

JOB 7: MARINE FISHERIES GIS

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JOB 7: MARINE FISHERIES GIS

GOAL

To maintain a geographic information system (GIS) of Project data to support map applications and geospatial analyses, assist with planning and executing Connecticut DEEP Marine Fisheries Division (MFD) surveys that support sport fish restoration goals, help people visualize the spatial extent of MFD project sampling efforts, assist in evaluating the effects of fishing and environmental conditions on the distribution and abundance of living resources in Long Island Sound, evaluate effects of marine spatial planning projects on living marine resources and fisheries in Long Island Sound, and improve coordination with other agencies.

OBJECTIVES

1) Provide GIS-compatible, or GIS-ready, datasets and geo-referenced layers of data collected through other Jobs of this Project that are sanctioned by the Marine Fisheries Division.

2) Provide maps and geospatial analyses of Marine Fisheries Division data or other information relevant to managing living marine resources in Long Island Sound.

INTRODUCTION

In recent years, there has been an increased need for staff to use geospatial technology to map and analyze marine environmental or fisheries related information. Project staff have also experienced an increasing number of requests to provide geospatial data to others (intra-agency, inter-agency, NGOs, academic institutions, etc). Therefore, a new job (Job 7) was created within the project to support this need for geospatial datasets, data layers, analyses and products. This report includes results from the first year of Job 7.

METHODS

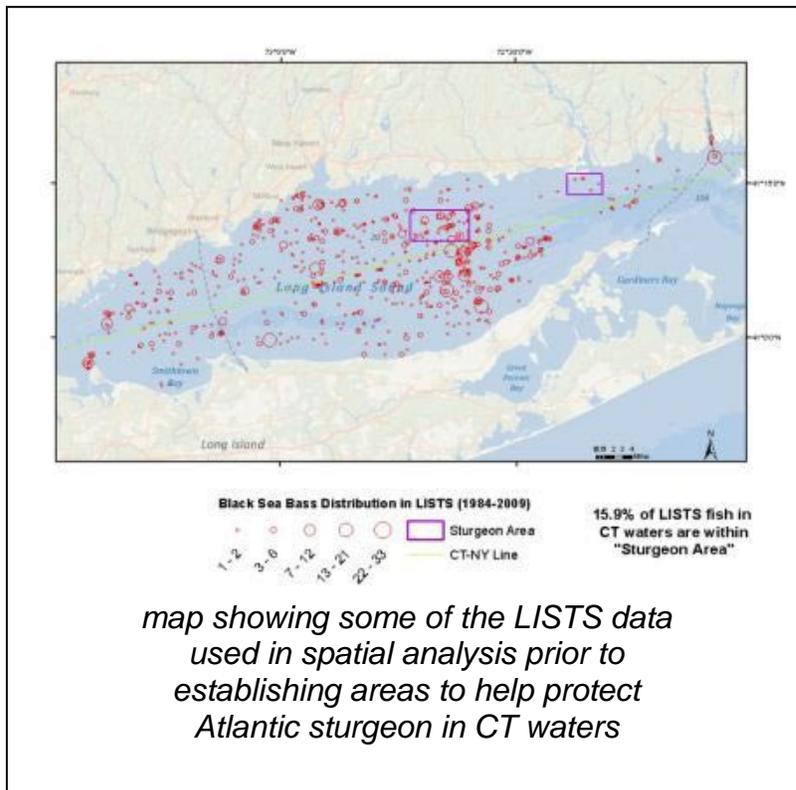
GIS work was accomplished using ESRI ArcMap software and extensions licensed by the Connecticut DEEP. Published layers comply with Department policy pertaining to GIS data. Initial efforts focused on developing file inventories, creating individual layers of Project-specific data and creating and publishing maps depicting project data with other relevant spatial data layers. “Publishing” in this context refers to packaging the GIS data layers so that users did not need access to ArcMap to view a map.

Since most staff did not have access to desktop GIS software, effort was expended in making GIS data sets and data layers readily available for Marine Fisheries Staff through the use of Adobe Reader. This entailed exporting ArcMAP map documents in PDF format with data-driven layers that could be turned on or off in Adobe Reader. In some cases, the data tables ‘behind’ the ArcMap layers could also be accessed in the PDF versions.

RESULTS

Since CT DEEP Marine Fisheries GIS projects use so much spatial data collected in-house, as well as data layers provided by other sources, there is the potential for the data layers to be in different “projections” - different coordinate systems. GIS data layers should all be in the same “projection” in order to conduct spatial analyses so multiple copies of many of the data layers used in this project were maintained (unprojected GCS, CT State Plane and UTM). The first task for this Job was to catalog the files and re-project if necessary; a list was created with file names, creation dates and hyperlinks to locations and multiple projections of each layer. A tool was created in ModelBuilder to mass project files when appropriate. Over 1,000 GIS data layers were cataloged in the first year of this job.

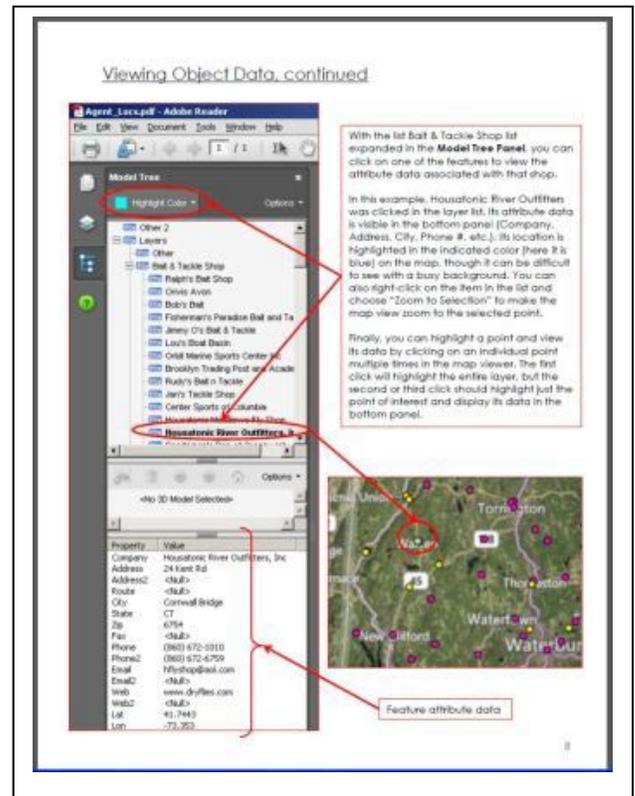
During the project year, Atlantic sturgeon became a Federally Endangered Species prompting the CT DEEP to conduct a spatial analysis of information related to the



distribution of Atlantic sturgeon in CT waters prior to promulgating regulations to establish gear-restriction areas for the protection of Atlantic sturgeon. The spatial analysis used data from the Long Island Sound Trawl Survey (LISTS, Job 2.1) in conjunction with data from other Marine Fisheries projects to calculate areas that would offer the greatest protection to Atlantic sturgeon while having the least impact on other fishery resources. Maps were created to show areas encompassing varying percentages of

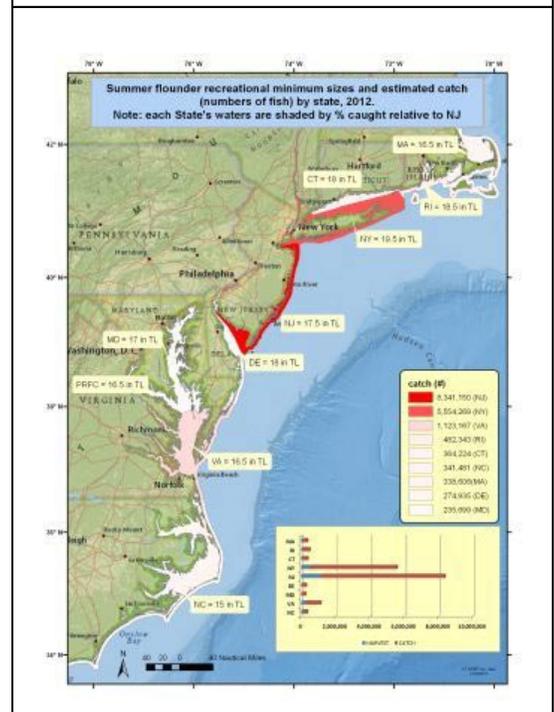
Atlantic sturgeon locations documented in CT DEEP surveys. Maps were also created to show the percentages of LISTS catch of recreationally important species in these same areas, such as the distribution of black sea bass (shown above).

As stated previously, most of the Marine Fisheries staff do not have access to desktop GIS, so maps created in ArcMap were often exported as PDFs which could be viewed on any computer once the free Adobe Reader was installed. Many of the maps had data-driven pages enabled so layers could be turned on/off in Adobe Reader. Viewers could even 'drill into' the data behind the maps in some cases. A tutorial was created to demonstrate and explain features in Adobe Reader that would help Marine Fisheries staff get the most use out of PDF maps and data layers. Shown at right is a page from the PDF Map Tutorial explaining how to 'drill into' the data behind the map.



fluke recreational fishing measures and catch for ASMFC partners

To assist in coastwide management of the recreationally important summer flounder (fluke) stock, project staff created a map showing summer flounder recreational fishing measures and amount of catch in 2012 for ASMFC partners. The magnitude of each ASMFC partner's recreational catch of summer flounder in 2012 as a percent of the coastwide total was used to develop a color ramp that directly reflected the percentage (i.e. the color shade was the actual percent of coastwide catch).



In an effort to improve shore-based angler opportunities and fishing success, CT DEEP has enacted special regulations to allow shore-based anglers in specific locations to keep smaller sized summer flounder and scup than can legally be kept from other locations or other modes (e.g. from boats). Many of these “Enhanced Opportunity Shore Fishing Access Sites” are also State properties featured in the on-line CT Coastal Access Guide. To help promote this important benefit to recreational anglers in CT, an interactive web-based GIS map containing the locations of these sites with links to the on-line Coastal Access Guide was developed and is now available on the Agency website.

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Enhanced Opportunity Shore Fishing Access Sites

Enhanced Shore Fishing Access Sites are shore-based fishing locations where summer flounder (fluke) may be taken at 16 inch minimum length (compared to 18 inches elsewhere) and scup may be taken at 9 inch minimum length (compared to 10.5 inches elsewhere).

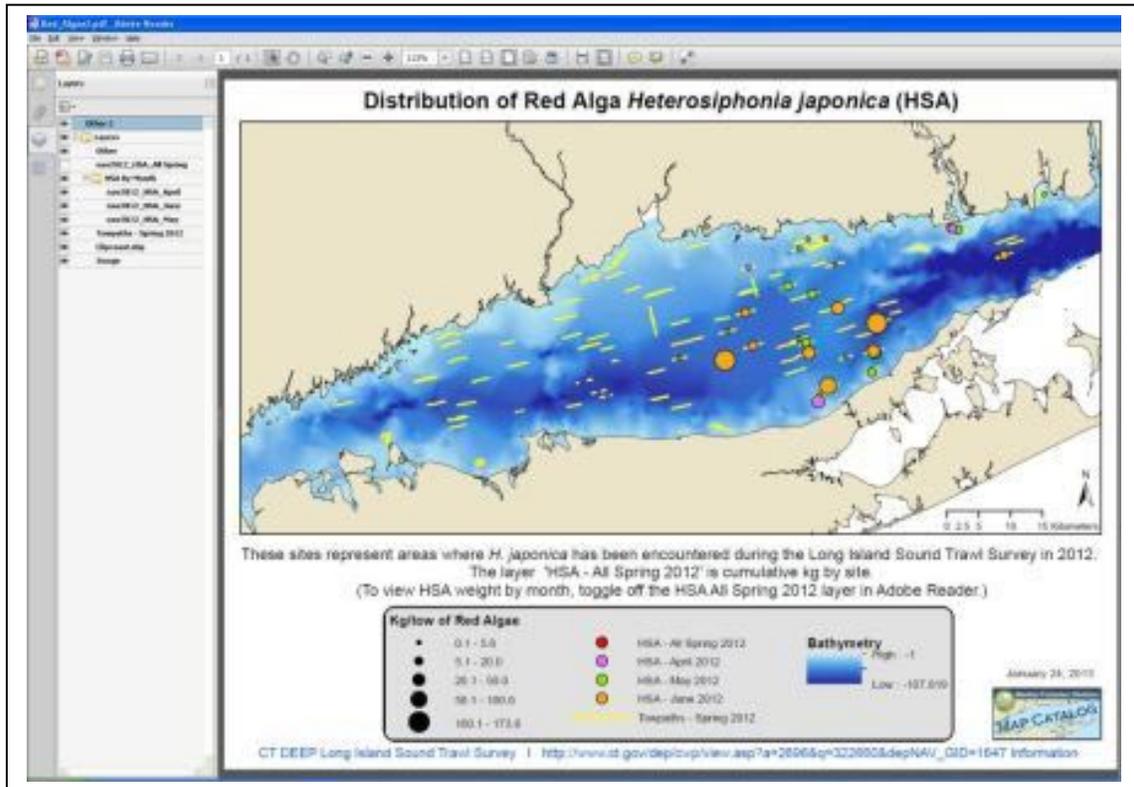
To aid law enforcement, the sites chosen for this program are separate from any boat launches or marinas where boat caught fish may be present. It is important to the success and continuation of this program that anglers at these enhanced sites take their catch directly home after fishing. Possession of these species under the standard minimum size at other locations is a violation and can result in significant fines.

Site Information
Crisculo Park
New Haven
[Details](#) [Zoom to](#)

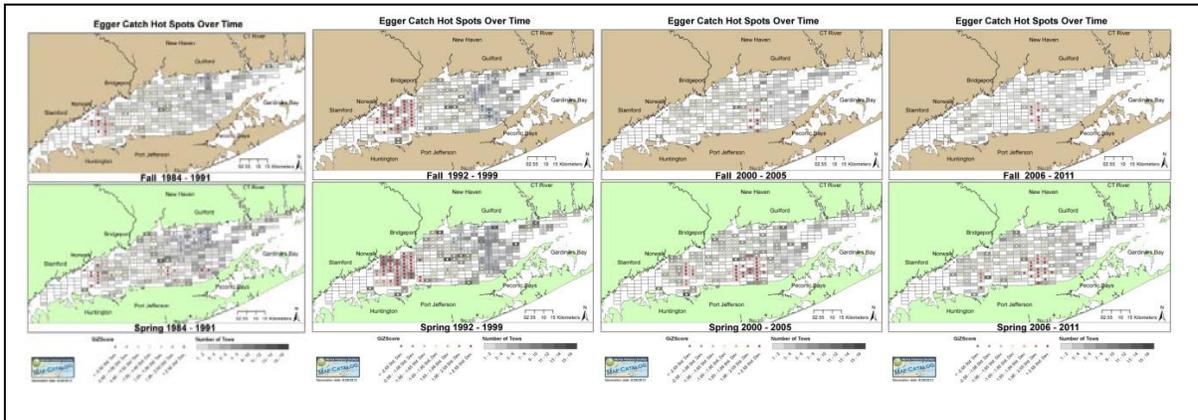
These sites are locations where [Enhanced Opportunity Shore Fishing Program](#) regulations are in place. Select a site for more information.

interactive GIS map of “Enhanced Opportunity Shore Fishing Access Sites” for recreational saltwater anglers on CT DEEP web site:
<http://www.depdata.ct.gov/maps/marinefish/fishmap.htm>

A new invasive alga in Long Island Sound, *Heterosiphonia japonica*, had a significant impact on LISTS spring 2012 sampling (see Job 2.1 section of this report). Project staff created a GIS map of *H.japonica* distribution from the spring trawl survey and exported it as a PDF with active layers for each month of the spring survey. The PDF was then shared with other State of Connecticut Agencies (OLISP, Sea Grant) and interested researchers. An image of the PDF map with active layers is shown below.



LISTS species distribution maps were used to fulfill a variety of data requests in 2012, including requests from Marine Fisheries Division Staff to fulfill needs for fishery stock analyses and assessments as part of ASMFC Technical Committee work. For the ASMFC Lobster Technical Committee, a time series of maps was created to show concentrations of lobsters with eggs from LIS Trawl Survey catches in four time periods (1984 – 1991, 1992 – 1999, 2000 – 2005 and 2006 – 2011, see image below) using “Hot Spot Analysis” in the Spatial Statistics toolbar.



MODIFICATIONS

None.