



INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of Unesco)

REPORT OF THE CONSULTATIVE GROUP
ON OCEAN MAPPING (CGOM) TO THE
NINETEENTH SESSION OF THE IOC ASSEMBLY

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This report is submitted to the IOC Assembly in accordance
with clause 1 of the Terms of Reference of the
Consultative Group on Ocean Mapping (CGOM).
It covers the period since the last report of the CGOM
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1. GENERAL BATHYMETRIC CHART OF THE OCEANS (GEBCO)

1.1 GENERAL

1.1.1 The GEBCO project is jointly sponsored by the IOC and the International Hydrographic Organization (IHO). The CGOM, as an IOC subsidiary body, again wishes to pay tribute to the IHO for the excellent close collaboration which characterizes all dealings and discussions held between the two agencies.

1.2 MEETINGS

1.2.1 The Joint IOC-IHO Guiding Committee for the GEBCO has met once during the period covered by this report:

GEBCO-XV International Hydrographic Bureau, Monaco
15-17 May 1995 (ref: doc. IOC-IHO/GEBCO-XV/3).

1.2.2 During the intersessional period the GEBCO Officers have also met once:

GEBCO Officers-X East-West Centre, Honolulu, Hawaii, USA,
3 May 1996 (ref: doc. IOC-IHO/GEBCO Officers-X/3).

1.2.3 The Sub-Committee on Undersea Feature Names (formerly the Sub-Committee on Geographical Names and Nomenclature of Ocean Bottom Features) has met once:

GEBCO SCUFN-XI International Hydrographic Bureau, Monaco,
11-13 May 1995 (ref: doc. IOC-IHO/GEBCO SCUFN-XI/3).

1.2.4 The Sub-Committee on Digital Bathymetry has met twice:

GEBCO SCDB-XII SACLANT Undersea Research Centre, La Spezia,
Italy 9-12 May 1995 (ref: doc. IOC-IHO/GEBCO SCDB-XII/3).

GEBCO SCDB-XIII East-West Centre, Honolulu, Hawaii, USA,
30 April-2 May 1996

1.3. COMPOSITION OF THE GEBCO GUIDING COMMITTEE AND ITS SUB-COMMITTEES

1.3.1 The composition of the GEBCO Guiding Committee and its Sub-Committees, together with a list of Scientific Advisers to the GEBCO, will be found in Annex I.

1.3.2 Mr Desmond P D Scott, retired from the post of Permanent Secretary GEBCO on 31 December 1995 after 25 years in the post. He has been succeeded by Mr Brian Harper, formerly of the United Kingdom Hydrographic Office.

1.4 TRADITIONAL PRINTED PAPER CHART SERIES

1.4.1 Compilation of a new and revised edition of Sheet 5.12 covering the South Atlantic (with the same sheet limits as the previous edition published in 1978) was completed in 1995, and this sheet has now been published as the final sheet in the 5th Edition.

1.4.2 Since the 1st Edition was published in 1905, the traditional approach, in conformity with available technology, has been the publication of printed paper chart series in 24 sheets (reduced to 18 large scale (1:10 million) and a world sheet for the 5th Edition). This approach would, if continued, greatly inhibit the future development of GEBCO. By its very nature, the printed chart sets constraints on the scale, projection and resolution of the information it portrays. Furthermore, the costs and resources necessary to keep the GEBCO regularly updated using traditional cartographic techniques would be prohibitive.

1.4.3 With the rapid development of computing technology, these problems can be readily overcome using digital techniques. It is now possible to maintain the GEBCO in digital form without in any way compromising the high standards of quality to which it has always aspired. Not only does it provide flexibility in the manner in which bathymetry may be displayed and manipulated by the user, but the charts need no longer be constrained to a fixed scale and updating on a regular basis becomes a practical proposition.

1.4.4 The fifth edition of GEBCO has proved a great success - over 60,000 copies have been sold. However if a sixth edition is to be produced, it will be prepared from the updated versions of the GEBCO Digital Atlas (GDA), rather than vice-versa as with the 5th Edition and the first release of the GDA (see Section 1.5 below).

1.5. GEBCO DIGITAL ATLAS (GDA)

1.5.1 The First Release of the GEBCO Digital Atlas (GDA) on CD-ROM was made in March 1994. This has been highly successful and the GDA is now in regular use in many research laboratories, hydrographic offices, commercial companies, universities, data centres, libraries and government departments scattered around the globe. In the three years following its publication, over 700 copies have been despatched, on request, to over 500 institutions in 65 different countries.

1.5.2 The distribution package for the GDA includes a User Registration Form and a Problem Report Sheet as it is considered important to keep in close contact with the community of users, so as to ensure that they are made aware of periodical upgrades and 'bug' corrections for the GDA Software Interface, and of updates to the GDA content. For this reason users are advised to register with the British Oceanographic Data Centre (BODC).

1.5.3 A Second Release of the GDA was made in February 1997. The GEBCO-97 CD-ROM supersedes and replaces the CD-ROM and floppy disk issued with the First Release. Major updates therein include revised bathymetry for the southern Indian Ocean, the Weddell Sea and the north-east Atlantic off the British Isles, and a new coastline for Antarctica.

1.5.4 A pre-publication copy of Sheet 5.12 revised (paragraph 1.4.1 above) was digitized for inclusion in the First Release of the GDA using material compiled at a scale of 1:5 million. This was the first example of the use of digital techniques for updating the GEBCO. This approach has now been continued with the release of GEBCO-97.

1.6. SUB-COMMITTEE ON DIGITAL BATHYMETRY

1.6.1 For a number of years the Guiding Committee has been of the opinion that the deliberations, decisions and advice provided by the Sub-Committee on Digital Bathymetry form the basis for the future of the GEBCO, and ensure that the project is in the forefront of modern technological developments, without losing its reputation for excellence which is so essential for the future.

1.6.2 The demand from physical and chemical oceanographers who are involved in modelling the ocean environment and predicting changes in global circulation, for an authoritative global description of the bathymetry of the world's oceans as a gridded data set, is steadily becoming more insistent, in addition to the increasingly fine resolution requirements of marine geologists and geophysicists. Repeated routine ocean observations, as anticipated in IOC's Global Ocean Observing System (GOOS), will be required to monitor oceanic change, and this will require a secure framework of global bathymetry.

1.6.3 In 1994, in anticipation of these needs, the Guiding Committee (working through the Sub-Committee) set up a Task Team under Dr Walter Smith of the National Oceanic and Atmospheric Administration (NOAA), USA, to study the production of a gridded data set from the GEBCO contours, and to make recommendations. This has proved more difficult than anticipated but a 'Review of Gridding Methods' is expected shortly. In parallel with this, and with some of the same international oceanographers and scientists, the Scientific Committee on Oceanic Research (SCOR) has established a Working Group (WG 107) on 'Improved Global Bathymetry'.

1.6.4 In addition to the above, Dr Walter Smith, working with Dr David Sandwell (Scripps Institution of Oceanography), has completed a series of maps on the same scale (1:10M at the equator), projection (Mercator) and sheet limits (16 sheets between 72°N and 72°S) as the GEBCO 5th Edition, providing full global coverage of contoured gravity anomalies from satellite altimetry. This series will be of considerable value for the GEBCO, and wider scientific, community, as it indicates topographic trends and the possibility of the existence of undersea features; however, the data as presented cannot be considered a substitute for true bathymetry obtained by conventional means.

1.7 SUB-COMMITTEE ON UNDERSEA FEATURE NAMES

1.7.1 The Sub-Committee's biennial meetings are always active and intensive. Several hundred newly proposed names are considered, most of them received by IHB during the intersessional periods. In addition a great deal of work is carried out by correspondence, mainly between the Chairman and Secretary (Ing.en Chef Michel Huet) of the Sub-Committee, but also with several other members.

1.7.2 At its eleventh session, the Sub-Committee expressed two particular concerns about the naming of undersea features:

- i. the tendency to depart from a basic principle that 'if names of living persons are used, they should be limited to those who have made an outstanding or fundamental contribution to ocean sciences'; and
- ii. the frequent use of the term "seamount" (or "guyot") for topographically minor features that do not meet the scale, dimensions and shape criteria laid down in the publication 'Standardization of Undersea Feature Names'.

The Guiding Committee has instructed the Sub-Committee to reject such names if any should come before them.

1.7.3 The IHO-IOC Gazetteer of Geographical Names of Undersea Features (Publication B-8) is now being maintained and regularly updated in digital form. The draft second edition, which includes additional historical information about many features, was issued by IHB in July 1996. It is also available for interrogation on the IHB Bulletin Board and through Internet. When suitable techniques have been developed, it will be necessary to delineate the boundaries, at present ill defined, of many undersea features listed in the Gazetteer.

1.7.4 A review is being undertaken of the generic names in use by GEBCO, which appear in publication B-6 'Standardization of Undersea Feature Names'.

1.7.5 Dr Gary Robinson, Reading University, United Kingdom, has continued with his work to develop digital techniques for labelling features in the GEBCO Digital Atlas.

1.8 GEBCO GUIDELINES (PUBLICATION B-7)

1.8.1 The final part of the revised GEBCO Guidelines: Part 4 Digital Bathymetric Data (Multibeam Echo Sounders), which gives guidance on the processing and storing of digital bathymetric data collected by multibeam sounding systems, is nearing completion; publication is expected after approval during the forthcoming GEBCO meetings in June 1997.

1.8.2 These 'Guidelines' provide firstly a full description of the GEBCO Organizational Framework, but in addition they include a very comprehensive and valuable guide to bathymetric data management and the collection, processing and storage of other underway geophysical data. It has been published in loose-leaf form so that it can be updated periodically as and when developments make this necessary.

1.9 THE FUTURE

1.9.1 The most important future development is seen to be the provision of a global gridded data set. However at the same time, the GEBCO Digital Atlas in its present form will continue to be updated periodically, as and when new data become available; this will include sophisticated automatic name placements (scale related) and new and improved shorelines.

1.9.2 As the centenary of the GEBCO approaches work is starting on a publication to trace its history through five editions and the GDA, since its conception at the Seventh International Geographic Congress in Berlin in 1899, together with a well written popular book for sale to the general public.

2. CONSULTATIVE GROUP ON OCEAN MAPPING (CGOM)

2.1 GENERAL

2.1.1 In the early 1970s the joint IOC/ICSEM/FAO Co-operative Studies in the Mediterranean identified the need for a large scale bathymetric chart of their area of interest, and decided to develop an International Bathymetric Chart of the Mediterranean on a scale of 1:1 million (at 38°N), with the Black Sea on a scale of 1:2 million. This series, which was published in 1982 by the Head Department of Navigation and Oceanography, Leningrad (now St Petersburg), was the first of the IOC's regional ocean mapping projects, and it is from this beginning that the present structure has evolved.

2.1.2 IOC now sponsors five such projects:

- i. The International Bathymetric Chart of the Mediterranean and its Geological-Geophysical Series (IBCM);
- ii. The International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico (IBCCA);
- iii. The International Bathymetric Chart of the Central Eastern Atlantic (IBCEA);
- iv. The International Bathymetric Chart of the Western Indian Ocean (IBCWIO);
- v. The International Bathymetric Chart of the Western Pacific (IBCWP).

2.1.3 These regional projects are guided by the Consultative Group on Ocean Mapping (CGOM) which is composed of the Chairmen (or Chief Editors) of the five Editorial Boards, together with the Chairman of the Joint IOC/IHO Guiding Committee for the General Bathymetric Chart of the Oceans (GEBCO) and the Chief Editor of the International Geological-Geophysical Atlases of the Atlantic and Pacific Oceans (GAPA).

2.2 MEETING

2.2.1 The Consultative Group on Ocean Mapping has met once during the period under review:

CGOM-VI, Monaco 21-22 April 1997

(ref: doc. IOC/CGOM-VI/3).

2.3 COMPOSITION OF THE CONSULTATIVE GROUP ON OCEAN MAPPING

2.3.1 The Consultative Group on Ocean Mapping (CGOM) is composed of the Chairmen (or Chief Editors) of the five Editorial Boards, together with the Chairman of the Joint IOC/IHO Guiding Committee for GEBCO and the Chief Editor of the International Geological-Geophysical Atlases of the Atlantic and Pacific Oceans (GAPA). A Director of the International Hydrographic Organization is ex-officio a member of CGOM. See Annex I.

2.4 PURPOSES OF THE CGOM

2.4.1 The CGOM has three main purposes: i. to act as a 'chapeau' body for the IOC's Ocean Mapping projects, so as to ensure a full exchange of knowledge on procedures and developments between the GEBCO and the regional projects; ii. to ensure that common exchange formats are used in the preparation of traditional paper chart series and for digitization (thus facilitating incorporation of regional products into the GEBCO Digital Atlas (GDA); and iii) to prepare a biennial report on Ocean Mapping Projects sponsored or co-sponsored by the IOC for submission to the IOC Assembly (i.e. this document).

**3. INTERNATIONAL BATHYMETRIC CHART OF THE MEDITERRANEAN AND
ITS GEOLOGICAL/GEOPHYSICAL SERIES (IBCM)**

3.1 MEETINGS

3.1.1 It has not been possible for the EB-IBCM to hold a full formal meeting during the period under review. However, opportunity has again been taken to convene Informal Consultations from time to time as circumstances allow:

Paris, 28 September 1996 (doc. IOC/INF-1065)

Monaco, 19-20 April 1997 (doc. IOC/INF-1070)

3.2 COMPOSITION OF THE EDITORIAL BOARD FOR THE IBCM

3.2.1 The present composition of the Editorial Board for the IBCM will be found in Annex I.

3.3 IBCM BATHYMETRY

3.3.1 It is the stated intention of the Editorial Board to compile and publish a second edition of the IBCM bathymetric series after publication of the five geological/geophysical series (see below), and all new data are being collected and archived for that purpose. However at the informal consultations it was decided to defer detailed consideration until the next full session of the Editorial Board.

3.3.2 It is known that there is a growing amount of swath data being collected in the Mediterranean Sea, both by the Institut Français de Recherche pour l'Exploitation de la Mer (IFREMER) and commercial companies such as International Sea Mapping (ISM). Although some of these data are commercially classified at the present time (though there are clauses in the contracts requiring companies to give their data to the Hydrographic Services of the countries concerned), by the time the IBCM 2nd Edition is produced (the year 2000 at the earliest), these data might well be released or could be obtained by negotiation. It is considered essential that this situation be taken fully into account as proceeding with a 2nd Edition using traditional methods might well consume a great deal of time and effort, not least in the Chief Editor's office, for the production of an obsolete and inferior product.

3.3.3 In the meantime Dr John Hall (Geological Survey of Israel) has been working on the development of a 0.1' Digital Terrain Model (sea and land) for the area of sheets 1.05 (Black Sea), and 1.08, 1.09 & 1.10 (Eastern Mediterranean) - see Annex II - upon which the second edition will be based.

3.4 PROGRESS WITH THE GEOLOGICAL-GEOPHYSICAL SERIES

3.4.1 Three of the IBCM Geological/Geophysical series: Bouguer Gravity Anomalies (IBCM-G), Seismicity (IBCM-S) and Thickness of Plio-Quaternary Sediments (IBCM-PQ) have now been published. Publication of the fourth series: Unconsolidated Bottom Surface Sediments (IBCM-Sed) is imminent. Compilation of the fifth and final series: Magnetic Anomalies (IBCM-M) is complete and colour proof copies are expected shortly. The sea surface magnetic data from the Osservatorio Geofisico Sperimentale (OGS), Trieste, surveys, supplemented for the eastern Mediterranean with NOAA data, were processed digitally at OGS.

3.4.2 Explanatory texts for each series (including a revision of Chapter 1, the original general text supporting the bathymetric series published as a preprint in September 1988), are nearing completion and will be published shortly. It is intended that 500 of these will be issued as chapters in a summary volume, and a preliminary copy presented at the IOC Assembly session.

3.5 LISTING OF PRODUCTS

3.5.1 A full listing of available IBCM products is given in Annex III

4. INTERNATIONAL BATHYMETRIC CHART OF THE CARIBBEAN SEA AND THE GULF OF MEXICO (IBCCA)

4.1 MEETING

4.1.1 The Editorial Board for the IBCCA has met once:
in Cartagena de Indias, Colombia, 18-20 November 1996
(doc. IOC/EB-IBCCA-VI/3)

4.2 COMPOSITION OF THE EDITORIAL BOARD FOR THE IBCCA

4.2.1 The present composition of the Editorial Board for the IBCCA will be found in Annex I.

4.3 PROGRESS WITH COMPILATION AND PRODUCTION OF THE IBCCA

4.3.1 Two sheets of this series (1-04 and 1-09 - see Annex II) have so far been published and placed on sale; they have also been digitized and incorporated into the digital database, so the capacity to generate new products based on these sheets now exists. Other sheets are being scanned and vectorized, as production progresses. Guidelines for documenting and despatch of digital files have been developed and distributed to all IBCCA members.

4.3.2 Most of the other sheets are in various stages of preparation, as follows:

- 1-01 USA Topographic and bathymetric compilation complete. Editing work in progress. A 3-D colour image of the bathymetry of this sheet has been created with vectorized contours.
- 1-02 USA) Topographic and bathymetric compilation complete.
- 1-03 USA) Editing work in progress.
- 1-04 USA Published 1994.
- 1-05 Mexico Bathymetric compilation complete. Contours have been vectorized. Further editing work in progress. Colour proof presented to IBCCA-VI.
- 1-06 Mexico Bathymetric compilation complete. Contours have been vectorized. Editing work in progress.
- 1-07 Cuba) Preliminary editing work complete. Returned to
- 1-08 Cuba) Cuba for further revision and correction.
- 1-09 USA Published 1993.
- 1-10 France Responsibility accepted by France but compilation will follow their work in IBCEA.
- 1-11 Mexico Bathymetric compilation complete.
- 1-12 Costa Rica Following Staff training, compilation has now started.
- 1-13 Colombia) Compilation submitted to the Chief
- 1-14 (part) Colombia) Editor. To be edited.
- 1-14 (part) Venezuela) Editing work complete. Revised
- 1-15 Venezuela) material submitted to Chief Editor.
- 1-16 France Responsibility accepted by France but compilation will follow their work in IBCEA.
- 1-17 Colombia Compilation in hand.

4.4 DEVELOPMENT OF OTHER NEW PRODUCTS

4.4.1 In view of the expanding digital database, the Editorial Board is interested in the development of new products, derived from the IBCCA, such as Digital Terrain Models, virtual 3-D charts and colour maps using chromostereoscopy. A 3-D colour image of the bathymetry of sheet 1.01 has been created with vectorized contours, using a cartographic program, the General Mapping Tool (GMT).

4.4.2 A decision to initiate the production of geological and geophysical maps based on the IBCCA bathymetric base map has been reached. Discussions are being held with appropriate and interested national organisations and it is foreseen that compilation of such series will start shortly in a few member states, taking into consideration the experience gained by the IBCM. Financial support has been requested by IOCARIBE from SAREC for a technical meeting in the region to discuss this proposal further.

**5. INTERNATIONAL BATHYMETRIC CHART OF THE CENTRAL EASTERN
ATLANTIC (IBCEA)**

5.1 MEETING

5.1.1 The Editorial Board for IBCEA met in Unesco House, Paris, 9-11 October 1996 (doc. IOC/EB-IBCEA-II/3), for the first time since the establishment meeting in Lagos, in February 1990. This followed the urgent need expressed in the CGOM's 1995 report.

5.2 PROGRESS WITH COMPILATION AND PRODUCTION OF THE IBCEA

5.2.1 Following a slow start and problems largely caused by the fact that no Editorial Board session was held for over six years, and also in relation to the identification of available data and their provision to the Co-Chief Editors, this project is now moving once again though there are serious problems still needing solution. Action is now in hand to overcome these problems.

5.2.2 The present situation with progress in the compilation and publication of IBCEA sheets (see Annex II) is as follows:

- 1.01 Portugal Work began in 1990 at the Instituto Hidrográfico, Lisbon. Compilation was completed in 1993 in co-operation with Professor J.-R.Vanney. As yet only a reduced copy of the compilation has been distributed and the sheet awaits a full review.
- 1.02 Portugal Compilation and contouring is expected to begin in 1997.
- 1.03 Portugal Compilation has started with Prof. J.-R.Vanney. Expected date of completion end 1997/early 1998.
- 1.04 France)
1.05 France)
Mr Peter Hunter, GEBCO Bathymetric Editor. Responsibility for production has been accepted by France (SHOM).
- 1.06 France The first compilation prepared by the Service Hydrographique et Océanographique de la Marine (SHOM) was withdrawn following review and the discovery that additional data were available. The sheet will be recontoured in 1997.
- 1.07 Portugal Compilation and contouring is expected to begin in 1997 with the support of, and input of material for the area of the Cape Verde Islands by, Mr Peter Hunter, GEBCO Bathymetric Editor.
- 1.08 France)
1.09 France)
The first compilations prepared by SHOM were withdrawn following review and the discovery that additional data were available. Sheet 1.08 will be recontoured in 1997 and 1.09 in 1998.
- 1.10 France)
1.11 France)
Compilation of both sheets is in hand and completion is expected in 1998.
- 1.12 France Compilation not yet started. Completion expected 1999.

5.2.3 It is noted that this is the only IBC project so far where not only compilation but also printing and publication of sheets is to be divided between organisations in different countries. For this reason it is essential for the two national editors to liaise closely in order to ensure that all charts of the series are printed in the same presentation, and that all contours match at sheet boundaries.

5.2.4 The Editorial Board has expressed a desire that the whole series be published by the year 2000.

5.3 COMPOSITION OF THE EDITORIAL BOARD FOR THE IBCEA

5.3.1 The present composition of the Editorial Board for the IBCEA will be found in Annex I.

5.4 RECOMMENDATIONS ADOPTED AT THE SECOND SESSION OF IBCEA

5.4.1 In the course of its Second Session, the Editorial Board for IBCEA made a number of recommendations (see Annex IV). These were considered in detail by the CGOM at its sixth session and action taken as considered necessary - see the Summary Report of the session (doc. IOC/CGOM-VI/3).

6. INTERNATIONAL BATHYMETRIC CHART OF THE WESTERN INDIAN OCEAN (IBCWIO)

6.1 MEETINGS

6.1.1 It has unfortunately not been possible for the IBCWIO Editorial Board to meet during the period under review. This has now become an urgent requirement if this project is to develop satisfactorily.

6.2 COMPOSITION OF THE EDITORIAL BOARD FOR THE IBCWIO

6.2.1 The present composition of the Editorial Board for the IBCWIO will be found in Annex I. The Russian Federation and South Africa have recently joined the Board.

6.3 GENERAL

6.3.1 All source data have now been plotted. Depending on the density of depth figures in each area, they are printed on a scale of either 1:1M (21 sheets), or 1:250,000 (185 sheets). These plots are being distributed to the voluntary collaborators in the region.

6.3.2 Since the second meeting of the Editorial Board in 1990 there has been a significant change in the ability of most IBCWIO member states to handle digital source material. The Chief Editor is working with the Sheet Co-ordinators to identify their capabilities, and the hardware/software now available in their institutions, with a view to furnishing them with any additional programs needed to handle IBCWIO data. Steps are then being taken to supply digital data in the appropriate format.

6.4 PROGRESS WITH COMPILATION AND PRODUCTION OF THE IBCWIO

6.4.1 The Sheet Assembly Diagram has been modified. IBCWIO now consists of a network of more (21) but smaller sheets (see Annex II).

6.4.2 National responsibilities for each of these sheets (based on the following list) are being confirmed:

1.01, 1.02	United Kingdom
1.03, 1.06, 1.09	Russia
1.04	Russia & Kenya (proposed)
1.05	Seychelles or USA (proposed)
1.07	Tanzania (proposed)
1.08, 1.12	Mauritius (proposed)
1.10	Mozambique
1.11	France & Madagascar (proposed)
1.13, 1.14	South Africa & Mozambique
1.15	France
1.16 - 1.21	South Africa

6.4.3 At the third session of EB-IBCWIO (October 1994) Captain Valery Fomchenko (Russian Federation) presented a first draft of sheet 1.04. Compilation work has also started on the southern sheets.

6.4.4 The present plans allow for the printing and publishing of at least the first two sheets of the IBCWIO in 1998.

6.5 TRAINING AND EDUCATION

6.5.1 A Training Course for the IBCWIO region on application of bathymetric charting and the use of related digitized data was held in December 1995. This included an initial two days of training in Durban, followed by two weeks aboard the German research ship R/V Meteor.

7. INTERNATIONAL BATHYMETRIC CHART OF THE WESTERN PACIFIC (IBCWP)

7.1 MEETING

7.1.1 The Editorial Board for IBCWP has met once: in Bangkok, Thailand, 7-12 December 1996 (doc. IOC/EB-IBCWP-II/3)

7.2 COMPOSITION OF THE EDITORIAL BOARD FOR THE IBCWP

7.2.1 The present composition of the Editorial Board for the IBCWP will be found in Annex I. Recently the South Pacific Applied Geoscience Commission (SOPAC) Secretariat has agreed to collaborate.

7.3 GENERAL

7.3.1 Due to the very large size of the Western Pacific region, the IBCWP has as many projected sheets as the other four IBC projects combined. It has therefore been divided up into six sub-regions, with separate production responsibilities in each:

1	Sea of Okhotsk and South-east Kamchatka	13 sheets
2	Japan Sea and waters surrounding Japan	13 sheets
3	The Central Western Pacific	25 sheets
4	The Australian Northern and Eastern Margin	14 sheets
5	Waters surrounding New Zealand	13 sheets
6	SOPAC area	23 sheets

plus, later, a number of offshore sheets on a smaller scale.

7.3.2 A standard format for a Data Catalogue has been prepared and distributed. National data listings (for incorporation into the Data Catalogue) will be submitted to the Chief Editor with each plotting sheet as it is finalized.

7.4 ALLOCATION OF COUNTRY RESPONSIBILITIES FOR SUB-REGIONS

7.4.1	<u>Responsible Country/ Organization</u>	<u>Producing Country/ Organization</u>	<u>Participating Country/ Organization</u>
1	Russia	Russia	Japan
2	Japan	Japan, Russia China	China, Russia Rep.of Korea
3	China	China, Malaysia Vietnam	Japan, Malaysia Vietnam, Philippines
4	Australia	Australia	Australia, China
5 and 6	(Being negotiated)		

7.4.2 Interest has been shown in the project by New Zealand and Thailand.

7.5 PROGRESS WITH COMPILATION AND PRODUCTION OF THE IBCWP

7.5.1 The present state of progress with compilation and publication of IBCWP sheets is as follows:

Sub-region 1 Russia has completed compilation of Sheet 1-13 (see Annex II) for submission to the Chief Editor, and plans to start compilation of Sheet 1-12 in 1997 and 1-11 in 1998.

Sub-region 2 China has completed compilation of Sheets 2-4, 2-8 and 2-11; these sheets are being assigned to the following producing countries: 2-4 to China, 2-8 to Korea and 2-11 to Japan. When ready they will be submitted by Japan as the Responsible Country for the Sub-region to the Chief Editor, for evaluation.

Japan has under consideration the production of some IBCWP sheets by re-compilation of 1:1,000,000 scale Japanese bathymetric charts using a Japan Hydrographic Department (JHD) chart compilation system (computer assisted cartography).

Sub-region 3 Extensive data have been collected by China in the East and South China Seas. Vietnam is collecting source data for sheets 3-1, 3-6, 3-11 and 3-12 and Malaysia has started compilation of sheets 3-16 and 3-17.

Sub-region 4 Australia has in hand sheets 4-12 and 4-14; draft sheets and contour strings are expected to be available for evaluation by mid-1997.

7.5.2 The United States has offered to host a training course for IBCWP members (covering all local costs). It is planned that this course shall be held in 1998 in conjunction with the third session of the Editorial Board.

7.5.3 It is expected that some 13 sheets will be ready for Editorial Board approval by the time of the next session of the Board in 1998.

8. INTERNATIONAL GEOLOGICAL-GEOPHYSICAL ATLASES OF THE ATLANTIC AND PACIFIC OCEANS (GAPA)

8.1 MEETING

8.1.1 The Central Editorial Board for GAPA has met once: GAPA-XIV Ocean Research Institute, University of Tokyo, Japan, 20-22 September 1995.

8.2 COMPOSITION OF THE CENTRAL EDITORIAL BOARD FOR GAPA

8.2.1 The present composition of the Central Editorial Board for GAPA will be found in Annex I.

8.3 PACIFIC OCEAN ATLAS

8.3.1 All material for this final atlas of the series has now been received and compilation is nearing completion. It is envisaged that the atlas will be published towards the end of 1997 and stocks will become available for distribution by mid-1998.

9. ACKNOWLEDGMENT

9.1 The Consultative Group on Ocean Mapping wishes to place on record its gratitude and appreciation for the close co-operation and support that has been, and continues to be, provided by the International Hydrographic Organization both to the jointly sponsored General Bathymetric Chart of the Oceans (GEBCO) and to IOC's Regional Ocean Mapping Projects.

10. REPORT TO THE IOC ASSEMBLY AT ITS NINETEENTH SESSION, PARIS
2-18 JULY 1997

10.1 This comprehensive report (doc. IOC/INF-1063) on the Ocean Mapping activities of the Commission was approved by the CGOM at its sixth session (Monaco, 21-22 April 1997).

ANNEX I

MEMBERSHIP OF ALL GROUPS RESPONSIBLE FOR SUPERVISING OCEAN
MAPPING PROJECTS SPONSORED (OR CO-SPONSORED) BY THE COMMISSION

A. JOINT IOC-IHO GUIDING COMMITTEE FOR THE GENERAL BATHYMETRIC
CHART OF THE OCEANS (GEBCO)

Sir Anthony Laughton (UK)	Chairman	representing SCOR
Mr David Monahan (Canada)	Vice-Chairman	IHO appointment
Capitao-de-Fragata Lucas de Campos Costa (Brazil)		IHO appointment
Capitan de Navio J.M.Fernandez de la Puente (Spain)		IHO appointment
Dr Robin K.H.Falconer (New Zealand)		representing CMG
Lic. José Luis Frías Salazar (Mexico)		IOC appointment
Dr Ing. Hans-Werner Schenke (Germany)		IOC appointment
Mr Alexis E.Hadjiantoniou (Greece)		IHO appointment
Dr Gleb B.Udintsev (Russian Federation)		IOC appointment
Prof Kunio Yashima (Japan)		IHO appointment

SCIENTIFIC ADVISERS TO THE GEBCO

Mr Norman Z.Cherkis, U.S.Naval Research Laboratory
Dr Meirion T.Jones, Director,
British Oceanographic Data Centre
Dr Yuri Kiselev, VNIIOKEANGEOLOGIA, St Petersburg,
Russian Federation
Dr Michael S.Loughridge, Director,
National Geophysical Data Center, USA
Dr Larry A.Mayer, University of New Brunswick, Canada
Dr Gary Robinson, Environmental Systems Science Centre,
University of Reading, United Kingdom
Dr Walter H.F.Smith, Geosciences Laboratory, NOAA/NOS, USA

also (ex-officio):

Mr Brian Harper, Permanent Secretary GEBCO
Mr Peter Hunter, GEBCO Bathymetric Editor
Ms Pauline Weatherall, GEBCO Digital Atlas Manager
Rear Admiral Christian Andreasen,
President of the Directing Committee, IHO
Mr Dmitri Travin, IOC Secretariat, Unesco, Paris

GEBCO SUB-COMMITTEE ON DIGITAL BATHYMETRY

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Director, British Oceanographic Data Centre
Mr Norman Z.Cherkis, U.S.Naval Research Laboratory
Ing.en Chef Michel Huet, International Hydrographic Bureau
Dr Michael S.Loughridge, Director
National Geophysical Data Center, USA
Mr William Rankin, U.S. Naval Oceanographic Office
Dr Andrey Popov
Head Department of Navigation & Oceanography, Russia
Dr.Ing.Hans-Werner Schenke, Alfred-Wegener-Institut, Germany
Mr Shin Tani, Japan Oceanographic Data Center
Mr Alexis Hadjiantoniou, Hellenic Navy Hydrographic Service
and Mr Adam J.Kerr, Director IHO, Chairman IHO Committee on
Electronic Data (CoE) (ex-officio)

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Scripps Institution of Oceanography, USA
Ing.en Chef Michel Huet **Secretary**
International Hydrographic Bureau
Dr Galina V.Agapova, Geological Institute of
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Rear Admiral Christian Andreasen,
President of the Directing Committee, IHO
Capitão-de-Fragata Roberto F.Carvalho, Diretoria de
Hidrografia e Navegação, Niterói, RJ, Brazil
Dr Robin K.H.Falconer, Institute of Geological and Nuclear
Sciences Ltd., New Zealand
Prof Kunio Yashima, Hydrographic Laboratory,
Maritime Safety Agency, Hiroshima, Japan
and Mr Trent Palmer, US Board on Geographic Names, NIMA
Hydrographic/Topographic Center, Washington DC, USA
(ex-officio as an observer)

**B. CENTRAL EDITORIAL BOARD FOR THE INTERNATIONAL GEOLOGICAL-
GEOPHYSICAL ATLASES OF THE ATLANTIC AND PACIFIC OCEANS
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Vernadsky Institute of Geochemistry, Russian Federation
Mr Desmond P.D.Scott **Deputy Editor**
Academician Igor S.Gramberg, Director,
Institute of Ocean Geology, Russian Federation
Dr Brian T.R.Lewis, University of Washington, USA
Dr Kiyoshi Suyehiro, University of Tokyo, Japan
Dr Manik Talwani, Houston Advanced Research Center, USA
Dr Seiya Uyeda, Tokai University, Japan
Dr Dina Zhiv, Mapping Production Association 'Kartografia',
Russian Federation

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THE MEDITERRANEAN AND ITS GEOLOGICAL/GEOPHYSICAL SERIES
(IBCM)**

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Prof. Jannis Makris, Vice Chairman
Universität Hamburg
Captain Andrey Popov, Chief Editor
Head Department of Navigation & Oceanography,
St Petersburg, Russian Federation
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Prof. Frank Fabricius, Technische Universität Munchen,
Germany
Prof. Maurice Genesseeux, Université Pierre et Marie Curie,
France
Dr John K. Hall, Geological Survey of Israel, Jerusalem,
Israel
Prof. Emelyan Emelyanov, Atlantic Branch of the Institute of
Oceanology, Kaliningrad, Russian Federation
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Instituto Nacional de Estadística, Geografía e
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Geográfico Nacional, Costa Rica
Major Rolando Feitö Sarduy, Instituto Cubano de Hidrografía,
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Dr Troy L. Holcombe, National Geophysical Data Center, USA
Ing. en chef Michel Le Gouic, Service Hydrographique et
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Director de Hidrografía y Navegación, Venezuela
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 Boulder, Colorado, USA
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 Mr Sidney G.Osborne, Hydrographic Office of South Africa
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 (vacant) representative of Madagascar
 Mr Adam J.Kerr (ex-officio) Director, IHO

**G. EDITORIAL BOARD FOR THE INTERNATIONAL BATHYMETRIC CHART OF
THE WESTERN PACIFIC (IBCWP)**

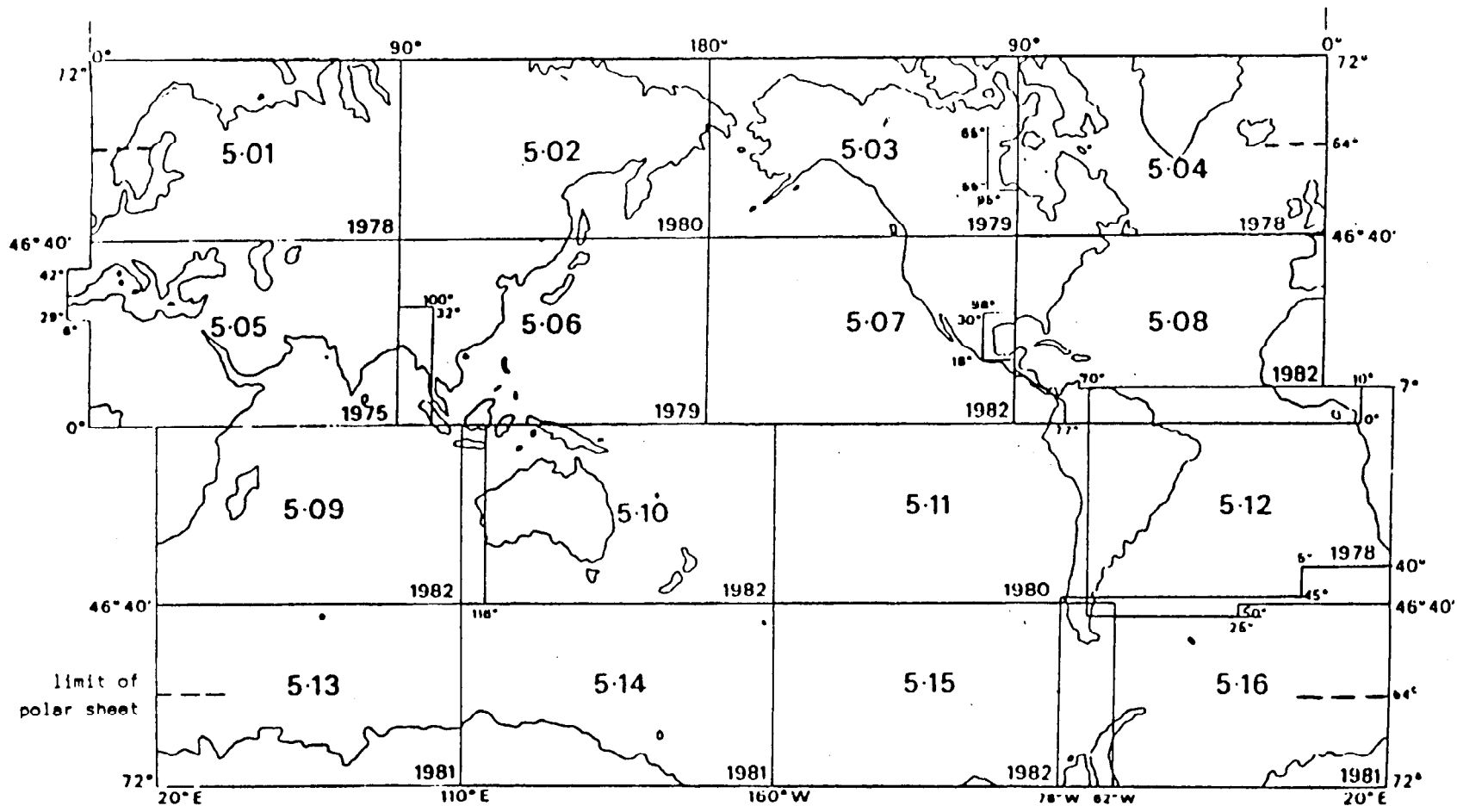
First Admiral Mohd. RASIP BIN HASSAN RMM, Chairman
Hydrographic Directorate, Kuala Lumpur, Malaysia
Dr HOU Wenfeng, National Marine Data & Chief Editor
Information Service, Tianjin, China
Mr Peter HILL, Vice-Chairman
Australian Geological Survey Organisation, Canberra
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Captain Nakorn TANUWONG, Hydrographic Department,
Royal Thai Navy, Bangkok, Thailand
Prof Kunio YASHIMA, Hydrographic Laboratory,
Maritime Safety Agency, Hiroshima, Japan
Mr Adam J.KERR (ex-officio) Director, IHO
Mr HUANG Zumo (adviser), Mapping Agency of Navigation
Guarantee Department, Tianjin, China

H. IOC CONSULTATIVE GROUP ON OCEAN MAPPING (CGOM)

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Prof. Carlo MORELLI	Chairman IBCM	Vice-Chairman
Mr Desmond P.D.SCOTT		Past Chairman
Dr Werner BETTAC	Chairman IBCWIO	
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Sir Anthony LAUGHTON	Chairman GEBCO	
Ing.Gén. André ROUBERTOU	Chairman IBCEA	
Dr HOU Wenfeng	Chief Editor IBCWP	
Dr Gleb B.UDINTSEV	Chief Editor GAPA	
Rear Admiral Christian ANDREASEN (ex-officio)		representing IHO

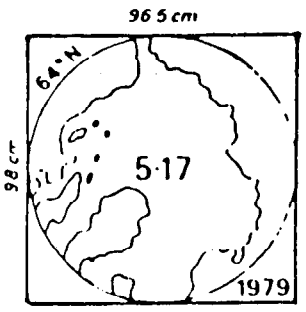
Representative of the IOC Secretariat for Ocean Mapping

Mr Dmitri Travin, Intergovernmental Oceanographic Commission,
Unesco, 1 rue Miollis,
75732 Paris Cedex 15, FRANCE
Fax: +33 (1) 45 68 58 12
Tel: +33 (1) 45 68 40 44
Time Zone: +1 (Summer +2)



**ASSEMBLY DIAGRAM OF THE
 GENERAL BATHYMETRIC CHART OF THE OCEANS (GEBCO)**
 scale 1:1 million at the Equator

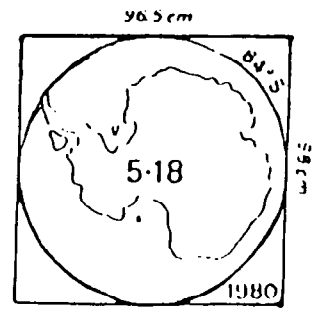
ANNEX II



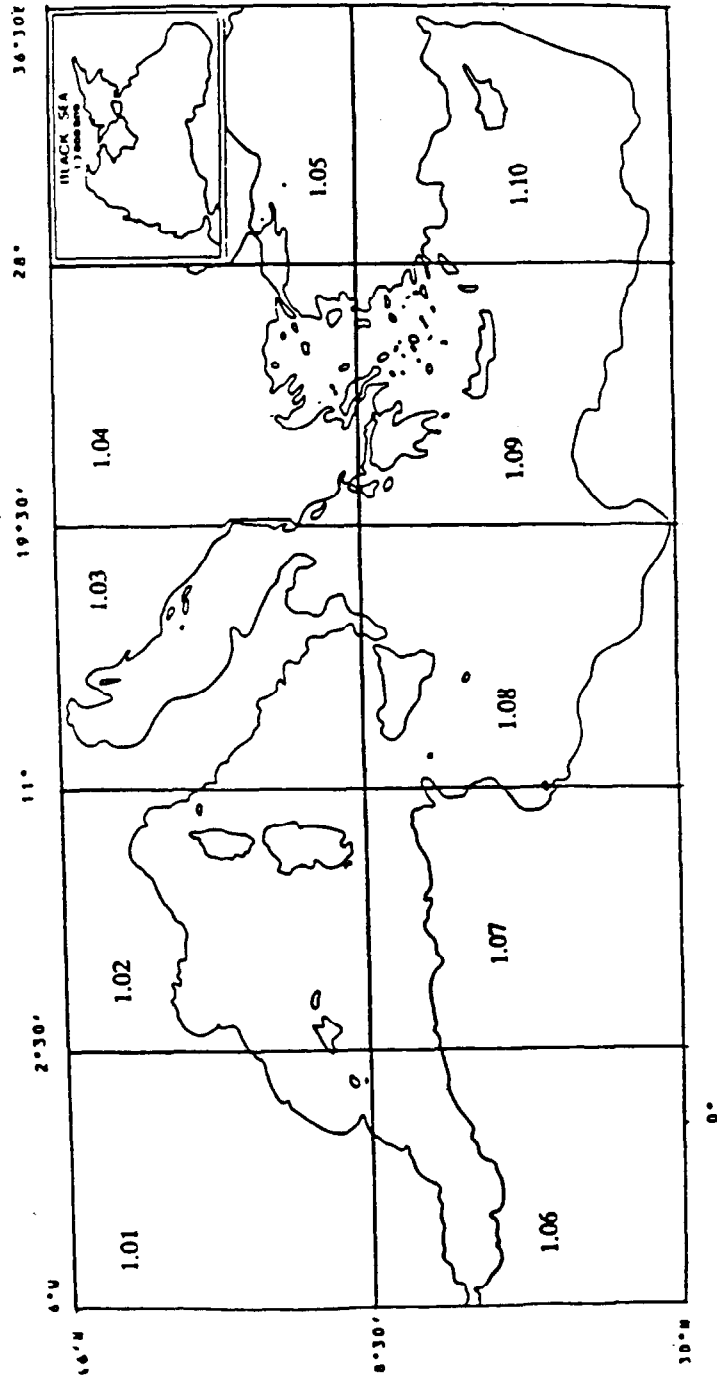
WORLD MAP

The 5th edition of GEBCO has been assembled into a single map of the world at a scale of 1:35 000 000 with the polar regions at 1:25 000 000

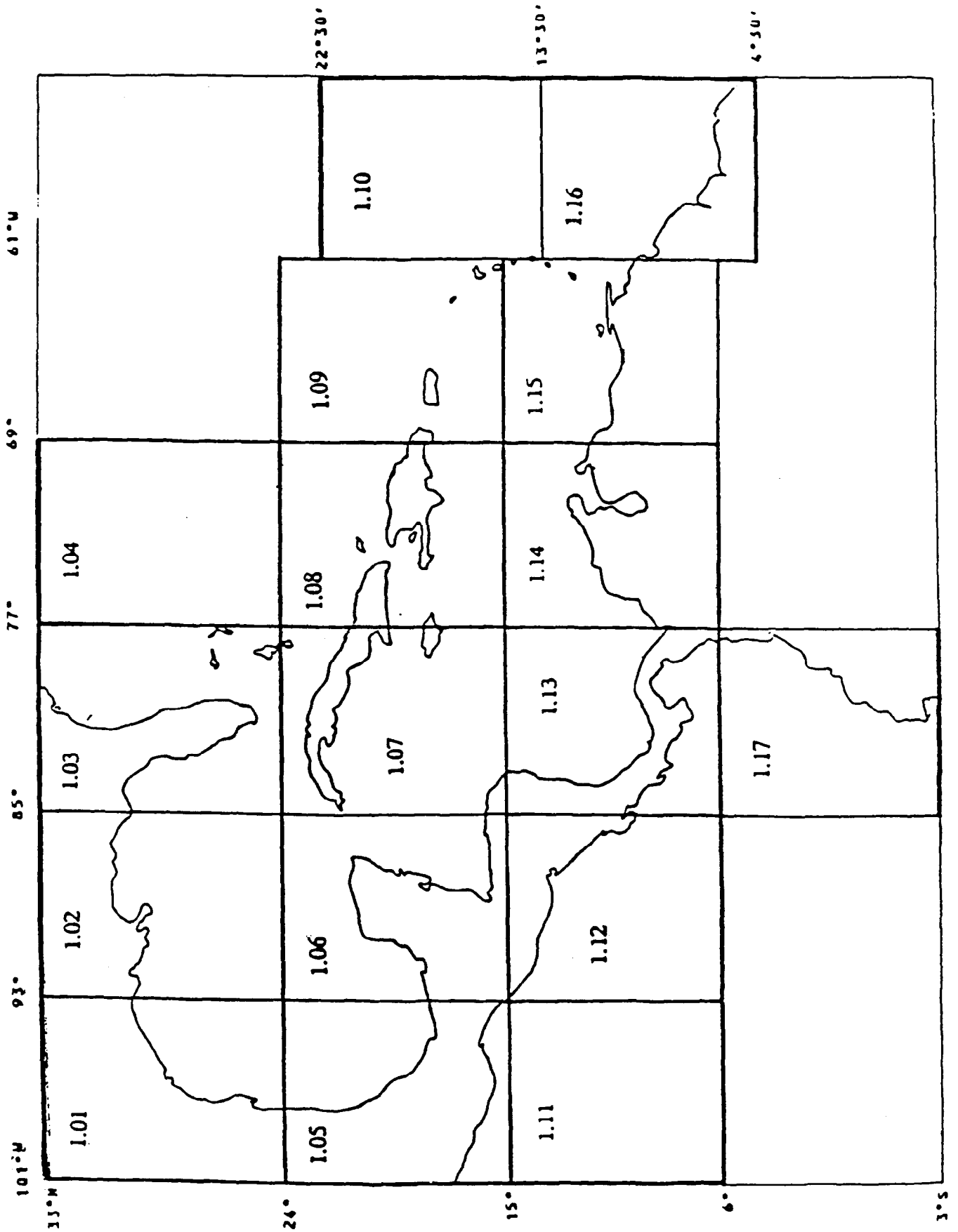
This world map is identified as GEBCO 5.00



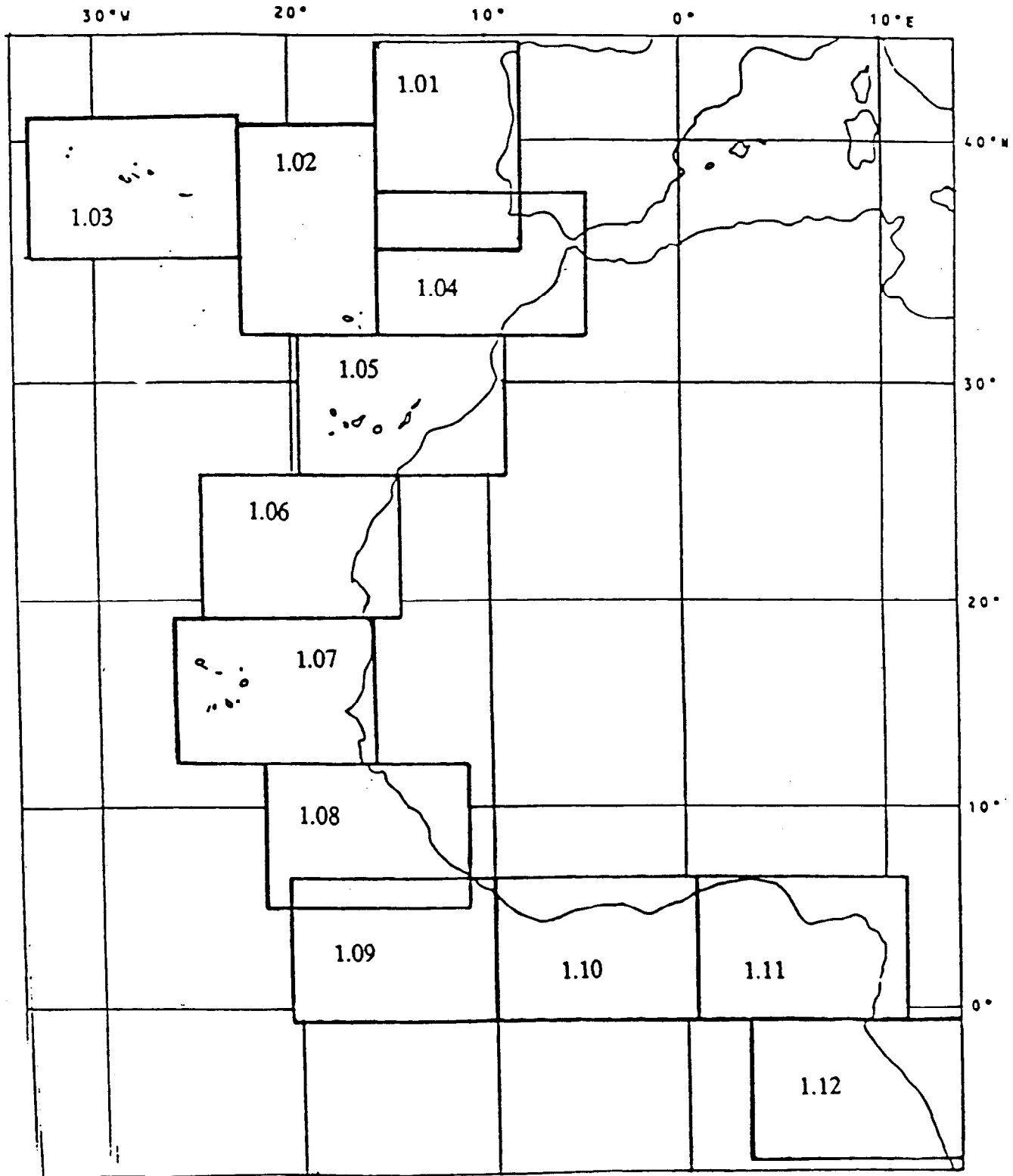
**ASSEMBLY DIAGRAM OF THE
INTERNATIONAL BATHYMETRIC CHART OF THE MEDITERRANEAN (IBCM)
scale 1:1 million at 38°N**



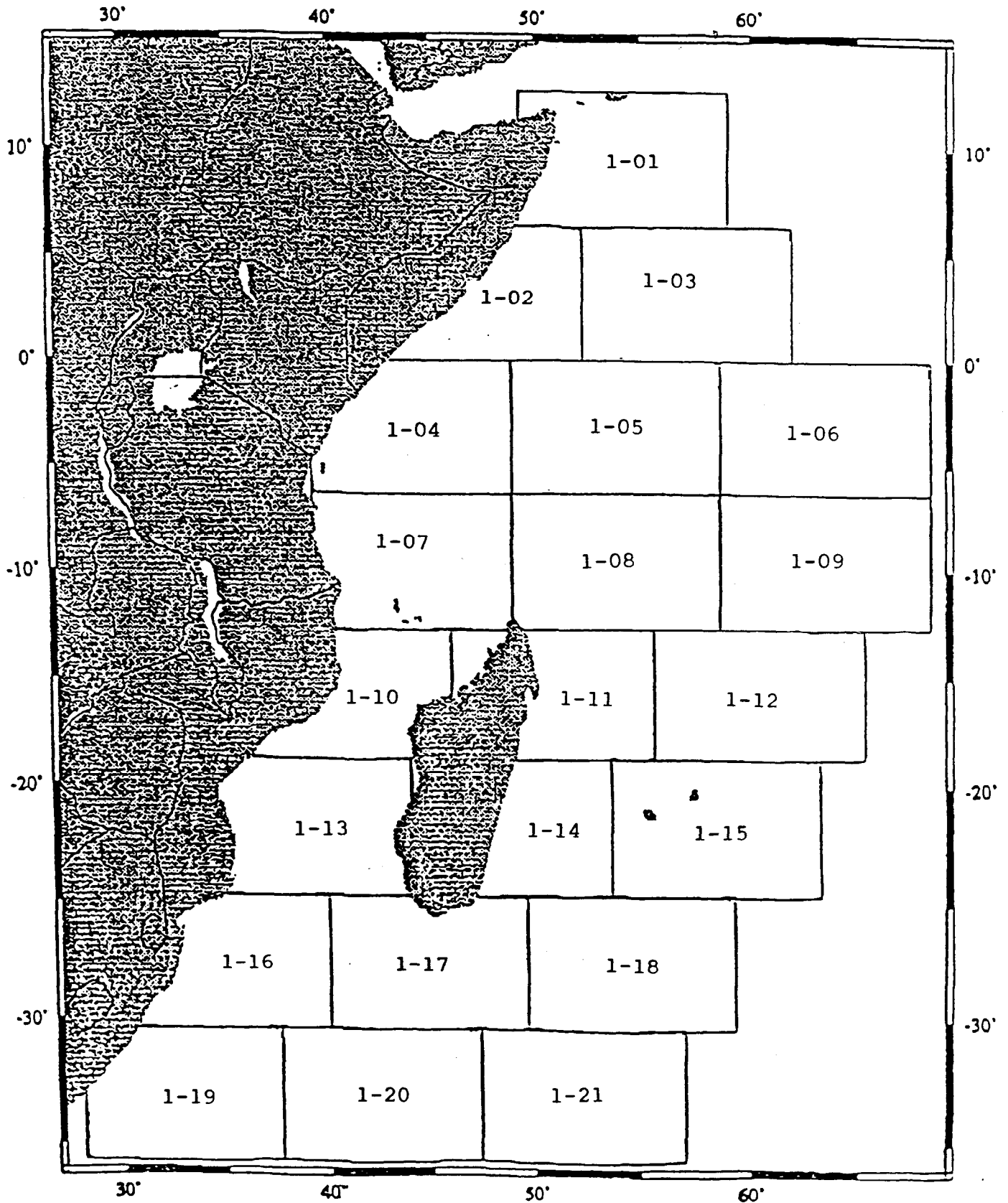
**ASSEMBLY DIAGRAM OF THE INTERNATIONAL BATHYMETRIC CHART OF THE
CARIBBEAN SEA AND GULF OF MEXICO (IBCCA)**
scale 1:1 million at 15°N



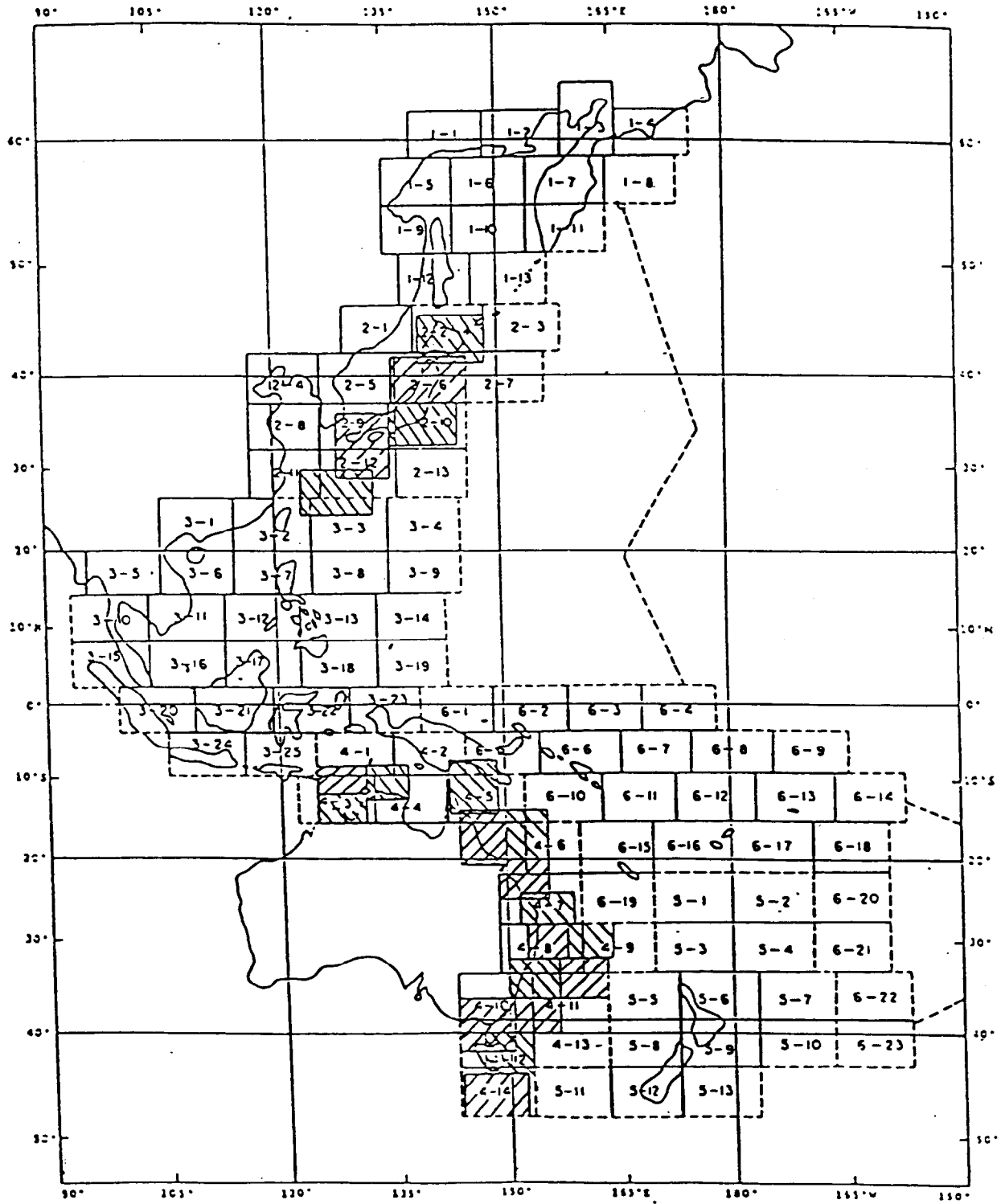
**ASSEMBLY DIAGRAM OF THE INTERNATIONAL BATHYMETRIC CHART OF THE
CENTRAL EASTERN ATLANTIC (IBCEA)**
scale 1:1 million at 20°N



**ASSEMBLY DIAGRAM OF THE INTERNATIONAL BATHYMETRIC CHART OF THE
WESTERN INDIAN OCEAN (IBCWIO)**
scale 1:1 million at the Equator



**ASSEMBLY DIAGRAM OF THE INTERNATIONAL BATHYMETRIC CHART OF THE
WESTERN PACIFIC (IBCWP)**
scale 1:1 million at 33° latitude



The prefixes (1- to 6-) against these sheet numbers indicate the IBCWP Sub-regions - see section 7.4 of this document.

ANNEX III

LIST OF IOC OCEAN MAPPING PRODUCTS

1. **THE GENERAL BATHYMETRIC CHART OF THE OCEANS (GEBCO)**
[Jointly sponsored with the International Hydrographic
Organization]
(see Assembly Diagram Annex II, page 1)

Flat sheets:

- 16 sheets 72°N to 72°S, Mercator projection
Scale 1:10M at the equator;
- 2 polar sheets to 65° lat. Polar Stereographic projection
Scale 1:6M at 75° latitude;
- 1 world sheet, 72°N to 72°S, Mercator projection
Scale 1:35M at the equator and 2 polar insets
(as above) Scale 1:25M at 75° latitude.
- Supporting Volume.

Boxed Set containing all above 19 sheets (folded)
Supporting Volume and legend.

GEBCO Digital Atlas (GDA) on CD-ROM (GEBCO-97)

GEBCO-97 (February 1997) is the Second Release of the GEBCO Digital Atlas (GDA). It is an updated version of the First Release (March 1994). The following new (updated) data sets are included in the GEBCO-97 CD-ROM:

- bathymetry of the southern Indian Ocean, the north-east Atlantic off the British Isles, and the Weddell Sea
- five versions of the SCAR Coastline of Antarctica at a range of scales from 1:30 million up to 1:250,000 (a new data set replacing the World Vector Shoreline south of 60°S)
- a trackline inventory of the digital echo-sounding data held at the IHO Data Centre for Digital Bathymetry (updated to January 1997)
- a digital set of geographically referenced feature names including the IHO-IOC Gazetteer of Geographical Names of Undersea Features, a list of the ports/cities and Antarctic islands portrayed on the printed sheets of the GEBCO (5th edition), a list of Antarctic stations and a specially prepared list of oceanic islands (IHO/IOC Gazetteer updated with recently approved names)
- a set of supporting documents describing each of the data sets included on the CD-ROM (updated to cover new data sets)
- GDA Software Interface Version 2 (with modifications to correct bugs and some new features)

Guidelines for the GEBCO - IHO/IOC publication B-7

The present state of production is as follows:

- Part 1 GEBCO Organizational Framework
- Part 2A Bathymetric Data Management - Analogue Data
- Part 2B Bathymetric Data Management - Digital Data
- Part 3 Digital Bathymetric Data (Single-Beam Echo Sounders)
- Part 4 Digital Bathymetric Data (MultiBeam Echo Sounders)
(Publication expected 1997)
- Part 5 Underway Geophysics Data

Catalogue of Bathymetric Plotting Sheets and its Annex
- IHO/IOC publications B-2 and B-3

B-2 4th Edition published March 1991;

B-3 6th Edition published May 1991.

Note: B-2 contains indexes showing the 1:250,000 plotting sheet coverage of IOC's regional ocean mapping projects.

Standardization of Undersea Feature Names *

- IHO/IOC publication B-6

Versions:	English/French	[2nd Edition published 1989]
	English/Russian)	[2nd Edition published 1990]
	English/Spanish)	[2nd Edition published 1993]
	English/Japanese	[1st Edition published 1991]
	English/Chinese	[1st Edition published 1992]

* These publications are provided free of charge on request.

Gazetteer of Geographical Names of Undersea Features shown (or which might be added) on the GEBCO and on the IHO small-scale international chart series (1:2,250,000 and smaller)

[IHO/IOC publication B-8, 2nd Edition, July 1996]

This item is now being maintained and regularly updated in digital form.

=====

2. THE INTERNATIONAL GEOLOGICAL-GEOPHYSICAL ATLASES

The Geological-Geophysical Atlas of the Indian Ocean
(published 1975)

The International Geological-Geophysical Atlas of the
Atlantic Ocean (published 1991)

The International Geological-Geophysical Atlas of the
Pacific Ocean (in preparation).

**3. THE INTERNATIONAL BATHYMETRIC CHART OF THE MEDITERRANEAN
AND ITS GEOLOGICAL/GEOPHYSICAL SERIES (IBCM)**
(see Assembly Diagram Annex II, page 2)

Flat sheets:

Bathymetric Chart in 10 sheets Mercator projection
Scale 1:1M (at 38°N.) Black Sea 1:2M.
Bathymetric Chart in 1 sheet Mercator projection
Scale 1:5M (at 38°N.) Black Sea 1:10M.

Digitized contours

These are contained in the GEBCO Digital Atlas (see above).

Geological/Geophysical series

(same scales and sheet limits as the bathymetric chart):

Bouguer Gravity Anomalies (IBCM-G)

Seismicity (IBCM-S)

Thickness of Plio-Quaternary Sediments (IBCM-PQ)

Unconsolidated Bottom Surface Sediments (IBCM-Sed)

Magnetic Anomalies (IBCM-M) (in press)

List of Geographical Names of Undersea Features shown (or which might be added) on the International Bathymetric Chart of the Mediterranean (IBCM) and on the IHO small-scale international chart series for the Mediterranean [IHO/IOC publication B-8 Supplement No.1 (IBCM), 1st Edition, 1990]

=====

**4. THE INTERNATIONAL BATHYMETRIC CHART OF THE CARIBBEAN SEA
AND GULF OF MEXICO (IBCCA)**

(see Assembly Diagram Annex II, page 3)

Flat sheets:

Bathymetric Chart Mercator projection Scale 1:1M (at 15°N.)

Sheet 1.04 Published 1994 (USA);

Sheet 1.09 Published 1993 (USA).

ANNEX IV

RECOMMENDATIONS OF EB-IBCEA-II, OCTOBER 1996

1. Compilation and Publication of IBCEA Sheets

- i. Further attempts should be made to obtain additional bathymetric data from IFREMER and ORSTOM (France) and CERESCOR (Guinea) and other organizations, in order to complete the bathymetric charts. Compilers need to identify areas where data are sparse so requests to individual investigators can be well focussed.

2. Liaison with the GEBCO Guiding Committee and with the other IBC Regional Boards

- i. Two members of EB-IBCEA (e.g. the Chairman and one other) should be invited to the next GEBCO Guiding Committee session to facilitate collaboration.
- ii. The three national editors must seek an agreement to ensure that all IBCEA sheets are printed in the same presentation, and to ensure that all contours match at sheet boundaries. The GEBCO specifications should be extended to cover the regional IBC series.
- iii. Liaison with Editorial Boards for other regions should be facilitated through CGOM and the IOC Secretariat.

3. Future Derived Products

- i. The IOC Assembly should examine whether its global compilations should be extended in the future to sedimentary and other data potentially relevant to the work of the Commission on the Limits of the Continental Shelf.

4. Publicity and Sales

- i. Producers of IBCEA sheets should only recover the price of printing.
- ii. The whole IBCEA series should be available at each producer point.
- iii. Each bordering country should be asked to set up a local selling point for the whole IBCEA series.
- iv. Marketing of the IBCEA series should be continued using established methods.