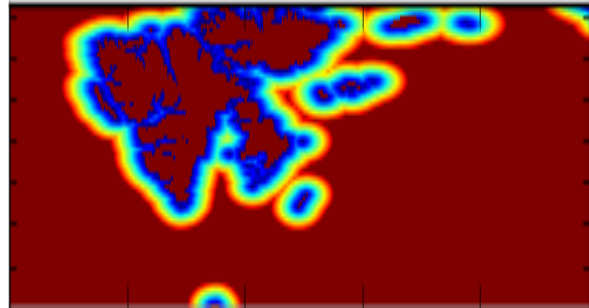# The Land Proximity Layer

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Spitsbergen region

Background.

It is common for grid-interpolation routines to be guided by terrain and environmental data grids over an area, for example slope. Co-Kriging and Random Forest methods do this, but IDW can also be guided by adapting a parameter like search radius to conditions. In dbSEABED search radius expands from the coastline out to sea, because bottom-type patchiness is mostly greater near shore. To do this a gridded layer of distance-from-shoreline is needed. Till recently the grid provided by NAVO has been used. Now a higher-resolution, more comprehensive, fully global grid is computed.

The rationale for this is that inshore sediment facies exhibit strong zonations due to energy, biological ecotones, human interferences. The land-proximity-layer offers a guiding layer correlated with those facets.

Methods.

The primary foundation dataset is the Global Self-consistent, Hierarchical, High-resolution Geography Database (GSHHG; http://www.soest.hawaii.edu/wessel/gshhg/) as shapefile. The "**h**igh resolution version (about 80 % reduction in size and quality) is employed. For all cells in a map area, a k-tree search is done after cropping the GSHHG data to a 3x3 area the size of the map-area of interest. That cropping ensures all land that could possibly register in the map is included. The k-tree operation records the distance of approach of the GSHHG vector points to the cell.

The GSHHG does not record all small or semi-submerged reefs, islets, platforms. Therefore all points of the SRTM30+ world elevations/bathymetry dataset (http://topex.ucsd.edu/WWW_html/srtm30_plus.html) which have elevation >-2m are similarly searched with a k-tree method. This detects most coral reefs as well as extended coastal rock shelves.

Outputs.

This operation is carried on-demand in preparation for compiling dbSEABED for a new map area. A gridding is made for the 'selvage' area (20nm beyond the 'project' area), then interpolated to the 'project' area bounds and resolutions. This is usually a down-sampling operation. At present the land proximity is recorded only out to 25km.

The land-proximity data is useful for adapting interpolation search-radius operations to the near shore, interrogating data which is in the coastal strip, and guiding machine learning methods of interpolation.

CJJ, 28 June 2018, Boulder