

Addendum to  
Maine Molluscan Shellfish Resource Mapping Project,  
Using Geographical Information System (GIS)

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# CONTENTS

Introduction.....	3
Project Objectives Update.....	3
Methods.....	3
Results.....	4
Discussion.....	4
Conclusions and Recommendations.....	5
Acknowledgements.....	5

## **Introduction**

This addendum provides an update on the Maine Molluscan Shellfish Mapping Project activities from August 2009 to October 7, 2010. The project is complete as of October 12, 2010.

## **Project Objectives Update**

After the first data-gathering phase of the project was completed in May 2009, the Maine Department of Marine Resources (MDMR) Director of the Resource Management Program asked the project manager to collect molluscan shellfish distribution data for those towns not represented in data from the first phase of the project. The project manager contacted additional people to gather more information for towns already represented in the project's data. The project manager worked with MDMR Marine Patrol officers to record their observations of shellfish locations, in order to ground-truth data and collect new data.

## **Methods**

The project manager imported Maine town layer "MEDMR.TownArc24" into the project file, in order to distinguish the town line in the Spurwink River that separates Scarborough from Cape Elizabeth. The town boundary line wasn't drawn completely through the river (which is indicated on electronic National Oceanic and Atmospheric Administration [NOAA] chart 13286), so the project manager had to make her best guess as to where the line was located.

Prepared maps of selected towns were sent to a MDMR Area Biologist and a shellfish committee, to capture their knowledge of local shellfish resources.

The project manager met with MDMR Marine Patrol officers in person, and the officers marked shellfish locations on paper NOAA charts. Officers were asked to mark shellfish resources by outlining areas on the charts where species were observed within the past two to three years, so the compiled data would show a "snapshot in time" of where shellfish were located. Participants could write in the names of the species, or use a different pen color for each species. Paper NOAA charts were mailed to several Marine Patrol officers.

Marked charts and maps were scanned into Adobe Acrobat 6.0 Professional, and a .PDF document was created. The .PDF documents were georeferenced to the appropriate raster navigational NOAA chart, and polygons were created to encompass each marked location of molluscan shellfish. Where multiple sources indicated a specific location, the most "hands-on" source category was used as the source. Some polygons are composites from several sources, and show the largest boundary indicated by the multiple sources. Shellfish polygons that were confirmed by Marine Patrol officers, and those polygons that were significantly modified by an officer's knowledge, were listed in the attribute tables as being sourced from Marine Patrol.

The MDMR scallop tow survey data for years 2008 and 2009 were extracted from the Department's MARVIN database, and placed into a Microsoft Excel spreadsheet. This spreadsheet was converted into an Access database file, and imported into the GIS project file. The X-Y coordinates were plotted in ArcMap, using geographic coordinate system "North

American Datum 1983". Polygons were drawn around points containing reported quantities of at least one scallop.

The raster navigational NOAA charts used in the project were both large and small-scale (1:80,000 down to 1: 20,000). The project manager updated shellfish polygon data from the first phase of the project to correspond to small-scale charts that covered the same area as the originally-sourced large-scale chart. She compared the electronic versions of the large-scale and the small-scale charts in the GIS project file, when adjusting the edges of the polygon to the small-scale chart. The attribute tables were updated to reflect the new corresponding NOAA chart. This was done because the small-scale charts often showed more detail in the coastline and islands, which would provide better orientation for users of the shellfish distribution data.

The project manager tried to use small-scale charts whenever possible. However, consideration had to be given to adequate chart coverage of the coast, which sometimes was more effective with a large-scale chart.

## **Results**

Marine Patrol officers provided most of the new shellfish location data, and ground-truthed data collected in the first phase of the project. New shellfish location information was also obtained from Harbormasters, shellfish committees, MDMR Area Biologists and harvesters. Locations were collected for the following eight species: softshell clam (*Mya arenaria*), blue mussel (*Mytilus edulis*), European oyster (*Ostrea edulis*), American oyster (*Crassostrea virginica*), hard clam -also called quahog (*Mercenaria mercenaria*), atlantic surf clam (*Spisula solidissima*), razor clam (*Ensis directus*) and sea scallop (*Placopectin magellanicus*).

There were many points in the 2009 sea scallop data that were outside of the three-mile limit of state jurisdiction. Since there was no reference town in the "towns-24k" file to correspond to these points, they were excluded from the sea scallop shapefile.

A .PDF document showing shellfish locations was received from the Chebeague Island Harbormaster.

The project manager included six additional coastal towns in the second phase of this project, which resulted in the coastline of 113 towns being reviewed for shellfish resources. The project manager received data for 109 towns by the project's completion. The only towns along the Maine coast that don't have any shellfish data as part of this project are: Bucksport, Orland, Prospect and Warren. Polygon datasets titled "Molluscan\_Shellfish" are available through the Maine Office of GIS website at <http://www.megis.maine.gov/> .

## **Discussion**

The project provides an overview of known shellfish resource locations, which are obtained from a variety of sources. It is acknowledged that not all shellfish locations are currently represented in the project's data. This lack of data could be a function of the limited number of shellfish harvesters who participated (as compared to the total number of harvesters in the state), the

unavoidable limitations on a project manager to contact every person who has shellfish location knowledge, or the periodic variability of shellfish locations over time.

### **Conclusions and Recommendations**

The project's shapefiles provide a general overview of Maine molluscan shellfish distribution information. The "local knowledge" data obtained from many different people and organizations is an asset; as is the narrow three-year observation span requested by the project manager to participants, when shellfish locations were marked for the project.

As with many data-gathering projects, there is always room for additional data from other participants; and additional field verification would benefit future updates to the shellfish layers. Projects of this nature require adequate communication and cooperation among all participants.

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