**Derived Enviro Layers in dbSEABED**

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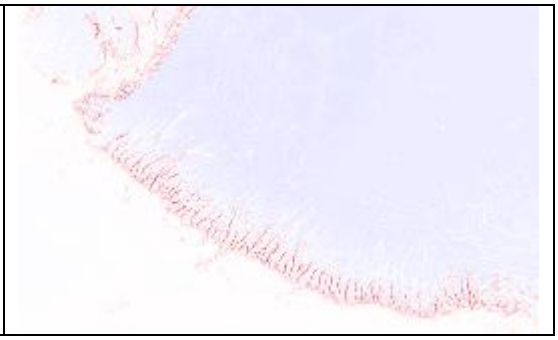

Many grid interpolation/extrapolation routines depend on supporting information to guide data selection and weighting. This is particularly true of the co-kriging and random forest methods.

dbSEABED uses the SRTM 1/120 degree resolution global elevations and the GSSH coastline datasets to derive these layers. Their properties are described here:

(i) Elevations, the raw data extracted from the SRTM Global Elevations dataset, at 1/120dg resolution in layers labelled 'selvage' then at project resolutions for 'project', 'map' and 'box' renditions.
(ii) Slope and aspect (''slp', 'asp') are calculated using Sobel filters as described by ESRI ("http://pro.arcgis.com/en/pro-app/tool-reference/spatial-analyst/how-aspect-works.htm").
(iii) Bathymetric Position Index and Topographic Ruggedness Index ('bpi', 'tri') are un-dimensional metrics of seabed curvature and roughness ("https://www2.unil.ch/biomapper/Download/Wilson-MarGeo-2007.pdf").
(iv) Divergence, Laplacian, Largest Eigenvalue of the Hessian Matrix ('div', 'lap', 'hsn') are calculus-based measures of terrain curvature, tending to show canyoning and ridging well. Div is more noise prone and dependent on scale than hsn.
(v) Land Proximity ('prox') is the distance from land in km, with values beyond 51km limited to 51km. This layer follows the NRL dataset, but is available per project for the whole world in dbSEABED. Proximity is a control on the IDW search radius in dbSEABED, decreasing to shore.
(vi) Bottom Water Temperature ('btmp') is a convolution of the WOA 2013 temperatures atlas ("https://www.nodc.noaa.gov/cgi-bin/OC5/woa13/woa13.pl") with the SRTM 30+ topography such that highpoints take the temperature of layers above the bottom of each 0.25dg WOA cell.
(vii) Surface water turbidity ('kd490') represents areas affected by plumes of suspended sediment, mostly coastal river discharges.

The mapbases: 'Project' unprojected, WGS84 spheroid latitude-longitude map area as ordered by the client for the project. 'Selvage' the same area but extended by 20 cells all around so marginal cells can be mapped correctly. The resolution is always as the SRTM, i.e. 1/120dg. 'Map' is the client-ordered area in terms of a projection such as Albers or UTM. The units are often metres or kilometres but may be lat/lon, and map borders are snapped to the nearest kilometer. 'Box' is the same as the Map area but extended all around by 20 km, again for accurate treatment of the marginal cells.

*The figure shows the Chukchi Sea continental slope leading into the Arctic Basin with close submarine canyoning, rendered by HSN (interfluves red).*

*CJJ 29Jan2018, Boulder.*