

## ENVIRONMENTAL DATA ON THE RESOURCES OF LONG ISLAND SOUND

In this Appendix, Table D-1 identifies natural resource information that is available in a digital (GIS) format for mapping at a 1:125,000 scale in Long Island Sound's coastal, nearshore, and offshore environments. The table lists the primary sources for such GIS-based information and indicates the resources for which data are not available in a GIS-mapped format. In addition, Table D-1 draws a distinction between data required by PA No. 02-95, and data that may be useful for the purposes of planning and permitting (*i.e.*, regulatory approval). The table includes a separate listing of other available geographic, environmental, and infrastructure data that are not specifically identified in PA No. 02-95, but are useful in meeting the objectives of PA No. 02-95. In compiling this information, the Task Force consulted with the Institute of Water Resources at the University of Connecticut and the University of Connecticut Cooperative Extension Service.

In addition, Table D-2 lists a number of data gaps that the Task Force has identified with respect to the natural resources of Long Island Sound, along with suggested approaches to resolving such data gaps.

These tables primarily identify areas and coverage of resources. Data gaps also exist for quantification of resources.

Much of the data presented in Table D-1 were developed by state and federal agencies, and are useful in generally identifying the resources of Long Island Sound. However, substantially more detailed and timely information may be required for comprehensive resource planning and review to make project specific assessments and site-specific determinations of resource delineation, environmental impact, and engineering constructability.

In addition to the GIS-based data referenced in Table D-1, the Task Force acknowledges that there are other, non-digitized data regarding Long Island Sound, which can be obtained by consulting with the appropriate federal and state regulatory agencies. Such data should also be considered as part of resource planning or project-specific reviews.

The following agencies develop and maintain data regarding the natural resources of Long Island Sound:

### **Connecticut Department of Environmental Protection**

DEP Environmental and Geographic Information Center, maintains an extensive database of GIS coverages.<sup>1</sup> These have been made available to the Task Force and were recently released as a seven CD set for public distribution. The data also include town boundaries, county boundaries, coastline, roadway infrastructure, drainage basins, land use, DEP property and other data. Metadata (detailed information describing data sets) is well documented. Included are digital orthophotos and digital USGS maps. These are digital images that have been geometrically corrected to overlay accurately with other GIS datalayers. These serve as a useful backdrop for much of the GIS data.

There is a substantial amount of data gathered by DEP that is not readily available in a GIS format, or not readily available but important in understanding the condition of the Long Island Sound:

- DEP, on behalf of the LISS, conducts a *Long Island Sound Water Quality Monitoring Program*. Water quality is monitored by collecting samples once a month from 18 sites from October to May. Bi-weekly hypoxia surveys start in mid-June and end in September with up to 48 stations being sampled during each survey.<sup>2</sup>
- Fisheries data are collected as part of the "Long Island Sound Trawl Survey" (LISTS). Trawl surveys have been conducted between Groton and Norwalk since 1984, with over 4,000 samples collected since 1984. Semiannual surveys (spring and fall) are conducted yearly. To date, 104 fish species and 49 invertebrate species have been identified. The trawl survey data are published annually in Technical Bulletins (Department of Commerce). Limited trawl survey data are presently available in GIS format; DEP's objective is to digitize such data in the future. No trawl survey data are available east of the Thames River.
- Fisheries and other biological resource data have been provided to DEP since the early 1970s from monitoring programs at the Millstone Power Station in Waterford, Connecticut.

## **National Oceanic and Atmospheric Administration (NOAA)**

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<sup>1</sup> Connecticut DEP - Environmental and Geographic Information Center - Programs and Activities <http://dep.state.ct.us/cgnhs/prgactiv.htm>. For more information on Connecticut's Coastal Resources GIS, contact Ron Rozsa at (860) 424-3616, or [ron.rozsa@po.state.ct.us](mailto:ron.rozsa@po.state.ct.us).

<sup>2</sup> Save the Sound has an EPA Quality Assurance Approved Water Quality Monitoring Program that is separate from the DEP program. The data was gathered once per week from mid-May to mid-October from 1991-2002. The results included 8 harbors. Save the Sound has also provided this data to the Task Force.

Environmental Sensitivity Index (ESI) Maps have been developed by NOAA and depict sensitive environmental resources along the nation's coast.<sup>3</sup> While chiefly for planning oil and chemical spill response, they provide useful information for identifying vulnerable coastal locations.

The ESI maps are developed through a cooperative effort among the primary state response agency, other state and federal agencies, and industry. DEP provided much of the information about Connecticut, and is familiar with the quality and completeness of the data. In 1995, ESI project members began using a GIS to produce, update, and distribute ESI maps that are of higher quality. ESI maps include three kinds of information:

Shoreline Rankings - Shorelines are ranked according to their sensitivity, the natural persistence of oil, and the expected ease of cleanup. Shorelines are color-coded to indicate their sensitivity to oiling.

Biological Resources - Oil-sensitive animals, as well as habitats that either (a) are used by oil-sensitive animals, or (b) are themselves sensitive to spilled oil (e.g., coral reefs). Sensitive biological resources, such as seabird colonies and marine mammal hauling grounds, are depicted by special symbols on the maps.<sup>4</sup>

Human-Use Resources - Resources and places important to humans and sensitive to oiling, such as public beaches and parks, marinas, marine sanctuaries, water intakes, and archaeological sites, are located on the maps.

Four categories of human-use resources are depicted on the ESI maps:

- High-use recreational use and shoreline access areas, such as boat ramps, marinas, recreational beaches, and sport-fishing and diving areas;
- Officially-designated natural resource management or protected areas, such as national parks, marine sanctuaries, national wildlife refuges, preserves, and reserves;
- Resource extraction sites, such as aquaculture sites, locations of subsistence and commercial fisheries, log storage sites, mining leases, and surface water intakes; and
- Water-associated archaeological, historical, and cultural sites, including lands managed by Native Americans.

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<sup>3</sup> National Oceanic and Atmospheric Administration (NOAA). 2002. Environmental Sensitivity Index Atlas. Rhode Island, Connecticut, and the New York-New Jersey Metropolitan Area. National Ocean Service. Office of Response and Restoration. Hazardous Materials Response Division.

<sup>4</sup> To further efforts to afford protection of these resources, the exact locations of such species are not shown on ESI maps.

NOAA also maintains the National Shellfish Register of Classified Growing Waters (Register).<sup>5</sup> This Register has been published every five years since 1966 as a cooperative effort among the nation's shellfish-producing states, federal agencies such as the U.S. Food and Drug Administration (FDA), and the Interstate Shellfish Sanitation Conference (ISSC). Its purpose is to summarize the status of growing-water classifications of the nation's commercial shellfish resources. The 1995 Register includes information on the status of estuarine and non-estuarine commercial shellfish-growing waters.

Data are also gathered by NMFS, a division of NOAA. Reports and publications are available and accessible through the web site for the Northeast Fisheries Science Center.<sup>6</sup>

### **U.S. Environmental Protection Agency - Long Island Sound Study**

The LISS<sup>7</sup> is a cooperative effort involving researchers, regulators, user groups and other concerned organizations and individuals. Begun in 1985, Congress appropriated funds for the U.S. EPA and the states of Connecticut and New York to research, monitor and assess the water quality of Long Island Sound.

Primary partners in the LISS include the states of Connecticut and New York, EPA Region 1 in the New England area, and EPA Region 2 in the New York area. The goal is to work together to protect and improve the health of Long Island Sound by implementing Long Island Sound's Comprehensive Conservation and Management Plan completed in 1994.<sup>8</sup> The plan is the result of nearly ten years of effort to research and monitor conditions in Long Island Sound. The plan characterizes priority problems affecting Long Island Sound and identifies specific recommendations for actions to improve water quality, protect habitat and living resources, educate and involve the public on Long Island Sound, and improve the long-term understanding of how to manage Long Island Sound. Specific commitments of agencies to take actions addressing issues are incorporated into the plan, progress is monitored and efforts are redirected as necessary. The plan recognizes that despite advances by such programs as the Clean Water Act, the quality of Long Island Sound could be improved. Among the problems the plan seeks to address are: impairment of large areas of fish and shellfish habitat due to hypoxia (low dissolved oxygen); diminished productivity of wetlands, intertidal areas, and other habitat from pollution and development; contamination of bay and harbor bottoms with toxic substances; periodic beach closures; and closures of many prime shellfish beds due to contamination.

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<sup>5</sup> [http://puyallup.nos.noaa.gov/projects/95register/states/CT\\_species.html](http://puyallup.nos.noaa.gov/projects/95register/states/CT_species.html)

<sup>6</sup> Northeast Fisheries Science Center <http://www.nefsc.noaa.gov/nefsc/publications/>

<sup>7</sup> Long Island Sound Study on-line <http://www.epa.gov/region01/eco/lis/>

<sup>8</sup> Summary of the Comprehensive Conservation and Management Plan. July 1994. Long Island Sound Study. U.S. Environmental Protection Agency. EPA 842-S-94-001.

In cooperation with the LISS, EPA also sponsors the Marine Environmental Monitoring Network for Long Island Sound.<sup>9</sup> This is an EPA EMPACT (Environmental Monitoring for Public Access and Community Tracking) project undertaken by the University of Connecticut Department of Marine Sciences.

The EPA also maintains a web site with information on available databases and coverages in the New York/New Jersey harbors and Long Island Sound. The site allows access to metadata records and searches based on user needs.<sup>10</sup> The data set includes a Regional Index that provides a searchable, centralized, comprehensive database of environmental studies within the New York/ New Jersey harbors and Long Island Sound areas with pointers to the actual data or contact person. Categories include habitat and living resources, monitoring, land use management, public participation and education, toxics, and water use.

### **U.S. Environmental Protection Agency - Dredge Disposal Site Designation**

The EPA is charged under the Marine Protection, Research and Sanctuaries Act of 1972 with designating sites for disposal of dredged material. EPA Region I, in collaboration with the Army Corps of Engineers, has developed a site screening methodology and is preparing a draft Environmental Impact Statement (EIS) for dredge disposal sites in Long Island Sound. This gathering of substantial data to characterize potential disposal sites and evaluate potential impacts. Much of the data was compiled in cooperation with the DEP as well as other federal agencies such as the ACOE, and the USGS.

### **United States Geological Survey (USGS)**

Since the 1980s, the USGS and DEP have been cooperatively studying Long Island Sound<sup>11</sup> through the USGS's Coastal and Marine Geology Program. The Long Island Sound Environmental Studies program, initiated in 1995, was designed to examine three main topics:

- Modern sediment transport processes that control the formation of benthic habitats;

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<sup>9</sup> [http://www.mysound.uconn.edu/mys\\_realobs.html](http://www.mysound.uconn.edu/mys_realobs.html)

<sup>10</sup> HEP/LISS Data Depot <http://www.epa.gov/region01/eco/lis/data.htm>

<sup>11</sup> For further information and accompanying maps see: The Journal of Coastal Research Vol. 16, No.3; U.S.G.S. Open- File Report 00-304; or <http://woodshole.er.usgs.gov/project-pages/longislandsound/index.htm>.

- Benthic habitats throughout the region for future studies and management decisions; and
- The distribution, transport, and fate of contaminants in sediments of Long Island Sound.

Other USGS studies have focused on water quality in the watersheds that discharge into the Sound, and on coastal wildlife. Additional studies have been undertaken in collaboration with Connecticut, New York, EPA, NOAA, ACOE, and academic institutions in the region. USGS research on geologic, chemical, oceanographic, and biological aspects of Long Island Sound includes data pertaining to surficial sediment distribution, sedimentary environments, contaminant distribution, and accumulation in sediments.

The USGS Woods Hole Field Center's Information Archives is responsible for maintaining and updating inventories of all pertinent data and other information. Examples of such information include cruise data, map collections, publications and the Gosnold Reading Room Periodicals.<sup>12</sup> The website provides an inventory of publications, many of which are available on-line, including a map viewer for displaying datalayers.<sup>13</sup>

The Federal Geographic Data Committee (FGDC) is an interagency committee composed of representatives from the Executive Office of the President, Cabinet-level and independent agencies. The FGDC is developing the National Spatial Data Infrastructure (NSDI) in cooperation with organizations from state, local and tribal governments, the academic community, and the private sector. The NSDI encompasses policies, standards, and procedures for organizations to cooperatively produce and share geographic data.

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<sup>12</sup> USGS/Woods Hole Field Center Data Archive: <http://woodshole.er.usgs.gov/operations/ia/index.html>

<sup>13</sup> On-line Map Viewer: <http://kai.er.usgs.gov/ArcIMS/Website/usa/northeast/lis/viewer.htm>

**Table D-1 – Environmental Data on the Natural Resources of Long Island Sound Required by PA No. 02-95<sup>14</sup>**

General Data on Natural Environmental Resources (Required by PA No. 02-95)	Description (Features, Primary Sources for GIS Data)	Issues Addressed by Data	Comment
<b>Coastal Resources as defined in CGS Section 22a-93</b>			
Coastal Bluffs and Escarpments	<ul style="list-style-type: none"> <li>Shoreline Types: Vegetated steeply sloping bluffs, sheltered vegetated low bluffs (NOAA-ESI)</li> </ul>	<ul style="list-style-type: none"> <li>Coastal habitats</li> </ul>	Data available for entire coast. Shows length along shoreline. Useful for planning purposes. GIS format.
Rocky Shorefront	<ul style="list-style-type: none"> <li>Shoreline Types: Sheltered rocky shores, exposed wave-cut platforms in bedrock (NOAA-ESI)</li> </ul>	<ul style="list-style-type: none"> <li>Visual/aesthetic features</li> <li>Rocky habitat for birds, reptiles, invertebrates</li> <li>Storm damage prevention</li> </ul>	Data available for entire coast. Shows length along shoreline. Useful for planning purposes. GIS format.
Beaches and Dunes	<ul style="list-style-type: none"> <li>Shoreline Types: Gravel beaches, fine to medium sand beaches, mixed sand and gravel (NOAA)</li> </ul>	<ul style="list-style-type: none"> <li>Wildlife habitat including birds and invertebrates.</li> <li>Recreational resources</li> </ul>	Data available for entire coast. Shows length along shoreline. Useful for planning purposes. GIS format.
Migratory Stopover Areas	<ul style="list-style-type: none"> <li>Migratory bird habitat</li> </ul>	<ul style="list-style-type: none"> <li>Coastal (terrestrial) habitat</li> <li>Sensitive nesting or breeding seasons</li> </ul>	No statewide map or inventory available. Needs to be compiled from multiple sources. Useful for planning purposes.

<sup>14</sup> Natural resource information in GIS format was gathered from numerous public agencies, including DEP, the Connecticut Department of Agriculture (Bureau of Aquaculture), the USGS, EPA, the U.S. Fish and Wildlife Service (USFWS), and the National Oceanic and Atmospheric Administration (NOAA), including the NMFS. Data on energy infrastructure were obtained from the Siting Council, the Connecticut and New York electric utilities, gas pipeline companies, and other public sources. Commercially available sources include navigation charts and associated software.

**Table D-1 – Environmental Data on the Natural Resources of Long Island Sound Required by PA No. 02-95 (Cont.)**

<b>General Data on Natural Environmental Resources (Required by PA No. 02-95)</b>	<b>Description (Features, Primary Sources for GIS Data)</b>	<b>Issues Addressed by Data</b>	<b>Comment</b>
Intertidal Flats	<ul style="list-style-type: none"> <li>• Hard clams, soft clams (DEP)</li> <li>• Mud flats (NOAA-ESI) (Bureau of Aquaculture)</li> </ul>	<ul style="list-style-type: none"> <li>• Circulation patterns, inundation</li> <li>• Shellfish habitat</li> </ul>	Data not adequate for site specific determinations. GIS format.
Tidal Wetlands	<ul style="list-style-type: none"> <li>• Saltmarsh (USFWS-National Wetland Inventory, NRCS Soils)</li> <li>• Salt and brackish water marshes (NOAA-ESI)</li> </ul>	<ul style="list-style-type: none"> <li>• Wetlands and associated functions and values for wildlife habitat, storm damage prevention, pollution control</li> </ul>	Multiple data sets may be available. Useful for planning purposes. GIS format.
Freshwater Wetlands and Watercourses	<ul style="list-style-type: none"> <li>• Mapping of wetlands based on state and Federal definitions (USFWS-National Wetlands Inventory, NRCS Soils)</li> </ul>	<ul style="list-style-type: none"> <li>• Wetlands and associated functions and values for wildlife habitat, storm damage prevention, pollution control</li> </ul>	Data are 10 years old. May not be adequate for site-specific determinations. GIS format.
Coastal Hazard Areas	<ul style="list-style-type: none"> <li>• FEMA Flood Zones, Velocity Zones (DEP), Coastal Barriers subject to Coastal Barrier Resources Act</li> </ul>	<ul style="list-style-type: none"> <li>• Flood control and storm damage prevention</li> <li>• Shoreline development and restrictions</li> </ul>	Data available in digital format. Useful for planning purposes. Survey required to accurately locate. GIS format.
Coastal Water and Estuarine Embayments	<ul style="list-style-type: none"> <li>• Navigation Charts (NOAA)</li> </ul>	<ul style="list-style-type: none"> <li>• Public Trust Lands and CZM Consistency</li> </ul>	Image data available in electronic format. Useful for planning purposes.
Developed Shorefront	<ul style="list-style-type: none"> <li>• Sheltered, solid man-made structures, marina, ferry terminals (NOAA-ESI)</li> </ul>	<ul style="list-style-type: none"> <li>• Recreational, commercial, industrial activity</li> </ul>	Map data show general locations. Specific information on ownership may not be available. GIS format.

**Table D-1 – Environmental Data on the Natural Resources of Long Island Sound Required by PA No. 02-95 (Cont.)**

<b>General Data on Natural Environmental Resources (Required by PA 02-95)</b>	<b>Description (Features, Primary Sources for GIS Data)</b>	<b>Issues Addressed by Data</b>	<b>Comment</b>
Islands	<ul style="list-style-type: none"> <li>• Navigation Charts (NOAA)</li> <li>• Islands (DEP)</li> </ul>	<ul style="list-style-type: none"> <li>• Public Trust Lands and CZM Consistency</li> </ul>	Data under development by DEP. Useful for planning purposes. GIS format.
Nearshore Waters	<ul style="list-style-type: none"> <li>• Navigation Charts (NOAA)</li> <li>• Bathymetry (USGS)</li> </ul>	<ul style="list-style-type: none"> <li>• Public Trust Lands and CZM Consistency</li> </ul>	Data available for entire coast. ESI maps show length along shoreline. Useful for planning purposes. GIS format.
Offshore Waters	<ul style="list-style-type: none"> <li>• Navigation Charts (NOAA)</li> <li>• Bathymetry (USGS)</li> </ul>	<ul style="list-style-type: none"> <li>• Public Trust Lands and CZM Consistency</li> </ul>	Data available for entire coast. Useful for planning purposes. GIS format.
Shorelands	<ul style="list-style-type: none"> <li>• Navigation Charts (NOAA)</li> </ul>	<ul style="list-style-type: none"> <li>• Public Trust Lands and CZM Consistency</li> </ul>	Data available for entire coast. ESI maps show length along shoreline. Useful for planning purposes. GIS format.
Significant Wildlife Habitat	<ul style="list-style-type: none"> <li>• Sensitive biological resources - marine mammals, terrestrial mammals, amphibians, reptiles, invertebrates. Includes lobsters and horseshoe crabs (NOAA-ESI)</li> </ul>	<ul style="list-style-type: none"> <li>• Sensitive and potentially unique habitat</li> </ul>	General habitat locations are shown on ESI maps. Useful for planning purposes, but not adequate for site-specific determinations.

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<b>General Data on Natural Environmental Resources (Required by PA 02-95)</b>	<b>Description (Features, Primary Sources for GIS Data)</b>	<b>Issues Addressed by Data</b>	<b>Comment</b>
Shellfish Concentration Areas	<ul style="list-style-type: none"> <li>▪ Oysters, soft shell and hard shell clams (ESI-NOAA, LIS Study) (Bureau of Aquaculture)</li> </ul>	<ul style="list-style-type: none"> <li>• Recreational and commercial resources</li> </ul>	General locations of shellfish habitat, under state jurisdiction, in GIS format. Mapping may not be adequate for site-specific determinations. Inventory of leased lands, under state jurisdiction, in paper format.
<b>Other Information Required Pursuant to PA No. 02-95 (A)</b>			
Unusual and Important Submerged Vegetation	<ul style="list-style-type: none"> <li>• Eelgrass Beds (UConn/DEP)</li> <li>• Submerged aquatic vegetation including eelgrass and species other than eelgrass (NOAA-ESI)</li> <li>• 2002 Eelgrass Beds (USFWS)</li> </ul>	<ul style="list-style-type: none"> <li>• Fish habitat especially breeding and feeding areas</li> <li>• Important for dissipation of wave energy</li> </ul>	Eelgrass bed data currently under preparation by DEP (draft available subject to additional field verification). Useful for planning purposes.
Historically Productive Fishing Grounds	<ul style="list-style-type: none"> <li>• Areas important to commercial and recreational fishing (DEP)</li> </ul>	<ul style="list-style-type: none"> <li>• Areas important for commercial and recreational fishing</li> <li>• Fish habitat especially breeding and feeding areas</li> </ul>	Under production by DEP (Marine Fisheries). Not yet developed in GIS format.

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<b>General Data on Natural Environmental Resources (Required by PA 02-95)</b>	<b>Description (Features, Primary Sources for GIS Data)</b>	<u>Issues Addressed by Data</u>	<b>Comment</b>
Locations of Rare and Endangered Species Including Breeding and Nesting Areas	<ul style="list-style-type: none"> <li>• Natural Diversity Database (DEP)</li> </ul>	<ul style="list-style-type: none"> <li>• Habitat</li> <li>• Compliance with Endangered Species Act</li> </ul>	Limited data on coastal and marine species. No data in GIS format for coastal and marine species.
Points of Public Access	<ul style="list-style-type: none"> <li>• Coastal Access points, beaches, marinas (DEP)</li> </ul>	<ul style="list-style-type: none"> <li>• Public access</li> <li>• Recreational and commercial uses</li> <li>• Public Trust lands</li> </ul>	May be inadequate mapped information on Town/City owned land compared to State and Federal properties. GIS format.
<b>Information Required Pursuant to PA No. 02-95 (E)</b>			
Existing Transmission Infrastructure	<ul style="list-style-type: none"> <li>• Inventory of current utility crossings of Long Island Sound</li> <li>• Connecticut power plants</li> <li>• Connecticut transmission system</li> <li>• Connecticut Gas pipelines</li> <li>• Telecommunications cable corridors</li> </ul>	<ul style="list-style-type: none"> <li>• Construction safety</li> <li>• Design of crossings</li> <li>• Management of potentially conflicting uses</li> </ul>	Generalized information available; exact locations are confidential due to security considerations. GIS format.

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General Data on Natural Environmental Resources	Description (Features, Primary Sources for GIS Data)	Issues Addressed by Data	Comment
<b>Navigation</b>			
Navigation Charts	<ul style="list-style-type: none"> <li>• NOAA Navigation Charts (Maptech)</li> </ul>	<ul style="list-style-type: none"> <li>• Navigation, access, hazards</li> <li>• Planning</li> </ul>	Image data only are available, but Maptech includes tide charts and photos for locations throughout Long Island Sound. GIS format
Dredged Material Disposal Sites	<ul style="list-style-type: none"> <li>• Location of designated dredged material disposal sites (EPA)</li> </ul>	<ul style="list-style-type: none"> <li>• Locations of existing and proposed disposal sites</li> <li>• Location of potentially contaminated sediments</li> </ul>	GIS format.
Bathymetry	<ul style="list-style-type: none"> <li>• Water depths (USGS)</li> </ul>	<ul style="list-style-type: none"> <li>• Identification of habitat fish and benthic habitat</li> </ul>	Incomplete in nearshore areas less than 30 ft deep. GIS format.
<b>Sediments and Benthic Environment</b>			
Surficial Sediments	<ul style="list-style-type: none"> <li>• Composition of top layer of sediment (USGS)</li> <li>• Thickness of sediments (USGS, Long Island Sound Resource Center – LISRC)</li> </ul>	<ul style="list-style-type: none"> <li>• Identification of potential habitat</li> <li>• Sediment characteristics (<i>e.g.</i>, grain size and sorting)</li> </ul>	Incomplete in nearshore areas less than 30 ft deep. Useful elsewhere for planning purposes. GIS format.
Sedimentary Environments	<ul style="list-style-type: none"> <li>• Erosion, reworking, transport, deposition (USGS, LISRC)</li> </ul>	<ul style="list-style-type: none"> <li>• Description of aquatic habitat</li> <li>• Potential for sediment restoration by natural processes</li> </ul>	Incomplete in nearshore areas less than 30 ft deep. Useful elsewhere for planning purposes. GIS format.

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<b>General Data on Natural Environmental Resources</b>	<b>Description (Features, Primary Sources for GIS Data)</b>	<b>Issues Addressed by Data</b>	<b>Comment</b>
Sediment Quality	<ul style="list-style-type: none"> <li>• Metals sampling (USGS)</li> <li>• Distribution of total organic carbon (LISRC, Johan Varekamp, Wesleyan University)</li> </ul>	<ul style="list-style-type: none"> <li>• Dredged material disposal alternatives</li> <li>• Location of contaminated sediments.</li> </ul>	Incomplete in nearshore areas less than 30 ft deep. Can not substitute for project-specific data but useful for identifying regions with potential water quality and sediment impacts. GIS format.
<b>Land and Coastal Features</b>			
State Land	<ul style="list-style-type: none"> <li>• State Property (DEP)</li> <li>• DEP Wildlife Refuge/Management Areas (NOAA-ESI)</li> </ul>	<ul style="list-style-type: none"> <li>• Public land, protected and managed areas, including State forest, wildlife management areas</li> </ul>	Currently being updated by DEP. GIS format.
Coastal Land-use	<ul style="list-style-type: none"> <li>• Land Use Land Cover Maps (UCONN-MAGIC)</li> </ul>	<ul style="list-style-type: none"> <li>• Distribution of existing developed areas.</li> <li>• Urban concentrations, undeveloped land, agricultural land</li> </ul>	From satellite imagery. More than ten years old. GIS format
Water Dependent Uses	<ul style="list-style-type: none"> <li>• Marinas, ferry terminals, port facilities, etc. (NOAA-ESI)</li> </ul>	<ul style="list-style-type: none"> <li>• Water dependant commercial and recreational activities</li> </ul>	Usefulness of existing data needs to be evaluated.
Special Designation	<ul style="list-style-type: none"> <li>• RAMSAR Wetlands - Internationally Significant, Connecticut River</li> </ul>	<ul style="list-style-type: none"> <li>• Undisturbed habitat of special significance</li> </ul>	No ecological reserves or sanctuaries are mapped.
Waterfowl Concentration Area	<ul style="list-style-type: none"> <li>• Shorebirds, wading birds, coastal waterfowl (NOAA-ESI)</li> </ul>	<ul style="list-style-type: none"> <li>• Sensitive habitat, seasonal wildlife activity</li> </ul>	General locations indicated on ESI maps, but not suitable for site-specific habitat evaluation. GIS format

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<b>General Data on Natural Environmental Resources</b>	<b>Description (Features, Primary Sources for GIS Data)</b>	<b>Issues Addressed by Data</b>	<b>Comment</b>
Open Space	<ul style="list-style-type: none"> <li>• Municipal and private open space (DEP)</li> </ul>	<ul style="list-style-type: none"> <li>• Public lands</li> </ul>	Currently being updated by DEP. GIS format.
<b>Shellfish and Finfish Resources</b>			
Shellfish Classification Coverage	<ul style="list-style-type: none"> <li>• Department of Agriculture classification: Approved, Conditionally Approved, Conditionally Restricted, Prohibited (DEP)</li> </ul>	<ul style="list-style-type: none"> <li>• Posting of recreational and commercial shellfisheries</li> <li>• Identifies restrictions on shellfish harvesting due to water quality</li> </ul>	Useful for identifying existing and potentially exploitable shellfish areas. GIS format.
Aquaculture	<ul style="list-style-type: none"> <li>• Leased Beds (Connecticut Department of Agriculture - Bureau of Aquaculture)</li> <li>• Leased Shellfish Beds (Town Leases)</li> </ul>	<ul style="list-style-type: none"> <li>• Commercial shellfisheries</li> </ul>	Available in paper format. Conversion to GIS format is in process. Digitizing of all leased land is not complete. No data are available on productivity of leases.
Anadromous Fish	<ul style="list-style-type: none"> <li>• Migratory Fish (DEP)</li> </ul>	<ul style="list-style-type: none"> <li>• Migratory activity / seasonality</li> <li>• Existing and potential runs identified.</li> </ul>	Data available. GIS format.

**Table D-1 – Environmental Data on the Natural Resources of Long Island Sound Required by PA No. 02-95 (Cont.)**

<b>General Data on Natural Environmental Resources</b>	<b>Description (Features, Primary Sources for GIS Data)</b>	<b>Issues Addressed by Data</b>	<b>Comment</b>
Fisheries Trawl Data	Data gathered by DEP, Division of Marine Fisheries, including: <ul style="list-style-type: none"> <li>• Total Catch per Unit Effort (CPUE)</li> <li>• Richness (finfish, squid, lobster)</li> <li>• Species CPUE of a group of selected species</li> <li>• Total harvestable CPUE of Commercial/Recreational Species</li> <li>• Species CPUE of juveniles and young of year (if available) of selected species</li> </ul>	<ul style="list-style-type: none"> <li>• Historically productive fishing grounds</li> <li>• Location of fish habitat</li> </ul>	Not all data available in GIS format. Limited to offshore sites.  Additional data gathered by others also available from DEP, but likely not in GIS format.
Essential Fish Habitat <sup>15</sup> (EFH)	<ul style="list-style-type: none"> <li>• Quadrants showing list of potential fish species and habitat requirements (NOAA)</li> </ul>	<ul style="list-style-type: none"> <li>• Fish habitat important to spawning, feeding, breeding or growth to maturity</li> </ul>	Quadrants available in GIS format. Left to project proponents to map EFH.

<sup>15</sup> As defined by Congress in the Magnuson-Stevens Act, EFH includes "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 USC. 1802(10)). Those fish species present within a region are identified by quadrants. Applicants for permits from the ACOE must evaluate potential impacts of their project on EFH.

**Table D-1 – Environmental Data on the Natural Resources of Long Island Sound Required by PA No. 02-95 (Cont.)**

<b>General Data on Natural Environmental Resources</b>	<b>Description (Features, Primary Sources for GIS Data)</b>	<b>Issues Addressed by Data</b>	<b>Comment</b>
Water Quality	<ul style="list-style-type: none"><li>• Water Quality Classification (DEP)</li></ul>	Attainment of water quality standards	GIS format.

**Table D-1 – Data Gaps**

<b>Data Need</b>	<b>Gap</b>	<b>Resolution</b>
Benthic Environments (Near shore - less than 30 ft depth)	The large volume of benthic data currently available (DEP - "Pelligrino Study" and others) is limited to offshore waters due to limitation on vessel access. No data for nearshore areas.	Project specific data are not available from applicant/proponent. For sensitive and important coastal environments may be present in the environment.
Leased Natural Shellfish Habitat and State Designated Natural Grounds	Currently available shellfish data (hard shell, soft shell, oysters) were developed by the Bureau of Aquaculture in support of NOAA's effort to prepare ESI maps. According to DEP, these were prepared at a gross scale and are inadequate for siting purposes.	Compile accurate data state of this nature are normally not available from applicant/proponent.
Cultivated Shellfish Beds	State jurisdictional data are only partly available in GIS format. The Bureau of Aquaculture has extensive records state jurisdictional areas. Municipal data are not available.	DEP is working cooperatively with the Bureau of Aquaculture in converting municipal areas into GIS format. Municipal data are not available.
Historically Productive Fishing Grounds	Data do not exist in electronic format. In part, much of this information is anecdotal in nature. DEP Marine Fisheries has extensive trawl survey data but the data are not available in GIS format. Survey data indicate presence of fishery resources but do not indicate commercial or recreational fishing grounds.	Through a collaborative project with the Bureau of Fisheries and other fishing organizations, general locations of such areas are being identified.

**Table D-1 – Data Gaps (Cont.)**

<b>Data Need</b>	<b>Gap</b>	<b>Resolution</b>
Colonial Waterbirds	Not mapped in GIS format for Connecticut Waters. Limited data are available from U.S. Fish and Wildlife Service (USFWS). Mapped but not updated since circa 1997. Data from recent surveys compiled by Wildlife Division.	Project specific data are to be provided by applicant/proponent.
Migratory Stopover Areas	Not mapped statewide. Areas may be readily identified from habitat surveys. Such surveys may also be available from various public and private sources.	Project specific data are to be provided by applicant/proponent.
Points of Public Access and Use	Limited data for other than state and federal sites. Data must be compiled from individual cities and towns.	Project specific data are to be provided by applicant/proponent. Long-term monitoring program in process of identification.
Private Riparian Use	Not mapped statewide	Project specific data are to be provided by applicant/proponent. Long-term monitoring program in process of identification.
Threatened and Endangered Species	Not mapped in nearshore and coastal waters. Terrestrial species mapped in the DEP/Natural Diversity Database.	Comprehensive program to be developed for threatened and endangered species. Data of this nature is normally provided by applicant/proponent.