Shellfish Habitats for Maine, Massachusetts and New Hampshire
Northeast United States
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Prepared for:
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1. INTRODUCTION

This shellfish habitat layer was derived from datasets from Maine, Massachusetts and New Hampshire state GIS resources. Shapefiles downloaded/provided from these states include delineated shellfish habitats for oysters (American oyster, Eastern oyster, European oyster), clams (Atlantic surf clam, ocean quahog, quahog, razor clam, and soft-shell clam), blue mussel, and scallops (bay scallop and sea scallop). Maine's molluscan shellfish layer is based on habitat distribution data from February 2008 to September 2010 provided by town officials, harvesters, harbormasters, Maine Department of Marine Resources (MEDMR) biologists, MEDMR specialists, MEDMR Marine Patrol officers and MEDMR scientists. The Massachusetts shellfish suitability data maps areas along the coast of Massachusetts where shellfish have been observed since the mid-1970's depicting areas that are suitable for shellfish habitats. This data is a compilation of information provided by Massachusetts Division of Marine Fisheries, local shellfish constables, commercial fisherman, maps and studies. The New Hampshire dataset contains delineations of tidal shellfish beds from 2005 to 2013 provided by data from New Hampshire Department of Environmental Services (NHDES) Shellfish Program, Morrissey, E and C. Nash (2013), University of New Hampshire [Grizzle, R. and K. Ward (2009 and 2013), Capone et al. (2008)], and Normandeau Associates, Inc. (2008).

This regional dataset does not include shellfish habitats for Connecticut, New York or Rhode Island; however, this dataset will be updated to include these states once data is available.

2. PURPOSE

This dataset shows shellfish suitability areas (habitats) for eleven shellfish species (Atlantic surf clam, ocean quahog, quahog, razor clam, soft-shell clam, blue mussel, American oyster, Eastern Oyster, European oyster, bay scallop, and the sea scallop) for New Hampshire, Maine, and Massachusetts.

3. SOURCES AND AUTHORITIES

- Maine Office of GIS Data Catalog, Molluscan Shellfish Areas http://www.maine.gov/megis/catalog/shps/state/molluscan_shellfishs.zip
- New Hampshire Department of Environmental Services, current_shellfish_beds_20130923_update.shp
- University of New Hampshire
- Normandeau Associates, Inc.
- MassGIS, SHELLFISHSUIT_POLY.shp

4. DATABASE DESIGN AND CONTENT

Native storage format: ArcGIS File Geodatabase – simple feature class

Feature Types:

Shellfish Habitat Polygons

Data Dictionary:

Line	Name	Definition	Type	Size
1	OBJECTID*	Uniquely identifies a feature	OBJECTID	*
2	Shape*	Geometric representation of the feature	Geometry	*
3	commonSpecies	Common name of shellfish species	String	255
4	state	State Abbreviation (relates to source datasets)	String	2
5	source	Contributor of shellfish data (from source datasets)	String	255
6	comments	Additional information related to shellfish habitat from source datasets (MA: basic life history information and NH: shellfish bed names)	String	255
7	date	MA and ME: year or date of shellfish modification, NH: mapping year	String	50
8	habitat	Shellfish habitats	String	50
9	Shape_Length	Length of features	String	255
10	Shape_Area	Area of features	Double	*

Feature Class Name: ShellfishHabitat

Total Number of Unique Features: 5,350

Dataset Status: In Progress

5. SPATIAL REPRESENTATION

Geometry Type: vector polygon
Reference System: GCS North American 1983
Horizontal Datum: North American Datum 1983
Ellipsoid: Geodetic Reference System 1980

XY Resolution: XY Scale is 999999999.99999988
Tolerance: 8.9831528411952133e-009

Geographic extent: -71.286 to -66.938, 41.199 to 45.160

IS0 19115 Topic Category: Biota, Environment, Oceans

Place Names: Place Names:

Atlantic Ocean, Blue Hill Bay, Bay of Fundy, Broad Sound, Buzzards Bay, Cape Cod Bay, Cape Neddick Harbor, Casco Bay, Cobscook Bay, Duxbury Bay, Englishman Bay, Essex Bay, Frenchman Bay, Great Bay, Gulf of Maine, Hate Cove, Hingham Bay, Ipswich Bay, Jericho Bay, Kingston Bay, Luckse Sound, Maine, Massachusetts, Massachusetts Bay, Maquoit Bay, Merriconeag Sound, Merrimack River, Muscongus Bay, Nahant Bay, Nantucket Sound, New Hampshire, Plum Island Sound, Plymouth Bay, Quincy Bay, Saco Bay, Salem Sound, Sandy Bay, South Bay, Vineyard Sound, Wellfleet harbor, West Penobscot Bay, York Harbor

Recommended Cartographic Properties:

(Using ArcGIS ArcMap nomenclature)

Simple Fill Symbol: outline width: 1, outline color: same as fill, color model: RGB

Clam: 140-24-115
Mussel: 0-132-168
Oyster: 255-66-142
Scallop: 92-173-99

Scale range for optimal visualization: 5,000 to 500,000. Optimal at 1:100,000

6. DATA PROCESSING

A description of each states' datasets and subsequent processing are described below.

Maine - Data (*Molluscan Shellfish Areas-10/12/2010—american_oysters.shp, atlantic_surf_clams.shp, blue_mussels.shp, european_oysters.shp, hard_clams.shp, razor_clams.shp, sea_scallops.shp, softshell_clams.shp*) were downloaded directly from (ME Data) and original metadata can be found here (ME Metadata). Original Maine data contact: Michelle Mason (Michelle.Mason@maine.gov) from Maine Department of Marine Resources.

Data were provided based on input from town officials, harvesters, harbormasters, Maine Department of Marine Resources (MEDMR) biologists, MEDMR specialists, MEDMR marine patrol officers and MEDMR scientists. Please see original metadata for more information on Maine Shellfish data.

New Hampshire - Dataset (*current_shellfish_beds_20130923_update.shp*) was provided by the New Hampshire Department of Environmental Services (NHDES). NHDES data contact: Matt Wood (Matthew.Wood@des.nh.gov). University of New Hampshire source data contact: Ray Grizzle (ray.grizzle@unh.edu).

Details of New Hampshire's shellfish mapping sources by common name and year:

Blue Mussels

2006: Field observations made by the NHDES Shellfish Program. Bed dimensions were interpolated using aerial imagery and local knowledge of resources.

2013: Field observations made by the NHDES Shellfish Program. Bed dimensions were mapped by NHDES staff using GPS units.

- Morrissey, E. and C. Nash (2013). Identifying Blue Mussel (*Mytilus edulis)* Resource in Coastal New Hampshire. New Hampshire Department of Environmental Services, Shellfish Program. June 26, 2013.

Eastern Oysters

2005: Oyster bed boundaries mapped by University of New Hampshire researchers in 2005. Bed dimensions were provided to NHDES via ArcGIS coverages.

- Capone et al., (2008). Intertidal Oysters in Northern New England. Published in 2008, Northern Naturalist, 15(2):209–214.

- Grizzle, R., and K. Ward (2009) Restoration of Eelgrass and Shellfish Habitats in the Great Bay Estuary. NRCS/WHIP 2005-2008 Final Report. February 13, 2009.

2006: Field observations made by the NHDES Shellfish Program. Bed dimensions were interpolated using aerial imagery and local knowledge of resources.

2008: Oyster bed boundaries mapped by University of New Hampshire researchers in 2008. Bed dimensions were provided to NHDES via ArcGIS coverages.

- Grizzle, R., and K. Ward (2009) Video-Based Mapping of Oyster Bottom in the Upper Piscataqua River, Sturgeon Creek, and Spruce Creek. A final report to the Piscataqua Region Estuaries Partnership. University of New Hampshire, Durham, NH. January 21, 2009.

2012: Oyster bed boundaries mapped by University of New Hampshire researchers in 2012. Bed dimensions were provided to NHDES via ArcGIS coverages.

- Grizzle, R. and K. Ward (2013). Oyster Bed Mapping in the Great Bay Estuary, 2012-2013. A final report to the Piscataqua Region Estuaries Partnership and New Hampshire Department of Environmental Services from the University of New Hampshire, Jackson Estuarine Laboratory, Durham, NH. June 26, 2013.

Razor Clams

2006: Field observations made by the NHDES Shellfish Program. Bed dimensions were interpolated using aerial imagery and local knowledge of resources.

Soft-shell clams

2006: Field observations made by the NHDES Shellfish Program. Bed dimensions were interpolated using aerial imagery and local knowledge of resources.

2008: Field survey conducted by Normandeau Associates, Inc. on Oct 1st, 2008. Bed dimensions were interpolated from the Normandeau report and aerial imagery.

Atlantic Surf Clams

2006: Field observations made by the NHDES Shellfish Program. Bed dimensions were interpolated using aerial imagery and local knowledge of resources.

Massachusetts - Data (*Shellfish Suitability Areas-May 2011: SHELLFISHSUIT_POLY.shp*) was downloaded directly from (MA Data). This dataset maps potential shellfish habitats based on data since the mid-1970's, depicting areas where shellfish have been observed

throughout this timeframe. Original metadata for this dataset can be accessed by downloading the original dataset's metadata as well as accessing the following website (MA Metadata). Original MA data contact: Mark Rousseau (mark.rousseau@state.ma.us) from MA Division of Marine Fisheries.

The original layer was developed by Massachusetts Division of Marine Fisheries in collaboration with the Massachusetts Office of Coastal Zone Management and the National Oceanographic and Atmospheric Administration Coastal Services Center. Input for creation of the original dataset was also provided by local shellfish constables, commercial fisherman, maps and shellfish studies.

Processing environment: Microsoft Windows 7 Version 6.1 (Build 7601) Service Pack 1; ESRI ArcGIS 10.0.5.4400

	Process Steps Description
	Maine
1	Downloaded Molluscan shellfish areas (10/12/2010) shellfish data for Maine.
2	MERGE individual shapefiles for American oysters, Atlantic surf clams, blue mussels, European oysters, hard clams, razor clams, sea scallops and soft-shell clams.
3	State field was added to the attribute table and ME was populated in the cells.
4	The following fields were preserved from the original shapefiles: SPECIES, UPDATED, SOURCE, and COMMENT. TOWN, NOAA_CHART and ACRES2 were not included in the regional layer. i. SPECIES is found in the commonSpecies field of the regional layer ii. UPDATED is found in the date field of the regional layer iii. SOURCE is found in the source field of the regional layer iv. COMMENT is found in the comments field of the regional layer
	Massachusetts
5	Downloaded Shellfish Suitability Areas for Massachusetts.
6	State field was added to the attribute table and MA was populated in the cells.
7	The following fields were preserved from the original shapefiles: COM_NAME, LH_STAGE, BEGIN_DATE, END_DATE, and ENTRY_DATE. HABITAT was not included in the regional layer's attribute table. i. COM_NAME is found in the commonSpecies field of the regional layer ii. LH_STATE, BEGIN_DATE and END_DATE are all found in the comments field of the regional layer iii. ENTRY_DATE is found in the date field of the regional layer
	New Hampshire
8	State field was added to the attribute table and NH was populated in the cells.
9	The following fields were preserved from the original shapefiles: DATASOURCE, YEAR, RESOURCE, BEDNAME and CITATION. ACRES, HECTARES, AREA_FEET, PERIMETER_ were not included in the regional layer's attribute table. i. DATASOURCE and CITATION are found in the source field of this regional layer ii. YEAR is found in the date field of this regional layer. iii. RESOURCE is found in the commonSpecies field of this regional layer iv. BEDNAME is found in the comments field of this regional layer
	Merged Product

10	State datasets were merged to create a regional dataset.
11	A common name field (commonSpecies) was added to the merged shapefile. This common name field corrected formatting of common species names from original data sources as well as grouped some species into a common name. Maine's hard clam was assigned to the quahog common name, and Massachusetts and New Hampshire's surf clam were assigned to Atlantic surf clam. New Hampshire's data only listed oyster for these features, after contacting the data source it was determined that the species of these features were Eastern oysters, these were updated in this layer.
12	The habitat field (clam, mussel, oyster, scallop) was joined to each common name indicating the associated habitat for the selected species.
13	Null values in the field SOURCE were updated to 'Not available from source data'.

7. QUALITY PROCESS

Attribute Accuracy: Original content was acquired from authoritative sources – no new testing was done to cross reference or confirm otherwise the field or geometry values. Accuracy is based on original state datasets. This dataset integrates shellfish habitat polygon features from three separate sources. Common themes were identified across attribute fields that unify the datasets, and these were incorporated to provide consistency and efficient communication of information. No new analysis was conducted on these datasets. Please see each state's metadata for more information.

Logical Consistency: None

Completeness: Data is based on the most up to date and available shellfish habitat GIS datasets available for coastal New England States. Currently New Hampshire, Maine and Massachusetts are included in this dataset; however, Connecticut, New York, and Rhode Island will be added once data is available. Not all records have complete information for each field due to the differences in sampling and recording programs for each state. Please see individual state's metadata for more information on update frequency.

Positional Accuracy: May vary by state. The user should consult the metadata of each individual state for positional accuracy information.

Timeliness: This dataset is a compilation of data from three states: Maine data is based on a timeframe between February 2008 to September 2010. The Massachusetts data is based on data since the mid-1970's. The New Hampshire dataset is based on data from 2005 to 2013.

Use restrictions: Data are presented as is. Users are responsible for understanding the metadata and individual state's metadata prior to use. The Nature Conservancy nor Northeast Ocean Data shall not be held liable for improper or incorrect use of the data described and/or contained herein.

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