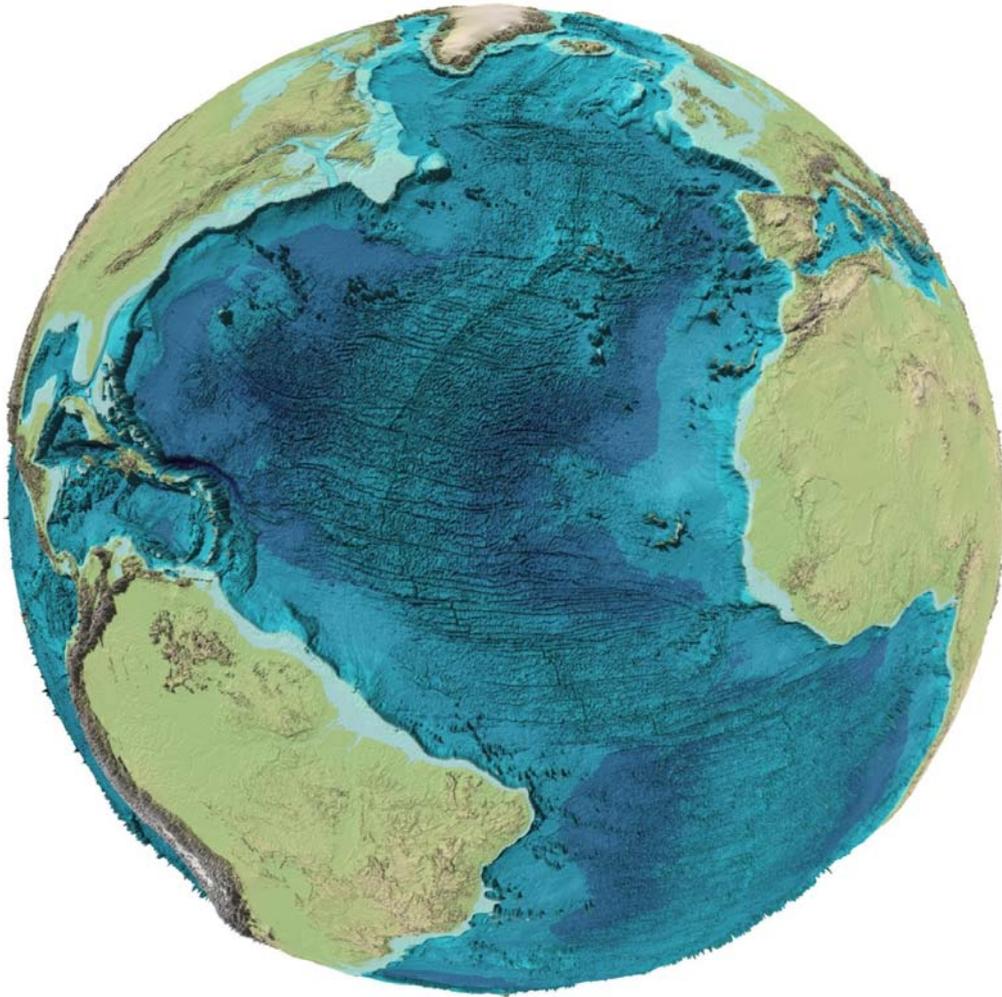


General Bathymetric Chart of the Oceans (GEBCO)

The GEBCO_08 Grid



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Preface

The General Bathymetric Chart of the Oceans (GEBCO) consists of an international group of experts who work on the development of a range of bathymetric data sets and data products, with the aim of providing the most authoritative, publicly-available bathymetric grids for the world's oceans.

GEBCO operates under the joint auspices of the International Hydrographic Organization (IHO) and the Intergovernmental Oceanographic Commission (IOC) of UNESCO.

This document provides information on GEBCO's latest gridded product, the GEBCO_08 Grid.

Find out more about GEBCO from our web site: www.gebco.net

1. Introduction – The GEBCO_08 Grid

The GEBCO_08 Grid is a continuous terrain model for ocean and land with a spatial resolution of 30 arc-seconds.

The bathymetric portion of the grid has largely been generated from a database of ship-track soundings with interpolation between soundings guided by satellite-derived gravity data. However, in areas where they improve on the existing GEBCO_08 grid, data sets generated by other methods have been included.

Further information on the data sources used to generate the grid is given in the **Grid contents** section below. Details of the **update history** of the grid are given below.

For information on the data sets referenced in this document, identified by bracketed numbers, please see the **References and Links** section below.

The grid was initially developed as a collaborative effort by the following organisations:

- The General Bathymetric Chart of the Oceans (GEBCO)
- International Hydrographic Bureau (IHB)
- The US National Geospatial-Intelligence Agency (NGA)
- The US National Oceanic and Atmospheric Administration (NOAA)
- The US Naval Oceanographic Office (NAVO)
- Scripps Institution of Oceanography (SIO)
- The UK Natural Environment Research Council (NERC)

2. Data set update history

The GEBCO_08 Grid was first released in January 2009. It is our aim to continually update the grid as new data sets become available. The table below gives information on the update history of the GEBCO_08 Grid.

The current version of the grid is: 20100927 – released in October 2010

For further information on the data sets used to update the GEBCO_08 Grid please see the annexes at the end of this document.

Grid version number	Updated region	Annex	Grid release date
20100927	Weddell Sea: Bathymetric Chart of the Weddell Sea (BCWS), grid provided by the Alfred Wegener Institute for Polar and Marine Research (AWI).	B.3	October 2010
20100927	Black Sea: gridded data set provided by John K. Hall.	B.2	October 2010

20100927	Caspian Sea: gridded data set provided by John K. Hall.	B.1	October 2010
20091120	Arctic Ocean (north of 64°N): International Bathymetric Chart of the Arctic Ocean (IBCAO).	A.1	December 2009

3. Grid contents

3.1 Bathymetry data

The bathymetric portion of the GEBCO_08 Grid was produced by combining the published Smith and Sandwell global topographic grid ⁽¹⁾ between latitudes 80°N and 81°S (version 11.1, September, 2008) with a database of over 290 million bathymetric soundings.

Within the Smith and Sandwell global topographic grid, the predicted depths are based on version V16.1 of the Sandwell and Smith gravity anomaly from Geosat and ERS 1 satellite altimetry, ⁽²⁾ created in March 2007.

Bathymetric sounding data sets and compilation grids of measured bathymetry from a number of sources have been used to generate the grid, including:

- Bathymetric soundings from the GEODAS data set maintained by the International Hydrographic Organization (IHO) Data Center for Digital Bathymetry (DCDB) at the US National Geophysical Data Center (NGDC). ⁽³⁾
- Bathymetric grids and data files from the marine geology and geophysics community, including contributions from the Lamont Doherty Earth Observatory (LDEO) Ridge Multibeam Synthesis Project, ⁽⁴⁾ GEOMAR, National Science Foundation (NSF) Polar Programs, the School of Ocean and Earth Science and Technology (SOEST) at the University of Hawaii at Manoa and the WHOI/GLOBEC programme.
- Swath bathymetry grids from Scripps Institution of Oceanography multibeam cruises.
- Multibeam grids contributed by the Japan Agency for Marine-Earth Science and Technology (JAMSTEC). ⁽⁵⁾
- The US National Geophysical Data Center (NGDC) Coastal Relief Model. ⁽⁶⁾
- Multibeam grids from “Law of the Sea” work for areas around Alaska and the Arctic, the Marianas, Kingman Reef and Palmyra Atoll, the Western Atlantic Ocean and the Gulf of Mexico from the Center for Coastal and Ocean Mapping/Joint Hydrographic Center at the University of New Hampshire, USA. ⁽⁷⁾
- Bathymetric soundings contributed by the Institut Français de Recherche pour L’Exploitation de la Mer (IFREMER) from centre beam data from over 100 cruises.
- The Arctic bathymetry (north of 64°N) is taken from version 2.23 of the International Bathymetric Chart of the Oceans (IBCAO). ⁽⁸⁾

- The Geological Survey of Ireland (GSI) provided a bathymetric grid for Irish designated waters based on multibeam surveys carried out between 2000 and 2006 as part of the Irish National Seabed Survey. ⁽⁹⁾
- OLEX, a private company in Norway made available to GEBCO a sub-sample of their marine sounding data, which greatly improves the GEBCO DTM in shallow water areas, especially in the North Atlantic. ⁽¹⁰⁾
- In some shallow water areas (shallower than 300m), bathymetry data have been provided by a number of the International Hydrographic Organization's (IHO) Member States. This work has been done through a project, coordinated by the International Hydrographic Bureau (IHB), to extract shallow water bathymetry data from Electronic Navigation Charts (ENCs).
- Bathymetric grid for the Black Sea region ^(16; Annex B.2) supplied to GEBCO by Dr. John Hall, Geological Survey of Israel (retired).
- Bathymetric grid for the Caspian Sea region ^(16; Annex B.1) supplied to GEBCO by Dr. John Hall, Geological Survey of Israel (retired).
- Bathymetric grid for the Weddell Sea region ^(17; Annex B.3) supplied to GEBCO by the Alfred Wegener Institute for Polar and Marine Research (AWI).

3.2 Land data

For the area north of Antarctica, the land data are based on the 1-km averages of topography derived from version 2.0 of the US Geological Survey SRTM30 gridded digital elevation model data product ⁽¹¹⁾ created with data from the US National Aeronautics and Space Administration (NASA) Shuttle Radar Topography Mission ⁽¹²⁾ and, for high latitudes where SRTM data are not available, the US Geological Survey GTOPO30 data set. ⁽¹³⁾

For the area around Antarctica, the land data are taken from the Geoscience Laser Altimeter System (GLAS) instrument on the Ice, Cloud, and land Elevation Satellite (ICESat) laser altimetry digital elevation model. ⁽¹⁴⁾

4. GEBCO_08 Source Identifier (SID) Grid

The GEBCO_08 Grid is accompanied by a 'source identifier' (SID) grid. This data set identifies which grid cells in the GEBCO_08 Grid are based on bathymetric soundings or bathymetric depth values from grids and which cells contain predicted depth values. Further information about the format and coding of the data set is given below.

For future releases, it is planned that the SID grid will contain an identifier code, which will identify the individual surveys used to generate the data set.

5. Development of the GEBCO_08 grid

The SRTM30_plus data set ⁽¹⁵⁾, from which the GEBCO_08 grid derives, was originally developed in 2004. Version 5.0, on which this data set is based, was released in September 2008.

This version has gone through six iterations of identifying apparent bad sounding tracks, editing the offending profiles and constructing a new grid.

The GEBCO_08 Grid is a development product, which will undergo periodic update. We expect that errors will be found, mostly in the predicted bathymetry; we also expect some artifacts where the areas of predicted bathymetry joins surveyed areas.

See the GEBCO_08 Grid errata page for information on known bugs in the dataset.

http://www.bodc.ac.uk/help_and_hints/errata/gebco/gebco_08.html

If you find any anomalies in the grid then please report them via e-mail (enquiries@bodc.ac.uk), giving the problem location, and we will investigate.

6. Grid format

Within the netCDF files for the GEBCO_08 Grid and GEBCO_08 SID Grid, the data are stored as one-dimensional arrays of 2-byte signed integer values.

The complete data sets give global coverage and each file consists of 21,600 rows x 43,200 columns, resulting in 933,120,000 data points. The data start at the Northwest corner of the files, i.e. for the global files, position 89° 59' 45''N, 179° 59' 45''W and are arranged in latitudinal bands of 360 degrees x 120 points/degree = 43,200 values. The data range eastward from 179° 59' 45''W to 179° 59' 45''E. Thus, the first band contains 43,200 values for 89° 59' 45''N, then followed by a band of 43,200 values at 89°59' 15''N and so on at 30 arc-second latitude intervals down to 89° 59' 45''S.

The data values are pixel centre registered i.e. they refer to data values at the centre of grid cells.

The data are suitable for use with the Generic Mapping Tools (GMT) software system <http://gmt.soest.hawaii.edu/>

7. Data coding

7.1 GEBCO_08 Grid

The data values within the GEBCO_08 Grid represent elevations in metres, with negative values for bathymetric depths and positive values for topographic heights.

7.2 GEBCO_08 SID Grid

The table below details the coding of the GEBCO_08 Source Identifier (SID) grid. It includes a description of the data source that the corresponding grid cell in the GEBCO_08 Grid is based on at each location.

SID file coding	Description
0	<p>The grid value at this location has been developed from a database of ship-track soundings with interpolation between soundings guided by satellite-derived gravity data.</p> <p>At this location in the grid, the data value has been interpolated.</p>
9999	<p>The grid value at this location has been developed from a database of ship-track soundings with interpolation between soundings guided by satellite-derived gravity data.</p> <p>At this location, the grid cell has been constrained by a bathymetric sounding(s) data during the gridding process.</p>
-8888	<p>The grid value at this location has a positive value (+ve), i.e. is coded as land.</p>
110	<p>The grid value at this location is taken from the Caspian Sea grid, (see Annex B.1). This grid has been generated from a data set of soundings using a kriging gridding algorithm.</p> <p>SID grid cells which contain a sounding(s) from the Caspian Sea source data set are coded as '1100'.</p>
120	<p>The grid value at this location is taken from the Black Sea grid, (see Annex B.2). This grid has been generated from a data set of soundings using a kriging gridding algorithm.</p> <p>SID grid cells which contain a sounding(s) from the Black Sea source data set are coded as '1200'.</p>
130	<p>The grid value at this location is taken from the Weddell Sea grid, (see Annex B.3). This grid has been generated from a data set of bathymetric contours based largely on multi-beam and single beam bathymetric surveys.</p>

	SID grid cells which contain trackline control from the Weddell Sea source data set are coded as '1300'.
1000	The grid value at this location is taken from version 2.23 of the International Bathymetric Chart of the Arctic Ocean (IBCAO), (see Annex A.1).
1100	The grid value at this location is taken from the Caspian Sea grid, (see Annex B.1). The grid cell at this location contains a sounding(s) from the Caspian Sea source data set. For the Caspian Sea grid, cells which do not contain a sounding(s) are coded as '110'.
1200	The grid value at this location is taken from the Black Sea grid, (see Annex B.2). The grid cell at this location contains a sounding(s) from the Black Sea source data set. For the Black Sea grid, cells which do not contain a sounding(s) are coded as '120'.
1300	The grid value at this location is taken from the Weddell Sea grid, (see Annex B.3). This grid has been generated from a data set of bathymetric contours based largely on multi-beam and single beam bathymetric surveys. The grid cell at this location is 'crossed' by trackline control information, i.e. survey track or isolated sounding, from the Weddell Sea source data set. For the Weddell Sea grid, cells which do not contain trackline control are coded as '130'.

8. Data set attribution

If the data sets are used in a presentation or publication then we ask that you acknowledge the source. This should be of the form (including the appropriate version number):

For the GEBCO_08 Grid:

'The GEBCO_08 Grid, version 20100927, <http://www.gebco.net>'.

For the GEBCO_08 SID Grid:

'The GEBCO_08 SID Grid, version 20100927, <http://www.gebco.net>'.

The version number of the grid is given in the header information within the grid file.

9. Terms of use

Data within the GEBCO_08 Grid are subject to copyright and database right restrictions.

Reproduction of the gridded bathymetry data in derivative form for scientific research, environmental conservation, education or other non-commercial purposes is authorised without prior permission, providing the source material is properly credited.

The production of these gridded data sets is the result of an international collaboration of numerous scientists and hydrographers who have devoted much of their time and effort, often on a voluntary basis. This work was stimulated by a wish to create an authoritative, high-quality bathymetry of the world's oceans for the benefit of all.

Therefore, we ask that you contact us first, should you wish to pass on the data to third parties or use the data for commercial purposes.

In the first instance, please contact the British Oceanographic Data Centre (BODC) enquiries@bodc.ac.uk and include a clear statement of the purpose for which the material will be used and the manner in which it will be reproduced.

In the case of commercial activities, a contribution may be requested for the further improvement of GEBCO's data sets.

10. Disclaimer

THE GEBCO_08 GRID IS NOT TO BE USED FOR NAVIGATION OR FOR ANY OTHER PURPOSE RELATING TO SAFETY AT SEA.

Information in the GEBCO_08 grid has been obtained from sources believed to be reliable but its accuracy and completeness cannot be guaranteed. Whilst every effort has been made to ensure its reliability within the limits of present knowledge, no responsibility can be accepted by those involved in its compilation or publication for any consequential loss or damage arising from its use.

The GEBCO_08 grid is essentially a deep ocean product and does not include detailed bathymetry for shallow shelf waters. Even to the present day, most areas of the world's oceans have not been fully surveyed and, for the most part, bathymetric mapping is an interpretation based on random tracklines of data from many different sources. The quality and coverage of data from these sources is highly variable. Although the GEBCO_08 grid is presented at 30 arc-second intervals of latitude and longitude, this does not imply that knowledge is available on sea floor depth at this resolution - the depth in most 30 arc-second squares of the world's oceans has yet to be measured.

11. References and links

- (1) Smith, W. H. F., and D. T. Sandwell, Global seafloor topography from satellite altimetry and ship depth soundings, *Science*, v. 277, p. 1957-1962, 26 Sept. 1997
ftp://topex.ucsd.edu/pub/global_topo_1min
<http://topex.ucsd.edu/sandwell/publications/74.pdf>
- (2) Sandwell, D. T., W. H. F. Smith, Marine gravity anomaly from Geosat and ERS 1 satellite altimetry, *Journal of Geophysical Research*, v. 102 , No. B5, p. 10039-10054, 1997.
ftp://topex.ucsd.edu/pub/global_grav_1min
<http://topex.ucsd.edu/sandwell/publications/71.pdf>
- (3) GEODAS data set at the IHO Data Center for Digital Bathymetry at the US National Geophysical Data Center (NGDC)
<http://www.ngdc.noaa.gov/mgg/bathymetry/iho.html>
- (4) Lamont Doherty Earth Observatory (LDEO) Ridge Multibeam Synthesis Project:
<http://www.ldeo.columbia.edu/research/marine-geology-geophysics/ridge-multibeam-bathymetry-synthesis>
- (5) JAMSTEC Data Site for Research Cruises
<http://www.jamstec.go.jp/cruisedata/e/>
- (6) The US National Geophysical Data Center (NGDC) Coastal Relief Model: Divins, D.L., and D. Metzger, NGDC Coastal Relief Model,
<http://www.ngdc.noaa.gov/mgg/coastal/coastal.html>
(Data from Puerto Rico and Hawaii is not presently included.)
- (7) Center for Coastal and Ocean Mapping/Joint Hydrographic Center (CCOM/JHC): Law of the Sea Data, UNCLOS, Article 76, extended continental shelf, foot of slope, multibeam bathymetry, seafloor mapping, University of New Hampshire, USA
- (8) The International Bathymetric Chart of the Arctic Ocean (IBCAO) version 2.23: Citation: Jakobsson, M., Macnab, R., Mayer, M., Anderson, R., Edwards, M., Hatzky, J., Schenke, H-W., and Johnson, P., 2008, An improved bathymetric portrayal of the Arctic Ocean: Implications for ocean modeling and geological, geophysical and oceanographic analyses, v. 35, L07602, *Geophysical Research Letters*, [doi:10.1029/2008GL033520](https://doi.org/10.1029/2008GL033520)
- (9) Gridded bathymetry data for Irish designated waters, based on multibeam surveys, provided by the Geological Survey of Ireland (GSI). High-resolution grids of the GSI multibeam data can be accessed from: <https://jetstream.gsi.ie/iwdds/index.html>
- (10) Gridded bathymetry data for shallow water areas around the Northwest European Shelf derived from single beam-echosounder data collected by fishing vessels. The data have been provided by Olex AS.

(11) SRTM30 data and documentation:

<http://www2.jpl.nasa.gov/srtm/cbanddataproducs.html>

(12) Shuttle Radar Topography Mission (SRTM)

<http://www2.jpl.nasa.gov/srtm/>

(13) GTOPO30 Global 30 Arc Second Elevation Data

http://eros.usgs.gov/#/Find_Data/Products_and_Data_Available/gtopo30_info

(14) The Geoscience Laser Altimeter System (GLAS) instrument on the Ice, Cloud, and land Elevation Satellite (ICESat) laser altimetry digital elevation model:

DiMarzio, J., A. Brenner, R. Schutz, C. A. Shuman, and H. J. Zwally. 2007.

GLAS/ICESat 500 m laser altimetry digital elevation model of Antarctica. Boulder, Colorado USA: National Snow and Ice Data Center. Digital media

(15) SRTM30_plus, J.J. Becker, David T. Sandwell et al

ftp://topex.ucsd.edu/pub/srtm30_plus

(16) Bathymetric compilations of the seas around Israel I: The Caspian and Black Seas, J.K. Hall, Geological Survey of Israel, Current Research, Vol. 13, December 2002.

(17) Schenke, H.-W., Dijkstra, S., Niederjasper, F., Hinze, H., Hoppmann, B., Schöne, T. (1998). The new bathymetric charts of the Weddell Sea: AWI BCWS, In: Ocean, ice, and atmosphere : interactions at the Antarctic continental margin / Stanley S. Jacobs and Raymond F. Weiss (eds.). - Washington, DC: American Geophysical Union, 1998, (Antarctic Research Series;75) 371-380.

(18) Antarctic Digital Database (ADD) CD-ROM published in 1993 by the ICSU Scientific Committee on Antarctic Research (SCAR) and compiled jointly by the British Antarctic Survey, the Scott Polar Research Institute and the World Conservation Monitoring Centre; Cambridge, UK.

<http://www.add.scar.org:8080/add/>

(19) Jezek, K. C., and the RAMP Product Team, 2002. RAMP AMM-1 SAR Image Mosaic of Antarctica. Fairbanks, AK: Alaska SAR Facility, in association with the National Snow and Ice Data Center, Boulder, CO. Digital media.

<http://nsidc.org/data/nsidc-0082.html>

Annexes: Descriptions of the data sets used to update the GEBCO_08 Grid

1. Annex A.1: International Bathymetric Chart of the Arctic Ocean (IBCAO)
2. Annex B.1: The Caspian Sea
3. Annex B.2: The Black Sea
4. Annex B.3: The Weddell Sea

Annex A.1

International Bathymetric Chart of the Arctic Ocean (IBCAO)

Included in: version 20091120 of the GEBCO_08 Grid, released in November 2009

Data set coverage: 64°N - 90°N; 180°W - 180°E.

Data set provider: IBCAO, supplied to GEBCO on behalf of the IBCAO by Prof. Martin Jakobsson, Stockholm University, Sweden

Version 2.23 of the IBCAO data set, sampled to 30 arc-second intervals, was supplied to GEBCO for updating the GEBCO_08 Grid. The edge-matching of the data sets at 64°N was carried out using a feather-blending routine, part of the Global Mapper v11.01 software package.

Further details about the IBCAO data set along with grids and maps for downloading can be found at <http://www.ibcao.org>

Annex B.1

The Caspian Sea

Included in: version 20100927 of the GEBCO_08 Grid, released in October 2010

Data set coverage: 46° 40'E – 54° 2'E; 36° 31'N – 47°N

Data set provider: Dr. John K. Hall, Geological Survey of Israel (retired)
(jkh1@012.net.il)

Information on the data set is given below and further details can be found in:
Bathymetric compilations of the seas around Israel I: The Caspian and Black Seas, J.K. Hall, Geological Survey of Israel, Current Research, Vol. 13, December 2002. ⁽¹⁶⁾

Data source and gridding method

The grid was generated from over 280,000 bathymetric soundings and points digitised from bathymetric contours, taken from 107 Russian hydrographic charts, on a Mercator projection relative to the Pulkovo 1942 datum.

The digitised soundings and contour data were converted from Mercator projection co-ordinates to x,y,z values on a Universal Transverse Mercator (UTM) projection on the WGS 84 datum using Global Mapper software.

The data, in UTM co-ordinates, were then gridded using a kriging algorithm from Golden Software Inc.'s Surfer software package using 100m interval grid spacing.

The 100m interval UTM grid was converted to geographic co-ordinates, with grid intervals of three arc-seconds. Due to the Caspian Sea's lower sea level stand, 28m was added to the depths in the grid, using Global Mapper software. The data set was supplied to GEBCO at this resolution.

Inclusion of the Caspian Sea grid into the GEBCO_08 Grid

The grid was sampled to 30 arc-second intervals using 'grdsample' from Generic Mapping Tools (GMT, <http://gmt.soest.hawaii.edu/>).

Quality control checks were carried out on the data set, looking for artifacts in the gridded data. This was done by comparing the gridded data set with the source sounding and contour data. Any artifacts noted in the grid were removed.

The Caspian Sea grid was then incorporated into the GEBCO_08 Grid. This was achieved by firstly extracting grid points (largely land elevation) from the GEBCO_08 Grid that fell outside the geographic coverage of the Caspian Sea grid. These data were converted to ASCII x,y,z values. An ASCII x,y,z file of data values was created from the Caspian Sea grid and the data sets were combined and then gridded at 30 arc-second intervals using 'Surface' (a minimum tension surface gridding algorithm) from GMT.

Annex B.2

The Black Sea

Included in: version 20100927 of the GEBCO_08 Grid, released in October 2010

Data set coverage: 26°E – 41° 46'E; 40°N – 47° 15'N

Data set provider: Dr. John K. Hall, Geological Survey of Israel (retired)
(jkh1@012.net.il)

Information on the data set is given below and further details can be found in:
Bathymetric compilations of the seas around Israel I: The Caspian and Black Seas, J.K. Hall, Geological Survey of Israel, Current Research, Vol. 13, December 2002. ⁽¹⁶⁾

Data source and gridding method

The grid was generated from over 196,400 bathymetric soundings digitised from Russian hydrographic charts, on a Mercator projection, relative to the WGS 72 and Pulkovo 1942 datums.

The data were gridded using a kriging algorithm from Golden Software Inc.'s Surfer software package. The gridded was converted to geographic co-ordinates (relative to WGS 84) and the data set was supplied to GEBCO at 15 arc-second grid intervals.

Inclusion of the Black Sea grid into the GEBCO_08 Grid

The Black Sea grid was sampled to 30 arc-second intervals using 'grdsample' from Generic Mapping Tools (GMT, <http://gmt.soest.hawaii.edu/>).

Quality control checks were carried out on the data set, looking for artifacts in the gridded data set. This was done by comparing the gridded data set with the source sounding data. Any artifacts noted in the grid were removed.

The Black Sea grid was then incorporated into the GEBCO_08 Grid. This was achieved by firstly extracting grid points (largely land elevation) from the GEBCO_08 Grid that fell outside the geographic coverage of the Black Sea grid. These data were converted to ASCII x,y,z values. An ASCII x,y,z file of data values was created from the Black Sea grid and the data sets were combined and then gridded at 30 arc-second intervals using 'Surface' (a minimum tension surface gridding algorithm) from GMT.

Annex B.3

The Weddell Sea - Bathymetric Chart of the Weddell Sea (BCWS)

Included in: version 20100927 of the GEBCO_08 Grid, released in October 2010

Data set coverage: 60°S to 66°S; 75°W to 15°W, 66°S to 79°S; 65°W to 2°E

Data set provider: Alfred Wegener Institute for Polar and Marine Research (AWI), <http://www.awi.de>

Data source and gridding method

The bathymetric grid was generated at AWI from the contours of the Bathymetric Chart of the Weddell Sea (BCWS). ⁽¹⁷⁾ Further information about the BCWS is given below.

Bathymetric Chart of the Weddell Sea (BCWS)

The BCWS ⁽¹⁷⁾ is a 1:1,000,000 map series plus a 1:3,000,000 master sheet based on compilations of bathymetric data in the Weddell Sea. This data set consists of bathymetric contour lines, generally at interval of 100m, but at 50m in the southern Weddell Sea.

Chief Editor: Dr. Hans Werner Schenke (AWI)

Publication dates: 1998-2001

Data set Digital Object Identifier (DOI): [doi:10.1594/PANGAEA.708081](https://doi.org/10.1594/PANGAEA.708081)

Further information about the BCWS is given on [AWI's web site](#).

Grid preparation

The bathymetric contour data from the BCWS were gridded in Mercator projection coordinates. Firstly, a Triangulated Irregular Network (TIN) grid was created from the contour lines using the Douglas-Peucker algorithm.

The TIN was converted to a grid with a regular cell spacing using Natural Neighbours interpolation with a cell size of 250m. The grid was then projected from Mercator to geographic coordinates with a cell size of 30 arc-seconds.

Coastline data from the Scientific Committee on Antarctic Research (SCAR) Antarctic Digital Database (ADD) ⁽¹⁸⁾ was used to mask land and ice shelf areas from the interpolated grid.

Inclusion of the Weddell Sea grid into the GEBCO_08 Grid

The grid generated from the BCWS contours was then incorporated into the GEBCO_08 Grid. This was done using a feather-blending routine, part of the Global Mapper v11.01 software package.

Data for land and ice shelf areas is largely taken from 500m laser altimetry Digital Elevation Model (DEM) derived from measurements of the Geoscience Laser Altimeter System (GLAS) instrument on the Ice, Cloud, and Land Elevation Satellite (ICESat). ⁽¹⁴⁾ However, for some of the island groups to the west and north of the Antarctic Peninsula, including the South Orkney Islands, South Shetland Islands, Adelaide Island, Lavoisier Island, Renauld Island, Anvers Island, Brabant Island and Trinity Island the land data are taken from the Radarsat Antarctic Mapping Project (RAMP) DEM, Version 2, (400m raster) ⁽¹⁹⁾.