

Soft sediments by grain size (in mm)
Northwest Atlantic United States
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Northeast Regional Ocean Council (NROC)
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1. INTRODUCTION

This data product was created as part of the Northwest Atlantic Marine Ecoregional Assessment (2010) and revised with additional data in 2015. The Nature Conservancy developed this science-based ecoregional assessment for the Northwest Atlantic Marine region (Bay of Fundy to Cape Hatteras, North Carolina). This assessment synthesizes information on oceanography, chemistry, geology, biology, and social science to inform decisions about coastal and marine ecosystems. By integrating this information at a regional level, the Conservancy is able to provide both a greater understanding of the interrelated biological diversity of the marine ecoregion, and a clearer picture of the current condition of its natural areas and the challenges to their continued persistence. The ten categories of targets identified as the primary structure for the marine ecoregional assessment are: coastal and estuarine habitats, benthic habitats, diadromous fish, demersal fish, pelagic fish, forage fish, nearshore shellfish, shorebirds and seabirds, marine mammals, and sea turtles. For more information and a detailed report, please visit <http://nature.org/namera/>.

This layer classifies soft-sediments based on their grain size. Source data include USGS usSEABED: Atlantic coast offshore surficial sediment data (Data series 118, version 1.0) and the USGS East Coast Sediment Texture Database (2005), Woods Hole Coastal and Marine Science Center. The usSEABED database is an innovative system that brings assorted numeric and descriptive sediment data together in a unified database (Reid et al. 2015). It provides information on textural, geophysical, and compositional characteristics of different point locations collected from the seafloor, and is spatially explicit. We classified these samples based on grain-size according to the Wentworth (1922) scale. This classification process resulted in the following classes: clay (< 0.002 mm), silt (0.002 – 0.06), very fine sand (0.06 – 0.125 mm),

fine sand (0.125 – 0.25 mm), medium sand (0.25 – 0.5 mm), coarse sand (0.5 – 1.0 mm), very coarse sand (1 – 2 mm), and Gravel/granule (> 2 mm). Finally, point data was interpolated using kriging to create the resulting raster layer.

2. PURPOSE

This dataset was created for the Northwest Atlantic Marine Ecoregional Assessment (NAMERA) in order to map soft sediments based on their grain size (in mm). This version (2) is an update of the original 2010 soft sediments layer using new data.

3. SOURCES AND AUTHORITIES

- Reid, J.M., Reid, J.A., Jenkins, C.J., Hastings, M.E., Williams, S.J., Poppe, L.J (2005) USGS usSEABED: Atlantic coast offshore surficial sediment data. U.S. Geological Survey Data series 118, version 1.0.
- USGS East Coast Sediment Texture Database (2005), Woods Hole Coastal and Marine Science Center
- Wentworth, C. K. (1922). A scale of grade and class terms for clastic sediments. *The Journal of Geology*, 30(5), 377-392
- Anderson, M. G., Greene, J., Morse, D., Shumway, D. and Clark, M (2010) Benthic Habitats of the Northwest Atlantic in Greene, J.K., M.G. Anderson, J. Odell, and N. Steinberg, eds. *The Northwest Atlantic Marine Ecoregional Assessment: Species, Habitats and Ecosystems. Phase One.* The Nature Conservancy, Eastern U.S. Division, Boston, MA.

4. DATABASE DESIGN AND CONTENT

Native storage format: ArcGIS File Geodatabase Raster Dataset

Columns and Rows: 1946, 3047

Number of Bands: 1

Cell Size: 500 meters

Source Type: Generic

Pixel Type: Floating Point

Pixel Depth: 32 Bit

Statistics:

Minimum: 0.0003077633446082473

Maximum: 5.656854152679443

Mean: 0.4831709617227126

Standard Deviation: 0.7504969524730262

Dataset Name: SoftSediments

Dataset Status: Complete

5. SPATIAL REPRESENTATION

Reference System: GCS North American 1983

Horizontal Datum: North American Datum 1983

Ellipsoid: Geodetic Reference System 1980

Linear Unit: Meter (1.0)

Angular Unit: Degree (0.0174532925199433)

False Easting: 0.0

False Northing: 0.0

Central Meridian: 0.0

Geographic extent: -78.124 to -63.608, 33.273 to 46.851

ISO 19115 Topic Category: Environment, Oceans, Biota

Place Names:

Albemarle Sound, Baltimore Canyon, Bay of Fundy, Block Island Delta, Cashes Ledge, Chesapeake Bay, Cholera Bank, Delaware Bay, Georges Bank, Georges Basin, German Bank, Great South Channel, Gulf of Maine, Hudson Canyon, Hydrographer Canyon, Jeffreys Ledge, Jordan Basin, Lake Ontario, Long Island Sound, Mid-Atlantic Bight, Nantucket Shoals, Norfolk Canyon, Northeast Channel, Stellwagen Bank, Southern New England, Wilkinson Basin

Recommended Cartographic Properties:

(Using ArcGIS ArcMap nomenclature)

Classified. Manual classification, 8 classes: RGB

Clay (< 0.002): 115 – 38 – 0

Silt (0.002 – 0.06): 115 – 76 – 0

Very Fine Sand (0.06 – 0.125): 168 – 112 – 0

Fine Sand (0.125 – 0.25): 230 – 152 – 0

Medium Sand (0.25 – 0.5): 255 – 255 – 115

Coarse Sand (0.5 – 1): 178 – 178 – 178

Very Coarse Sand (1 – 2): 115 – 115 – 0

Gravel/Granule (> 2): 104 – 104 – 104

Scale range for optimal visualization: 1:5,000,000

6. DATA PROCESSING

Processing environment: Microsoft Windows 7 Professional, Service Pack 1; ESRI ArcGIS 10.2.2, Spatial analyst extension;

	Process Steps Description
1	Remove hard-bottom points from databases.
2	Merge all data sources together and clean for duplicate points
3	Interpolation using KRIGGING with the following parameters: spherical semi-variogram, variable search radius using 3 points with no maximum distance, and output cell size of 500 meters.
4	EXTRACT BY MASK to clip raster to area of study

7. QUALITY PROCESS

Attribute Accuracy: The accuracy of the data is a result of the accuracy of the source data.

Logical consistency: These data are believed to be logically consistent.

Completeness: This layer is an interpolation from all available data samples. Areas with data gaps signify locations without enough information.

Positional Accuracy: The accuracy of the data is a result of the accuracy of the different data sources and the interpolation methods used to derive this raster dataset.

Timeliness: Based on data from 1800s to present.

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