**FREQUENT ASKED QUESTIONS**

**UPDATES – SEAFLOOR LAYERS – SEPTEMBER 2020**

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**BATHYMETRY, SEABED FORMS, AND SEAFLOOR COMPLEXITY**

**What do these data show?**

Bathymetry layers show the estimated average depth within each 100m cell.

Seabed forms show the shape of the seafloor. They compare the depth of a site with the information from surrounding locations. For example, areas that are shallower than the surrounding areas, can be considered peaks or banks. They are based on a metric called “Benthic Position Index” or BPI (see below for more information). Seabed forms are scale-dependent. This layer combines broad (e.g. banks, depressions, …) and finer scale features (e.g. scrapes).

Seafloor complexity is how “diverse” the seafloor is in one location. It calculates how many fine-scale features can be found within a 10 km buffer. If there are many different features (e.g. several peaks and valleys within a small space), then the seafloor complexity is high.

**What do the classes represent?**

|  |  |
| --- | --- |
| **SEABED FORMS** | |
|  |  |
| **10** | Depression/valley |
| **15** | Valley peaks |
| **20** | Low flat |
| **30** | Mid flat |
| **40** | Upper flat/bank |
| **45** | Upper slope/peak |

|  |  |
| --- | --- |
| **Seafloor complexity (within 10km)** | |
|  |  |
| **0** | Low |
| **1** | Medium |
| **2** | High |
| **3** | Very high |

**Are there other similar datasets available for the region?**

There are several different bathymetry products available on the regional portals. They all cover different regions and use slightly different methodologies, but the majority are based on the same raw soundings used for the bathymetry layer you see in this tool. The big differences are both the resolution and the extent of the layer. In this case, we wanted to have a layer that covered our full area of study (from Maine to NC). The resulting bathymetry has a 100 meter spatial resolution.

**How did you create this bathymetry layer?**

This was created interpolating all available bottom soundings for the region to ensure a continuous surface. The majority of soundings originate from previous multibeam maps (see sources here: <https://maps.ngdc.noaa.gov/viewers/bathymetry/>) and NOS surveys. However, in locations where there were no other sources of bathymetry, gaps were filled using the digital bathymetry database from the US Naval Oceanographic Office (<https://gcmd.nasa.gov/records/GCMD_DBDBV.html>). Points were interpolated using Empirical Bayesian Kriging in ArcPro (ESRI).

**How did you create the seabed forms layer?**

To create the seabed forms layer, we calculated the Benthic Position Index (BPI) using the bathymetry layer as input. We used NOAA’s Benthic Terrain Modeler for these calculations. We calculated BPI at two separate scales:

* “Broad-scale” BPI - inner radius: 9 cells; outer radius: 90 cells, standardized
* “Fine-scale” BPI - inner radius: 3 cells; outer radius: 25 cells, standardized

We then reclassified the resulting layers to determine the “features” at both scales. To visualize Broad-scale features, we created four classes: Deep valley, Valley, Peak, and High-peak. For fine-scale features, we created two classes: deep valleys and high peaks. The two resulting layers were them combined to create the final seabed forms.

**How did you create the seafloor complexity layer?**

Using the fine-scale BPI derived from the bathymetry information, we used the Focal Statistics Tool in ArcPro to calculate the standard deviation from each cell within a 10 km buffer. We then reclassified the resulting standard deviation values into different categories.

**What are the limitations of these datasets?**

These layers were created to provide a regional overview of the depth and shape of the seafloor across the region. They should not be used for navigation or for local-scale surveys.

These layers are based on interpolations from samples from different sources, so their accuracy depends on the source data. The resulting layers are estimates of actual depths, not actual observations. Please consider when the samples were taken and their source to determine accuracy of depth for each location.

**When were these last updated?**

These layers were last updated in September 2020.

**How can I find more information about these layers?**

For an overall overview of benthic layers resulting from The Nature Conservancy’s Northwest Atlantic Ecoregional Assessment (NAMERA), please check out this page: <https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/edc/reportsdata/marine/namera/namera/Pages/default.aspx>

For any other questions, please contact the team at [eScience@tnc.org](mailto:eScience@tnc.org)

**SEDIMENT TYPE (SOFT SEDIMENTS)**

**What do these data show?**

These data show the different combinations of soft sediments (sand, mud, gravel) within each 100 km cell.

**What do the classes represent?**

|  |  |
| --- | --- |
| **SEDIMENT TYPE** | |
| **COMBINED CLASSES** | |
|  |  |
| **1000** | Majority Sand |
| **2000** | Majority Mud |
| **5000** | Majority Gravel |
| **120** | Sand with some mud |
| **150** | Sand with some gravel |
| **170** | Sand with some mud and gravel |
| **210** | Mud with some sand |
| **250** | Mud with some gravel |
| **260** | Mud with some sand and gravel |
| **510** | Gravel with some sand |
| **520** | Gravel with some mud |
| **530** | Gravel with some sand and mud |
| **30** | Mix of sand and mud |
| **60** | Mix of sand and gravel |
| **70** | Mix of mud and gravel |
| **80** | Mix of sand, mud and gravel |

**Are there other datasets available for the region?**

Yes. At a regional scale, the Northeast Data Portal provides an additional sediment estimate resulting from the New England Fishery Management Council’s Fishing Effects model (<https://www.nefmc.org/library/fishing-effects-model> ).

**How did you create the sediment layer?**

This layer is a result of an interpolation of point based samples compiled from different sources, The sources for the sediment information were a combination of: USGS Sediment Texture Database (<https://woodshole.er.usgs.gov/project-pages/sediment/gis-data-catalog.html> ), USGS’ usSEABED database (<https://www.usgs.gov/natural-hazards/coastal-marine-hazards-and-resources/science/accessing-usseabed?qt-science_center_objects=0#qt-science_center_objects>), and data from recent NOS surveys (<https://www.ngdc.noaa.gov/geosamples/survey.jsp>). All these were cleaned to remove erroneous and duplicate values. We also removed samples where percentages could not be easily derived. All the points were interpolated using EBK regression prediction tool from ArcGIS’ Geostatistical Analyst, with Bathymetry and BPI at two different scales as covariates. We interpolated three different surfaces: percentage of sand, percentage of mud, percentage of gravel.

We reclassified the resulting surfaces in 3 classes depending on the percentages. For example, for sand: <25% (absence of sand), 25-75%(sand combined with others), >75% (majority sand). Finally, we combined the three distinct sediment layers into one combined layer.

**What are the limitations of these datasets?**

These layers were created to provide a regional overview of the type of sediment found across the region. They should not be used for navigation or for local-scale surveys.

These layers are based on interpolations from samples from different sources, so their accuracy depends on the source data. The resulting layers are estimates of actual sediment types, not actual observations. Please consider when the samples were taken and their source to determine accuracy of the values for each location.

**When were these last updated?**

These layers were last updated in December 2020.

**How can I find more information about these layers?**

For an overall overview of benthic layers resulting from The Nature Conservancy’s Northwest Atlantic Ecoregional Assessment (NAMERA), please check out this page: <https://www.conservationgateway.org/ConservationByGeography/NorthAmerica/UnitedStates/edc/reportsdata/marine/namera/namera/Pages/default.aspx>

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