JOB 4: MARINE FISHERIES GIS

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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 Program (MFP) surveys that support sport fish restoration goals, help people visualize the spatial extent of MFP 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 Program.

2) Provide maps and geospatial analyses of Marine Fisheries Program 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.) for use in, for example, fisheries stock assessments, habitat assessments, environmental sensitivity maps, and public outreach efforts. Therefore, in 2012, a new job was created within the project to support this need for geospatial datasets, data layers, analyses and products. This report includes results from the most recent year of the Job (2020).

METHODS

GIS work was accomplished using ESRI products licensed by the Connecticut DEEP including ArcMap desktop and ArcGIS Online. Published products comply with Department policy pertaining to GIS data. Script development used well established scripting utilities (*e.g.* Python, HTML, CSS, Javascript). Products designed for the Internet adhere to Agency requirements for Agency websites, pages and products. A number of the custom applications, scripts and tools created during earlier segments of the Job continued to be used as templates in subsequent years.

RESULTS

As was the case for most activities in 2020, work for this project segment was hindered by COVID19 and CT DEEP's virus-mitigation policies requiring all project staff to work remotely throughout most of 2020. Although GIS-related work is computer oriented, the rapid, unplanned transition to 100% teleworking impacted staff's ability to collaborate on some projects. Never-the-less, after the transition period was completed, considerable GIS-related work was accomplished.

Living Marine Resources – As has been reported previously (Gottschall et al 2020a and 2020b), the Long Island Sound Trawl Survey (LISTS; Job 5 of this project) has evolved from primarily recording data with paper and pencil to an onboard electronic data acquisition system (FEED; Job 6 of this project) in the past couple years. As GIS technology was incorporated into LISTS standard procedures over the years, the GPS tracks of LISTS samples were routinely brought into GIS to assist with error-checking and planning subsequent years' sampling locations. GPS coordinates of LISTS sampling tow tracks are now being captured in FEED with different hardware and software, resulting in data files of a different format than previously in the time-series. During this project segment, new post-processing techniques were developed to transform the navigation data files collected by FEED during LISTS samples into GIS-ready format. Post-processing of FEED tracks from LISTS 2018 and 2019 were completed during this project segment.

The "American Shad & Land Cover on the Connecticut River, 1965-2016" ESRI StoryMap produced in early 2020 (Pacileo 2020) was so well received, that a follow-up StoryMap focusing on the ecological status of the American Shad in the Connecticut River watershed was begun in this project segment.

Recreational Fishing – In late 2020 and early 2021, Public Outreach staff (Job 3 of this project) began receiving numerous troubling reports of an aquatic invasive species along the Connecticut coastline. Although relatively new to Connecticut (first reported in state waters in 2012), the damage caused by this invasive species has been well documented in Europe. As reports of this invasive species in Connecticut accelerated, project staff needed a way to facilitate collection of new sighting information and disseminating that information to both the public and CT DEEP partners in a timely manner. GIS staff initiated development of an ESRI AGOL tool to include a Survey123 form to collect sightings then use those sightings to populate an online, public map viewer. The new GIS tool, currently being referred to as the CT DEEP MAIS (Marine Aquatic Invasive Species viewer), is in the final stages of development. Since the Marine Angler Survey,
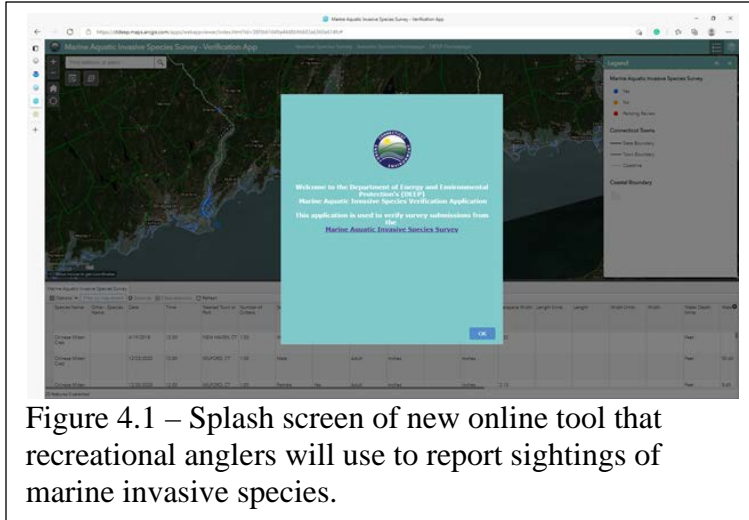
Figure 4.1 – Splash screen of new online tool that recreational anglers will use to report sightings of marine invasive species.

Volunteer Angler Survey and Public Outreach segments of this project (Jobs 1, 2 & 3) are so well connected with the recreational fishing communities, these will prove to be valuable mechanisms for educating the public about the harm invasive species can do to native fish populations, as well as for getting the word out about this new online reporting and tracking tool.

Previously reported work (Pacileo 2020, Pacileo and Roberts 2019 & 2018) on GIS layers of popular recreational fishing areas included in the Saltwater Fishing Resource Maps and LIS Blue Plan data viewer, enable CT DEEP staff to consider the interests of the recreational fishing communities when reviewing proposals for new in-water activities are proposed in Long Island Sound. As an example, CT DEEP staff reviewed an application for in-water activity in the area of a popular fishing area off Guilford, CT and subsequently recommended the project be relocated to an area nearby that was not as heavily fished by recreational anglers nor as important
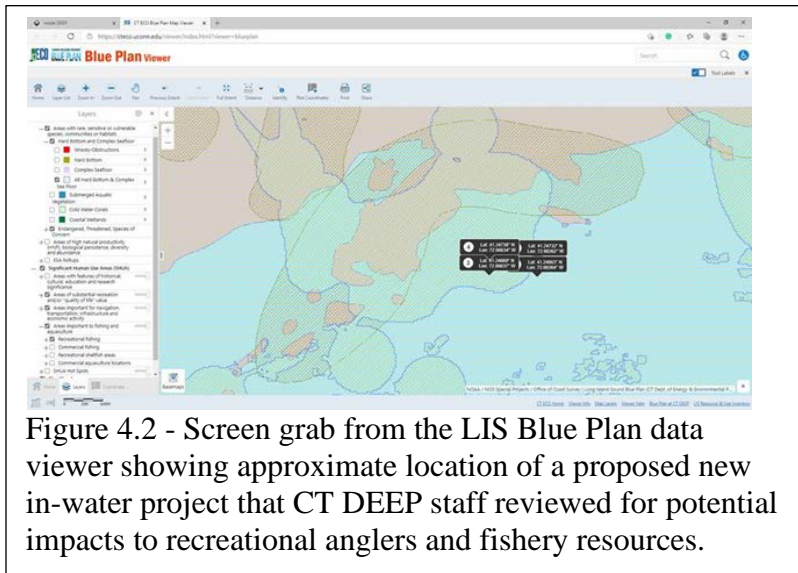

Figure 4.2 - Screen grab from the LIS Blue Plan data viewer showing approximate location of a proposed new in-water project that CT DEEP staff reviewed for potential impacts to recreational anglers and fishery resources.

for fish biodiversity as determined by spatial analysis which included fish abundance layers derived from the LIS Trawl Survey data contributed to the Blue Plan data viewer. See previous report (Pacileo and Roberts 2019) for additional detail on the processes used to generate over 100 GIS layers based on the LIS Trawl Survey for pelagic finfish, demersal finfish and macroinvertebrates. For more information on the LIS Blue Plan, please see CT DEEP's Long Island Sound Blue Plan website.

MODIFICATIONS

None.

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