

Project Bathymetry Data Analysis

Purpose

The focus for the next several versions of the [product] will involve adding support for new types of data that customers can consume from the appliance. This document will discuss the need for and challenges behind implementing bathymetric data.

The Need for Bathymetry

Bathymetric data has not been requested by customers at the writing of this document. However, [target organization] is currently the [project]'s biggest customer and catering to their operational needs is a great idea to ensure their continued interest in the product. Private maritime organizations may also find interest in [product] with bathymetric data in the event that their employees on the field also find themselves in a situation without stable network connectivity.

Sources for Bathymetric Data

The highest resolution (3 arc-second) bathymetric data found during this period of research was provided by the United States' National Oceanic and Atmospheric Administration (NOAA). NOAA has the ability to generate multibeam sonar bathymetry mosaics using their data which can be seen on an ArcGIS online service they have published (<https://maps.ngdc.noaa.gov/viewers/bathymetry>). This data is available to the public, but can only be processed with a limited number of tiles and survey lines per request using their AutoGrid tool (<https://www.ngdc.noaa.gov/maps/autogrid>). To be able to have all of the data available to the [project] without individual requests, a point of contact within NOAA must be identified and contacted for further discussion. This discussion should also include how regularly their data is updated and how frequently the [project] can have access to these updates (potentially similar to [sister project]).

As for completely open and public data, the only alternatives are the General Bathymetric Chart of the Oceans (GEBCO) grid and ETOPO1. Both offer a 1 arc-minute resolution and are unlikely candidates for something that would be useful to [target organization] and other interested parties.

All of the sources listed so far are raster data and are either in netCDF or Esri ASCII Grid format. Both are easily consumable by ArcGIS and only require a minor addition in logic to handle in [product] based on the code that exists for the other raster types (another geoprocessing tool wrapper).

Implementation Challenges

Loading and offering the bathymetric data along with any code changes to the [component] that are required to allow this to happen should be fairly straightforward. Based on the robust foundation the [product] already has for raster data, the development time shouldn't exceed much beyond a month. The main issue regarding bathymetry is the dialogue with NOAA that has to begin in order to receive the latest data to offer to [project] customers. Talking with NOAA through to the final implementation can take an indefinite amount of time, but if the [product] development team has access to some initial, complete set of the data, that should be enough for now to get started.

Another concern with adding bathymetric data is that any exports involving it through [component] will likely have to be disabled. Water boundaries and oceans being international prevent the current logic from being applied as is to bathymetric exports. Coordination with NOAA to implement AutoGrid for exports on [product] may be something to consider for the future.

Conclusion

The time sinks for offering bathymetric data lie more with potential NOAA communication issues than actual development. This factor is indefinite and the challenges associated with it and acquiring the data may be as great as what the team can already see through the issues with [sister project]. The implementation itself should take about a month and then testing should occur for an additional week based on existing resources on other raster implementations.

Relevant Links

NOAA

<https://maps.ngdc.noaa.gov/viewers/bathymetry/>

<https://gis.ngdc.noaa.gov/arcgis/rest/services>

<https://www.ngdc.noaa.gov/maps/autogrid/>

Esri Conversion

<http://gis.ucar.edu/projects/working-netcdf-esri-arcgis>

Additional Sources

<https://www.gebco.net>

<https://www.ngdc.noaa.gov/mgg/global/>