

A precise calculation of average depth for ETOPO1

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NOAA calculated global ocean average depth as -3688m (https://www.ngdc.noaa.gov/mgg/global/etopo1_ocean_volumes.html), but in their method, there are deviations for distribution of sampling points, especially at high latitude area. Generally, perfect uniform sampling points are needed to calculate precise average depth using digital elevation data such as ETOPO1.

We tried a different method for creating uniform sampling points on spherical surface. Yamaji(2001) created this software called GSS generator(GSS). The GSS makes almost perfect uniform sampling points on sphere, but not on WGS84 ellipsoid. Therefore we compared the two methods, and performed a statistical analysis for both methods.

We found that the two methods produced similar average depth values and the errors, and that the average depth of ETOPO1 is $3685.9 \pm 0.5\text{m}$ and about 2m shallower than NOAA's 3688m value.

Keywords: ETOPO1, average depth, GSS Generator