency of the national effort to protect, preserve, and restore these areas.

(2) PURPOSEs.-The purposes of this section are to-

(A) identify nationally significant estuaries that are threatened by pollution, development, or overuse;

(B) promote comprehensive planning for, and conservation and management of, nationally significant estuaries;

(C) encourage the preparation of management plans for estuaries of national significance; and

(D) enhance the coordination of estuarine research.

See also P.L. 100-4, § 320. NATIONAL ESTUARY PROGRAM

(B) PRIORITY CONSIDERATION-The Administrator shall give priority consideration under this section to Long Island Sound, New York and Connecticut.

[14]http://longislandsoundstudy.net/about-the-sound/by-the-numbers/

at its eastern end through the Block Island Sound, and at its western end through the East River at Throgg's Neck and the New York City incorporated municipal boundary. As noted by the U.S. Geological Survey (USGS), the circulation of waters in Long Island Sound, is controlled by an east-to-west tidal current coupled with a westward-directed estuarine bottom drift.[15] This circulation pattern has produced a succession of sedimentary environments, which begin with erosion at the narrow eastern entrance to the Sound. This environment is followed by an extensive area of coarse-grained bed load transport in the east-central Sound, which is followed by a contiguous band of sediment sorting where the estuary noticeably widens. The last of the sedimentary environments is characterized by broad areas of fine-grained deposition on the flat basin floor in central and western Long Island Sound.

The semi-enclosed geographical nature of the Sound causes sediments to accumulate and concentrate on the floor of the Sound rather than being flushed out to the open ocean. Wind, current, and flow dynamics in the Sound tend to transport sediments from Connecticut's higher energy and flow eastern Sound waters toward New York's western Sound waters where suspended contaminants are deposited. When a scow releases dredged sediments in the eastern Sound, the finer sediments and silts – to which heavy metals and organic carbons adhere - are transported by currents beyond the confines of the disposal site.[16]

Eastern Long Island Sound

EPA's proposed designation of ELDS would encompass substantial portions of NLDS, which is located in the northeastern side of the eastern basin of Long Island Sound at its juncture with Fishers Island Sound approximately two nautical miles from the entrance to the New London, Connecticut Harbor and one-and-one-half nautical miles west of Fishers Island. Beginning in 1955, NLDS has served intermittently as an open water disposal site for dredged sediments. Since approximately 1995, NLDS has been classified as an "interim site" under ODA § 103. NLDS has not been formally designated by EPA under ODA § 102. The DMMP estimates that, since 1955, NLDS has received in excess of 8.9 million cubic yards (mcy) of dredged material.[17]

Eastern Long Island Sound is characterized by strong to moderate currents. The eastern basin of the Sound includes the area between Six Mile Reef to the west and The Race to the east. The Race has particularly strong tidal currents.[18] Ocean waters generally flow into the LIS as bottom currents through the constricted eastern entrance, and Sound waters generally leave the Sound as surface currents through the same eastern entrance. NLDS is located near this eastern entrance to the Sound, and is affected by these water flow patterns. At NLDS, water depths range from approximately 46 to 79 feet. At the eastern edge of the LIS, extending approximately 5 to 8 km westward from The Race, there is a large erosion or non-deposition basin, likely caused by a combination of strong currents and a net westward movement of sediments into the LIS estuary. Current speeds in the eastern basin are the strongest observed in the Sound. These current velocities have been measured at 62-82 cm/sec and are sufficient to erode and move silt and sand and prevent the deposition of silts and clays. There is a paucity of silt and clay sized particles in surficial sediments in the eastern basin, reflecting the high energy current resuspension of fine

[15] http://woodshole.er.usgs.gov/project-pages/longislandsound/overview.html.
[16] DSEIS, Chapter 5 – Environmental Consequences, Section 5.1 "Open-Water Disposal Processes" p. 5-1 to 5-3.
[17] DSEIS at p. ES-5.
[18] DSEIS at p. 3-6.

sediments.[19] Additionally, the eastern Sound has benthic habitat features including diverse bottom topography and hard bottom. These features support high quality habitats in the marine environment.

The eastern Sound has several geographic features that make it especially vulnerable to ecological stressors. Due to its coastal proximity, the Sound is a regular target for major coastal storms and hurricanes that contribute high winds, upwelling, storm surge, flooding, and circulation dynamics that cause resuspension and remobilization of contaminated sediments. The strong currents that characterize the eastern LIS reflect that it is poorly suited to serve, as it has for decades, as a dump site for contaminated and uncontaminated dredged materials.[20]

Finally, the LIS CMP identified Fishers Island and its surrounding waters as one of the State's regionally important natural areas; these areas possess significant natural resources which are at risk and require additional management to protect or restore resource values.[21] The importance of the natural resources of the island are more than just regional as The Nature Conservancy has named the Peconic Bay/Block Island Sound area, including Fishers Island, as one of the world's "Last Great Places," and has included the region in its program designed to protect and manage natural habitats.[22]

History of Contamination

Two centuries of industrial activities along New York's and Connecticut's rivers and harbors, much of which occurred before modern environmental protection laws offered pollutant regulation, have generated an accumulating deposit of heavy metals and toxic organic compounds in the sediments of the Sound.

Industrial pollution of Connecticut rivers and harbors is well documented.[23] With this industrialization came enormous quantities of raw material and waste products. "The Sound has seen the most severe environmental changes over the last 400 years during its 10,000 year history…suggesting that human impacts have overwhelmed the natural forces at play."[24]

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[19] The Geology of Six Mile Reef, Eastern Long Island Sound Physiographic and Geologic Setting (USGS) http://woodshole.er.usgs.gov/pubs/of2007-1191/html/setting.html; The Residual Circulation In Long Island Sound: Gyral Structure In The Central And Western Basins (NOAA Technical Memorandum NOS CS 2, 2003) http://www.nauticalcharts.noaa.gov/csdl/publications/TM_NOS-CS02_FY2003-Schmalz_LIS_circulation.pdf

[20] As stated in the DSEIS for the ELDS designation: "Eastern Long Island Sound increasingly narrows and deepens toward the east and has stronger tidal currents that scoured the seafloor. Water enters Long Island Sound from Block Island Sound through two deep elongate depressions (The Race), located between Fishers Island and Little Gull Island. These depressions reach a maximum water depth of approximately 330 feet (101 m) on the Long Island Sound side." (p. 4-9)
"Parts of the seafloor in eastern Long Island Sound is relatively flat and featureless, as strong tidal currents prevent the deposition of marine sediments and erode the finer grain size fractions in the sediments. This process leaves exposed lag deposits of gravel and gravelly sand that armor the seafloor. Larger sessile benthic organisms were not observed on these gravel pavements, suggesting periodic mobilization of the gravel." (DSEIS at p. 4-15)

[21] LIS CMP p. 92.

[22] http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/rhodeisland/placesweprotect/block-island.xml; see also Town of Southold LWRP Section II –J Reach 10 pp 12 and 13.

[23] Metals, Organic Compounds, and Nutrients in Long Island Sound: Sources, Magnitudes, Trends, and Impacts, Johan C. Varekamp, Anne E. McElroy, John R. Mullaney and Vincent T. Breslin, Chapter 5, J. S. Latimer et al. (eds.), Long Island Sound: Prospects for the Urban Sea (2014).

[24] Id.

In 1982, the Oceanic Society prepared and submitted a report to the New England Governors' Conference entitled "Dredging and Dredged Materials Management in the Long Island Sound Region". The Report outlined the flagrant abuses shown by dredgers for the massive amounts of pollution deposited in the Sound.

> An estimated 126 million cubic yards of material (the vast majority of which is dredged material) have been disposed of in the open waters of Long Island Sound in the period 1890-1977. (Schubel et al, 1979). Some 100 million cubic yards was dredged from federal maintenance channels during the same period with the majority (80%) coming from Connecticut ports and harbors. The remainder of material came from private dredging for which records are incomplete.[25]

Since the 1980s, the USGS Coastal and Marine Geology Program has been comprehensively studying the Long Island Sound environment and has also documented trace metal contamination. Sediments of the Sound "are a sink for wastes and contaminants from various sources such as riverine input, wastewater treatment plants, urban and agricultural runoff, and sediment and waste disposal".[26] Due to the significant human population, the Sound is used heavily and its sea floor has been impacted by human activities. Existing background levels of heavy metal contamination from legacy pollution remain toxic and harmful indefinitely, but the full extent of the impacts of all contaminants present in the Sound, including dredge disposal sites, is unknown. Neither EPA nor the Corps has conducted comprehensive research to understand the condition of the benthic marine environment.[27] In the absence of such studies,

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[25] https://www.gpo.gov/fdsys/pkg/CZIC-tc187-d768-1982/pdf/CZIC-tc187-d768-1982.pdf. This important report provided a historical perspective on over a century of dredge material dumping in the Sound. In an attempt to control open water disposal, around the turn of the century, 19 disposal sites were designated. The report observed: "Although disposal of dredged materials in the Sound was supposed to be confined to the 19 designated sites, it is important to recognize that little or no effort was made to enforce this requirement. Observations by divers confirm the presence of dredged materials outside designated disposal sites, but the distribution and quantity of improperly dumped materials is not known. In part, this situation may have developed from imprecise navigation combined with little thought of the need to dump spoils at the designated site... Regulated only by the Rivers and Harbors Act of 1899, Long Island Sound was the disposal option for any and all of the region's waste. Studies and reports conducted in the late 1960's and early 1970's document deteriorating water quality around the Sound. While disposal of dredged material is named as a contributor to the degraded quality (US EPA 1971), no report ever qualified or quantified dredged material's contribution. Instead, dredged material was thrown together with industrial, domestic, and marine vessel pollution." PP. 10-12. As a consequence, the Sound floor is polluted with heavy metals, toxic organic compounds, and nutrients. Despite many improvements, Long Island Sound is still considered one of the most polluted estuaries in the United States. See Footnote 114. This pollution, along with other ecological stressors, has resulted in the steady decline of the marine coastal economy that was based on fishing, shellfishing and seafood processing and has harmed the workers that depend on it. The decline and, in some cases, collapse of commercial fishing in Long Island Sound was documented in the programmatic environmental impact statement for the DMMP with descriptions of the steady declines in the most commercially viable species: American Lobster, Eastern Oyster, Scallop, Blue Crab, Hard Clams, Atlantic Surf Clam, Blue Mussel, and Horseshoe crabs. PEIS pp. 4-123 through 4-131.

[26] U.S. Geological Survey Studies in Long Island Sound: Geology, Contaminants, and Environmental Issues http://woodshole.er.usgs.gov/project-pages/longislandsound/overview.html

[27] "Sandy Point in West Haven is located in the outer harbor. During the 1800's Sandy Point was home to flourishing oyster beds. Oysters were taken from the Chesapeake Bay and transplanted along the site. Today the only signs of oysters on the beach are the signs, which read that oyster beds are contaminated and that shellfishing is prohibited." Historical Harbor Habitats, Matthew D. Cacopardo (Yale-New Haven Teachers Institute) http://teachers.yale.edu/curriculum/viewer/new_haven_05.05.04_u See also "Biogeochemistry and Contaminant Geochemistry of Marine and Estuarine Sediments, New Haven, Connecticut," (Kruge & Benoit 2002)

informed decisions about whether to authorize continued disposal of dredged materials cannot be made.

The Eastern Long Island Sound region is home to numerous contaminated sites

The Navy and the Coast Guard, which have facilities located on the 17-mile-long Thames River, are the primary users of the NLDS.[28] The Navy maintains a homeport for the Naval Submarine Base New London (SUBASE) on the eastern bank of the Thames River in the towns of Groton and Ledyard, Connecticut. Periodically, it requests the Corps to arrange for maintenance dredging of the pier area and the channel in order to have adequate depth of water for floating dry docks and navigation within the river by various sizes of submarines. The Thames River adjacent to the SUBASE contains a significant amount of very fine grained material and silt, to which contaminants readily adhere. In its more than 6 decades of use as an open water dump site, NLDS has received a total of approximately 8.9 million cubic yards of dredged material.[29]

The toxicity of Connecticut's river and harbors has been well documented over the years. For example, in 1990, the Navy's SUBASE in New London Harbor was placed by EPA on the Superfund National Priorities List (NPL).[30]

Despite the heavy contamination of the Thames River and New London Harbor,[31] sediments from these locations have continued to be disposed of in Long Island Sound.[32] If this proposed

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[28] CENAE-R-PEB, Final Navy Site Selection, Memorandum for the Record, Thomas L. Koning, Colonel, Corps of Engineers, District Engineer (April 15, 2005) p. 5 "The largest volumes have come from U.S. Navy-related dredging projects, and as such the site has experienced large fluctuations in annual volumes. NLDS receives the largest volumes from the Thames River."

[29] DSEIS at p. ES-5.

[30] https://www3.epa.gov/region1/superfund/sites/newlondon/263757.pdf. It was identified as Naval Submarine Base - New London (NSB-NLON).

[31] Lee, Metal concentrations in the sediment of the Thames River and New London Harbor. Dissertation, Southern Connecticut State University, New Haven, CT (2010). https://www.southernct.edu/research/research-centers/ccms/Lee-Thesis.pdf The author observed: "Sediment copper concentrations in the Thames river and New London harbor ranged from 3.20 mg/kg for station 33 at Pine Island to 252 mg/kg for station 28 at a Dry Dock facility in New London harbor. Twelve out of the fifteen stations sampled in this study had copper concentrations that exceeded the crustal abundance of copper (25 mg/kg). Similarly, sediment zinc concentrations ranged from 10 mg/kg at station 33 to 642 mg/kg at station 28. Twelve out of the fifteen stations had zinc concentrations that exceeded crustal abundance (65 mg/kg). Sediment metal contamination was highest at stations located near industry where there was evidence of industrial discharge and near the highway overpasses, in which polluted runoff may have contributed to sediment metal contamination. A comparison of sediment metals in this study and the Breslin (2009) study for the Thames river and New London harbor showed that twenty six out of the thirty five stations analyzed had copper and zinc concentrations that exceed the Effects Range Low (ERL) values for these respective sediment metals. Station 28, located proximate to the dry dock, was the only station where both zinc and copper concentrations approached or exceeded Effects Range Medium thresholds. Based on both copper and zinc exceeding the ERL thresholds at multiple locations throughout the river/harbor complex it is likely that some adverse effects are occurring to benthic organisms at these locations along the Thames river." P. 1.

[32] The Navy's Consistency Determination for Waterfront Maintenance Dredging of Naval Submarine Base New London (2008) contains the following statement:

> Sediment samples were recovered from 30 designated locations along the SUBASE waterfront during the period from October 29 to October 31, 2008… The results of the sediment chemistry analysis for the waterfront area samples indicate that these sediments contain a wide variety of environmental pollutants including detectable concentrations of all metals tested; detectable concentrations of one or more of the 22 PCB congeners tested; detectable concentrations of all PAHs tested; and detectable concentrations of pesticides. Results of the bulk sediment chemistry analysis are summarized in tables contained in the attached Sediment Sampling Results Report, January 2009 (TEC, 2009). **The results of the sediment chemistry analysis indicate that the**

designation of ELDS was to go forward, it is highly likely that the despoliation of the Sound would continue unabated into the future.

Efforts to Improve the Environmental Health of Long Island Sound

Over the past four decades, major efforts have been undertaken by all levels of government and by the general public to improve the quality of the Sound. Billions of taxpayer dollars have been invested and new laws, regulations and policies have been enacted in an effort to stem the tide of decline. This is a remarkably complex objective, since the Sound itself is a highly complex and sensitive ecosystem with multiple uses and stressors.

As early as 1973, Federal and state agencies sought to address both the need for navigational dredging and environmentally wise disposal options. The New England River Basins Commission, a partnership including the federal government and the states of New York and Connecticut, developed the Long Island Sound Regional Study to protect, conserve and wisely develop the Sound as a major economic and life-enriching resource for the region. On June 20, 1980, the Commission released the Interim Plan for the Disposal of Dredged Material from Long Island Sound, which identified the need to limit dredged materials disposal and develop a comprehensive dredged materials management plan for the Sound. Other efforts that have reflected and acknowledged the need to reduce open water disposal of dredged materials in order to improve the Long island Sound ecosystem include: Congressional amendments to the federal ODA limiting the disposal of contaminated materials in the Sound; the Sound's designation as an Estuary of National Significance pursuant to the National Estuary Program, the Long Island Sound CCMP, the federal Office of Coastal Resource Management's (OCRM) concurrence with the incorporation of the regional Long Island Sound Coastal Management Program into the New York State CMP, and OCRM's concurrence with New York's and Connecticut's interstate consistency lists. Despite these clear policies, the open-water disposal of dredged materials has continued largely unabated.

Because of actions taken by state, federal and local partners to improve the health of the Sound and to implement the Long Island Sound CCMP, the Sound continues to maintain promising future potential for restored ecosystem productivity and sustainable natural resource-based economic activities as long as the current array of stressors continue to be reduced in number and intensity. For this reason, the progress which EPA, New York and Connecticut are making through the CCMP must not be undermined through the unnecessary and biologically damaging disposal of dredged material at ELDS.

New York's History of Long Island Sound Consistency Objections and Federal Lawsuits

At the National Estuary Program designation ceremony, New York pledged to support the goals of the Long Island Sound Management Conference and to restore and protect the environmental quality of Long Island Sound. New York State continues to honor this "commitment to act". At

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> **waterfront area sediments have concentrations of various contaminants at levels that would most likely prevent the unconfined ocean disposal of this dredged material.**

The Navy has publicly recognized that dredged material from the SUBASE waterfront area is "moderately contaminated due to the presence of various contaminants commonly associated with historically industrialized waterfronts" and "therefore it is likely that unconfined ocean disposal at approved ocean disposal sites would not be viable." US Navy, Dredged Material Disposal Alternatives Analysis Waterfront Maintenance Dredging -SUBASE NLON (May 2009) pp. 1-1 and ES-2.

Emphasis added. See U. S. Navy Consistency Determination sent to DOS on NY STATE REGISTER, September 9, 2009 p. 77 http://docs.dos.ny.gov/info/register/2009/sep9/pdfs/miscellaneous.pdf.

times, New York has taken legal and regulatory actions to ensure that other government agencies play their part in protecting the Sound. That occasionally has taken the form of consistency objections under the CZMA and lawsuits in federal court.

Federal lawsuits regarding non-compliance with ODA requirements

Lawsuits have been brought by the State and private organizations to ensure that federal agencies comply with the procedures of the ODA and with the National Environmental Policy Act (NEPA) when conducting dredged material disposal and site designation.[33]

The 1975 case of Natural Resources Defense Council, Inc. v. Callaway[34] remains significant today because it concerned a conflict over the dumping of dredged spoils at NLDS in Long Island Sound. In Callaway, the Second Circuit found that the Navy, the Corps and others had violated NEPA by failing to consider the cumulative effects of other dumping projects in Long Island Sound for a dredging project proposed by the Navy. The final environmental impact statement (FEIS) prepared by the Navy had only evaluated the environmental impact of a specific dredging and dumping project. The Court found that the Navy's failure to analyze the effects of such other dumping projects rendered the FEIS "deficient."[35] The Court cautioned that an agency cannot treat "a project as an isolated 'single-shot' venture in the face of persuasive evidence that it is but one of several substantially similar operations, each of which will have the same polluting effect in the same area. To ignore the prospective cumulative harm under such circumstances could be to risk ecological disaster." *id*. at 88. If other projects are closely enough related so that they are "expected to produce a cumulative environmental impact", such impacts must be evaluated as a whole, under NEPA's "comprehensive evaluation" requirement.[36] The Court concluded that the Navy's failure to do so constituted "isolated decision making sought to be eliminated by NEPA." [37]

Dumping in Long Island Sound was also at issue in a 1988 case entitled Town of Huntington v. Marsh.[38] The case was reviewed under the Ambro amendment which required that the dumping of dredged material in Long Island Sound by federal agencies, or by private parties whose projects exceed 25,000 cubic yards of waste, be subject to the provisions of the ODA. In Town of Huntington, the Second Circuit found violations of both NEPA and the ODA, as a result of deficiencies in EIS procedures. As in Callaway, the EIS was deemed to be insufficient under NEPA for failing to assess the cumulative effects of other dredge material disposal projects in Long Island Sound. The court cautioned against "segmentation" of projects and stated that such a

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[33] See Town of Huntington v. Marsh, 859 F.2d 1134, 1135 (2nd Cir. 1988) where the Second Circuit Court of Appeals observed:

> "The Long Island Sound (the "Sound") is host to a myriad of recreational and industrial uses, including swimming, boating and fishing. Recreational users, commercial fisheries and environmentalists share a sometimes uneasy coexistence with use of the Sound as a waste dumping ground. Marinas and harbors which line the Sound must be dredged periodically to provide safe berthing for pleasure craft, commercial fishing boats, and military ships. The spoil from these dredging operations has for decades been dumped into the Sound. This litigation arises out of the ongoing effort of citizens and the federal government to balance the use of the Sound as a waste dumpsite with the need to protect its increasingly fragile waters."

See also Town of Huntington v. Marsh (II), 884 F.2d 648 (2nd Cir. 1989).

[34] 524 F.2d 79 (2nd Cir. 1975).

[35] Id. at 87.

[36] Id. at 89.

[37] Id. at 89.

[38] 859 F.2d 1134 (2nd Cir. 1988).

process is to be "avoided." [39] The Court stated that it was improper to defer a cumulative effects analysis when *designating a new open water disposal site*.[40]

DOS Actions and Involvement to Protect the Sound

On March 8, 2004, EPA submitted to DOS a consistency determination that its designation of two Long Island Sound dredged material disposal sites, Central Long Island Sound (CLDS) and Western Long Island Sound (WLDS), would be consistent with New York's Coastal Management Program. On June 3, 2004, in accordance with the CZMA, DOS objected to EPA's designation of CLDS and WLDS.[41] In that objection, DOS pointed out that EPA had not adequately addressed the availability of alternatives to open-water disposal of dredged materials in the Sound or analyzed the cumulative impacts of historic dump sites and decades of dumping events on Long Island Sound. DOS called for EPA and Corps to prepare a comprehensive plan for managing dredged material in the region to identify the alternatives to open water dumping.

On May 15, 2004, following negotiations with federal and State agencies, DOS agreed to withdraw its federal consistency objection in return for the insertion of certain terms and conditions in the EPA 2005 Final Rule. Those terms and conditions required restrictions on the use of CLDS and WLDS for all federal dumping projects and those for private applicants exceeding 25,000 cubic yards. The agreement was intended to reduce or eliminate the disposal of dredged materials in Long Island Sound.[42]

On June 3, 2005, EPA issued the 2005 Final Rule,[43] which directly linked the continued use of the two new open water disposal sites to a requirement that the Corps prepare and complete a regional Long Island Sound Dredged Material Management Plan (DMMP) by June 2013. The DMMP was to achieve the "goal of reducing or eliminating the disposal of dredged material in Long Island Sound" by identifying alternatives to open-water disposal.[44] The Final Rule also

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[39] I*d*. at 1142.

[40] I*d*. at 1143 (italics added). See also Conservation Law Foundation v. Watt, 560 F. Supp. 561, 577 (Dist. Ct. of Mass. [March 28, [1983]). In Conservation Law Foundation, the U.S. Department of the Interior separated future actions of lease sales on the Outer Continental Shelf, to take place at a future date from the lease plan it submitted to Massachusetts for consistency review under CZMA (15 C.F.R. Part 930 Subpart C). The Court rejected the Department of Interior's segmentation of the lease plan from the activities that would to take place pursuant to the plan and found that "[h]owever, even at this early stage in the procedure, I find that it is simply insufficient for the Secretary [of the Interior] to base a finding of consistency on similar aims and goals between the State and federal regulatory schemes and the admittedly significant amount of state participation to come in the future. If that participation is to be meaningful overall, it must be considered at every stage, including this one. Therefore, I find that the Secretary has failed to articulate a proper basis for his finding that the proposed Lease Sale is consistent with the Massachusetts Coastal Zone Management Program, and I conclude that he has failed to discharge his obligations under the Coastal Zone Management Act." As the Secretary of the Interior was found to have erred in segmenting associated future actions to take place within a federal agency activity subject to CZMA consistency review, the EPA here has also improperly segmented the anticipated dredged disposal activities from consideration in this rulemaking.

[41] See Letter dated June 3, 2004 from George Stafford, Director, Division of Coastal Resources to Linda M. Murphy, Director, Office of Ecosystem Protection, U.S. Environmental Protection Agency, Region 1.

[42] See Objection withdrawal letter from George Stafford, Director, Coastal Resources Division, to Linda M. Murphy, Director, Office of Ecosystem Protection, U.S. Environmental Protection Agency, Region 1. The letter contains an Appendix A inclusive of fourteen (14) restrictions of the use open water disposal in Long Island Sound.

[43] 70 Fed. Reg. 32498-01 (June 3, 2005); see also 40 C.F.R. § 228.15(b)(4)(vi)(C) [2005].

[44] The Preamble to the EPA Final Rule states, "the DMMP for Long Island Sound will include the identification of alternatives to open-water disposal and the development of procedures and standards for the use of practicable alternatives to open-water disposal, so as to reduce wherever practicable the open-water disposal of dredged material … [and] also may contain recommendations regarding the use of the sites themselves." This goal was reiterated in

made clear that the failure to complete the DMMP on time would result in CLDS and WLDS losing their ODA § 102 designations.[45]

Despite many meetings, as well as participation and comments submitted by New York State, Connecticut, and members of the public, the Corps issued a DMMP that recommended a continuation of open water dumping and the designation of three or more disposal sites. Ignoring its mandate, the DMMP failed to identify, primarily on the basis of cost, any practicable alternatives to open water disposal other than beach nourishment with coarse sand.

On November 2, 2009, DOS objected to the U.S. Department of Navy's use of NLDS to dispose of approximately 170,000 cubic yards of dredged material from a Confined Aquatic Disposal cell in the Thames River. DOS found that the disposal of the dredged material was not consistent with the Long Island Sound coastal policies. The Navy subsequently disposed of the material at CLDS.[46]

In 2011, a provision for five-year interim extensions for NLDS, pursuant to ODA § 103(b) was set forth in an omnibus appropriations bill for the Corps, the Military Construction and Veterans Affairs and Related Agencies Appropriations Act, 2012 (PL 112-74) section 116. The temporary authorization allowed the Corps to use NLDS for open water disposal and stated that EPA would use the five-year time period to complete a supplemental environmental impact statement (SEIS) for eastern Long Island Sound. Within the last five years, DOS has issued numerous objections to disposal projects headed to NLDS.[47]

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the Long Island Sound "Project Management Plan for Regional Dredged Material Management Plan" (LIS DMMP PMP), as issued in October of 2007 (*see* LIS DMMP PMP § 1.4, "LIS DMMP Goals and Objectives").

[45] The central and western disposal sites (CLIS and WLIS, respectively) were renamed during the DMMP process to the Central Long Island Sound and Western Long Island Sound Disposal Sites (CLDS and WLDS).

[46] In 2006, the Navy failed to follow the consistency review process when it disposed of the sediments from the CAD cell for a SUBASE project at NLDS. (See 15 C.F.R. § 930.36(a)) The Navy violated the CZMA when it conducted the dredged material disposal without obtaining a consistency concurrence from New York State. The Navy also failed to provide DOS with a consistency determination for the 2008 proposed federal agency activity until NY specifically requested the Navy's submission. See Letter dated July 22, 2009 from Fred Anders, Chief Natural Resources Management Bureau, DOS, to Diane Ray, U.S. Department of the Army, Corps of Engineers/New England District informing the Corps of DOS's intent to review the U.S. Navy activity involving the proposed disposal of 237,000 cubic yards at NLDS because DOS "determined that this federal agency activity within New York and Connecticut waters will have reasonably foreseeable effects on uses and resources in New York's coastal area."

[47] **F-2014-0047** – Objection to consistency certification of Gwenmor Marina, Stonington, Ct. to dispose of 13,500 cubic yards (c.y.) of dredged material at NLDS (suitability determination showed that sediments contained 3.5 to 10 times the levels of cadmium present at the NLDS); **F-2014-0109 (DA**), Objection to consistency certification of U.S. Army Corps of Engineers to place 250,000 c.y. of dredged material from the Mystic River Federal Navigation Project, Groton and Stonington, Ct. at NLDS (suitability determination showed elevated concentrations of arsenic, cadmium, chromium, copper, lead, mercury, zinc, pesticides (4,4'DDD ; 4,4'DDE ; 4,4'DDT) and PAHs that were identified in the FNP sediment as compared to the NLDS reference values); **F-2014-0254-** Objection to consistency certification of Town of Stonington, Ct., to place 13,300 c.y. of dredged material from the Primary Auxiliary Channel, Upper Mystic Harbor at NLDS (suitability determination showed that sediments contained between 3.8 to 7.8 times the levels of cadmium, 2.4 to 2.8 times the levels of copper, and up to 2 times the levels of mercury present at the NLDS); **F-2014-0255** – Objection to consistency certification of Town of Stonington, Ct., to place 6,340 c.y. of dredged material from the Secondary Auxiliary Channel, Upper Mystic Harbor at NLDS (suitability determination showed that sediment contained 5.6 to 8.6 times the levels of cadmium and up to 2.4 times the levels of copper present NLDS); **F-2014-0279** – Objection to consistency certification of Spicer's Marina, Noank, Ct. to place 16,000 c.y. of silty dredged material at NLDS (suitability determination showed that sediments contained 2 times the levels of cadmium and copper present at the NLDS); **F-2014-0434** - Objection to consistency certification of Mason Island Landing, LLC, Stonington, Ct. to place 13,238 c.y. of dredged material at NLDS (suitability determination showed that dredged material contains over 2 times the levels of cadmium, copper, and mercury

On July 7, 2016, EPA issued an Amended Final Rule permanently designating two open water sites for the disposal of dredged materials in the Central and Western Regions of Long Island Sound. DOS concurred with this rule only after EPA agreed to place restrictions on the use of the two sites to help meet the goal of reducing or eliminating dredged material disposal in the open waters of Long Island Sound and set standards and procedures to promote the development and use of practicable alternatives to open-water disposal, with measureable reductions in open water disposal over time - a goal EPA disregarded when it issued the EPA Proposed Rule on April 27, 2016.

Town of Southold LWRP

The Southold LWRP's enforceable coastal policies guide federal and state agencies in their decision-making responsibilities for activities affecting the town's coastal resources.

In its consistency determination, EPA provided a cursory discussion of the consistency of designating one or more open-water disposal site in eastern Long Island Sound with the Southold LWRP generally. EPA did not address the specific local policies.[48] Despite its failure to perform an LWRP policy analysis, EPA broadly concluded that the proposed designation is consistent to the maximum extent practical with the LWRP's enforceable coastal policies. By contrast, DOS carefully considers both the LIS CMP and the LWRPs policies in the policy analysis section below.

The Southold LWRP anticipates and specifically addresses EPA's possible designation of an open water disposal site in the eastern Sound. Under the CZMA, EPA had an opportunity to review Southold's LWRP as part of the routine program change process and did not object to its content. This LWRP passage is relevant to the interpretation of the LWRP policies:

> The Town also requests cooperation and support from federal agencies such as the U.S. Environmental Protection Agency, the U.S. Navy and the U.S. Army Corps of Engineers during the review of dredging and dredging disposal projects proposed within or near Town waters. Of primary concern are projects where contaminated underwater land may be dredged (or contaminated sediment disposed of) near highly productive and pristine

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present at the NLDS); **F-2014-0435 -** Objection to consistency certification of Pine Island Marina, Groton, Ct. to dispose of 21,545 c.y. of dredged sediments at NLDS (suitability determination showed that sediments contained over 2 times the levels of arsenic, 2.8 to 3.2 times the levels of cadmium, up to 4.2 times the levels of copper, over 2 times the levels of zinc, over 2 times the levels of 13 PAHs than those present at the NLDS); **F-2012-0691** - Objection to consistency certification of Noank Village Boat Yard, Groton, Ct. to dispose of 9,000 c.y. of dredged material at the NLDS (suitability determination showed that sediment contained 5.5 to 8.0 times the levels of cadmium present NLDS); **F-2009-0645(DA) -** Objection to consistency certification of Navy to dispose of ~230,000 c.y. of dredged material from the Thames River at NLDS (no suitability determination for the CAD cell material was conducted or provided however the Thames River sediments were composed of 50/50 silt and clay, to which contaminants readily adhere); and **F-2009-0140 -**Objection to consistency certification of Fishers Island Yacht Club, Southold, NY to dispose of ~19,000 c.y. of material at NLDS (suitability determination showed that sediments contained low levels of PCBs and elevated mercury levels; source and chemical analysis of cap material not disclosed). Also, in **F-2014-0123,** New York conditionally concurred with the consistency certification of the Shennecosset Yacht Club, Groton, Ct. to dispose of ~9,000 c.y. of clean sediments provided that the disposal site was changed from NLDS to CLIS.

[48] EPA stated: "Although a separate discussion of the Southold LWRP is not necessary because of the above discussion of the LIS CMP, EPA discusses the Southold LWRP below just to be doubly sure of the adequacy of this determination." pp. 38-39.

fisheries resource areas. A case in point is the dredging of the mouth of the Thames River near Groton and the disposal of that dredged material near the Fishers Island Race.

The dredging issue is of central importance because Long Island Sound has been designated an estuary of national significance under the *National Estuary Program*. Pursuant to that designation, millions of dollars have been and will continue to be spent to improve the water quality and to protect the ecosystem from further degradation. The eastern portion of Long Island Sound, including Fishers Island Sound, consists of and supports some of the most physically and biologically diverse marine environments in the State of New York. Accordingly, this region supports lucrative commercial and recreational fishing and shellfishing industries.

Deposition of the dredged material from this channel to the NLDS is of concern because of the extent of the material, (millions of cubic yards), its contaminated nature, and its location relative to physically dynamic, biologically diverse and heavily fished waters. Since 1981 and 1990, the *Ocean Dumping Act* (ODA) has been in effect in Long Island Sound. However, the NLDS has not been formally designated as an approved disposal site in accordance with that act. It is the Town's position that the New London site does not meet the criteria set forth in the ODA, and therefore should be closed to future depositions of dredged material. The standards of the ODA ought to be upheld, not circumvented by federal agencies.[49]

EPA's Proposed Rulemaking for the Permanent Designation of Eastern Long Island Sound Disposal Sites

On October 16, 2012, EPA published a Notice of Intent to prepare a supplemental environmental impact statement (SEIS) identifying site(s) in Eastern Long Island Sound for potential designation under ODA § 102(c).[50] On October 22, 2012, DOS accepted EPA's request to serve as a cooperating agency in the preparation of the SEIS under the following conditions: "DOS reserves all of its statutory rights and jurisdictional authority as New York's CZMA administrator, including but not limited to the ability to seek judicial review of its federal consistency decisions in federal court as it relates to any EPA proposed open water disposal site designations (Marine Protection, Research, and Sanctuaries Act §1412) arising from the completion of the ELDS SEIS or to otherwise legally challenge the content, sufficiency or scope of the information and analyses contained in the ELDS SEIS and subsequent Record of Decision."[51]

In designating dredged material disposal sites, the EPA Administrator is required to choose a site that will "mitigate adverse impact on the environment to the greatest extent practicable."[52] Before such designation, EPA must prepare a site management plan that includes:

> "(A) a baseline assessment of conditions at the site; [and]

[49] Southold LWRP Section II – K pp.25- 26.
[50] 77 Fed. Reg. 63312 [Oct. 12, 2012].
[51] Letter from George Stafford, Deputy Secretary of State to H. Curtis Spalding, EPA Region 1 Administrator (July 27, 2012).
[52] 33 U.S.C. § 1412(C)(1).

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(D) consideration of the quantity of the material to be disposed of at the site, and the presence, nature, and bioavailability of the contaminants in the material;"[53]

To meet this directive, EPA must consider both the quantity and quality of the material to be disposed of at ELDS over the next 30 years. EPA projects that, during that time period, approximately 13.5 million cubic yards of fine-grained sediment will be classified as "suitable" for open water disposal, a huge quantity that vastly exceeds the total amount dumped at NLDS in more than 6 decades.[54] If past practice is any guide, ELDS is expected to receive most, if not all, of the sediment from the New London Dredging Center.[55]

On September 17, 2014, DOS submitted comments on the Physical Oceanography Study Report prepared for the Draft Supplemental Environmental Impact Statement (DSEIS) that focuses on several deficiencies, including: the absence of supporting field data or an analysis thereof used to inform the sediment transport model; the lack of quantitative evidence that the sample sizes collected were adequate for performing statistical analyses; the failure of the data to account for seasonal differences; the failure to address sediment transport in the water column versus on-bottom transport stresses; and gaps in the statistical analysis.[56] EPA did not address these deficiencies in the DSEIS. DOS also submitted comments on the DSEIS on November 6, 2013 (Fishing Survey) and July 10, 2013 (Biological Characterization) citing the numerous deficiencies of those sections of the SEIS as well.[57]

On March 4, 2016, DOS and New York State Department of Environmental Conservation (DEC) issued joint comments to EPA on the pre-draft of the Eastern Long Island Sound DSEIS. These comments also highlighted deficiencies in the DSEIS.[58] EPA has not addressed these deficiencies.

EPA's Consistency Determination

On July 20, 2016, DOS received the EPA Determination, which concluded that EPA's proposed designation of a third dredged material disposal site in eastern LIS is consistent with the enforceable policies of New York's Coastal Management Program. In its determination, EPA relied on a number of arguments to support its reasons for concluding that the designation of

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[53] 33 USC § 1412(C) (3).

[54] EPA Region 1 Determination of Federal Action's Consistency with Enforceable Policies of New York's Coastal Zone Management Program (July 20, 2016) p. 16. EPA estimates that 9.1 mcy are projected to be coarse-grained sand that also meets MPRSA and CWA standards for aquatic disposal.

[55] DMMP Table 5-35 - New London Area Dredging Center - Available/Potential Placement Alternatives (DMMP pp. 5-51 and 5-52**.)** "For the purposes of this DMMP, the Navy's improvement dredging materials and the Coast Guard's maintenance materials [from the Thames River] will be assumed to be suitable for open water placement or any other use for fine-grained suitable materials." (DMMP p. 5-50.)

[56] See Letter dated September 17, 2014 from Jeffrey Herter, Asst. Director of Development Division, DOS, to Jean Brochi, U.S. EPA, Region 1.

[57] DOS comments includes "[DOS] believes that the Report will be seriously flawed unless these comments are appropriately addressed with the Report revised accordingly." See Letter dated July 10, 2014 from Jennifer Street, DOS Coastal Specialist to Jeannie Brochi, US EPA Region 1, "Re: New York State Department of State comments on the Eastern Long Island Sound Dredged Material Disposal Sites – Biological Characterization Final Report" (July 10, 2014). DOS has not received responses to these comments.

[58] See Letter dated March 4, 2016 from Sandra Allen, Deputy Secretary of State, Office of Planning and Development, DOS to Jean Brochi, LIS DMMP Manager, EPA, Region 1.

ELDS would be consistent to the maximum extent possible with New York's Long Island Sound policies. Two of those arguments, and New York's summary response to them, are set forth below.[59]

Disposal Conditions

EPA generally asserts that designation will not cause any adverse coastal effects. Before authorizing a given project for open-water dumping, the Corps must first find that: (a) There are no practicable alternatives (as defined in 40 C.F.R. 227.16(b)) to open-water disposal in Long Island Sound, and that any available practicable alternative to open water disposal will be fully utilized for the maximum volume of dredged material practical; and (b) The dredged material satisfies the applicable environmental impact criteria specified in EPA's regulations at 40 C.F.R. part 227. See 40 C.F.R. 227.1(b), 227.2 and 227.16.

Objectively, both factors appear reasonable. However, there are problems in the details.

a. *No Practicable Alternatives (as defined in 40 C.F.R. 227.16(b))*

The proposed EPA regulation designating ELDS has been written to allow the Corps to use cost alone to judge the practicability of an alternative to open water disposal. § 40 C.F.R. § 227.16(b) provides that ocean dumping "will be considered to have been demonstrated when a thorough evaluation of the factors listed in § 227.15 has been made," and the Corps' District Engineer has determined that waste treatment or storage technologies are unavailable which could otherwise reduce open water disposal of dredged materials.

> (b) …[W]aste treatment or improvements in processes and alternative methods of disposal are practicable <u>when they are available at reasonable incremental cost and energy expenditures</u>, which need not be competitive with the costs of ocean dumping, taking into account the environmental benefits derived from such activity, including the relative adverse environmental impacts associated with the use of alternatives to ocean dumping.

Cited above, 40 C.F.R. § 227.15 sets forth factors in the consideration of open water disposal, which include:

> (c) The relative environmental risks, impact and <u>cost</u> for ocean dumping as opposed to other feasible alternatives.

As discussed further below, the reliance on cost as a factor in the selection of alternatives for individual disposal decisions will lead to open water disposal as a preferred option every time. The cost of disposing of dredged sediments from the Thames River and New London Harbor at ELDS will always be cheaper than any alternative, even if the alternatives were latch-key or shovel-ready.

b. *Dredged materials satisfy the applicable environmental impact criteria.*

[59] EPA's individual policy analyses will be dealt with later in the policy discussion.

The EPA Determination states that, following site designation, the Corps' compliance with the ODA's strict dumping protocols will protect the marine environment:

> Designating the ELDS would make a dredged material disposal site available, when needed, for the management of suitable dredged material from the eastern region of Long Island Sound. Dredged material is only suitable for placement at a site designated by EPA under the MPRSA if the material satisfies the rigorous sediment quality criteria of EPA's regulations under the MPRSA. See 40 C.F.R. Part 227. Thus, even if the proposed designation of the ELDS (or another site or sites) is finalized, any specific proposal to place dredged material at the site will still have to go through a separate, case-specific review and authorization process. See 33 U.S.C. §1413; 40 C.F.R. Part 227.

Compliance with the rigorous sediment quality criteria of the MPRSA/ODA has been the rule since 1980, when the Ambro amendment was enacted into law. Whether dredged material is disposed of at an ODA § 102 designated site or an ODA § 103(b) Corps' selected alternative site, the dredged material must meet all testing criteria in 40 C.F.R. Part 227, Subpart B, which sets forth the limitations on the disposal of certain types of materials and sets forth the standards for the disposal of such material in open sites. However, while the proposed rule includes a statement that "the dredged material from each proposed disposal project will be subjected to MPRSA and/ or CWA sediment testing requirements to determine its suitability for possible

open-water disposal at an approved site"[60], 40 C.F.R. § 227.13(b) and 40 C.F.R. § 230.60(b) provide the testing exemptions for dredged material that would negate this reassurance.[61] [62]

The proposed EPA rule would also permit the open water placement of "s*uitable fine-grained material,"* which it explains "typically has greater than 20 to 40 percent fine content but has been determined to be suitable for open-water placement by testing and analysis." Contaminants adhere to fine grained sediments and the suitability may not be environmentally safe to place them for unconfined open water disposal. EPA allows this practice to continue in the proposed Rule:

> Materials dredged from upper river channels in the Connecticut, Housatonic and Thames Rivers should, whenever possible, be disposed of at existing Confined Open Water sites, onshore, or through in-river placement. <u>If no other alternative is determined to be practicable, suitable fine-grained material may be placed at the designated sites</u>.[63]

DOS's Conditional Concurrence with EPA's Designation of WLDS and CLDS

The EPA Determination repeatedly cites to New York's concurrence with conditions with EPA's designation of WLDS and CLDS. New York did in fact conditionally concur subject to the requirement that EPA "establish additional procedures and standards that will result in clear,

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[60] See 81 FR 24749; see also 40 C.F.R. § 227.1(b). "With respect to the criteria to be used in evaluating disposal of dredged materials, this section and subparts C, D, E, and G apply in their entirety. To determine whether the proposed dumping of dredged material complies with subpart B, only §§ 227.4, 227.5, 227.6, 227.9, 227.10 and 227.13 apply."

[61] 40 C.F.R. § 227.13 (b) Dredged material which meets the criteria set forth in the following paragraphs (b)(1), (2), or (3) of this section is environmentally acceptable for ocean dumping without further testing under this section:

> (1) Dredged material is composed predominantly of sand, gravel, rock, or any other naturally occurring bottom material with particle sizes larger than silt, and the material is found in areas of high current or wave energy such as streams with large bed loads or coastal areas with shifting bars and channels; or
> (2) Dredged material is for beach nourishment or restoration and is composed predominantly of sand, gravel or shell with particle sizes compatible with material on the receiving beaches; or
> (3) When: (i) The material proposed for dumping is substantially the same as the substrate at the proposed disposal site; and (ii) The site from which the material proposed for dumping is to be taken is far removed from known existing and historical sources of pollution so as to provide reasonable assurance that such material has not been contaminated by such pollution.

See 40 C.F.R. § 230.60(b). Subpart G of the CWA 404(b)(1) Guidelines provide for testing exemptions of the dredged material sediment composition is similar to that of the open water disposal site. See also DSEIS at p. 1-12. "National guidance for determining whether dredged material is acceptable for open-water disposal is provided in the Ocean Testing Manual (Green Book; USEPA and USACE, 1991) and in the Inland Testing Manual (USEPA and USACE, 1998). The Regional Implementation Manual, consistent with the Green Book and the Inland Testing Manual, provides specific testing and evaluation methods for dredged material projects at specific sites or groups of sites (USEPA and USACE, 2004c)"; See also DSEIS, Appendix G, "Physical and Chemical Properties of Sediments in Eastern Long Island Sound", which contains a complex inventory of sediments that can be used when "(i) The material proposed for dumping is substantially the same as the substrate at the proposed disposal site; and (ii) The site from which the material proposed for dumping is to be taken is far removed from known existing and historical sources of pollution so as to provide reasonable assurance that such material has not been contaminated by such pollution." 40 C.F.R. § 227.13(b)(3).

[62] As noted elsewhere in this decision, DOS has on numerous occasions objected to the consistency of dredged projects proposed by the Corps, the Navy and private applicants on the basis that the materials contained contaminants, including heavy metals that exceeded MRPSA/ODA standards. That the federal agencies themselves were the project sponsors raises serious questions about how seriously the Corps is following the rigorous standards of the ODA and how seriously it will follow them in the future.

[63] 80 FR 24764. See also, EPA Region 1 Determination of Federal Action's Consistency with Enforceable Policies of New York's Coastal Zone Management Program (July 20, 2016) p.7.

staged reductions in open water disposal of dredge material over time," and EPA altered its rule accordingly. However, New York made clear in its conditional concurrence that these conditions were specific for CLDS and WLDS only.[64], [65]

Inclusion of the same conditions in the EPA Proposed Rule cannot not override the fact that, under an objective analysis, ELDS cannot meet the ODA criteria, due to its shallow waters (less than 40 feet in places),[66] vulnerability to storm wave action, strong tidal currents (the Race has some of the strongest on the East Coast),[67] and location near a major military and commercial navigation channel, surrounded by finfish and shellfish habitats, fisheries and aquaculture sites.[68]

Unlike CLDS and WLDS, ELDS has never been designated an ocean disposal site by EPA under the ODA. The Corps has used the area for placement of often contaminated sediments without first complying with the public notice, public comment and designation requirements for interim or alternate sites under the ODA, or complying with the consistency provisions of the CZMA. This EPA rulemaking presents a belated first opportunity for New York to voice its strong opposition to sanctioned dumping of dredged sediments in eastern Long Island Sound.

State Issues with Respect to Impacts from the Dumping Dredged Materials and the Designation Process for ELDS

A number of issues have been central to New York's concerns with open water disposal of dredged material in Long Island Sound and have been raised repeatedly by State agencies in comment letters and consistency decisions. These issues are discussed below and have been integrated more specifically into the individual policy analyses that follow.

Reduce and Eliminate Open Water Disposal of Dredged Materials

In a joint letter[69] dated February 8, 2005, then New York Governor Pataki and Connecticut Governor Rell wrote to the Commanding General of the Corps requesting that the North Atlantic Division develop a Dredged Material Management Plan (DMMP) to address the management of dredged material for the Sound region. The Governors urged the Corps to "identify feasible and environmentally sound alternatives and establish future protocols for dredged material management,… [which] include, but are not limited to, reducing sediment sources, reducing

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[64] See Conditional Concurrence dated April 25, 2016 from Sandra Allen, Deputy Secretary of State to Mel Coté ("The conditions included in this letter are specific for CLDS and WLDS only").

[65] Both WLDS and CLDS have been designated and have served as ocean disposal sites for 11 years, are situated far from New York waters and are located in the most heavily polluted region of Long Island Sound. See Mitch AA, Anisfeld SC, "Contaminants in Long Island Sound: data synthesis and analysis."
Est Coasts 33:609–628 (2010); "Metals, Organic Compounds, and Nutrients in Long Island Sound: Sources, Magnitudes, Trends, and Impacts" Johan C. Varekamp, Anne E. McElroy, John R. Mullaney and Vincent T. Breslin, Chapter 5, J. S. Latimer et al. (eds.), Long Island Sound (2015).

[66] See 40 C.F.R. § 228.5(e) "EPA will, wherever feasible, designate ocean dumping sites beyond the edge of the continental shelf and other such sites that have been historically used."

[67] See 40 C.F.R. § 228.6(a)(6) "Dispersal, horizontal transport and vertical mixing characteristics of the area, including prevailing current direction and velocity, if any".

[68] See 40 C.F.R. § 228.5(a) "The dumping of materials into the ocean will be permitted only at sites or in areas selected to minimize the interference of disposal activities with other activities in the marine environment, particularly avoiding areas of existing fisheries or shellfisheries, and regions of heavy commercial or recreational navigation.; 40 C.F.R. § 228.6(a)(2) "Location in relation to breeding, spawning, nursery, feeding, or passage areas of living resources in adult or juvenile phases."

[69] Joint letter from Governors George E. Pataki and M. Jodi Rell to General Strock, Chief of Engineers, February 8, 2005.

contaminant loading, and developing feasible beneficial reuses for dredged material*, with the goal of reducing or eliminating the need for open water disposal*."[70]

More than 10 years and $7 million later, the DMMP prepared by the Corps ignored the Governors' directive and simply recommended permanent designation of multiple dumpsites in the Sound, guaranteeing the open water placement of millions more cubic yards of sediments. Instead of "reducing sediment sources, reducing contaminant loading, and developing feasible beneficial reuses for dredged material with the goal of reducing or eliminating the need for open water disposal", the final DMMP merely reflected the Corps' determination to dump, in the cheapest manner possible, in the Sound.

EPA's recent designations of WLDS and CLDS in July 2016, and its current effort to designate additional sites in eastern Long Island Sound, make clear that EPA is willing to facilitate the Corps' preferred approach, which favors open water disposal over all other disposal options on the basis of cost alone. This approach ignores EPA's directive to "mitigate adverse impacts on the environment to the greatest extent practicable," when determining whether to designate a potential site. The effort to designate additional sites based on a perceived need for additional capacity necessarily assumes that alternatives will not be developed and, therefore, reduction and elimination of open water disposal will not take place.

EPA has provided no scientific evidence or explanation, in either its consistency determination or in the DSEIS, that shows how designating a new site and thereby authorizing permitting for subsequent open water disposal of contaminated and non-contaminated sediments "will ensure protection of waters" in the Sound or reduce or eliminate open water sediment disposal. It is illogical to contend that designating a third or fourth disposal site will somehow "ensure protection of the waters of Long Island Sound" and "help reduce or eliminate open-water dredged material disposal in the Sound over time." It would do exactly the opposite.

New York has not wavered in its steadfast opposition to open water disposal in Long Island Sound and its continued commitment to reducing or eliminating such disposals.[71] DOS's prior consistency objections have reflected New York's intention to prevent further pollution of the Sound's benthic environment and its adherence to the overriding policy objective that has, without exception, focused on use of alternatives over open water disposal.[72]

EPA's Failure to Consider Viable Alternatives to Open Water Disposal in Long Island Sound

Despite the clear requirement that EPA adhere to the ODA's site selection criteria, EPA appears to have ignored these criteria. Much of EPA's justification for the designation of ELDS is based on the DMMP's conclusion that there are no readily available practicable alternatives to open water disposal that can handle the dredged material from eastern Long Island Sound. EPA argues that because none of the alternatives identified in the DMMP can individually handle all sediments dredged in the future, the only option is to designate an open water disposal site. In its explanation of this rulemaking, EPA stated:

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[70] Id.

[71] See past communications to federal agencies: October 16, 2015 letter to Megan Quinn Project Manager, LIS DMMP Comments on the Public Review Draft DMMP and PEIS; and Joint letter of DOS and DEC July 18, 2016 letter to Jean Brochi, EPA, providing comments on DSEIS for ELDS, the draft Site Management and Monitoring Plan, and the proposed rule for the designation of one or more open water Dredged Material Disposal Site(s) in Eastern Long Island Sound, Connecticut and New York.

[72] See footnote 47.

> While the DMMP and associated PEIS identified potential alternatives to open-water disposal for some amount of dredged material from the waters of Long Island Sound, these reports also make clear that the alternatives to open-water disposal (e.g., beneficial use alternatives, upland and confined in-water disposal) do not provide sufficient capacity to handle the full amount of material expected to be dredged from the central, western and eastern regions of Long Island Sound, either individually or collectively. In light of this, and other factors, EPA decided not to forego designating … ELDS.[73]

During the DMMP development process, the Corps determined that "[t]he total estimated dredged material disposal needs for the eastern Long Island Sound region (i.e., ports and harbors of Connecticut, New York, and southwestern Rhode Island, located within the ZSF) over the next 30 years are 22.6 million cubic yards (cy), or 17.3 million cubic meters (m3)."[74] The DMMP evaluated numerous sites within the Zone of Siting Feasibility (ZSF) including the following:

Site Name[75]	Capacity (cubic yards)
Shoreline CDF Norwalk Outer Harbor Islands – Marsh	930,000
Shoreline CDF Norwalk Outer Harbor Islands – Shore	400,000
CAD Sherwood Island Borrow Pit	750,000
Island CDF New Haven Breakwaters	58,250,000
Island CDF Falkner Island	17,180,000
Shoreline CDF Clinton Harbor	700,000
Island CDF Duck Island Roads	1,610,000
Island CDF Twotree Island	3,400,000
Island CDF Groton Black Ledge	7,500,000

Total capacity = 90,720,000 cubic yards

Despite the DMMP's identification of the above alternatives for eastern LIS, which clearly show sufficient potential capacity, the DSEIS eliminated those alternative sites identified in the DMMP and selected ELDS as the preferred alternative for receipt of all projected dredged material for the next 30 years.[76]

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[73] DSEIS at p. 1-2. "A review of reports prepared in support of the LIS DMMP (i.e., the dredging needs report and alternatives reports) helped USEPA determine that the amount of dredged material expected to be collected over the next 30 years far surpasses the capacity of all of the possible alternatives to open-water disposal (see Chapters 2 and 3)." In selecting ELDS as the preferred alternatives, EPA misapplies 40 C.F.R. § 228.6(a)(4) to mean that an alternative, whether open water or beneficial use, be capable of receiving the entire anticipated quantity of dredged material for the next 30 years. See DSEIS at p. 3-27. "*Site Dimension* [40 C.F.R. 228.6(a)(4)]: Alternative sites were evaluated based on the need and capacity using a minimum area of 1 nmi2 (3.4 km2), and adequate capacity to accommodate the dredged material disposal needs over the next 30 years." See also DSEIS at p. 1-2. "A review of reports prepared in support of the LIS DMMP helped USEPA determine that the amount of dredged material expected to be collected over the next 30 years far surpasses the capacity of all of the possible alternatives to open-water disposal". However, the 40 C.F.R. § 228.6(a)(4) criterion applies *only* to the selection of open water disposal sites and only requires the consideration of the type and quantity of material and not the requirement for the site to accommodate the entirety of all future anticipated dredging needs for a region.

[74] See EIS at p. ES-4.

[75] See DMMP, sections 5 and 6, Table 5-35; see also DSEIS at § 3.2.5 "Dredged Material Containment Facilities". Table 3-5 identifies 30,390,000 mcy of capacity at potential containment facilities in eastern LIS.

[76] Neither the EPA nor the DMMP appropriately explain why certain combinations of alternative technologies aren't even considered as alternatives to disposal of sedimentary waste. For example, one alternative site that is available to and capable of receiving dredged materials from Long Island Sound is the innovative sediment decontamination

EPA has also provided conflicting reasons for rejecting alternate disposal sites as practicable alternatives. For example, EPA deemed the Rhode Island Sound Disposal Site (RISDS) to be "infeasible" for receipt of dredged material from eastern LIS, due to its close proximity to nearby communities. As a result, EPA eliminated RISDS as an alternative for eastern LIS in the DSEIS. (RISDS is located approximately 9.1 nmi (16.8 km) south-southeast of Point Judith, Rhode Island, and approximately 11.3 nmi (21 km) south of the entrance to Narragansett Bay). [77] At the same time, EPA did not exclude ELDS for these same reasons, even though ELDS is a mere 1.4 nmi (2.6 km) from Fishers Island, NY. EPA has provided no additional information or rationale to support its conflicting conclusion that RISDS, an EPA designated site that has received 5 million cy of dredged material since 2004, is unsuitable as an open water alternative while EPA seeks to designate ELDS, a site that is six times closer to New York local communities.

Through the elimination of all possible alternatives, or the combination of alternative, on a number of suspect and questionable grounds, EPA has improperly skirted the requirements of the ODA and the CZMA.

The DMMP Is Deficient

EPA has apparently relied on the DMMP, and the accompanying PEIS, to support its rulemaking. However, as DOS has previously commented,[78] these documents are flawed and should not be relied on by EPA. Instead of establishing a pathway to reduce or eliminate open water disposal in Long Island Sound, the DMMP established a pathway to achieve the opposite result by identifying the use of open water disposal sites for the next 30 years as the only practicable alternative.

The DMMP contains a list of the proposed navigation projects that are accompanied by a "Federal Base Plan".[79] The use of the open water sites would permit a significant increase in the volume of dredged material disposed of at the sites.[80] In order to ensure this outcome, the DMMP contains pre-selected "Federal Base Plans" for each of the identified federal navigation projects based upon the Corps' "Federal Standard" (33 C.F.R. § 335.7; 33 C.F.R. § 336.1(c)(1)) calculations. These plans included NLDS as the "preferred option" for the majority of the eastern Long Island Sound federal navigation projects. In fact, at the time that the DMMP was completed on January 7, 2016, NLDS had not yet been designated for receipt of dredged material in accordance with ODA § 102 (33 U.S.C. § 1412).

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facility in New York Harbor, which converts contaminated sediments into clean by-products. This alternative is already in use for one important nearby harbor, and could, if properly considered, eliminate the need for designation of an open water disposal site at ELDS and indeed, future use of the newly designated sites at WLDS and CLDS.

[77] See DSEIS, Appendix B, Sec, 3.1.

[78] See Letter dated July 10, 2015 from DOS and the NYS Department of Environmental Conservation to the Corps, New England District indicting that the then draft version of the DMMP does not achieve the goal of reduce or eliminating the use of open water disposal. See also Letter dated October 16, 2015 from Sandra Allen, Deputy Secretary of State for Planning and Development, DOS to Meghan Quinn, Project Manager, LIS DMMP Corps of Engineers/New England District provide extensive comments on the DMMP document in not achieving the 2005 Final Rule goals to reduce or eliminate open water disposal.

[79] Section 6 of the DMMP contains the listing of the "Federal Base Plans", of which a majority reflect open water disposal sites (CLDS, WLDS, NLDS) as the "preferred option".

[80] See 81 RF 24650 "The DMMP also included a detailed assessment of alternatives to open-water disposal and determined that, while all the sand generated in this region should be able to be used beneficially to nourish beaches, there are not practicable alternatives to open-water disposal with sufficient capacity to handle the projected volume of fine-grained sediment."

Impermissible Cost Determinations Under the CZMA and the ODA

Cost has pervaded the Corps' and EPA's decisions on dredged material dumping and choice of interim disposal sites in Long Island Sound for decades, and EPA has previously joined the Corps in using cost, not environmental protection, as the determinative factor in choosing to designate permanent open water disposal as the repository for often contaminated sediments from Connecticut rivers and harbors.

For example, in Callaway, the Second Circuit highlighted the Corps' overreliance on costs, and EPA's failure to challenge the Corps' decision-making. The Navy's first choice of disposal site was Brenton Reef, a site located in Rhode Island Sound that was some 23 miles from the mouth of Thames River in Connecticut. However, this choice was rejected by the Corps in favor of the closer New London site, NLDS. In rejecting the Corps arguments in favor of the disposal action at NLDS, the Court observed: "The basis for the Corps' decision is not altogether clear, but the choice seems to have been based upon economics, sketchy information regarding the extent to which sediment at the New London site was moved by currents, the fact that the latter site had been previously used, and the abandonment by EPA of its objections to disposal in Long Island Sound." The Corps' arguments, rejected by the Second Circuit 40 years ago, are still invalid today.

EPA's consistency determination makes clear that EPA has impermissibly followed the Corps' lead in dismissing any alternatives that would increase the costs of disposal. EPA explained: "EPA also considered relying on existing designated sites outside of the eastern region of the Sound, but this would contribute to prematurely using up capacity at those sites and would **increase costs**, vessel air emissions and the risk of vessel accidents."[81] In fact, WDLS, CLDS, and RISDS have sufficient capacity for the total amounts of dredged sediments planned for open water disposal over the next 30 years, even if no alternatives to open water disposal are implemented and used. And none of the balance of EPA's reasons for dismissing alternatives outside eastern Long Island Sound, including increased costs, are relevant to the selection criteria to be used in selecting a disposal site under the ODA.

The environmental costs of open water dumping are also important to consider. Long Island Sound, as a public resource, is not priced and allocated by market forces; therefore, open water dumping will always appear cheaper to the Corps than land disposal. The lands under water have no human population so it is the State that must protect its fragile benthic environment.

EPA's proposed boundary change to move ELDS entirely into Connecticut waters responds only to an imaginary political boundary; because of its semi-enclosed nature, what happens in the Sound literally stays in the Sound and affects the entire marine environment. The contaminants deposited on the Sound floor have already made their way up the food chain and have affected fish consumption. No one can seriously question that it is ecologically wiser to reprocess harmful sediments as is currently being done at the decontamination facility in NY-NJ Harbor, than to dump them in the Sound; allowing cheap open water disposal minimizes the pressures to choose the cleaner, more responsible approach.

The CZMA acknowledges that federal agencies retain their jurisdictional authorities when conducting activities affecting a coastal state,[82] however, the implementing regulations also

[81] EPA Determination at 17.
[82] See 16 U.S.C. § 1456(e).

make clear that a lack of funding or a federal agency's failure to properly budget, is not a limiting factor to avoid full consistency.[83] Federal courts have disagreed with a federal agency's general claim that a "lack of funding" meets the 15 C.F.R. Part 930 Subpart C requirement that an action be "consistent to the maximum extent practicable" with a State's enforceable coastal policies and instead held such an interpretation is noncompliant with CZMA.[84]

In brief, neither the CZMA nor the ODA permit EPA to rely on cost factors to support its site designations in eastern Long Island Sound.

The "Federal Standard" Does Not Control EPA's Action

In its proposal to designate one or more additional sites in eastern Long Island Sound, EPA has relied on the DMMP prepared by the Corps. The DMMP adhered to the "Federal Standard", which encourages use of a "lowest cost option" to the exclusion of other viable environmentally-sound alternatives.[85]

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[83] See 15 C.F.R. § 32(a)(2) and (3).

> For the purpose of determining consistent to the maximum extent practicable under paragraphs (a)(1) and (2) of [930.32], federal legal authority includes Federal appropriation Acts if the appropriation Act includes language that specifically prohibits full consistency with specific enforceable policies of management programs. **Federal agencies shall not use a general claim of a lack of funding or insufficient appropriated funds or failure to include the cost of being fully consistent in Federal budget and planning processes as a basis for being consistent to the maximum extent practicable with an enforceable policy of a management program.** The only circumstance where a Federal agency may rely on a lack of funding as a limitation on being fully consistent with an enforceable policy is the Presidential exemption described in section 307(c)(1)(B) of the Act (16 U.S.C. 1456(c)(1)(B)). **In cases where the cost of being consistent with the enforceable policies of a management program was not included in the Federal agency's budget and planning processes, the Federal agency should determine the amount of funds needed and seek additional federal funds. Federal agencies should include the cost of being fully consistent with the enforceable policies of management programs in their budget and planning processes, to the same extent that a Federal agency would plan for the cost of complying with other federal requirements.** (Emphasis added).

[84] See City of Sausalito v. O'Neill, 386 F.3d 1186, 1222 (Ninth Cir. 2004) (holding that "[t]he Park Service's and the Bay Commission's reliance on a proscribed criterion in concluding that the Fort Baker Plan is "consistent to the maximum extent possible" with the Bay Plan is a "compelling reason" for holding that the Park Service's consistency determination was improper under the CZMA . . . [as] the Park Service 'relied on factors which Congress has not intended [them] to consider,' we hold that the Park Service acted arbitrarily and capriciously with respect to its statutory obligations under the CZMA.").

[85] See 33 C.F.R. § 335.7. "Federal standard means the dredged material disposal alternative or alternatives identified by the Corps which represent the least costly alternatives consistent with sound engineering practices **and meeting the environmental standards established by the 404(b)(1) evaluation process or ocean dumping criteria**." (Emphasis added). See also 33 C.F.R. § 336.1(c)(1). "**(1)** ***Navigation and Federal standard.*** The maintenance of a reliable Federal navigation system is essential to the economic well-being and national defense of the country. The district engineer will give full consideration to the impact of the failure to maintain navigation channels on the national and, as appropriate, regional economy. It is the Corps' policy to regulate the discharge of dredged material from its projects to assure that dredged material disposal occurs in the least costly, environmentally acceptable manner, consistent with engineering requirements established for the project. The environmental assessment or environmental impact statement, in conjunction with the section 404(b)(1) guidelines and public notice coordination process, can be used as a guide in formulating environmentally acceptable alternatives. The least costly alternative,

In the final version of the DMMP, released by the Corps on January 11, 2016, the document contained, for the first time, an Appendix K entitled "USACE October 21, 2015 Guidance Memorandum on the Federal Standard" ("2015 Federal Standard Guidance" or "Guidance"). The 2015 Federal Standard Guidance was appended to only the final version DMMP after the public comment period had closed on October 16, 2015.[86]

The distinction between a federal agency Guidance document and a federal regulation is critical, as the Corps has relied upon the contents of the 2015 Federal Standard Guidance to justify its selection of open water disposal sites as the "Federal Base Plan" in the DMMP.
In the selection of open water disposal sites as the "Federal Base Plan", the Corps asserts that "[t]he 1978 guidance [the predecessor to the 2015 document] and USACE [Corps] current regulations are predicated on the essential principle that federal funds available for maintenance of federal navigation channels nationwide are limited, and thus must be allocated and spent responsibly and carefully."[87] Unlike the Corps, EPA's reliance of the Federal Base Plan to designate an open water disposal site in eastern Long Island Sound makes no sense and leads to conflict with the CZMA.

In summary, the EPA Proposed Rule endorses the elimination of existing affordable beneficial use alternatives identified in the DMMP and provides for a new and expanded open water disposal site at ELDS that would guarantee the availability of the open water disposal site as the "Federal Base Plan" and the "lowest cost" option for the open water disposal for millions of cubic yards of dredged material. By this measure, beneficial use options will be permanently relegated to an "unaffordable" and not "practicable" classification, justifying the use of open water disposal as the solution for dredged material disposal for the next 30 years.[88]

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consistent with sound engineering practices and selected through the 404(b)(1) guidelines or ocean disposal criteria, will be designated the Federal standard for the proposed project."

[86] On October 15, 2015, DOS had requested an extension of the October 16, 2015 comment period to provide additional time for the public's participation in reviewing and providing comments on the voluminous DMMP document. The Corps denied DOS's request.

[87] 2015 Federal Standard Guidance at p. K-3. The Corps' selection of open water disposal sites as the "lowest cost option" expands the scope of the definition of the "Federal Standard" in 33 C.F.R. § 335.7 in order to avoid "full consistency" with a State's enforceable coastal policies due to a lack of funding. See 16 U.S.C. § 1456(c)(1)(B); see also 65 FR 77124, 77134 [Dec. 8, 2000].

[88] In support of its proposed rule for the designation of an eastern LIS disposal site, EPA's consistency determination states that:

> Designating the ELDS (or another site or sites) would make a dredged material disposal site available, when needed, for the management of *suitable* dredged material from the eastern region of Long Island Sound. Dredged material is only suitable for placement at a site designated by EPA under the MPRSA if the material satisfies the rigorous sediment quality criteria of EPA's regulations under the MPRSA. *See* 40 C.F.R. Part 227. Thus, even if the proposed designation of the ELDS (or another site or sites) is finalized, any specific proposal to place dredged material at the site will still have to go through a separate, case-specific review and authorization process. *See* 33 U.S.C. § 1413; 40 C.F.R. Part 227.

However, the EPA's explanation improperly segments the designation of an open water disposal site as an event to be evaluated separately from the dredged material slated to be disposed at the site (see LIS DMMP section 6 that identifies NLDS as the "Federal Base Plan" for the majority of eastern LIS dredging projects). The EPA's approach to site designation pursuant of ODA § 2 is in direct conflict of the Court's holding in Town of Huntington v. Marsh, 859 F.2d 1134, 1142 (Oct. 19, 1988), which rejected this segmentation approach by finding that such "segmentation" has been rejected by the courts and site "designation clearly has no utility apart from its planned

Need Was Not Properly Established

A demonstration of need prior to the dumping of dredged material is an important component of compliance with the ODA and is required to be factored into the decision to designate a disposal site under the ODA.[89]

EPA has determined that there is a need to designate additional open water disposal sites in eastern Long Island Sound for two primary reasons. First, EPA asserts there is inadequate capacity at the existing and available disposal sites. Second, EPA has determined that use of sites outside eastern Long Island Sound would present a host of additional problems, including (1) dredging delays; (2) the potential for "a proliferation" of Corps-authorized short term disposal sites in the eastern part of Long Island Sound that would not be subject to Site Management and Monitoring Plans (SMMPs) and would impose resource demands on regulatory agencies due to required site selection procedures; and (3) the consequences that would stem from hauling dredged material for longer distances, such as greater costs, more energy use, greater air emissions, and greater risk of vessel accidents.[90]

In their July 18, 2016 joint comment letter to the EPA Proposed Rule, DOS and Department of Environmental Conservation (DEC) stated:

> The primary justification provided by the EPA and Army Corps for an eastern Long Island Sound dredged material disposal site is based on the assertion that there is inadequate capacity at the Western Long Island Sound (WLIS), Central Long Island Sound (CLIS) and Rhode Island Sound (RISDS) sites. Our review of the estimates has yielded a much different conclusion. Based on our analysis of the information in the DMMP, over the next 30 years there is anticipated to be approximately 34.4 million cubic yards (mcy) of fine-grained dredged material suitable for open water disposal, well within the current stated capacity at the Central and Western sites of 40 mcy. This is in addition to the approximately 3 mcy cubic yards of unsuitable material and approximately 15 mcy of coarse-grained material suitable for beach nourishment and other beneficial uses that comprises the remainder of the estimated 52.9 mcy to be dredged in LIS over the next 30 years.

The "need" for this site designation is not due to the lack of upland alternatives or other available disposal sites, because the DMMP *did* identify numerous environmentally-protective alternatives as well as in-water alternatives to using ELDS.[91] However, because of the imposition of the "federal standard," in-water placement at NLDS was determined to be the lowest cost option, and has ended up being a choice endorsed by EPA:

> The least cost placement alternative for the maintenance dredging of suitable fine-grained material from the New London Harbor FNP [Federal Navigation Project] is open water placement at the New London site. The second least costly alternative is open water placement at the Cornfield Shoals site at about twice the cost of using the NLDS. The

usage as a disposal site" … and "[I]t is simply untenable to view site designation as distinct from issuing permits to use the site."

[89] 33 USC § 1413.

[90] EPA Determination, pp. 15-16.

[91] DMMP, Sections 4 and 6.

> next least costly alternatives are open water placement at either the Central Long Island Sound or Rhode Island Sound sites (at 2.7 times the cost of using the NLDS).… Placement upland at a landfill would be between 7 and 8 times as costly as using the NLDS.[92]

Similar cost-based reasoning was used in the DMMP, the document relied on by EPA to determine the need for the additional disposal sites in eastern Long Island Sound, to justify the selection of NLDS for receipt of sediments from the U.S. Coast Guard's New London Station,[93] lower Thames River FNP,[94] upper Thames River channel,[95] U.S. Coast Guard Academy,[96] and the U.S. Navy facilities in the lower Thames River,[97] over all other available upland and in-water disposal options.

A cost-based selection of ELDS over other more distant disposal sites, such as WLDS, CLDS, and RISDS, or other more environmentally protective options, runs counter to several of the LIS CMP's and Southold LWRP's coastal policies. A "need" analysis based on these grounds defies logic, especially considering the fact that, except in Long Island Sound, all federal and state agencies wishing to dispose of dredged sediments under the ODA must currently travel beyond the territorial sea[98] to dispose of their dredged sediments. Convenience and cost savings should are insufficient factors to support a finding of need for an additional disposal site in eastern Long Island Sound, especially in light of the many Congressional and administrative efforts that have been enacted and implemented over the years to improve the ecology of the Sound.

Cumulative Impacts and Segmentation

Given the Sound's 100-year history as a "waste dumping ground"[99] for the polluted sediments and other wastes, the analysis of the cumulative impacts of designating a third disposal site at ELDS becomes a matter of paramount importance. The analysis of cumulative impacts or effects of designating ocean disposal sites is required under the CZMA regulations, the NEPA regulations and the ODA regulations.[100] As will be shown, because EPA filed to complete a reasonable cumulative impact analysis, the Proposed Rule is suspect under all three statutes and regulations.

The CZMA regulations state that:

> [t]he term ''effect on any coastal use or resource'' means any reasonably foreseeable effect on any coastal use or resource resulting from a Federal agency activity or federal license or permit activity …. Effects are not just environmental effects, but include effects on coastal uses. Effects include both direct effects which result from the activity and occur at the same time and place as the activity, and indirect (cumulative and secondary) effects which result from the activity and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects are effects resulting from

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[92] DMMP p. 5-54.
[93] DMMP p. 5-55.
[94] DMMP p. 5-56.
[95] DMMP p. 5-57.
[96] DMMP p. 5-58.
[97] DMMP p. 5-58.
[98] 40 C.F.R. § 228.5(e).
[99] See Town of Huntington v. Marsh, 859 F.2d 1134, 1135 (2nd Cir. 1988).
[100] See ODA § 102(a)(E) and (F); 40 C.F.R. § 228.6(a)(7); and 15 C.F.R. § 930.11(g).

> the incremental impact of the federal action when added to other past, present, and reasonably foreseeable actions, regardless of what person(s) undertake(s) such actions.

15 C.F.R. § 930.11(g).

The term "cumulative impact" is defined in the NEPA regulations as follows:

> *"Cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other action. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*[101]

The White House Council on Environmental Quality (CEQ) publishes a handbook that articulates eight principles to aid in the preparation of a meaningful cumulative effects study.[102] These principles state:

1. Cumulative effects are caused by the aggregate of past, present and reasonably foreseeable future actions.
2. Cumulative effects are the total effect, including both direct and indirect effects, on a given resource, ecosystem, and human community of all actions taken, no matter who (federal, nonfederal or private) has taken the actions.
3. Cumulative effects need to be analyzed in terms of the specific resource, ecosystem, and human community being affected.
4. It is not practical to analyze the cumulative effects of an action of the universe; the list of environmental effects must focus on those that are truly meaningful.
5. Cumulative effects on a given resource, ecosystem, and human community are rarely aligned with political or administrative boundaries.
6. Cumulative effects may result from the accumulation of similar effects or the synergistic interaction of different effects.
7. Cumulative effects may last for years beyond the life of the action that caused the effects.
8. Each affected resource, ecosystem, and human community must be analyzed in terms of its capacity to accommodate additional effects, based on its own time and space parameters.[103]

Under the ODA, the criteria for site designation for dredged material are set forth in 40 C.F.R. §§228.4, 228.5 and 228.6. With respect to cumulative impacts, 40 C.F.R. §228.6 states:

> §226.6 Specific criteria for site selection.
>
> (a) In the selection of disposal sites, in addition to other necessary or appropriate factors determined by the Administrator, the following factors will be considered:
>
> . . .

[101] 40 C.F.R. §1508.7.
[102] https://ceq.doe.gov/nepa/ccenepa/sec1.pdf
[103] https://ceq.doe.gov/nepa/ccenepa/sec1.pdf at p.8.

> (7) Existence and effects of current and previous discharges and dumping in the area (*including cumulative effects*).[104]

EPA has prepared a guidance document entitled "Consideration of Cumulative Impacts in EPA Review of NEPA Documents"[105] to assist EPA reviewers with the assessment of cumulative impacts. The document states:

> The combined, incremental effects of human activity, referred to as cumulative impacts, pose a serious threat to the environment. While they may be insignificant by themselves, cumulative impacts accumulate over time, from one or more sources, and can result in the degradation of important resources. Because federal projects cause or are affected by cumulative impacts, this type of impact must be assessed in documents prepared under the National Environmental Policy Act (NEPA).[106]

EPA's DSEIS purports to address cumulative impacts to the environment that could result from the designation of ELDS.[107] EPA recognized that: "(r)eported effects of disposing dredged material at open-water sites include direct, indirect, and cumulative impacts, both short-term and long-term (e.g. , Wright, 1978; USACE, 1981; USACE, 1982a; USACE, 1982b; Fredette et al., 1993; Fredette and French, 2004; Germano et al., 2011; Lopez et al., 2014)."[108]

Section 5.7 of the DSEIS addresses cumulative effects of dumping in the Sound. It broadly states:

> *The area of analysis for cumulative impacts is the entire Long Island Sound.* Projects and activities that could interact with the proposed action to cause cumulative impacts on the resources of Long Island Sound, and that are considered in this analysis, include dredged material disposal events within the Sound, namely at the two designated dredged material disposal sites within western and central Long Island Sound (WLDS and CLDS), and other, unrelated activities such as shipping, recreation, and fishing that occur on or near Long Island Sound. [109]

It then inadequately addresses[110] the anticipated cumulative effects of dumping following this site designation together with dumping at the other designated disposal sites. It concluded:

> Overall, any cumulative impacts from the proposed action on natural resources, as well as air quality and noise, would be ***imperceptible***. Cumulative impacts to socioeconomic resources in the Long Island Sound region would be beneficial, as designation of dredged material disposal sites can facilitate that dredging of harbors and navigational channels, which would help keep harbors fully operational, thus avoiding a partial shift to truck traffic for some commercial goods.[111]

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[104] 40 C.F.R. § 228.6(a)(7).
[105] https://www.epa.gov/sites/production/files/2014-08/documents/cumulative.pdf
[106] Id.
[107] 40 C.F.R. § 228.6(b).
[108] DSEIS at p.5-4.
[109] DSEIS at p. 5-105, italics added.
[110] DSEIS at pp. 5-91 through 5-94.
[111] DSEIS at p. ES-18.

The DSEIS also notes, in the cumulative effects discussion of "Sediment Quality", that dredged sediments dumped in the eastern Sound would be resuspended over time by strong tidal flows and storms.

> On balance, the larger portion of resuspended dredged material would be transported westward toward deeper areas of central Long Island Sound where particles would be expected to partially settle. Considering the physical and chemical characteristics of the sediment in Long Island Sound and of the dredged material to be disposed, and considering the sediment transport processes with extensive dispersion throughout the water column, *impacts to sediment quality in other parts of Long Island Sound would be minimal*…. Additional dredged material would not be eroded and dispersed in the water column of Long Island Sound from the WLDS and CLDS since they are containment sites. [112]

The cumulative impact of dredged material on water quality is also easily dismissed in the DSEIS:

> Similar to the nature of impacts within eastern Long Island Sound resulting from the proposed action, the disposal of dredged material at the WLDS and CLDS could potentially have short-term impacts to the water column from the release of suspended dredged material. However, as would be the case for disposal at alternative sites in eastern Long Island Sound, the suspended material would rapidly dilute and disperse in the water column. *Therefore, cumulative impacts to the water quality in Long Island Sound from the disposal at the eastern Long Island Sound alternative sites would not be expected*.[113]

Despite multiple references to cumulative impacts in the DSEIS, nowhere is there an analysis of all past, current, and future direct and indirect cumulative impacts on the health and ecology of Long Island Sound. Neither is there any analysis of the adverse environmental impacts, including cumulative impacts, of multiple dredging projects in the Sound and the potential for simultaneous dumping of dredged material at more than one designated disposal site. This is simply not sufficient due to the many studies that have shown that the Sound is heavily polluted[114], and EPA's own assertion that dispersal of dumped sediments is expected and common.[115]

Notably, EPA has stated it has also relied on the PEIS prepared for the DMMP and the EIS prepared in 2004 for Central and Western LIS as support for its review of environmental effects

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[112] DSEIS at pp. 5-105 and 5-106.

[113] DSEIS at p. 5-106.

[114] See Varekamp, McElroy, Mullaney and Breslin, "Metals, Organic Compounds, and Nutrients in Long Island Sound: Sources, Magnitudes, Trends, and Impacts" Ch. 5, Long Island Sound: Prospects for the Urban Sea (2015); Final Report (March 31, 2006) "New Approaches for Assessing Mutagenic Risk of Contaminants in the Long Island Sound Environment", Prof. Anne McElroy, MSRC, SUNY Stony Brook: "Several national surveys characterizing chemical contamination in sediment and biota in U.S. estuarine waters have identified a number of sites in [Long Island Sound] as being among the most contaminated in country (Long et al., 1993, Gronlund et al. 1991, Wolf et al., 1994)."

[115] See DSEIS at p.5-90. "For the New London Alternative, disposed dredged material would be contained on-site since the maximum bottom stress expected at the site would be below the bottom stress required to erode the disposed dredged material. This is supported by DAMOS observations of disposal mounds at the NLDS." However, these overly simplistic observations do not support a conclusion that no materials placed at ELDS located in eastern LIS, a high energy environment containing high velocity currents.

of designating ELDS. However, none of those documents, singly or combined with the DSEIS for the proposed ELDS designation, adequately considers and assesses the cumulative impacts from three Sound dredge disposal sites – ELDS, CLDS and WLDS. Conducting separate environmental analyses of these closely related events constitutes impermissible "segmentation."

The DSEIS downplays the cumulative impacts of dredged material disposal as being "imperceptible". It therefore fails to address the century-long history of open-water disposal in the Sound, conditions in the ambient marine and benthic environment, simultaneous sediment disposal actions or the direct impacts on resident species. In addition, the draft SEIS fails to address the cumulative impacts of multiple stressors that currently or will impact benthic life in the Sound. Information and analysis are lacking on the following points:

- When Connecticut's harbors are dredged, the dredged materials have been tested and found to contain an array of contaminants, including heavy metals, PCBs, DDT and other pesticides, PAH's, ammonia, nitrogen, phosphorus, radioactive isotopes and other contaminants.

- Long Island Sound's hypoxia (low oxygen) events can be compounded by contaminants found in dredged materials disposed in Long Island Sound, and natural upwelling events can bring hypoxic and more contaminated benthic waters to the surface.

- Under hypoxic conditions, marine benthic layers become a toxic layer when low to no oxygen results in the creation of ammonia—enhanced by dredged materials—and hydrogen sulphide. While some marine species may be tolerant to any one of these conditions, the synergistic effects of this toxic layer usually causes adverse effects and/or death.

- As Long Island Sound benthic chemistry changes under warming waters, ocean acidification, increased hypoxia, migration of marine species, collapse of food chains involving marine organisms with calcium carbonate-based shells and skeletons, and change in water flow dynamics from sea level rise and storm activities, preliminary scientific evidence shows that legacy heavy metal contaminants will drastically change bioavailability and increase in toxicity. Combined with eutrophication, hypoxic/anoxic conditions, and a layer of ammonia and hydrogen sulfide, this will create a deadly "toxic soup" effect for benthic level marine life.

- There is inadequate scientific analysis of the comprehensive, sub-lethal and long-term ecological impacts, especially on fish and other marine life of Long Island Sound, of contaminated sediments, included dredged material disposal sites.

- There is inadequate scientific information about the dynamics and impacts of currently unfolding climate change effects, especially rapid ocean acidification, on the chemistry of Long Island Sound waters, contaminated sediments and benthic marine life.

The EPA's obligation to consider cumulative impacts as part of the EIS process for both dredged material dumping and for designation of open water disposal sites has also been clear for decades based on the Second Circuit's decisions in Callaway[116] and Town of Huntington, [117] which

[116] 524 F.2d 79, at 87- (2nd Cir. 1975)
[117] 859 F.2d 1134, at 1142-43. See also Manatee County v. Gorsuch, 554 F.Supp 778 (M.D. Florida, 1982), also decided under both NEPA and the ODA.

clarified that segmentation is prohibited because it fragments a single action into multiple actions, each with less-than-significant environmental effects. Accordingly, EPA's segmentation of the proposed designations and its failure to properly consider the cumulative environmental impacts from past and future dredge spoil disposal in the Sound have created a deficient rulemaking that violates the ODA and is inconsistent with LIS CMP policy #5. If EPA finalizes the EPA Proposed Rule it will also have violated the CZMA.

Deficiencies of EPA's Sediment Analysis

While EPA and the Corps claim that the dredged sediments will only be deposited at the eastern Long Island Sound disposal site(s) if they are "suitable", the EPA/Corps sediment testing manual used to determine the suitability of dredged material for offshore disposal in LIS (the Green Book) does not actually provide a testing protocol to ensure that no contaminants are present in the dredged sediments. "Suitable" does not mean "contaminant free." The EPA/Corps sediment testing protocol only determines if the level of contaminants "statistically exceeds" the already existing level of contaminants in the Sound by more than 10-20%. And if it does exceed this level, the testing protocol then determines if the level of contaminants is statistically likely to bioaccumulate in fish at levels that exceed FDA standards for human consumption (based on eating contaminated seafood). The EPA/Corps Green Book sets up a testing protocol that not only permits contaminants to be deposited into Long Island Sound, it also allows the average contaminant concentration levels to exceed the existing contaminant concentration levels by 10 - 20%, effectively increasing the reference sediment contamination levels incrementally over time.

While the amount of contaminants that can permissibly be deposited under these testing parameters for any particular dredging project may appear to be relatively small, when multiplied over the 22.6 million cubic yards EPA anticipates will be dredged over the next twenty nine years, New York is concerned that these same amounts will incrementally create a significant and persistent impairment to water quality, benthic species, benthic habitat and ecosystem cycles and functions as a result of cumulative and synergistic effects (interactions) under the Sound's already stressed and changing benthic water conditions (increasingly warm, acidic, anoxic, and periodically turbulent from storms).

EPA and the Corps use two categories of assessments as part of the dredged sediment disposal process: (1) suitability assessments for assessing the suitability of dredged sediments for disposal, and (2) impacts assessments to monitor the short-term and long-term effects of dredged material disposal sites. In order to minimize costs and efficiency, both categories of assessments use a tiered approach that allows simpler, quicker and less expensive screening processes at the lowest level tiers to be used to determine suitability or acceptable levels of impacts.

For suitability assessments, which are described in the USEPA/Corps "Green Book"[118] , the upper level testing tiers are used only when absolutely necessary, because of their increased costs and the additional time it takes to receive laboratory testing results. For example, Tier IV testing is used only when lower tier levels demonstrate that the dredged sediments contain high enough levels of contaminants that they could harm the environment, benthic aquatic species and/or human health.

The MPRSA does not allow the EPA or the Corps to approve the dumping of dredge materials when their composition and properties are insufficiently described. Under 40 C.F.R. 227.5(c), dredged materials inadequately described in terms of their compositions and properties are

[118] Evaluation of Dredged Material Proposed for Ocean Disposal – Testing Manual, 1991.

prohibited from being dumped into Long Island Sound. The Corps has not provided the full documentation that is required. The burden of proof rests squarely on the Corps to prove that the dredged material is not contaminated before it can be approved for disposal in Long Island Sound.

The EPA and the Corps developed the Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual (Green Book) as an internal set of guidelines to assist the agencies in interpreting the ODA and its implementing regulations. Included in this EPA/Corps guidance is a tiered testing process for determining appropriate disposal decisions. This tiered testing protocol, however, is structurally flawed. It creates a series of loopholes that heavily biases the testing protocols toward findings of suitability, almost always guaranteeing the dredged material will be found suitable for disposal in Long Island Sound. DOS has previously raised its concerns with EPA on the deficiencies in the Green Book and these concerns have not been addressed.[119]

It is commonly known that Connecticut's rivers and embayments contain some of the most contaminated sediments in the United States (EPA National Sediment Quality Survey). It is this contaminated sediment from Connecticut's river bottoms and embayments that is dredged and disposed of into Long Island Sound. It is expected that any new dredged sediment may still be contaminated with heavy metals, PCB's, dioxins and other toxins, including newer contaminants like pharmaceuticals and endocrine disruptors.

The future projections of dredging needs in eastern Long Island Sound include dredged materials from Clinton/Westbrook Area (including Clinton Harbor, Westbrook Harbor, and the Patchogue River), Connecticut River Area, New London/Thames River Area (including New London Harbor Complex, Thames River, and Mystic River, Guilford/Branford Area (including Guildford Harbor and Branford Harbor), and the Niantic Area (including Niantic Bay). Ongoing sediment contaminant research over the past few decades confirms the level of contamination in these areas.

The second categories of assessments used as part of the dredged sediment disposal process is the impacts assessment ("monitoring") of the short-term and long-term effects of dredged material disposal sites. This monitoring process has been turned over to the Corps DAMOS program, which also uses a tiered assessment process. At this time, however, the DAMOS monitoring only determines if the dredged sediment disposal mounds are staying in place and

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[119] See SEIS Scoping Comments in a letter dated January 31, 2013 from Fred Anders, Bureau Chief, DOS to Jean Brochi, EPA. DOS Scoping Comment # 7: "There is a need for enhanced testing and study to ensure that the disposal of dredged material pursuant to Ocean Dumping Act toxicity standards "Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual" (Green Book) is safe for disposal within the estuary environment of LIS. Study of the biology, chemistry, and hydrology that reflects the unique LIS estuarine environment should be used to evaluate whether the current Green Book standards are appropriate for LIS. Reference site locations for baseline evaluations and comparisons need to be located outside of an affected area to adequately reflect ambient levels to determine suitability for disposal. It is suggested that the ELIS SEIS should refer to such material as "legally permissible" under the applicable standards, rather than 'clean' or 'safe'". See also DOS Scoping Comment # 12 "The chemical containment and biological testing of the organisms re-colonizing new mounds of disposed dredged material, as well as those feeding on those communities, needs to be fully evaluated to also determine whether organisms are bringing those contaminants back to the surface or to other locations in LIS. Advancement in the methodology and technology are available to conduct marine field research on dispersion of sediment contaminants via subaquatic vegetation and benthic macroinvertebrates (especially polychaetes) and subsequent bioaccumulation in fish. This research should be done to determine environmental and human health impacts of contaminant dispersal from disposal." EPA has not addressed DOS's concerns in the either the proposed rule or the DSEIS.

intact, and if the sites are being colonized by benthic aquatic species. The monitoring of dredged sediment disposal mounds is no longer assessing broader environmental impacts. According to a Corps report on the DAMOS Program:

> Bioaccumulation monitoring is not part of routine monitoring for unconfined, open water disposal mounds in the DAMOS program, because numerous past DAMOS investigations that used the current guidelines for sediment characterization to determine suitability for open-water disposal (the "Green Book"; EPA/Corps 1991) have revealed no adverse ecological effects. Although the possibility exists that contaminant hot spots may be missed during the evaluation of sediment deemed suitable for unconfined open-water disposal, the probability is extremely low.[120]

According to the Corps' own research, there are flaws in its own assessments of dredged sediments:

> As noted in a recent EPA report, "Decision-making processes predicated on bioaccumulation are complicated by numerous factors, including site-specific issues and the variability in chemical bioavailability due to seasonal physicochemical conditions or anthropogenic changes to the environment. It is no longer sufficient to know only whether chemicals accumulate, because bioaccumulation itself is not an effect but a process. Regulatory managers must know whether the accumulation of chemicals is associated with or responsible for adverse effects to aquatic organisms and organisms that prey on them, including humans" (EPA 2000). The many complex issues underlying these statements are the subjects of on-going research within numerous monitoring and regulatory programs, as documented in several recent publications (Bridges et al. 1996; EPA 1998, 2000).
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> In practice, using the specified tiered approach to evaluate bioaccumulation associated with dredged material disposal has raised complex technical and regulatory problems (Bridges et al. 1996). For example, the Tier II screening test used to calculate the "Theoretical Bioaccumulation Potential" (TBP) of neutral organic chemicals is based on a relatively simple equilibrium partitioning model that does not account for metabolism of compounds, disequilibrium and non-constancy of exposure, organism feeding behavior, or numerous other processes that can influence bioaccumulation (EPA 1998).
>
> Interpreting Tier III and IV bioaccumulation test results has also proven to be problematic because of a reliance on a number of subjective evaluation factors (Bridges et al. 1996; Lechich 1998). […] Given these considerations, there has been interest for some time in evaluating the bioaccumulation potential in the small benthic organisms that are typically the first to colonize new dredged material deposits. Many of these "Stage 1" organisms are opportunistic polychaetes that have high population growth and turnover rates. They colonize new dredged material deposits in high numbers and live at the sediment surface, where they are readily preyed upon by secondary consumers such as crustaceans and fish. Some are surface deposit-feeders that ingest sediment particles, particulate organic matter, and associated chemical contaminants (Rhoads et al. 1978; Rhoads and Germano 1982; 1986). Such characteristics have engendered questions about the bioaccumulation potential of these organisms, even though chemicals of concern are

[120] Valente, R. M; Rhoads, D. C; Myre, P. L.; Read, L. B.; Carey, D.A. 2006. Evaluation of Field Bioaccumulation as a Monitoring Tool. DAMOS Contribution No. 169. U.S. Army Corps of Engineers, New England District, Concord, MA, p. 3.

> typically present at relatively low concentrations in the dredged material. The specific concern is that rapid bioaccumulation by these abundant, fast-growing organisms might result in significant trophic transfer of low level contaminants. Ultimately, this could result in food-chain biomagnification that might pose significant ecological or human health risks.[121]

Also, of particular concern is the focus on DAMOS recolonization studies. The recolonization rate of benthic species is not a good proxy for measuring the ability of the LIS benthic ecosystem for naturally restoring its own health. Recolonization must be seen in context of bioturbation rates.

> Sediment-dwelling organisms modify their local environment as they burrow, scavenge for food, and hide from predators. Biological reworking of sediments, termed bioturbation, mixes particles in the sediment bed. Reworked sediments encounter different biogeochemical environments that control particle transformation, for example, by microbial metabolism, precipitation/dissolution, and sorption/desorption processes. Particulate organic matter is metabolized more slowly in anoxic sediments, and particles retained in such environments are more likely to be preserved. Similarly, reduced metal sulfides are oxidized when transported from depth into oxic surficial environments, leading to liberation of bioavailable dissolved metals. Bioturbation is thus an important transport process that should be included in biogeochemical models for sediment diagenesis and contaminant fate in sediments.[122]

Recolonization is evidence of bioturbation that can remobilize dredged sediment contaminants into the benthic layer of eastern Long Island Sound. Remobilized contaminants then may become bioavailable to the food chain, especially fish and shellfish. Earlier Corps research confirms that heavy recolonization by benthic species occurs even on heavily contaminated dredged sediment mounds. The DAMOS studies do not provide this type of research data which is essential for New York to determine the effects and impacts of disposal of contaminated dredge materials into Long Island Sound.[123]

In brief, current sediment assessment protocols do not provide New York with the adequate and appropriate research data necessary to draw adequate conclusions on the contaminant content and quantity in dredged materials destined for disposal in Long Island Sound. Sediment assessment data do not provide adequate answers for determining the impacts and effects on the Long Island Sound environment, especially concerning bioturbation, bioavailability, bioaccumulation, and sub-lethal effects. Moreover, data on levels of contaminants in tissues of LIS aquatic species are limited.[124]

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[121] Valente, R. M; Rhoads, D. C; Myre, P. L.; Read, L. B.; Carey, D.A. 2006. Evaluation of Field Bioaccumulation as a Monitoring Tool. DAMOS Contribution No. 169. U.S. Army Corps of Engineers, New England District, Concord, MA.

[122] Kevin R. Roche, Antoine F. Aubeneau, Minwei Xie, Tomás Aquino, Diogo Bolster, and Aaron I. Packman (2016). An Integrated Experimental and Modeling Approach to Predict Sediment Mixing from Benthic Burrowing Behavior. Environ. Sci. Technol. 2016, 50, 10047−10054.

[123] Monitoring Survey of the Central Long Island Sound Disposal Site – September and October 2011, USACE DAMOS - Disposal Area Monitoring System, January 2013 found at: http://www.nae.usace.army.mil/portals/74/docs/DAMOS/TechReports/192.pdf

[124] Johan C. Varekamp, Anne E. McElroy, John R. Mullaney and Vincent T. Breslin. (2014) Chapter 5 Metals, Organic Compounds, and Nutrients in Long Island Sound: Sources, Magnitudes, Trends and Impacts in Latimer, James S; Tedesco, Mark A; Swanson, R. Lawrence; Yarish, Charles; Stacey, Paul E; Garza, Corey. Long Island Sound: Prospects for the Urban Sea. New York: Springer, 2014.

The EPA/Corps dredged sediment assessment process is also not transparent. Materials submitted by the Corps for New York's coastal policy consistency determinations often lack the backup data from sediment assessment results despite requests for the data. The sediment assessment data are not available on the Corps DAMOS site, nor are these sediment assessment results included in Corps reports submitted as part of international ocean disposal reports. Accordingly, New York is not satisfied that current testing protocols are sufficient for it to determine that the designation of a permanent disposal site in eastern Long Island Sound would be consistent with the LIS CMP and Southold LWRP policies.

Ecological Stressors and Resilience

An environmental or ecological stressor can be most simply defined as any environmental condition, situation, or factor that causes a biological system to mobilize its resources and increase its energy expenditure (S. Marshal Adams, 2002). Stress may be triggered by just one stressor, however when several stressors are introduced or acting simultaneously, multiple stress occurs. Nearly all ecosystems are subject to periodic disturbances by natural events, and in healthy ecosystems, these perturbations are seldom more than a temporary setback and recovery is generally rapid (Odum, 1969). Stated another way, a healthy ecosystem that successfully accommodates and adapts to a normal amount of stressors is resilient.

Environmental stressors can also overtax the system, triggering a process of environmental degradation. As an urban estuary, Long Island Sound is surrounded by developed coastal lands, industrial activities, and a dense human population making intensive use of its waters. As a result, Long Island Sound is continually exposed to a variety of overwhelming anthropogenic stressors, and as a result is losing its capacity to adapt to prolonged, multiple, intense stressors, and its ability to maintain its normal functions and structure. Long Island Sound is losing its resilience.

A degraded ecosystem is commonly characterized by less biodiversity, reduced primary and secondary production, increased disease prevalence, reduced efficiency of nutrient cycling, increased dominance of exotic species, increased dominance by smaller, shorter lived or opportunistic species, and, overall, an impaired ability to recover from disturbances of all kinds.[125] Stress can cause changes in bioenergetics, metabolism, behavior, and spatial distribution of individuals, populations and communities. Exposure can ultimately affect growth, survival, and reproductive success at all levels. Impacts to populations and community structures have implications for other populations and communities as food web interactions may be dramatically changed.

Stress can manifest as reduction in genetic diversity within populations, reduced taxonomic richness within communities and, ultimately, can impacts ecosystem biodiversity. Multiple indicators are useful for assessing cumulative and/or synergistic effects of stress and can be early warning indicators of environmental problems in an ecosystem (S. Marshal Adams, 2002). As an additional complicating factor, the various stressors do not always act independently. In some cases the effects can be additive, or even amplified, and a cumulative analysis is essential (S. Marshal Adams, 2002). According to a 2008 NOAA report:

[125] Barrett and Rosenberg, 1981; Odum, 1985; Mageau et al, 1995; Rapport, 1999.

> The end point of gradual declines in the quality of habitat can be the complete loss of habitat structure and function (Deegan and Buchsbaum 2005). Losses of habitat quantity and quality may reduce the ability of a region to support healthy and productive fish populations. From the population perspective, the loss of habitat quantity and quality creates stresses on a population. *Populations that are stressed by one or more factors can be more susceptible to stresses caused by other factors (Robinson and Pederson 2005), resulting in cumulative effects.* [Emphasis added].[126]

The Long Island Sound, like any other ecosystem, functions within thresholds (various system parameters and limits), but too many stressors can shock the system into a regime change, where the entire systems flips into a "new normal" arrangement or regime. This new regime may no longer provide all the ecosystem services, functions, resources, and uses needed from the ecosystem. An ecosystem under too much stress is forced to operate close to system thresholds, where the system experiences wild fluctuations—like rapid species population spikes and dips--and hovers precariously on the verge of a system regime flip. These wild fluctuations make the system even more unpredictable than normal.

Some of the major stressors to Long Island Sound include intensive coastal development and heavy human recreational and commercial use of the Sound; a 250 year history of legacy industrial pollution; a legacy of dredged contaminated sediment disposal in Long Island Sound; impacts of major hurricanes and floods that can mobilize many of these legacy pollutants; hypoxic (low oxygen) conditions from excessive nutrient loads (eutrophication) causing "Dead Zones" with oxygen levels too low to support aquatic life; loss of marine habitats; loss of marine species biodiversity; fish and shellfish overharvesting and species collapse. A special set of current and future anticipated stressors are resulting from unfolding climate change impacts. These include water acidification and warming in the Sound; sea level rise; increased intensity of coastal storms and amounts of precipitation; increased coastal flooding with contaminated coastal flood waters draining into the Sound; migration of marine species; collapse of food chains involving marine organisms with calcium carbonate-based shells and skeletons; changing toxic benthic water chemistry; increased hypoxia and upwelling of benthic layer waters to the surface, and bioavailability of benthic level contaminants through remobilization. The cumulative effects of already existing stressors reduce the ability of the Long Island Sound estuary and its species to adapt to additional stressors and shocks under climate change.

Level of scale of analysis of stressors is important. Stress can occur at various levels or scales – e.g., molecular, tissue, organismal, population, community, or ecosystem. While the cumulative impacts analysis of the DSEIS assigns the area of analysis for cumulative impacts to the entire Long Island Sound, it is important to analyze the effects at other scales. Some stressors have the greatest impact on the level of the entire estuary (like sea level rise) and some stressors, including disposal of contaminated dredge material, have the greatest impact at a lower level scale.

For the most appropriate analysis of stressors, the Sound can be divided into nine discrete (though intimately interconnected and interdependent) segments: the surface waters, where most human activities take place; the water column, where most fish, marine plants and plankton live; and the benthic layer (bottom layer), which includes the lowest level of the water below the water column, the bottom sediments, and the benthic species, including lobsters, crabs, shellfish,

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[126] Impacts to Marine Fisheries Habitat from Nonfishing Activities in the Northeastern United States, NOAA Technical Memorandum NMFS-NE-209, February 2008 found at http://www.fpir.noaa.gov/Library/HCD/NOAA%20Technical%20Memo%20NMFS-NE-209.pdf

and macroinvertebrates (like such as worms). The Sound is also commonly divided into three geographic sections—Eastern Sound, Central Sound, and Western Sound—for research, planning and management purposes because of the distinct sediment types, bathymetry, currents, water quality, levels of stressors, and levels of soil contamination. Since each of the three geographic sections has the three discrete layers (surface waters, water column, and benthic layer), the stressors on the Sound need to be considered at the most appropriate scale. Many stresses caused by the effects of dredged sediment disposal concentrate on the lower scale and in particular the benthic layer of the Eastern Long Island Sound.

According to the same 2008 NOAA Report:

> Sediment particles can bind to some nutrients, and resuspension of sediments following dredge material disposal can cause a rapid release of nutrients to the water column (Lohrer and Wetz 2003). Ocean disposal of dredge material with high organic content can result in oxygen reduction (hypoxia) or even anaerobic conditions (anoxic) on the bottom and overlaying waters, particularly during periods when strong thermoclines are present (Kurland et al. 1994). Hypoxic and anoxic conditions can kill benthic organisms or even entire communities and lead to a proliferation of stress-tolerant species of reduced value to the ecosystem (Kurland et al. 1994). Generally, offshore waters are less sensitive to disposal of dredge material containing nutrients than inshore, enclosed water bodies. [127]

A particular vulnerability to the stressors at the benthic layer is a result of the changing benthic water chemistry. This is of special concern because of its impacts on the remobilization and bioavailability of legacy contaminants, and upwelling effects that bring these toxic benthic waters to the surface to compound water quality and hypoxic conditions. Hypoxia occurs when dissolved oxygen (DO) levels in seawater are below what is essential for supporting marine life. Long Island Sound's current hypoxic (low oxygen) conditions have a synergistic effect when combined with anticipated effects of climate change at the benthic layer, and the additional heavy metals and other contaminants accumulating at the benthic layer of dredge disposal sites. Under the right conditions, marine benthic layers become a toxic layer when low to no oxygen results in the creation of ammonia—enhanced by dredged materials—and hydrogen sulphide. While some marine species may be tolerant to any one of these conditions, the synergistic effects of this toxic layer usually causes adverse effects and/or death.

> In marine sediments sulphate reduction is the dominant microbiological process, and results in ammonia accumulation within anoxic sediments and a concentration gradient towards the sediment surface. If the water above the sediment surface is anoxic then ammonia can be released, otherwise the ammonia is rapidly oxidised. Thus it is only under extremely poor conditions with almost no oxygen that high amounts of ammonia and hydrogen sulphide occur in bottom waters. From the foregoing it is clear that the effects that are produced are not caused by a single factor but are the interaction of a number of different factors. It is not just 'organic enrichment' that leads to the effects, but the interaction of sedimenting organic matter with reduced oxygen concentrations, and the presence of hydrogen sulphide and possibly ammonia.[128]

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[127] Impacts to Marine Fisheries Habitat from Nonfishing Activities in the Northeastern United States, NOAA Technical Memorandum NMFS-NE-209, February 2008 pp 173-174found at http://www.fpir.noaa.gov/Library/HCD/NOAA%20Technical%20Memo%20NMFS-NE-209.pdf

[128] John S. Gray, Rudolf Shiu-sun Wu, Ying Or (2002) Effects of hypoxia and organic enrichment on the coastal marine environment. Marine Ecology Progress Series, Vol. 238: 249–279.

> Once anaerobic conditions ensue and H2S is present, mass mortalities of nearly all organisms occur (Stachowitsch 1984). In the innermost Oslofjord (Bunnenfjord) at dephts greater than 50 m, H2S is found in the water column and no macrobenthic fauna exists (J.S.G. unpubl.). Such conditions occur naturally under the thermocline in upwelling areas off Peru, where mats of the bacterium *Thioplaca* sp. can attain wet weight biomass of 2 kg m–2.[129]

As Long Island Sound benthic chemistry is transformed under climate change, preliminary scientific evidence warns that legacy heavy metal contaminants will drastically change bioavailability and increase in toxicity.[130] Combined with eutrophication, hypoxic/anoxic conditions, and a layer of ammonia and hydrogen sulfide, this will create a deadly "toxic soup" effect for benthic level marine life.

To continue to improve Long Island Sound's water quality and benthic environment quality, to prevent further system stressors and declines, and to ensure that the Long Island Sound Estuary system is a healthy, vibrant, resilient and adaptive system, it is important to avoid, reduce or completely eliminate as many major stressors and shocks to the system as possible. Efforts to significantly reduce and eventually eliminate all new contaminant inputs must be actively pursued, including those inputs that will be added through planned open water disposals of contaminated dredged materials in Long Island Sound. For this reason, designation and disposal of dredged material at ELDS is an unnecessary and biologically damaging action.

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[129] Rosenberg et al. 1983, Tarazona et al. 1986.

[130] The Incidence and Severity of Sediment Contamination in Surface Waters of the United States, National Sediment Quality Survey: Second Edition EPA-823-R-04-007, Washington, D.C.: U.S. Environmental Protection Agency, 2004. W. Sunda and W. Cai (2012). "Eutrophication Induced CO2-Acidification of Subsurface Coastal Waters: Interactive Effects of Temperature, Salinity, and Atmospheric PCO2" Environ SciTechnol. Oct 2:46(19):10651-9; Melzner, Frank, Jörn Thomsen, Wolfgang Koeve, Andreas Oschlies, Magdalena Gutowska, Hermann Bange, HansPeter Hansen, Arne Körtzinger (2013). "Future ocean acidification will be amplified by hypoxia in coastal habitats", Marine Biology, 160: 8. August 1. p. 1875-1888; "Synthesis of Climate Change Drivers and Responses in Long Island Sound." November 13, 2009. US Environmental Protection Agency at http://longislandsoundstudy.net/wp-content/uploads/2011/03/LISS-Synthesis-of-CC-Impacts-Memo.pdf; J. Latimer, M. Tedesco, R. Swanson, C. Yarish, P. Stacey, and C. Garza. 2014. Long Island Sound: Prospects for the Urban Sea. New York: Springer, p.163; S. Moffitta, T. Hillb, P. Roopnarined, and J. Kennette. (2014) "Response of seafloor ecosystems to abrupt global climate change", Proceedings of the National Academy of Sciences of the USA, vol. 112 no. 15; J. Slater and D. Capone (1984). "Effects of metals on nitrogen fixation and denitrification in slurries of anoxic saltmarsh sediment" Marine Ecology - Progress Series Vol. 18: 89-95; K. Sakadevan, H. Zheng and H. Bavor. 1999. Impact of heavy metals on denitrification in surface wetland sediments receiving wastewater. Wat. Sci. Tech 40(3), 349-355; J. Camargoa and Á. Alonsob (2006) Ecological and toxicological effects of inorganic nitrogen pollution in aquatic ecosystems: A global assessment. Environment International, Vol 32, Iss 6, August, Pages 831–849; J. Gray, R. Shiu-sun Wu and Y. Ying Or (2002) Effects of hypoxia and organic enrichment on the coastal marine environment. Marine Ecology Progress Series, Vol. 238: 249–279; R. Jones and G. Lee (1981). "The Significance of Dredging and Dredged Material Disposal as a Source of Nitrogen and Phosphorus for Estuarine Waters," IN: Estuaries and Nutrients, Humana Press, Clifton, NJ, pp 517-530; J. Varekamp (2102). "Long Island Sound in the 21st century: Cleaner but some problems linger." Sound UPDATE: Newsletter of the Long Island Sound Study - Fall 2012 found at http://longislandsoundstudy.net/wp-content/uploads/2012/11/ToxPath2012_for-Web.pdf

Policy Analysis

Policy 5 **Protect and improve water quality and supply in the Long Island Sound coastal area.**

Sub-Policy 5.3 **Protect and enhance the quality of coastal waters.**

Protect water quality based on physical factors (pH, dissolved oxygen, dissolved solids, nutrients, odor, color, and turbidity), health factors (pathogens, chemical contaminants, and toxicity), and aesthetic factors (oils, floatables, refuse, and suspended solids). Protect water quality of coastal waters from adverse impacts associated with excavation, fill, dredging, and disposal of dredged material.

Southold LWRP Policy 5

Protect and improve water quality and supply in the Town of Southold.

Sub-policy 5.1 **Prohibit direct or indirect discharges that would cause or contribute to contravention of water quality standards.**

A. Restore the Town of Southold's water quality by limiting major sources of surface water quality impairment.

3. Remediate existing contaminated sediment and limit the introduction of new contaminated sediment in order to reduce loading of toxic materials into surface waters

Sub-policy 5.2 **Minimize non-point pollution of coastal waters and manage activities causing nonpoint pollution.**

A. Minimize non-point pollution of coastal waters using the following approaches, which are presented in order of priority.

2. Reduce pollutant loads to coastal waters by managing unavoidable nonpoint sources and by using appropriate best management practices as determined by site characteristics, design standards, operational conditions, and maintenance programs.

Sub-policy 5.3 **Protect and enhance quality of coastal waters.**

A. Protect water quality based on an evaluation of physical factors (pH, dissolved oxygen, dissolved solids, nutrients, odor, color and turbidity), health factors (pathogens, chemical contaminants, and toxicity), and aesthetic factors (oils, floatables, refuse, and suspended solids).

C. Protect water quality of coastal waters from adverse impacts associated with excavation, fill, dredging, and disposal of dredged material

LIS CMP Policy # 5 is directed at protecting and improving water quality in the Sound, including the protection of water quality caused by the introduction of pathogens, chemical contaminants, and toxicity, and "from adverse impacts associated with excavation, fill, dredging, and disposal of dredged material." (Subpolicy 5.3). Cumulative impacts from past, present and future dredged disposal events must be considered when judging water quality.

Long Island Sound has a long history of open water disposal of contaminated sediments, which has contributed to its water quality problems. Despite these problems, the Sound remains a national treasure. The Federal, State and local governments have invested billions of dollars in actions to improve water quality in Long Island Sound. The continuation of dumping contaminated sediments as embodied in EPA's Proposed Rule is inconsistent with this policy because expanding areas affected by dumping of contaminated dredged material contributes to the degradation of water quality in Long Island Sound and negatively impacts the productivity, health, and economic viability of the Sound, including sportfishing and other recreational activities, commercial and recreational fishing.

Dumping dredged material in the open waters of the Sound already has and will continue to damage the Sound and its estuarine environment. It therefore needs be managed in a way that reduces or eliminates continued impairment of Sound waters. Development of any sediment management plans for the Sound must first start with a demonstrated understanding of the history of use and misuse of its waters and resources. Unfortunately, the DSEIS lacks any discussion or analysis of the more than 100-year history of open water disposal in the Sound, does not contain information on this dumping history, and, more importantly, does not provide any scientific documentation of the chemical composition of sediments on the Sound's bottom. Therefore, the selection of an eastern LIS open water disposal site was evidently made without consideration of the residual toxicity levels in this enormous quantity of disposed sediments.

Also absent in the DSEIS is an analysis of cumulative impacts from the designation and use of all dredged material disposal sites in this semi-enclosed shallow estuary. Given the well-documented estuarine circulation patterns,[131] the effects of dumping at one or more sites in Long Island Sound necessarily affects all basins in the semi-enclosed Sound. With the possible long-term designation of up to three new open water disposal sites, in addition to the two previously designated in July 2016, the DSEIS should have acknowledged the possibility of multiple projects occurring contemporaneously. However, nowhere in the DSEIS is there an analysis of the cumulative effects of multiple dredging projects and the dumping of dredged material at multiple sites across the Sound on water quality, sediment quality, and natural resources.

Furthermore, EPA's consistency determination does not sufficiently consider important and available water quality data and trends, particularly as they relate to cumulative and secondary effects, and does not sufficiently consider the continued disposal of millions of cubic yards of contaminated fine grained sediments on water quality. Of particular concern is the absence of a discussion of bioavailability as it relates to the range of toxins potentially available to the biota of the Sound. Sediment-bound toxins may be remobilized by storm and flooding activity, as well as changing benthic layer water chemistry under a range of environmental factors -- such as

[131] Lelacheur, E.A. and Sammons, J.C., 1932. Tides and currents in Long Island and Block Island Sounds. *U.S. Coast and Geodetic Survey, Special Publication* 174; Gadd, P.E.; Lavelle, J.W., and Swift, D.J.P., 1978. Estimates of sand transport on the New York shelf using near-bottom current meter observations; *Journal of Sedimentary Petrology,* 48, 239252.Bokuniewicz, H.J. and Gordon, R.B., 1980a. Sediment transport and deposition in Long Island Sound. *Advances in Geophysics, 22,*69-106; Signell, R.P.; List, J.H, and Farris, A.S., 2000; Physical processes affecting the sea-floor environments of Long Island Sound. *Journal of Coastal Research,* 16(3),551-566. West Palm Beach (Florida), ISSN 0749-0208; Richard P. Signell, Jeffrey H. List and Amy S. Farris (2000) Bottom Currents and Sediment Transport in Long Island Sound: A Modeling Study. Journal of Coastal Research, vol. 16, No. 3 (Summer), pp. 551-566.

increasing temperatures and acidification, nitrogen loading and anoxic conditions -- that are magnified by climate change.[132]

The resuspension of sediments during dredging and placement operations may result in the re-exposure and bioavailability of contaminants in dredged sediments readily transferable to the Sound ecosystem and may also result in substantial local oxygen depletion. EPA's consistency determination should identify known, understood and reasonably foreseeable beneficial and adverse effects of this activity, commensurate with CZMA 16 U.S.C. § 1456(c)(2).[133]

The reasonable and foreseeable coastal effects on New York's resources include, but are not limited to, the following parameters:

1. physical parameters such as living space, circulation, turbidity, morphology, substrate type, and erosion and sedimentation rates;
2. biological parameters such as community structure, food chain relationships, species diversity, predator/prey relationships, population density and size, mortality rates, reproductive rates, meristic features, behavioral patterns and migratory patterns; breeding, feeding, and nursery areas.
3. chemical parameters such as dissolved oxygen, carbon dioxide, acidity, dissolved solids, nutrients, organics, and pollutants such as heavy metals, volatile organics, and hazardous materials;
4. use of alternatives which minimize the need for dumping; and
5. use of methods to minimize sediment sources which, in turn, reduces the need for dredging.

Additionally, as DOS has noted in previous consistency decisions regarding dredged material disposals in Long Island Sound, the effects of subaqueous capping of contaminated disposals on water quality are varied and of limited scope. It is also an impermissible practice under the ODA regulations. There have been very few long term studies of the viability and effectiveness of capping in isolating and containing toxic materials. However, there have been many studies that have focused on the limits and failures of cap design and installation that result in remobilization of contaminants. When capping is required as an alleged remedy to sequestering higher concentrations of contaminated materials from the environment, that management approach results in the contaminated materials remaining exposed to the environment during removal and placement prior to any final capping or complete sequestration. This exposure may remain for several months until cap material is placed on the disposal site since the most contaminated material is disposed of first in the sequence. These effects may be significantly exacerbated with the presence of elevated levels of known contaminants, such as mercury, PCB congeners, and copper.[134] Further, capping disturbs the underlayment, causing spatial expansion of dispersal footprints. Experience in numerous locations[135] has shown that capping dredged material may be

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[132] Rice, E., Dam, H.G. & Stewart, G. (2015) Impact of Climate Change on Estuarine Zooplankton: Surface Water Warming in Long Island Sound Is Associated with Changes in Copepod Size and Community Structure, Estuaries and Coasts 38: 13.; Chris Field and Chris Elphick (2014), Sentinels of climate change: coastal indicators of wildlife and ecosystem change in Long Island Sound - Final report September, 2014 , Connecticut Department of Energy and Environmental Protection/ US EPA Long Island Sound Study found at http://www.sound.uconn.edu/lissm/documents/Elphick_et_al_Sentinels_final_report.pdf.

[133] See 15 C.F.R. § 930.31(a).

[134] See CENAE Suitability Determination for Mystic River Dredging (F-2014-0109 (DA))

[135] J. Brannon, R. Hoeppel, T. Sturgis, I. Smith, Jr., D. Gunnison (1985), Effectiveness of Capping in Isolating Contaminated Dredged Material from Biota and the Overlying Water. U.S. Army Corps of Engineers Technical

unpredictable as a reliable management technique for isolating contaminant-bearing fine-grained sediment from the environment.

The disposal of additional dredged material in eastern Long Island Sound, –in waters which have already been significantly compromised as a result of historic industrial discharges and dredged material disposal, will exacerbate this condition and further degrade water quality. Disposal at an eastern Long Island Sound site would require consistency New York's water quality standards, which seek to maintain or restore waters so that they are suitable for fish, shellfish and wildlife propagation and survival. Disposal at an eastern LIS site could violate New York's water quality standards.

Given the potential risk of adverse effects on human health and the environment by exposure to contaminants in sediment, systematically reducing or avoiding open-water disposal is the most appropriate approach to managing dredged material. This management approach requires both an accurate assessment of present and future dredging and disposal needs, and a thorough and comprehensive review of alternative strategies to disposal that pose reduced risk to impaired water quality. EPA provided neither.

Based on the potential risks to ecological integrity as discussed above, EPA's failure to adequately consider alternatives that would reduce this risk, sufficiently consider legacy contamination, and conduct a cumulative impacts assessment, has led to insufficient information in the record that would allow DOS to conclude that the proposed designations of the ELDS dump site(s) will be consistent to the maximum extent practicable with the New York State CMP. Therefore, the proposed activity is not consistent with this policy.

Policy 6 **Protect and restore the quality and function of the Long Island Sound ecosystem.**

Sub-Policy 6.1 **Protect and restore ecological quality throughout Long Island Sound**

Avoid significant adverse changes to the quality of the Long Island Sound ecosystem as indicated by physical loss, degradation, or functional loss of ecological components. Avoid fragmentation of natural ecological communities and maintain corridors between ecological communities. Maintain structural and functional relationships between natural ecological communities to provide for self-sustaining systems. Avoid permanent adverse change to ecological processes. Reduce adverse impacts of existing development when practical. Mitigate impacts of new development; mitigation may also include reduction or elimination of adverse impacts associated with existing development.

Southold LWRP Policy 6

Protect and restore the quality and function of the Town of Southold ecosystem.

Sub-policy 6.1 **Protect and restore ecological quality throughout the Town of Southold.**

A. Avoid adverse changes to the Long Island Sound and the Peconic Bay ecosystems that would result from impairment of ecological quality as indicated by:

Report D-85-10; S. Nadeau and M. Skaggs (2015), Analysis of Recontamination of Completed Sediment Remedial Projects in: A.K. Bullard, D.T. Dahlen (Chairs), Remediation and Management of Contaminated Sediments—2015. Eighth International Conference on Remediation and Management of Contaminated Sediments (New Orleans, LA; Jan 12–15, 2015).

2. *Degradation of ecological components*
Degradation occurs as an adverse change in ecological quality, either as a direct loss originating within the resource area or as an indirect loss originating from nearby activities. Degradation usually occurs over a more extended period of time than physical loss and may be indicated by increased siltation, changes in community composition, or evidence of pollution.
3. *Functional loss of ecological components*
Functional loss can be indicated by a decrease in abundance of fish or wildlife, often resulting from a behavioral or physiological avoidance response. Behavioral avoidance can be due to disruptive uses that do not necessarily result in physical changes, but may be related to introduction of recreational activities or predators. Timing of activities can often be critical in determining whether a functional loss is likely to occur. Functional loss can also be manifested in physical terms, such as changes in hydrology.

B. Protect and restore ecological quality by adhering to the following measures.
1. Maintain values associated with natural ecological communities.
Each natural ecological community has associated values which contribute to the ecological quality of the Town of Southold. These values should be assessed on a case-by-case basis.
3. Avoid fragmentation of ecological communities and maintain corridors to facilitate the free exchange of biological resources within and among communities.
4. Maintain ecological integrity of particular locales by maintaining structural and functional attributes, including normal variability, to provide for self-sustaining systems.
5. Avoid permanent adverse change to ecological processes

The history of the Long Island Sound coastal area is one of population growth and increased development pressure in the region, resulting in significant adverse impacts to the Sound's natural resources. Those familiar with its condition acknowledge the need to clean the Sound and reverse its decline.[136]

Successful resolution of problems, such as estuarine water quality, in such complex, interdependent social-ecological systems, requires identifying and addressing the full array of potential stressors affecting that system.[137] Long Island Sound water quality impairment should be viewed from a perspective of environmental degradation (and ecosystem collapse) and is best addressed from this perspective. The Sound's cumulative legacy of pollution and habitat degradation has resulted from a range of human activities, such as historical point discharges, wetland filling and draining, dumping of waste, channel dredging and harbor deepening, road and hard surface runoff, agricultural runoff, wastewater contamination, and dredged material disposal. Following a systems approach in managing these issues, Policy 6.1 requires a reduction in adverse impacts resulting from existing stressors, when practical, as well as mitigation of impacts from new stressors. However, EPA's analysis does not take this system stressors approach to addressing potential contaminant issues associated with continued reliance on open

[136] This fact was noted by Congress when it designated the Sound as an estuary of national significance in 1987.
[137] F. Berkes (2015). *Coasts for People: Interdisciplinary Approaches to Coastal and Marine Resource Management*. New York: Routledge.

water disposal as the preferred means of managing dredged material. Instead, EPA proposes to individually select, separate and apart from related actions within the Sound, additional open water disposal sites based, in part, on the assumption that the sites proposed for designation, because of their past use for receiving dredged material and the attributable presence of elevated contaminant levels in baseline sampling, are appropriate and would not significantly degrade the Long Island Sound ecosystem.

Utilizing this outdated approach, EPA significantly underestimates the breadth and extent of ecosystem impacts. As a result, its determination has not addressed reasonably foreseeable ecological effects of bioavailability of contaminants from dumping dredged material into Long Island Sound. EPA's consistency determination also fails to examine legacy and new contamination, regardless of relative amounts, from the perspective of open water disposal acting as a system stressor that contributes to compromising ecosystem function. While the DSEIS contains data reflecting elevated contaminant levels (e.g., mercury, copper, and pesticides such as toxaphene) in their baseline sediment surveys, EPA concludes, without supporting evidence, that the historical use of the site, and the presence of contaminants such as mercury and copper, does not preclude continuing use of the site as a dredged material disposal area and would not result in further degradation of the Long Island Sound ecosystem. However, the historical use of the site has already contributed to the overall degradation of ecological quality throughout the Sound. Dumping at the ELDS would add stress on the estuarine system, resulting in reasonably foreseeable, and avoidable, cumulative effects and would exacerbate the Sound ecosystem's exposure to additional contamination. EPA's expansion of the ELDS to include 1.5 square miles of "new" benthic habitat simply expands the ecosystem stressor to cover greater acreage, adding further stress to an already impaired area, and impacting previously unaffected areas as well.

EPA maintains, in its consistency determination, that the designation and continuing use of this site for disposal of dredged material would have negligible or "imperceptible" effects on water quality in the LIS ecosystem. Their assertions fail to assess any cumulative effects of the proposed designations, including the cumulative effects of the long-term use of the site after designation. In the absence of specific criteria for determining the potential toxicity of dredged material in a changing environment and an assessment of the cumulative effects and bioavailability of contaminants that accompany open-water dumping according to those criteria, New York concludes that EPA has not demonstrated the consistency of its proposed designations with Policy #6.1. For these reasons, the activity is not consistent to the maximum extent practicable with this policy.

Policy 8	**Minimize environmental degradation in the long Island Sound coastal area from solid waste and hazardous substances and wastes.**
Sub-Policy 8.1	**Manage solid waste to protect public health and control pollution.**
Sub-Policy 8.3	**Protect the environment from degradation due to toxic pollutants and substances hazardous to the environment and public health.**

Plan for proper and effective solid waste disposal prior to undertaking major development or activities generating solid wastes. Manage solid waste by: reducing the amount of solid waste generated, reusing or recycling material, and using land burial or other approved methods to dispose of solid waste that is not otherwise being reused or recycled. Prevent the discharge of solid wastes into the environment by using proper handling, management, and transportation practices.

Prevent release of toxic pollutants or substances hazardous to the environment that would have a deleterious effect on fish and wildlife resources. Prevent environmental degradation due to persistent toxic pollutants by: limiting discharge of bioaccumulative substances, avoiding resuspension of toxic pollutants and hazardous substances and wastes, and avoiding reentry of bioaccumulative substances into the food chain from existing sources.

Southold LWRP Policy 8

Minimize environmental degradation in Town of Southold from solid waste and hazardous substances and wastes.

Sub-policy 8.3 **Protect the environment from degradation due to toxic pollutants and substances hazardous to the environment and public health.**

A. Prevent release of toxic pollutants or substances hazardous to the environment that would have a deleterious effect on fish and wildlife resources.
The Town's Site Plan application process will determine whether proposed land use activities will involve toxic substances. Protection measures to prevent their release to the environment, particularly fish and wildlife resources, will be determined during the environmental review.
Further, the dredging of toxic material from underwater lands and the deposition of such material shall be conducted in the most mitigative manner possible so as not to endanger fish and wildlife resources, in either the short or long term.
B. Prevent environmental degradation due to persistent toxic pollutants by:
1. limiting discharge of bio-accumulative substances,
2. avoiding re-suspension of toxic pollutants and hazardous substances and wastes, and avoiding reentry of bio-accumulative substances into the food chain from existing sources

The intent of Policy 8 is to protect both human health and Long Island Sound's coastal resources from degradation through proper control and management of wastes and hazardous materials. This policy identifies avoidance and minimization as particularly critical components of any such waste management planning.

Over the past twenty years, federal, state and local agencies have worked cooperatively, investing billions of public dollars to clean up the Sound. In addition, due to the Ambro Amendment, the ODA standards have been applicable since 1980 and the guidance, procedures and standards contained in the ODA provide a template for proper management of dredged materials in the Sound. EPA has failed to properly use these ODA standards in its analysis supporting its site designation proposal. In particular, the cumulative impact analysis required by the ODA is insufficient.

Further, EPA has failed to fully consider all adverse impacts of open water disposal pertinent to Long Island Sound. In addition to the adverse effects associated with the re-introduction of dredged material contaminants to the water column and benthos discussed under the Policy #5 section, the open-water disposal of dredged material potentially affects aquatic species, especially the benthic community, directly through sediment dispersal through the water column, burial of biota and habitat under dumped dredged sediments, and long term bioavailability of pollutants within the dredged material disposal mounds and surrounding benthic sediments. In addition, disposal in eastern Sound and its resulting adverse effects are exacerbated because strong middle and bottom currents disperse the descending fine sediments and clays to other areas in the Sound. Moreover, following placement, the bottom currents will continue to erode the deposition and transport materials and any associated contaminants elsewhere in the Sound.

Since at least 1975, the Corps has claimed NLDS was a containment site. Their standard practice has been to "cap" the finer material with coarser sand. According to EPA, this is impermissible. As noted in EPA's comments on the draft DMMP: "14. 'Capping' is not allowed under the Ocean Dumping Act regulations …." So the unconfined disposal of "suitable" fine sediment may not be readily contained at the disposal site. Compounding the problems associated with EPA's analysis, several known contaminants present in the sediments of Connecticut's rivers and harbors are not tested for in dredged materials before disposal into Long Island Sound.[138] Even more concerning to New York, some known contaminants have never been assigned a standard for safe levels by EPA.[139]

Exacerbating the assessment inadequacies resulting from these gaps in information and analysis, EPA and the Corps currently use inadequate and outdated testing methodologies and analytical approaches that do not accurately determine the toxicity levels of contaminants in the dredged sediments before disposal.[140] Review of EPA's analysis shows that inadequate efforts have been made to determine sub-lethal and long term effects on fish and shellfish species. Research has shown that the adverse effects of chemical contamination to an ecosystem may not be manifest until after several generations of species propagation. A good example of this is provided by contamination by PCBs, known to exist in sediments near LIS dredging centers, and now present

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[138] See 40 C.F.R. § 228.13(b) and 40 C.F.R. 230.60. These regulatory exemptions provide for sediments to evade biological and chemical testing if certain sediment types are present in the dredged material. This exemption pathway is problematic because the contaminated sediments in eastern LIS dredging areas could evade testing when mixed with coarser grained material collected during sampling.

[139] See SEIS Scoping Comments in a letter dated January 31, 2013 from Fred Anders, Bureau Chief, DOS to Jean Brochi, EPA. DOS Scoping Comment # 7: "There is a need for enhanced testing and study to ensure that the disposal of dredged material pursuant to Ocean Dumping Act toxicity standards "Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual" (Green Book) is safe for disposal within the estuary environment of LIS. Study of the biology, chemistry, and hydrology that reflects the unique LIS estuarine environment should be used to evaluate whether the current Green Book standards are appropriate for LIS. Reference site locations for baseline evaluations and comparisons need to be located outside of an affected area to adequately reflect ambient levels to determine suitability for disposal. It is suggested that the ELIS SEIS should refer to such material as "legally permissible" under the applicable standards, rather than 'clean' or 'safe'". See also DOS Scoping Comment # 12 "The chemical containment and biological testing of the organisms re-colonizing new mounds of disposed dredged material, as well as those feeding on those communities, needs to be fully evaluated to also determine whether organisms are bringing those contaminants back to the surface or to other locations in LIS. Advancement in the methodology and technology are available to conduct marine field research on dispersion of sediment contaminants via subaquatic vegetation and benthic macroinvertebrates (especially polychaetes) and subsequent bioaccumulation in fish. This research should be done to determine environmental and human health impacts of contaminant dispersal from disposal." EPA has not addressed DOS's concerns in the either the proposed rule or the DSEIS.

[140] Jones, R. A., Mariani, G. M., and Lee, G. F., "Evaluation of the Significance of Sediment-Associated Contaminants to Water Quality," Proc. Am. Water Resources Assoc. Symposium, Utilizing Scientific Information in Environmental Quality Planning, AWRA, Minneapolis, MN, pp. 34-45 (1981); Jones, R. A., and Lee, G. F. (1981). "The Significance of Dredging and Dredged Material Disposal as a Source of Nitrogen and Phosphorus for Estuarine Waters," in Estuaries and Nutrients, Humana Press, Clifton, NJ, pp 517-530; G. Fred Lee and Anne Jones-Lee (1993). Sediment Quality Criteria: Numeric Chemical– vs. Biological Effects–Based Approaches, Proceedings of Water Environment Federation National Conference, Anaheim, CA, October 1993; Jones-Lee, A., and Lee, G. F., "Water Quality Aspects of Dredged Sediment Management," Water Encyclopedia: Water Quality and Resource Development, Wiley, Hoboken, NJ pp 122-127 (2005); Valente, R. M; Rhoads, D. C; Myre, P. L.; Read, L. B.; Carey, D.A. 2006. Evaluation of Field Bioaccumulation as a Monitoring Tool. DAMOS Contribution No. 169. U.S. Army Corps of Engineers, New England District, Concord, MA, 40 pp.; Anne Jones-Lee and G. Fred Lee (2005) Unreliability of Co-Occurrence-Based Sediment Quality Guidelines for Contaminated Sediment Evaluations at Superfund/Hazardous Chemical Sites, Remediation, Spring 2005; Long, E. R., Field, L. J., & MacDonald, D. D. (1998). Predicting toxicity in marine sediments with numerical sediment quality guidelines. Environmental Toxicology and Chemistry, 17(4), 714–727.

at the disposal sites as a result of past disposals.[141] These contaminants have been shown to bioaccumulate in benthic and aquatic marine species,[142] with long term low level exposure resulting in an array of behavioral and physiological impacts on specific species.[143] The persistent presence of PCBs in and near open water disposal sites should be analyzed and considered in a cumulative impact analysis.

New York regulates dredged material as a solid waste when managed upland and regulates dredging and dredged material disposal under the NYSDEC, Division of Water Technical and Operational Guidance Series (TOGS) 5.1.9 when managed in-water and in the riparian area. The DEC is currently in the process of revising its solid waste regulations, in part to facilitate the beneficial reuse of dredged material at upland sites.[144] EPA's analysis of prospective alternative options, particularly the beneficial use of material dredged in the Long Island Sound region was not adequately addressed in the consistency determination, the DSEIS or in the LIS DMMP. Because of this, EPA has not demonstrated the need for additional sites, particularly in light of the States of New York and Connecticut, and EPA's agreed upon goal of phased measurable reductions over time and developing viable alternatives to open water dumping, such as coastal marsh restoration, coastal resiliency projects, confined disposal facilities, containment islands, and the use of upland containment and processing sites. EPA's decision to follow the U.S. Army Corps "Federal Standard", which is implemented in part through a Corps' "guidance" document and not through an Administrative Procedures Act rulemaking,[145] serves as a recurring theme and primary basis of need through the low cost of open water disposal. As EPA has been influenced by the Corps' "lowest cost" approach in the "Federal Standard" 2015 guidance and has incorporated it into this rulemaking, it has not adequately considered all adverse effects resulting from open water disposal. EPA disqualified appropriate alternative management strategies due to cost and failed to include sufficient substantive analysis to justify conclusions regarding disposal impacts. As a result, EPA has failed to provide a supportable justification for dredged material disposal that requires designation of additional sites in eastern Long Island Sound. Furthermore, if a permanent open water disposal site were to be created in eastern Long Island Sound, as EPA proposes, and given the current reliance on the Army Corps application of the "Federal Standard", there would cease to be any economic reasons to find alternative ways to dispose of dredged material. Open water disposal will always be the lowest cost option when externalized environmental harms, environmental costs and other benefits are not considered.

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[141] DMMP PEIS p. 4-50: "The PCB content in one sample from the Mystic River and in samples from the East River were extremely high, exceeding 500 ng/g (Varekamp, et al., 2014)…. The median PCB concentration in western Long Island Sound was, on a concentration basis, within the top 15% of samples analyzed nationally, exceeded ERL SQGs, and was an order of magnitude above the Eastern Basin median (Mitch & Anisfeld, 2010)."

[142] The EPA has determined PCBs to be probable human carcinogens. See "Health Effects of PCBs", U.S. EPA, June 13, 2013. https://www.epa.gov/pcbs/learn-about-polychlorinated-biphenyls-pcbs#healtheffects.

[143] https://www.epa.gov/sites/production/files/2015-06/documents/ny_hh_227_f_03121998.pdf

[144] Colwell, R. and G. Sayler. (1977) Effects and Interactions of Polychlorinated Biphenyls (PCB) with Estuarine Microorganisms and Shellfish. U.S. Environmental Protection Agency, Washington, D.C., EPA/600/3-77/070; r.n. Reid, J.E. O'Reilly, and V.S. Zdanowicz (eds.), (1980). Contaminants in New York Bight and Long Island Sound Sediments and Demersal Species, and Contaminant Effects on Benthos, NOAA Technical Memorandum NMFS-F/NEC-16; Greig RA and Sennefelder G. (1985) Metals and PCB concentrations in mussels from Long Island Sound, Bull Environm Contam Toxicol. 35(3):331-4; Greig, R.A. & Sennefelder G. (1987) PCB concentrations in winter flounder from Long Island Sound, 1984-1986, G. Bull. Environ. Contam. Toxicol. (1987) 39:863; Gronlund, W.D., Chan, S. McCain, B.B. et al. (1991) Multidisciplinary assessment of pollution at three sites in Long Island Sound. Estuaries 14: 299.)

[145] U.S Army Corps of Engineers Memorandum on the Federal Standard Clarification Regarding Federal Dredging Mission and Interactions with Non-Federal Agencies, October 21, 2015 found at http://planning.usace.army.mil/toolbox/library/MemosandLetters/15Oct-FederalStandardClarification.pdf

EPA's proposal would, therefore, have the effect of using this already stressed urban estuary as a permanent dumping ground.

Overall, the information presented in the DSEIS does not adequately support the conclusion that potential risks to human health "appear to be very low" for EPA's preferred disposal option. The DSEIS is deficient in that it did not characterize the potential health risks associated with other disposal options and, therefore, comparison of various alternatives on the basis of health risk is not possible. Furthermore, the location of this proposed designation could actually compound effects elsewhere in the Sound. EPA did not adequately analyze these impacts.

Finally, the Southold LWRP specifically addresses dredged site designation and indicates such a designation would be inconsistent with its approved program, to wit:

> Deposition of the dredged material from this [federal navigation] channel to the NLDS is of concern because of the extent of the material, (millions of cubic yards), its contaminated nature, and its location relative to physically dynamic, biologically diverse and heavily fished waters. Since 1981 and 1990, the *Ocean Dumping Act* (ODA) has been in effect in Long Island Sound. However, the NLDS has not been formally designated as an approved disposal site in accordance with that act. It is the Town's position that the New London site does not meet the criteria set forth in the ODA, and therefore should be closed to future depositions of dredged material. The standards of the ODA ought to be upheld, not circumvented by federal agencies.[146]

After decades of directives to include in planning efforts and to develop and implement innovative alternatives to the disposal of dredged materials in Long Island Sound and reflecting that in the Long Island Sound Coastal management Program and its policies, EPA's treatment and analysis of the proposed site designation essentially dismisses innovative alternatives to the disposal of dredged materials in Long Island Sound and the possibilities of advancing them. The designation of this site for the continued disposal and dredged materials would allow varied and continuing impairments to Long Island Sound from solid wastes and toxic pollutants and substances hazardous to the environment and public health. Rather than advancing applicable coastal policy objectives it would be contrary to and undermine them. The designation of these sites in the open waters of Long Island Sound would therefore, not be consistent with these policies. In addition, failing to develop and implement alternatives to open water disposal of dredged materials because of the added costs of doing so, would contravene CZMA requirements that this proposed activity be undertaken in a manner consistent to the maximum extent practicable with New York's Long Island Sound Coastal Management Program.

For the foregoing reasons, the designation of these sites in the open waters of Long Island Sound is not and would not be consistent to the maximum extent practicable with this policy.

Policy 10	**Protect Long Island Sound's water-dependent uses and promote siting of new water- dependent uses in suitable locations.**
Sub-Policy 10.6	**Provide sufficient infrastructure for water-dependent uses.**

[146] Southold LWRP Section II – K p. 26.

Use suitable dredged material for beach nourishment, dune reconstruction, or other beneficial uses. Avoid placement of dredged material in Long Island Sound when opportunities for beneficial reuse of the material exist. Allow placement of suitable dredged material in nearshore locations to advance maritime or port-related functions, provided it is adequately contained and avoids negative impacts on vegetated wetlands and significant coastal fish and wildlife habitats. Avoid shore and water surface uses which would impede navigation.

Southold LWRP Policy 10

Protect Southold's water-dependent uses and promote siting of new water-dependent uses in suitable locations.

Sub-policy 10.5 Provide sufficient infrastructure for water-dependent uses.

A. Provide adequate navigation infrastructure.

Dredging is an essential activity but with costs and impacts that require it to be undertaken only to the extent necessary to meet the current and future needs of water-dependent uses of the Town of Southold. The Town of Southold will work in cooperation with New York State, Suffolk County, the Village of Greenport and private owners of water-dependent uses to:

5. Avoid placement of dredged material in Long Island Sound when upland alternatives exist.

6. Put clean dredge material to beneficial use for either beach nourishment or dune reconstruction.

Sub-policy 10.6 Promote efficient harbor operation.

C. Promote efficient harbor operation in the waters off Fishers Island

5. Maintain the chemical, physical and biological integrity of the island's surrounding waters and harbors and their dependent habitats.

Policy 10 first aims to promote beneficial uses of dredged material, consistent with past practices in the Long Island Sound region, by requiring the beneficial use of suitable dredged material wherever possible; and second, it speaks to the importance of planning shore and surface uses so as to not impede navigation and other water-dependent uses

EPA states in its consistency determination that open-water site designation advances water-dependent uses and the infrastructure that supports those uses. Having a way to dispose of dredge material makes it easier to dredge rivers and harbors for navigation. However, open water disposal is not the only way to dispose of dredged material and New York's Coastal Policies value beneficial reuse as a preferred disposal option. EPA did not adequately address beneficial reuse options, including containment options in the Proposed Rule and supporting documents. Instead, EPA simply concluded that a disposal site needed to be created in Eastern Long Island Sound to make available an even more "cost effective" method of disposal. This approach would support a dredged material disposal site adjacent to every dredging need in the Sound. EPA's definition of "cost-effective", however, does not utilize full-cost accounting approaches that include the costs of environmental harm. The end result is that EPA, in making its cost-effective, but environmentally damaging disposal option readily available, while simultaneously concluding that no alternatives to open-water disposal in Long Island Sound would meet the long-term regional disposal need, is guaranteeing that few, if any, beneficial reuse projects will be meaningfully pursued. This lack of due diligence to seek viable alternatives to open water dumping suggests EPA places cost savings over environmental responsibility and stewardship. This is particularly troubling as Long Island Sound is a designated Estuary of National Significance and continues to receive federal and state funding for environmental improvement projects while at the same time EPA is proposing open water dumping. Given the high risk for

environmental damage, no demonstrated need, and a singular focus on an artificially generated lowest cost option, EPA's Proposed Rulemaking seems contrary, ill conceived, and at cross purposes with EPA stewardship responsibility for Long Island Sound.

In support of its determination that open water site designation advances water dependent uses, EPA claims that there is inadequate capacity at the existing designated sites (CLDS and WLDS) to facilitate disposal. As stated in New York's joint agency comment letter of July 18, 2016, New York's analysis of the DMMP, and EPA's own submission documents yields a much different conclusion. There is more than enough capacity in existing designated sites within the Zone of Siting Feasibility. Furthermore, EPA, New York and Connecticut, have agreed to work towards measurable reductions in open water dumping over time. Those reductions over the next thirty years will further diminish the notion that there is not adequate capacity elsewhere.

While The EPA Determination contends that beneficial use options are inadequate to accommodate projected disposal needs, their analysis fails to adequately and comprehensively evaluate those alternatives. Examples of alternatives to open-water disposal for both contaminated and uncontaminated dredged material are available and have been used in the LIS region, including in New York Harbor, Eastchester Creek, and Hempstead Harbor, and should be thoroughly evaluated in a region-wide assessment of potential dredged material management options. New York has previously provided an extensive list of potential alternative uses that would result in reduction or elimination of adverse coastal impacts.[147] EPA has not fully considered these options in its determination.

EPA has also neglected to provide any analysis of current vessel uses and any potential conflicts with those uses. For example, the proposed ELIS is located in one of the busiest recreational and ferry traffic areas in the Sound (NROC boating survey, and AIS CG data). The Coast Guard AIS data show significant commercial vessel traffic, including cargo, ferry, and barge traffic. The EPA Determination, however, includes inadequate or no recreational or commercial use analysis for this area of eastern Long Island Sound and fails to recognize the area as having some of the best recreational fishing waters and busiest boating traffic in the region. Absent this analysis, it is not possible to determine if these user groups are potentially subject to any significant adverse effects as a result of continued disposal operations.

EPA failed to fully investigate the feasibility of implementing alternatives and did not conduct a full environmental analyses on those alternatives; therefore, the proposed site designation fails to provide adequate information to support EPA's consistency determination and the need for designating one or more additional sites in Long Island Sound. Accordingly, the proposed activity is not consistent to the maximum extent practicable with this policy.

Policy 11 Promote sustainable use of living marine resources in Long Island Sound.
Sub-Policy 11.1 Ensure the long-term maintenance and health of living marine resources.

Ensure that commercial and recreational uses of living marine resources are managed in a manner that: results in sustained useable abundance and diversity of the marine resource; does not interfere with population and habitat maintenance and restoration efforts; uses best

[147] See DOS Scoping Letter dated January 13, 2013 from Fred Anders to EPA.

available scientific information in managing the resources; and minimizes waste and reduces discard mortality of marine fishery resources.
Ensure that the management of the state's transboundary and migratory species is consistent with interstate, state-federal, and interjurisdictional management plans. Protect, manage, and restore sustainable populations of indigenous fish, wildlife species, and other living marine resources.
Foster occurrence and abundance of Long Island Sound's marine resources by: protecting spawning grounds, habitats, and water quality; and enhancing and restoring fish and shellfish habitat, particularly for anadromous fish, oysters, and hard clams.

Southold LWRP Policy 11

Promote sustainable use of living marine resources in Long Island Sound, the Peconic Estuary and Town waters.

Sub-policy 11.1 **Ensure the long-term maintenance and health of living marine resources.**

A. Ensure that commercial and recreational uses of living marine resources in the Town of Southold are managed in a manner that:
1. places primary importance on maintaining the long-term health and abundance of marine fisheries, *3. does not interfere with population and habitat maintenance and restoration efforts,*
4. uses best available scientific information in managing the resources
C. Foster the occurrence and abundance of the Town's marine resources through:
1. protection of spawning grounds, habitats, and water quality,
2. enhancement and restoration of fish and shellfish habitat

Sub-policy 11.2 **Provide for commercial and recreational use of the Town of Southold's finfish, shellfish, crustaceans, and marine plants.**

C. Protect the public health and the marketability of marine and fishery resources by:
4. maintaining and improving water quality of fishery and marketable marine resources to protect public health.

The living marine resources of the Sound play an important role in the social and economic well-being for millions of people in the Long Island Sound region. New York's commercial and recreational uses are dependent on the Sound's living marine resources, ranging from boating and swimming, to fishing, and diving. The continued use of the Sound's living resources by New Yorkers depends on maintaining a healthy ecosystem structure – the physical, chemical, and biological attributes that together support its ecological functions. Ensuring the long-term health and abundance of marine animals, and the range of habitats important to their life stages, is critical to ensure that commercial and recreational uses can be maintained for future generations.

Open water disposal may result in a range of different water quality and ecosystem effects, many of which can be stressors for marine resource populations. The DSEIS and consistency determination acknowledge the adverse effects of the direct burial of living benthic organisms during placement of dredged material at the sites during open-water dumping operations. Motile organisms that do survive dumping disposal events may respond through the bioaccumulation of dredged material contaminants in the sediment and in the water column. Effects of

bioaccumulation and toxicity have the potential to multiply through the ecosystem.[148] EPA states these effects are acceptable due to the re-colonization that may happen after a period of time. However, re-colonization does not indicate the level of contaminants in the biota, sub-lethal effects of this contamination, or normal patterns of spatial distribution. In fact, re-colonization can create bioturbation that re-suspends more fine sediments into the water column for dispersal. Other EPA regions have rigorous capping programs to avoid the very recolonization and resuspension of material that EPA Region 1 asserts is good and indicates a healthy "recovery" form dumping events. In addition, the proposed dumping will be done periodically and repeatedly over 30 years with little, if any, adequate recovery time between dumping events and these repeated dumping events will result in cumulative effects over time that lead to a slow and steady increase in risk to the ecological health of the Sound.

It remains unclear from the information provided by EPA what effects the impermissible practice of "capping" would have on the re-colonization that is suggested to occur at the disposal sites. Even less certain, and left undefined in the DSEIS and EPA's consistency determination, is the nature of potential trophic changes likely to result from such activities, particularly when the dumped material is composed of different physical characteristics than the ambient, benthic material. These physical habitat alterations will affect species colonization and may result in lower biodiversity and longer re-colonization periods.[149]

In addition to potential direct and indirect effects on the Sound ecosystem, contaminants, both legacy and future, adversely affect the ecosystem cumulatively. Insufficient data has been provided by EPA on the cumulative effects to the Sound's benthic ecology from repeated disposal activities at these sites. While the Corps and EPA have relied heavily on the DAMOS monitoring program,[150] this program provides limited and inadequate details in the accompanying revised SMMPs as required by ODA § 102(c); and there is no evidence that proposed 'management' of contaminated material would successfully encourage comparable re-colonization patterns at the disposal sites by the same species that may have inhabited these locations prior to disposal activities.

Another ecosystem stressor that is inadequately addressed by EPA is the changing climate and how it affects the Sound and its living resources. There is mounting evidence that climate change-induced alterations in the Sound ecosystem, including increased precipitation and flooding, increased storm activity and intensity, ocean acidification (reduced pH), and warming of marine waters, are changing the chemistry of the Sound environment and amplifying negative

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[148] J. Lake, G. Hoffman, S. Schimmel (1985). Bioaccumulation of Contaminants from Black Rock Harbor Dredged Material by Mussels and Polychaetes US Environmental Protection Agency Technical Report D-85-2; A Jakimska, P Konieczka, K Skóra, and J Namiesnik (2011). Bioaccumulation of metals in tissues of marine animals, Part I: the role and impact of heavy metals on organisms. Pol. J. Environ. Stud; C. Hammerschmidt and W. Fitzgerald (2006). Bioaccumulation and Trophic Transfer of Methylmercury in Long Island Sound. Archives of Environmental Contamination and Toxicology V 51, pp 416-424; Chen, C., Amirbahman, A., Fisher, N. et al. (2008) Methylmercury in Marine Ecosystems: Spatial Patterns and Processes of Production, Bioaccumulation, and Biomagnification EcoHealth 5: 399.

[149] Valente, R. and Fredette, T. (2003) Benthic Recolonization of a Capped Dredged Material Mound at an Open Water Disposal Site in Long Island Sound. Dredging '02: pp. 1-14.; Wilber DH, Clark DG, 2007. Defining and assessing benthic recovery following dredging and dredged material disposal, p. 603–618. In: R.E. Randall (ed.), Proceedings of the XVIII World Dredging Congr., Lake Buena Vista, FL, USA.; A. Brooks (1983) A Study of the Benthic Macrofauna at the Central Long Island Sound Disposal Site, US Army Corps of Engineers.

[150] DAMOS (Disposal Area Monitoring System) is a program initiated in 1977 by the New England District of the U.S. Army Corps of Engineers to manage and monitor offshore dredged material disposal sites from Long Island Sound to Maine.

impacts of legacy contaminants already present in benthic sediments.[151] This changing chemistry of the system will create new toxic threats, stressors, risks and vulnerabilities. Studies show warming temperatures and lower pH can "activate" contaminants in the bottom sediments and increase their bioavailability. Climate change effects may also reduce the Sound's capacity to absorb the stress of additional contamination loads, particularly because of warming of marine waters and ocean acidification. With this level of risk and uncertainty of continued dumping and subsequent elevated contaminants to living resources in the Sound, proposals to expand the distribution of open water dump sites should be avoided.

Overall, EPA's analysis lacks a competent and comprehensive consideration of ecosystem stressors in LIS, including those associated with a changing climate, that directly or indirectly affect living resources of importance to New Yorkers. EPA's failure to address and evaluate the proposed redistribution of contaminated materials resulting from dumping invalidates its ability to determine the range of subsequent potential effects on ecosystem function necessary to sustain the Sound's marine resources. Therefore, the proposed activity is not consistent to the maximum extent practicable with this policy.

Conclusion

Pursuant to 15 C.F.R. § 930.43 and §930.112, you may attempt to resolve these issues with DOS, or request Secretarial Mediation from the U.S. Department of Commerce. Given that the mediation process may be lengthy, if you would like to continue discussions with this office while pursuing mediation, please call Ms. Sandra Allen at (518) 474-6000.

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[151] W. Sunda and W. Cai (2012). Eutrophication Induced CO_2-Acidification of Subsurface Coastal Waters: Interactive Effects of Temperature, Salinity, and Atmospheric PCO2. *Environ. Sci. Technol.*, *46* (19), pp 10651–10659; R. Feely, et al. (2008). Evidence for Upwelling of Corrosive "Acidified" Water onto the Continental Shelf, Science, v320, 1490-1492; R. Feely, et al. (2004), Impact of Anthropogenic CO2 on the CaCO3 System in the Oceans, Science, v305, 362-366; C. Kennedy (2009). An Upwelling Crisis: Ocean Acidification. National Oceanic and Atmospheric Administration's Climate.gov website at https://www.climate.gov/news-features/features/upwelling-crisis-ocean-acidification. October 30, 2009. Accessed September 1, 2016; F. Melzner, J. Thomsen, W. Koeve, A. Oschlies, M. Gutowska, H. Bange, H. Hansen, A. Körtzinger, (2013). Future ocean acidification will be amplified by hypoxia in coastal habitats, Marine Biology, 160: 8. August 1, pp 1875-1888; Doney et al., 2009 and Pew Center, 2009 as quoted in EPA's "Synthesis of Climate Change Drivers and Responses in Long Island Sound" at http://longislandsoundstudy.net/wp-content/uploads/2011/03/LISS-Synthesis-of-CC-Impacts-Memo.pdf Accessed September 1, 2016; S. Moffitta, T. Hillb, P. Roopnarined, and J. Kennette (2014). Response of seafloor ecosystems to abrupt global climate change, *PNAS; J.* Latimer; M. Tedesco, R. L. Swanson, C. Yarish, P. Stacey, C. Garza (2014). *Long Island Sound: Prospects for the Urban Sea*. New York: Springer; E. Mecray, M. Buchholtz ten Brink, and E. Galvin (2000). Distribution and accumulation of contaminated sediments in Long Island Sound, Long Island Sound Research Conference, Stamford, CT; I. Johnson (1987). The effects of combinations of heavy metals, hypoxia and salinity on oxygen consumption and carbohydrate metabolism in *Crangon crangon* (L.) & *Carcinus maenas* (L.) *Ophelia* Volume 27, Issue 3; J. Camargoa, and Á. Alonsob (2006) Ecological and toxicological effects of inorganic nitrogen pollution in aquatic ecosystems: A global assessment. Environment International, Vol 32, Iss 6, August, Pages 831–849; C. Magalhãesa, J. Costaa, C. Teixeiraa, and A. Bordaloa (2007). "Impact of trace metals on denitrification in estuarine sediments of the Douro River estuary, Portugal" *Marine Chemistry*, Vol 107, Iss 3, Pages 332–341; J. Gray, R. Shiu-sun Wu, Y. Ying Or (2002) Effects of hypoxia and organic enrichment on the coastal marine environment. Marine Ecology Progress Series, Vol. 238: 249–279; T.I. Moiseenko, (2010). Effect of Toxic Pollution on Fish Populations and Mechanisms for Maintaining Population Size. Russian Journal of Ecology, Vol. 41, No. 3, pp. 237-243; USEPA (2011) Synthesis of Climate Change Drivers and Responses in Long Island Sound" USEPA at http://longislandsoundstudy.net/wp-content/uploads/2011/03/LISS-Synthesis-of-CC-Impacts-Memo.pdf. Accessed September 1, 2016.

The U.S. Department of Commerce is being notified of this decision by copy of this letter.

Sincerely,

Rossana Rosado
Secretary of State

cc:
OCM - David Kennedy, Director
OCM - David Kaiser, Chief, Coastal Programs Division
OCM - John King
COE/New England District - Diane Ray, Timothy J. Dugan
COE/New York District - Randall G. Hintz
USEPA Region 1 – Curtis Spaulding, Regional Administrator
USEPA Region 2 – Judith Enck, Regional Administrator
Connecticut DEP – Brian Thompson
NYSDEC Central Office – Tom Berkman
NYSDEC Region 1 - Roger Evans
NYSDEC Region 2 - Stephen Watts

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COASTAL ZONE MANAGEMENT CONSISTENCY DETERMINATION – RHODE ISLAND

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

July 28, 2016

Grover J. Fugate
Executive Director
Coastal Resources Management Council
State of Rhode Island
Stedman Government Center
4808 Tower Hill Road
Wakefield, Rhode Island 02879

Re: EPA Determination that its Proposed Designation of a Dredged Material Disposal Site in the Eastern Region of Long Island Sound Will Either Have No Effect On, Or Will Be Consistent with, Rhode Island's Coastal Zone Management Program

Dear Mr. Fugate:

The New England Office of the United States Environmental Protection Agency (EPA) is proposing to designate an open-water dredged material disposal site for the eastern region of Long Island Sound pursuant to Sections 102(c) and 106(f) of the Marine Protection, Research and Sanctuaries Act (MPRSA). 33 U.S.C. §§ 1412(c) and 1416(f). *See also* 40 C.F.R. § 228.4(e). On April 27, 2016, EPA published a Proposed Rule notifying the public of this proposed action and seeking public review and comment. 81 Fed. Reg. 24748 - 244767 (April 27, 2016) (EPA's April 2016 Proposed Rule). EPA also simultaneously published for public review and comment a Draft Supplemental Environmental Impact Statement (DSEIS) that evaluated the proposed action and various possible alternatives to it (EPA's April 2016 DSEIS).

EPA has determined that its proposed action either (a) would not affect any coastal use or resource of Rhode Island's coastal zone (*i.e.*, "a negative determination" under 15 C.F.R. § 930.35), or, alternatively, (b) would be fully consistent with the enforceable policies of Rhode Island's Coastal Management Program ("RI CMP") (*i.e.*, a "consistency determination" under 15 C.F.R. § 930.36). Therefore, EPA is submitting this negative determination or, in the alternative, consistency determination to the Coastal Resources Management Council of the State of Rhode Island ("RI CRMC") pursuant to Section 307(c)(l)(C) of the Federal Coastal Zone Management Act ("CZMA") and applicable federal regulations. 16 U.S.C. § 1456(c)(l)(C); 15 C.F.R. §§ 930.35 and 930.36.

The Proposed Site Designation and Primary Alternatives under Consideration

Specifically, EPA is proposing to designate a site offshore of New London, CT. The site is referred to as the "Eastern Long Island Sound Dredged Material Disposal Site" (ELDS). While identifying designation of the ELDS as its preferred alternative, EPA also indicated that two other alternatives, the Niantic Bay Disposal Site (NBDS) and the Cornfield Shoals Disposal Site (CSDS), or portions thereof, could also potentially be designated in addition to, or instead of, the ELDS. EPA invited public comment on the option of designating one or both of these sites. EPA also has proposed that the same site use restrictions that govern use of the Central Long Island Sound (CLDS) and Western Long Island Sound (WLDS) dredged material disposal sites would also be applied to the site or sites designated in the eastern region of the Sound. *See* 81 Fed. Reg. 44220 (July 7, 2016) (Final Rule) (amended site use restrictions for the CLDS and WLDS).

The Zone of Siting Feasibility (ZSF) – i.e., the area within which EPA looked for possible dredged material disposal site options to serve the eastern region of Long Island Sound, *see* 81 Fed. Reg. 24762 – extends in this case from Connecticut and New York waters in the eastern region of Long Island Sound into Rhode Island waters generally north and west of Block Island. *See* 81 Fed. Reg. 24762 (the ZSF has "a southern boundary from Montauk Point to the southern tip of Block Island, and an eastern boundary from the northern tip of Block Island due north to the Rhode Island shoreline."). *See also* EPA's April 2016 DSEIS, Figs. ES-2 and 3-1. That said, all three sites now being considered by EPA – the ELDS, NBDS and CSDS – are in Connecticut waters, many miles from the Rhode Island border.[1]

The Proposed Site Designation (or Designations) Either Would Not Affect Rhode Island Coastal Zone Resources or Uses, or Would Affect Them in an Insignificant Way and EPA's Proposed Action Would Be Fully Consistent with Rhode Island's CMP

Designating the ELDS (or the NBDS or CSDS) would have no *direct* effects on any resource or use of Rhode Island's (or any other state's) coastal zone. This is because EPA designation of a dredged material disposal site does not actually authorize the placement of dredged material at the site. *See* 15 C.F.R. §930.11(g) ("direct effects … result from the activity and occur at the same time and place as the activity …"). Designation only makes the site *potentially* available to receive dredged material. No material may be placed at the site unless such placement is first specifically authorized by the United States Army Corps of Engineers (USACE). Such authorization, in turn, cannot be granted until the material has been assessed and found to satisfy the strict sediment quality criteria of the MPRSA regulations, and it has been determined that no practicable alternative to open water disposal is available that would have less adverse environmental effects. *See* 40 C.F.R. §§ 227.1(b), 227.5, 227.6, 227.16(b).

Thus, any coastal zone effects of a dredged material disposal site designation would be *indirect* effects. The CZMA regulations of the National Oceanic and Atmospheric Administration (NOAA) explain that "indirect (cumulative and secondary) effects … [are

[1] EPA has provided CZMA consistency determinations to both Connecticut and New York.

effects that] result from the activity and are later in time or farther removed in distance, but are still reasonably foreseeable." 15 C.F.R. § 930.11(g). Designation of a disposal site could potentially have indirect effects (a) at the disposal site, (b) in other areas affected by placement of material at the disposal site, (c) at the sites where dredging would occur, and/or (d) along transit routes from dredging sites to the disposal site.

Because it is "reasonably foreseeable" that once a site has been designated, later federal actions will approve placement of at least some dredged sediments at the site,[2] designation of the ELDS (and/or the NBDS or CSDS) could result in indirect effects *at the disposal sites* or *any other area affected by the placement of material at the disposal sites*. Placing material at the site will have some type of environmental effect as material travels through the water column and lands on the seafloor. While EPA has concluded that any such effects would be insignificant, the key point for purposes of this CZMA consistency determination is that there would be no such effects in Rhode Island's coastal zone. The site alternatives are all located in Connecticut waters, miles from Rhode Island's coastal zone. Any dredged material placed at one of the disposal sites would travel rapidly to the seafloor and would not disperse horizontally through the water column and away from the site.[3] *See* 81 Fed. Reg. 24754, 24758. Data also indicate that placing dredged material at one of the disposal sites would not adversely affect water quality other than temporarily raising water column turbidity in the area of the disposal site during initial mixing.

Furthermore, material can only be authorized for placement at a designated site if is first tested and found to satisfy the MPRSA's strict sediment quality criteria in 40 C.F.R. Part 227, Subpart B.[4] These criteria prohibit, among other things, the placement of toxic or bioaccumulative material at a designated site. *See* 40 C.F.R. §§ 227.3, 227.5 and 227.6. While placing the material at a site would affect the seafloor and smother some benthic organisms, research shows that areas receiving dredged material are quickly recolonized by resident benthic organisms. As discussed in the USACE's PEIS in support of the DMMP, which cites Germano et al, 2011, "although short-term impacts and long-term changes in habitat due to sediment type and elevation of the seafloor have occurred [at the disposal sites], there is no evidence of long-term effects on benthic processes or habitat conditions." Another reason that the environmental effects would not be significant is that none of the disposal site alternatives encompass natural resource areas of particularly heightened sensitivity. *See* 81 Fed. Reg. 24754 – 24755. Moreover, placement of dredged material at the sites would not have significant adverse effects on

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[2] Such future disposal is reasonably foreseeable in light of the DMMP's projections that alternatives to open-water disposal cannot accommodate all the dredged material that will need to be managed over the next 30 years.

[3] It should be noted that the CSDS and part of the NBDS are considered to be dispersive sites. This means that material placed at these sites tends to be dispersed from the sites by bottom currents. The prevailing bottom currents at the CSDS and the dispersive portion of the NBDS are to the west, away from Rhode Island's coastal zone.

[4] In addition, material cannot be authorized for placement at a designated site unless there are no practicable alternative management methods available that would have less adverse environmental effects.

aquatic organisms transiting the sites because of the restrictions on the type of material that could be placed there and the limited exposures that would occur. Any effects of dredged material disposal would be further limited by the fact that placement of material at the sites could only occur during the limited months when dredging is allowed (typically only from October to April). *See* 81 Fed. Reg. 24754, 24756 (discussing "environmental windows" or "time-of-year restrictions" for dredging). Thus, no effects on Rhode Island's coastal zone would occur.

It can also be argued that a site designation might result in indirect effects *at locations where dredging will occur*. This argument posits that by providing a way for dredged material to be managed, a disposal site designation enables dredging to take place and, therefore, causes indirect effects at dredging sites. After considering this argument, however, EPA concludes that effects at dredging sites would neither be the result of the proposed EPA site designation(s) nor be significant.

Any effects at dredging sites are not *caused* by site designations. The need for dredging exists regardless of whether a disposal site is designated. Moreover, disposal site designations do not authorize dredging activities, which are subject to separate regulation under other legal authorities. In addition, even without designation of the ELDS (or the NBDS or CSDS), dredging would still occur because the dredged material could potentially be managed in ways other than placement at a designated site in the eastern region of Long Island Sound. (Of course, this would depend on the quality and quantity of dredged material at issue and the availability of alternative management methods.) For example, with regard to dredging sites in Rhode Island, suitable dredged material could still potentially be placed at open-water disposal sites designated by EPA *outside* of the eastern Sound, such as the Rhode Island Dredged Material Disposal Site (RIDS), or at other sites *selected* by the USACE. *See* 33 U.S.C. § 1413(b). More specifically, there are two Rhode Island dredging centers (Block Island and South-Central/Southeast Washington County) located within the ZSF, but both are closer to the Rhode Island Sound Dredged Material Disposal Site (RISDS), which is located in waters offshore of Rhode Island, than to the sites EPA is considering in the eastern region of Long Island Sound. As a result, dredged material from Rhode Island's coastal zone will either be sent to the RISDS or, if the dredged material is suitable sand, it will be used for beach nourishment or other beneficial uses in Rhode Island's coastal zone. 81 Fed. Reg. 24750. *See also* EPA's April 2016 Proposed Rule, 81 Fed. Reg. 24748 - 24752; EPA's April 2016 DSEIS, §§ 3.4.2.3 and 3.4.2.5. Therefore, the proposed site designation(s) in this case would not cause dredging effects in Rhode Island waters.

Furthermore, EPA expects that any adverse dredging effects would be insignificant because dredging is carefully regulated. Dredging proposals are subject to federal, state and possibly local regulatory review, which should prevent adverse dredging effects. Moreover, dredging in Rhode Island waters would be expected to benefit public coastal uses by improving navigational safety and facilitating marine commerce and recreation.

Finally, designating the ELDS (or the NBDS or CSDS) could, in theory, also indirectly affect Rhode Island's coastal zone as a result of barges travelling from dredging locations

in Rhode Island to the disposal site (or sites). No such effects would occur within Rhode Island's coastal zone, however, because, as stated above, material dredged from Rhode Island will not be barged to any of the three site alternatives.[5] Indeed, if no disposal site is designated in the eastern region of Long Island Sound, dredged material from New York and Connecticut might need to be hauled a long distance to the RISDS. Thus, transport-related effects are more of a risk if none of the proposed site alternatives is designated.

In addition, since designation of the ELDS (or the NBDS or CSDS) would reduce the likelihood that dredging proponents in eastern Long Island Sound would need to use the previously designated RISDS, it would also, in effect, preserve capacity at the RISDS for potential use by dredging projects in Rhode Island and southeastern Massachusetts, as originally planned when the site was designated.

Thus, designating the ELDS (and/or the NBDS and/or the CSDS) would have no effect on Rhode Island's coastal zone. If such designation did have any effects on Rhode Island's coastal zone, EPA's proposed action would be fully consistent with the RI CMP.

Prior Consultation with RI CRMC

On March 11, 2016, EPA Region 1 sent your office a letter indicating the Region's intent to review its possible designation of a dredged material disposal site in the eastern region of Long Island Sound to determine its consistency with the RI CMP and seeking guidance regarding which of the enforceable policies of the RI CMP should be considered. In response to EPA's letter, on March 22, 2016, Jeff Willis of your office sent an email to Jean Brochi of EPA to provide information.

Conclusion

EPA Region 1 has completed its evaluation and, as stated above, has determined that its proposed action, as well as the primary alternatives under consideration, would be consistent to the maximum extent practicable with the enforceable policies of the Rhode Island CMP. The Region's determination is supported by the above-cited Federal Register notice and other materials referenced in the consistency determination.

The waters of Long Island Sound are a precious natural resource that provide immeasurable benefits to the people of our Nation, including residents of the States of Connecticut, New York and Rhode Island. These waters also provide invaluable habitat for aquatic life, a wonderful aesthetic and recreational resource, and a crucial engine for the region's economy. Maintaining their navigability is also important to our national security planning. All of these purposes and functions must be served in our collective

---

[5] In addition, EPA does not consider any such barge trip effects to be significant. Conditions are in place that will prevent significant adverse effects. Barge and navigation technology ensure that sediments are placed only at the intended disposal sites. The regulations also preclude disposal trips during threatening sea conditions. *See* 81 Fed. Reg. 24757, 24760; 40 C.F.R. § 228.15(b)(4)(vi)(I).

stewardship of Long Island Sound. As the RI CMP recognizes, dredging is needed at times to ensure safe navigation and adequate mooring space for recreational, commercial and military vessels. *See* RI CMP, Section 300.9. At the same time, it is critical that dredging and dredged material management be conducted in an environmentally sound manner. EPA Region 1 believes that its proposed action correctly balances this multitude of interests.

In developing this proposal, EPA has taken into account the input of the federal and state agencies and members of the interested public. We look forward to receiving and considering public comments on the Proposed Rule and the DSEIS. When considering the proposed action, it is again important to remember that EPA designation of a disposal site does not authorize either any dredging or the placement of any particular dredged material at the designated disposal site. It just makes the designated site available as a potential management option for use in appropriate circumstances. Any proposal to place dredged material at a site in the waters of Long Island Sound will be subject to a separate case-specific permitting review. Placement at a disposal site can only be authorized if (a) the sediments are analyzed and found suitable for marine disposal after physical, chemical and biological testing, and (b) there are no practicable alternatives to such marine disposal.

EPA Region 1 requests that RI CRMC provide a written concurrence with the attached CZMA consistency determination within 60 days of receipt of this letter.
If you have any questions regarding this letter, your staff may call Mel Cote, chief of the Surface Water Branch at (617) 918-1553 and/or your legal counsel may call Senior Assistant Regional Counsel Mark Stein at (617) 918-1077. Thank you for your continued cooperation in this important effort.

Sincerely,

Ken

Kenneth Moraff, Director
Office of Ecosystem Protection

cc (by email):
David Kaiser, NOAA
Mark Habel, USACE
Kathleen Moser, NYDEC
Jeffrey Zappieri, NYDOS
Brian Thompson, CT DEEP

State of Rhode Island and Providence Plantations
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August 9, 2016

Mr. Kenneth Moraff, Director
Office of Ecosystem Protection
US Environmental Protection Agency
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

RE: EPA Determination of Consistency for Proposed Designation of a Dredged Material Disposal Site in the Eastern Region of Long Island Sound
CRMC File No. 2016-08-029

Dear Mr. Moraff:

In accordance with Title 15 of the Code of Federal Regulations, Part 930, Subpart C (Consistency for Federal Activities) and review of your consistency determination received July 29, 2016 entitled *"EPA Determination that its Proposed Designation of a Dredged Material Disposal Site in the Eastern Region of Long Island Sound Will Either Have No Effect On, Or Will Be Consist with, Rhode Island's Coastal Zone Management Program,"* the Coastal Resources Management Council hereby concurs with the determination that the referenced activity is consistent with the federally approved Rhode Island Coastal Resources Management Program and applicable regulations therein.

Please contact this office at (401) 783-3370 should you have any questions.

Sincerely,

Grover J. Fugate, Executive Director
Coastal Resources Management Council

/lat
cc: David Kaiser, NOAA
Mark Habel, ACOE
Brain Thompson, CT DEEP
Kathleen Moser, NYDEC
Jeffrey Zappieri, NYDOS
Jeff Willis, RICRMC
Dan Goulet, RICRMC

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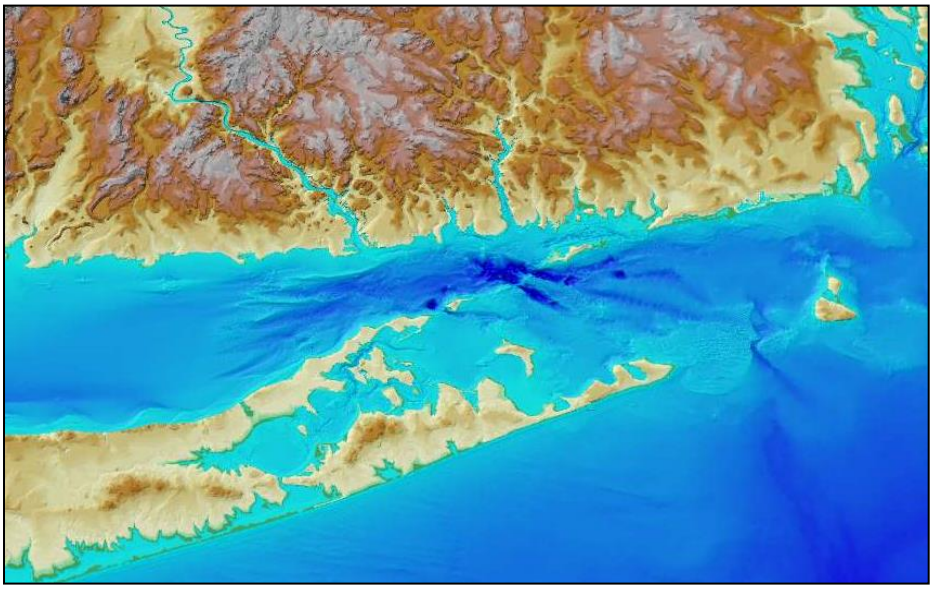
Supplemental Environmental Impact Statement for the Designation of Dredged Material Disposal Site(s) in Eastern Long Island Sound, Connecticut and New York

APPENDIX B

Analysis of Alternative Open-Water Dredged Material Disposal Sites



Prepared for: United States Environmental Protection Agency

Sponsored by: Connecticut Department of Transportation

Prepared by: Louis Berger

with support from

University of Connecticut

April 2015

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APPENDIX B

ANALYSIS OF ALTERNATIVE OPEN-WATER DREDGED MATERIAL DISPOSAL SITES

Prepared for:
United States Environmental Protection Agency
5 Post Office Square, Suite 100
Boston, MA 02109

Sponsored by:
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Prepared by:
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April 2015

NOTE: This Alternatives Analysis report includes a very few minor edits from the version submitted along with the Draft SEIS in April 2016. The minor edits are mentioned in the Response to Comments on the Draft SEIS (Appendix J). The date on the Alternatives Analysis report (April 2015) remains unchanged as it reflects the status of the assessment at that time.

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Acronyms and Abbreviations

CLDS	Central Long Island Sound Disposal Site (formerly abbreviated as CLIS in the literature)
CLIS	Central Long Island Sound
CSDS	Cornfield Shoals Disposal Site
CTDEEP	Connecticut Department of Energy and Environmental Protection
CTDOT	Connecticut Department of Transportation
CTDPH	Connecticut Department of Public Health
CPUE	Catch per Unit Effort
CWA	Clean Water Act
cy	cubic yard(s)
DAMOS	Disposal Area Monitoring System
DMMP	Dredged Material Management Plan
EIS	Environmental Impact Statement
ERM	Effects Range-Median
GIS	Geographic Information Systems
km	kilometer(s)
km^2	square kilometer(s)
LIS	Long Island Sound
LISS	Long Island Sound Study
LWRP	Local Waterfront Revitalization Program
m	meter(s)
m/s	meter(s) per second
m^3	cubic meter(s)
MLW	mean low water
MPRSA	Marine Protection, Research, and Sanctuaries Act
n/a	not applicable
NBDS	Niantic Bay Disposal Site
NEPA	National Environmental Policy Act
NLDS	New London dredged material disposal site
nmi	nautical mile(s)
nmi^2	square nautical mile(s)
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service

NYSDEC	New York State Department of Environmental Conservation
NYSDOS	New York State Department of State
ODMDS	Open water dredged material disposal site
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PO	Physical oceanography
RICRMC	Rhode Island Coastal Resources Management Council
RIDEM	Rhode Island Department of Environmental Management
RIDFW	Rhode Island Division of Fish and Wildlife
RISDS	Rhode Island Sound Disposal Site
SAMP	Special Area Management Plan
SEIS	Supplemental Environmental Impact Statement
TOC	Total organic carbon
UCONN	University of Connecticut
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WHG	Woods Hole Group
WLDS	Western Long Island Sound Disposal Site (formerly abbreviated as WLIS in the literature)
WLIS	Western Long Island Sound
ZSF	Zone of Siting Feasibility

EXECUTIVE SUMMARY

This report provides a summary of the selection process for alternative open-water dredged material disposal sites (ODMDSs) to be evaluated in a supplemental environmental impact statement (SEIS) for the designation of one or more ODMDSs in eastern Long Island Sound and/or Block Island Sound in Connecticut, New York, and Rhode Island. The SEIS will supplement the Environmental Impact Statement (EIS) for the designation of dredged material disposal sites in the Western and Central Long Island Sound, completed in 2004 (USEPA and USACE, 2004a). The SEIS is prepared by the U.S. Environmental Protection Agency (USEPA) and supported by the Connecticut Department of Transportation (CTDOT). It is conducted in consultation with other federal and state agencies of New York State and Connecticut, as well as with consultation of the public.

As stated in the Notice of Intent (NOI) published in October 2012, the SEIS would consider alternatives including: No-action (*i.e.*, no designation of any sites); designation of one or both of the currently active selected sites; designation of alternative ODMDSs identified within the study area; and identification of other disposal and/or management options.

The selection of alternative sites in eastern Long Island Sound and Block Island Sound was conducted using a two-tiered process following the Marine Protection, Research, and Sanctuaries Act (MPRSA). Tier 1 screening identified areas within the ZSF not acceptable for locating an ODMDS. Tier 2 screening identified specific alternative ODMDSs within the acceptable areas for further evaluation in the SEIS. Eleven sites were initially identified and evaluated in more detail. Six of these sites were located in eastern Long Island Sound; five sites were located in Block Island Sound. Three sites remained that are recommended for analysis as alternative sites in the SEIS. These sites are the two existing disposal sites (*i.e.,* the New London and Cornfield Shoals disposal sites) and the historically used Niantic Bay disposal site. In order to be able to accommodate the capacity needs for dredged material in the eastern Long Island Sound region over the 30-year planning period, the boundary of the New London alternative site recommended to be analyzed in the SEIS was extended to the west by 1.5 nautical miles; the boundary of the Niantic Bay alternative site was extended to the east by 0.75 nautical miles.

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1. INTRODUCTION

This report summarizes the process and results for the selection of alternative open-water dredged material disposal sites (ODMDSs) to be evaluated in a supplemental environmental impact statement (SEIS) for the designation of one or more ODMDSs in eastern Long Island Sound and/or Block Island Sound in Connecticut, New York, and Rhode Island.

The U.S. Environmental Protection Agency (USEPA) has the authority to manage the disposal of dredged material in open water, including the designation of ODMDSs under Section 102(c) of the Marine Protection, Research, and Sanctuaries Act (MPRSA)[1] and 40 CFR 230.80 of USEPA's regulations under Section 404 of the Clean Water Act. USEPA Region 1 (New England) and Region 2 (Mid-Atlantic) jointly manage dredged material disposal in Long Island Sound. The preparation of the SEIS is financially supported by the State of Connecticut through the Connecticut Department of Transportation (CTDOT).

There are two currently active disposal sites in eastern Long Island Sound, the Cornfield Shoals and New London dredged material disposal sites (CSDS, NLDS). The use of these two sites was extended for 5 years by Public Law on December 23, 2011 (PL-112-74, Title I, Sec 116). These sites are scheduled to close in December 2016.

In October 2012, the USEPA published a Notice of Intent (NOI) in the Federal Register to prepare a federal SEIS to evaluate alternative ODMDSs within the eastern Long Island Sound region for the potential designation of one or more sites needed to serve the Eastern Long Island Sound region (FR 77:200 October 16, 2012). The dredging needs report prepared by the U.S. Army Corps of Engineers (USACE) identified a continued need for dredged material disposal for this region (USACE, 2009). As stated in the NOI, the SEIS would "identify and evaluate locations within the eastern Long Island Sound study area … to determine the sites that are best suited to receive dredged material for open-water disposal." At a minimum, the SEIS would consider alternatives including: No-action (*i.e.*, no designation of any sites); designation of one or both of the currently active disposal sites selected by the USACE; designation of alternative open-water sites identified within the study area that may offer environmental advantages to the existing sites; and identification of other disposal and/or management options, including beneficial uses. The alternative ODMDSs are to be developed and identified as part of the NEPA process.

The eastern Long Island Sound region or study area, hereafter referred to as the Zone of Siting Feasibility (ZSF)[2] developed for the SEIS in January 2013, includes eastern Long Island Sound and Block Island Sound (Figure 1).

The University of Connecticut (UCONN) and Louis Berger were tasked to assist the USEPA in the screening process for alternative ODMDSs to the NLDS and CSDS within this ZSF. The screening was based on readily available data and information from agencies, scientific literature, technical reports, and other relevant sources. This report presents the results of this process. The alternatives analysis process for the SEIS is similar to the process and format used

[1] The MPRSA is also referred to as the Ocean Dumping Act [ODA]) of 1972.

[2] Area within which ODMDSs could potentially be sited and which will be studied in the SEIS.

for the designation of the Central and Western Long Island Sound dredged material disposal sites (CLDS, WLDS) (USEPA and USACE, 2002; 2004a).

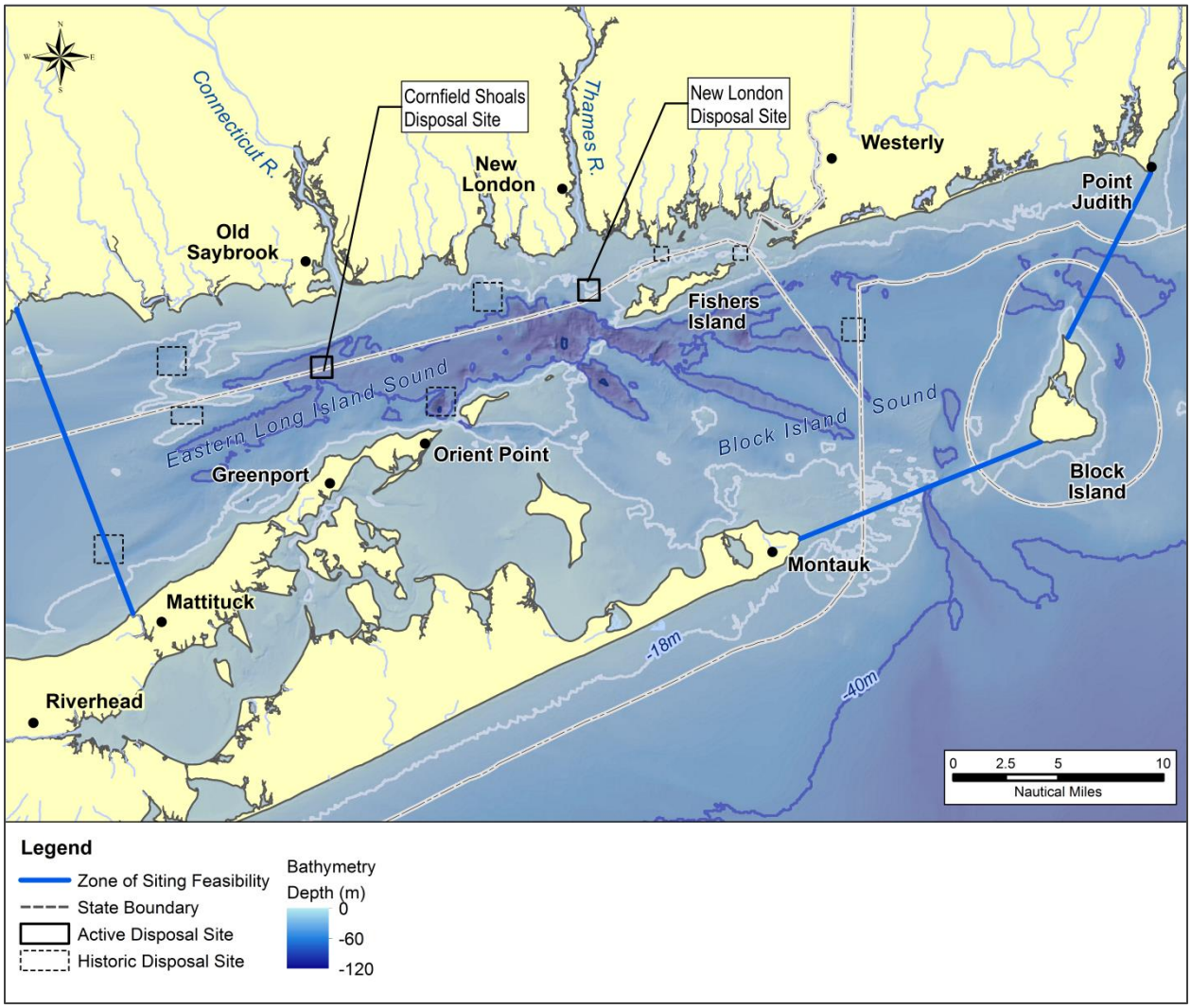

Figure 1. Zone of Siting Feasibility (ZSF) for the SEIS. The two active disposal sites (New London Disposal Site; Cornfield Shoals Disposal Site) are marked, as well as other historic[3] dredged material disposal sites.

[3] To be consistent with the terminology used in the CLIS/WLIS EIS (USEPA and USACE, 2004a) , the term 'historic dredged material disposal site' (or 'historic disposal site' or 'historic site') refers to an area that was used historically for dredged material disposal.

2. SITE SCREENING PROCESS

The USEPA, in consultation with other federal and state agencies, selects alternative ODMDSs to the NLDS and CSDS for evaluation in the site designation SEIS following guidance in MPRSA. MPRSA lists five general and eleven specific required considerations in the evaluation and designation of ODMDSs (40 CFR 228.5 and 40 CFR 228.6, respectively; Table 1).

Screening was conducted in two tiers:

- *Tier 1 screening:* Identification of areas within the ZSF not acceptable for locating an ODMDS(s) designated under the MPRSA.
- *Tier 2 screening:* Identification of specific areas within the remaining acceptable areas for potentially siting an ODMDS(s), for further evaluation in the SEIS.

Table 2 describes the screening criteria. During the screening, GIS layers were created for specific resource issues using available data and information from multiple sources, including the U.S. Geological Survey (USGS), Connecticut Department of Energy and Environmental Protection (CTDEEP), New York State Department of Environmental Conservation (NYSDEC), Rhode Island Coastal Resources Management Council (RICRMC), and the USACE. Included in the USACE database were documents from their Disposal Area Monitoring System (DAMOS) program, as well as from their Long Island Sound Dredged Material Management Plan (LIS DMMP) program (USACE, 2014a).

For Tier 1 screening, these layers were then used to rule out areas unacceptable for open water disposal. Tier 2 considerations used additional resource information in the remaining areas to initially screen for potential ODMDSs; based on this information eleven potential sites were identified. These eleven sites were further assessed based on more in-depth literature review and field survey information, resulting in a reduced number of sites that are recommended for analysis in the SEIS.

Table 1. Required Considerations in the Evaluation and Designation of Ocean Dredged Material Disposal Sites (40 CFR 228.5 and 228.6)

Sec. 228.5 (a-e): General criteria for the selection of sites	
(a) The dumping of dredged material into the ocean will be permitted only at sites or in areas selected to minimize the interference of disposal activities with other activities in the marine environment, particularly avoiding areas of existing fisheries or shellfisheries, and regions of heavy commercial or recreational navigation.	
(b) Locations and boundaries of disposal sites will be so chosen that temporary perturbations in water quality or other environmental conditions during initial mixing caused by disposal operations anywhere within the site can be expected to be reduced to normal ambient seawater levels or to undetectable contaminant concentrations of effects before reaching any beach, shoreline, marine sanctuary, or known geographically limited fishery or shellfishery.	
(c) If at any time during or after disposal site evaluation studies, it is determined that existing disposal sites presently approved on an interim basis for ocean dumping do not meet the criteria for site selection set forth in Section 228.5 through 228.6, the use of such sites will be terminated as soon as suitable alternate disposal sites can be designated.	
(d) The sizes of ocean disposal sites will be limited in order to localize for identification and control any immediate adverse impacts and permit the implementation of effective monitoring and surveillance programs to prevent adverse long-range impacts. The size, configuration, and location of any disposal site will be determined as a part of the disposal site evaluation or designation site study.	
(e) USEPA will, wherever feasible, designate ocean dumping sites beyond the edge of the Continental shelf and other such sites that have been historically used.	
Sec. 228.6(a)(1-11): Specific criteria for site selection	
(a) In the selection of disposal sites, in addition to other necessary or appropriate factors determined by the Administrator, the following factors will be considered:	
(1)	Geographical position, depth of water, bottom topography and distance from coast;
(2)	Location in relation to breeding, spawning, nursery, feeding or passage areas of living resources in adult or juvenile phases;
(3)	Location in relation to beaches and other amenity areas;
(4)	Types and quantities of wastes (dredged material) proposed to be disposed of, and proposed methods of release, including methods of packaging the waste (dredged material), if any;
(5)	Feasibility of surveillance and monitoring;
(6)	Dispersal, horizontal transport and vertical mixing characteristics of the area, including prevailing current direction and velocity, if any;
(7)	Existence and effects of current and previous discharges and dumping in the area (incl. cumulative effects);
(8)	Interference with shipping, fishing, recreation, mineral extraction, desalination, fish and shellfish culture, areas of special scientific importance and other legitimate uses of the ocean;
(9)	The existing water quality and ecology of the site as determined by available data or by trend assessment or baseline surveys;
(10)	Potentiality for development or recruitment of nuisance species in the disposal site;
(11)	Existence at or in close proximity to the site of any significant natural or cultural features of historical importance.
(b) The results of a disposal site evaluation and/or designation study based on the criteria stated in paragraphs (1) – (11) will be presented in support of the site designation promulgation as an environmental assessment of the impact of the use of the site for disposal, and will be used in the preparation of an environmental impact statement for each site where such a statement is required by USEPA policy. By publication of a notice in accordance with this Part 228, an environmental impact statement, in draft form, will be made available for public comment not later than the time of publication of the site designation as proposed rulemaking, and a final EIS will be made available at the time of final rulemaking.	

Table 2. Open-water Disposal Reference Table for the Eastern Long Island Sound Disposal Site Designation SEIS

MPRSA	Key Words and Phrases from 40 CFR 228	Evaluation Factors*	Scree-ning Tier
Sec. 228.5 (a-e): General Considerations for the Selection of Sites			
228.5(b)	Perturbations to the environment during initial mixing	• Disposal site feasibility and stability	1
228.5(e)	Designating historically used sites	• Disposal sites	2
228.5(a)	Interference with other activities: *avoiding areas of existing fisheries or shellfisheries, and regions of heavy commercial or recreational navigation*	• Navigation considerations • Designated marine habitats • Commercial and recreational fisheries	1 1 1
228.5(d)	Limiting site size for monitoring and surveillance	• Accessibility	2
228.5(c)	Closure of interim ODMDSs	n/a	n/a
Sec 228.6(a)(1-11): Specific Considerations for Site Selection			
228.6(a)(3)	Location relative to beaches and amenities	n/a	1
228.6(a)(6)	Site dispersion, transport, and mixing characteristics	• Disposal mound height limit • Disposal site feasibility and stability • Site characteristics	1 1 2
228.6(a)(8)	Interference with other uses	• Site use conflicts • Conservation areas • Economic Impacts • Renewable energy siting	1 1 2 2
228.6(a)(1)	Geography, depth, topography, distance from coast	• State waters/basins • Site characteristics	1 1
228.6(a)(2)	Location relative to living resources: *breeding, spawning, nursery, feeding, or passage areas of living resources in adult or juvenile phases*	• Existing seafloor habitat	2
228.6(a)(9)	Existing water quality and ecology of site	• Existing habitat(s) at site • Recreational uses • Essential fish habitats	2 2 2
228.6(a)(4)	Types and quantities of wastes and disposal methods	• Capacity and area of impact	2
228.6(a)(11)	Proximity to historical features	• Cultural/archaeological resource at site	2

3. TIER 1 SCREENING

The ZSF was discussed with the group of Federal and State Cooperating Agencies at a meeting on January 8, 2013. Tier 1 screening, as used for this SEIS, defined areas within the ZSF not acceptable for locating an open-water disposal site designated under the MPRSA. Factors used for Tier 1 screening considerations are described below.

3.1 NY/CT/RI State Waters [40 CFR 228.6(a)(1)]

The geography, depth, and distance of potential sites from the coast are relevant for considering effects on natural and human resources along the coast. These factors further affect the hauling distance for barges from dredging centers, as well as environmental and safety risks during transport in areas of strong currents.

The state boundary between New York and Connecticut runs roughly east-west through the center of eastern Long Island Sound (Figure 1). The western part of Block Island Sound is part of New York State waters. Most of Rhode Island's waters extend 3 nautical miles (nmi) (5.6 km) from shore (mainland and Block Island) into Block Island Sound. For site screening purposes, New York, Connecticut, and western Rhode Island state waters were considered equally. Lesser weight was given to the eastern portion of Block Island Sound for the following reasons:

- Long travel distance of greater than 25 nmi (46 km) from major dredging centers in eastern Long Island Sound. Longer distances increase transportation costs and have higher risks of accidents in high energy areas such as The Race.
- Close proximity of some of Rhode Island's communities (*e.g.*, Block Island [New Shoreham], Point Judith) to the Rhode Island Sound dredged material disposal site (RISDS[4]) to the east of Block Island.

3.2 Stability and Feasibility [40 CFR 228.5(b), 228.6(a)(1)]

The active NLDS is a "containment area"[5]; the CSDS is a 'dispersive areas'[6]. As stated in the NOI, both currently active disposal sites would be considered in the SEIS along with other alternative site(s). This approach was also discussed with the Cooperating Agency Group on January 8, 2013. For Tier 1 screening purposes, water depth was used as a surrogate for sediment stability, following the approach used for the 2004 EIS for the CLDS/WLDS (USEPA and USACE, 2002; 2004a). Specifically, waters shallower than 59 feet (18 m)[7] deep were

[4] The RISDS was designated by the USEPA in 2004 after preparation of an EIS (USEPA and USACE, 2004b).

[5] Containment areas have physical and geological features that restrict movement of bottom sediments from the area to surrounding areas. Containment areas could be topographical depressions in the seafloor or other locations where peak bottom current velocities are too slow for resuspending sediment.

[6] Dispersive areas have physical and geological features that disseminate materials from the disposal area to surrounding areas over time. Disposal areas would have sufficiently high peak bottom current velocities that resuspend sediments and carry them beyond the disposal area.

[7] The 2004 EIS (USACE and USACE, 2004a) utilized information collected from the disposal of dredged material throughout Long Island Sound; this information noted that waves and currents can remove material from dredged

eliminated from consideration because wave and storm driven bottom currents in shallower depths in Long Island Sound were considered strong enough at times for resuspending bottom sediments.

Figure 2 shows the ZSF screened for water depths shallower than 59 feet (18 m). The same depth was applied for both eastern Long Island Sound and Block Island Sound. In Block Island Sound, this depth mostly eliminated shallow areas around Long Island from consideration.

Areas of erosion and areas of coarse-grained sediments, based on USGS interpretation (*e.g.,* Knebel et al., 1999; O'Donnell, 2014a, 2014b) were not screened out in Tier 1 but given consideration in Tier 2 regarding their potential as alternative ODMDSs.

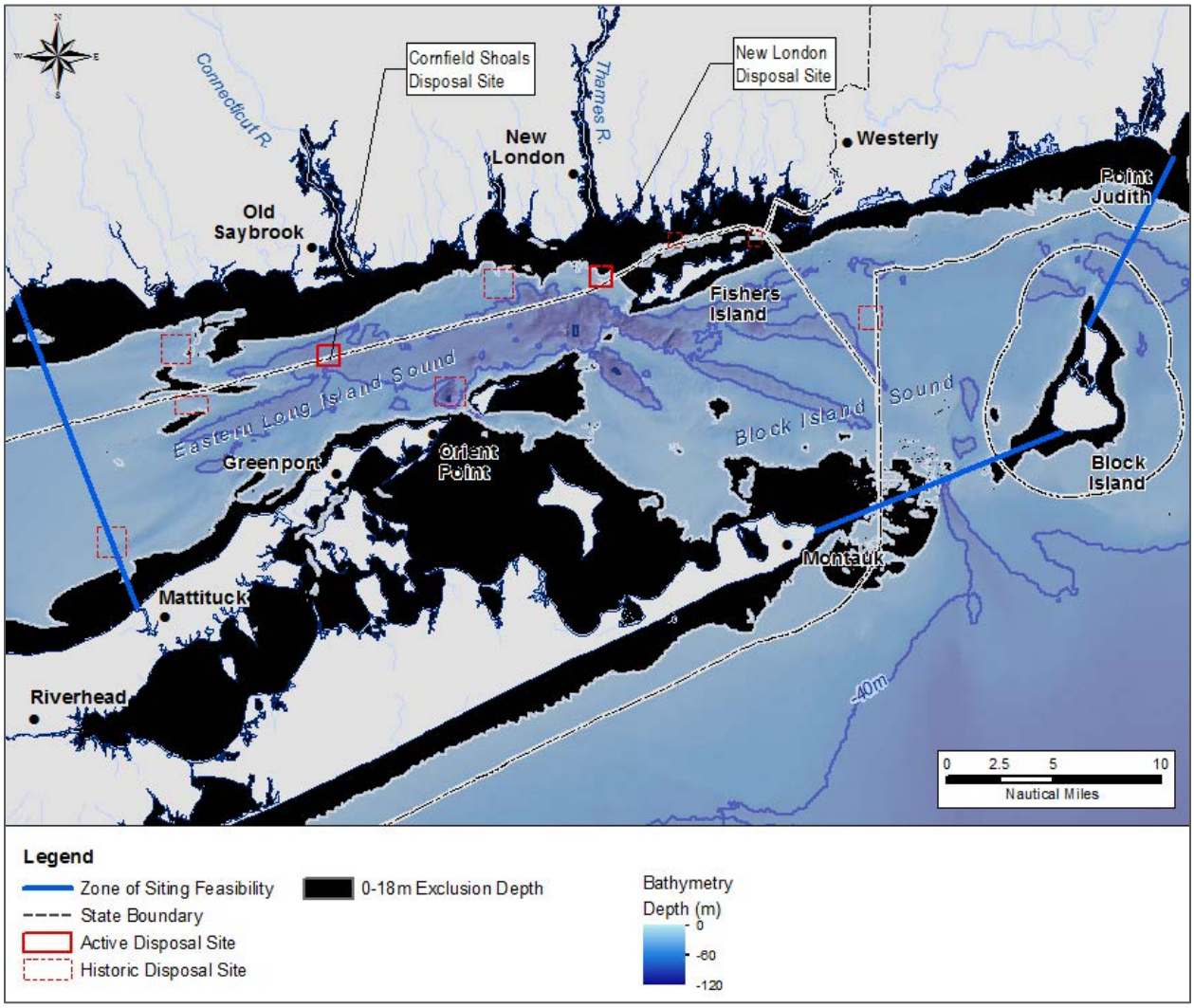

Figure 2. ZSF with waters shallower than 59 feet (18 m) screened in black. These shallow waters were considered susceptible to resuspension of sediment during storms and were thus removed from consideration.

material mounds that are at water depths shallower than 46 feet (14 m). Therefore, the 2004 EIS used a minimum depth of 59 feet (18 m) as a Tier 1 screening parameter.

3.3 Areas with Conflicting Uses [40 CFR 228.5(b), 228.6(a)(3), 228.6(a)(8)]

Conflicting use considerations included the following:

- *Beaches and amenities* (Figure 3): Data on beaches and parks were available from the LIS DMMP (WHG, 2010), as well as from State agencies and municipalities. Alternative ODMDSs would not be placed near beaches. Recreational boating is discussed in Section 3.4 below.

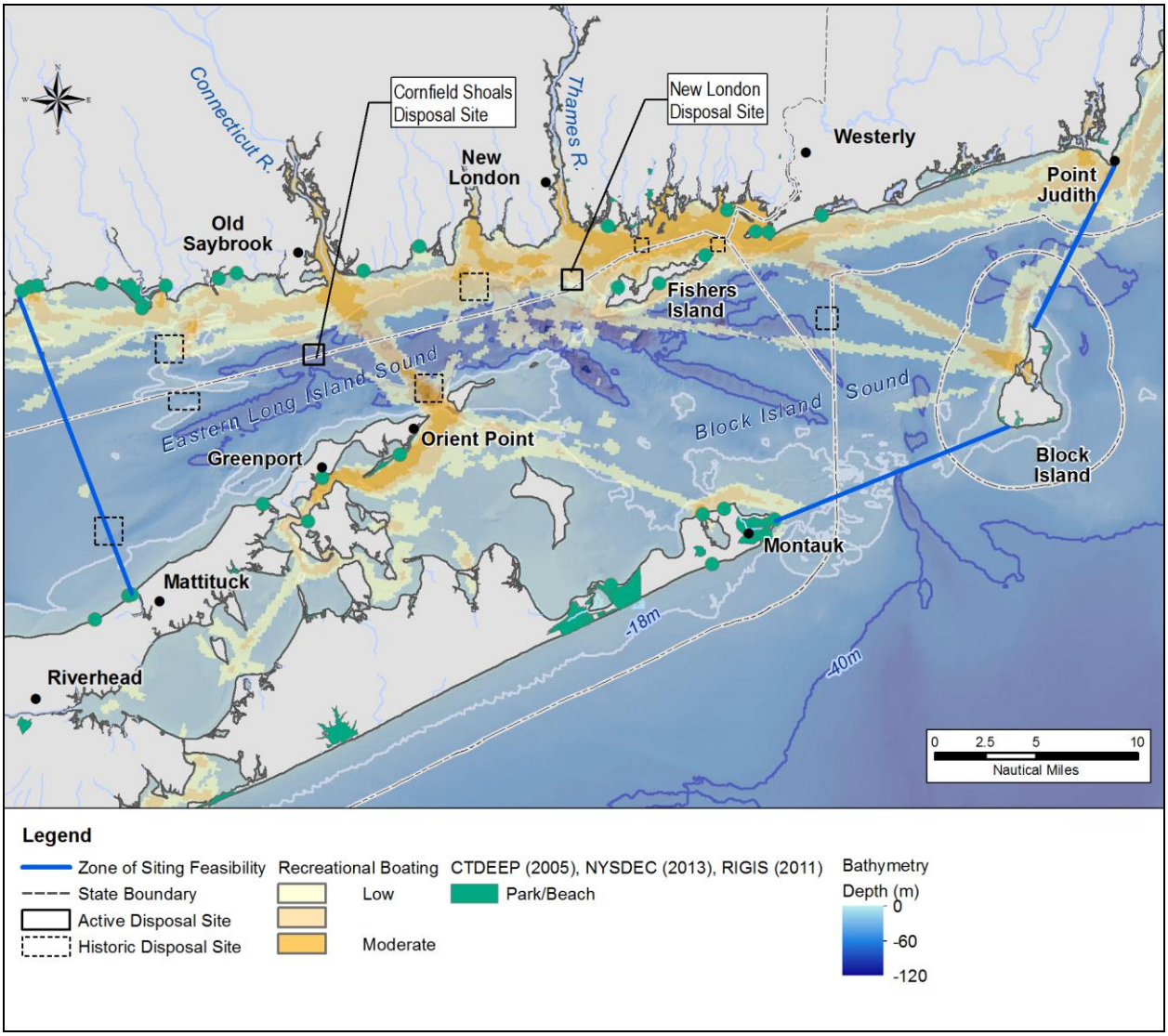

Figure 3. Public beaches, parks, and recreational boating in the ZSF. (Data sources: State GIS data bases [CTDEEP, NYSDOS, RIGIS] and NROC, 2012)

- *Conservation areas* (Figure 4): Conservation areas (nature preserves, sanctuaries, wildlife refuges, national seashores, parks, fish havens, artificial reefs, etc.) are located along the shore and in nearshore areas throughout the ZSF. Most conservation areas in the ZSF are in waters shallower than 59 feet (18 m). Alternative ODMDSs would not be placed near State or Federal reserve areas, artificial reefs, or other conservation areas. Hardbottom areas (rock outcrop, identified as reefs on NOAA charts; Figure 4) in the ZSF are considered fish havens and would be avoided.

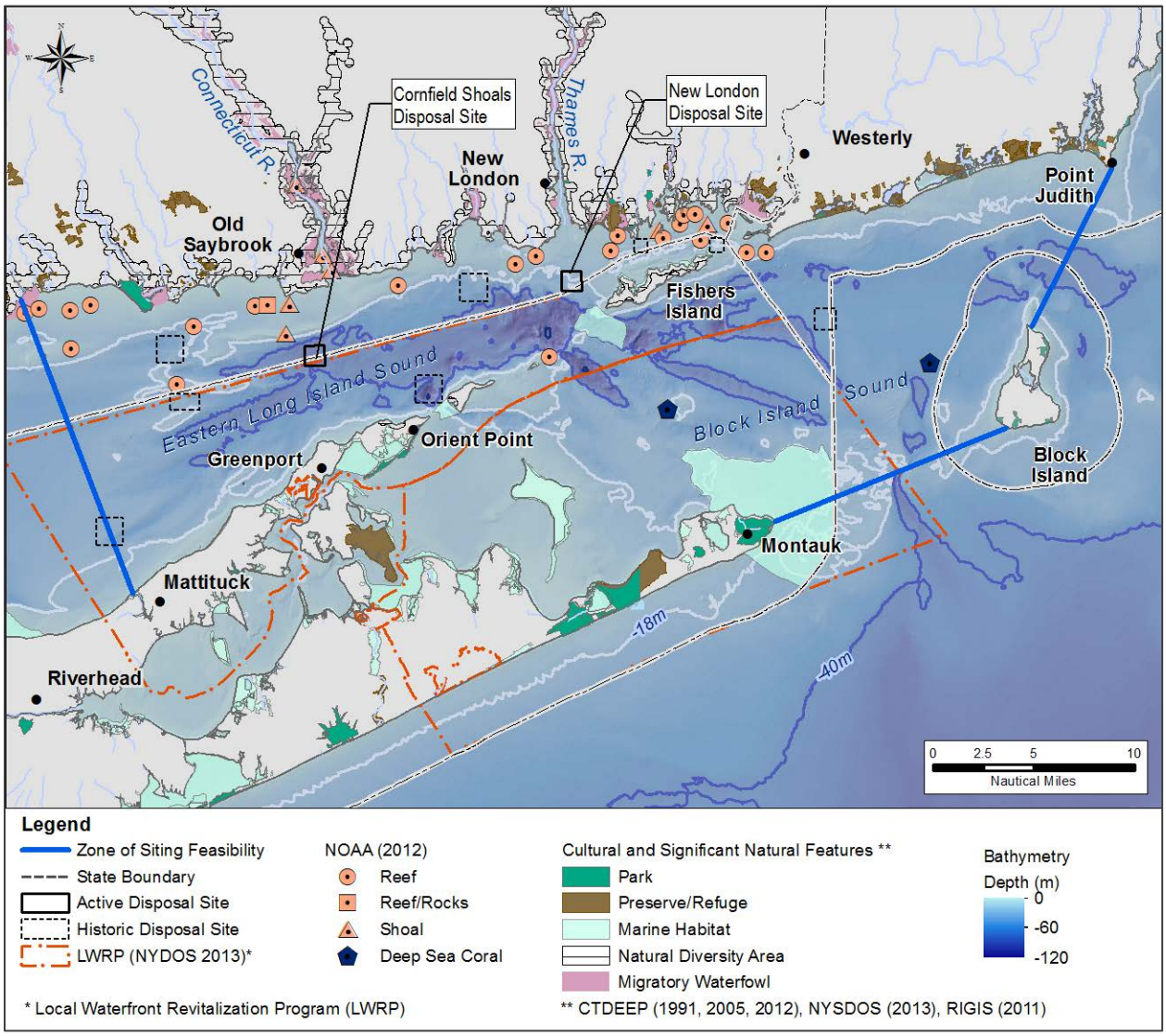

Figure 4. Conservation areas in the ZSF. (Data sources: State GIS data bases [CTDEEP, NYSDOS, RIGIS] and NOAA, 2012, 2013a)

- *Utilities (pipelines, cables, cable areas, etc.)* (Figure 5): Utilities in the ZSF consist of submarine pipelines, installed cables, and areas identified on NOAA charts for the installation of cables. Pipelines in the ZSF are limited to crossings in coastal estuaries of

Connecticut only. Submarine cables in the ZSF consist of electric and telecommunications cables.

Some of the cable areas near Fishers Island contained cables that were installed during the Second World War. Inquiries with various agencies and other organizations revealed that these cables are no longer in use and have at least partially been removed. These agencies and organizations included the U.S. Coast Guard, Naval Undersea Warfare Center, Fishers Island Electric Corporation, and the American Museum of Natural History [presently own Great Gull Island]). For the selection of disposal sites, active cable areas would be avoided. A minimum 200-ft (60-m) buffer zone around each pipeline, cable, and cable area was assumed during the screening; the exception were the cable areas in the vicinity of Fishers Island as marked in Figure 5 by the red polygon.

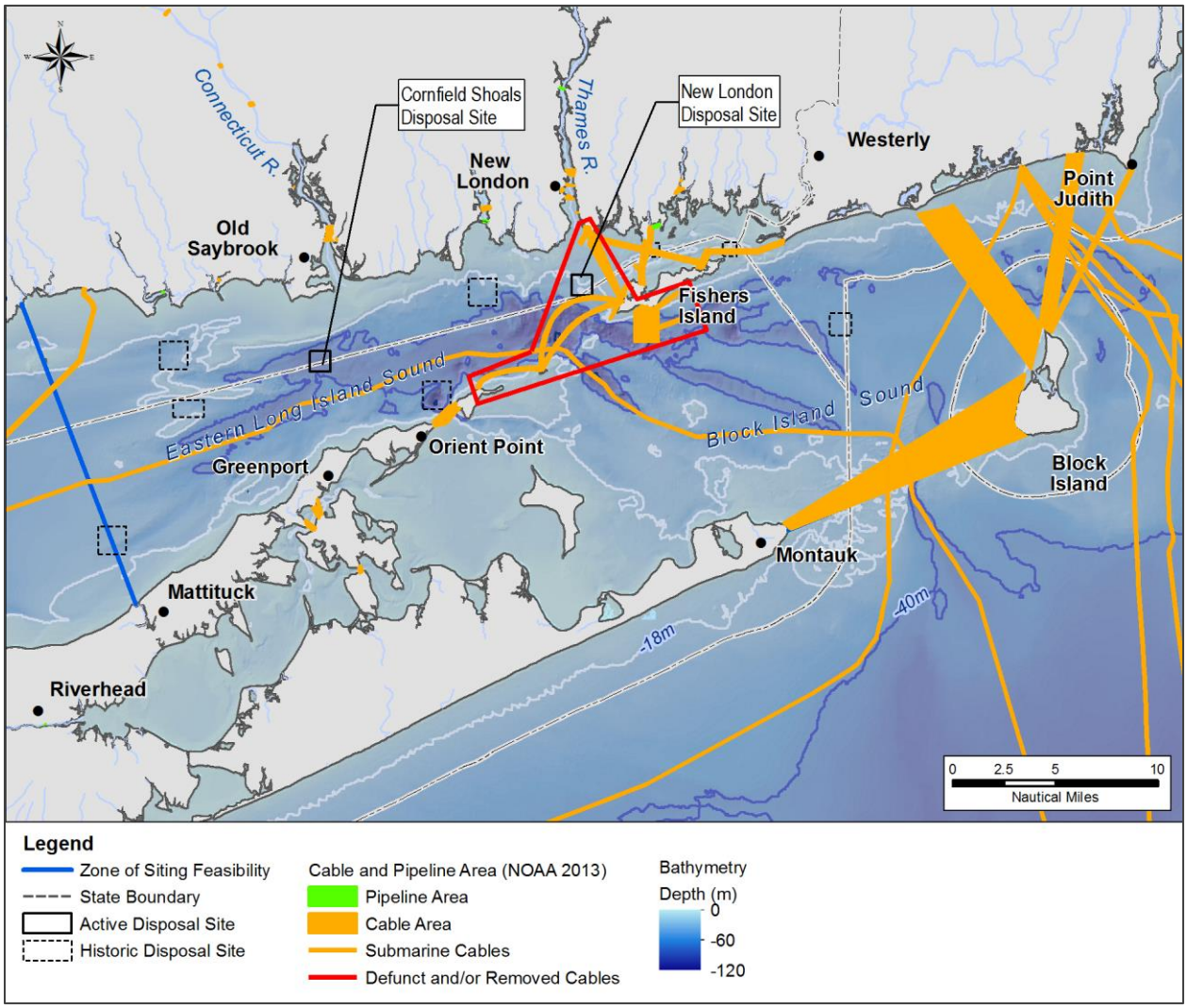

Figure 5. Utilities (pipelines, cables, and cable areas) in the ZSF (Data source: NOAA, 2013a). Cable areas within the red polygon near Fishers Island appear on current NOAA charts; however, inquiries indicate that either these cable areas no longer contain cables, or cables are no longer in use and have at least partially been removed. See Final SEIS Section 4.15.6 for a description of the cables in this polygon as well as a listing of all information sources.

3.4 Interference with Navigation [40 CFR 228.5(a)]

There is active commercial vessel traffic within the ZSF, which includes ferry operations (Figure 6). Recreational traffic is included in Figure 3. Generally, vessel traffic (especially recreational vessel traffic) was less of a concern for the selection of alternative ODMDSs given the open water conditions in the ZSF and the generally short time duration that dredged material transport barges would be present at a site during dredged material disposal. Therefore, commercial and recreational traffic was not considered during Tier 1 screening, but will be discussed in the SEIS.

There are also several anchorage areas within the ZSF (Figure 6). These areas were considered during Tier 2 screening.

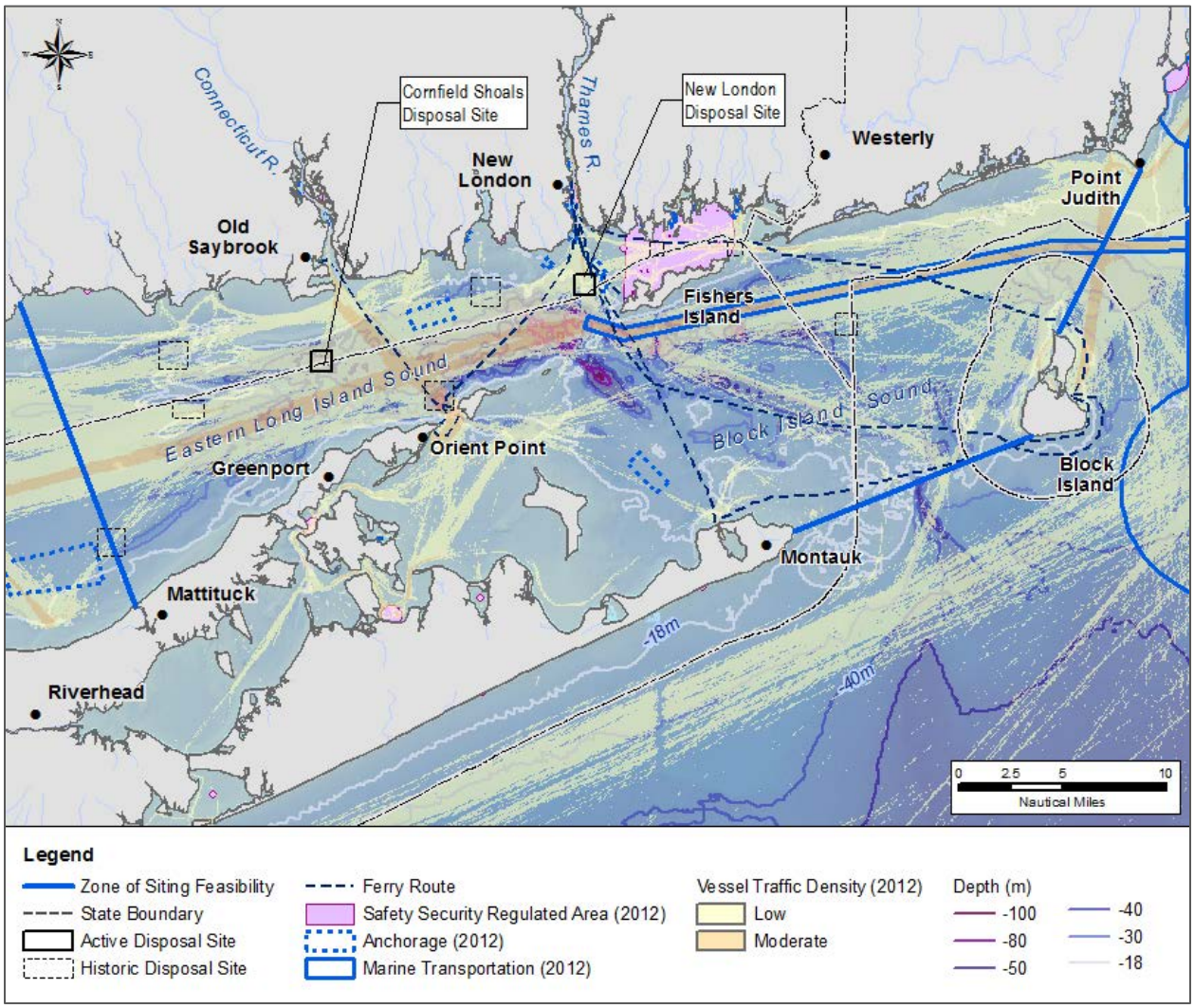

Figure 6. Density of commercial vessel traffic, marine transportation routes, and anchorage areas in the ZSF. (Data Sources: U.S. Coast Guard, 2012; NOAA, 2013a).

3.5 Shellfisheries Areas [40 CFR 228.5(a)]

Shellfish beds (Figure 7) were considered areas within which alternative ODMDSs would not be sited. Shellfish beds are generally identified based on the abundance of attached shellfish (oysters) and shellfish with limited mobility (clams, scallops).

Shellfishing zones were considered mostly under Tier 2 screening (see Section 4.6). However, zones of "Approved" shellfishing were considered under Tier 1 screening; these zones were removed from consideration for siting alternative ODMDSs.

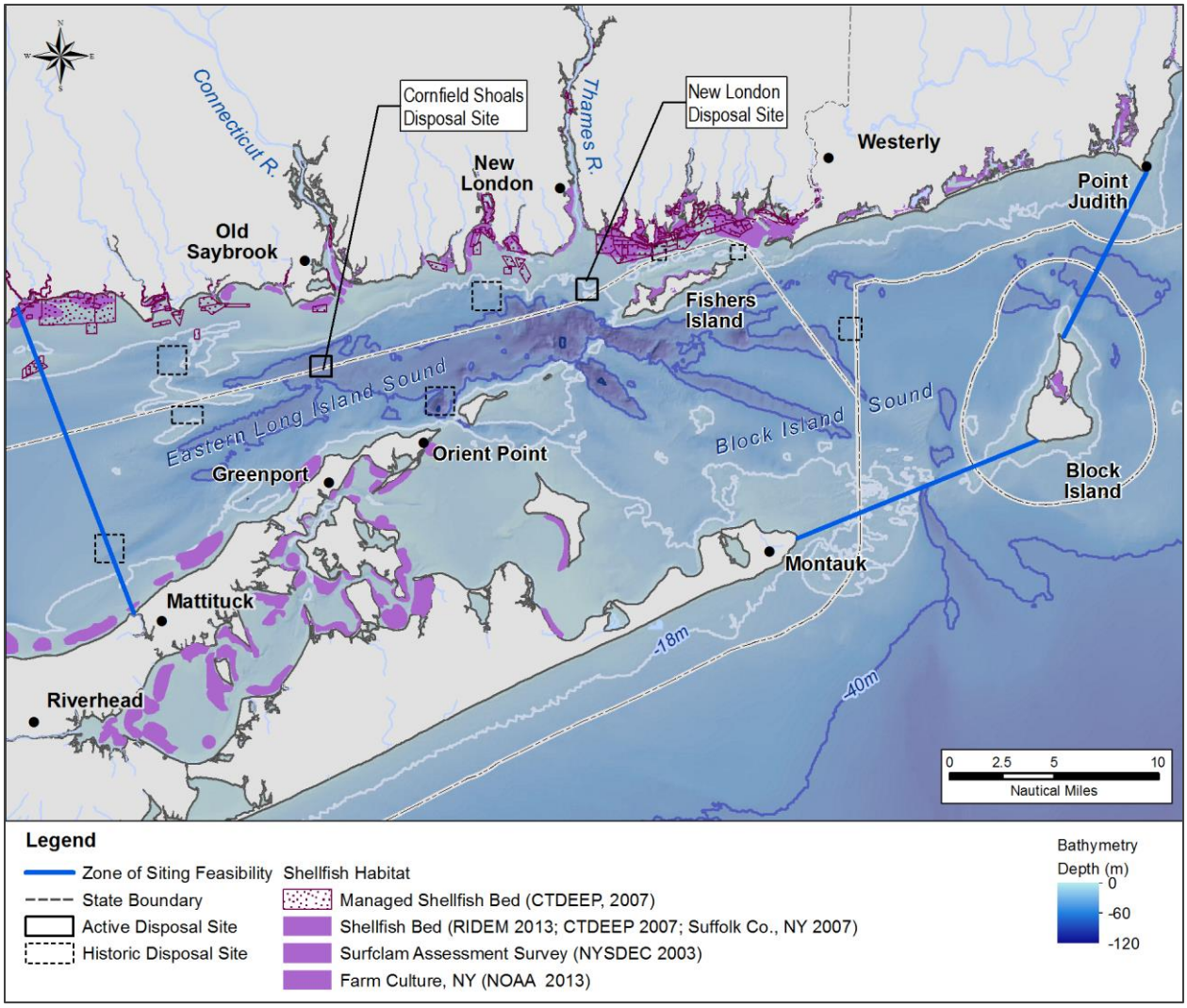

Figure 7. Shellfish beds in the ZSF. (Data sources: GIS data bases from States, Suffolk County [NY], and NOAA [2013a])

3.6 Valuable Marine Habitats [40 CFR 228.5(a), 228.6(a)(2)]

Generally, sediment texture (*e.g.*, clay/silt, sand, gravel, boulders) and seafloor morphology (*e.g.*, rock outcrops, sand waves, and mud flats) affect the suitability of the habitat for benthic organisms (including oysters, clams, worms, etc.). Specifically, sediment texture and morphology affect breeding, spawning, nursery, feeding, and shelter of species at various life stages. Benthic habitats vary considerably in the ZSF. Areas of extensive hardbottom (rock outcrops and boulder fields) in the ZSF were considered important marine habitats because they provide topographic relief important to living marine resources. Therefore, they were not considered for siting alternative ODMDSs. Sediment texture in the ZSF in water depths below 59 feet (18 m) is presented in Figure 8. Unusual seafloor morphology (*e.g.,* shoals, ridges, scour holes) and tidal conditions in the ZSF may result in unique habitats, such as in The Race (the area between Fishers Island and Little Gull Island), Plum Gut (the area between Plum Island and Orient Point), and Montauk Point Shoals. These three areas have been designated as Significant Coastal Fish and Wildlife Habitats (NYSDOS, 2002, 2005a, 2005b; see Section 5 for additional information). The areas are included in Figure 4 under the category "Marine Habitat".

3.7 Areas of High Dispersion Potential [40 CFR 228.6(a)(6)]

The estimated future dredging needs for communities in the ZSF (USACE, 2009) and available site capacities were factors for considering containment site(s) versus dispersive site(s). This consideration included the type of sediment to be dredged and disposed. The majority of sediment from the eastern Long Island Sound region would consist of fine-grained material from harbors. This type of sediment should be disposed in containment sites for appropriate management and monitoring. The active CSDS is a dispersive site selected by the USACE for coarser-grained material.

3.8 Summary of Tier 1 Considerations

Figure 8 summarizes the Tier 1 screening considerations, with sediment texture as background. The areas removed from consideration are shaded in black (water depth shallower than 59 feet [18 m], reefs, and significant marine habitats), solid brown (cables, cable areas, pipelines), and cross-hatched brown (approved shellfishing zones). Hardbottom areas were also not considered for siting alternative ODMDSs. The remaining areas, not screened out under Tier 1 were considered further under Tier 2.

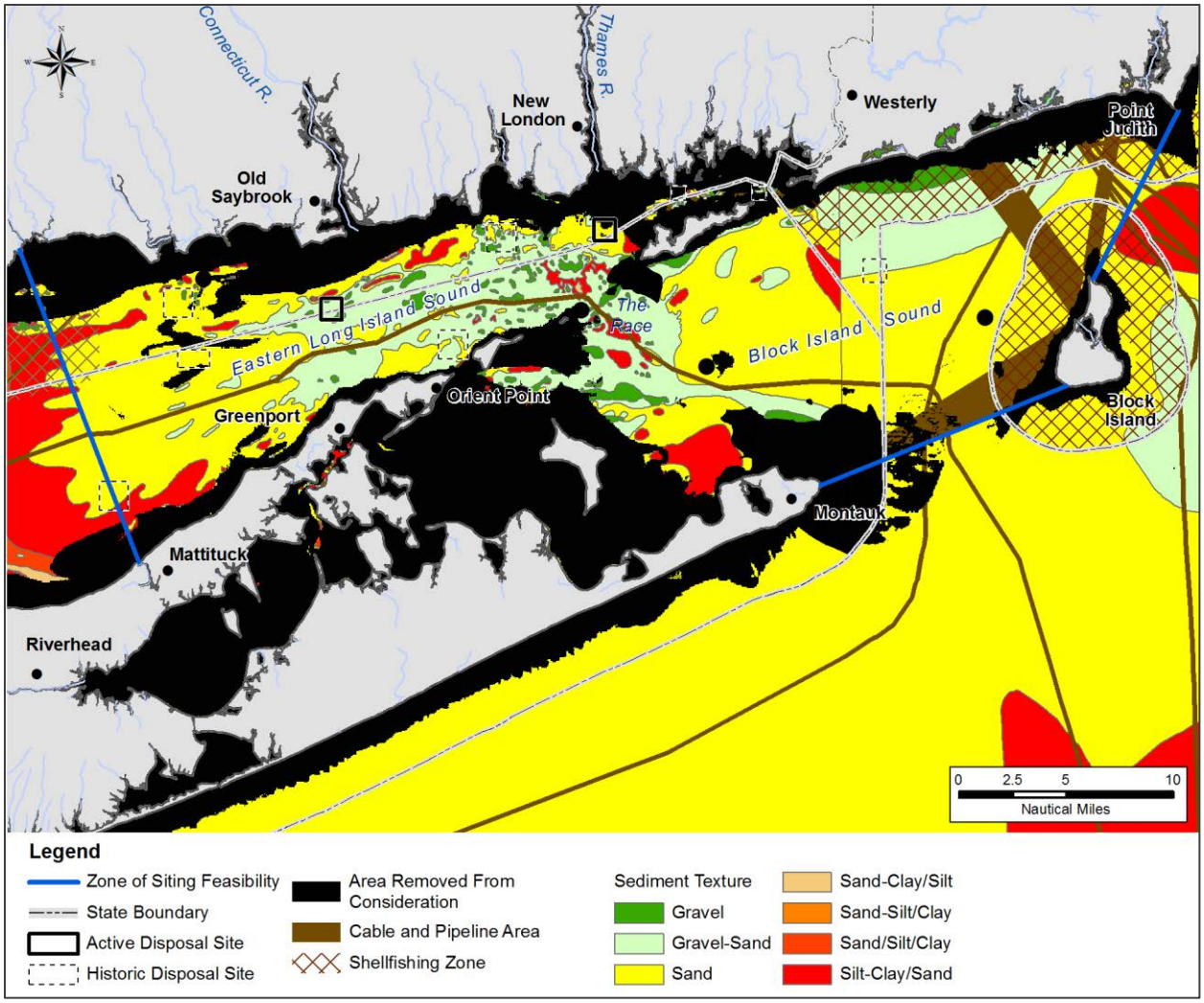

Figure 8. Summary of Tier 1 screening considerations. The background represents sediment texture (Source: Poppe et al., 2000).

4. TIER 2 SCREENING

The objective of Tier 2 screening was to identify specific alternative ODMDSs within the areas remaining after Tier 1 screening for further evaluation in the SEIS.

4.1 Active and Historic Disposal Sites [40 CFR 228.5(e)]

There are two active disposal sites and seven historic sites in the ZSF (Figure 9). Preference was given to historic disposal sites for siting alternative ODMDSs, although the two historic disposal sites within Fishers Island Sound (North Dumpling and Stonington) were not considered due to the more enclosed nature of this waterbody.

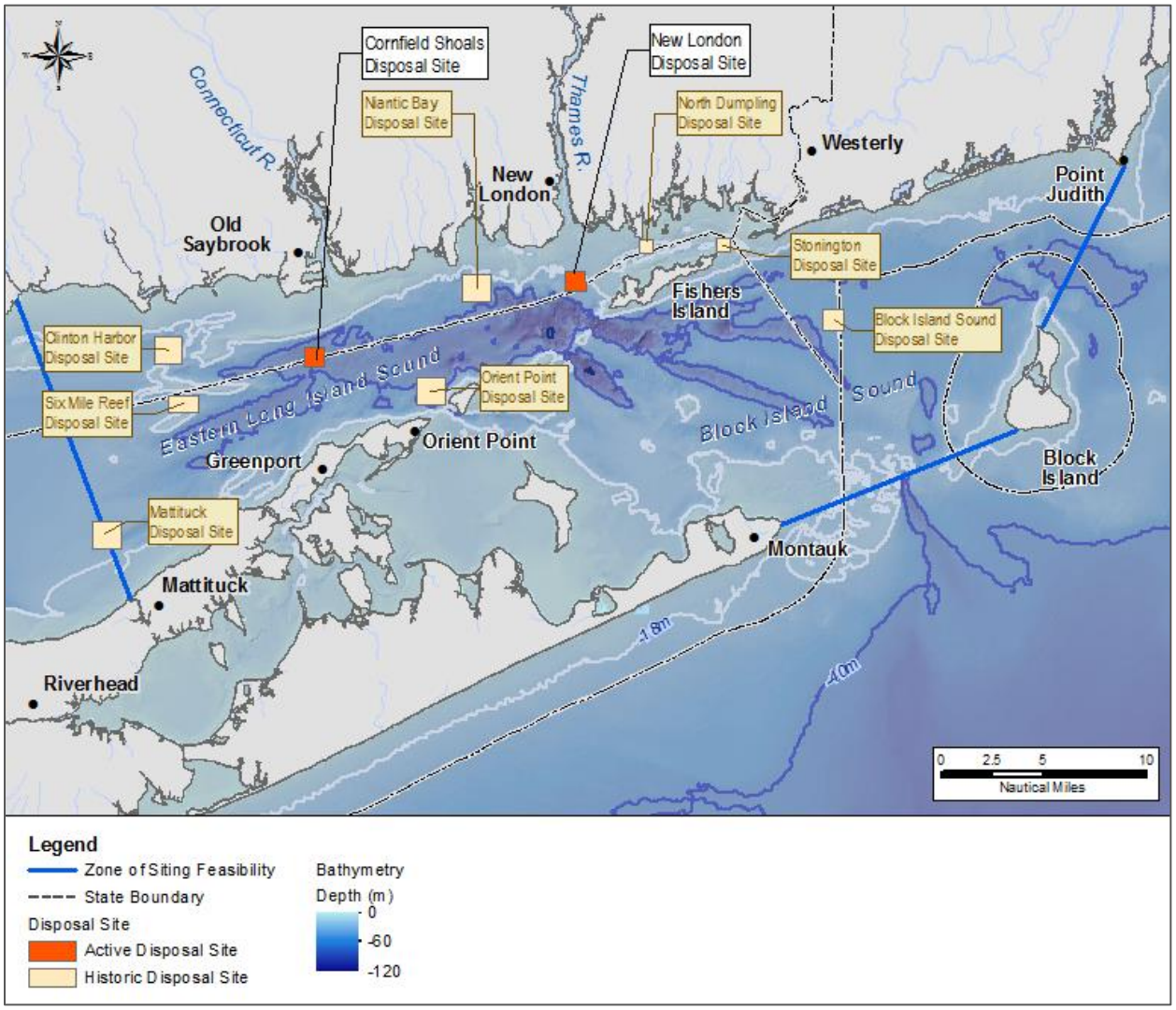

Figure 9. Active and historic dredged material disposal sites in the ZSF. (Source: Database of the USACE, New England District).

Use of historically used disposal sites would avoid modifying the bottom type and habitat of additional areas in the ZSF and additionally could address potential adverse sediment quality issues resulting from the historical use of these sites. This consideration is consistent with 40 CFR 228.5(e) which directs the USEPA to, "wherever feasible, designate ocean [disposal] sites … that have been historically used."

4.2 Minimize Impacts to Archaeological Resources [40 CFR 228.5(a)(11)]

There are a number of shipwrecks within the ZSF (Figure 10). Information was gathered from NOAA's Automated Wreck and Obstruction Information System (AWOIS), which provides a historical record of selected wrecks and obstructions including a brief history and descriptive details.

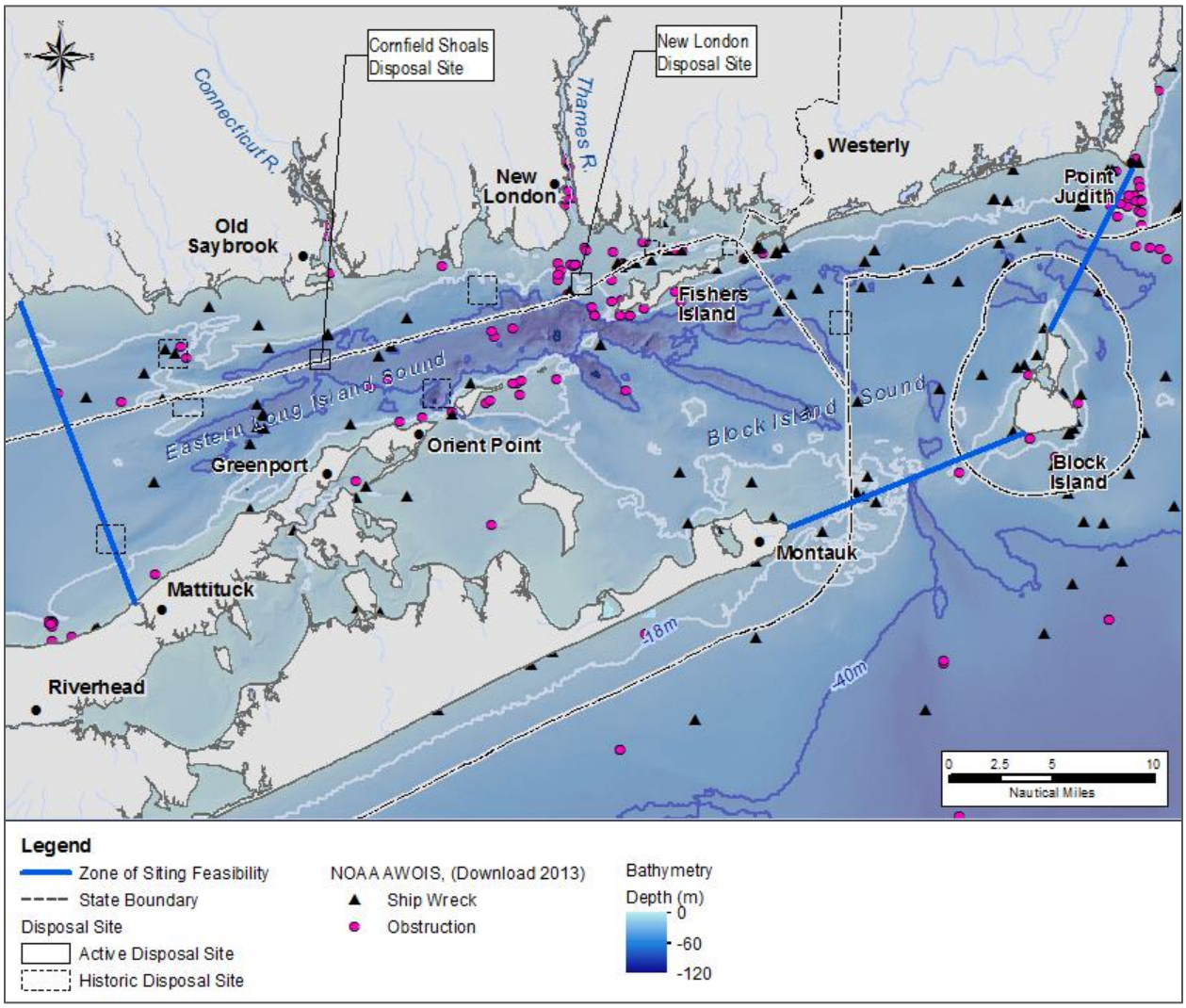

Figure 10. Shipwrecks and obstructions in the ZSF. (Data source: NOAA, 2013b)

4.3 Minimize Impact to Fish Habitats and Fish Concentrations [40 CFR 228.5(a), 228.6(a)(8), 228.6(a)(9)]

The alternative ODMDS siting should minimize significant impacts to fish habitat and fish concentrations. Recent fish habitat and fish concentrations data from CTDEEP's monitoring program, conducted since 1984, were considered (*e.g.,* Gottschall and Pacileo, 2012; 2014). The program surveys an area from New London to Greenwich, Connecticut, and includes both Connecticut and New York State waters ranging in depths from 16 to 150 feet (5 to 46 m). Typically, Long Island Sound is surveyed in the spring, from April through June, and in the fall, from September through October. Since 2003, twenty finfish species and two invertebrate species (lobster and long-finned squid) have been measured. Generally, fish catches (measured in catch-per-unit-effort [CPUE]) indicate that there is higher finfish abundance in the western and central Long Island Sound compared to the eastern Long Island Sound.

Tetra Tech (2014) analyzed the CTDEEP data and in addition performed a fishing activity survey. In essence, commercial and recreational fishing is generally more extensive in Block Island Sound than in eastern Long Island Sound. In eastern Long Island Sound, review of finfish data from the corridor between NLDS and CSDS indicated that catches in areas of disposal sites were not different from other areas, and that the data did not provide significant insight or discriminatory power for decision making.

Tetra Tech (2014) also assessed lobster fishing in the ZSF through the fishing activity survey and by reviewing CTDEEP fish trawl data (Gottschall and Pacileo, 2012). Overall, the abundance of lobsters in the ZSF is low. The relatively highest commercial lobster fishing activity appears to occur in eastern Block Island Sound. The American lobster population experienced a die-off in Long Island Sound in 1999 as a result of abiotic stressors coupled with disease. As a result, lobster abundance in all of Long Island Sound has declined 40-fold from a peak of approximately 12 million pounds in 1996 to 300,000 pounds in 2011 (LISS, 2013).

4.4 Minimize Impact to Living Resources (Breeding, Spawning, Nursery, Feeding, and Passage Areas) [40 CFR 228.228.6(a)(2)]

Living resources were evaluated by reviewing biological data as well as the seafloor morphology as an indication of the habitat. In eastern Long Island Sound, Tetra Tech (2014) examined the biological resources based on CTDEEP fish catch data, benthic sampling, and a fishing activity survey. Seafloor morphology information was obtained from multibeam echosounding surveys of the sea-floor topography by the USGS and NOAA (*e.g.*, Poppe et al., 2011, 2014), as well as recent reports by the DAMOS program (*e.g.,* ENSR, 2005; AECOM, 2009, 2012). Generally, seafloor areas with hardbottom and boulder fields were considered to have higher living resource values.

4.5 Minimize Impacts to Benthic Community [40 CFR 228.6(a)(6)]

The relationship between sediment texture and geomorphology and benthic community was shown for example by Zajac et al. (2000a,b) and Pellegrino and Hubbard (1983). Generally, in

Long Island Sound, species richness[8] is low in western Long Island Sound and increases toward eastern Long Island Sound (Figure 11). Higher species richness in eastern Long Island Sound may be a result of factors such as a larger potential species pool at the eastern end of Long Island Sound and the connection to the open coastal waters of Block Island Sound and the Atlantic Ocean (Lopez et al., 2014).

Samples of the benthic infauna[9] in eastern Long Island Sound were obtained in July 2013, including from the NLDS and CSDS (Tetra Tech, 2014). The benthic community was observed to be well-developed and highly diverse. However, no differences were apparent between taxa from samples within the disposal sites and outside disposal sites. This finding is consistent with findings from ongoing ODMDS monitoring that has demonstrated recovery to typical benthic communities within short time periods after dredged material disposal at existing sites in Long Island Sound (*e.g.*, ENSR, 1998, 2001; AECOM, 2010, 2012).

The maintenance of the continuity of benthic community type was considered during screening to preserve benthic community habitat (*e.g.*, disposal of fine-grained dredged material on fine-grained bottom sediment), if possible.

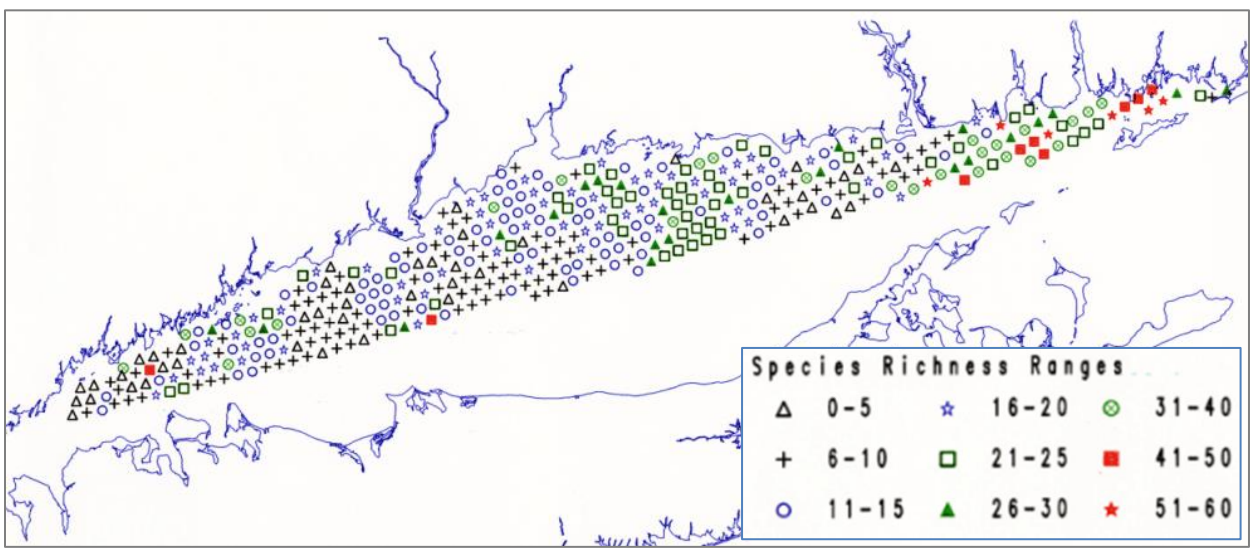

Figure 11. Benthic species richness in Long Island Sound determined by Pellegrino and Hubbard (1983, as provided in Lopez et al., 2014). A generally higher species richness was observed in eastern Long Island Sound (red symbols).

4.6 Minimize Impact to Shellfisheries and Shellfishing Resource Areas [40 CFR 228.5(a), 228.6(a)(8)]

Shellfishing consists of the harvesting of naturally-growing or farmed shellfish. Shellfishing resource areas consist of approved zones for recreational and commercial shellfish harvesting.

[8] Species richness is the number of different species represented in an ecological community, landscape or region.

[9] Benthic infauna consists of organisms that dwell *within* the upper layer of the sediment on the seafloor.

Shellfish collection in waters below 59 feet (18 m) is prohibited at NLDS and CSDS, as well as in coastal waters surrounding Plum Island (Figure 12). Other areas are classified approved, conditionally approved (with various restrictions), conditionally restricted (with various restrictions), or restricted. "Approved" shellfishing areas were eliminated from further consideration for alternative ODMDSs during Tier 1 screening (see Section 3.5). Tier 2 screening considered other types of shellfishing zones, and proximity of alternative ODMDSs to "Approved" shellfishing zones.

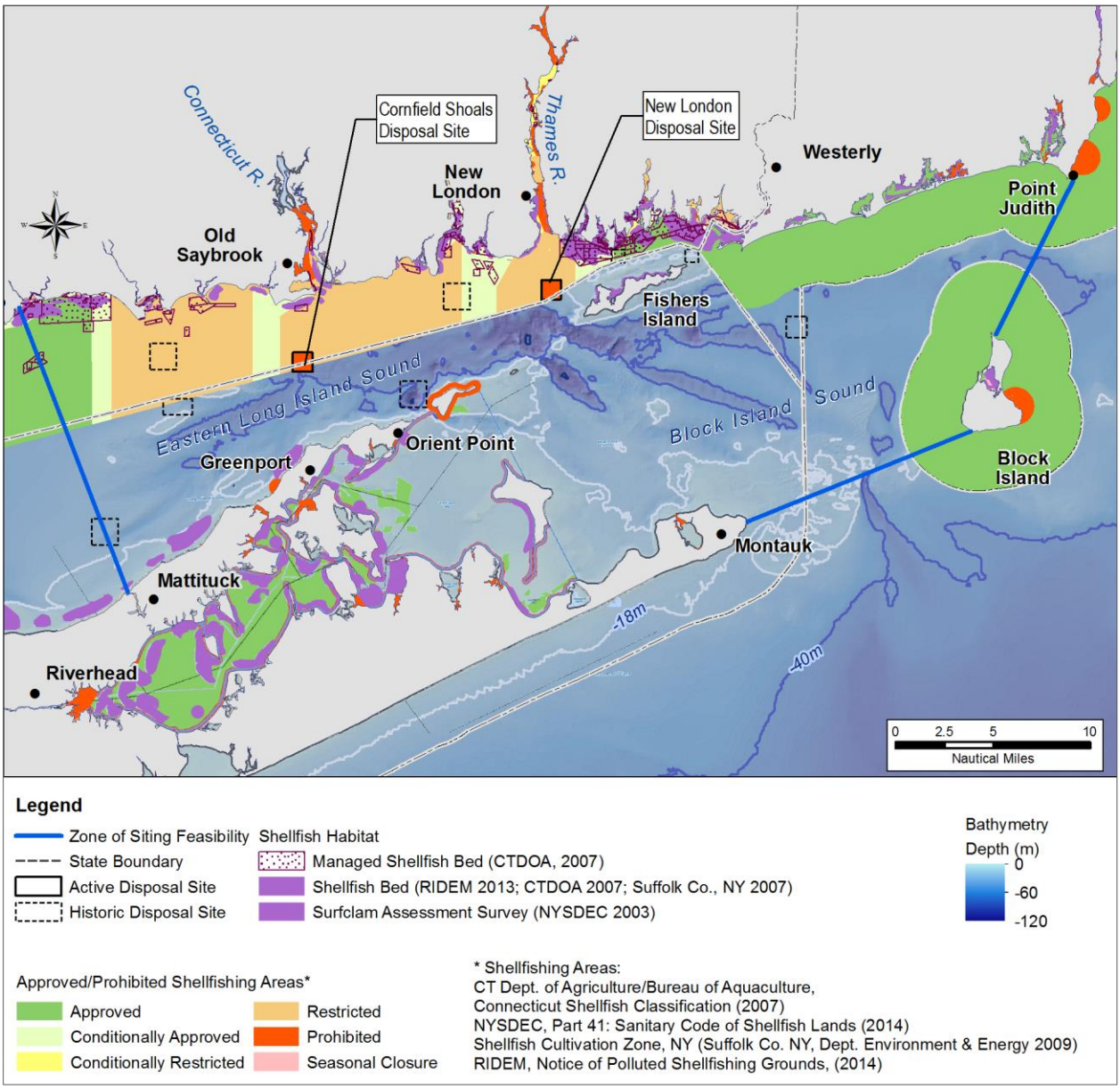

Figure 12. Shellfish beds and shellfishing zones in the ZSF. (Data sources: GIS data bases from States, Suffolk County [NY], and NOAA [2013a]).

4.7 Consideration of Site Characteristics [40 CFR 228.6(a)(6)]

Sediment chemistry data were obtained in eastern Long Island Sound to determine background conditions in eastern Long Island Sound. Specifically, sediments were sampled in eastern Long Island Sound at 35 stations and analyzed for metals (copper, mercury, lead, zinc, cadmium, chromium) and organic compounds (polycyclic aromatic hydrocarbons [PAHs], pesticides, polychlorinated biphenyls [PCBs]), and total organic carbon concentrations (TOC) (UCONN and Louis Berger, 2015). Concentrations of metals and total PAHs, pesticides, and PCBs were generally low or below the analytical reporting limit. None of the metal concentrations at any of the 35 stations exceeded the NOAA Effects Range Median (ERM) guideline values[10] for any of the analyzed metals. Samples from two stations slightly exceeded the NOAA Effects Range Low (ERL)[11] guideline value for copper; these two stations were located in the NLDS. Concentrations of organic compounds (PAHs, pesticides, PCBs) were low or often not detected. None of the individual samples were above the ERM values for any organic compound. Two samples located at the NLDS exceeded ERL values for some compounds. One station was above the ERL value for multiple PAHs and the sum of the pesticides DDD+DDE+DDT. Another station was above the ERL value for DDT and total PCBs.

TOC in the sediment is an indication of the organic matter content, used as background but not for site screening. TOC is commonly higher in finer- grained sediment (silt/clay) and lower in coarser-grained sediment (sand). TOC concentrations in all sediment samples ranged between approximately 0.2% and 3.5% dry weight (UCONN and Louis Berger, 2015), with highest individual concentrations at the NLDS consistent with the presence of fine-grained sediments at the site. Metal concentrations analyzed at the three Alternatives were generally low.

Concentrations of metals and organic compounds in Block Island Sound sediments are expected to be low due to the comparatively long distance to urban sources for such chemicals and the generally coarse grain size of the sediments (organic compound and metal concentrations are typically higher in finer-grained sediments).

4.8 Site Dimension [40 CFR 228.6(a)(4)]

The two active disposal sites were developed by the USACE for their site selection documentation. Alternative ODMDSs were evaluated based on the need and capacity using a minimum area of 1 nmi^2 (3.4 km^2). Similarly, each site should have sufficient capacity for the placement of all or most of dredged material that is expected to be generated in the eastern Long Island Sound region over the 30-year planning period (2008 to 2027). This volume for the eastern Long Island Sound region is 14.4 million cubic yards (cy) (11 million m^3), as determined by the USACE (2009).

[10] A ERM guideline value is simply a point on a continuum of bulk chemical concentrations in sediment that roughly relates to the median probability of sediment toxicity. The 50th percentile of the ranked data is identified as the ERM. The ERM is indicative of concentrations above which adverse biological effects frequently occur. Guideline values are published in Buchman (1999), based on multiple references therein.

[11] A ERL guideline represents the 100th percentile. It is indicative of concentrations below which adverse biological effects rarely occur. However, it is noted that the literature suggests that the ERL value cannot be used as an indicator of sediment toxicity (O'Connor, 2004).

4.9 Surveillance and Monitoring [40 CFR 228.5(d), 228.6(a)(5)]

The feasibility of monitoring and assessment in the ZSF is affected by the seafloor morphology and physical oceanographic conditions. This consideration used the USGS/NOAA seafloor morphology data (*e.g.*, Poppe et al., 2011, 2014) and the tidal current information from the physical oceanography (PO) study (O'Donnell, 2014b).

4.10 Interference with other Uses [40 CFR 228.6(a)(8)]

Aside from uses of the ZSF already discussed above, other uses include renewable energy generation potential. Overall, the potential for renewable energy generation is marginal, as follows:

- *Wind energy*: Most of eastern Long Island Sound is classified by the U.S. Department of Energy (USDOE) as Wind Power Class 3 or 4; Block Island Sound is classified mostly as Class 4 or 5 (Figure 13). For reference, the proposed Cape Wind offshore wind farm project is located within Class 5 and 6 areas. Due to the comparatively low wind energy classes in the ZSF, wind energy generation potential was not considered for siting alternative ODMDSs.

- *Wave energy*: Wave power density is comparatively low throughout the ZSF (NOAA, 2013c). The wave power density is expected to be lower in eastern Long Island Sound than in Block Island Sound due the more protected nature of eastern Long Island Sound. Wave energy was not considered for siting alternative ODMDSs, as all locations in the ZSF have lower potential than the nearby wide-open continental shelf of the Atlantic Ocean.

- *Tidal energy*: The tidal energy potential coincides with tidal current velocities. The relatively highest tidal energy exists in The Race, Plum Gut, and at Montauk Point Shoals (Georgia Tech, 2013); these three areas have also been designated by NYSDEC as Significant Coastal Fish and Wildlife Habitats and were therefore screened out in Tier 1. Tidal energy potential in other areas within the ZSF was not considered for siting alternative ODMDSs, as it is considered minor compared to areas around Martha's Vineyard and Nantucket.

There is no evidence from the physical oceanography study (O'Donnell, 2014a; 2014b) that would modify the results of the USDOE program studies focused on these other renewable energy resources.

Another factor considered during Tier 2 screening was travel distance for barges from dredging centers as higher costs for disposal may prohibit dredging of some public or private shore facilities. Using the same threshold that was used in the WLIS/CLIS EIS (USEPA and USACE, 2004a), candidate disposal sites more than 25 nmi (46 km) from a dredging center in the eastern Long Island Sound region were determined to not be economically and operationally feasible.

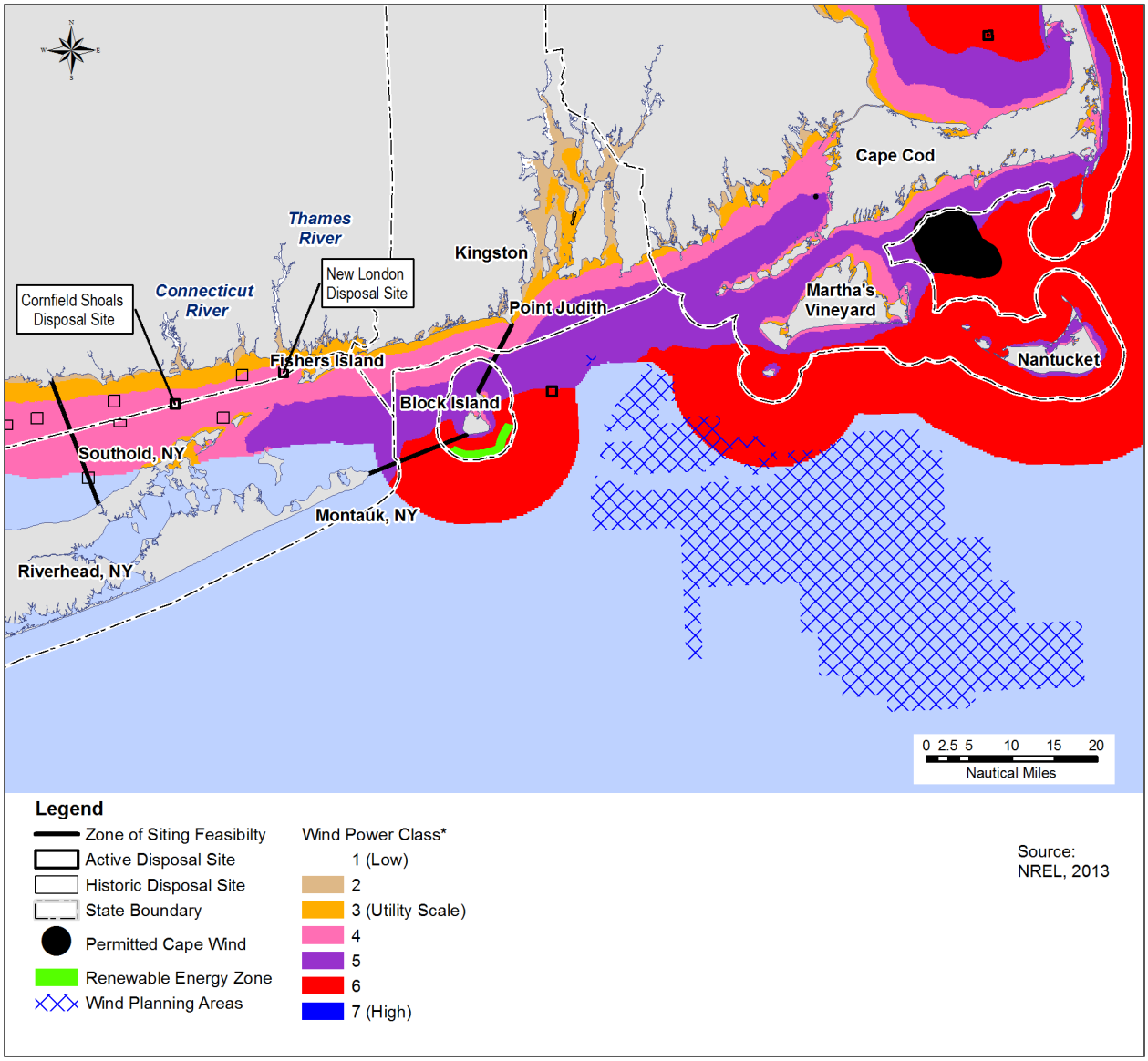

Figure 13. Wind energy potential in the ZSF (Data source: NREL, 2013).

5. ALTERNATIVE SITES

Based on the results of the Tier 1 and 2 screening, eleven initial sites were identified. These sites included the two active disposal sites, five areas that were historically used for dredged material disposal, and four 'new' areas not previously used for disposal (Figure 14).

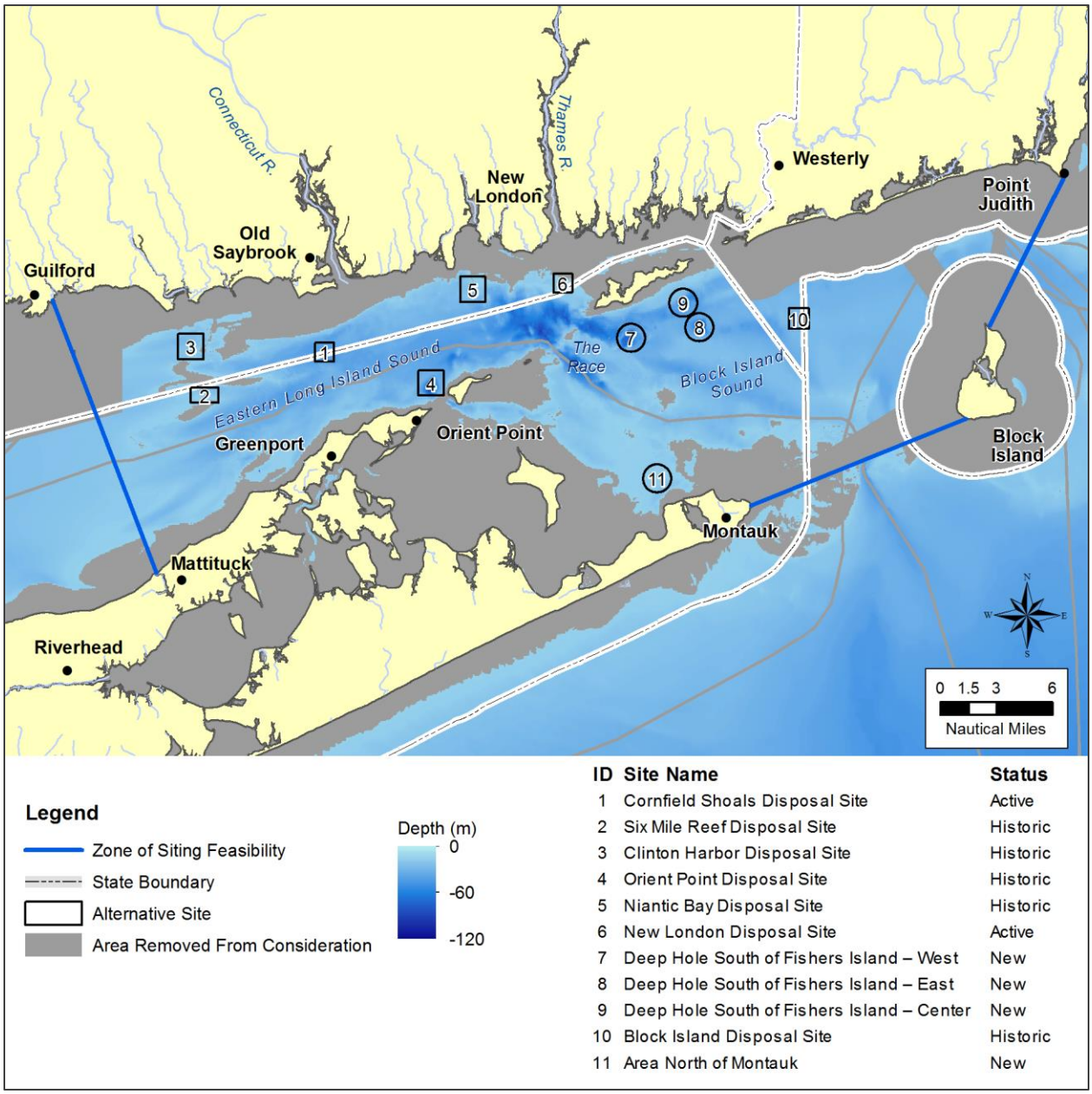

Figure 14. Locations of eleven initially screened potential ODMDSs in the ZSF, as presented to the Cooperating Agency Group on May 20, 2013.

These eleven sites were introduced to the Cooperating Agency Group during a webinar on May 20, 2013. Additional information from the literature was reviewed and data were collected in the field in order to reduce the number of potentially suitable sites that would be evaluated in more detail in the SEIS. Following is a review of each of these eleven sites.

5.1 Cornfield Shoals Disposal Site (Site 1)

The CSDS is an active disposal site, located in a central location in eastern Long Island Sound approximately mid-way between Connecticut and New York. Specifically, the site is located 3.3 nmi (6.1 km) south of Cornfield Point in Old Saybrook, Connecticut (Figure 15). The site has an area of 1 nmi^2 (3.4 km^2) centered at 41°12.6858' N, 72°21.4914' W (NAD83) and a water depth of approximately 150 feet (50 m) (Figure 16). Over 80% of the site is located within Connecticut waters, with the remainder of the site located in New York State waters.

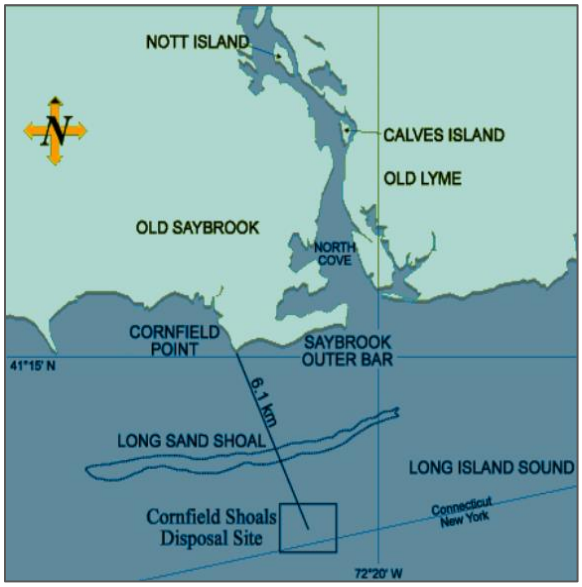

Figure 15. Cornfield Shoals dredged material disposal site (CSDS) south of the mouth of the Connecticut River and of Long Sand Shoal (Source: USACE, 2014b).

Bottom currents are directed generally east-west, due in part to the shallow Long Sand Shoal approximately 0.5 nmi (1 km) to the north of the site. This shoal is an elongate ridge about 2 nmi (3.5 km) off the mouth of the Connecticut River (Figure 15). It is 6 nmi (11 km) long and up to about 1,500 feet (450 m) wide, with a minimum water depth over the shoal of 8 feet (2.4 m) (Williams, 1981).

The seafloor around the CSDS is relatively flat, with longitudinal ripples and other bedforms that suggests that this area is sediment-starved; the site is classified as erosional/nondepositional (Poppe et al., 2013). Surface sediments at the CSDS consist predominantly of gravel and gravelly sediment (Figures 16 and 17). Gravelly sediment consists of a mixture of 50-90% sand, silt and clay; the remaining fraction consists of gravel. Sediment sampling for the SEIS indicates that the dominant size fraction in the gravelly sediment is sand (Tetra Tech, 2014; UCONN and Louis Berger, 2015).

The CSDS was selected as a dispersive site by the USACE using their site selection authority. The use of the site was then further extended by Public law on December 23, 2011 (PL-112-74, Title I, Sec 116). An estimated 1.2 million cy (0.95 million m^3) were disposed at the site between 1960 and 1976 (Oceanic Society, 1982[12]), and additional 1.7 million cy (1.3 million m^3) between 1982 and 2013 (USEPA, 2015).

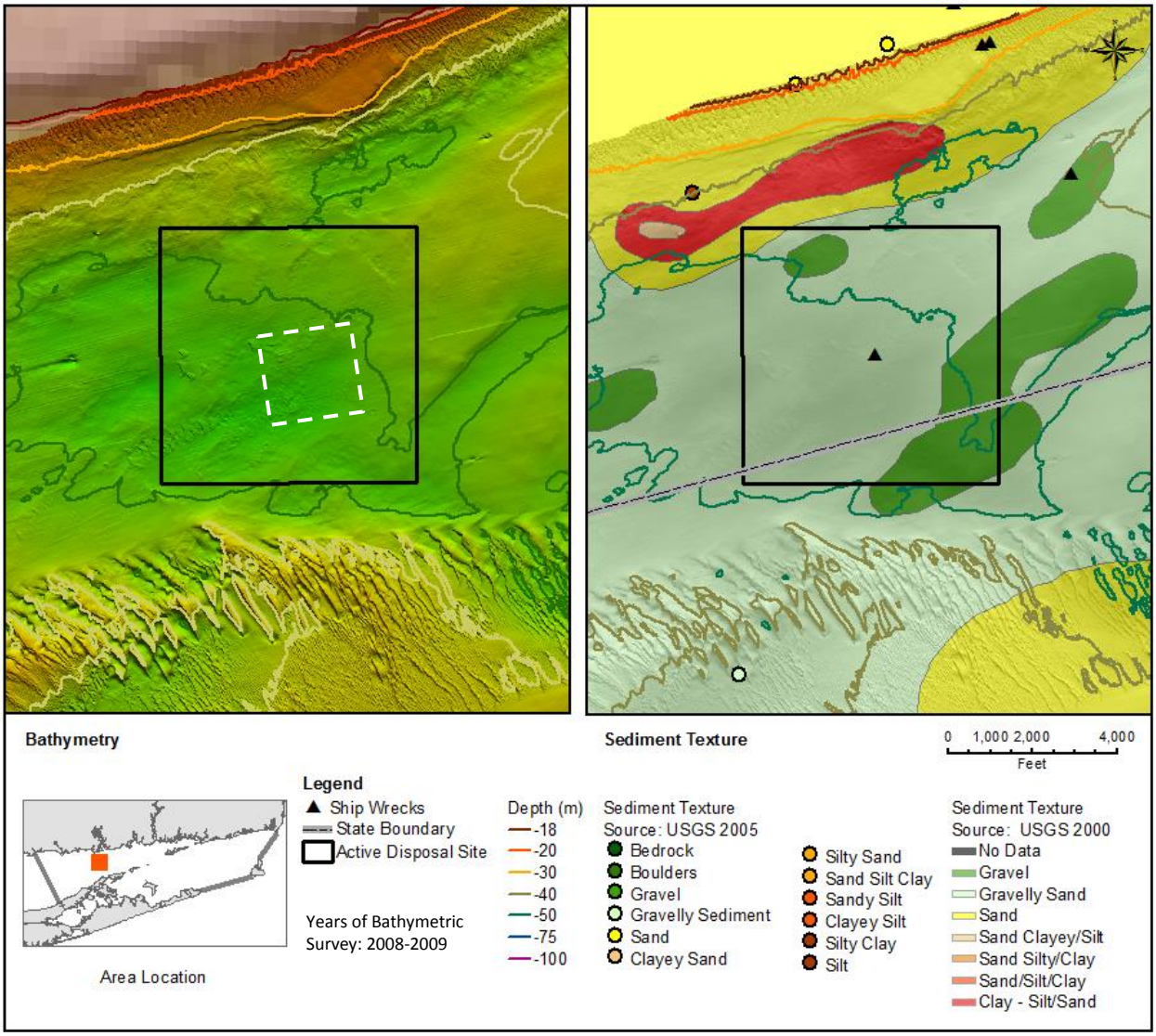

Figure 16. Water depth and sediment texture[13] at the Cornfield Shoals dredged material disposal site. The seafloor at the site is flat and has scour features and bedforms. The approximate area of the close-up in Figure 18 is marked by a white dashed line. (Data sources: Poppe et al., 2000, 2005, 2011).

[12] The Oceanic Society (1982) report cited the CTDEEP and NYSDEC as the source for the dredged material disposal information for the sites in Long Island Sound.

[13] Note that the sediment texture legend is kept uniform for maps of all eleven sites. Not all textures are present at each site.

As part of the DAMOS program, the USACE has monitored the site periodically since 1978 to characterize the hydrodynamics and sediments at CSDS. Well-defined dredged material mounds were not detected at CSDS by bathymetric surveys performed in 1978, 1987, and 1990, 1992, 1994, and 2004 (ENSR, 2005), although the sediment survey in 1990 detected fine-grained dredged material near the center of the site. Between 1994 and 2004, approximately 438,000 cy (335,000 m^3) of dredged material was placed at the center of CSDS. A comparison of the data from 1994 and 2004 bathymetric surveys, performed under the DAMOS program, indicated that limited sediment accretion of less than 3.1 feet (1 m) in thickness was present to the west of the disposal location and limited erosion was observed to the east (ENSR, 2005). The erosion and accretion pattern and the lack of a distinct mound at CSDS were considered consistent with sediment transport patterns observed previously, *i.e.*, they were consistent with the dispersive nature of this site and the dominant east-west transport orientation.

Diffuse mounds[14] of dredged material were also identified during a 2009 multibeam bathymetric survey with the largest spoil mound extending 3.7 feet (1.1 m) above the surrounding seafloor (Poppe et al., 2013; Figure 18). The physical oceanography study for the SEIS confirmed the dispersive nature of the site (O'Donnell, 2014b). Specifically, the maximum bottom stress[15] modeled for the site exceeds the threshold for erosion of typical dredged material. Therefore, disposed dredged material would not be contained at the CSDS over time.

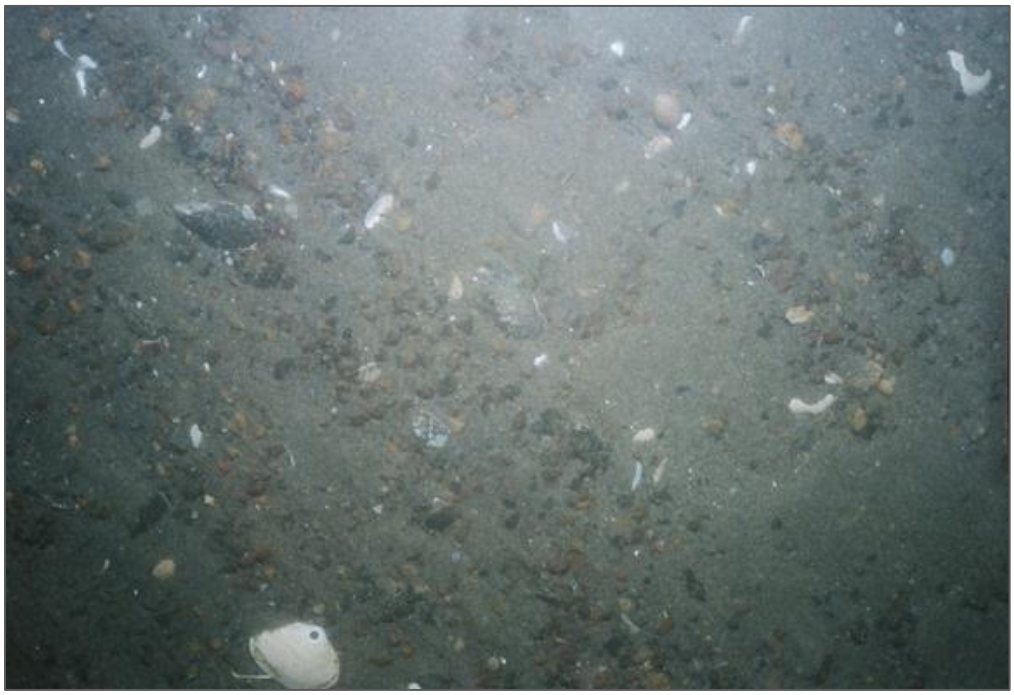

Figure 17. Photograph of rippled sand with some pebble and pea-sized gravel, approximately 0.3 nmi (0.5 km) to the east of the CSDS. Scattered shells and shell debris are concentrated in the troughs of the ripples. (Source: Poppe et al., 2013).

[14] Diffuse mounds are defined as mounds that have been reworked by currents over time.

[15] Bottom stress along with sediment characteristics (primarily grain size and cohesiveness of the sediment) determine the potential for sediment erosion, settling, and resuspension. Bottom stress is largely a function of waves and currents affecting the seafloor.

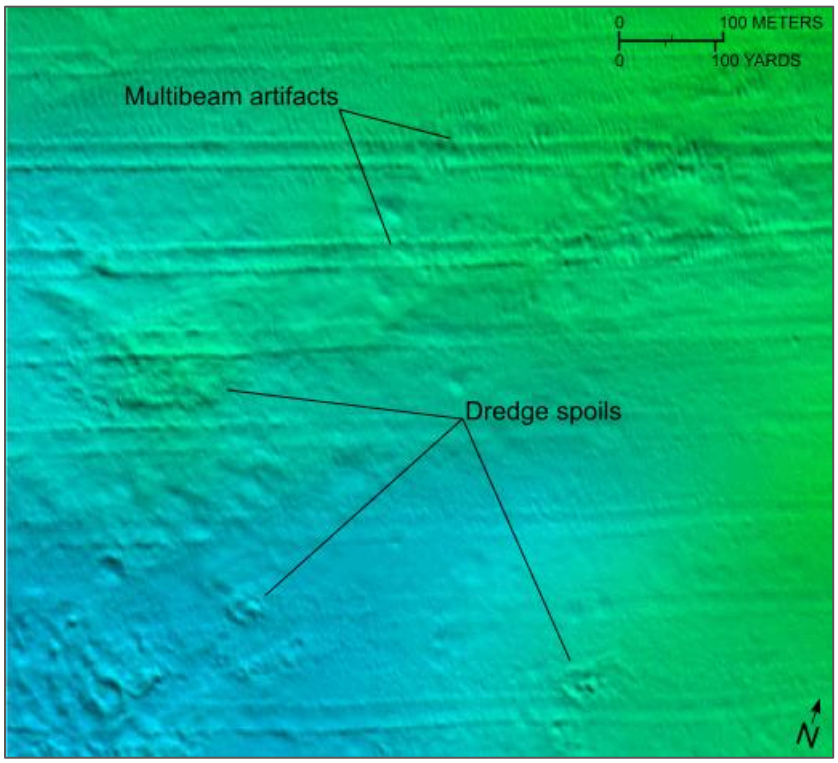

Figure 18. Closeup of bathymetry within the CSDS with diffuse dredged material disposal mounds, as identified by Poppe et al. (2013). See Figure 16 for location of the close-up area. Note that the horizontal lines from left to right are 'multibeam artifacts' (caused by a faulty receiver during data acquisition) and are not features on the seafloor.

A DAMOS program study investigated potential impacts to shellfish beds to the north of Long Sand Shoal (SAIC, 1996); as shown in Figure 7, the closest distance between the CSDS and shellfish beds to the north is approximately 2 nmi (3.7 km). The study concluded that the predominant east-west current direction, the presence of Long Sand Shoal, and the gradual dispersion of disposed sediment over weeks and months reduces concerns about transport of resuspended material over those shellfish beds to the north.

Evaluation: The CSDS is being evaluated in the SEIS as an alternative ODMDS because it has been used as a regional disposal site and monitored by the USACE under the DAMOS program since 1978 (*e.g.*, ENSR, 2005). The site has a predominant east-west transport direction (*i.e.*, approximately parallel to coast rather than toward the coast), has sufficient water depth (*i.e.*, plenty of capacity), and is reasonably close to dredging centers. This site, if designated, would be a dispersive site, not a containment site.

5.2 Six Mile Reef Disposal Site (Site 2)

Six Mile Reef is located within the Mattituck Sill. The Mattituck Sill is a submerged shallow sedimentary area that extends between Mattituck, New York, to Branford, Connecticut. The sill is a remnant of the marine delta at the mouth of the Connecticut River, created from sediments contributed by the draining and erosion of a former glacial lake (Lewis, 2014). As the delta has been reworked by tidal forces, the sediments have been eroded in eastern Long Island Sound and transported westward. Finer sediments were transported into the central basin of Long Island Sound and the sands formed large shoals and fields of giant sand waves. Transport is still ongoing. Six Mile Reef is one of these sandy shoals consisting of a core of postglacial marine deltaic deposits mantled by tidally reworked modern sediments (Poppe et al., 2007a; 2008). The site has active sediment transport, as reflected by sedimentary bedforms such as sand waves and megaripples[16] (Figure 19). These bedforms are gradually moving, mainly from east to west, under the present hydraulic regime.

The historic Six Mile Reef disposal site currently has a water depth of approximately 62 to 110 feet (19 to 35 m). Approximately 80% of the site is located within New York State waters, with the remainder of the site located within Connecticut waters. The site would be a dispersive site as determined by physical oceanographic modeling of the ZSF (O'Donnell, 2014b).

Evaluation: The site is located in an area of large bedforms on the sea floor. Therefore, shifting sands in the area may reduce water depths at the site over time [40 CFR 228.6 (a)(1)] and may also complicate the management of the site. The site is *not recommended* as an alternative ODMDS to be analyzed further in the SEIS.

[16] "Regular" ripples a spacing between crests of up to 60 cm; the crest spacing in megaripples ranges from 60 cm to 10 m *(e.g., http://geology.uprm.edu/Morelock/barrsys.htm)*.

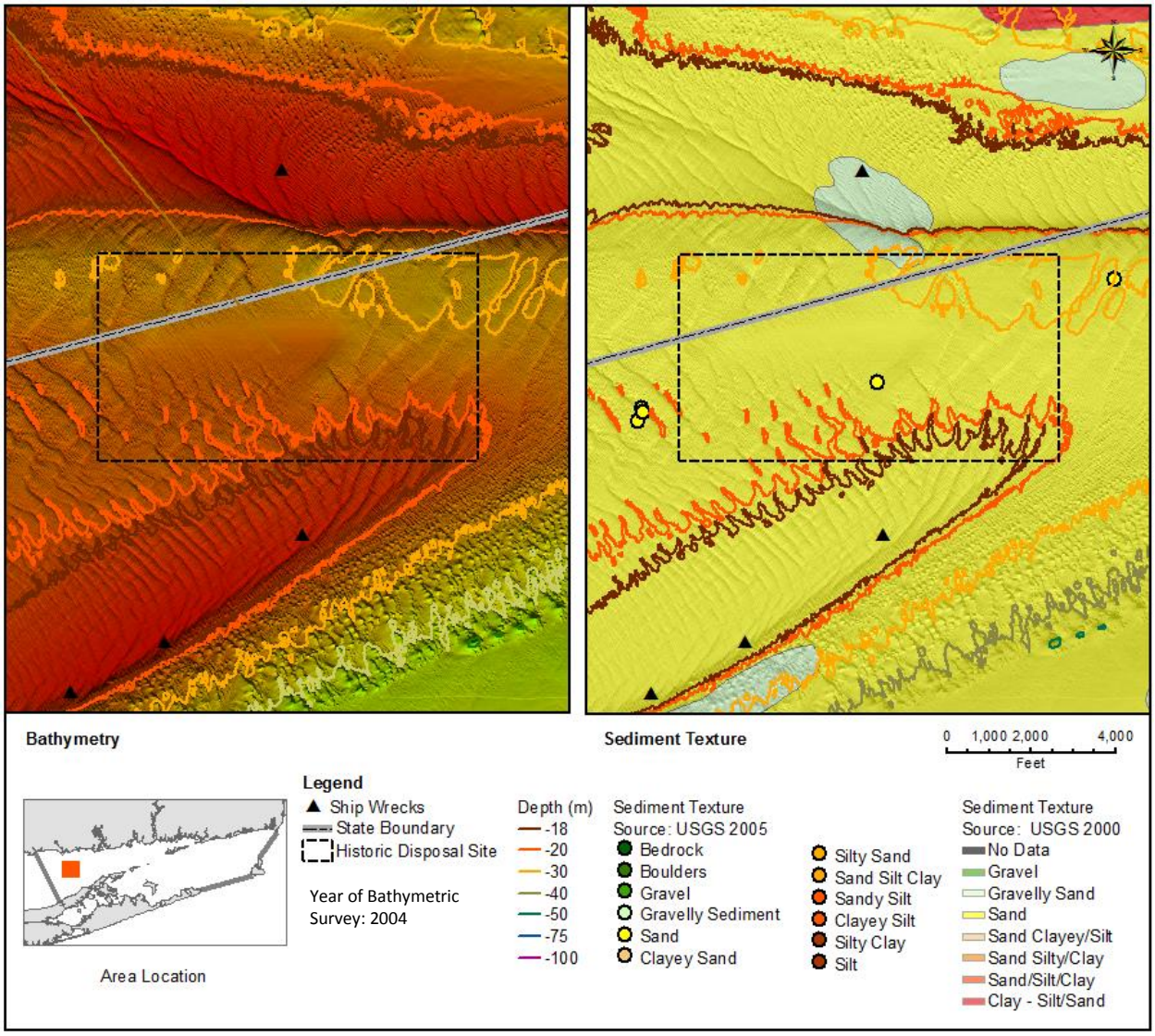

Figure 19. Water depth and sediment texture at the historic Six Mile Reef disposal site. The bottom of the site is marked by sand waves and other bedforms reflecting net sediment transport to the west (Data sources: Poppe et al., 2000, 2005, 2007a).

5.3 Clinton Harbor Disposal Site (Site 3)

This historic disposal site is located about 1.5 nmi (2.8 km) south of Clinton harbor, and is located within the Mattituck Sill. The site currently has a water depth of approximately 65 to 110 feet (20 to 35 m) (Figure 20). The substrate consists predominantly of sand with areas of gravel, boulders, and bedrock. According to the Oceanic Society (1982), approximately 27,000 cy (21,000 m^3) of dredged material were disposed at the Clinton site. There are four shipwrecks scattered throughout the center of the site (NOAA, 2013b) [40 CFR 228.6 (a)(11)].

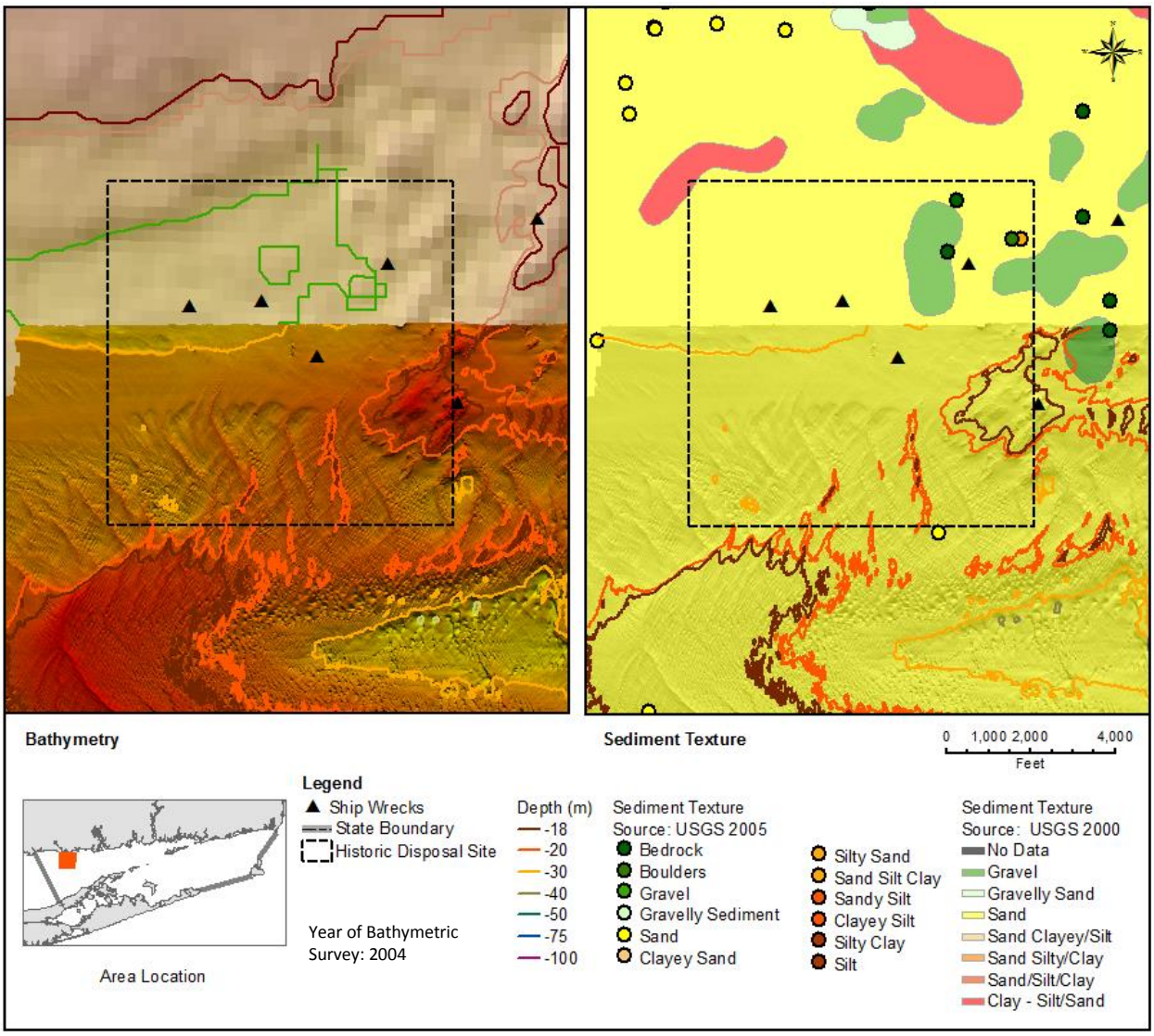

Figure 20. Water depth and sediment texture at the historic Clinton Harbor disposal site. Detailed multibeam bathymetric data are available for the southern half of the site. (Data sources: Poppe et al., 2000, 2005, 2007a)

The site may have a more complex current pattern. While the overall net sediment transport in the general area is to the west, Poppe et al. (2007a) observed a sand-wave morphology at the site that also suggests countercurrents and sediment transport to the east. The site would be a

dispersive site as determined by physical oceanographic modeling of the ZSF (O'Donnell, 2014b). The site is located completely within State of Connecticut waters.

Evaluation: As for the historic Six Mile Reef, sediment transport with shifting bedforms and a more complex current pattern may complicate management of the site [40 CFR 228.5 (d)]. The site also contains four shipwrecks. The site is *not recommended* as an alternative ODMDS to be analyzed further in the SEIS.

5.4 Orient Point Disposal Site (Site 4)

The historic Orient Point disposal site is characterized by a deep scour depression formed by tidal flows entering Long Island Sound through Plum Gut that covers a large part of the site (Figure 21). Plum Gut is the channel between Plum Island and Orient Point. The southeastern corner of the disposal site directly abuts Plum Gut. The site is also close to shore. The closest distance to Plum Island is approximately 0.3 nmi (0.5 km); the closest distance to Orient Point is approximately 0.7 nmi (1.2 km). The scour depression in the center of the site has a water depth of up to 340 feet (103 m) (McMullen et al., 2010). Sediments at the site consist primarily of gravelly sediment and sand. The Oceanic Society (1982) listed the site as an historic or interim site but did not have information available about the volume of sediment disposed at the site. The site is located completely within New York State waters.

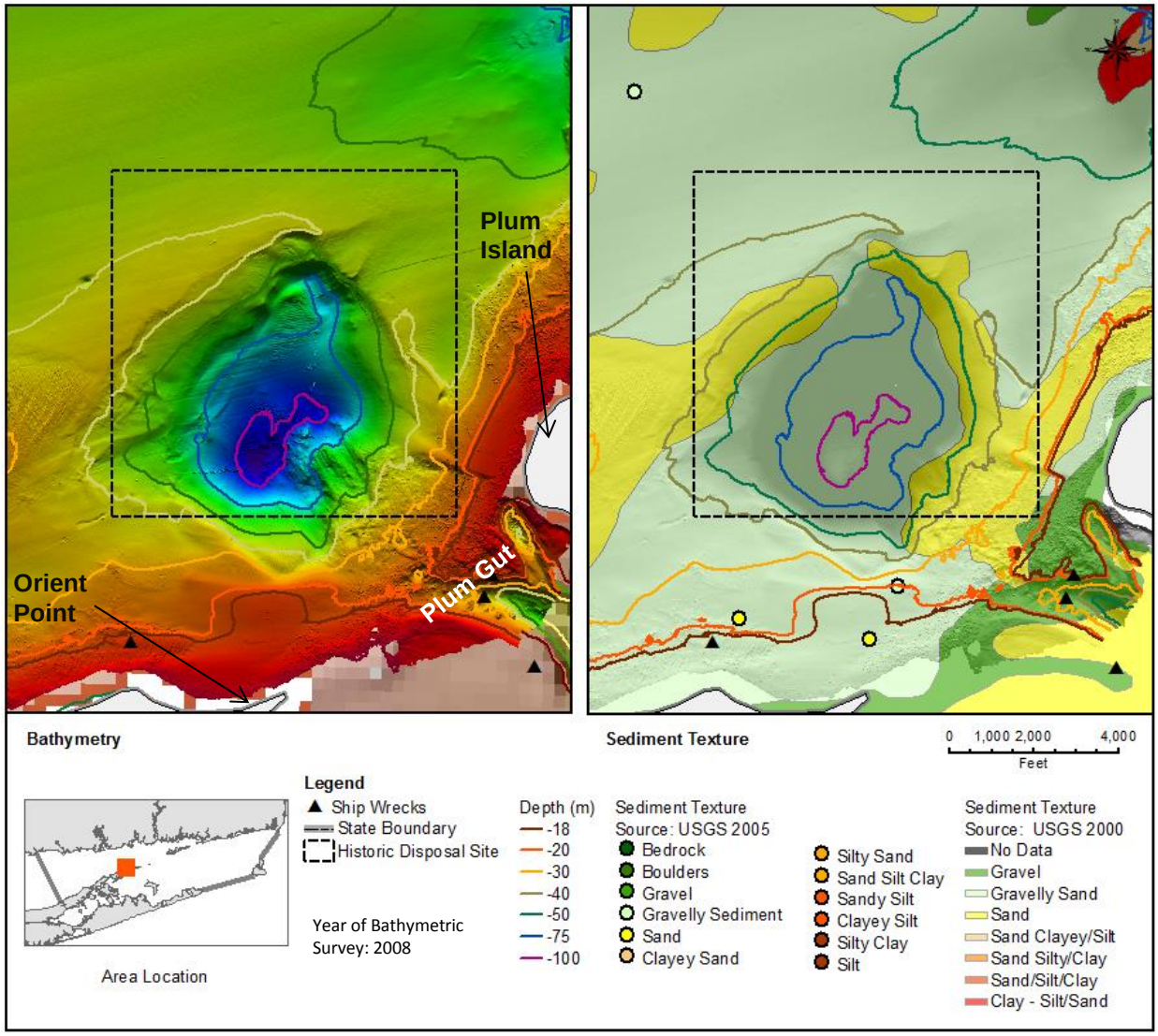

Figure 21. Water depth and sediment texture at the historic Orient Point disposal site. Water depths in the scour depression reach 340 feet. (Sources: McMullen et al., 2010; Poppe et al., 2000, 2005)

Orient Point and Plum Island are part of a terminal moraine left behind by glaciers (*i.e.*, the Roanoke Point-Orient Point-Fishers Island moraine system; Sirkin, 1980). Sediments in terminal moraines are unsorted, containing a wide range of grain sizes from large boulders to silts and clay. As a result, large areas of boulders, covering several square miles, flank the shore north of Plum Island and Orient Point (Figure 22). These areas are rich in benthic life (Figure 23).

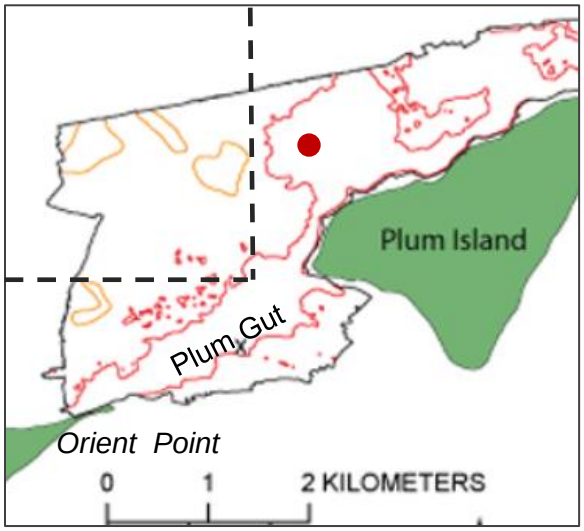

Figure 22. Areas of boulders (delineated by red lines) and sand waves (delineated by orange lines) in Plum Gut. Marked by a black dashed line is the southeast corner of the Orient Point disposal site boundary. The location of photographs of the seafloor (Figure 23) is marked by a red dot. (Source: McMullen et al., 2010).

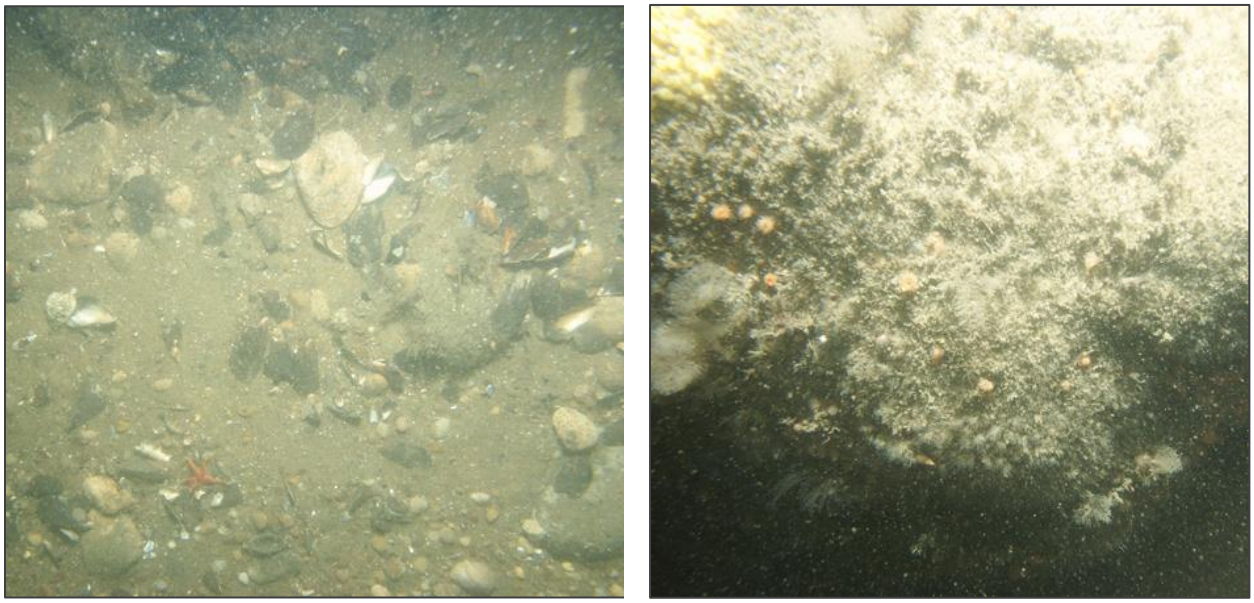

Figure 23. Bottom photographs of the seafloor northwest of Plum Island, near the Orient Point disposal site (see location in Figure 22). The location has boulders colonized by sponges, seaweed, anemones, hydrozoans, and barnacles. Pebble- and cobble-sized gravel and sand variably cover the seafloor between the boulders. Living mussels and mussel-shell debris are common; red starfish are present. (Source: McMullen et al., 2010)

Plum Gut (Figures 21 and 22) is a constricted channel located to the south of the historic disposal site. Plum Gut reaches a depth of about 200 feet (60 m) and has an uneven seafloor, likely due to currents scouring the submerged moraine. The crests of the sand waves and megaripples tend to be northwest-southeast reflecting the direction of tidal currents. Plum Gut was designated in 1987 as a Significant Coastal Fish and Wildlife Habitat; NYSDOS (2005a) describes its fish and wildlife values as follows:

> *"Plum Gut represents an unusual physical environment in New York State. The turbulent marine deepwater habitats and shoals combine to produce a productive and diverse habitat for marine fishes and invertebrates.*
>
> *Significant concentrations of many fish species forage in this area, including striped bass, bluefish, tautog, summer flounder, and scup. Plum Gut is one of two major passage corridors for striped bass, which move into Long Island Sound in spring en route to their spawning grounds, and return to southern overwintering areas during fall. Plum Gut is also thought to be the major corridor for Atlantic salmon returning to the Connecticut (CT) and Pawtucket (RI) Rivers in the early spring.*
>
> *As a result of the abundant fisheries resources in the area, Plum Gut is one of the most popular areas in the northeastern United States for recreational fishing, with an extensive fishery occurring throughout spring, summer, and fall. Much of this activity is due to the involvement of charter boats from Greenport and Montauk Harbor as well as Connecticut. In addition to sportfishing, the commercial trap net fishery and lobster fishery in Plum Gut are of regional significance. The richness and productivity of this area are also reflected in the use of Plum Gut by marine mammals, particularly bottlenosed dolphin, harbor porpoise, harbor seal, and by sea turtles, especially juvenile Atlantic ridley (E) and loggerhead (T) sea turtles."* (p. 2)

Maximum current velocities through Plum Gut are reported as 7.1 knots (3.7 m/s) (E3 Inc., 2007). The scour depression in the center of the Orient Point disposal site was likely caused by tidal flows rushing through Plum Gut into Long Island Sound. Physical oceanographic modeling indicates that, overall, the Orient Point disposal site is a dispersive site (O'Donnell, 2014b).

Evaluation: Considering that the site would overall be a dispersive site, its proximity to shore [40 CFR 228.5(b)], and its proximity to Plum Gut with its significant marine resources [40 CFR 228.5(a), 228.6(a)(1), 228.6(a)(2)] and active recreational fishing [40 CFR 228.6(a)(8)], the site is *not recommended* as an alternative ODMDS to be analyzed further in the SEIS.

5.5 Niantic Bay Disposal Site (Site 5)

The water depth at the historic Niantic Bay disposal site (NBDS) ranges from approximately 60 to 130 feet (18 to 40 m) (Figure 24). The area of the marked site is approximately 1.8 nmi^2 (6.4 km^2). Bartlett Reef, a bedrock shoal, is located approximately 1.5 nmi (3 km) to the east of the site. The site was used for dredged material disposal between 1969 and 1972 when a total of 176,000 cy (135,000 m^3) of dredged material was placed at this location (Oceanic Society, 1982). The site is located completely within State of Connecticut waters.

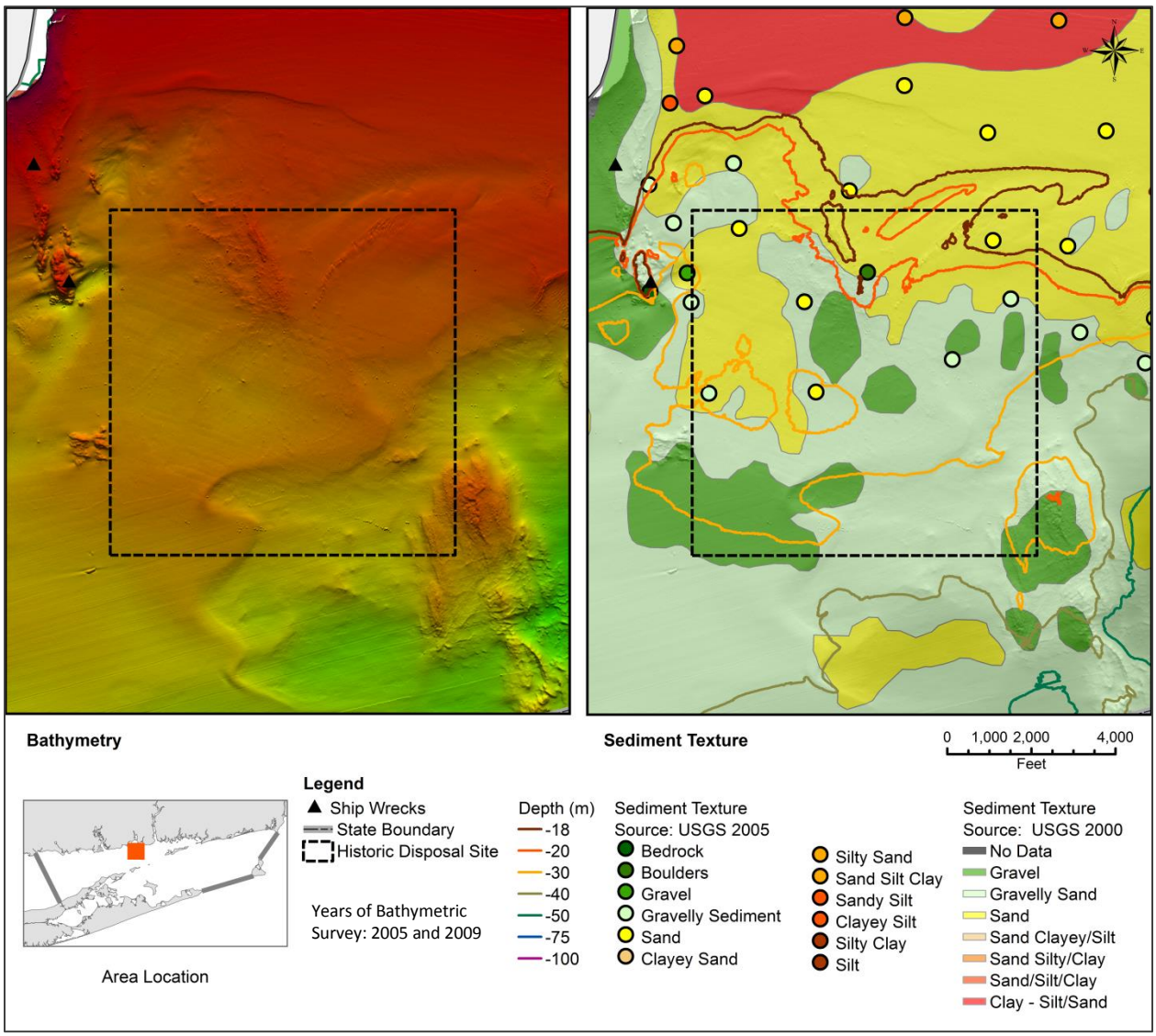

Figure 24. Water depth and sediment texture at the historic Niantic Bay disposal site. (Data sources: Poppe et al., 2000, 2005, 2011).

Sediments at the site consist of sand to the north and northwest, and mostly gravelly sediment with patches of gravel in the remainder of the area (Figure 24). Sediment sampling in 2013 for the SEIS confirmed that the dominant size fraction at the site is sand (Tetra Tech, 2014; UCONN

and Louis Berger, 2015). The site contains a boulder area in the northwestern part of the site (Poppe et al., 1998; WHG, 2014; also shown in Figure 25) and scour depressions in the south (Figure 25). The southeastern corner of the site abuts a bedrock area (Poppe et al., 2013).

The depressions around outcrops to the west of the site are an indication of sediment transport by tidal currents, and the asymmetry of scour-marks ('comet marks'[17]; Figure 25) indicates net sediment transport direction toward the west (Poppe et al., 2010). The physical oceanography study for the SEIS determined that maximum bottom stress from currents exceed the threshold for erosion of typical dredged material for most of the site except for the northeastern part (O'Donnell, 2014b). Bottom stress just to the east of the site (but west of Bartlett Reef) was modeled to be below the erosion threshold.

The western and central portion of the site is zoned by the State of Connecticut as "conditionally restricted" for shellfishing, while the eastern part of the site is zoned "conditionally approved". There are no shipwrecks at the site according to the NOAA data base (NOAA, 2013b).

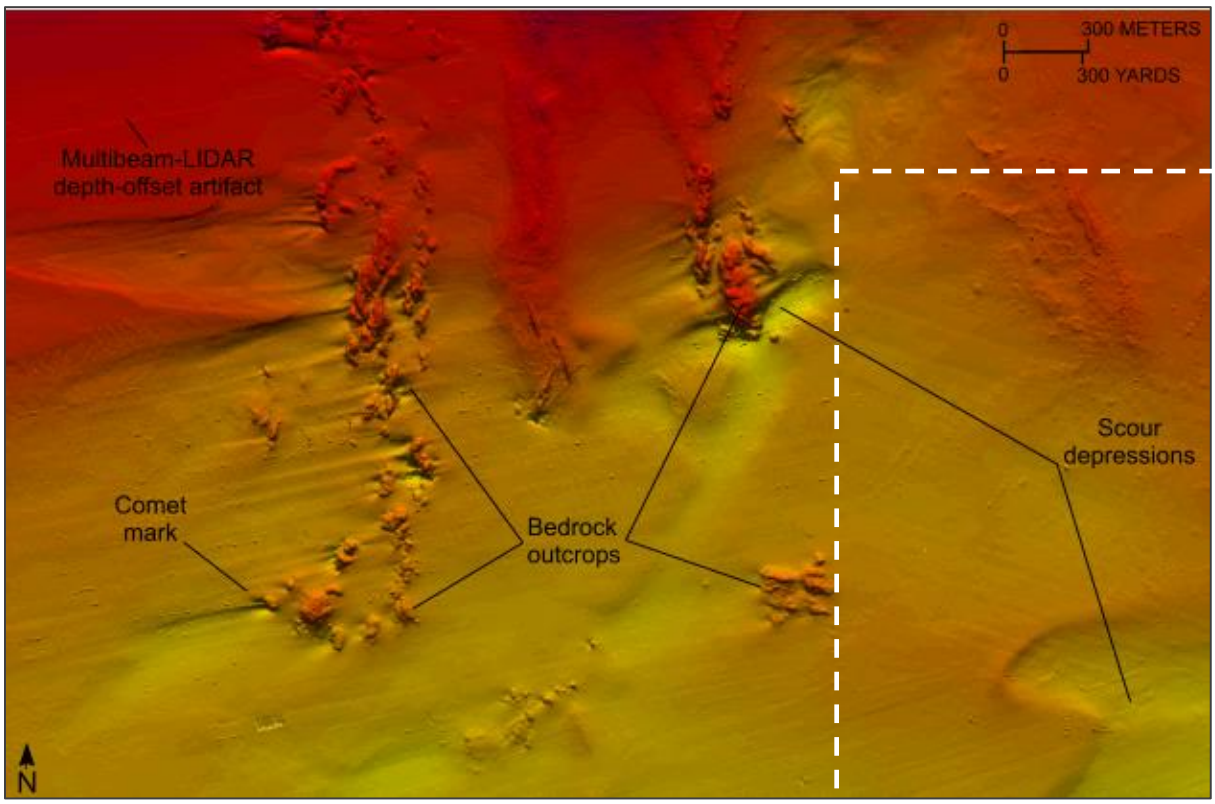

Figure 25. Closeup view of the western portion of the Niantic Bay disposal site (marked by the white dashed line) and surrounding area. Scour depressions in the southwest of the site, and around bedrock outcrops to the west of the site, indicate net westward sediment transport. (Source: Poppe et al., 2010)

[17] 'Comet marks' are areas scoured out behind objects (such has rock outcrops) by currents flowing over and around these objects. The scoured area behind an object indicates the down-current direction.

Evaluation: The historic Niantic Bay disposal site has a predominant east-west transport direction. Biological resources at the Niantic Bay site are similar to other offshore areas in eastern Long Island Sound such as at the CSDS, NLDS, and at control areas outside of these sites (Tetra Tech, 2014). The exception may be the boulder area in the northwestern part of the site and the bedrock area in the southeastern-most corner. However, the historic Niantic Bay site is almost twice as large as the active NLDS and CSDS, thus a potentially designated site at Niantic Bay could be smaller than the historic site, avoiding bedrock and gravel areas. The Niantic Bay site further has sufficient water depth and is reasonably close to dredging centers. For these reasons, the site is *recommended* as an alternative ODMDS to be analyzed further in the SEIS. Most of the historic NBDS would be a dispersive site. The northeastern part of the site would be an containment area based on PO modeling results. In addition to the NBDS, it is recommended to include a 0.75-nmi (1.4-km) wide area to the east of the NBDS in the analysis in the SEIS for added disposal capacity (see Section 5.10 for further discussion). The northern and central part of that area would also be a containment area according to PO modeling results.

5.6 New London Disposal Site (Site 6)

The New London dredged material disposal site (NLDS) is an active open-water disposal site to the south of the mouth of Thames River estuary, approximately mid-way between Connecticut and New York (Figure 26). Specifically, the center of site is located approximately 2.5 nmi (4.6 km) to the southeast of Goshen Point, Connecticut, and 2.3 nmi (4.3 km) to the northwest of Race Point, Fishers Island, New York. It has a square area of 1 nmi^2 (3.4 km^2) centered at 41°16.306' N, 72°04.571' W (NAD83) and water depths ranging from 46 to 79 feet (14 to 24 m) (Figure 27). Over 90% of the site is located within State of Connecticut waters, with the remainder of the site located in New York State waters.

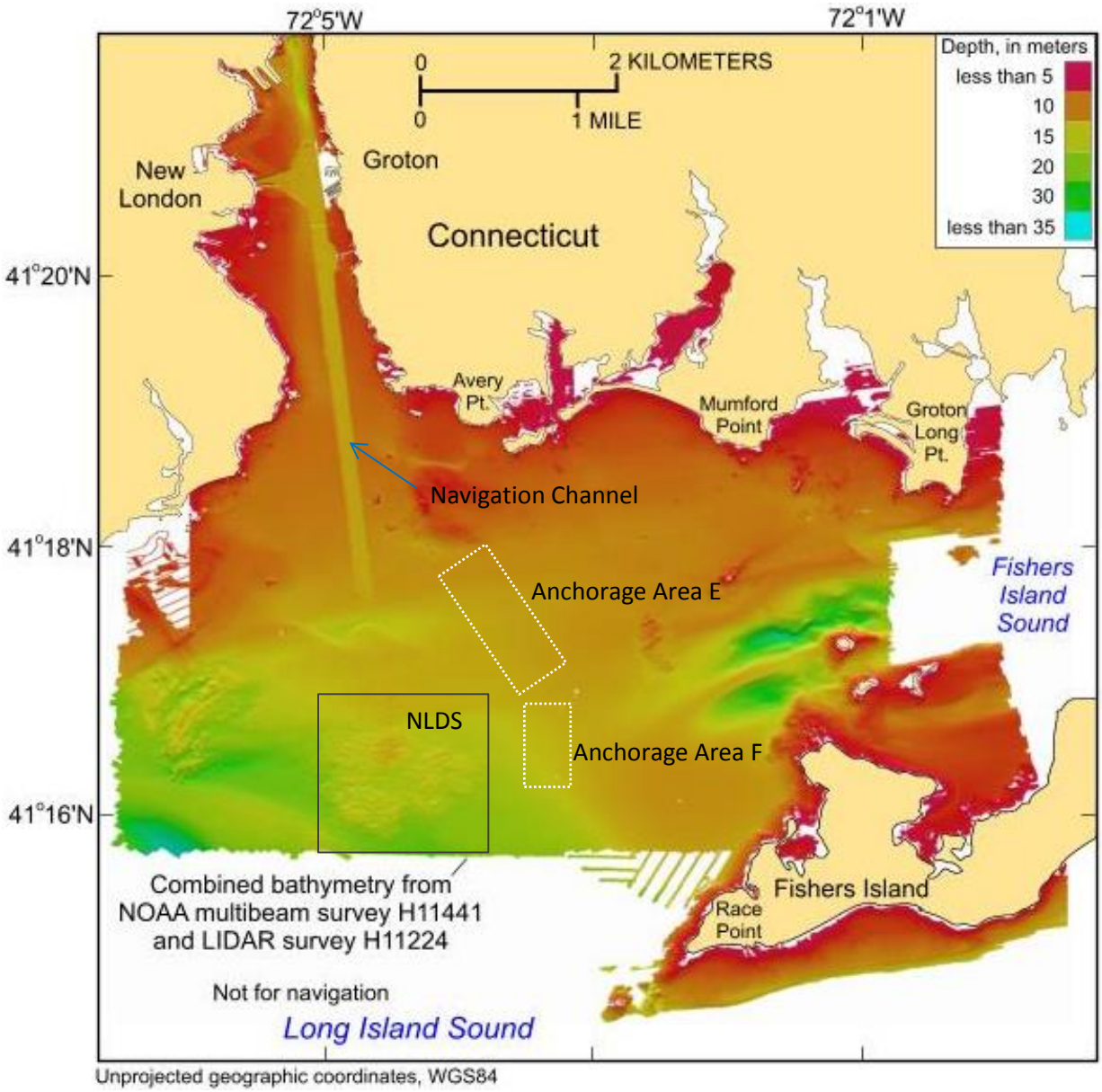

Figure 26. Bathymetry of the mouth of the Thames River, including the New London dredged material disposal site. (Source: Poppe et al., 2010)

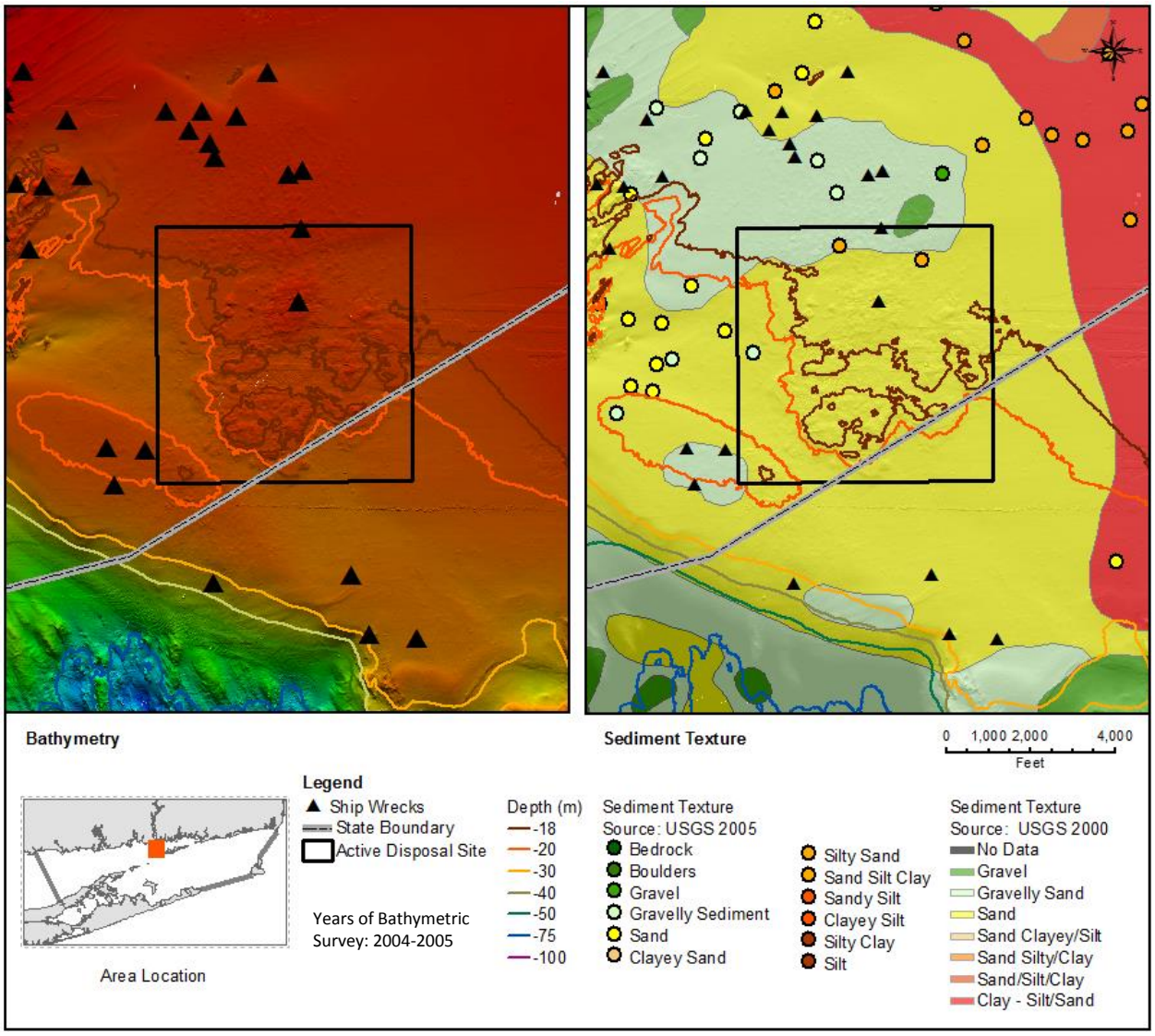

Figure 27. Water depth and sediment texture at the active New London dredged material disposal site. Two anchorage areas are located to the northeast and east of the site. (Data sources: Poppe et al., 2000, 2005, 2011).

The site has been used for dredged material disposal since 1955 (SAIC, 2001). A total of approximately 3.5 million cy (2.6 million m^3) of dredged material were placed at this location since 1982 (USEPA, 2015). In addition, approximately 5.4 million cy (4.1 million m^3) were disposed at the site between 1955 and 1976 (Oceanic Society, 1982). The dredged material (and sediment used to cap some of it) gives the area a hummocky appearance; the deposits can rise 16 to 20 feet (5 to 6 m) above the surrounding seafloor (Figure 28).

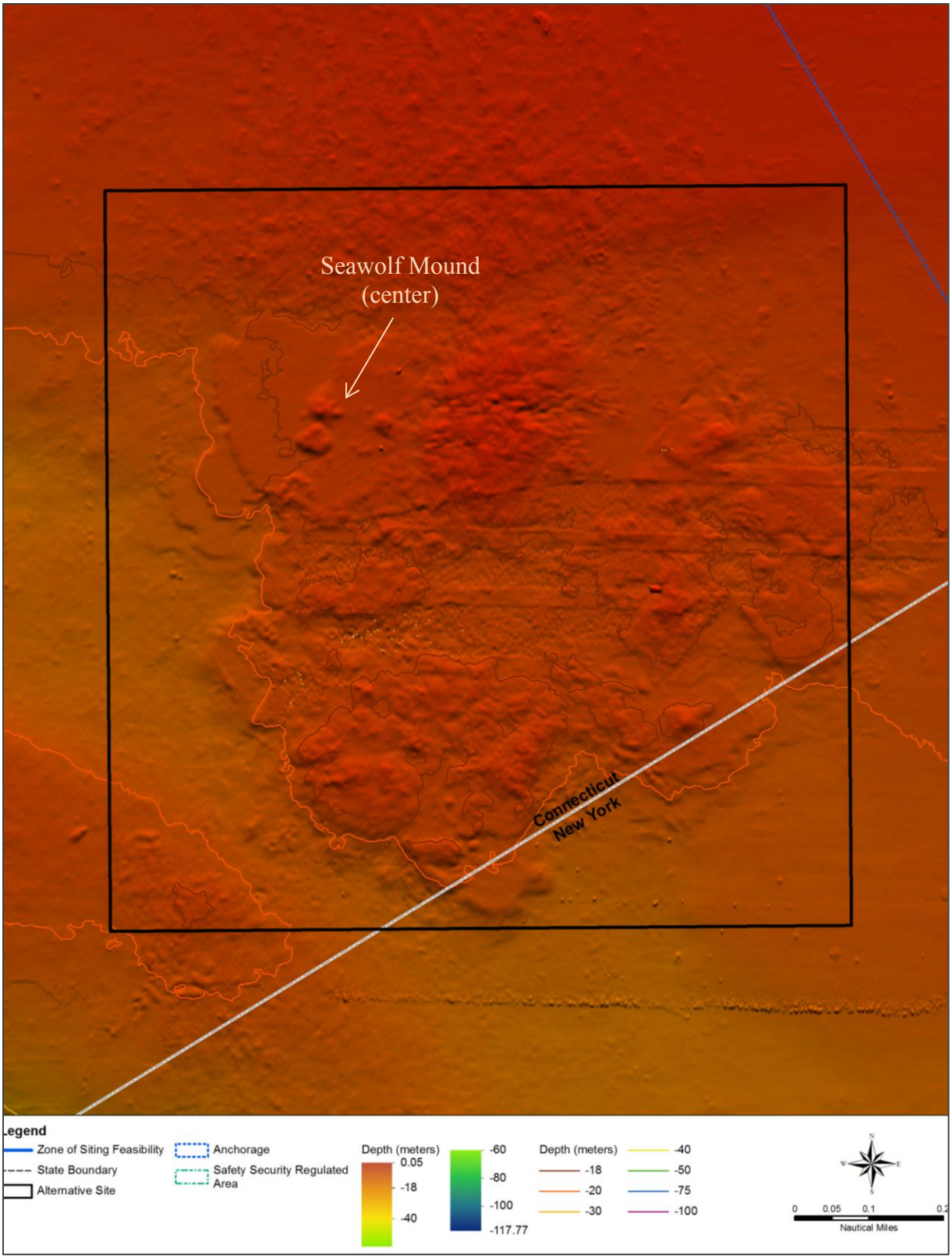

Figure 28. Closeup of the bathymetry at the New London dredged material disposal site (close-up of Figure 27; Poppe et al., 2011). Dredged material mounds are visible. The center of the Seawolf Mound is marked.

The USGS mapped the sediment at the NLDS as predominantly sand (Figure 27); in the northernmost part of the site, sediments were mapped as gravelly sediment. NUSC (1979) described the sediment at the site as generally fine sand. Much of the surface sediments at the site consist of placed dredged material (Figure 28). Sediment sampled by the DAMOS program at locations approximately 0.5 nmi (1 km) to the east and west of the NLDS consisted of silt/clay and very fine silty sand (AECOM, 2009). Similar grain sizes of predominantly silty and clayey sand were observed in 2013 by Tetra Tech (2014) and UCONN and Louis Berger (2015).

There are several indications that the placed sediments are stable and the site is a 'containment site'. A survey conducted in 2007 as part of the DAMOS program did not observe any substantial changes in bathymetry since the prior survey in 1997, except for a new disposal mound that had been placed during this period (AECOM, 2009). Similarly, monitoring of the capped Seawolf Mound[18] within the NLDS demonstrated that the cap was stable (SAIC, 2003, 2004; AECOM, 2012). Biological monitoring on the Seawolf Mound has shown a continuance of advanced successional stages and stable benthic habitat conditions, even after a storm in October 2002 (SAIC, 2003).

Another sign of sediment stability at the site is the absence of scour features and bedforms on the seafloor that are characteristic of shifting sediments (Figure 28). Further, the physical oceanography study for the SEIS determined that maximum bottom stress from currents is below the threshold for erosion of typical dredged material (O'Donnell, 2014b). This area of low bottom stress extended westward for approximately another 1.5 nmi (2.8 km).

The site is crossed by ship traffic that enters the federal navigation channel for New London to the north of the NLDS (Figure 26). The channel has a depth of 40 feet (12 m) at mean low water (MLW) and a width of 500 feet (153 m) (Moffat & Nichol, 2012).

There are two general anchorage areas to the northeast (Anchorage E) and to the east (Anchorage F) of the NLDS (Figure 26). Anchorage F is reserved for the use of naval vessels, except during emergencies.

The USGS/NOAA bathymetric survey (Figure 28) was performed in 2004 and 2005. Since Considering that 390,000 cy (300,000 m^3) of dredged material were disposed at the NLDS between 2006 and 2013. The current water volume between a depth of 59 feet (18 m) and seafloor is approximately 4.5 million cy (3.8 million m^3). Therefore, the remaining storage capacity for dredged material is roughly estimated with around 3 million cy (2.3 million m^3), given that disposal mounds have uneven surfaces and thus a "filled" site would have multiple areas remaining with water depths greater than 59 feet (18 m), and also given that the footprint of disposal mounds shall remain within the site boundary.

[18] The Seawolf Mound was created in 1995/96 by placing material dredged from the Thames River; the material was considered unsuitable for open-water disposal due to elevated trace metal and PAH concentrations. This placed material was then covered with suitable dredged material to form a cap layer and isolate the underlying unsuitable material from the environment.

Evaluation: The NLDS is being evaluated in the SEIS as an alternative ODMDS because it has been used as a regional disposal site and monitored by the USACE under the DAMOS program since 1978. The NLDS is an active site [40 CFR 228.5(e)], sediments on the seafloor are stable (*i.e.*, containment site), the area does not appear to contain unique biological resources. However, considering that the NLDS has limited capacity remaining for the placement of dredged material, it is recommended to include a 1.5-nmi (2.8-km) wide area to the west of the NLDS in the analysis of the SEIS (see Section 5-10 for additional discussion). This area would also be a containment area according to PO modeling results.

5.7 Deep Holes south of Fishers Island – West, East and Center (Sites 7, 8, and 9)

Deep holes, or depressions, in Block Island Sound south of Fishers island were observed by Needell and Lewis (1984) during a high-resolution, seismic-reflection survey. These three depressions were initially considered as potential alternative sites due to their potential for being containment sites. Multibeam bathymetry data were collected in the Block Island Sound between 2008 and 2011 (Poppe et al., 2011 and 2014; McMullen et al., 2015); combined with digital terrain modeling these data provided details of these depressions south of Fishers Island (Figure 29) and allowed for further interpretation of their origin. All three deep holes are completely within New York State waters.

The three deep holes have the following characteristics:

- *Deep Hole south of Fishers Island - West (Site 7):* This depression is an extension of The Race (Figure 30). It is separated from the mid-section of The Race by a terminal moraine consisting of less erosive coarser material (Poppe et al., 2007b). The roughly rectangular-shaped deep hole has dimensions of 1.0 x 0.5 nmi (1.8 x 0.9 km) and a maximum water depth of 309 feet (94 m). The closest distance from the center of this deep hole to Fishers Island is approximately 1.9 nmi (3.5 km).
- *Deep Hole south of Fishers Island - West (Site 8):* This depression is part of an elongate channel in Block Island Sound that extends from The Race toward the southern Block Island Sound opening to the Atlantic Ocean. The circular depression has a diameter of approximately 0.8 nmi (1.5 km) and a maximum water depth of 325 feet (99 m). It is bounded by a comparatively steep wall to the north and east, while the western and southern slopes transition gradually into the channel (Figure 31). The closest distance of the center of this deep hole to Fishers Island is approximately 3.1 nmi (5.7 km).
- *Deep Hole south of Fishers Island - Center (Site 9):* This depression is part of another broad channel in Block Island Sound that extends from Rhode Island Sound westward toward The Race. The roughly triangular-shaped depression is small; it has a length of approximately 0.8 nmi (1.5 km), a width of 0.3 nmi (0.6 km), and a maximum water depth of 246 feet (75 m). It is bounded by a comparatively steep slope to the east, and gradual slopes on its other sides. The steep slope appears to have formed behind a less erosive structural geological feature, possibly a north-south-trending drumlin[19] as suggested by multibeam bathymetry data (McMullen et al., 2015; Figure 31). The closest distance from the center of this deep hole to Fishers Island is approximately 1.4 nmi (2.7 km).

[19] A drumlin is a ridge of coarser-grained sediment that formed underneath a glacier as it slowly moved across the area.

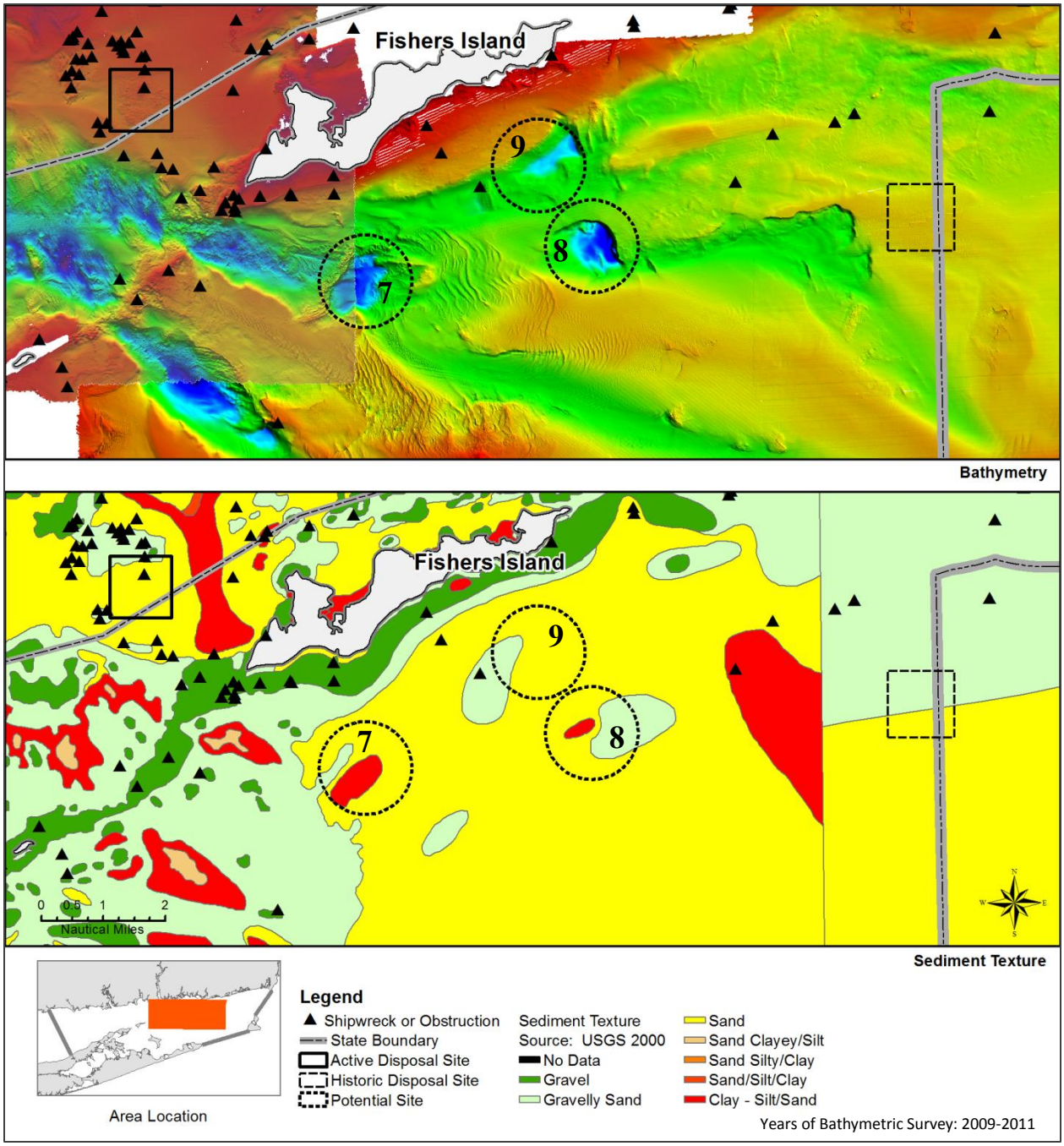

Figure 29. Water depth and sediment texture in northwestern Block Island Sound. The three deep holes are marked (7– West; 8 – East; 9 – Center). (Data sources: Poppe et al., 2000, 2005, 2011, 2014). It is noted that the sediment texture data for the eastern and western Block Island Sound come from two separate USGS data bases.

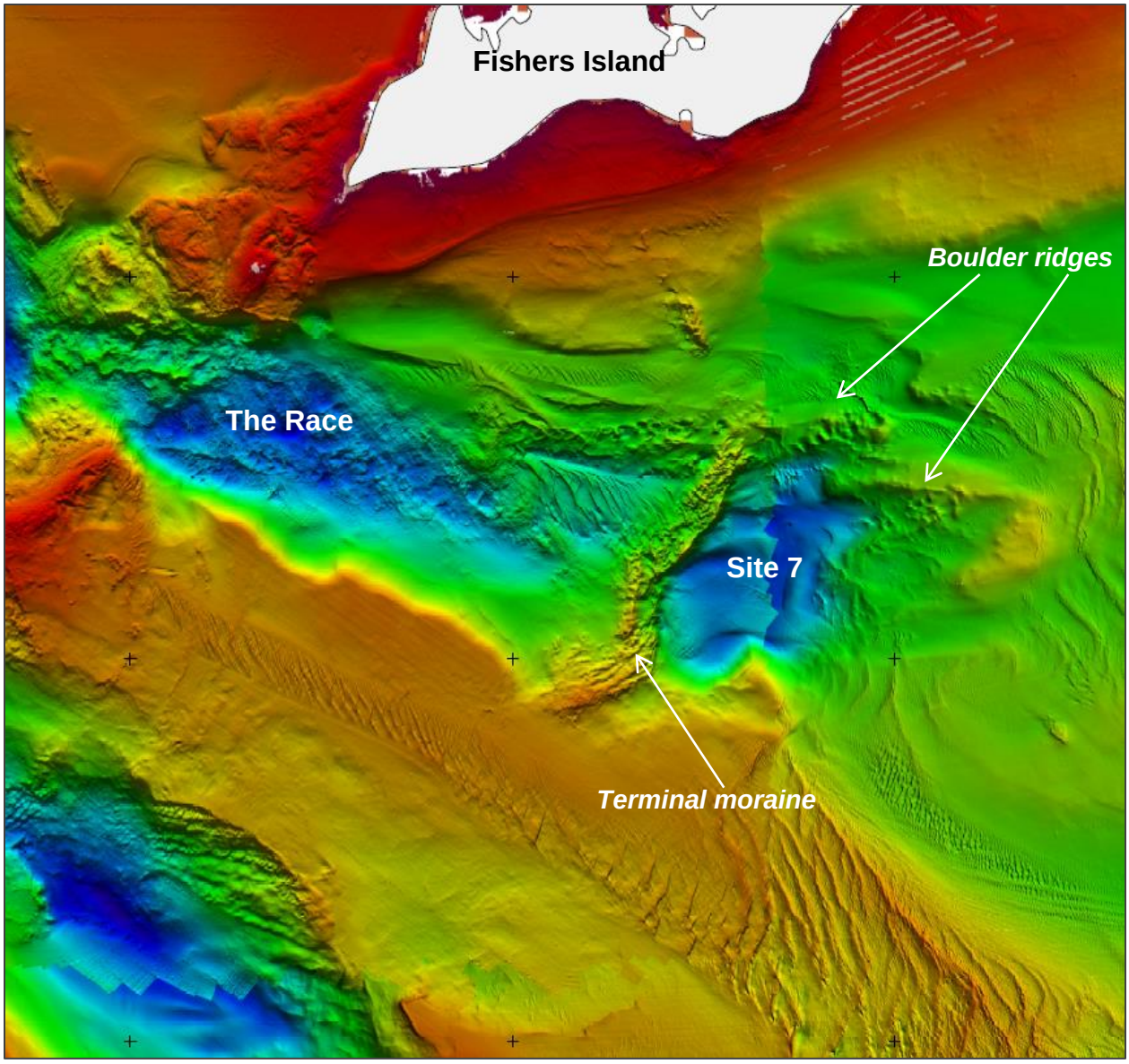

Figure 30. Detailed multibeam-bathymetric image of The Race and the Deep Hole south of Fishers Island - West (Site 7) (Poppe et al., 2011; 2014). Site 7 is bounded on its western side by a terminal moraine, which extends as cobble ridges on its northern and eastern side (McMullen, et al., 2015). There are also areas with sand waves and megaripples around the site.

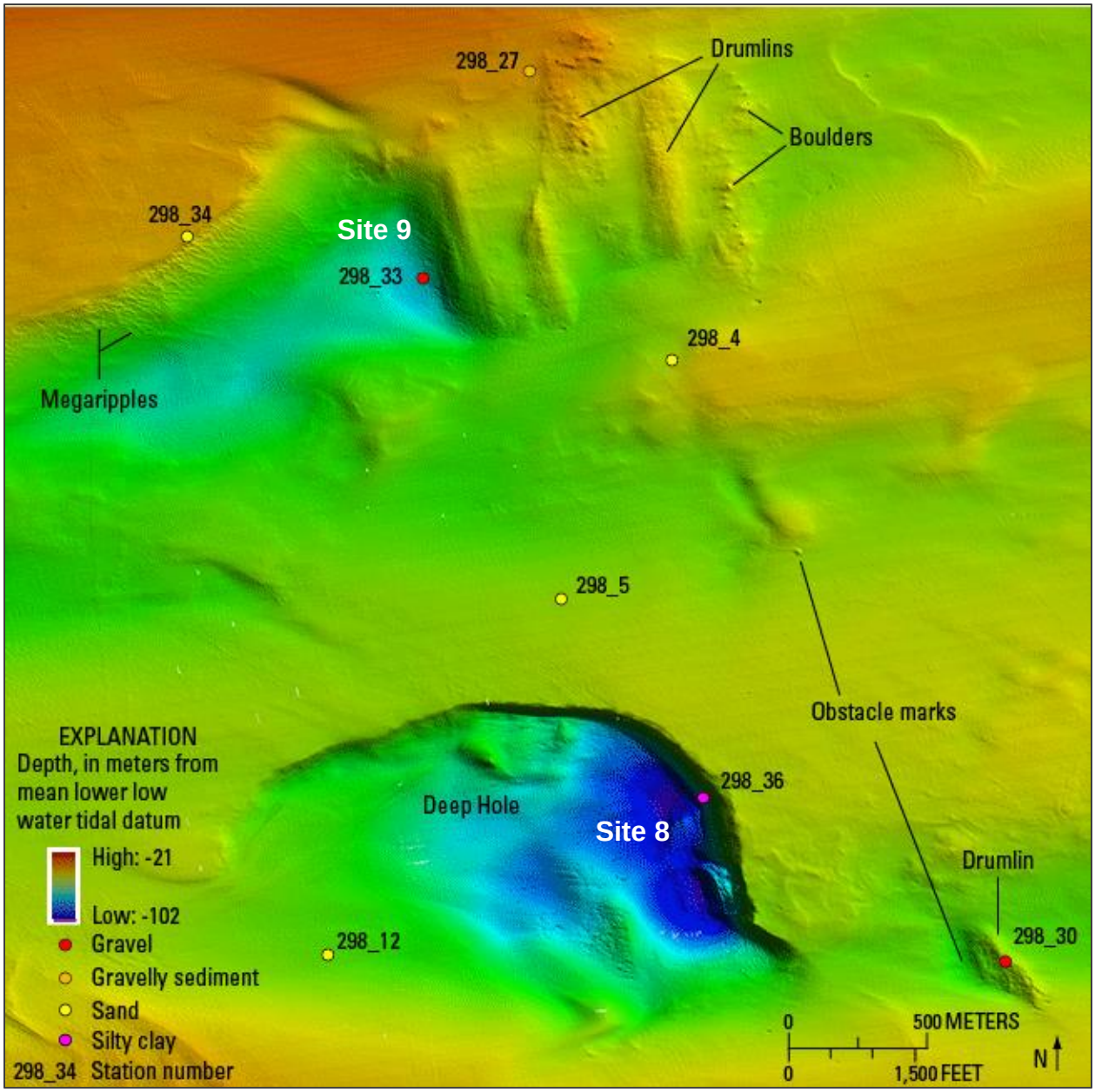

Figure 31. Detailed multibeam-bathymetric image of the Deep Holes south of Fishers Island (West [Site 8] and Center [Site 9]) (Source of image: McMullen et al., 2015). Site 8 has a steep eastern and northern wall composed of silty clay and rip-up clasts (Figure 32). Site 9 has gravel and boulders at the bottom and along the steep eastern slope where it has likely eroded into the nearby glacial drift topped with features interpreted by McMullen et al. (2015) as drumlins.

The texture of the surface sediments in the three deep holes ranges from silt and clay to sand and gravel (Figure 29). In addition, the steep northern and eastern wall of the eastern deep hole (Site 8) consist of varved fine-grained glaciolacustrine deposits. These exposed deposits have been burrowed by worms and other organisms, and fallen to the base of the deep hole as larger rip-up-clasts[20] during tidal scour (Figure 32; McMullen et al., 2015). These clasts likely remain in place until broken down into smaller particles that are then carried away by currents. Due to the likely mix of older glacial sediments and younger sediment transported by tidal currents, grain size may not be a reliable indicator of current strength in the three deep holes. Rocks and boulders are found in the central deep hole (Site 9) (Figure 33), which may be exposed deposits from the drumlin to the east.

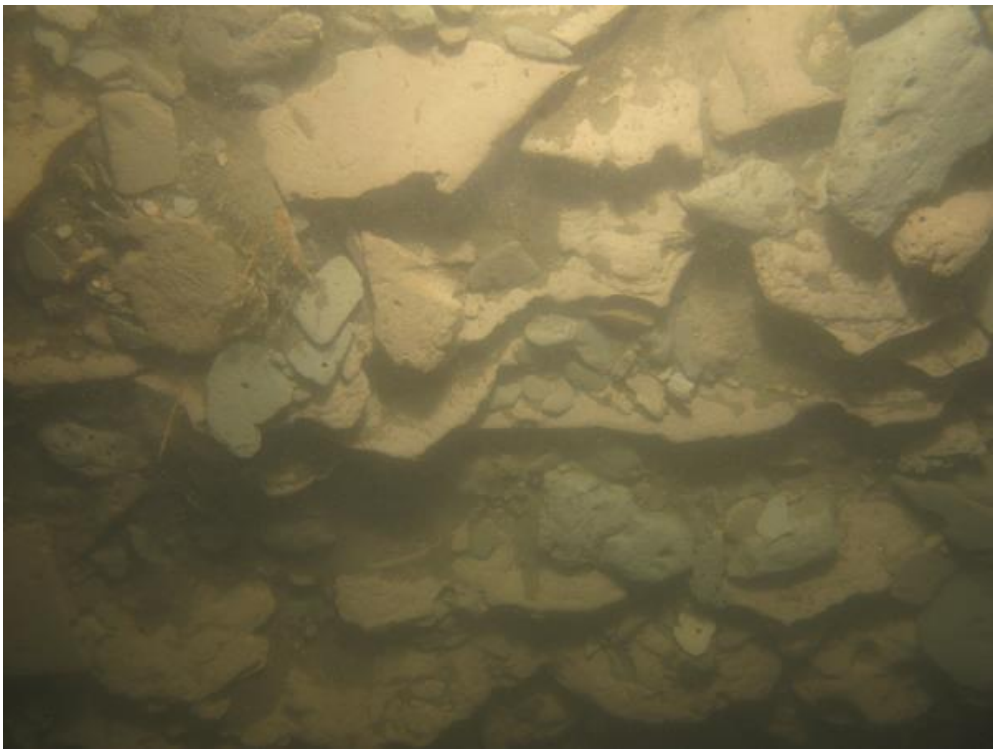

Figure 32. Photograph of the steep wall along the Deep Hole south of Fishers Island - West (Site 8); the wall consists of reddish brown and gray, layered outcrops and rip-up clasts composed of silty clay (see Station 298-36 on Figure 31 for location; source of photograph: McMullen et al., 2015). The authors observed that some clasts showed signs of bio-erosion; they also observed hydrozoans, algae, crabs, and skates along the wall.

[20] Rip-up clasts are pieces of mudstone torn by erosive currents from the substrate and carried over some distance. The clasts are held together by the cohesive nature of the material.

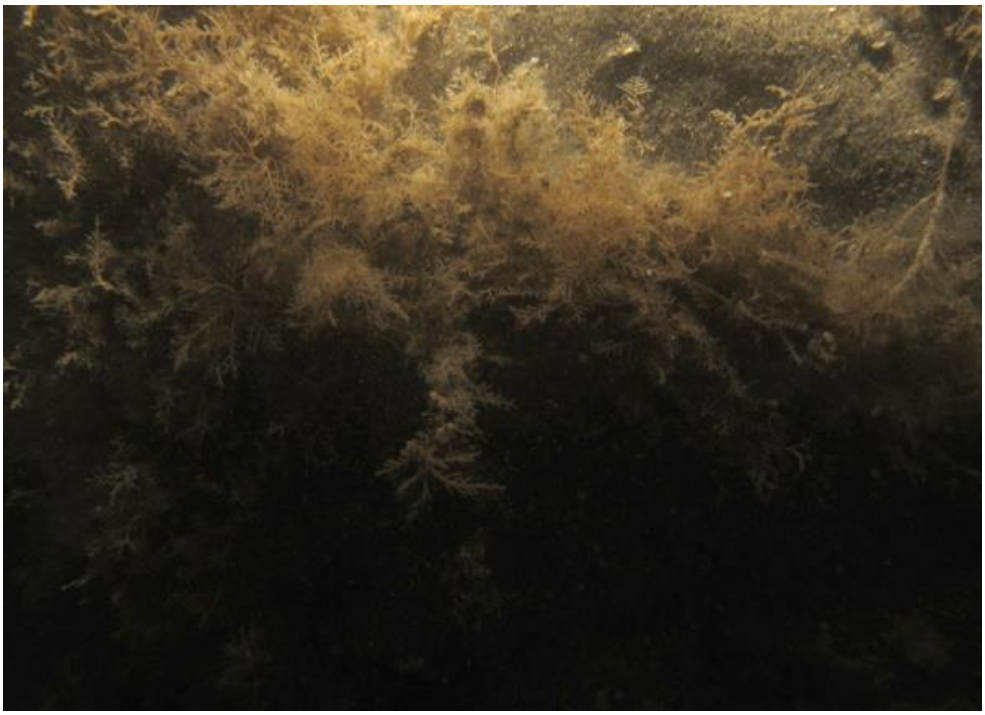

Figure 33. Photograph of the bottom of the deep Hole south of Fishers Island – Center (Site 9) consisting of boulders, gravel, and sand with burrows and amphipod tubes (see Station 298-33 on Figure 31 for location; source of photograph: McMullen, et al., 2015). The authors observed abundant sea life in the deep hole including anemones, hydrozoans, tunicates, sponges, shrimp, skate, sea robin, starfish, lobster, crabs, urchins, and snails. Skate and moon-snail egg cases, shells, and shell hash were present as well.

The bottom morphology of the three holes, the bedforms with sand waves in area, and the presence of tidal currents in the area all indicate that these holes were caused by erosional forces that cut through Holocene sediment into glacial drift and coastal-plain strata. Strong tidal currents funneling through channels in this part of Block Island Sound scour the seafloor around obstacles such as the drumlins and form eddies in the bathymetric depressions; these eddies maintain and continue to erode the depressions (McMullen et al., 2015). These eddies also expose the laminated glaciolacustrine sediments on the steep northern and eastern wall of Site 8, as well as the flanks of a drumlin and underlying glacial deposits to the east of Site 9. There appears to be considerable sediment movement in western Block Island Sound, as indicated by sand waves (Figures 30 and 31).

The physical oceanography study also determined that at the western deep hole (Site 7) the maximum bottom stress from currents exceeds the threshold for erosion of typical dredged material; thus, disposed dredged material would not be contained over time (O'Donnell, 2014b). At the eastern and central deep holes (Sites 8 and 9), this threshold value was not exceeded; however, geomorphological evidence discussed above indicates occasional localized turbulence that created and maintains these deep holes. This turbulence appears to be strong enough to prevent the shifting sand from filling these holes.

The Race, adjacent to the western deep hole (Site 7), is an important recreational fishing location. It was designated in 1987 as a Significant Coastal Fish and Wildlife Habitat. The designated area is located approximately 0.5 nmi (1 km) to the west of Site 7 at its closest point. NYSDOS (2005b) describes the fish and wildlife values of the designated area as follows:

> *"The Race's deep, turbulent waters and shoals combine to generate a productive and diverse habitat for marine fishes. The habitat area represents a physical environment unusual to New York State. Significant concentrations of many fish species forage in this area, including striped bass, bluefish, tautog, summer flounder, and scup. The Race is also one of two primary migration corridors for striped bass, which move into Long Island Sound in spring en route to their breeding grounds. As a result of the abundant fisheries resources in the area, The Race is a nationally renowned sportfishing area and supports an extensive recreational fishery throughout spring, summer, and fall. Much of this activity is by charter boats from Greenport, Montauk Harbor, and Connecticut. In addition to sportfishing, The Race supports a commercial lobster fishery of regional significance."* (p. 2)

Evaluation:

- *Deep Hole south of Fishers Island – West (Site 7):* Considering that this site is an extension of The Race (a significant marine habitat with strong tidal currents), this site is *not recommended* as an alternative ODMDS to be analyzed further in the SEIS.
- *Deep Hole south of Fishers Island – East (Site 8):* Recent findings by the USGS (McMullen et al., 2015) indicate that this hole is a scour hole carved and maintained by eddies. Erosional walls with rip-up clasts to the north and east of the hole also suggest higher habitat quality than the surrounding area in Block Island Sound. The site is *not recommended* as an alternative ODMDS to be analyzed further in the SEIS.
- *Deep Hole south of Fishers Island – Center (Site 9):* Recent findings by the USGS (McMullen et al., 2015) indicate that this hole is a scour hole carved and maintained by tidal currents. Bottom sediments contain boulders with higher habitat value. Considering further that this deep hole is comparatively small, it is *not recommended* as an alternative ODMDS to be analyzed further in the SEIS.

5.8 Block Island Disposal Site (Site 10)

The historic Block Island disposal site is located to the east of the center of Block Island Sound. Most of the site is located in State of Rhode Island waters; the remaining area is located in open ocean waters. The central coordinates of the site are 41º14.280' N (latitude) and 71º47.905' W (longitude) (NAD83). The site is located approximately 6.1 nmi (11 km) southeast of Fishers Island and 9.5 nmi (18 km) northeast of Block Island. The water depth at the site is uniform at approximately 105 feet (32 m) (Figure 34).

Sediments at the site consist primarily of sand with some gravelly sediment to the north (Figure 34; Poppe et al., 2012; Savard, 1966)**.** The southern half of the site contains a field of barchanoid megaripples[21]; the asymmetry and orientation of these bedforms indicate net sediment transport to the east (Poppe et al., 2012) (Figure 35). The area has abundant shells and shell debris (Poppe et al., 2012; Figure 36).

The multibeam bathymetry image does not show any indication of remnant dredged material disposal mounds. The physical oceanography study for the SEIS determined that maximum bottom stress from currents were just below the threshold for erosion of typical dredged material in the central and northeastern parts of the site, although stress values in other parts of the site exceeded the threshold (O'Donnell, 2014b).

Site-specific biological data are limited. Bottom photographs taken by Poppe et al. (2012) show crabs, finfish, and small burrows. Historic trawl survey data and a targeted trawl surveys in 2009 at multiple locations in Block Island Sound (including a station near the Block Island disposal site) and Rhode Island Sound indicate that the fish catches near the site are not unique (Bohaboy et el., 2010; Smythe et al., 2010; Malek et al., 2010; RICRMC, 2010). Similarly, the benthic roughness[22] in the area is in the medium range for Block Island Sound (King and Collie, 2010; Figure 37). Benthic roughness may be used as an approximate measure of structural complexity in the benthic environment, which in turn may be used as a proxy for ecological complexity[23].

The Block Island disposal site is located at a considerable distance from dredging centers [40 CFR 228.6(a)(1)] resulting in higher dredging costs (40 CFR 228.6(a)(8)]. For example, New London is located approximately 19 nmi (33 km) from the site. The communities near the mouth of the Connecticut River are located approximately 25 nmi (46 km) from the site.

Evaluation: Considering that overall the site would be a dispersive site, and considering the comparatively long distance to dredging centers, the site is *not recommended* as an alternative ODMDS to be analyzed further in the SEIS.

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[21] Crescent or horn-shaped bedforms on the seafloor with the crescent pointing down-current.

[22] Benthic roughness data are based simultaneously collected swath bathymetric and side-scan sonar data that are processed into side-scan backscatter and bathymetry mosaics (Malek et al., 2010). According to Malek et al. (2010), areas with high bottom roughness tend to correspond with prime fishing areas for several species targeted by commercial and recreational fisheries in Block Island Sound.

[23] This is based on the paradigm is that as bottom complexity increases from smooth sand and mud to rock and cobble, ecological complexity and species diversity about marine benthic communities increases (Malek et al., 2010, and references therein).

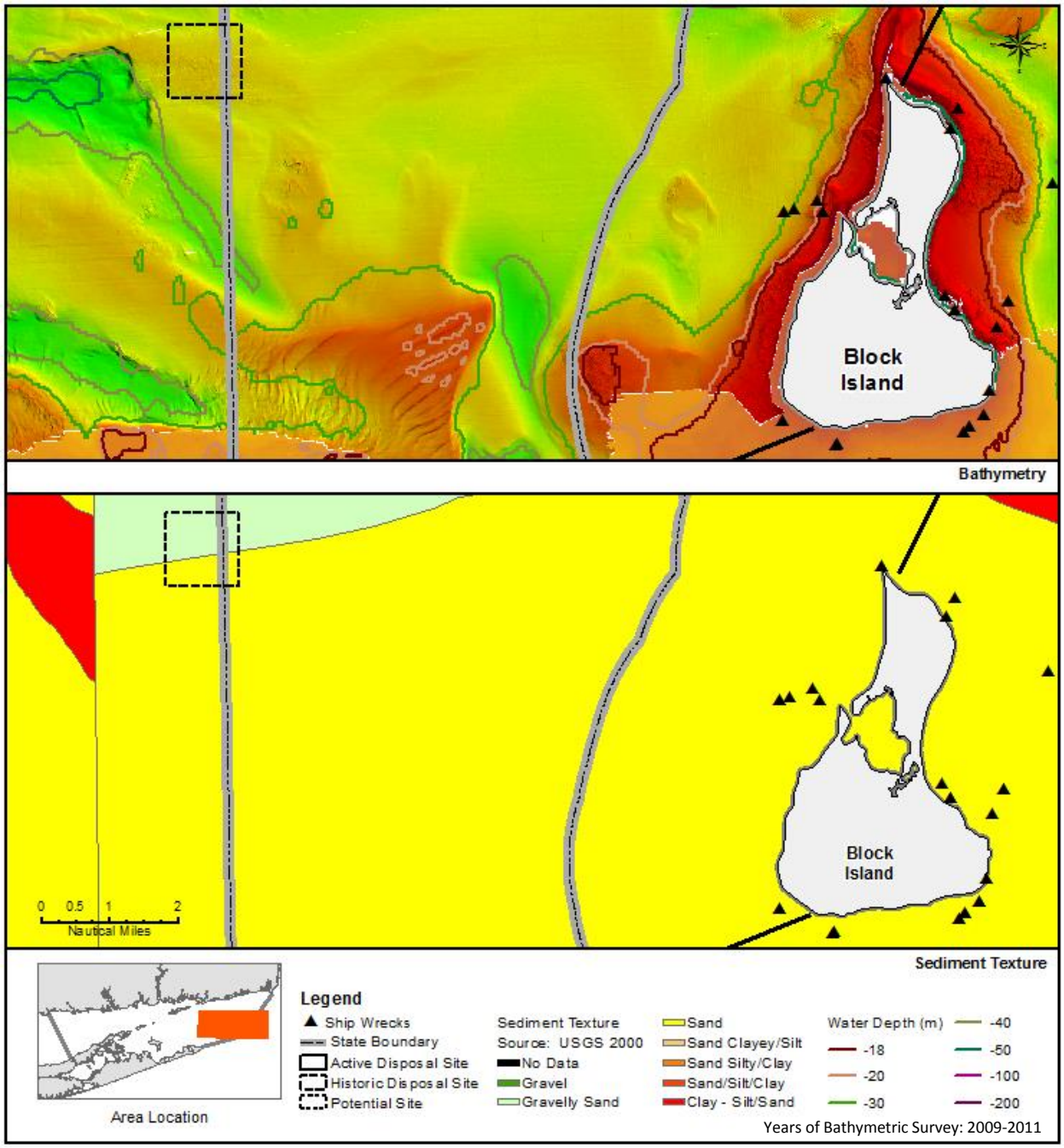

Figure 34. Water depth and sediment texture in eastern Block Island Sound, including at the Block Island disposal site, located in the upper left corner (outlined black box). (Data sources: Poppe et al., 2000, 2012). It is noted that the sediment data for eastern and western Block Island Sound come from two separate USGS data bases.

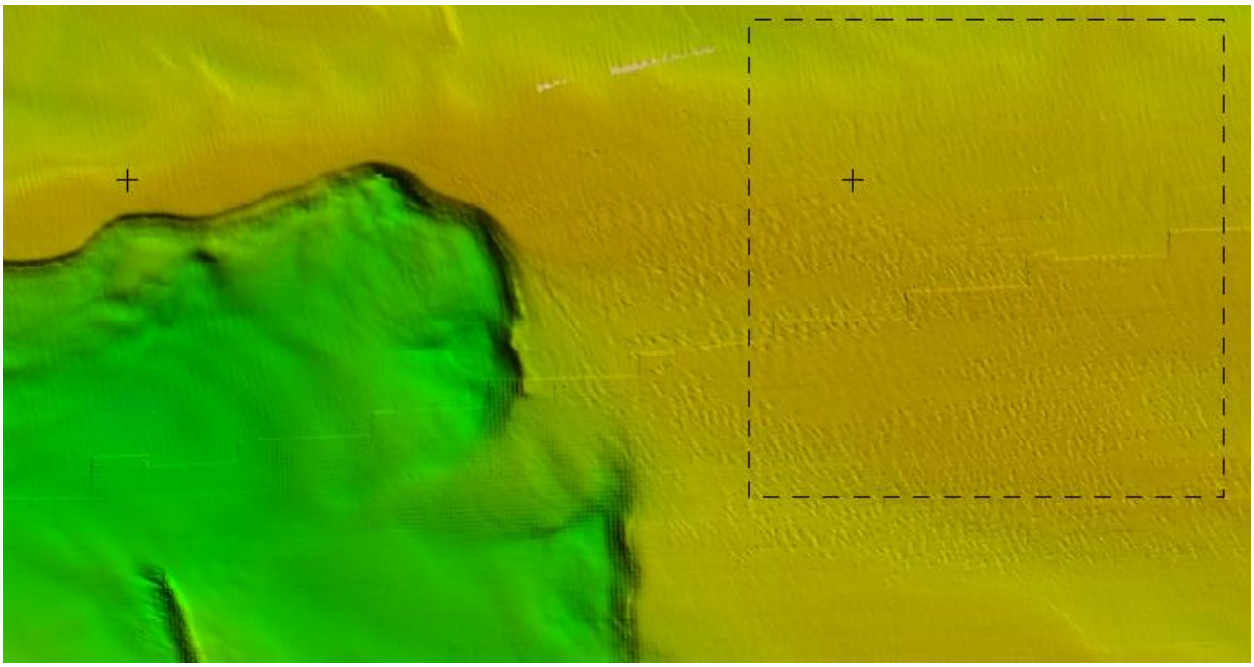

Figure 35. Block Island disposal site (outlined by the black dashed line) surveyed by USGS/NOAA in 2009. The site is comparatively featureless, except for the field of barchanoid megaripples (small marks scattered across the bottom half of the image). The site is located close to a wide tidal channel that appears to have similarly steep walls as observed at Site 8; these walls were possibly also carved by strong tidal eddies. It is noted that the stair-step line across the center of the site is a data-processing artifact. (Source: Poppe et al., 2012)

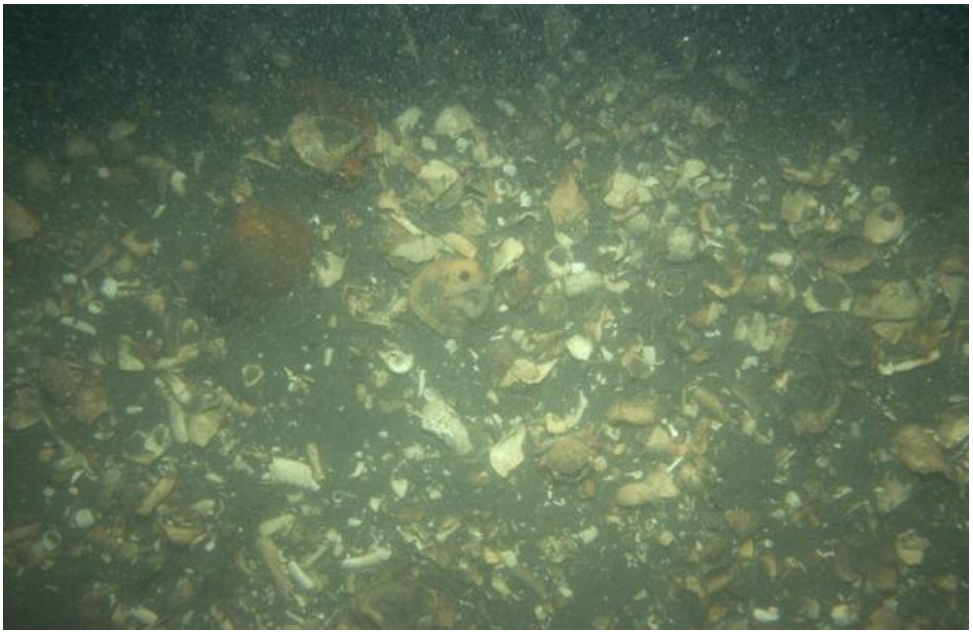

Figure 36. Photograph of the seafloor from the Block Island disposal site. The area has faintly rippled to flat sand with patches of abundant shells and shell debris. Hydrozoans, crabs, finfish, and small burrows are present. (Source: Poppe et al., 2012)

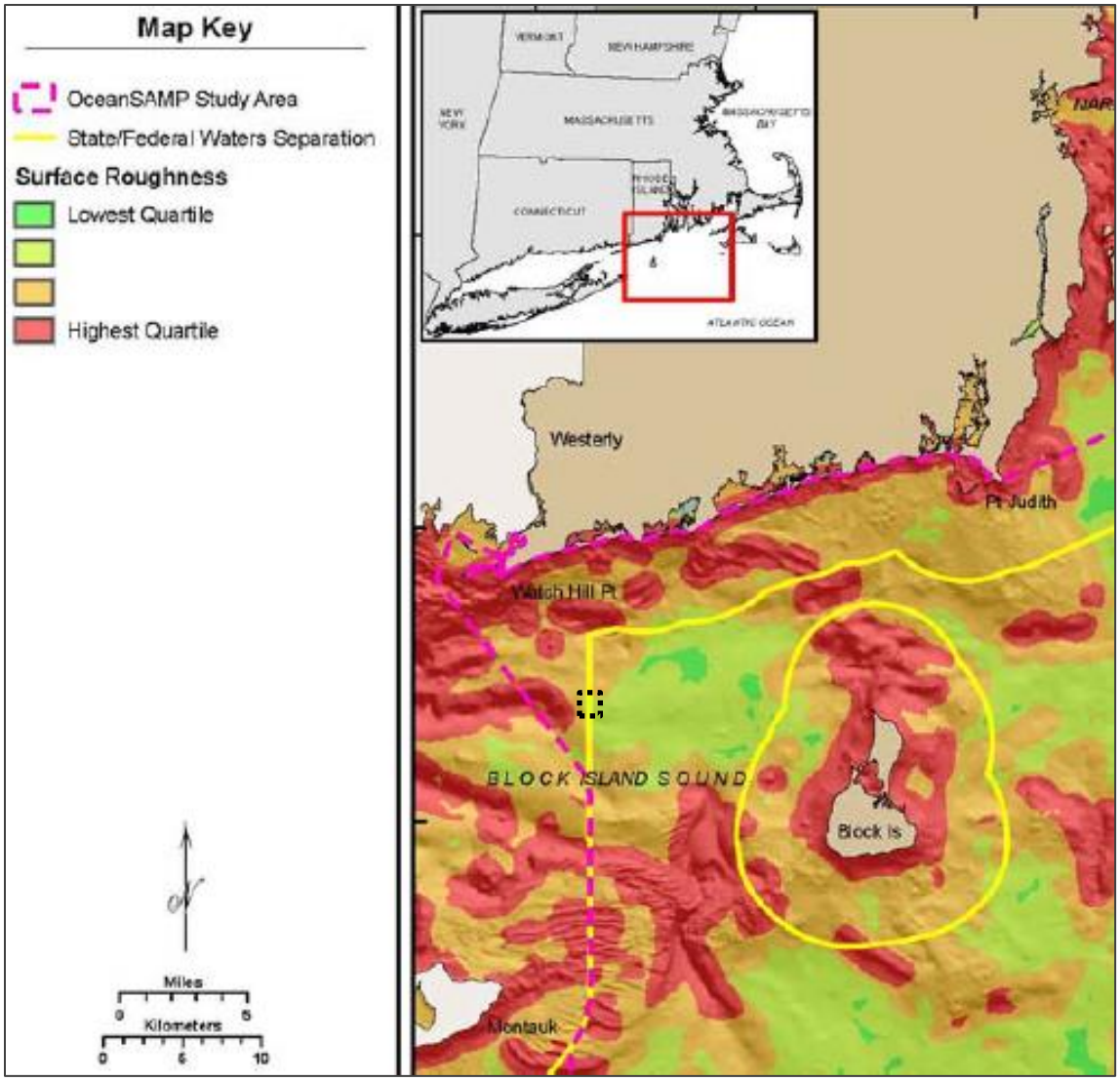

Figure 37. Benthic surface roughness as a first approximation proxy for habitat complexity in the OceanSAMP study area (King and Collie, 2010; accessed in RICRMC, 2010). The Block Island disposal site is marked by a black dashed line.

5.9 Area north of Montauk (Site 11)

The area is located approximately 1 nmi (1.8 km) from the northern shore of Montauk (Figure 38). This site does not appear to have received dredged material in the past and would thus be a new disposal site. Water depths at the site exceed the 59 feet (18 m) threshold depth; depths at the site range from approximately 64 to 73 feet (20 to 22 m) (Figure 39). Overall, the seafloor at the site is flat with an elongate depression between the site and the shoreline; the depression is trending northeast to southwest and reaches a depth of 91 feet (28 m). The site is located completely within New York State waters.

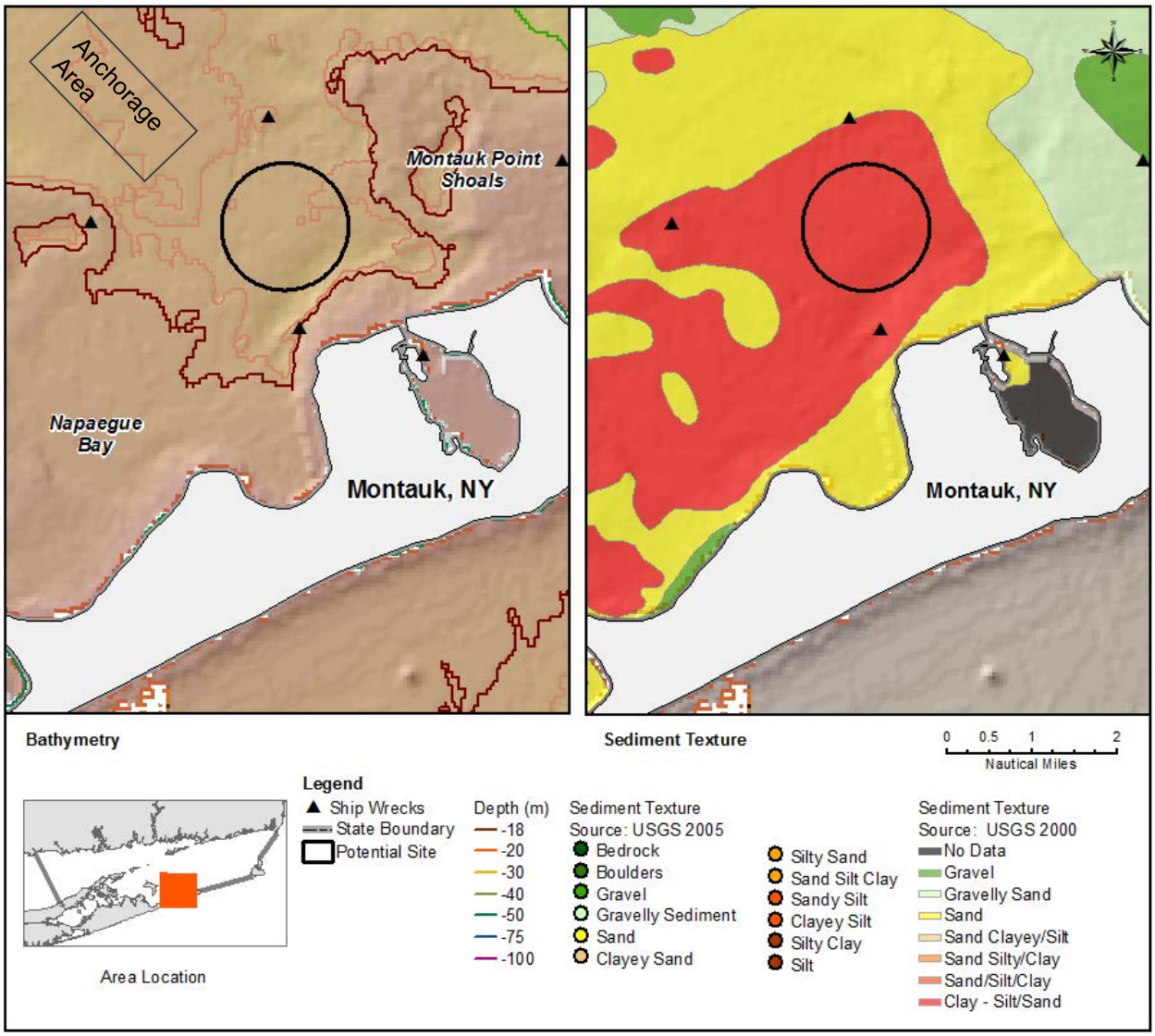

Figure 38. Water depth and sediment texture at the Area north of Montauk (black circle, which has a diameter of approximately 1.5 nmi (2.8 km) as shown. The boundary of the Montauk Point Shoals, located to the east of the site, largely follows the 60 feet (18 m) depth contour line (Data sources: NOAA, 2013a; Poppe et al., 2000; NYSDOS, 2002).

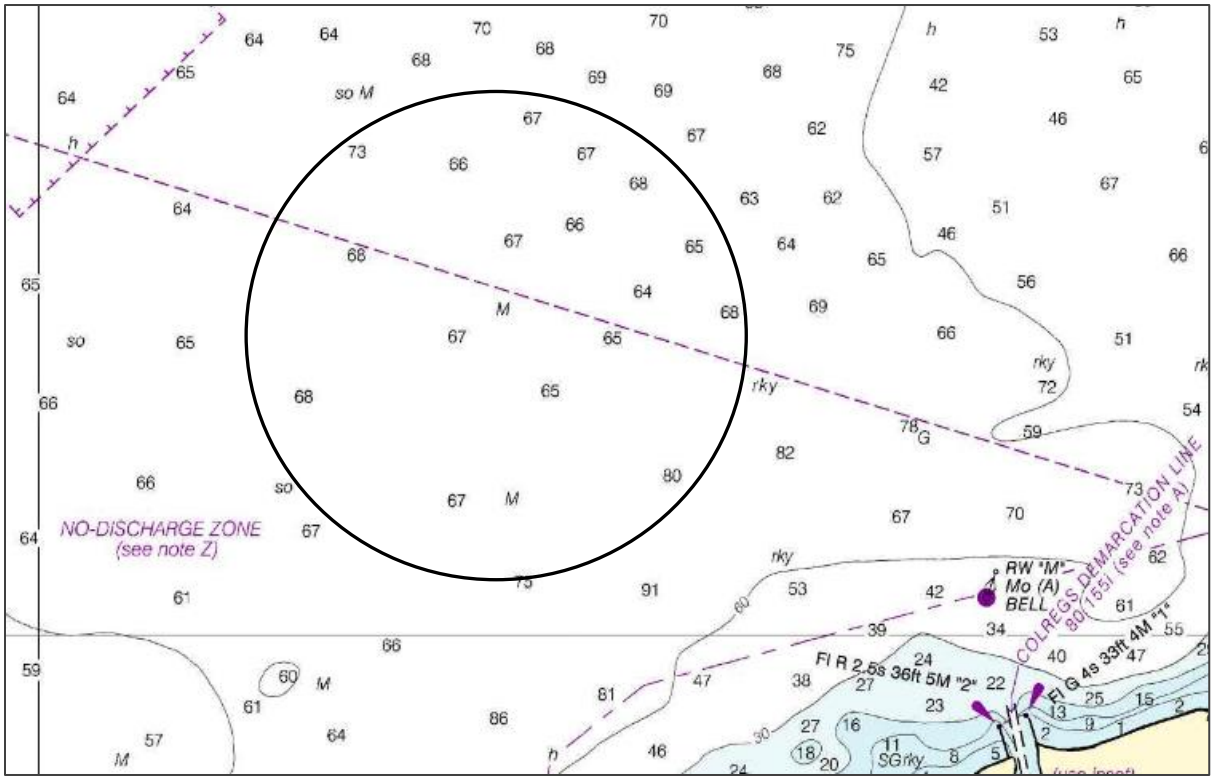

Figure 39. Detailed depth soundings from NOAA chart 13209 of the area (circle).

The bottom sediments at the site are predominantly fine-grained (i.e., sandy or silty clay; Poppe et al., 2003; Figures 8 and 38). The physical oceanography study for the SEIS determined that maximum bottom stress from currents is well below the threshold for erosion of typical dredged material (O'Donnell, 2014b). Thus, sediment disposed at the site is expected to remain in place.

Similar to the north shore of Long Island and the islands between Orient Point and Fishers Island, Montauk is part of a terminal moraine system that extends from central Long Island to Nantucket, and includes the now submerged shoals between Montauk and Block Island. Sediments within the moraine range widely and include rocks and boulders. Tidal currents entering Block Island Sound from the Atlantic Ocean have eroded finer-grained sediments as they cross the Montauk Point Shoals, leaving behind coarser-grained sediment (gravel and rocks; Poppe et al., 2003). This shoal area, consisting of several individual shoals including Endeavor Shoal, Washington Shoal, Montauk Shoal, was designated in 1987 as a Significant Coastal Fish and Wildlife Habitat (Figure 4). NYSDOS (2002) describes its fish and wildlife values, including its recreational fishing, as follows:

> "*The Montauk Point Shoals area is a marine habitat supporting a diverse assemblage of marine and coastal species, rare in the United States. The habitat is within an important migratory corridor for marine mammals and sea turtle species. The area also provides critical overwintering habitat for sea birds and waterfowl significant in the State of New York.*
>
> *The nearshore waters off Montauk Point are one of the most important areas for sea turtles in the New York Bight region. This area provides developmental habitat for*

juvenile Atlantic ridley turtles (E), and is an important feeding area for both leatherback turtles (E) and loggerhead turtles (T). Concentrations of marine mammals, including northern right whale (E), finback whale (E), humpback whale (E), minke whale, and pygmy sperm whale migrate through the area and feed nearshore throughout most of the year (January through September, depending upon the species). Sperm whales (E), normally considered a deep water species (>200 meters), have been observed regularly during spring and fall for more than ten years in waters less than 60 feet (18 meters) deep in an area south of Montauk Point. However, the importance of the Montauk Point Shoals area to this species requires additional documentation. Gray seal and harbor seal regularly use rocky areas off Montauk Point for haulout during winter. An inshore population of bottlenosed dolphin feed along the south shore of the Montauk peninsula during summer and early fall.

Wintering waterfowl concentrations in the Montauk Point Shoals area are of statewide significance. Species occurring here include common loon (SC), common eider, king eider, white-winged scoter, surf scoter, black scoter, bufflehead, common goldeneye, great cormorant, and red-breasted merganser. Harlequin duck (SC) are found in the area during winter, representing the southernmost regular wintering population of this species. To the north of the peninsula, large concentrations of wintering American black duck and oldsquaw have been documented. Sea duck concentrations around Montauk Point during winter are the largest in New York State, and spring, summer, and fall concentrations of pelagic seabirds are also notable.

There is an offshore fishery in this area of commercial and recreational significance in the Middle Atlantic and New England regions of the United States. In the fall, this area is a concentration area for a variety of fish species including striped bass, bluefish, little tunny, weakfish, scup, and black seabass. There are also extensive beds of blue mussel and kelp in the area, of local significance." (p. 2)

The northern portion of the shoal is bounded by the 60-foot (18 m) contour line. The distance to the potential ODMDS is approximately 0.5 nmi (1 km).

The potential ODMDS is also close to an anchorage area. According to 33 CFR 110.150, this anchorage area (110.150) is used by U.S. Navy submarines. Vessels or persons may not approach or need to remain within 500 yards (458 m) of a submarine within this anchorage area.

Similar to the Block Island disposal site, the site north of Montauk is located at a considerable distance from dredging centers [40 CFR 228.6(a)(1)] resulting in higher dredging costs [40 CFR 228.6(a)(8)]. For example, New London is located approximately 16 nmi (30 km) from the site. The communities near the mouth of the Connecticut River are located approximately 21 nmi (39 km) from the site.

Evaluation: Considering the proximity of the site to shore [40 CFR 228.5(b)] and to the Montauk Point Shoals potentially impacting marine resources [40 CFR 228.5(a), 228.6(a)(1), 228.6(a)(2)] and recreational fishing [40 CFR 228.6(a)(8)], and considering the distance to dredging centers, the site is *not recommended* as an alternative ODMDS to be analyzed further in the SEIS.

5.10 Recommended Sites - Summary

Based on information available in the literature and additional field investigations, eight of the eleven initial sites were screened out. The remaining three alternatives sites were recommended for further analysis in the SEIS (Cornfield Shoals, Niantic Bay, and New London) (Figure 40).

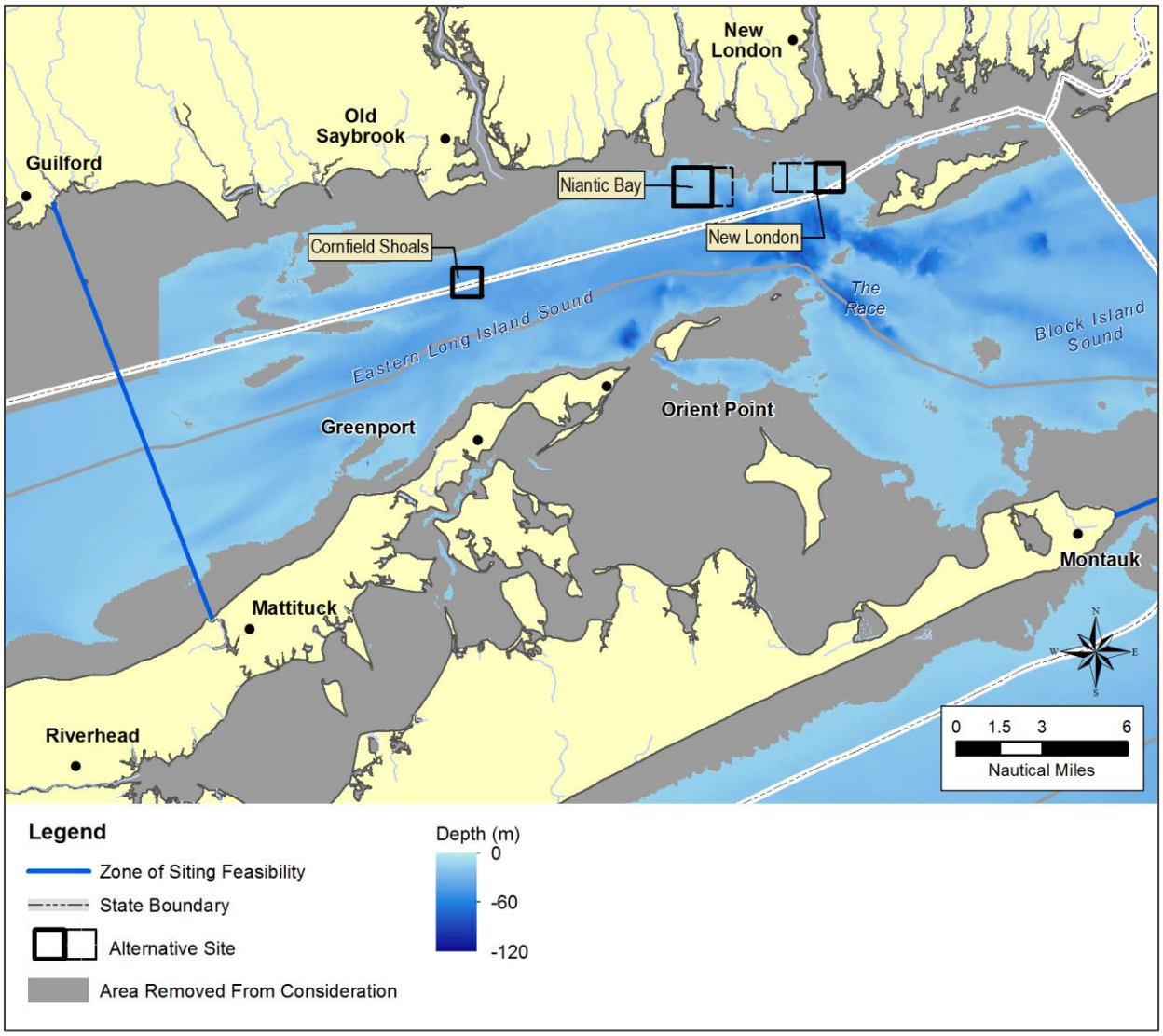

Figure 40. Results of site screening for alternative open-water dredged material disposal sites to be analyzed further in the SEIS.

The recommended Cornfield Shoals Alternative is identical to the active CSDS. However, in order to accommodate the dredged material disposal needs for the eastern Long Island Sound region over for the next 30 years (i.e., 14.4 million cy [11 m^3]; USACE, 2009), the boundaries of the recommended New London and Niantic Bay Alternatives, to be investigated in more detail in the SEIS, were increased from the initially considered boundaries, as follows:

- ***New London Alternative:*** The boundary of the recommended New London Alternative includes the active NLDS as well as two areas immediately to the west (referred to as "Site NL-Wa" and "Site NL-Wb") in order to increase the limited remaining capacity of the NLDS. The current water volume at the NLDS between a water depth of 59 feet (18 m) and the sediment surface is only approximately 4.5 million cy (3.4 million m^3), based on USGS/NOAA bathymetric data from 2005 and considering that an additional 390,000 cy (300,000 m^3) of dredged material were disposed at the NLDS between 2006 and 2013. (Note that the capacity for the disposal of dredged material at the site is somewhat lower than the water volume, given that disposal mounds are sloped and have uneven surfaces and thus a "filled" site would have multiple areas remaining with water depths greater than 59 feet [18 m].)

  Site NL-Wa extends the NLDS westward by 1.0 nmi (1.8 km); Site NL-Wb extends the NLDS westward by an additional 0.5 nmi (0.9 km). With the addition of Sites NL-Wa/b, the capacity at the New London Alternative would be sufficient to accommodate the dredged material disposal needs for the next 30-years. The water volume for Site NL-Wa below a water depth of 59 m (18 m) is approximately 14 million cy (11 million m^3), excluding a boulder zone in its north-central part. The water volume for Site NL-Wb below a water depth of 59 m (18 m) is approximately 10 million cy (8 million m^3). Bottom stress[24] analysis indicates that the NLDS, Site NL-Wa, and most of Site NL-Wb would be containment areas for cohesive fine-grained dredged material (O'Donnell, 2014b).

- ***Niantic Bay Alternative:*** The boundary of the recommended Niantic Bay Alternative includes the area of the historic NBDS and an area immediately to the east (referred to as "Site NB-E") in order to increase the capacity for sediment containment under this Alternative. Site NB-E extends the NBDS eastward by 0.75 nmi (1.4 km). Bottom stress analysis indicates that most of the Niantic Bay Alternative would be a dispersive site, except for a northeastern part of the NBDS (O'Donnell, 2014b). For Site NB-E, however, lower bottom stress in its central and northern parts suggests that it would partially be a containment area for cohesive fine-grained dredged material. The water volume below a water depth of 59 feet (18 m) for Site NB-E in the zone of lower bottom stress is approximately 24 million cy (18 million m^3). (As noted above, the capacity for dredged material disposal would be lower than this volume due to topographic constraints of individual disposal mounds.)

The recommended boundaries of the New London and Niantic Bay Alternatives for evaluation in the SEIS are shown in more detail in Figure 41.

[24] Bottom stress is the force acting on the surface sediments on the seafloor, potentially resuspending sediment is the bottom stress is high enough. This force is primarily a function of the strength of the waves and currents.

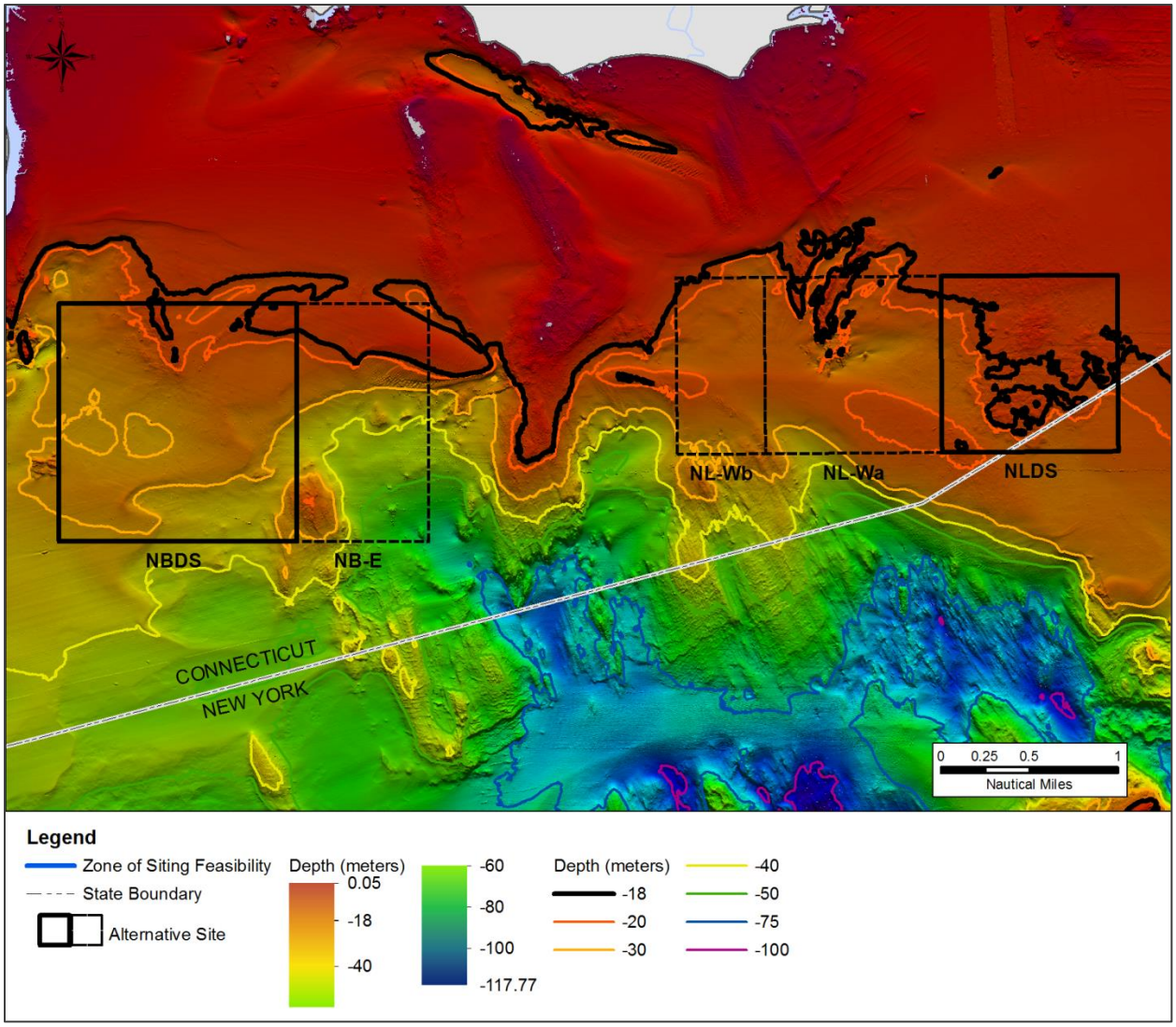

Figure 41. Location of the New London and Niantic Bay Alternatives, superimposed on the USGS/NOAA bathymetry (Source: Poppe et al., 2011).

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