GEBCO Sheet G.04
(NE Atlantic off the Iberian Peninsula)

Sheet G.04 is a composite of three bathymetric compilations:

A. Bathymetric Chart of the Bay of Biscay, published in 1994, and compiled by Jean-Claude Sibuet, Serge Monti and Guy Pautot, Centre de Brest, Institut Francais de Recherche de l'Exploitation de la Mer (IFREMER), France

B. Sheet 1.01 of the International Bathymetric Chart of the Central Eastern Atlantic (IBCEA) published in February 2002 by the Instituto Hidrografico, Lisbon, Portugal. Scientific coordinator: Jean-Rene Vanney (Universites Pierre et Marie Curie et Paris-Sorbonne, France) in collaboration with Denis Mougenot (Compagnie Generale de Geophysique, France)

C. Bathymetric compilation of the area between Madeira and the Strait of Gibraltar compiled for GEBCO in 2000 by Peter Hunter, Southampton Oceanography Centre (SOC), United Kingdom

Sheet Limits: 31°N - 48°N; 18°W - 0°W (see below for detailed coverage)

Scale: Bay of Biscay (1:1.2 million); IBCEA Sheet 1.01 (1:1 million); Madeira/Strait of Gibraltar (1:500,000).

Horizontal datum: WGS-84

Contour Units: Bathymetric depth in corrected metres

Contours present: Bay of Biscay and IBCEA Sheet 1.01 contain contours at 200m intervals - also included in the digital data, but not on the published charts, are contours at 500m and at 1000m intervals thereafter. IBCEA Sheet 1.01 also includes contours at 50m, 100m and 150m. Madeira/Strait of Gibraltar contains contours at 20m, 50m, 100m and at 100m intervals thereafter. Additional intermediate contours may be found in abyssal areas.

Coastline Source: NIMA World Vector Shoreline at a scale of 1:250,000

Geographic Coverage:

32°10'N - 42°N; 15°20'W - 5°15'W:
42N° - 47°N; 16W° - 0°W:
47°N - 48°N; 13°W - 11°30'W and 7°30'W - 1°W:
plus an irregular area within 31°N - 32°40'N; 18°W - 14°W.

Within the above area, IBCEA Sheet 1.01 was used in the area north of 36°N between 15°20'W and 7°20'W; and south of 44°N

between 12°W and 7°20'W but south of 43°N between 15°20'W and 12°W.

Digitization: Contours and tracklines for Areas A and C were digitized by BODC while contours for Area B were digitized by Instituto Hidrografico, Lisbon.

Published Charts: Sibuet, J-C., Monti, S. and Pautot, G. (1994). New bathymetric map of the Bay of Biscay. C. R. Acad. Sci. Paris, t.318, série II, p.615-625 including map published at a scale of 1:2.4 million. (Chart Limits: 43°N - 49°N; 18°W - 1°W).

Instituto Hidrografico (2002). Sheet 1.01 of the International Bathymetric Chart of the Central Eastern Atlantic (IBCEA) published by the Instituto Hidrografico, Lisbon, Portugal on behalf of the IOC and the IHO. Published at a scale of 1:1 million (Chart Limits: 36°N - 44°N; 15°20'W - 7°20'W).

PREPARATION OF GEBCO SHEET G.04

For the Bay of Biscay (Area A), Jean-Claude Sibuet provided BODC with the 1:1.2 million scale base chart version of the published chart, together with a corresponding chart (at the same scale) showing the multibeam coverage used in its compilation in the form of centre beam tracklines. The contours and tracklines were digitized from this material at BODC. Trackline information for the conventional soundings was taken from the NGDC GEODAS database although it should be noted that they do not fully represent all the conventional soundings used in the compilation. The 500m interval contours (i.e. at 500m, 1500m and at 1000m intervals thereafter) were interpolated from the 200m contours by Peter Hunter (SOC) and these were digitized at BODC.

Prior to its publication, the contours for IBCEA Sheet 1.01 were compiled at a scale of 1:250,000 in the form of a digital database at the Instituto Hidrografico, Lisbon and a DXF formatted copy of these data were submitted to BODC for incorporating into GEBCO. As with the Bay of Biscay chart, the 500m interval contours were interpolated from the 200m contours by Peter Hunter (SOC) and these were digitized at BODC. Trackline control information for IBCEA Sheet 1.01 is limited to a simple source diagram showing the origin of material used in the compilation of the contours in the various areas of the chart - unfortunately, it does not detail the data coverage available in these areas. The source diagram was digitized at BODC, together with the references.

The bathymetry for the Madeira/Strait of Gibraltar region (Area C) was compiled by Peter Hunter at SOC in a series of chartlets at a range of scales from 1:250,000 to 1:500,000. In general, the contouring was carried out at intervals of 100m although intervals of 20m or 50m were often used to better describe abyssal plain regions. Copies of the hand drawn contours were submitted to BODC for digitization and final edge-matching. The tracklines were submitted to BODC in digital form from a database maintained at SOC.

The merging and edge-matching of the contours from the three areas to form GEBCO sheet G.04 was carried out at BODC as was the edge-matching with the surrounding areas of the GEBCO Digital Atlas.

DATA SOURCES USED FOR GEBCO SHEET G.04 (AREA A: Bay of Biscay)

Extensive multibeam data collected by the IFREMER Centre de Brest including:

Seabeam data collected from RV Jean-Charcot from 1977 to 1983, as compiled in Lallemand et al. (1985), and on the Norestlante 3 cruise of 1989

EM12 data acquired on RV Atalante during the 1992 Brest-Dakar transit (Sibuet et al., 1993), the 1991 Sedimanche cruise (Bourillet et al., 1994) and the 1992 Zeegasc cruise (Pautot et al., 1995)

Conventional sounding data were acquired primarily from:

Service Hydrographique et Oceanographique de la Marine (SHOM), France, GEBCO Plotting Sheets: 42 and 43, up to 1989.

Vening Meinesz Laboratorium, Kroonvlag Project soundings compilations at 1:1,000,000 scale. University of Utrecht, The Netherlands.

The following were also consulted:

Lallemand, S., Maze, J.-P., Monti, S. and Sibuet, J.-C. (1985). Presentation d'une carte bathymetrique de l'Atlantique nord-est. C.R. Acad. Sc. Paris, Serie II, 300(4), 145-149. Bathymetric map (scale 1:2.4 million) published by IFREMER, France.

Laughton, A.S., Roberts, D.G. and Graves, R. (1975). Bathymetry of the northeast Atlantic : Mid-Atlantic Ridge to southwest Europe. Deep-Sea Research, 22, 791-810 and Admiralty chart C6568 (scale 1:2.4 million).

DATA SOURCES USED FOR GEBCO SHEET G.04 (AREA B: IBCEA Sheet 1.01)

IBCEA Sheet 1.01 includes a data source diagram where the data source(s) for each area are numerically referenced as follows:

1. Vanney, J.R., Rothwell, R.G. et al. (Groupe Transmarge) (1984). Leve bathymetrique a l'aide du sondeur multifasceaux SEABEAM du versant septentrional du Banc de Galice (marge continentale ouest iberique). Comptes Rendus, Academie des Sciences, Paris, Serie II, 299(3), 115-120.

2. Rojouan, F. (1985). Thesis - Universite de Paris-Sorbonne, France

3. Multibeam contours of Galicia Bank, Tore Seamount, Gorringe Bank and Setbal Canyon. IFREMER, France.

4. Mougenot, D., Kidd, R.B., et al., (1984). Geological interpretation of combined SEABEAM, GLORIA and seismic data from Porto and Vigo Seamounts, Iberian continental margin. Marine Geophysical Researches, 6, 329-363.

5. Vanney, J-R. and Mougenot, D. (1981). La plate-forme continentale du Portugal et les provinces adjacentes: analyse geomorphologique. Memorias dos Servicos Geologicos de Portugal, No. 28, 86 pp. and 41 figs.

   Lusitaine cruises 71,73,74,75; Hesperides cruises 76,78

6. Regnauld, H. (1987). Geormorphologie de la pente continentale du Portugal. Publiations du Department de Geographie de l'Universite de Paris-Sorbonne, No. 15, 141pp.

   Mougenot, D. (1989). Geologia da margem Portuguesa. Instituto Hidrografico, Lisboa, Documentos Tecnicos No. 32, 259pp.

7. Vanney, J-R. and Mougenot, D. (1990). A gouf-type Canyon, the Canhao da Nazare (Portugal). Oceanologica Acta, 13(1), 1-14 and bathymetric chart at scale 1:150,000.
8. H.M.S. Vidal (1959). Unpublished survey. (UK Hydrographic Office).

9. Soundings sheets maintained by IHPT, Instituto Hidrografico, Portugal.

10. Laughton, A.S., Roberts, D.G. and Graves, R. (1975). Bathymetry of the northeast Atlantic : Mid-Atlantic Ridge to southwest Europe. Deep-Sea Research, 22, 791-810 and Admiralty chart C6568 (scale 1:2.4 million).

    Lallemand, S., Maze, J.-P., Monti, S. and Sibuet, J.-C. (1985). Presentation d'une carte bathymetrique de l'Atlantique nord-est. C.R. Acad. Sc. Paris, Serie II, 300(4), 145-149. Bathymetric map (scale 1:2.4 million) published by IFREMER, France.

    Above two charts revised with data from Service Hydrographique et Oceanographique de la Marine (SHOM), France, GEBCO Plotting Sheets: 43 and 60.

DATA SOURCES USED FOR GEBCO SHEET G.04 (AREA C: Madeira - Strait of Gibraltar)

Contours were based on collected oceanic soundings from the following sources:

a) GEBCO Plotting Sheets of Collected Oceanic Soundings, up to 1983. Scale 1:1,000,000. Service Hydrographique et Oceanographique de la Marine (SHOM), Brest, France.

b) GEODAS Marine Trackline Geophysical Dataset, up to 1998. National Geophysical Data Center, NOAA, Boulder, U.S.A.

c) Southampton Oceanography Centre (formerly Institute of Oceanographic Sciences), up to 1998. Natural Environment Research Council, U.K.

The following was widely consulted:

Hunter, P.M., Searle, R.C. and Laughton, A.S. (1983). Bathymetry of the Northeast Atlantic, Sheet 5: Continental Margin Off West Africa, Scale 1:2,400,000. Admiralty Chart C6570, Hydrographer of the Navy, Taunton, U.K.

Detailed surveys were included from the following sources:

Ampere Seamount, scales 1:50,000 and 1:100,000. Unpublished chart. Alfred Wegener Institute, Bremerhaven, Germany.

Auzende, J.M., Monti, S. and Ruellan, E. (1983). Carte Bathymetrique de L'Escarpment de El Jadida (Mazagan), scale 1:100,000. Centre National pour l'Exploitation des Oceans (CNEXO), Brest, France.

R.R.S. 'Discovery' Cruise 144, 1984. Unpublished GLORIA sidescan sonar images. Institute of Oceanographic Sciences, Wormley, U.K.

R.R.S. 'Discovery' Cruise 161, 1986. Unpublished GLORIA sidescan sonar images. Institute of Oceanographic Sciences, Wormley, U.K.

Vanney, J-R and Mougenot, D. (1981). La Plate-forme Continentale du Portugal et les Provinces Ajacentes: Analyses Geomorphologique. Memorias dos Servicos Geologicos de Portugal, Lisboa, No. 28, 86 pp and 41 figures.

Western Approaches to the Strait of Gibraltar, Submarine Topography, Scale 1:1,000,000, 1969. Admiralty chart C6101. Hydrographer of the Navy, Taunton, U.K.