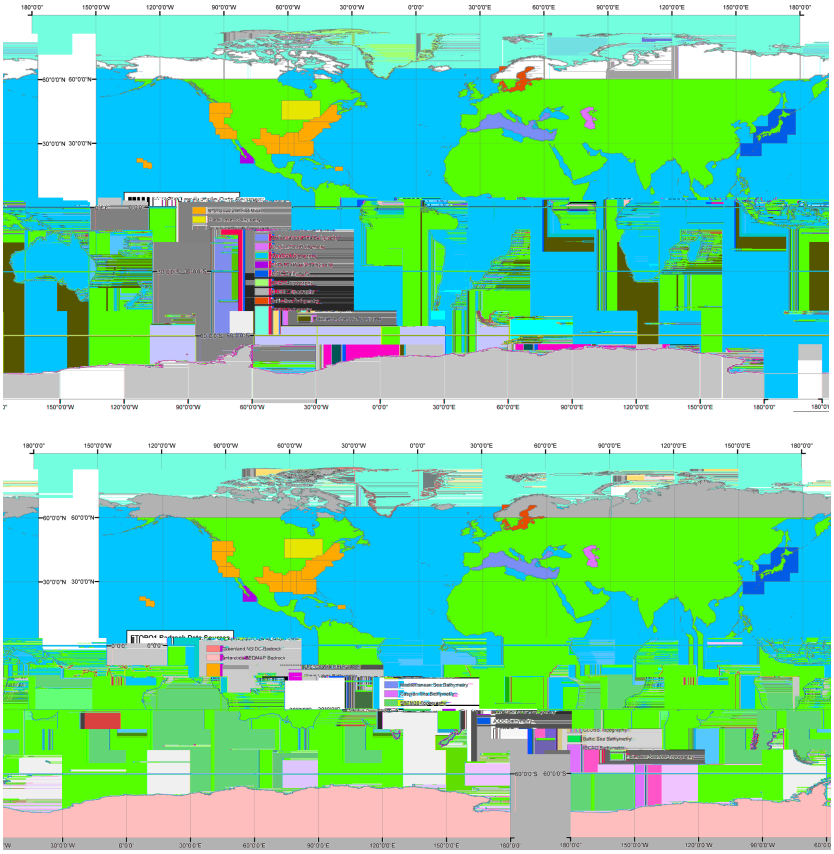
Data Sources

The Ice Surface and Bedrock versions of ETOPO1 were built from the same data sources with two exceptions: the RAMP topography of the Antarctic Ice Sheet surface, and bedrock DEMs for each ice sheet. All datasets were converted to WGS84 geographic coordinates before building ETOPO1. Caspian Sea data were shifted vertically to mean sea level to be consistent with the other datasets.



Citation

Eakins, B.W. and G.F. Sharman, Volumes of the World's Oceans from ETOPO1, NOAA National Geophysical Data Center, Boulder, CO, 2010.

Global

GLOBE Topography

The Global Land One-kilometer Base Elevation dataset is a thoroughly designed, documented and reviewed 30 arc-second (~1 km) topographic relief model of Earth that was created by

NGDC (now NCEI). It was created by combining topographic data sets from U.S. and foreign agencies. ETOPO1 incorporates GLOBE topographic data in regions outside the SRTM data coverage area, principally north of 60° N. See the Data Access tab for more information.

SRTM30 Global Topography

The Space Shuttle Radar Topography Mission (SRTM) collected topographic height measurements between 56° S and 60° N during an 11-day mission in Feb 2000. NGDC (now NCEI) extracted non-zero values from 30 arc-second grids of the SRTM data for use in building ETOPO1; the SRTM grids contain "zero" values over the open ocean.
More Information

Regional

Baltic Sea Bathymetry

The Leibniz Institute for Baltic Sea Research Warnemünde (IOW) has created two integrated bathymetric-topographic grids of the Baltic Sea: a roughly 2-km grid spanning the entire sea, and a roughly 1-km grid spanning the southwestern entrance to the sea. NGDC (now NCEI) extracted the bathymetric data for use in building ETOPO1.
More Information

Caspian Sea Bathymetry

Bathymetric contours of the Caspian Sea were obtained from the Caspian Environment Programme. NGDC (now NCEI) gridded the contours using a tight spline tension to infill depths between contours. This grid was shifted 28-m vertically to be consistent with mean sea level before use in building ETOPO1.
More Information

Gulf of California Bathymetry

A previously created 7 arc-second grid of multibeam swath sonar bathymetric surveys in the mouth of the Gulf of California was used in building ETOPO. This grid is not currently available to the public, though all of the multibeam swath sonar bathymetry data can be obtained from NCEI's multibeam bathymetry database.

IBCAO Bathymetry

The International Bathymetric Chart of the Arctic Ocean (IBCAO), is an integrated bathymetric-topographic grid. ETOPO1 incorporates bathymetry north of 65° N and Greenland topography from version 2.0, the most recent version.
More Information

JODC Bathymetry

The Japan Oceanographic Data Center (JODC) has created 500-m bathymetric grids of the seafloor surrounding Japan, derived from a huge amount of depth-sounding survey data.
More Information

Mediterranean Sea Bathymetry

The Mediterranean Science Commission (CIESM) has promoted the production of a morpho-bathymetric map of the Mediterranean Sea derived from multibeam swath sonar surveys. A 1-km grid of this data was graciously provided to NGDC by Benoit Loubrieu (Ifremer), which was used in building ETOPO1.
More Information

U.S. Coastal Relief Model

The Coastal Relief Model (CRM) is a 3 arc-second (~90 m) grid that integrates land elevations and ocean depths, providing a comprehensive view of the U.S. coastal zone. The CRM covers the East and West Coasts, Gulf of Mexico, Hawaii and Puerto Rico. This integrated bathymetric-topographic grid was extracted at 15 arc-seconds for use in building ETOPO1.
More Information

Ice Surface

Antarctica RAMP Topography

The National Snow and Ice Data Center (NSIDC) built a high-resolution digital elevation model of Antarctica's ice surface, derived from the Radarsat Antarctic Mapping Program (RAMP). NGDC (now NCEI) utilized the 400-m grid, version 2 in building the ETOPO1 Ice Surface grid.
More Information

Bedrock

Antarctica BEDMAP Bedrock

The British Antarctic Survey has integrated all available Antarctic ice sheet data into a series of grids, including ice surface, ice thickness, bedrock, at 5-km cell size: the BEDMAP project. NGDC (now NCEI) resampled the bedrock grid to 1 arc-minute and used it in building the ETOPO1 Bedrock grid.
More Information

Greenland NSIDC Bedrock

The National Snow and Ice Data Center (NSIDC) has built 5-km ice surface, ice thickness and bedrock elevation grids of Greenland. NGDC (now NCEI) utilized the bedrock grid, resampled to 30 arc-second cell size, in building the ETOPO1 Bedrock grid.
More Information

Coastlines

Two coastline datasets were used to evaluate individual source data and ETOPO1. They were also used to clip some data sets to the coastline to eliminate anomalous values.

Antarctic Digital Database

A medium-resolution coastline for Antarctica, south of 60° S, created by the British Antarctic Survey. The database is managed by the Scientific Committee on Antarctic Research.
More Information

Global Self-consistent Hierarchical High-resolution Shoreline (GSHHS)

A high-resolution shoreline data set amalgamated from two databases in the public domain. The data have undergone extensive processing and are free of internal inconsistencies such as erratic points and crossing segments.
More Information