Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

IOC CONSULTATIVE GROUP ON OCEAN MAPPING

EIGHTH SESSION

St. Petersburg, Russian Federation
10-14 May 2001

UNESCO

IOC/CGOM – VIII/3
Paris, 12 November 2001
English only

TABLE OF CONTENTS

ANNEXES

1. OPENING OF THE SESSION

The Chairman, Dr. Gunter Giermann, opened the Eighth Session of the IOC Consultative Group on Ocean Mapping (CGOM) on Thursday, 10 May 2001, at 10.00 at the Head Department of Navigation and Oceanography (HDNO) of the Russian Federation Navy, St. Petersburg, Russia. In the name of the IOC Executive Secretary Patricio Bernal, he welcomed the Members of the CGOM and wished them success in their upcoming discussions. He thanked Admiral Anatoly Komaritsyn for having invited CGOM to hold its meeting at HDNO, and expressed appreciation for the support shown by HDNO in the pursuit of CGOM's aims and objectives. He also thanked Dmitri Travin, the Secretary of the CGOM, for the excellent work he had done in the two years since the last Session.

In his welcoming remarks, Admiral Komaritsyn endorsed the work of the IOC Ocean Mapping Programme, and praised its accomplishments. He welcomed the CGOM participants to HDNO, and wished them every success in their deliberations.

Apologies were received from Professor Carlo Morelli, Chairman IBCM and from Dr. Hou Wenfeng, Chief Editor IBCWP. The latter was represented by Mrs.Lin Shoahua. Gleb Udintsev, Vice-Chairman GAPA, apologized for being unable to attend until the last day. A full list of participants is given in Annex II.

2. ADOPTION OF THE AGENDA AND ELECTION OF THE RAPPORTEUR

The Agenda was adopted with a few minor revisions (see Annex I). Ron Macnab was elected Rapporteur.

3. CONDUCT OF THE SESSION; DOCUMENTATION

The Secretary of the Meeting Dr. Dmitri Travin, and Captain Vadim Sobolev announced the arrangements for the Session and presented the general documentation.

4. PROGRESS AND PLANNED FUTURE DEVELOPMENTS IN OCEAN MAPPING

4.1 GEBCO

Sir Anthony Laughton submitted a list of meetings of GEBCO and its subcommittees that have taken place since the last CGOM Meeting in 1999 (See Annex XX). He explained that a formal report of the most recent series of meetings between April 17 and 25 in Japan was still in preparation, however he was able to present a summary of the principal discussions (see Annex VI).

4.1.1 Gridded dataset

See Annex VI, under the heading "New issue of the GDA"

4.1.2 Undersea feature names

Michel Huet of the IHB and Secretary of the GEBCO Subcommittee on Undersea Feature Names (SCUFN) remarked that SCUFN, which was originally set up to address GEBCO needs only, was being requested to deal with more and more names related to IBC projects on a 1:1 million scale. He further observed that this was in accordance with SCUFN's Terms of Reference.

This has resulted in an increasing workload for SCUFN. Thus more than 500 name proposals had to be considered at SCUFN-XIV, Tokyo, April 2001, as opposed to 250 at SCUFN-XIII, 1999. Also, the work involved at the IHB to review and prepare all these proposals before they can be circulated to SCUFN Members is not significant, in particular when typing and/or translation is involved.

In order to facilitate the work of SCUFN, he suggested that IBC Editorial Boards (Ebs) adhere to the following rules when name proposals are submitted:

- that proposal forms be filled in English only and provided to the IHB in digital form. A digital copy of the SCUFN proposal form is available from the Free Publications section of the IHO Website (www.iho.shom.fr).

- that adequate supporting documentation be provided, showing bathymetric evidence of the feature(s). If possible, a draft copy of the relevant IBC sheet should be provided.

- that IBC EBs appoint, if possible, one of their members with good knowledge of marine geomorphology, to participate in SCUFN work on a temporary basis when names related to their IBC projects are considered. This may be achieved through attendance by these experts at SCUFN meetings.

4.1.3 GEBCO Centenary

The Centenary of GEBCO will be celebrated in Monaco on 14 – 16 April 2001. The celebration will include the Conference of Ocean Mapping Past, Present and Future, an exhibition of GEBCO products and mapping equipment, a history of GEBCO and visits by surveying ships (see Annex VI).

4.2 IBCM

A meeting of the EB's seven members occurred recently in Kaliningrad. Patrick Souquiere has been appointed as the Vice-Chairman. On behalf of Prof. Morelli, the Chief Editor Captain Andrei Popov of HDNO, presented a report, which outlined the results of the meeting in Kaliningrad, and described the current status of the project. David Divins reported that NGDC has proposed to prepare a prototype map and a demonstration CD for presentation at the next IHO meeting in Monaco.

The Chairman thanked Captain Popov for this presentation, and asked him to convey members' thanks to Professor Morelli.

4.3 IBCCA

MEETINGS OF THE EDITORIAL BOARD FOR THE IBCCA

The programmed 8th Meeting of the IBCCA that was tentatively planned in September 2000 at the IHO Data Centre for Digital Bathymetry (DCDB), US National Geophysical Data Center (NGDC), Boulder, Colorado, USA, was cancelled due to financial restrictions at the IOC. Now it could take place in the second half of the year 2001.

Dr. Dmitri Travin informed that IOC still have financial restrictions for Ocean Mapping so the next meeting of the IBCCA must be delayed until the year 2002. Instead of that the Vice-Chairman, Mr. José L. Frías, suggested that an invitation to some number of officers of IBCCA be sent to join this year to discuss selected items on the development of this project.

COMPOSITION OF THE EDITORIAL BOARD

The present membership of the Editorial Board is listed in the Biannual Report.

PROGRESS IN COMPILATION AND EDITING OF IBCCA SHEETS

- Sheets 1.01, 1.02, 1.03, 1.04, 1.05, 1.06, 1.09 and 1.11 are available in digital format and have been incorporated into the digital database. Editing of them is in progress at INEGI.

- Sheets 1.07, 1.08 have incorporated new bathymetry for Cayman through and have been sent to Cuba for reviewing and acceptance.

- Sheets 1.12 Previous compilation has been done by Costa Rica (about 50%), but after reviewing, the bathymetric contours have been sent to Instituto Geográfico de Costa Rica for corrections. Copies of the compilation were sent to NGDC, in Boulder, Co. for reviewing. In order not to delete the work the Group recommends that the participants who have finished their work take part in the compilation of sheet 1-12.

- Sheets 1.13, 1.14, 1.15 and 1.17 are complete. They were structurized, jointly by the INEGI and the CIOH of Colombia and the DAHN of Venezuela, but digital files are not completely satisfactory for Chief Editor. In this project Mr. Frías asked the IOC Executive Secretary to support a visit of a specialist from the INEGI for 2 or 3 days to Colombia and Venezuela to get directly the digital files to allow the Chief Editor to incorporate them into the digital database.

- Sheets 1.10 and 1.16 are from the responsibility of Representante du Service Hydrographique et Océanographique de la Marine (SHOM), and no progress has been reported to the Chief Editor yet.

Printing of the IBCCA Sheets

- Copies of Sheet 1.04 and 1.09 are available at INEGI (01 800 490 42 00, www.inegi.gob.mx, Fax: +52 (4) 9 18 07 39, E-mail: atencion.usuarios@inegi.gob.mx) or from: Ocean Mapping (IOC), Cumbers, Mill Lane, Sidlesham, Chichester PO20 7LX, United Kingdom (Fax: +44 1243 641222).

- For Sheets 1-01,1-02,1-03,1-05,1-06 and 1-11 Chief Editor will produce a colour proof via plotter at the INEGI during the present year 2001.

Mr. Frías Salazar raised the problem to print the full-sized sheet at INEGI, but it is possible to print each map in two parts using a small press. The Printing Programme will take place not later than the year 2002.

Producing of CD-ROMs for the IBCCA

Considering that much information is now in digital form, the Board expressed its interest in producing a CD-ROM for IBCCA.

Chief Editor is now in the position to produce in the present year a CD-ROM for Sheets 1-01, 1-02, 1-03, 1-04, 1-05, 1-06, 1-09, and 1-11. In addition to that, accordingly with the Editorial Board agreement, a CD-ROM assembled with Vector files for the Gulf of Mexico areas: 1.01, 1.02, 1.05 and 1.06, including the Digital Terrain Model, is going to be released in September 2001.

In this respect, Mr. Frías pointed out that the Board agreed at the last Meeting that international financial support is required to continue with the printed sheets and the production of the CD-ROMs for IBCCA.

To this respect, at the beginning of the year 2000, financial support has been requested from UNESCO via IOCARIBE, but no answer has been received.

IBCCA Geophysical/Geological Series

During the last meeting the Editorial Board agreed that as a first step, the following three series of geophysical maps at scale 1:1 000 000 should be produced: magnetic anomalies, gravity anomalies and seismicity, but no progress has been reported to this respect.

Noting that general geophysical maps for the IBCCA area had already been published, it was further agreed that the initial work consists of digitizing those maps, with the permission of the authors/publishers and sending them to the members of the Editorial Board according with the area of responsibility.

General matters

- The US National Geophysical Data Center (NGDC) prepared, jointly with the INEGI (Instituto Nacional de Estadistica, Geoegrafia e I nformatica), Mexico, a Web Site for IBCCA, to promote the regional project via INTERNET.
  It is available since April 1998 at the following address: http://www.ngdc.noaa.gob/mgg/ibcca/ib_start.htm.

- The Chief Editor has continued with the digitization, integration and structuration of the sheets which they have received from compilers and have been incorporated into the digital data base.

Michel Huet remarked that Mexico has applied for IHO membership, and that he expected to see the country represented at the next meeting in April 2002. He complimented the EB for an excellent report, and asked whether the proposed CD-ROM for each IBCCA sheet represented a potential duplication of the GDA. Mr. Frias explained that the initiative was prompted by industry interest in the region. A demonstration CD-ROM has been prepared. Its contents were developed with proprietary GIS software; in addition to contours and track lines, it contains information such as land topography, feature and city names, and imagery.

In responding to Mr. Huet's request for elaboration on the Mexican Navy's anticipated involvement in IBCCA, Mr. Frias explained that the Navy has been showing increased interest in hydrographic work with a view to producing its own electronic charts. To this end, the Navy has assigned two vessels to mapping in the Gulf of Mexico, and has been enhancing its computing infrastructure. Mr. Frias reports that his Institute has a good working relationship with the Navy, and suggested that it could be useful if IOC were to formally invite the Navy to participate in IBCCA. Similar invitations would be useful if sent to the hydrographic offices of Columbia, Costa Rica, Cuba, France, and Venezuela. It was agreed that Mr. Frias would draft a generic letter of invitation and forward it to Dr. Travin.

Mr. Huet tabled for examination by all present a copy of the printing specifications for the IBCCA sheets.

4.4 IBCEA

The IBCEA Chairman, André Roubertou, described the current present compilation and production status of IBCEA:

FRANCE (sheets 6 and 8 to 12)

- sheet 8 has been published in June 1999
- sheets 6 and 9 have been published in April 2001
- sheet 10 should have been published together with 6 and 9, but had to be belated due to material problems of printing. It is about to be published
- sheets 11 and 12 are presently circulated for review by the members of the Editorial Board. Their geographical names have been submitted to SCUFN. Depending on results, publication should take place sooner or later during the second semester of 2001.

PORTUGAL (sheets 1 to 3 and 7)

- sheets 1 and 2 seem ready for publication and are expected to be printed in the immediate future, but no precise schedule is available
- sheet 3 is presently being compiled but no recent information is available about the progress of this work
- sheet 7 is still to be compiled.

UK – FRANCE (sheets 4 and 5, formerly Spain, now are attributed to Peter Hunter from SOC (UK) for compilation, and to France for printing)

- no recent information available upon the state of advance of the compilation work. We have good reason to guess that it is practically completed. The printing and publishing by France is still subject to the effective availability of the expected financial support. Both maps should be published during 2002 if no difficulty arises.

Some remarks:

- Due to different printing techniques used by the two printing offices, some differences in the aspect of printed sheets are to be expected between the French and Portuguese products (quadrichromy for France – final choice unknown for Portugal).

- It may be regretted that Portugal did not comply with provision 501-C of the Specifications for IBCEA, and that the undersea features names are shown on their charts with generic terms in the Portuguese language. It is all the more to be regretted that a Portuguese version of the B6 document of the OHI-COI "Standardization of undersea feature names" is not yet available.

- It is to be noted that for workload reasons no work can be initiated by SHOM on sheets 10 and 16 of IBCCA and sheets 15 and 11-14 of IBCWIO until completion of IBCEA. Besides, the necessary financial support is not to be expected until 2002 and possibly later. A proposal of stages for personnel of Madagascar has been issued, without answer to date.

- No third meeting of the Editorial Board is deemed necessary before completion of the (bathymetric) charts publication. It will have to take place than to decide about the work to follow.

- No particular remark about the introduction of data present in the published into GDA. It is all right as of France. The same is expected when Portuguese are published.

Responding to a question from Mr. Huet concerning the harmonization of French and Portuguese colour schemes, Mr. Roubertou asserted that there was good communication between the respective hydrographic offices.

4.5 IBCWIO

The IBCWO Chairman, Werner Bettac, reported on the 5th Session of the Editorial Board of the International Bathymetric Chart of the West Indian Ocean (IBCWIO), which was held at Quatre Bornes, Mauritius, 24 – 28 July 2000.

The proofs of four IBCWIO charts have been presented: 1.03, 1.04, 1.06 and 1.07.

Charts 1.03 and 1.06 have been printed by Russia (HDNO); charts 1.04 and 1.07 by Germany (BSH).

The charts have been critically examined by the Board and discussed with the producer. It was agreed that the proofs of chart 1.03 and 1.06 of HDNO should be sent to Mrs. Taylor (National Geophysical Data Center, Boulder, USA) and Mr. Parvillers (Direction du Service Hydrographique et Oceanographique de la Marine, Paris, France). Both accepted to study the proofs, to draw up comments, and to carry out careful reviews. The results should be returned before 15 October 2000.

Captain Fridman of HDNO announced that a further colour print – chart 1.09 – would be printed in September 2000.

Mr. Osborne, HO South Africa, Cape Town, announced in an e-mail of 23 November 1999 that the HO, after they had got new hardware equipment and also new software, will print soon the contours of chart 1.20, and that the contours of chart 1.19 will follow soon after.

The Chairman of the IBCWIO asked by a letter Dr. Robert L. Fisher, Chairman, SCUFN, to do the scientific review of proofs 1.04 and 1.07, but he refused. Therefore, Prof. Fleming of Senckenberg Institut, Wilhelmshaven, Germany, has carried out this work.

Chart 1.07 includes a large number of undersea feature names taken from the chart MARGE NORD-MOZAMBIQUE ET CHAIN DAVIE, drawn by Vanney and Mougenot, but not contained in the GEBCO Gazetteer. The IHB (Mr. Huet) was asked by the Chairman of IBCWIO, to check the names and to decide if they should be included in chart 1.07 or not. Up to now there was no definite decision taken by IHB.

In responding to the concerns expressed by the EB-IBCWIO relating to the use of bathymetry predicted from observations of satellite altimetry, it was agreed that advice and guidelines would be sought from Walter Smith of NOAA, a specialist in the derivation of such predictions, on how best to use this information in the construction of IBC contours.

4.6 IBCWP

Mrs. Lin Shaohua presented the report.

During the seven years from the 1st Session of the EB – IBCWP up to now, a series of activities related to the project have been carried out.

a) Some sheets have been completed. In sub-region 1, Russia has completed 12 sheets at a scale of 1:500,000, including standard bathymetric data, track maps and depth contours. In sub-region 2, Japan has completed 4 sheets at a scale of 1:1000,000, China has completed 3 sheets 2-4, 2-8 and 2-11. In sub-region 3, China has completed 5 sheets 3-6, 3-7, 3-11, 3-12 and 3-16, Vietnam has completed sheet 3-11. In sub-region 4, Australia has completed sheets 4-12 and 4-14.

b) Some activities related to the project have also been carried out by Member States. The Philippines requested to become Producing Country for sheet 3-12. Thailand has officially agreed to participate in the IBCWP and is actively compiling data for sheet 3-10.

Progress in sub-region 4, responsible country Australia, has been driven by a bathymetric mapping programme in Australia to support the UNCLOS activity.

New Zealand has agreed to take responsibility for sub-region 5 and to provide contour data for the IBCWP. SOPAC has accepted the invitation of IOC and agreed to contribute to the IBCWP as the responsible country for sub-region 6.

The bathymetric data in sub-regions 2 and 3 is being collected and being processed. China Bathymetric Data Base is being designed and established. The soundings were conducted in the inshore and offshore waters of China. Korea is actively collecting the new bathymetric data for its coastal area, also Malaysia is currently working on data acquisition for its sheets.

c) The compilation and publication of bathymetric charts by using computer cartography system has been set up by China. The computer-aided compilation system for bathymetric charts was established on the basis of some commercial software such as Arc/info, Arc/view, Map/info, Map/object, CorelDraw etc. Its functions include: image and graphic scanning input, graphic vectorization, data processing, graphic design and compilation, multi-media making, colour printing and Internet transmission etc. It provides advanced standard, prices and fast technological support for making the charts.

The third session of the EB – IBCWP was held in Tianjin, China, in September 2000.

Some suggestions, recommendations and an implementation plan have been discussed at the meeting

a) Data exchange and request:

Collecting the bathymetric data is most important for the development of the IBCWP Project, because the Member States have not enough data. The EB – IBCWP agreed that it is very important to exchange data between Member States in sensitive areas. Also we make requirements for bathymetric data which is located in this area from NGDC, UK, France.

b) The detailed implementation plan should be accomplished as soon as possible. At present the IBCWP overall progress is not so rapid as other regional mapping projects, so all of Member States should submit the status of the implementation plans to the responsible countries and then send to the Chief Editor. Concerning a table with the coordinates for each sheet in sub-regions 1-3 and circulate it to the members is not finished during the meeting. It

was decided by the meeting that all countries involved in sub-regions should discuss with their national authorities how to proceed in order to advance the project.

c) Preparation of the compilation sheets

The Board agreed that proof copies of all sheets for evaluation by the EB – IBCWP should be sent to the members well in advance of the next meeting in order to allow for thorough and detailed review to be carried out.

d) The Board recommended that NGDC and NMDIS of China cooperate to develop the Database, Meta-Database and website for the IBCWP Project.

e) The Board agreed that only names of undersea feature in international waters that were previously approved by SCUFN or those presented and subsequently approved would be included on the IBCWP sheets. The areas of undisputed national jurisdiction, the both local and English name would be included on the charts.

It is right time to make schedule for the training workshop of IBCWP. The training workshop will involve quality control of the bathymetric data, combining using of the sounding and multi-beam data quality control and standardization. IOC Secretariat and NGDC will explore the possibility for funding and organizing a training workshop for the IBCWP, to be hosted by NGDC as soon as possible.

It was agreed that the next session of the EB – IBCWP should be held in conjunction with the proposed training workshop. And it is tentatively scheduled for the fall of 2001 at the NGDC.

The Chairman thanked Mrs. Lin for her report and asked her to convey thanks to Prof. Hou. In the meeting a number of sheets were identified where some topics are potentially problematic, so as an interim measure, it was advised that all data sets relating to these sheets be deposited with the IHO/IOC DCDB, in anticipation of their eventual use in building individual grids. For each sheet, participants would be consulted concerning a possible solution, and the situation would be reviewed at the next EB meeting.

In light of the large number of sheets involved in the present IBCWP, it was suggested, subject to consultation with participants, that this Project be divided into two components: the northern one would comprise sub-regions 1, 2, and 3, while the southern would comprise 4, 5, and 6.

4.7 IBCAO

Ron Macnab provided a brief overview of the IBCAO Project, and of its accomplishments to date. By the beginning of last year, the project had assembled all available data sets north of 64N, and incorporated them into a coherent database. This information was used to construct a 2.5 X 2.5 km “Beta” grid, which was used in turn to construct a provisional map of shaded relief. Mr. Macnab showed comparisons between the GEBCO and IBCAO representations in a few selected areas. He indicated that the database is being updated with new information that has been received in the past twelve months, with

the intention of producing an improved grid that will be submitted to the GEBCO Digital Atlas.

The Third EB Meeting is scheduled for the end of May 2001, at the Center for Coastal and Ocean Mapping of the University of New Brunswick. This gathering will address a number of short to long-term issues, e.g. IOC and IHO priorities for the production of printed maps, the designation of CCOM as a base of operations for the project for the foreseeable future, and possible structural and procedural revisions to reflect the IASC view that the IBCAO should no longer qualify as a formal IASC project because it has achieved a significant level of completion.

In commenting on the comprehensive application of digital techniques in this project, Sir Anthony Laughton asked whether and to what extent manual methods might have been employed in the derivation of depth contours. Mr. Macnab explained that the project was an amalgam of manual and digital techniques, where an experienced bathymetrist developed contours while taking geomorphological and other factors into account. These contours were then converted into digital form.

There followed a short discussion concerning the choice of an orthogonal (X, Y) coordinate system for defining IBCAO grid points, as opposed to a geocentric (latitude, longitude) system. It was explained that the orthogonal system was computationally more convenient, and that it yielded far more satisfactory results in the visualization of the grid.

In responding to a query concerning the disposition of the IBCAO products and their constituent data sets, Mr. Macnab explained that several hundred copies of a provisional map had been distributed either separately or as an insert in Martin Jakobsson's PhD thesis at Stockholm University. A beta version of the grid is available for downloading from the project's Website. Copies of all constituent data sets are held by Martin Jakobsson in a working archive at the University of New Hampshire, but not all are reflected in the holdings of the IHO/IOC DCDB. Circumstances permitting, it was agreed that steps would be given to harmonizing the UNH and DCDB archives.

Recalling that the EB had agreed to print definitive IBCAO maps according to GEBCO and IOC specifications, Mr. Macnab asked for guidance on the design and format of the GEBCO version, and on procedural matters related to the production of the IOC version(s). Sir Anthony replied that GEBCO was still considering future options for printed products, and would advise when the choices were clear. Central to the production of the IOC maps was the source of the contour information, i.e. copied from the latest HDNO Arctic map, or derived from the IBCAO grid. This question was deferred for discussion at the upcoming meeting of the EB, scheduled for May 27-28, 2001 in New Hampshire.

In concluding the discussion on IBCAO, Dmitri Travin suggested that the project could serve as a prototype for future IBC projects, including second and subsequent editions of existing map sheets.

4.8 PROPOSAL FOR A NEW IBC FOR THE SE PACIFIC IBCSEP

Dmitri Travin reported on discussions with representatives of Chile, Columbia, Ecuador, and Peru, concerning the feasibility of initiating a new IBC project in the SE Pacific Ocean. This was subsequently proposed by Chile at last year's IOC Assembly, and adopted by the IOC Executive Council. The Hydrographic Office of the Chilean Navy has offered to host the first meeting of the new EB in Valparaiso in October 2001. Terms of reference, membership, and an assembly diagram will be resolved at this meeting, in the expectation that work will get underway at an early date.

4.9 GAPA

A brief statement was made by the Chief Editor of GAPA Dr. Glev Udintsev.

4.10 SELECTED LOCAL CHARTS IN EEZS OF DEVELOPING COUNTRIES

A letter has been received from the Director of the National Institute of Oceanography of Pakistan, requesting IOC advice and assistance in the constructing of selected local charts in that country's EEZ. After some discussion of the nature and scope of the IOC's role in these activities, it was agreed that Dmitri Travin would draft a letter of reply for the signature of the IOC Executive Secretary Patricio Bernal.

4.11 HARMONIZATION OF SPECIFICATIONS

Specifications for all IBCs were entrusted to the IOC and IHO Secretariats for harmonization.

4.12 SUGGESTION OF A NEW IBC FOR THE SOUTH ATLANTIC

In a brief presentation, Ron Macnab described how the implementation of UNCLOS Article 76 by wide-margin coastal states is promoting a significant increase in the mapping of deeper waters in many parts of the world, i.e. from the middle and lower reaches of the continental slope to the abyssal plain. He described recent contacts with Article 76 specialists from both sides of the South Atlantic Ocean, and enumerated the nations that are either mapping, or planning to map, that Ocean's eastern and western margins. He also mentioned several past and ongoing mapping initiatives in the same general region, which could be considered potential sources of bathymetric information, i.e. the IBCEA Project, Russian undertakings such as the Angola-Brazil Geotransect and the Geological-Geophysical Atlas of the Central Atlantic see Section 9 below), and regular expeditions by vessels of Germany, the United Kingdom, and other nations with Antarctic interests.

Based on his experience with the IBCAO project, Mr. Macnab expressed his belief that the technical procedures and administrative arrangements that worked well in the Arctic might with some modification be applicable to a comparable operation in the South Atlantic. In particular, the securing of endorsements and financial support would require approaching a different set of agencies and organizations with interests in the region. In this context, the IOC's TEMA program might offer both a framework and a justification for the acquisition of funds that could help pay for the training of project participants, as well as the establishment of the necessary data processing infrastructure in the region.

In the discussion that ensued, reservations were expressed that an IBC project for the whole of the South Atlantic would probably be too ambitious in scope, and that chances for success might improve if the scope of the activity were more limited, e.g. encompassing only the region adjacent to the coast of South America, where data sets are known to exist.

It was also suggested that nations wishing to participate in such an activity be asked to commit sufficient funds to support the operation. It was acknowledged that this would be a desirable condition, but at the same time, it was pointed out that such a requirement might have proven to be a serious impediment to the launching of the Arctic project, where new money to pay for the project would have been difficult if not impossible to obtain from some participating states.

As this presentation was largely in the nature of an information item, it was agreed that no specific follow-up action was required, but that the Chairman would engage in dialogue with potential participants as opportunities arose.

5. DIGITIZATION, IN PARTICULAR OF IBCS, AND INCLUSION IN THE GEBCO DIGITAL ATLAS

As a general principle, all digitized IBC contours should be submitted for inclusion in the GEBCO Digital Atlas.

6. SALES AND PUBLICITY

Sir Anthony referred to GEBCO and IBC Homepages on Websites operated by NGDC and IOC. Over 1000 visitors were attracted to these Websites last year. Desmond Scott continues to sell IBC maps. IBCCEA, meanwhile, is producing a postcard for distribution at the next IOC Assembly. GDA sales continue at a modest pace, with over 1200 copies now distributed worldwide.

7. TEMA AND CAPACITY BUILDING

Recent discussions in Mauritius identified opportunities for partnerships between developing and developed countries, featuring exchange visits and attendance at courses for which IOC support might be available. In this context, it was noted that the Italian Hydrographic Service has offered basic hydrographic training at its centre in Trieste. At last year's EB meeting in Tianjin, the feasibility of organizing a workshop in Boulder was discussed informally, but this proposition requires further consideration before it can be acted upon.

During the 1999 CGOM Meeting, prospects for organizing courses as part of IOC's Floating University Program were discussed. HDNO representatives pointed out that the "Siberikov" was engaged in training cruises, which could provide good TEMA opportunities if the seagoing curriculum could be expanded to include Ocean Mapping and Marine Cartography.

8 BIANNUAL REPORT OF CGOM TO THE 21ST SESSION OF THE IOC ASSEMBLY

A draft Table of Contents was tabled for the information of atendees.

9. OTHER MATTERS

Alexander Mazarovich of the Geological Institute of the Russian Academy of Science, Moscow, gave a presentation describing his organization's Atlas of the Central Atlantic, a GIS-based compendium of multibeam measurements complemented by geophysical observations and geological samples. He showed a series of thematic maps that are available for viewing and downloading via the World Wide Web, at http://atlantic.tv-sign.ru

In light of references to funding situations that touch upon several IBC activities, it was suggested that the Agenda for the next CGOM Meeting include a discussion of funding for IBC projects in general.

Note was taken of the proposed Global Ocean Mapping Project, a US-led initiative to produce high-quality maps of the world ocean. A preliminary meeting was held in 2000 at the Stennis Space Center in the USA, to review potential shiptime and technological requirements. No funding is available at this time for such an initiative, but as was stated out during the Stennis meeting, the entire project could likely be completed at a cost equivalent to that of one mission to Mars.

Sir Anthony asked about IOC involvement in the UN Atlas of the Oceans. Dmitri Travin replied that the IOC is involved in a secondary role, but that he would make inquiries concerning the status of the project and of its primary organizational contact within the UN system.

10. DATE AND PLACE OF NEXT SESSION

The next meeting will occur during the first half of 2003. Dmitri Travin will review options and advise members accordingly.

11. ADOPTION OF THE SUMMARY REPORT AND RECOMMENDATIONS

The Consultative Group adopted the Summary Report and Recommendations.

12. CLOSURE OF THE SESSION

The Chairman thanked HDNO for their generous hospitality and for the technical support that was placed at the disposal of the participants. He expressed his appreciation to the attendants for their contributions and the quality of their presentations, and thanked Dmitri Travin for his role in coordinating the preparations. He declared the meeting closed at 12.00 on Monday May 14, 2001.

ANNEX I

AGENDA

1. Opening of the Session

2. Adoption of the Agenda

3. Conduct of the Session; documentation

4. Progress and planned future developments in Ocean Mapping:
4.1 GEBCO (incl. GEBCO – VII, GEBCO – VIII)
4.1.1 Gridded dataset
4.1.2 Undersea Feature Names

4.2 IBCM (incl. IBCM – VIII)
4.3 IBCCA
4.4 IBCEA
4.5 IBCWIO (incl. IBCWIO – V)
4.5.1 Revised Terms of Reference and Specifications

4.6 IBCWP (incl. IBCWP – III)
4.6.1 Division of the Editorial Board into a West and Northwest Pacific Board and a Southwest Pacific Board

4.7 IBCAO (incl. IBCAO – II)
4.8 Proposal for a new IBC for the SE – Pacific (IBCSEP)
4.9 GAPA
4.10 Selected local charts in EEZs of developing countries
4.11 Harmonization of Terms of Reference and Specifications of IBCs
4.12 Suggestion for a South Atlantic IBC

5. Digitization, in particular of IBCs, and inclusion into the GEBCO Digital Atlas (GDA)

6. Sales and publicity

7. TEMA and Capacity Building

8. Biannual Report of CGOM to the 21st Session of the IOC Assembly (covering April 1999 to April 2001)

9. Other matters

10. Date and place of the next Session

11. Adoption of the Summary Report and Recommendations

12. Closure of the Session

ANNEX II

LIST OF PARTICIPANTS

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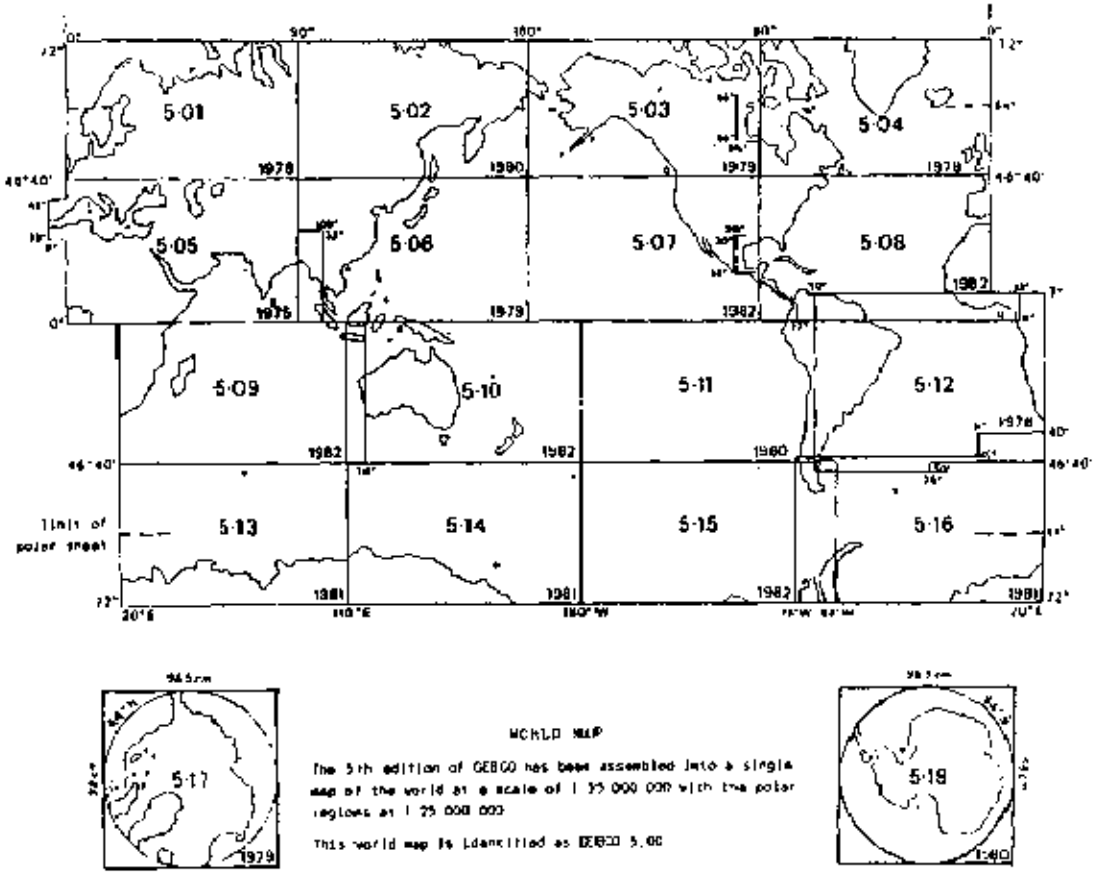
ANNEX III

ASSEMBLY DIAGRAM OF THE GENERAL BATHYMETRIC CHART OF THE OCEANS (GEBCO)

Scale l/l million at the Equator

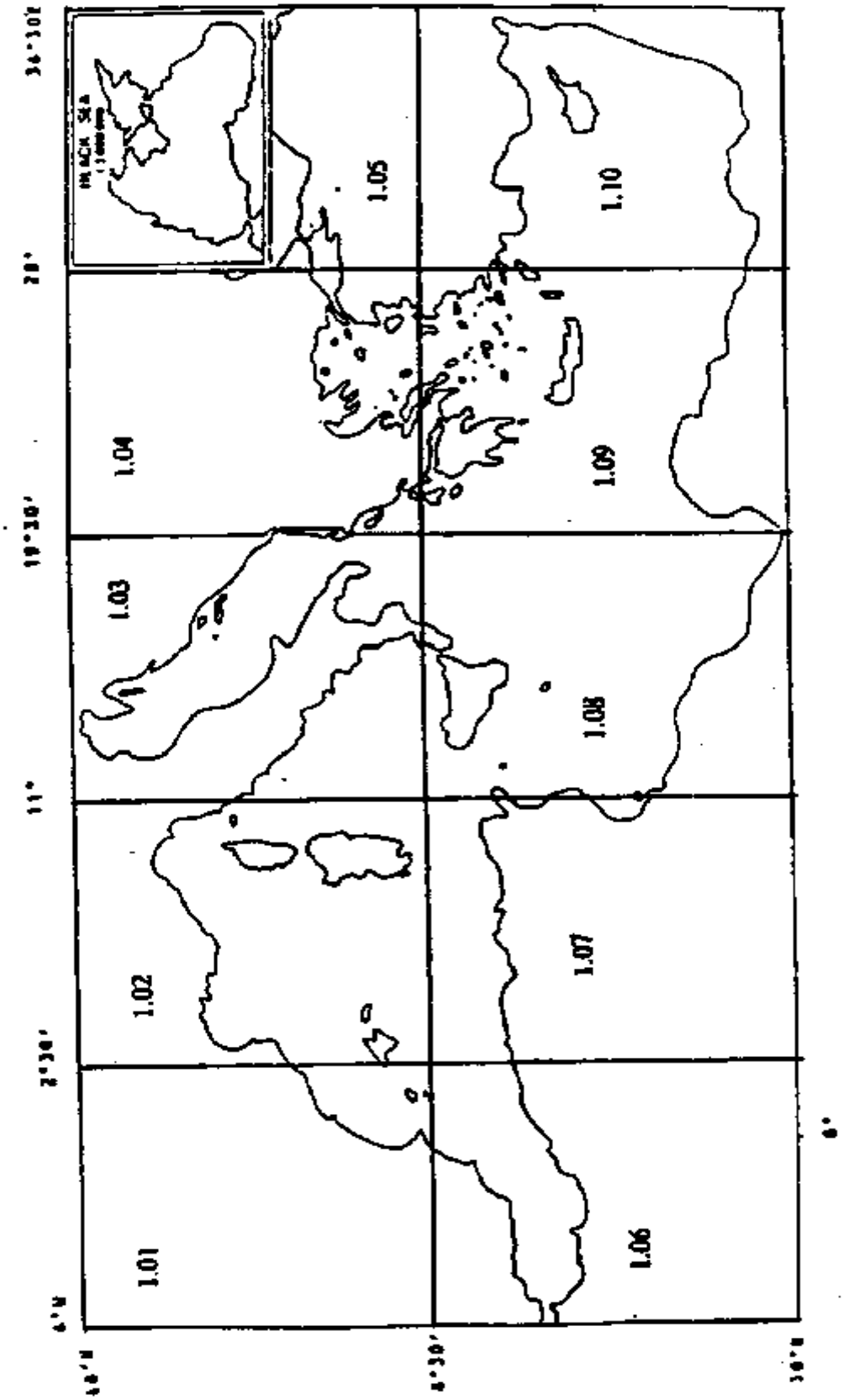


WORLD MAP

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

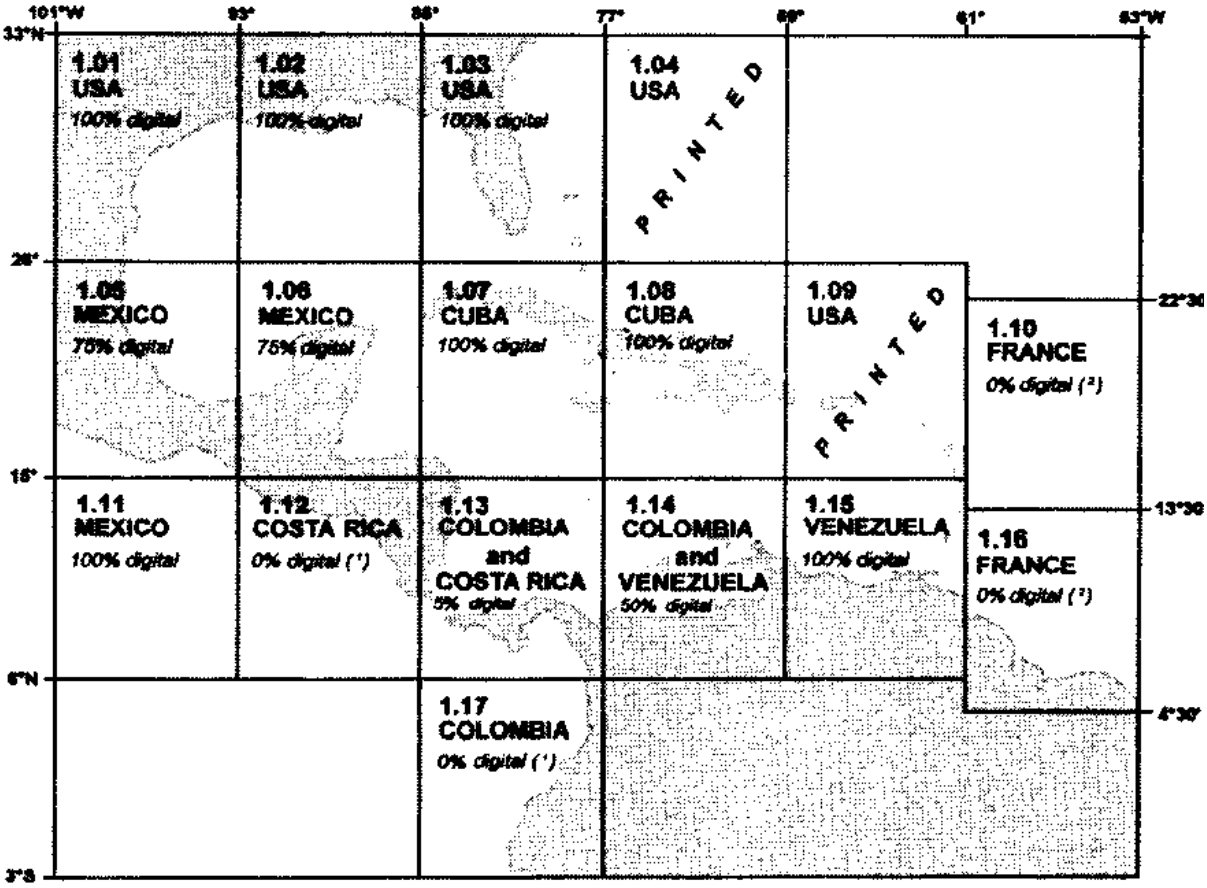
ASSEMBLY DIAGRAM OF THE INTERNATIONAL BATHYMETRIC CHART OF THE MEDITERRANEAN (IBCM)

Scale 1: 1 million at 38 “N



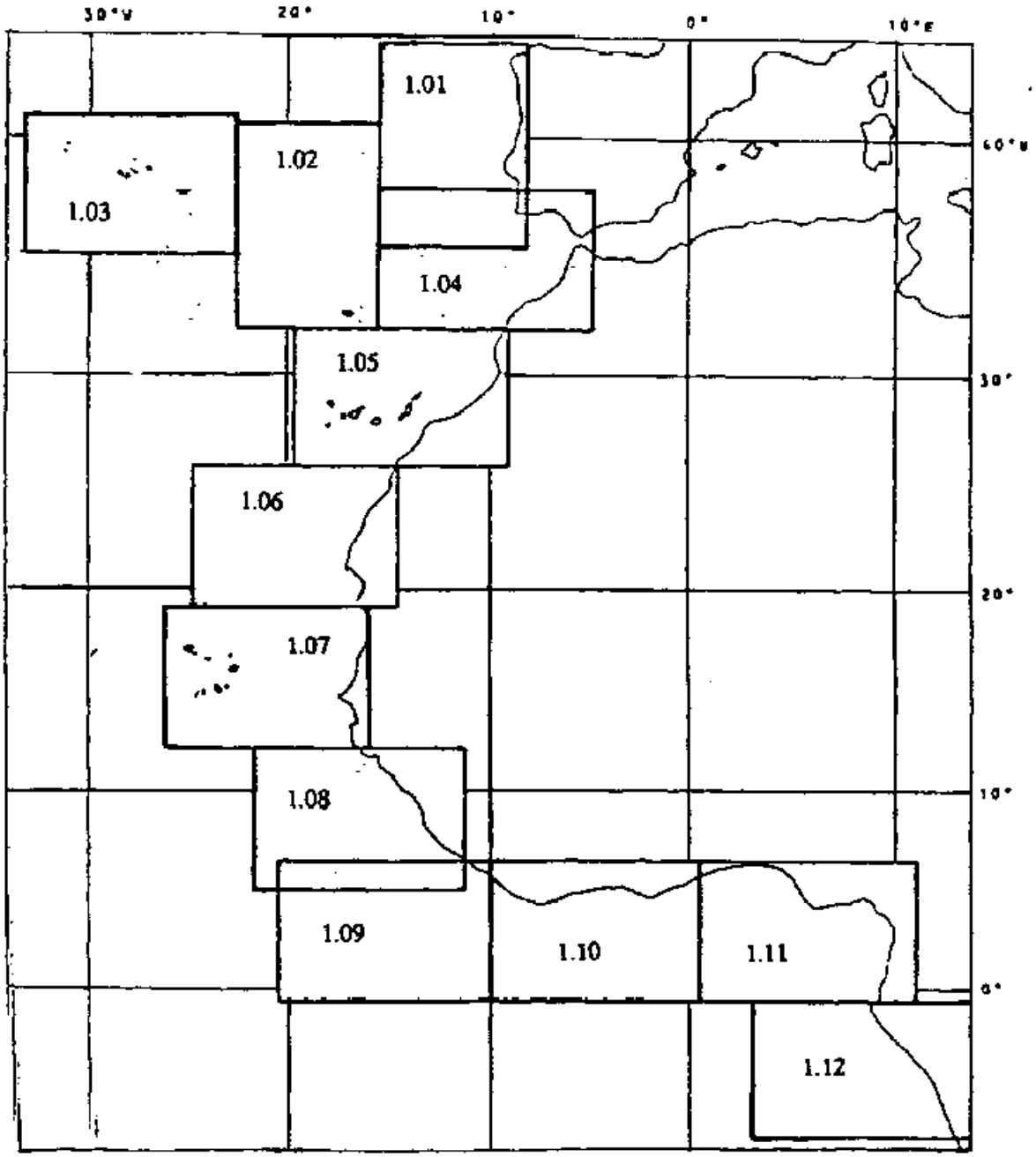
ASSEMBLY DIAGRAM OF THE INTERNATIONAL BATHYMETRIC CHART OF THE CARIBBEAN SEA AND GULF OF MEXICO (IBCCA)

Scale 1: 1 million at 15”N

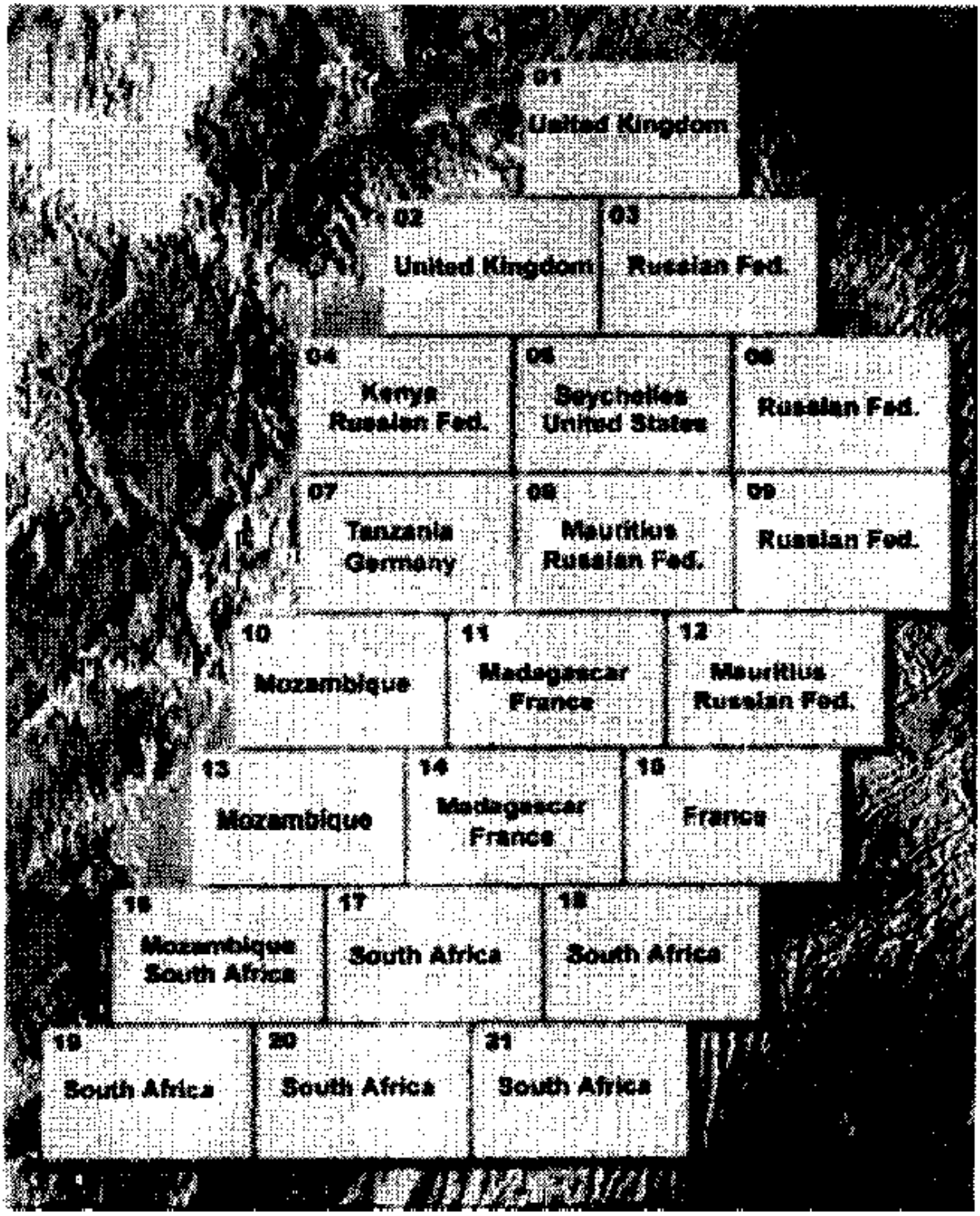


ASSEMBLY DIAGRAM OF THE INTERNATIONAL BATHYMETRIC CHART OF THE CENTRAL EASTERN ATLANTIC (IBCEA)

Scale 1: 1 million at 20”N

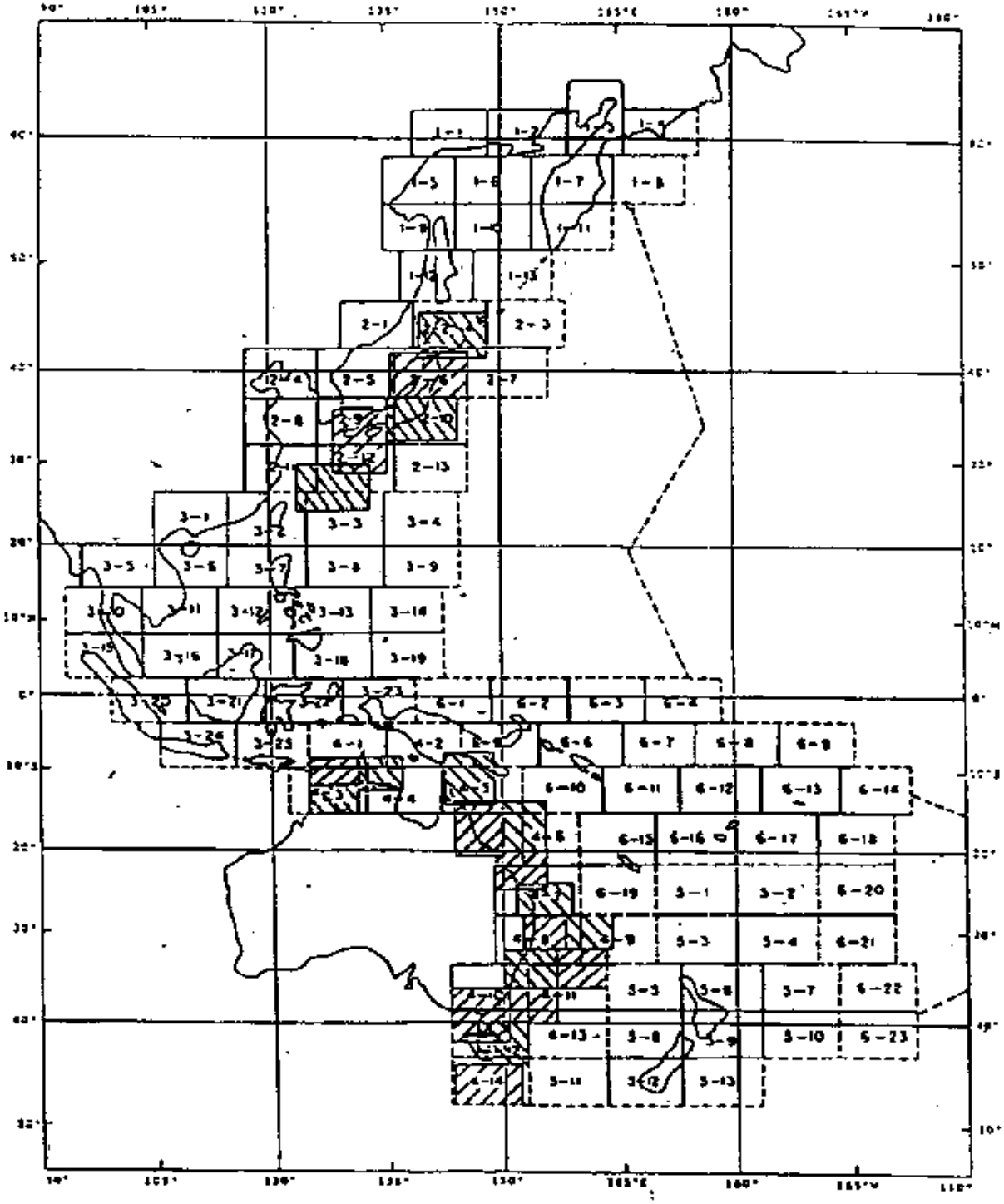


ASSEMBLY DIAGRAM OF THE INTERNATIONAL BATHYMETRIC CHART OF THE WESTERN INDIAN OCEAN (IBCWIO)
Scale 1: 1 million at the Equator

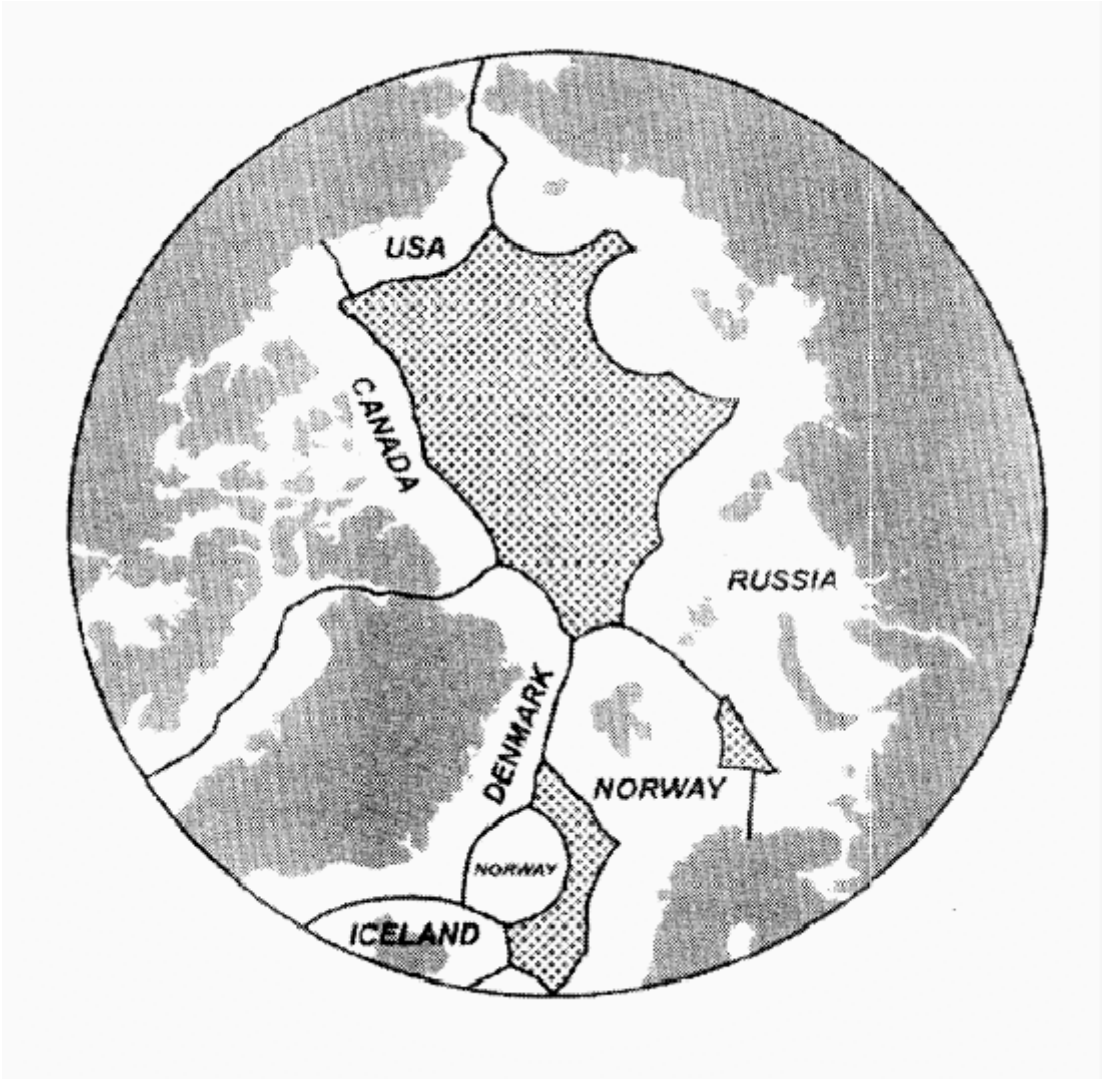


ASSEMBLY DIAGRAM OF THE INTERNATIONAL BATHYMETRIC CHART OF THE WESTERN PACIFIC (IBCWP)

Scale 1: 1 million at 33 o latitude



INTERNATIONAL BATHYMETRIC CHART OF THE ARCTIC OCEAN (IBCAO)
High Seas (patterned) and approximate limits of Zones of National Interest (ZNIs)
north of 64N



ANNEX IV

RECOMMENDATIONS

Recommendation 1:

The Consultative Group on Ocean Mapping,

Recognizing the increasing demand for both improved contoured charts of the ocean floor and for a bathymetric ocean grid from oceanographers, and from governments, and the need to collect all possible sounding data from countries throughout the world,

Noting the importance of ensuring close communications with coastal states,

Recommends to the Commission that funds are made available to ensure regular meetings of GEBCO and its subcommittees at centres of data and of excellence;

Recognizing the value placed on accurate bathymetry by many climate related and modeling oceanographic programmes,

Recommends to the IOC Executive Secretary that these IOC and other programmes also contribute towards the expenses of GEBCO;

Recognizing the importance of the input of the IBC Programmes to GEBCO,

Reminds Editorial Boards that IBC contours, once approved by the Boards, be made available for the GEBCO Digital Atlas (GDA), prior to publication.

Recommendation 2:

The Consultative Group on Ocean Mapping,

Noting with satisfaction the progress made in the implementation of the two main programme components of Ocean Mapping, namely GEBCO and the IBCs,

Accepts the Reports of GEBCO – XVII, IBCM – VIII, IBCWIO – V, IBCWP – III and IBCAO – II, and verbal information on GEBCO – XVIII,

Invites Mr. Walter Smith, NOAA, to prepare Guidelines on how to combine predicted sea floor topography with the bathymetric survey data to produce IBC contours,

Invites the Executive Secretary to hold an informal meeting on progress of officers of the Editorial Board of IBCCA before the end of the year making sure that the new chairperson will attend, and **recommends** that the 9th Session of the Editorial Board be held no later than May 2002,

Taking into consideration the digital files for sheets 1.13, 1.14. 1.15 and 1.17 are complete but are not completely satisfactory for Chief Editor,

Recommends that Executive Secretary support visit of a specialist from INEGI for 2 or 3 days to Columbia and Venezuela to get directly the digital files to allow the Chief Editor to incorporate them into the Digital Data Base.

Advises Member States to exchange data in the Western Pacific (IBCWP) through the IHB in Monaco,

Recommends that Member States include in their training programmes for IBCWP subjects such as quality control of bathymetric data, combining conventional and multibeam data, and standardization.

Invites Member States to review their unreleased data holdings in the Arctic Ocean, and to identify information that could be made available to improve the present version of the IBCAO.

Recommendation 3:

The Consultative Group on Ocean Mapping,

Taking into consideration the initiative of the Chilean Delegation during the 33rd Session of the IOC Executive Council, supported by IOC Member States mentioned in Resolution EC – XXXIII.7 "… as needs for extensive updating of the world bathymetry and of the Pacific and Arctic Oceans in particular…"

Recommends to the Assembly to establish an Editorial Board for the Southeast Pacific (IBCSEP), and invite the Executive Secretary IOC to set Terms of Reference and Specifications, as well as to arrange the 1st Meeting of the Board before the end of 2001.

Recommendation 4:

Noting the increase in the flow of new names of undersea features resulting from the more detailed mapping undertaken by the regional mapping projects of IOC,

Recommends to the Executive Secretary of IOC that funding for Ocean Mapping is increased to enable meetings of the GEBCO Sub- Committee on Undersea Feature Names (SCUFN) to take place yearly, alternate meetings being held at IHB, Monaco.

ANNEX V

Paragraph on Ocean Mapping for inclusion in a Draft Resolution of the Assembly

The Intergovernmental Oceanographic Commission,

Recalling that Ocean Mapping, since 1993, is a priority action of the Commission, and that charts and maps of the ocean bottom serve as indispensable base in regional and global marine science and service programmes on ocean dynamics and climate including tsunamis and storm surges, the exploration and exploitation of marine living and non-living resources, coastal development, offshore archaeology, the protection of marine environment, et al.

Noting with satisfaction the progress made in the implementation of the two main programme components of Ocean Mapping, namely GEBCO and the IBCs

Expressing hope that also the newest programme component on large-scale mapping of selected parts of EEZs will gain momentum and interest in Member States

Accepts the Report and Recommendations of the 8th Session of CGOM, which met in HDNO in St. Petersburg, 10 – 15 May 2001

Further accepts the biannual Report of CGOM, which had been submitted to the Assembly in accordance with Clause 1 of its Terms of Reference

Adopts the Revised Terms of Reference for IBCWIO

Decides to establish an Editorial Board for Southeast Pacific (IBCSEP)

Instructs the Executive Secretary to set up Terms of Reference and Specifications, and invite members, for IBCSEP, as well as to arrange for a first meeting in Valparaiso, Chile in October 2001

Further instructs the Executive Secretary to consult with Member States on splitting the existing Editorial Board for IBCWP, because of the size of the area, into two, namely a new IBC for the Southwest Pacific, and another IBC for the West and Northwest Pacific

ANNEX VI

Report of GEBCO to the Eighth Meeting of the CGOM

Anthony Laughton
Chairman Joint IHO/IOC Committee for GEBCO

Numerous meetings of GEBCO and its subcommittees have taken place since the Seventh Meeting of CGOM in April 1999.

13th Meeting of Sub Committee on Undersea Feature Names 22-25 June 1999.
16th Meeting of Sub Committee on Digital Bathymetry 23-25 June 1999.
17th Meeting of Joint *IOC/IHO* Guiding Committee 28-30 June 1999.
All in Halifax Nova Scotia

1st Meeting of GEBCO Centenary Organizing Committee 4 August 1999.
In Salisbury, UK

17th Meeting of Sub Committee on Digital Bathymetry 3-5 May 2000.
12th Meeting of Officers of Joint *IOC/IHO* Guiding Committee 8th May 2000.
2nd Meeting of GEBCO Centenary Organizing Committee 8th May 2000.
All in Copenhagen, Denmark

14th Meeting of Sub Committee on Undersea Feature Names 17-21 Apri12001.
18th Meeting of Sub Committee on Digital Bathymetry 18-21 April 2001.
Both in Tokyo, Japan

18th Meeting of Joint IOC/IHO Guiding Committee 23-24 April 2001.
3rd Meeting of GEBCO Centenary Organizing Committee 24 April 2001.
1st Meeting of GEBCO Strategic Planning Committee 25th April 2001.
All in Kobe, Japan

IOC has published the report of the 17th Guiding Committee and the 16th SCDB of 1999.

GEBCO has circulated reports of the meetings in Copenhagen in 2000 and of the 1st and 2nd Meetings of COC.

Reports of SCUFN meetings are held at IHB.
Reports are not yet available for the meetings in Japan in 2001.

This report to CGOM will address the issues raised in the meetings in Japan which have included most of those which were progressed in the previous meetings.

18th Meeting of Joint IOC/IHO Guiding Committee 23-24 April 2001.

It has become the custom that the meetings of the SCDB are attended by as many members of the GC as possible and that the SCDB members and advisers stay and contribute to the GC meeting. SCUFN met separately but members joined the GC for its meetings.

The SCDB has been the powerhouse behind GEBCO. Since the decision to exploit IT within GEBCO and the production of the GEBCO Digital Atlas (1st issue in 1994 and 2nd in 1997), experts from around the world have contributed to the up dating and improvement. Of the GDA, contributing both time, effort and travel costs often borne by their parent institutions. A typical meeting now comprises some 25 to 30 participants.

In the reports of the meetings, the discussions of the SCDB and the GC (or the Officers) have been merged into one report. SCUFN has reported separately.

New Issue of t he GDA

After several years of plans to issue a revision of the 1997 GDA, in Japan emphasis was put on ensuring that it would be issued in 2001. This issue will be a considerable advance on the previous issues.

- ► Revision of bathymetric contours including:

  The entire Indian Ocean together with the neighbouring parts of the SE Atlantic and the SW Pacific.
  The entire Arctic Ocean
  The waters around New Zealand parts of the North Atlantic
  some other smaller revisions

- ► Inclusion of a girded database of the whole world at 1-minute grid interval derived in part from the 5th edition contours, in part from the new contouring, in part from data obtained from the continental margins. A girding Working Group under Mike Carron of the US Naval Oceanographic Office has been progressing this. It is anticipated that it will replace the older and rather opaque DBDB5 (5 minute grid) prepared by the US Navy. The girding interval is comparable to that used by Smith and Sandwell (1997) in their "predicted" bathymetry, based on satellite altimetry data combined with soundings.

- ► Inclusion of the satellite altimetry derived sea surface gravity map.

- ► Inclusion of a Gazetteer of undersea feature names

- ► The new GDA wi1l be operated under Windows

Computer contouring of the girded database wi1l be compatible as far as possible with the vector contours on the GDA. However there may well be differences in areas where the data is scarce. The girded data base \\I.ill enable modelers to input the best available bathymetry and to manipulate the data more efficiently)'.
As part of its mandate the SCDB reviewed advances in contoured or girded surveys from around the world and debated whether they could be available to GEBCO.

Contributions from the IOC IBC series were considered for inclusion. Concern was expressed that these were not always easily available for GEBCO in spite of earlier agreements.

Many countries have undertaken extensive and intensive surveys of their own continental margins in relation to possible claims for an extended legal continental shelf under UNCLOS, and to assess resources in their EEZ. In some countries these data are not available pending legal decisions under UNCLOS and for security reasons. Potential commercial exploitation of the data has also restricted their availability.

When data have been made available, there have often been copyright constraints Laid on GEBCO when they are incorporated, whereas in some countries (e.g. the USA) freedom of information legislation insists that data are freely available. Some members of the GEBCO community would like to have GEBCO products freely available on the Internet, here as others recognize the constraints imposed by agreements where copyright is involved. Free access might prevent the acquisition of new data. This debate continues.

Undersea Feature Names

Under the leadership and scholarship of Dr Fisher, in Tokyo SCUFN reviewed some 500 names. The workload for SCUFN has increased considerably as new and more detailed surveys under the IOC mapping projects and along continental margins have defined more and more features. The Guiding Committee accepted Dr Fisher's view that SCUFN should meet annually rather than biannually and that alternate meetings should be held at the IHB in Monaco where Michel Huet maintains the database of names.

The GC urged that the IBCs of lOC should contribute to the costs of these additional meetings since many of the names have arisen from their activities. Dr Fisher was also concerned that the work tells on the relatively few members of SCUFN and looked for suitable new members to devote time and effort to the task of nomenclature. He indicated that he would continue as Chairman until at least 2003.

A draft of the Second Edition, running to 307 pages, of the IOC/IHO Gazetteer of Geographical Names of Undersea Features (BPS) was circulated for comment by the IHB in March 2001. It is also available as an Excel file.

SCOR WORKING GROUP 107

This WG as set up to advise lOC on the requirements for improved global bathymetry from the oceanographic, government, defense and commercial communities. It first met in 1996 in Southampton and again in 1997 in Baltimore, USA. Regrettably the final report has not yet been completed in spite of the increasing demands for accurate and usable bathymetry from modelers. When completed it should give lOC the necessary justification for increased effort in ocean mapping.

GEBCO CENTENARY CELEBRATIONS

To celebrate the centenary of the initiation of the GEBCO programme by Prince Albert 1st of Monaco in 1903, a conference on ocean mapping is being planned for 12th to l6th April 2003 in Monaco. This will be hosted by the International Hydrographic Bureau with the support of the Monegasque Government and of the Palace.

There have been three meetings of the Centenary Organizing Committee. The conference will be held in the Salle de Variete near the IHB and the programme is being organized by Dr Loughbridge of NGDC, Boulder, USA, with the assistance of a small committee. It will be a celebration and a history of the past hundred years, an analysis of the present state of ocean mapping and a visionary look to the future.

In association with the conference there will be a display of GEBCO products past and present, publication of a history of GEBCO, a commercial and technical exhibition of related hardware, visits from survey ships, social events and commemorative items.

The celebrations will be partly funded by IOC (cf. IOC Executive Council Resolution EC-:xx:3(.7), partly by the generosity of IHB and the Monegasque Government, partly by sponsorship and partly by registration fees.

SIXTH EDITION OF GEBCO PAPER CHARTS

In spite of the digital format of GEBCO products as CDROMs, there is still a demand for paper products for display, for teaching and for publicity. However it is not realistic nor are funds available to repeat the conventional chart production method of the 5th edition. Technology now enables charts to be prepared on demand from digital files to the customers needs.

It is planned to display some samples of. -print-on-demand.' products in the centenary exhibition. In Japan there were lengthy discussions on what products were actually required, what formats and styles should b~ used and what digital base was needed to produce them. During the next year trials will be made of different products ranging from charts similar to the~ 5th edition, to the more eye catching products of GMT technology.

Echo sounding around the Antarctic.

Considerable concern was expressed by Germany about a move by the green. movement to prevent the use of multibeam echosounders in the region of the. Antarctic Treaty, owing to the perceived damage to marine mammals from high-energy acoustic sources. GEBCO was asked to support the case for continued use of echosounders to improve our knowledge of, and safety of navigation in, the Antarctic environment.

G**EBCO meetings in 2002 and 2003**

Although Brazil has invited GEBCO to meet in Rio de Janeiro in 2002, the GC decided with regret that it would be too expensive in travel to hold the meetings there. An invitation from NGDC to hold the meetings in Boulder, Colorado was gratefully received, although an alternative venue in New Hampshire may also be considered.

In 2003 the meetings will be held in the week preceding the Centenary Conference in Monaco or somewhere nearby.

THE FUTURE OF GEBCO

In 1999, the Chairman of GEBCO tabled a paper about the future of GEBCO, recognizing that it has been limited in what it is able to do by very restricted funding. This has continued to be a substantial item on the GEBCO agenda in 2000 and 2001.

Concerns included:

- Lack of new attempts at recon touring major sections of the oceans, especially the Pacific.

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Concerns included:

- Lack of new attempts at recon touring major sections of the oceans, especially the Pacific.
- the difficulty in obtaining funds from scientific funding agencies for bathymetric compilations
- need for more staff committed to GEBCO
- inadequate funds for travel for meetings .no resources to print 6th edition
- limited resources for support of Centenary celebrations
- limited knowledge and use internationally of GEBCO products

Possible solutions:

- convert GEBCO to a commercial operation, marketing and pricing products to cover the cost of operations
- obtain patronage or sponsorship from individuals or companies
- obtain financial support from programmes and users of our products
- increase awareness of GEBCO by creating an educational GDA for free distribution to schools sponsored by advertising
- create GEBCO Centenary Fellowships dedicated to ocean bathymetry increase funding from IOC and/or IHO

In June 2000, the Chairman GEBCO made a presentation to the IOC Executive Council expressing concerns about the future of GEBCO and presenting possible options for the future. The EC applauded the aims and achievements of GEBCO but opposed the idea of commercialization. A resolution was passed (EC-XXXIII.7) ensuring support for the Centenary Conference and celebrations of EBCO with financial implications of $20,000. Subsequent financial support of $5,000 for travel to Japan came from NOAA of USA.

In pursuit of sponsorship, the Chairman of GEBCO GC also prepared four proposals for commercial support by Global Crossing, a telecommunications company concerned with laying a global fibre optic net, after discussions with the Vice Chairman of Global Crossing:

1. Headquarters organization and roll time Director at $390,000 over 5 years
2. Educational GDA at initial cost of $150,000
3. GEBCO Centenary Fellowship At $300,000 Over 5 Years
4. Support for GEBCO Centenary at $35,000.

Arising from these discussions, GEBCO has received the first installment of $50,000 spread over three years from Global Marine Systems, a subsidiary of Global Crossing. Further efforts are continuing to obtain more sponsorship.

GEBCO STRATEGIC PLANNING COMMITTEE

Discussions on the future of GEBCO in the Guiding Committee in Japan led to the formation of a GEBCO strategic Planning Committee under the Chairmanship of David Monahan (Canadian Hydrographic Service), Vice Chairman of GEBCO. A preliminary meeting was held in Kobe following the GC, and another is planned for November 2001 in Southampton.

The Committee will examine the fundamentals of the GEBCO programme, including what the users of today and tomorrow need, what participants can bring to the programme, what role IT will play in the decades ahead, the organization of GEBCO within or outside IOC/IHO, funding issues, products to be prepared etc.

The current structure of GEBCO and its relation to IOC and IHO is detailed in Part 1 of the "Guidelines for the General Bathymetric Chart of the Oceans", B- 7, published by the IHB in September 1991 and updated in 1993. The Strategic Planning Committee will examine this to see whether it is still relevant today and for the future.

(Other Parts of the Guidelines are:

Part 2 -Bathymetric Data Management -Analogue and Digital
Part 3 -Digital Bathymetric Data (Single Beam Echosounders)
Part 4 -Digital Bathymetric Data (Multibeam Echosounders)
(in draft but nearly complete)
Part 5 -Underway Geophysics Data)

The aim is to bring before our sponsoring bodies of lOC and IHO a strategic plan to take GEBCO into the next few decades.

8th April 2001

ANNEX VII
LIST OF ACRONYMS

ACUF	Advisory Committee on Undersea Features (SCUFN)
AGU	American Geophysical Union
BODC	British Oceanographic Data Centre
CERESCOR	Centre de Recherche Scientifique de Conakry (Guinee)
CGOM	IOC Consultative Group on Ocean Mapping
CHS	Canadian Hydrographic Service
DTM	Digital Terrain Model
EB	Editorial Board
EMSCS	European Mediterranean Seismological Centre (France)
GAPA	International Geological/Geophysical Atlases of the Atlantic and Pacific Oceans
GDA	GEBCO Digital Atlas (GEBCO Data base)
GEBCO	General Bathymetric Chart of the Oceans (IOC-IHO)
GLOSS	Global Sea Level Observing System (IOC)
HDNO	Head Department of Navigation and Oceanography (Russian Federation)
IASC	International Arctic Science Committee (Norway)
IBCCA	International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico
IBCEA	International Bathymetric Chart of the Central Eastern Atlantic
IBC	International Bathymetric Chart
IBCM	International Bathymetric Chart of the Mediterranean and its Geological/Geophysical Series
IBCWIO	International Bathymetric Chart of the Western Indian Ocean
IBCWP	International Bathymetric Chart of the Western Pacific
IFREMER	Institut Francais de Recherche pour l' Exploitation de la Mer
IGOSS	Integrated Global Ocean Services System (IOC-WMO)
IHB	International Hydrographic Bureau (Monaco)
IHO	International Hydrographic Organization (Monaco)
INEGI	Instituto National de Estadistica, Geografia e Informatica (Mexico)
IOC	Intergovemmental Oceanographic Commission (UNESCO)
IOS	Institute of Oceanographic Sciences (UK)
ISM	International Sea Mapping
NERC	Natural Environment Research Council (UK)
NGDC	National Geophysical Data Centre (USA)
ORSTOM	Institut Francais de Recherche Scientifique pour le Developpement en Cooperation
SAREC	Swedish Agency for Research Co-operation with Developing Countries
SCAR	Scientific Committee on Antarctic Research (UK)
SCDB	Sub-Committee on on Digital Bathymetry (GEBCO)
SCOR	Scientific Committee on Oceanic Research (USA)
SCUFN	Sub-Committee on Undersea Feature Names (GEBCO)
SHOM	Service Hydrographique et Oceanographique de la Marine (France)
SOC	Southampton Oceanographic Centre (UK)
SOPAC	South Pacific Applied Geoscience Commission (Fiji)
UNCLOS	United Nations Conference on the Law of the Sea

UNESCO	United Nations Educational, Scientific and Cultural Organization
WVS	World Vector Shoreline
WWW	World-Wide Web