Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans

Fifteenth Session

International Hydrographic Bureau
Monaco, 15-17 May 1995

UNESCO

In this Series, entitled

Reports of Meetings of Experts and Equivalent Bodies, which was initiated in 1984 and which is published in English only, unless otherwise specified, the reports of the following meetings have already been issued:

1. Third Meeting of the Central Editorial Board for the Geological/Geophysical Atlases of the Atlantic and Pacific Oceans
2. Fourth Meeting of the Central Editorial Board for the Geological/Geophysical Atlases of the Atlantic and Pacific Oceans
3. Fourth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño' *(Also printed in Spanish)*
4. First Session of the IOC-FAO Guiding Group of Experts on the Programme of Ocean Science in Relation to Living Resources
5. First Session of the IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources
6. First Session of the Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
7. First Session of the Joint CCOP(SOPAC)-IOC Working Group on South Pacific Tectonics and Resources
8. First Session of the IODE Group of Experts on Marine Information Management
9. Tenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies in East Asian Tectonics and Resources
10. Sixth Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibrafion
11. First Session of the IOC Consultative Group on Ocean Mapping *(Also printed in French and Spanish)*
12. Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ships-of-Opportunity programmes
13. Second Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
14. Third Session of the Group of Experts on Format Development
15. Eleventh Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of South-East Asian Tectonics and Resources
16. Second Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
17. Seventh Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
18. Second Session of the IOC Group of Experts on Effects of Pollutants
19. Primera Reunión del Comité Editorial de la COI para la Carta Batimétrica International del Mar Caribe y Parte del Océano Pacífico frente a Centroamérica *(Spanish only)*
20. Third Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
21. Twelfth Session of the Joint CCOP-IOC Working Group on Post-I DOE Studies of South-East Asian Tectonics and Resources
22. Second Session of the IODE Group of Experts on Marine Information Management
23. First Session of the IOC Group of Experts on Marine Geology and Geophysics in the Western Pacific
24. Second Session of the IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources *(Also printed in French and Spanish)*
25. Third Session of the IOC Group of Experts on Effects of Pollutants
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29. First Session of the IOC-IAEA-UNEP Group of Experts on Standards and Reference Materials
30. First Session of the IOCARIBE Group of Experts on Recruitment in Tropical Coastal Demersal Communities *(Also printed in Spanish)*
31. Second IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity programmes
32. Thirteenth Session of the Joint CCOP-IOC Working Group on Post-I DOE Studies of East Asia Tectonics and Resources
33. Second Session of the IOC Task Team on the Global Sea-Level Observing System
34. Third Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
35. Fourth Session of the IOC- UNEP-IMO Group of Experts on Effects of Pollutants
36. First Consultative Meeting on RNODCs and Climate Data Services
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43. First Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean
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45. Ninth Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
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47. First Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean
48. Twelfth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans
49. Fifteenth Session of the Joint CCOP-IOC Working Group on Post-I DOE Studies of East Asian Tectonics and Resources
50. Third Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity programmes
51. First Session of the IOC Group of Experts on the Global Sea-Level Observing System
52. Fourth Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean
53. First Session of the IOC Editorial Board for the International Chart of the Central Eastern Atlantic *(Also printed in French)*
54. Third Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico *(Also printed in Spanish)*
55. Fifth Session of the IOC-UNEP-IMO Group of Experts on Effects of Pollutants
56. Second Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean
57. First Meeting of the IOC *ad hoc* Group of Experts on Ocean Mapping in the WESTPAC Area
58. Fourth Session of the IOC Consultative Group on Ocean Mapping
59. Second Session of the IOC-WMO/IGOSS Group of Experts on Operations and Technical Applications
60. Second Session of the IOC Group of Experts on the Global Sea-Level Observing System
61. UNEP-IOC-WMO Meeting of Experts on Long-Term Global Monitoring System of Coastal and Near-Shore Phenomena Related to Climate Change
62. Third Session of the IOC-FAO Group of Experts on the Programme of Ocean Science in Relation to Living Resources
63. Second Session of the IOC- IAEA-UNEP Group of Experts on Standards and Reference Materials
64. Joint Meeting of the Group of Experts on Pollutants and the Group of Experts on Methods, Standards and Intercalibration
65. First Meeting of the Working Group on Oceanographic Co-operation in the ROPME Sea Area
66. Fifth Session of the Editorial Board for the International Bathymetric and its Geological/Geophysical Series
67. Thirteenth Session of the IOC-IHO Joint Guiding Committee for the General Bathymetric Chart of the Oceans *(Also printed in French)*
68. International Meeting of Scientific and Technical Experts on Climate Change and Oceans
69. UNEP-IOC-WMC-IUCN Meeting of Experts on a Long-Term Global Monitoring System
70. Fourth Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity programmes
71. ROPME-IOC Meeting of the Steering Committee on Oceanographic Co-operation in the ROPME Sea Area
72. Seventh Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño' *(Spanish only)*
73. Fourth Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico *(Also printed in Spanish)*
74. UNEP-IOC-ASPEI Global Task Team on the Implications of Climate Change on Coral Reefs
75. Third Session of the IODE Group of Experts on Marine Information Management
76. Fifth Session of the IODE Group of Experts on Technical Aspects of Data Exchange
77. ROPME-IOC Meeting of the Steering Committee for the Integrated Project Plan for the Coastal and Marine Environment of the ROPME Sea Area
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SC-95/WS-30

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SUMMARY REPORT

1. OPENING OF THE SESSION

The Fifteenth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans (GEBCO) was held at the International Hydrographic Bureau, Monaco. Sir Anthony Laughton, Chairman GEBCO, opened the session at 09.30 on Monday 15 May 1995. 1

Rear Admiral Christian Andreasen, President of the Directing Committee, welcomed the participants on behalf the International Hydrographic Organization, and Mr Dmitri Travin on behalf of Dr Gunnar Kullenberg, Secretary IOC. 2

The Chairman welcomed: 3
Lie. José Luis Frias Salazar (Mexico)
to the first session of the Guiding Committee he had attended as a full member.
Captain James E.Ayres, U.S.Defense Mapping Agency, who was well known to many members of the Guiding Committee and other participants.

A full List of Participants is given in Annex VII. 4
A full List of Acronyms used is given in Annex VIII.

Apologies for absence had been received from: 5
Mr David Monahan;
Dr Robin K.H.Falconer;
Dr Larry A.Mayer;
Capitán de Navio J.M.Fernández de la Puente;
Dr Andrey Popov;
Mr William Rankin;
Dr Kunio Yashima.

2. CONDUCT OF THE SESSION

2.1 Adoption of the Agenda

The Agenda was adopted - see Annex I. 6

2.2 Documentation; Administrative Arrangements; etc.

The Permanent Secretary introduced the documentation - see Annex II. The Administrative Arrangements and Social Programme were presented. 7

3. COMPOSITION OF THE GUIDING COMMITTEE AND ITS SUB-COMMITTEES

It was reported that the following changes had taken place since the Thirteenth Session of the Guiding Committee in June 1991: 8

GEBCO Guiding Committee

Lie. José Luis Frias Salazar (Mexico) had been appointed to the vacancy left by the resignation of Dr Robert L.Fisher. 9

Scientific Advisers to the GEBCO

10 The names of Carl Brenner, Leonard Johnson and Carl Nelius were removed from the list and thanks were recorded for their support over the years.

11 Dr Gary Robinson accepted an invitation to become a Scientific Adviser.

Sub-Committee on Undersea Feature Names (SCUFN)

12 Capitão-de-Fragata Roberto Figueria Carvalho (Brazil) had been appointed to the Sub-Committee.

13 Mr Randall E.Flynn, Executive Secretary for Foreign Names, BGN/ACUF, had been provisionally listed as an adviser to SCUFN to replace Mr Anthony Gregory. Dr Richard R.Randall, former Executive Secretary BGN, had retired.

Sub-Committee on Digital Bathymetry (SCDB)

14 Mr William Rankin had replaced Mr Frank Marchant, USNOO, on the Sub-Committee.

15 Mr Adam Kerr, Director IHO, now Chairman of the IHO Committee on Electronic data (CoE) was appointed to the Sub-Committee, ex-officio as an observer, to replace Rear Admiral J.Austin Yeager NOAA.

4. MATTERS ARISING FROM REPORTS OF PREVIOUS MEETINGS

4.1 Summary Report of the Fourteenth Session of the Joint IOC-IHO Guiding Committee for the GEBCO (doc. IOC-IHO/GEBCO-XIV/3)

13 All matters arising from this report were covered by item 4.2 below or other agenda items.

4.2 Summary Report of the Ninth Meeting of the GEBCO Officers (doc. IOC-IHO/GEBCO Officers-IX/3)

Patagraph 19 The GERCO Bathymetric Editor
The GEBC0 Digital Atlas Manager

17 The Chairman reported that the United Kingdom Natural Environment Research Council (NERC) had confirmed the extension of these two posts for 4 more years (until 1999) . These appointments form part of the U.K. contribution (in kind) to the IOC, so they can be assured for the next few years.

The Guiding Committee placed on record its great appreciation to NERC for its continued support to the GEBCO project. *18*

Paragraph 20 Proposed Surveys in the Arctic (formerly known as the 'Victor Project')

No further progress with this project has been reported. It will be retained as an information item only. Dr Gleb Udintsev and Dr Yuri Kiselev were invited to keep the Guiding Committee informed of any developments. *19*

Two cruises by U.S. submarines, collecting bathymetry and gravity data, were announced at the American Geophysical Union (AGU) meeting in December 1994. The U.S. Navy will provide space as available. *20*

Paragraph 21 Liaison with the National Geographic Society (NGS)

Rear Admiral Andreasen reported that he had written to NGS in an attempt to publicise the GDA. He was invited to maintain contact with the Society. *2l*

Paragraph 24 Liaison with the Circum-Atlantic Project (CAP)

Dr Meirion Jones reported that his contact was now Dr Terry Offield. The GDA bathymetry was being used and a preparatory CD-ROM was expected in early summer 1995. It was noted that due to USGS internal policy CAP was being given a much reduced level of visibility. *22*

Paragraph 26 Project 'Global Mapping for the Global Environment'

Dr Kunio Yashima would be invited to investigate whether there had been any new developments. *23*

Paragraph 97 Proposal by the Italian Hydrographer to submit material to the International Bathymetric Chart of the Mediterranean (IBCM) in the form of bathymetric contours instead of as sounding data.

Rear Admiral Andreasen reported that the Italian (and Spanish) Hydrographers have withdrawn their proposal. There is a necessary follow-up now to obtain their data in digital form. Dr Michael Loughridge (NGDC) has agreed to digitize the Italian bathymetric plotting sheets. *24*

5. REPORTS ON WORK CARRIED OUT BY, AND ACTIVITIES OF:

5.1 THE GEBCO BATHYMETRIC EDITOR

25 Mr Peter Hunter reported that due to the imminent move of his Institute from Wormley to Southampton, no visits had been possible over the past year. He had however kept up a close liaison with his contacts by correspondence. He had also been active in checking out the colour proof of sheet 5.12 (revised) South Atlantic (see item 9 below) and preparing material for updating the GDA, in particular in the North-east Atlantic.

26 He was planning visits to: Germany, in particular the BSH facility at Restock; Spain, the University of Barcelona - of particular interest was their work in the Antarctic in R/V 'Hesperides' (it was noted that Spanish name proposals had not been received for consideration by SCUFN); and Norway. In addition, he planned to attend all IBC Editorial Board meetings which would provide an opportunity for him to visit Mexico and countries in the Caribbean and Central America. Dmitri Travin confirmed that prior notification of all EB-IBC meetings would be sent to Peter Hunter.

27 A Baltic Consortium (Dr Emelyan Emelyanov), based in Riga, had issued a set of maps in the late 1980s. Cherkis agreed to send a set to the GBE. Scott will send a copy of the Baltic Sea Environment Proceedings No.9 map 'The Baltic Sea Area - Bathymetric Map', 1981, to the GBE.

28 Dr Michael Loughridge reported that he had received very little information from IBCWP (Dr Hou Wenfeng). Dmitri Travin agreed to investigate this, with Dr Li Haiqing (IOC Secretariat).

5.2 THE GEBCO DIGITAL ATLAS MANAGER

29 Ms Pauline Weatherall submitted a report on her activities: Report of GEBCO Digital Atlas Manager 1994-1995 (see Annex III). Her main task had been co-operating with Dr Robert L. Fisher (SIO) over digitizing his major work in the greater Indian Ocean area. The area 10 W (in the Atlantic south of 24°S) to 100°E had been digitized and he was now working to 120°E. Some three-quarters of the quality control work and edge matching had been completed.

30 Dr Fisher reported that due to major personality changes in Australia, data to 150°E from CSIRO and AGSO were now being released. IHB was invited to approach the Australian Hydrographer on behalf of SCDB, as no digital data had as yet been received from his office. Several institutions in Australia were willing to supply digital data, but with a restriction on further distribution. These data will be supplied for the 'Alliance exotique' project and GEBCO, but will not at this time be submitted to Data Centres.

However, following a request, he agreed to the release of his ship track plot for the area of IBCWIO to the Chief Editor IBCWIO, so that a comparison could be made with ship cruise data held, with a view to identifying and subsequently obtaining any missing data. *31*

The Guiding Committee congratulated Pauline Weatherall on her work which was proving most valuable. *32*

5.3 THE NERC UNIT FOR THEMATIC INFORMATION SYSTEMS (GEBCO PROJECT)

Dr Gary Robinson reported that he was the only person in the unit working on the GEBCO Project. He had been concentrating on ways of estimating the accuracy and quality of results when interpolating raw bathymetric contour data, for use when updating the GDA. Further work had also been carried out on the cartographic name placement project, designed to integrate names from the Gazetteer with the GDA generalized coastlines. A demonstration was given to show the latest developments. *33*

The Guiding Committee thanked Dr Robinson for his work and asked him to continue developing both projects. *34*

6. SUB-COMMITTEE ON UNDERSEA FEATURE NAMES, ELEVENTH MEETING, IHB, MONACO, 11-13 MAY 1995

Dr Robert L.Fisher, Chairman, Sub-Committee on Undersea Feature Names, introduced this item and presented the report of the Eleventh Meeting of his Sub-Committee, which had been held at the International Hydrographic Bureau the previous week, 11-13 May 1995. In taking the Guiding Committee through the draft report in some detail, he pointed out that, although approved in principle by the Sub-Committee, it would need a considerable amount of checking and editing by the Secretary of the Sub-Committee, Ing.en Chef Michel Huet, particularly the many geographical co-ordinates listed, and cross-references, before the text (doc. IOC-IHO/GEBCO SCUFN-XI/3) could be finalized. *35*

He drew attention to two concerns expressed by the Sub-Committee which are explained in the report in more detail under the heading 'Principles for Naming Features'. These are: 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 agreed fully with the concerns expressed and instructed the Sub-Committee to reject such names if any such came before them. The Chairman BGN/ACUF was invited to take note of this action. *36*

37 It was recalled that a proposal had been made at an earlier meeting of the Sub-Committee that a seamount group at the north-east end of the Guinea Rise (9°04'N. 20°20'W. to 8°58'N. 19°52'W.) be named the Grimaldi Seamounts after the Monegasque ruling family, and that individual seamounts in the group be named after Prince Albert I of Monaco and his two research ships, Hirondelle and Princesse Alice, which had worked in that area. It was agreed that this would b discussed with BGN/ACUF (which body had been naming seamounts in this region) and, if agreement could be reached, that clearance would be sought from Prince Rainier.

38 Ing.en Chef Michel Huet demonstrated the digitized version of the IHO/IOC Gazetteer which is maintained by IHB but now also forms part of the GEBCO Digital Atlas (GDA). It was noted that there is scope to add a great deal of additional material, in particular historical information on the origin of names. The IHB noted that it is planned to hire a summer student (geography) to begin loading historical information in 1995. Furthermore there is close linkage between the Gazetteer database and the Cartographic Name Placement Project using ICON technology, being developed by Dr Gary Robinson (see item 5.3 above).

39 The Guiding Committee expressed the need to record in the database the maximum and minimum depths (where known) of all named features, to help with their classification. Michel Huet said that at present such information only appeared in the Remarks column, and that if this was a requirement the database will have to be restructured.

40 It was noted that: i. the International Arctic Science Committee (IASC) was revising their Arctic dataset; ii. the International Cartographic Association Working Group on Marine Cartography (which is to become a Commission) is preparing a new multi-lingual Gazetteer of Ocean Names - the Representative of the IHO was invited to enquire from the ICA Working Group what they are using as a database; and iii. the SCAR Working Group on Geodesy and Geographic Information/ Sub-Working Group on Antarctic Place Names was developing an Antarctic database (incorporating both land and sea names) - Dr Schenke agreed to maintain close liaison with this Sub-Working Group.

41 The Guiding Committee acknowledged with great appreciation the enormous amount of work, together with erudition and research, needed to ensure the provision of academically acceptable names for undersea features, in particular by the Chairman, Dr Robert L.Fisher, and the Secretary of the Sub-Committee, Ing.en Chef. Michel Huet.

6.1 LIAISON AND CO-OPERATION WITH THE U.S. BOARD ON GEOGRAPHIC NAMES/ADVISORY COMMITTEE ON UNDERSEA FEATURES (BGN/ACUF)

42 The Chairman of the Sub-Committee on Undersea Feature Names reported that following the appointment of Mr Norman Z.Cherkis, a Scientific Adviser to the GEBCO, as Chairman BGN/ACUF, liaison and co-operation between the two bodies had improved greatly. As a

result 'Procedures to be adopted for the consideration of name proposals ' (doc. IOC- IHO/GEBCO SCUFN-XI/3, item 7) had been agreed.

Following an enquiry, Mr Cherkis agreed to confirm whether Mr Trent Palmer, Executive Secretary ACUF, or Mr Randall E.Flynn, BGN Executive Secretary for Foreign Names (who had replied to invitations), should be listed as the Adviser to SCUFN (ex-officio). *43*

6.2 Standardization OF UNDERSEA FEATURE NAMES (publication B-6)

The Permanent Secretary reported that no further work had been carried out on the English/German and English/Portuguese versions of this publication, and the English/Chinese version (although published) was incomplete as there were no references therein to usage of terms in the Chinese scientific literature. The full versions now available were: English/French (2nd Edition), English/Japanese, English/Russian (2nd Edition) and English/Spanish (2nd Edition). *44*

He pointed out that when this project was started, it had been the intention to publish all available language versions in a single volume and he asked whether this was still the intention. After discussion it was decided that there would be no significant advantage in so doing and the idea was dropped. *45*

However it was considered that the definitions of some generic names of undersea features need updating and certain names, e.g. seamount, channel/seachannel, need clarification. This requirement was referred back to the Sub-Committee on Undersea Feature Names which was also invited to complete all examples and definitions given in the English text. *46*

7. SUB-COMMITTEE ON DIGITAL BATHYMETRY, TWELFTH MEETING, SACLANT UNDERSEA RESEARCH CENTRE, LA SPEZIA, 8-12 MAY 1995

Dr Meirion T.Jones, Chairman, Sub-Committee on Digital Bathymetry, introduced this item and presented the report of the Twelfth Meeting of his Sub-Committee (to be issued as doc. IOC- IHO/GEBCO SCDB-XII/3) , which had been held at the SACLANT Undersea Research Centre, La Spezia, Italy, the previous week, 8-12 May 1995. He reported that twenty experts from nine countries had participated in the meeting and benefited from the excellent facilities and organizational support provided by the Centre. The SACLANT Centre had indicated that it was keen to establish working relationships with technical groups such as this GEBCO Sub-Committee. *47*

The agenda covered by the meeting was wide and varied, and included previews and discussion on bathymetric mapping activities worldwide; related activities of other national and international groups; development of the GDA; management of echo-sounding data; standards and guidelines for the management and exchange of digital bathymetric data; and the future development of GEBCO's digital products. *48*

49 *Progress* was reported on a wide range of international and national efforts in the field of bathymetric mapping and data management, as follows (more detail will appear in doc. IOC-IHO/GEBCO SCDB-XII/3):

Arctic Ocean

50 i. U.S. Naval Research Laboratory (NRL), (Cherkis) - new bathymetric map of the Arctic planned for' release mid-1997; Bathymetry of Franz Josef Land to be printed October 1995; new version of Barents and Kara Seas digitized contours; work on Arabian Sea map continues;

51 ii. IASC Working Group on Geophysical Mapping [Jones (for Macnab)] - (former) Soviet Union Arctic seismic and invaluable bathymetric data being rescued (with NATO grant); Macnab has created a revised Arctic gridded dataset/image incorporating GDA contours;

Atlantic Ocean

52 iii. U.K. Institute of Oceanographic Sciences Deacon Laboratory (Hunter) - North-east Atlantic bathymetric chart series (5 sheets) being updated and recontoured;

53 iv. IOC International Bathymetric Chart of the Central Eastern Atlantic (IBCEA) [Hunter and Loughridge (for Holcombe)] - good progress but concern for quality - see paragraphs 67 to 71 below;

54 v. Circum-Atlantic Project (CAP) (Cherkis) - see paragraph 22 above;

55 vi. IFREMER (Hunter) - a high quality bathymetric chart of the Gulf of Gascony (Bay of Biscay) has been produced;

54 vii. USA University of Rhode Island (Hall) - Russian multibeam data in the Atlantic is being processed;

Mediterranean Sea

57 viii. IOC International Bathymetric Chart of the Mediterranean and its Geological-Geophysical Series (IBCM) (Morelli and Hall) - plans leading to IBCM (bathymetry) 2nd Edition - see also paragraph 24 above;
Hall is experimenting with new presentation techniques which he will test out on IBCM Sheet 10;

Caribbean Sea

58 ix. IOC International Bathymetric Chart of the Caribbean Sea and Gulf of Mexico (IBCCA) (Frias) - proggress with series; participating Member States will to digitize their own sheets (guidance has been requested) - see paragraph 111 below;

Indian Ocean

59 x. U.S.A. Scripps Institution of Oceanography (SIO) (Fisher/ Weatherall) - Fisher has continued. his work of contouring the greater Indian Ocean, in collaboration with BODC - see BODC - see paragraph 29 above and Annex III;

Pacific Ocean

xi. Australian Geological Survey Organization (AGSO) (Hunter) - approval has been given for the release of AGSO's bathymetric data to the GDA and DCDB (and also to NMDIS for inclusion in the WDC-D and IBCWP databases); 60

xii. South Pacific Applied Geoscience Commission (SOPAC) (Eade) - the EEZs of many island states in the region have been mapped but no coherent digital bathymetric database yet exists; 61

xiii. Servicio Hidrográfico y Oceanográfico de la Armada de Chile (Jones) - the work of digitizing the collected soundings in Chile's area of responsibility is well advanced; 62

xiv. New Zealand Oceanographic Institute (NZOI) (Hunter) - digital bathymetric contours have been provided for New Zealand waters but these would be improved with closer contour spacing; 63

Antarctic Waters

xv. Alfred-Ne&ener-Institut, Bremerhaven, Germany (Schenke) - progress with bathymetric maps of the Weddell Sea; digitized map of Fram Strait available end-1995: recent cruises Polarstern and Boris Petrov collected 250,000kms multibeam data; liaising with British Antarctic Survey and Spanish (University of Barcelona) about mapping north of the Weddell Sea; Polarstern offsetting tracks to and from Southern Ocean to build up multibeam coverage; 64

xvi. IHO Permanent Working Group for Co-operation in the Antarctic (Schenke) - jointly agreed with SCAR-that IHO DCDB will be the repository for echo-sounding data, that SCUFN be the authority for undersea feature names, and that cruises would be reported through IHB Publication B-4; 65

General (worldwide)

xvii. ICA working Group on Marine Cartography (Jones) - preparation of a new multi-lingual Gazetteer of Ocean Names - see paragraph 40 above. 66

A colour proof copy of IBCEA Sheet 1.08 was tabled and came in for some criticism regarding the delineation of contours, in particular the absence of form lines for known canyons cutting the margin. Apart from circulation of copies to all members of the Editorial Board, it was not clear to the Guiding Committee whether this sheet had been reviewed in any way by impartial experts, or even whether there are any arrangements for an internal assessment the compilations. 67

The Guiding Committee considered that, if the regional bathymetric products are to be incorporated into the GDA, a review process similar to that used for the GEBCO sheets will be required to ensure that high standards are maintained. 68

It was agreed that initially an informal discussion should be held with the President IBCEA, Ing.Gén. André Roubertou, pointing out that it was questionable at the moment whether IBCEA sheets can be accepted for incorporation into the GDA because of their quality. Subsequently 69

(and with the concurrence of Ing. Gén. Roubertou) a formal letter might be written to the Director EPSHOM suggesting that an international review process be established.

70 The GBE was asked to take a new sheet and draw in where the canyons should appear, providing the necessary evidence for his compilation. He should then discuss the whole matter with IHB (Andreasen/Kerr/Huet) before arranging an informal meeting with Roubertou.

71 This action should be taken reasonably soon as it is known that compilations of IBCEA Sheets 1.06 and 1.09 are nearing completion.

7.1 IHO DATA CENTRE FOR DIGITAL BATHYMETRY (DCDB)

72 Dr Michael Loughridge reported that the flow of digital bathymetric data into the DCDB, and on to the GEODAS database, continues at a healthy rate. Major contributions came in 1994 from the Lamont-Doherty Geophysical Observatory, Scripps Institution of Oceanography, United States Geological Survey, Institute of Polar Research of Japan and the U.K. Natural Environment Research Council. First contributions had been received from India and Portugal. The DCDB was encouraged to follow up known data sources not routinely submitting data.

73 In addition to GEODAS, which deals with cruise ordered, time sequenced data, a HYDAS system has been developed to handle survey type data.

74 It was noted that some confusion exists as to whether a system exists for handling collected soundings from Bathymetric Plotting Sheets which are being digitized by VHOs, e.g. as Chile - see paragraph 62 above. The IHB was invited to undertake a review of the extent to which VHOs were digitizing their Bathymetric Plotting Sheets, and to seek advice as to how these data might be incorporated into a proper system with links to DCDB holdings.

7.2 GRIDDED DATASET

75 The Guiding Committee had noted that a small team had been invited by the SCDB to work intercessionally on the ways and means by which a 5′ uniform grid compatible with the GDA could be created. This team had been working by internet under the chairmanship of Dr Walter Smith (ref: doc. IOC-IHO/GEBCO Officers-IX/3, paragraphs 52 and 53). Mike Carron (USNOO) had recently joined the team while Frank Marchant had retired.

76 Dr Smith reported that whereas the user community desires and has need for a uniform global gridded dataset, there were a number of difficulties with the development of such a product and there were differences in opinion as to how it could be created. It was recognised that the global digital sounding database contained data of variable quality and that some level of interpretive quality control

had been exercised when the data had been contoured for GEBCO. It was important not to lose this value added contribution. Furthermore, the global coverage of sounding data was highly variable with significant areas having little or no data and being dependent on scientific interpretation for their bathymetry. However, contours alone were not the ideal base for constructing a grid and there were a number of different gridding techniques that could be used, each giving different solutions.

77 The problem had been discussed in considerable detail by the SCDB and the team had been asked to develop a short report and recommendations, indicating clearly what can, and what cannot, be achieved in the preparation of a gridded dataset, for the consideration of SCDB-XIII. The Guiding Committee endorsed this action.

7.3 BATHYMETRIC EXCHANGE FORMATS

78 This matter arose at the Ninth Meeting of the GEBCO Officers following receipt of, and comments upon, a discussion paper that had been prepared for the IHO Committee on Exchange of Digital Data (CEDD), at their request, by Mr Ian W.Halls of the RAN Hydrographic Service (ref: IOC-IHO/GEBCO Officers-IX/3, paragraph 100).

79 The Chairman SCDB reported that he had responded to Mr Halls' paper but unfortunately Halls is no longer with the RAN Hydrographic Service, and no response had been received. However a copy of his letter had been sent to the President of the Directing Committee IHO.

80 Michel Huet reported that the exchange format for hydrographic data developed by CEDD, known as S.57, is already officially in use by the Member States. However, the current version of the format only covers single beam echo sounding data; it does not cover multibeam data. In 1994, therefore, the IHO Data Base Working Group (DBWG) set up a Sub-group tasked to extend the capabilities of S.57 to handle multibeam data. This Sub-group is chaired by Mr George Spoelstra of the Netherlands. The DBWG will be meeting in May 1995.

81 The Specifications for Multibeam Data (draft) which are being developed within GEBCO under the co-ordination of Dr George Sharman) DCDB, and are destined to become Part 4 of the GEBCO Guidelines (see item 10 below), will be tabled at this meeting as a reference document. In addition contact will be established between the Sub-group Chairman and Dr Sharman, so as to ensure harmonisation of any future development of the multibeam format and avoid duplication of effort and differences of opinion.

82 On a relevant side matter, the reported availability of a study report on a format for multibeam data, produced at the University of Rhode Island, USA, was noted. Captain James E.Ayres, USA/DMA offered to enquire about the availability of this report with a view to providing Meirion Jones and Michel Huet with copies.

83 It was generally agreed that further action should await the production of draft subsets of S.57 geared to bathymetric data, at which time SCDB will be invited to submit comments.

8. GEBCO DIGITAL ATLAS (GDA)

8.1 PROGRESS WITH UPDATING THE 'GEBCO DIGITAL ATLAS'

84 Dr Meirion Jones reported that sales of the GDA on CD-ROM had been very satisfactory, and comments back had been highly complimentary. A User Registration Form was being distributed with each copy in order to maintain contact with users, so that they can be kept informed of developments and notified of additional datasets or new software releases as they become available. A Problem Report Sheet is also included in the package. To date only five minor software bugs in the GDA user interface had been reported to BODC and these had been corrected, with updated releases of the software distributed on floppy disk to all recipients of the GDA. All recipients had also been sent notification of an error in one of the data files together with instructions on how to overcome it.

85 He commented that the intention was to try to establish a world authority for bathymetry, moving away from the scale limitation of the GEBCO printed sheets. For this reason the biggest issue facing the project at the present time was the need to show the User Community that the GDA was a living entity being continually updated with new data as soon as possible after they become available. There was a need to create and maintain the necessary momentum for this purpose as a matter of urgency. Initially BODC was concentrating on the greater Indian Ocean area, being recontoured by Dr Robert Fisher - see paragraph 29 above.

86 Dr Meirion Jones accepted that it might be practicable to consider updating the GDA on an annual basis, although this would need to be tested out on the experience gained" in producing the first update. It was agreed that the next edition should be scheduled for issue in mid-1996.

87 He also noted that, with the exception of sheet 5.12 (revised), the GDA was still on the old French Carte Générale du Monde coastline. In some areas there were shifts of 5-7kms between this coastline and the WVS. The main problems of mismatch arise where there are steep slopes close to the coast. The first task however will be to update the Antarctic coastline with the data recently published on CD-ROM by the British Antarctic Survey (BAS) on behalf of the Scientific Committee on Antarctic Research (SCAR). Dr Meirion Jones was pleased to report that SCAR had granted permission to GEBCO for this material to be included in the GDA in return for SCAR being able to use GDA Southern Oceans bathymetry in their product.

88 The Guiding Committee expressed its appreciation to Dr Meirion Jones and all those involved with the development of the GDA. It pointed

out that there was a need to persuade other funding organizations addressing global problems - global syntheses, climate, etc. - that a high quality global bathymetric database is an essential element for their work.

8.2 GLOBAL NETWORK OF REVIEWERS

89 The 'List of Reviewers ' (Annex IV) was studied and updated. It was reported that Dr Alfred Simpson had replaced Dr James Eade as Deputy Director of SOPAC and would accept responsibility as a Reviewer for the SOPAC area. Dr Ian Wright, New Zealand Oceanographic Institute (NZOI) , had replaced Dr Lionel Carter for the New Zealand region.

90 Dr George Sharman (NGDC) had accepted responsibility for the North-east Pacific Ocean region but this would only be on an interim basis Sharman will step aside if someone, not in U.S. government employment, can be found, who has a connection to the research community and a perspective on the wider use of global bathymetry.

91 Lie. José Frias offered the services of Dr Juan GARCIA Abdeslem and M.C. Luis DELGADO Argote, both from the Centro de Investigación Científica y Educación Superior de Ensenada (CICESE), to act as Reviewers for the Central East Pacific Ocean from the Mexican coast out to 150°W. (both scientists subsequently accepted the task).

92 It was noted that there appears to be a breakdown in co-operation for the North-west Pacific Ocean region. Evgeniy Shchaulov (with David Monahan) had accepted responsibility for Arctic Ocean waters, and Gleb Udintsev, with Alexander Svarichevskiy, for the North-west Pacific Ocean. However it appears that the sheets of the Sea of Okhotsk and South-east Kamchatka being submitted to the EB-IBCWP (see doc. IOC/INF-988, paragraph 7.4.1) are being compiled by Shchaulov without reference to Svarichevskiy. Dr Gleb Udintsev was asked to investigate and resolve this apparent discrepancy.

93 It was considered that the essence of the role of the Reviewers is to advise the Guiding Committee, through the GBE, on the availability of new data in their areas of responsibility. They should act as an awareness network and should so far as possible be independent of the bathymetric generators. The GBE should plan with the Reviewers on an annual cycle, inviting them to report to him each year (to a deadline), drawing up a list of new material in their area that could be considered for incorporation into the GDA. He will then be able to report on the overall situation to either the Guiding Committee or the GEBCO Officers.

8.3 PREPARATION OF A PRIORITIZED WORK LIST FOR WORK ON THE GDA

94 The GBE presented a World Coverage Diagram of Maps and Mapping Projects that would be suitable for updating the GDA (Annex V) This

was accepted as a useful guide to show the areas from which the majority" of new material suitable for incorporation into the next edition of the GDA can be expected to originate.

95 The following work list, in order of priority, was approved:

A. Greater Indian Ocean (RLF);
B. Weddell Sea (AWI);
C. Arctic Ocean (NRL1, NRL2, FJL, HDNO, KN);
D. North-east Atlantic Ocean (IF, IOS1, IOS2);
E. South-west Pacific Ocean (AGSO, NZOI).

96 Priority would also be given by the GEBCO Digital Atlas Manager to examination of the following problems:

i. displacement of 2mm on GEBCO sheet 5.08;
ii. displacement of tracks over the coast of Iceland (sheet 5.04);
iii. the coastline being used by HDNO which differs from the WVS used by Cherkis.

A. Greater Indian Ocean

97 The layout of contoured sheets consists of 16 sheets on a scale of 1:5 million (see Annex III, page 4). Sheets 7, 8, 12 and 13 in the south-west quadrant had been displayed at a joint poster-paper presentation at the AGU fall meeting in San Francisco in December 1994. Dr Fisher confirmed that the embargo on release of these sheets (bathymetry and control) has therefore been lifted.

98 Dr Fisher was asked to release his contoured material south of 60°S to Dr Schenke for rectifying with his Polarstern product (10°W-40°E). He stated that Sheets 1, 2, 4 and 5 have been completed and he would discuss clearance with his 'Alliance exotique' colleagues. He expected all embargoes to be lifted by end-1996.

B. Weddell Sea

99 Dr Hans-Werner Schenke tabled a prototype copy of the first AWI Bathymetric Chart of the Weddell Sea (sheet 567, scale: 1:1 million). This generated considerable discussion on the contour steps and colour coding used, and also on the difficult specialist problem of how to display the edge of floating ice (if not made clear, this can result in contours running in and cutting the apparent coastline). The Guiding Committee expressed its liking for the Source and Reliability Diagrams. Dr Schenke offered to supply his material in digital form for incorporation into the GDA; this was accepted with pleasure but Dr Meirion Jones queried trackline portrayal, in particular the problem of how to represent multibeam tracks; he asked for a copy to be released early, before printing, so that work could be carried out on this problem.

100 Dr Schenke reported that he was co-operating closely with the British Antarctic Survey (Peter Barker and Roy Livermore), and with the Scientific Committee on Antarctic Research (SCAR) , as permission was being sought to use their coastline. He was seeking advice on finding a good bathymetric referee for these sheets.

C. Arctic Ocean

The GBE is co-operating with the three compilers: Norman Cherkis (NRL1, NRL2 and FJL) , Andrey Popov (HDNO) and Jørn Thiede, GEOMAR (KN), for this region. David Monahan and Evgeniy Shchaulov would be invited to act as reviewers for these sheets. *101*

D. North-east Atlantic

Peter Hunter, GBE, is himself the generator for these sheets. He is working closely with IFREMER (Jean-Claude Sibuet) for their area of interest. *102*

E. South-west Pacific

There are two main sources for this area, the Australian Geological Survey Organization (Chris Johnston) - see paragraphs 30 and 60 above and the New Zealand Oceanographic Institute (Lionel Carter and Ian Wright) - but see paragraph 63 above. *103*

9. PUBLICATION OF A REVISED EDITION OF SHEET 5.12 (SOUTH ATLANTIC)

A copy of this revised sheet was tabled and was well received by the Guiding Committee which expressed great appreciation to the Canadian Hydrographic Service, and in particular to David Monahan and his Marine Geomatic group. Complimentary copies would be needed for distribution to IHO Member States, as well as to individuals appearing in the GEBCO Personality List. It was confirmed that the material from this revised sheet had already been incorporated into the GDA. *104*

As a minor criticism, it was noted that a number of small islands were not named and were therefore difficult to locate. *105*

The Representative of the IHO reported that the revised sheet had been publicised in the I.H.Bulletin; Michael Loughridge said it was on the Web and Adam Kerr agreed to advertise it in 'Marine Geodesy'. *106*

10. STATE OF PREPARATION OF THE 'GUIDELINES FOR THE GEBCO' (Publication B-7)

Prior to the meeting the Chairman SCDB had distributed a further draft of Part 4 Digital Bathymetric Data (Multibeam Echo-sounders), which had been prepared by Dr George Sharman, NGDC, following extensive discussion with Larry Mayer, Walter Smith, Dale Chayes, Stuart Smith and Jim Charters. *107*

The Guiding Committee reviewed the paper, reaffirming the importance of maintaining cleaned up, quality controlled multibeam data in a time sequenced form reflecting the original data. However it was considered that it would be premature at this stage to attempt the specification of a generic format for the storage and exchange of such data. In all cases comprehensive metadata (i.e. documentation) was viewed as an essential component of multibeam data. *108*

109 It was agreed however that the paper had reached a sufficient level of maturity for it to be distributed widely for review and comments from:

a) IHO Member States, including the IHO Committee on Electronic data (CoE) - IHB to distribute;

b) manufacturers and users of multibeam equipment/systems [IHB to distribute but in consultation with the Chairman SCDB who drew attention to the List of Ships equipped with Multibeam Systems (doc. IOC-IHO/GEBCO SCDB-XI/3, Annex VII)];

and c) a wider community to be contacted over the Internet (by NGDC). All comments should be directed to Dr George Sharman, copy to the Chairman SCDB, with a view to preparing a final draft for review at SCDB-XIII (see paragraph 131 below).

110 Some minor editorial modifications were proposed and Dr Sharman was invited to append a set of documentation forms to his paper, along the lines of those already included in GEBCO Guidelines Parts 3 and 5. The Chairman commented that, compared with other parts of the 'Guidelines' , there was too much philosophy in this paper and it might be improved if this could be moved into an Annex.

111 The Guiding Committee noted the difficulties being faced by the members of the IBCCA community in producing standardized, digital bathymetric contour charts - see paragraph 58 above. The GDA Manager also reported similar problems when she received digitized contours from a variety of sources, coupled with a lack of supporting documentation. It was agreed that there was an urgent need for a set of guidelines to cover the digitizing of bathymetric contours and the specification of supporting documentation to accompany such data. It was decided that it would be appropriate for these guidelines to form an additional element in the 'Guidelines for the GEBCO' (publication B-7) .

112 The GBE and GDA Manager were invited to prepare an initial draft for consideration by the Chairman SCDB in the first instance. It was noted that some research would first be required to ascertain whether appropriate material was already available from other sources, and Dr Gary Robinson was invited to assist with this task. It was agreed that if a sufficiently mature document could be prepared during the intersessional period, then comments should be sought from relevant experts with a view to submitting a further draft for consideration at SCDB-XIII.

11. SALES, PUBLICITY AND LIAISON WITH OTHER MAPPING ORGANISATIONS

11.1 PUBLICITY AND SALES ARRANGEMENTS FOR THE GEBCO DIGITAL ATLAS (GDA)

113 Dr Meirion Jones tabled a paper detailing Promotion, Sales and Service for the GDA. This showed that, as of 1 May 1995, 374 copies had been sold or distributed as complimentary copies. He had been pleased at the many unsolicited congratulatory comments that had been received by BODC and by the widespread interest in the product from

around the world. Full details on the distribution of the GDA will be given in document IOC-IHO/GEBCO SCDB-XII/3, the Summary Report of SCDB-XII. He noted that it will be necessary to make an extra print run soon.

It was recognized that there are several large Conferences and *114* meetings of appropriate bodies each year at which it would be desirable to advertize the GDA. However the difficulties involved, i.e. provision of a suitable computer, setting up the equipment, and attendance of a knowledgeable and qualified demonstrator, as well as costs for showing space (sometimes up to $2,000-$3,000), usually make this impracticable. Should, however, any organization or individual be in a position to mount a demonstration, BODC will be pleased to provide: printed descriptive text, captions, a PC slide show loop and a supply of colour brochures.

11.2 LIAISON WITH THE INSTITUT GEOGRAPHIQUE NATIONAL (IGN)

The Permanent Secretary reported that the licencing agreement with *115* IGN had terminated at the end of 1994. IGN had been sent a gratis copy of the GDA and the sum of sterling f5,431, being half the licence fees accrued (from sales of the GDA on magnetic tape and CD-ROM) over a period of three years (1 January 1992 to 31 December 1994) , together with a letter of thanks for IGN's constructive contribution to the work of GEBCO'.

11.3 LIAISON WITH THE IHO COMMITTEE ON EXCHANGE OF DIGITAL DATA (CEDD)

The Representative of the IHO explained that on the retirement of *ll6* Rear Admiral J.Austin Yeager, it had been decided to combine CEDD and the Committee on ECDIS (CoE) into one group named the Committee on Electronic data (CoE) , under the chairmanship of Mr Adam Kerr, Director IHO. Mr Kerr would therefore become an ex-officio member of SCDB and Dr Meirion Jones an ex-officio member of CoE.

The outstanding action under this item - the follow up to a discussion *117* paper on Bathymetric Exchange Formats, prepared by Mr Ian W.Halls of the RAN Hydrographic Service, has been dealt with under item 7.3 above.

11.4 LIAISON WITH BARTHOLOMEW (a Division of HarperCollins Publishers)

Following an approach by the cartographic publishers Bartholomew *118* concerning the supply of digital bathymetric data for inclusion in their cartographic database (which was reported to the GEBCO Officers at their ninth meeting), the Chairman, the Permanent Secretary and the Chairman SCDB visited Bartholomew’s offices in Edinburgh in October 1994 and reached a satisfactory agreement.

119 The advice given to the GEBCO Officers 'not to get involved in commercialization , with its attendant pitfalls in the field of legal copyright' (ref: doc. IOC-IHO/GEBCO Officers-IX/3, paragraph 95) , was followed carefully and the agreement is based on an exchange of letters detailing a quid-pro-quo exchange of services in kind.

120 Bartholomew agreed *inter alia* to give full specific accreditation to the use of GEBCO bathymetric material in their products, and have offered in exchange the use of their digitizing and plotting facilities and/or provision of some of their digital data sets for use internally. This offer has already been followed up by BODC.

11.5 LIAISON WITH THE OCEAN MAPPING GROUP(OMG), UNIVERSITY OF NEW BRUNSWICK. CANADA

121 Dr Meirion Jones reported that liaison with the Ocean Mapping Group was continuing on a regular basis and proving to be extremely valuable. Dr Larry Mayer, who very much regretted being unable to attend these meetings, had sent some useful computer printouts for the SCDB-XII meeting in La Spezia, and had been active in providing input into the studies of the Visualization of Topographic Surfaces and the Handling of Multibeam Data.

12 IMPLICATIONS FOR GEBCO OF THE ENTERING INTO FORCE OF THE UN CONVENTION ON THE LAW OF THE SEA (UNCLOS), AND SETTING UP OF THE COMMISSION ON THE LIMITS OF THE CONTINENTAL SHELF (CLCS)

122 Attention was drawn to the 'Response to the Secretary IOC regarding the Contribution of the General Bathymetric Chart of the Oceans (GEBCO) to the U.N. Convention on the Law of the Sea' (ref: doc. IOC-IHO/GEBCO Officers-IX/3, Annex VII), which had been submitted by the GEBCO Officers and placed before the IOC Executive Council in July 1994. Dmitri Travin informed the Committee that the IOC Assembly had set up an ad hoc intersessional Working Group on IOC Responsibilities and Actions in relation to UNCLOS. He was asked to ascertain whether any task was being placed on GEBCO.

123 It was noted that membership of the Commission on the Limits of the Continental Shelf (CLCS) will have to be determined by 16 May 1996, with the closure date for nominations three months earlier. Whereas the onus for limits of claims devolves on individual states, both IHO and IOC were preparing themselves for requests and enquiries from their Member States. The decisions of the Commission are final with no right of appeal.

13. INTERNATIONAL HYDROGRAPHIC BUREAU - STRATEGIC PLAN

124 It was decided to defer this item until the tenth meeting of the GEBCO Officers (see item 15 below) when a working document will be ready for consideration.

14. GEBCO CENTENARY (1999-2005)

The Permanent Secretary reported that he had discussed this project with Mme Jacqueline Carpine-Lancre, Head Librarian at the Musée Océanographique, Monaco, who is very knowledgeable about the early history of the GEBCO, and he had found her most helpful and receptive to the idea. She had pointed out that the date of publication of the 1st Edition of GEBCO given in the GEBCO Supporting Volume, and copied in the Summary Report of GEBCO Officers-IX (paragraph 113) , was in fact May 1905 which is very much more feasible that the original 1904 date. " 125

The Guiding Committee decided that the history of GEBCO would be developed in two stages, to fit in with the Centenary period (December 1999 to May 2005): 126

The first activity would be to prepare an edited publication in three parts: early history (1st and 2nd editions). to be prepared by Mme Carpine-Lancre; Middle history (3rd and 4th editions) - IHB/ICSU period/SCOR Working Group; and the last 25 years or so (5th edition and modern developments) . This publication would be expected to have limited circulation. 127

The second activity, to be completed later in the Centenary period, would be the publication of a well written book directed towards the general public, and possibly a television programme. 128

Desmond Scott accepted an invitation to act as Editor for the first publication and generally guide the project; an interested author having an attractive style of presentation will, however, have to be found for the second part of the project. 129

It was suggested that a small group might be formed to develop suggestions for the end products. 130

15. DATES AND PLACES FOR THE TENTH MEETING OF THE GEBCO OFFICERS AND THE SIXTEENTH SESSION OF THE JOINT GUIDING COMMITTEE, TOGETHER WITH MEETINGS OF THE SUB-COMMITTEES

Following a suggestion from the Sub-Committee on Digital Bathymetry, the Guiding Committee agreed that it would be-desirable to hold SCDB-XIII and GEBCO Officers-X in Hawaii, so as to involve Pacific rim countries to a greater extent than at present. One week during the second half of April 1996 was suggested but dates should be selected that allow large reductions in air fares and hotel prices. 131

The Guiding Committee asked Chris Andreasen, Meirion Jones and Brian Harper to negotiate, but suggested that Chris Andreasen makes an initial enquiry with Barry Raleigh who should be asked to suggest convenient dates. 132

133 The Chairman reported that he had spoken with the Director of the new Southampton Oceanography Centre in the United Kingdom and had received a positive response in principle. He was therefore invited to negotiate for acceptable dates for SCDB-XIV and GEBCO-XVI, noting that IHC-XV was scheduled to be held 14-25 April 1997, and US participants advised avoidance of the last two weeks in May. The twelfth meeting of the Sub-Committee on Undersea Feature Names (SCUFN-XII) might be held either at the IHB, Monaco, or at the Hydrographic Office, Taunton, U.K.

16. ANY OTHER BUSINESS

16.1 DRAFT RESOLUTION SUBMITTED TO THE IOC ASSEMBLY BY THE CONSULTATIVE GROUP ON OCEAN HAPPING

134 The Permanent Secretary presented, as an information item, a draft resolution which had been developed for submission to the IOC Assembly (IOC-XVIII, 13-27 June 1995), by the IOC Consultative Group on Ocean Mapping. This was well received by the Guiding Committee. A copy of the final (adopted) resolution is attached as Annex VI.

16.2 APPROACH TO BODC BY AA PETROLEUM SERVICES FOR PERMISSION TO INCORPORATE THE GDA IN THEIR PETROVIEW PRODUCT

135 Dr Meirion Jones reported on an approach. which had been received from AA Petroleum Services for permission to incorporate the GDA in their PetroView product which comprises backdrop datasets, of which bathymetry would be but one.

136 Dr Meirion Jones pointed out that the GDA is an evolutionary product so it was highly desirable to remain in touch with users. It was important to protect the quality of the product and to do this, it is necessary to know who holds copies. There was a danger in allowing the product to get out into communities having no link back to the originators.

137 It was noted that there is an IHO Working Group looking at all aspects of licensing digital data. It was agreed that IHB would keep Meirion Jones fully appraised of developments.

16.3 REQUEST BY THE U.S.DEFENSE MAPPING AGENCY FOR PERMISSION TO COMBINE THE GDA WITH THE WVS TO FORM A SINGLE BATHYMETRIC DATABASE

138 Captain James Ayres, on behalf of the Project Manager WVS, said he was looking to the future in bringing this request to the Guiding Committee. The present issues of DMA's CD-ROMs use DBDB5 gridded bathymetry, but in future it would be good to have a single bathymetric database.

He pointed out that this would not be in competition with the GDA but would be to the advantage of GEBCO in that it would get its name more widely known by the general public. DMA would give full credits (from the present text on the GDA CD-ROM) and may be prepared to make a financial contribution to cover external expenditures and costs of updating, etc. *139*

No decision was taken by the Guiding Committee at this stage as Dr Meirion Jones said that he was apprehensive about the situation whereby WVS, with a volume distribution way in excess of the GDA, would be proliferating outdated versions of the GDA at a time when GEBCO was urgently considering how it could speed up its updating process so as to produce a higher quality bathymetric product. He and Captain Ayres would continue their discussions and negotiations on this matter. *140*

16.4 PREPARATION OF GLOBAL COVERAGE OF SHEETS OF CONTOURED GRAVITY ANOMALIES FROM SATELLITE ALTIMETRY

Dr Walter Smith presented three sheets of contoured gravity anomalies on a scale of 1:10 million, based on a preliminary dataset covering 72°N. to 72°S. He planned full global coverage when the series was complete as well as a product CD-ROM with NGDC. The contours presented are based on: GEOSAT data south of 30°S. and ERS-1 data north of 30°S., as these data are cleaner than those from GEOSAT. *141*

Dr Smith explained that some gravity images had been derived from the newly available ERS-1 Geodetic Phase data. These data had been obtained from two 168-day cycles of ERS-l; although the first of these had been completed in September 1994, the second was scheduled to be terminated in December when only half complete, which would have resulted in non-uniform coverage, with some areas having 8km tracks and some having 16km tracks. A plea by Walter Smith and colleagues to the European Space Agency had resulted in a very difficult decision being made to continue ERS-1 in Geodetic Phase orbit (at the expense of other planned work) until full coverage had been obtained. The Chairman was invited to write to Dr Guy Duchossois, ERS-1/2 Mission Manager, to thank the Agency most sincerely, on behalf of the GEBCO, for making this important alteration to his planned schedule. *142*

For the marine geological/geophysical community, the chief value of this map series will be to show topographic trends and the possibility of the existence of features, rather than definite bathymetry - this had been demonstrated in the eastern equatorial Pacific. The key people who will need copies of these sheets are bathymetric generators and GEBCO Reviewers. Dr Smith was congratulated on this very valuable development and was asked to liaise with the GBE to arrange the required distribution. *143*

17. APPROVAL OF THE SUMMARY REPORT OF THE SESSION

144 This Summary Report has been approved by correspondence.

18. CLOSURE OF THE SESSION

145 The Chairman closed the Session at 16.15 on Wednesday 17 May 1995, and in so doing thanked Rear Admiral Christian Andreasen, President of the Directing Committee, and his colleagues for their hospitality and the support that had been provided for the GEBCO Guiding Committee Session and for the meeting of the Sub-Committee on Undersea Feature Names. This had been greatly appreciated.

ANNEX I

AGENDA

1. OPENING OF THE SESSION

2. CONDUCT OF THE SESSION

2.1 Adoption of the Agenda

2.2 Documentation; Administrative Arrangements; etc.

3. COMPOSITION OF THE GUIDING COMMITTEE AND ITS SUB-COMMITTEES

4. MATTERS ARISING FROM REPORTS OF PREVIOUS MEETINGS

4.1 Summary Report of the Fourteenth Session of the Joint IOC-IHO Guiding Committee for the GEBCO (doc. IOC- IHO/GEBCO-XIV/3)

4.2 Summary Report of the Ninth Meeting of “the GEBCO Officers (doc. IOC-IHO/GEBCO Officers-IX/3)

5. REPORTS ON WORK CARRIED OUT BY, AND ACTIVITIES OF:

5.1 The GEBCO Bathymetric Editor

5.2 The GEBCO Digital Atlas Manager

5.3 The NERC Unit for Thematic Information Systems (GEBCO Project)

6. SUB-COMMITTEE ON UNDERSEA FEATURE NAMES, ELEVENTH MEETING, IHB, MONACO, 11-13 MAY 1995

6.1 Liaison and Co-operation with the U.S. Board on Geographic Names/Advisory Committee on Undersea Features (BGN/ACUF)

6.2 Standardization of Undersea Feature Names (Publication B-6)

7. SUB-COMMITTEE ON DIGITAL BATHYMETRY, TWELFTH MEETING, SACLANTCEN, LA SPEZIA, ITALY, 9-12 MAY 1995

7.1 IHO Data Centre for Digital Bathymetry (DCDB)

7.2 Gridded Dataset

7.3 Bathymetric Exchange Formats

8. GEBCO DIGITAL ATLAS (GDA)

8.1 Progress with updating the 'GEBCO Digital Atlas'

8.2 Global Network of Reviewers

8.3 Preparation of a prioritized work list for work on the GDA

9. PUBLICATION OF A REVISED EDITION OF SHEET 5.12 (SOUTH ATLANTIC)

10. STATE OF PREPARATION OF THE 'GUIDELINES FOR THE GEBCO' (Publication B-7)

11. SALES, PUBLICITY AND LIAISON WITH OTHER MAPPING ORGANISATIONS

11.1 Publicity and Sales Arrangements for the GEBCO Digital Atlas (GDA)

11.2 Liaison with the Institut Géographique National (IGN)

11.3 Liaison with the IHO Committee on Exchange of Digital Data (CEDD)

11.4 Liaison with Bartholomew (a division of HarperCollins Publishers)

11.5 Liaison with the Ocean Mapping Group (OMG), University of New Brunswick, Canada

12. IMPLICATIONS FOR GEBCO OF THE ENTERING INTO FORCE OF THE UN CONVENTION ON THE LAW OF THE SEA (UNCLOS), AND SETTING UP OF THE COMMISSION ON THE LIMITS OF THE CONTINENTAL SHELF (CLCS)

13. INTERNATIONAL HYDROGRAPHIC BUREAU - STRATEGIC PLAN

14. GEBCO CENTENARY (1999-2005)

15. DATES AND PLACES OF THE TENTH MEETING OF THE GEBCO OFFICERS AND THE SIXTEENTH SESSION OF THE JOINT GUIDING COMMITTEE, TOGETHER WITH MEETINGS OF THE SUB-COMMITTEES

16. ANY OTHER BUSINESS

16.1 Draft Resolution submitted to the IOC Assembly by the Consultative Group on Ocean Mapping

16.2 Approach to BODC by AA Petroleum Services for permission to incorporate the GDA in their PetroView Product

16.3 Request by the U.S. Defense Mapping Agency for permission to combine the GDA with the WVS to form a single Bathymetric Database

16.4 Preparation of Global Coverage of Sheets of Contoured Gravity Anomalies from Satellite Altimetry

17. APPROVAL OF THE SUMMARY REPORT OF THE SESSION

18. CLOSURE OF THE SESSION

ANNEX II

LIST OF DOCUMENTS *

IOC-IHO/GEBCO-XV/l prov.	Provisional Agenda
IOC-IHO/GEBCO-XV/2	Annotated Provisional Agenda
IOC-IHO/GEBCO-XV/3	Summary Report of the Session
IOC-IHO/GEBCO-XV/4	List of Documents
IOC-IHO/GEBCO-XV/5	Report of the GEBCO Digital Atlas Manager 1994-95
IOC-IHO/GEBCO-XV/6	GEBCO Digital Atlas - Promotion, Sales and Servicing
IOC-IHO.GEBCO-XV/7	Draft Resolution submitted by the Consultative Group on Ocean Mapping to the eighteenth session of the IOC Assembly, 13-27 June 1995
IOC-IHO/GEBCO-XIV/3 (in English & French)	Summary Report of the fourteenth session of the GEBCO Guiding Committee, Scripps Institution of Oceanography, La Jolla, California, USA, 4-6 May 1993
IOC-IHO/GEBCO Officers-IX/3	Summary Report of the ninth meeting of the GEBCO Officers, Canadian Hydrographic Service, Ottawa, Canada, 30 May - 1 June 1994
IOC-IHO/GEBCO SCGN-X/3	Summary Report of the tenth meeting of the GEBCO Sub-Committee on Geographical Names and Nomenclature of Ocean Bottom Features, Scripps Institution of Oceanography, La Jolla, California, USA, 29 April - 3 May 1993

* For reference only. Only stocks of Summary Reports of Sessions and Meetings are maintained.

IOC-IHO/GEBCO SCDB-XI/3	Summary Report of the eleventh meeting of the GEBCO Sub-Committee on Digital Bathymetry, University of New Brunswick, Canada, 25-27 May 1994
IOC/INF-988	Report of the Consultative Group on Ocean Mapping (CGOM) to the Eighteenth Session of the IOC Assembly (15 May 1995)
B-7 (in English & French)	Guidelines for the General Bathymetric Chart of the Oceans 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 5 Underway Geophysics Data
GEBCO Personality List	Revised 20 March 1995

ANNEX III

Report of GEBCO Digital Atlas Manager 1994-1995

Indian Ocean Area Bathymetry Data

Work on the digitisation of Dr. R. L. Fisher's bathymetric contour and trackline control charts for the Indian Ocean Area continued. A further 150 charts were digitised. The data set digitised at BODC now covers the area 20- 100° East; 29° North to Antarctica, (shown on the attached diagram). The data were digitised from charts at a scale of approximately 1:1,000,000, (4 inches to one degree of longitude).

Quality Control checks have been earned out on charts covering the area 22- 71° South; 20- 80° East. Quality Control work is continuing on the remainder of the area.

P1ots of the bathymetric contours and trackline control for the areas :

31- 71° South; 20- 71° East
22- 31° South; 29- 74° East

were displayed at the meeting of the American Geophysical Union in San Francisco during December 1994.

BODC has now received the majority of the bathymetric contour and trackline control data digitised at Scripps Institution of Oceanography for the area 10° West to 20° East.; 23° South to Antarctica. This data will now be incorporated with that held at BODC.

New Data- Sets for GEBCO

Digital coastline data were extracted from the Scientific Committee on Antarctic Research's Antarctic Digital Database CD-ROM for future use in the GDA. There are 5 coastline data sets; the first comprises data at the original scale of the source material and the others generalised to the following resolutions : 1:1,000,000; 1:3,000,000; 1:10,000,000; 1.30,000,000.

The coastline is divided into a number of different future types, i.e. :

Ice coastline (definite)
Rock coastline (definite)
Grounding Line (definite)
Rock against ice shelf (definite)
Ice wall (approximate)
Rock coastline (approximate)
Grounding line (approximate)
Rock against ice shelf (approximate)
Iceberg tongue
Floating glacier tongue

Ice shelf front
Ice rumples (distinct)
Ice rumples (indistinct)

Digital data sets for inclusion in the GDA were also received from :

1. NZOI for the area : 178° East - 165° West; 25 - 45° South (Kermadec Trench and Southwest Pacific Basin)

The data were digitised from charts at a scale of 1:1 million, with contours at the following depths : 1000m and then at 1000m intervals down to 9000m. The file contains 335 contour segments and 26643 points.

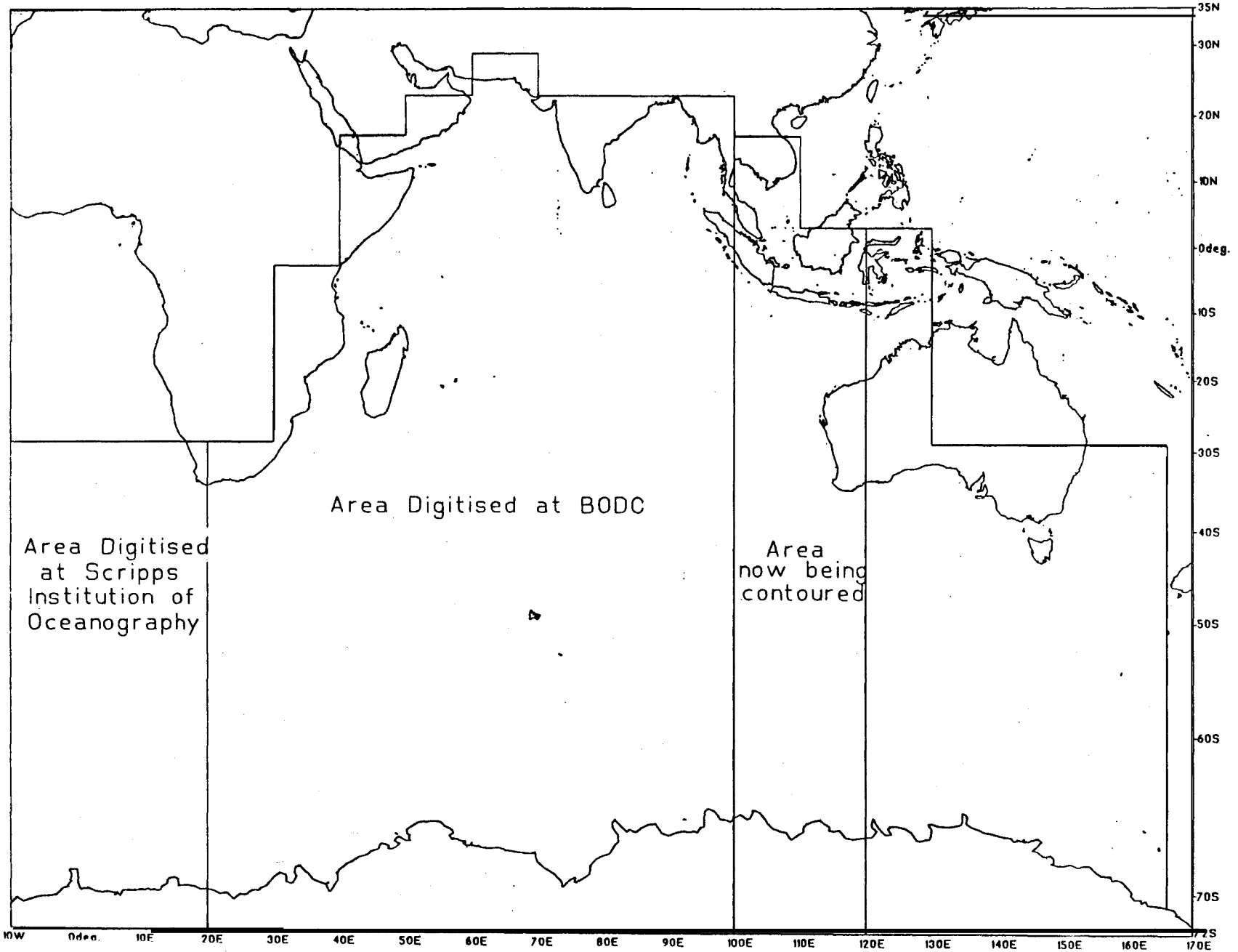
2. HDNO for the area : 78- 128° East; 72- 78° North (Kara and Laptev Seas)

Data set consists of contours at the following depths: 5m, 10m, 20m, 50m, 100m and 200m. The data set consists of 475 contour segments and 90818 data points.

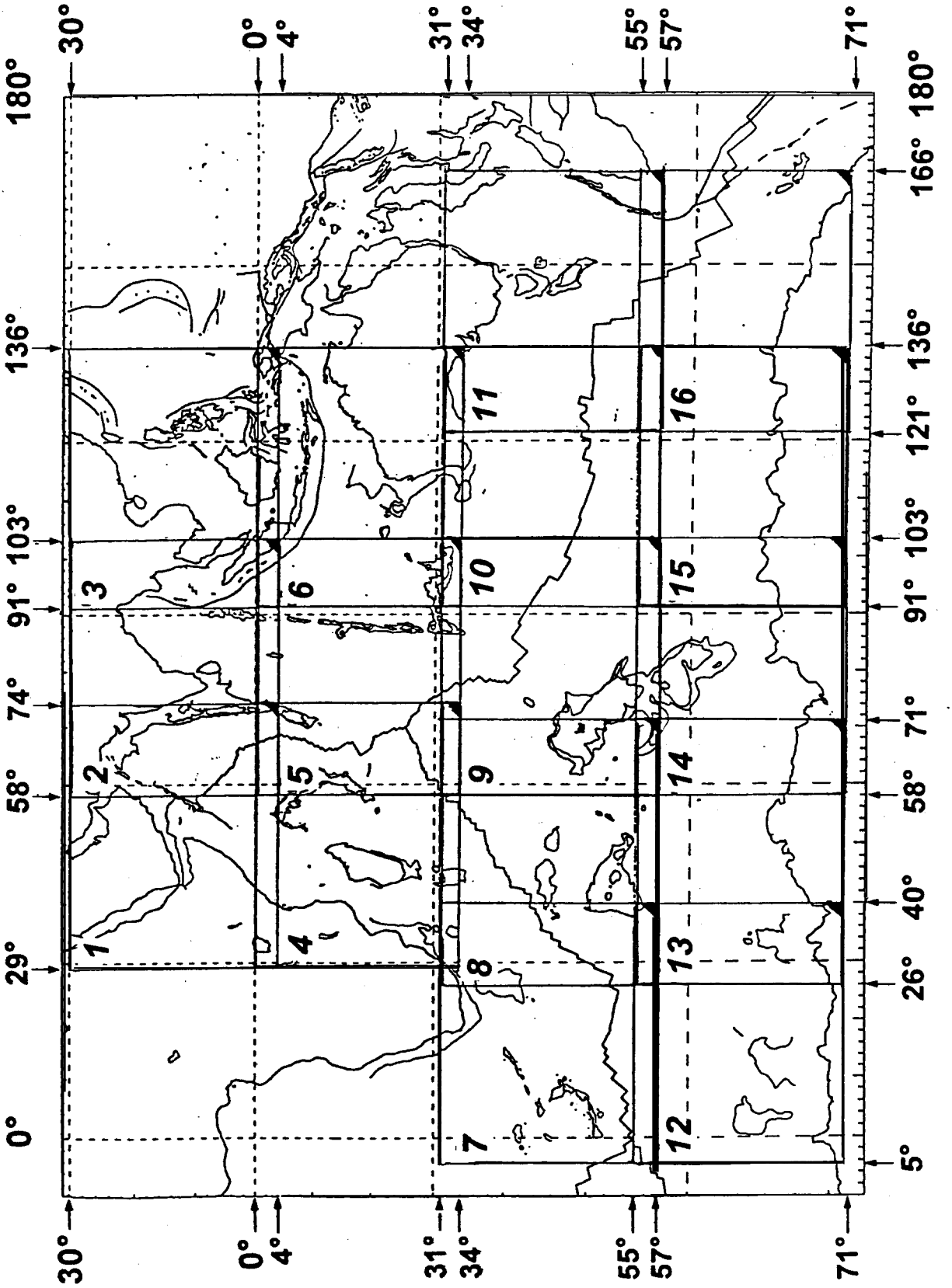
3. NRL for the area : 0 - 80° East; 68- 82° North (Barents and Kara Seas)

Pauline Weatherall
15 May 1995

Bathymetry of The Indian Ocean Area as at 15 May 1995



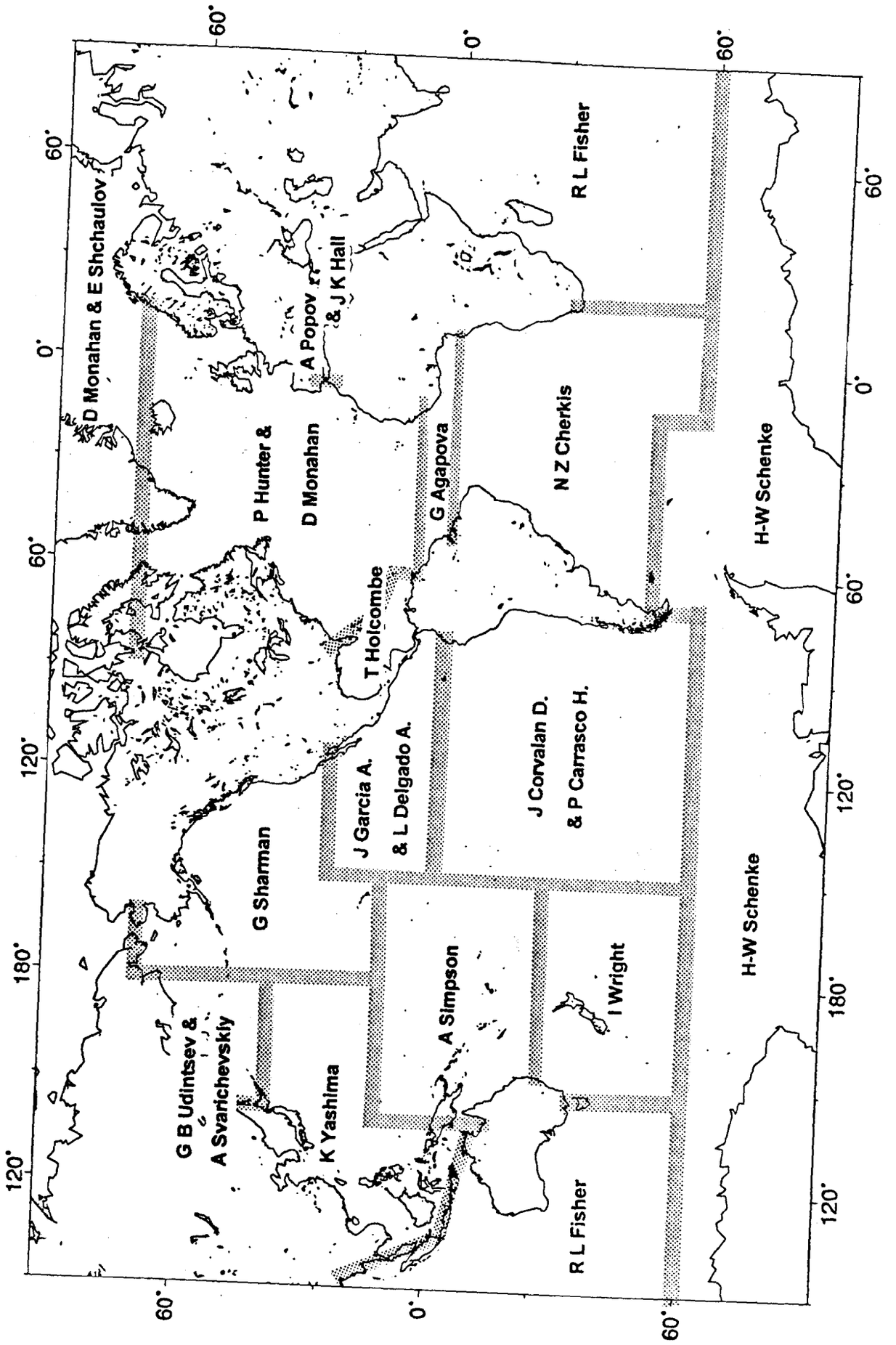
LAYOUT OF SHEETS OF THE GREATER INDIAN OCEAN
BEING CONTOURED BY DR.R.L.FISHER, SCALE: 1:5M.



ANNEX IV

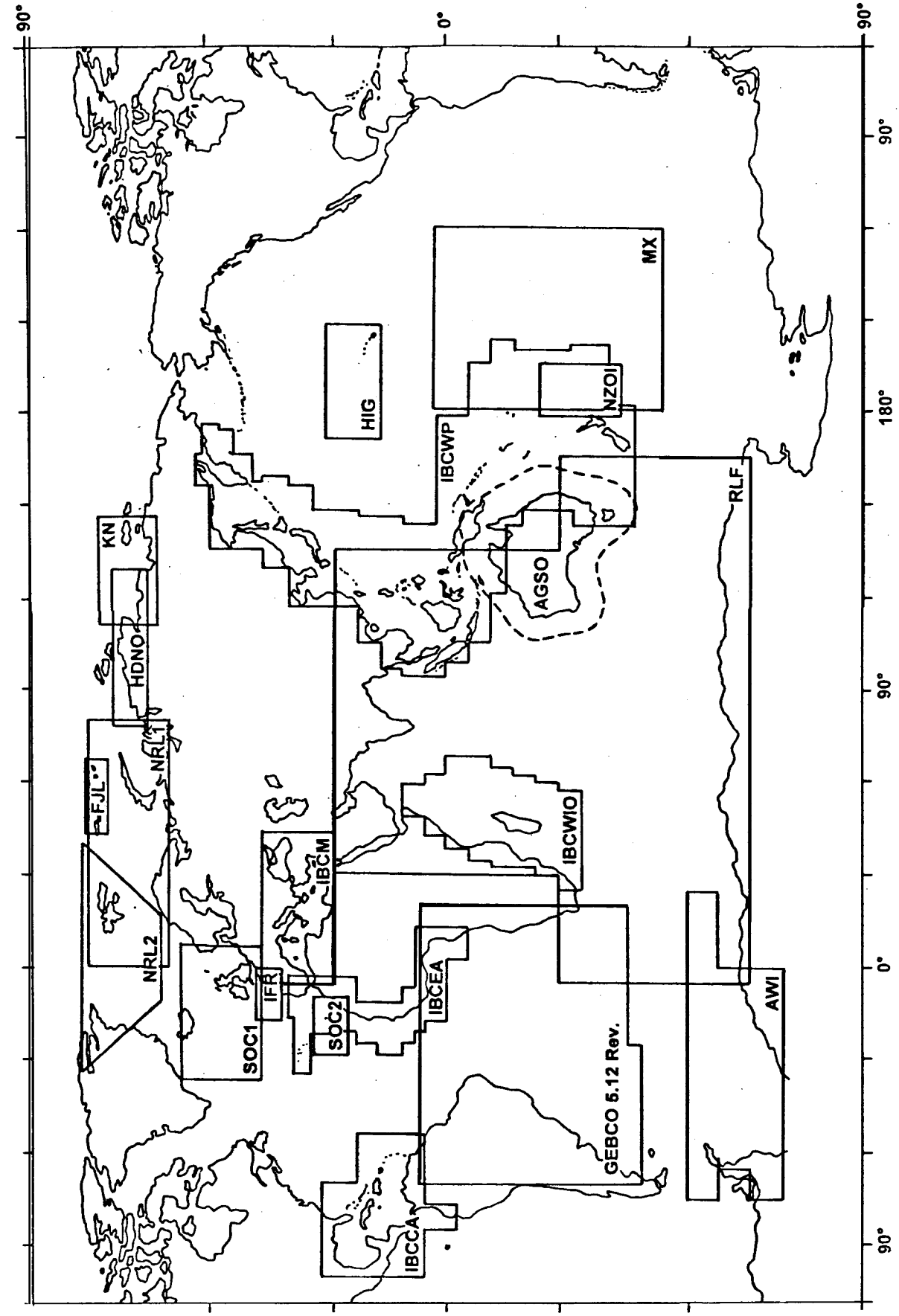
LIST OF REVIEWERS

Antarctic Waters south of 46040'S.	Hans-Werner Schenke	Accepted
North Atlantic Ocean (excluding Caribbean Sea & Gulf of Mexico)	Peter Hunter David Monahan (link to Galina Agapova for area 0°-7°N.)	Accepted Accepted
Caribbean Sea & Gulf of Mexico	Troy Holcombe	Accepted
Mediterranean & Black Seas	John K.Hall Andrey Popov	Accepted Accepted
Arctic Ocean	David Monahan Evgeniy Shchaulov	Accepted Accepted
South Atlantic Ocean	Norman Z.Cherkis (link to Brazilians, also Robert L.Fisher)	Accepted
Indian Ocean	Robert L.Fisher	Accepted
North-west Pacific Ocean	Gleb B.Udintsev Alexander Svarichevskiy	Accepted Accepted
Central West Pacific O.	Kunio Yashima	Accepted
South-west Pacific O.	Alfred Simpson	Accepted
North-east Pacific 0.	George Sharman	Accepted
Central East Pacific Ocean	Juan Garcia A. Luis Delgado A.	Accepted Accepted
South-east Pacific	José Corvalan D. Patricio Carrasco H.	Accepted Nominated
New Zealand region	Ian Wright	Accepted


60°
0°
60°
120°
180°
120°
60°
0°
60°
D Monahan & E Shchaulov
A Popov & J K Hall
R L Fisher
P Hunter & D Monahan
G Agapova
N Z Cherkis
H-W Schenke
T Holcombe
J Garcia A. & L Delgado A.
J Corvalan D. & P Carrasco H.
G Sharman
G B Udintsev & A Svarichevskiy
K Yashima
A Simpson
I Wright
H-W Schenke
R L Fisher

ANNEX V

COVERAGE DIAGRAM OF MAPS AND MAPPING PROJECTS
THAT WOULD BE SUITABLE FOR UPDATING THE GDA



Key to Bathymetric Maps

AGSO Offshore Resource Map Series - Australian Geological Survey Organisation, scale 1:1 million.

AWI Bathymetric Charts of the Weddell Sea - Alfred-Wegener-lnstitute, scale 1:1 million,

FJL Bathymetric Map of the Franz Josef Land Area - Matishov et al., Murmansk (1 995), scale 1:500,000 @ 80° N.

GL Bathymetry of the Great Lakes - NGDC, USA and Canada.

HDNO Bathymetric maps the Kara and Laptev Seas - Head Department of Navigation and Oceanography (1993), (digital files).

HIG Hawaii Seafloor Atlas -
Keating, Hawaii Institute of Geophysics (1995), scale 1:4 million

IBCCA IBC Caribbean Sea and Gulf of Mexico, scale 1:1 million @ 15°N.

IBCEA IBC Central Eastern Atlantic, scale 1:1 million@ 20°N.

IBCM IBC Mediterranean, scale 1:1 million @ 38°N.

IBCWIO IBC Western Indian Ocean, scale 1:1 million @ the Equator.

IBCWP IBC Western Pacific, scale 1:1 million @ 33° latitude.

IFR New Bathymetric Map of the Bay of Biscay -
Sibuet et al., IFREMER (1994), scale 1:2.4 million @ 41°N.

SOC1 Bathymetry of the Northeast Atlantic, sheets 1 & 2-
Southampton Oceanography Centre, scale 1:1 million.

SOC2 Bathymetry of the Madeira and Canary Abyssal Plains -
Southampton Oceanography Centre, scale 1:1 million.

KN Bathymetry of the Laptev Seas - Kassens, GEOMAR.

MX Bathymetry of Southcentral Pacific - Mammerickx,
Scripps Institution of Oceanography (1992), scale 1:6.4 million @ Equator.

NRL1 Bathymetry of the Barents and Kara Seas -
Cherkis, Naval Research Lab. (1991), scale 1:2.3 million@ 72°N.

NRL2 Regional Bathymetry of the Northern Norwegian - Greenland Seas -
Cherkis, Naval Research Lab. (1994), scale 1:3 million.

NZOI Oceanic Chart Series - New Zealand Institute of Water and Atmospheric Research (NZOI), scale 1:1 million @ 46°S.

RLF Bathymetry of the Indian Ocean (Alliance Exotique) -
Fisher, Scripps Institution of Oceanography, scale 1:2 million.

ANNEX VI

RESOLUTION ADOPTED BY THE IOC ASSEMBLY
at its Eighteenth Session, Paris, 13-27 June 1995

Resolution XVIII-10

SUPPORT TO THE JOINT IOC-IHO OCEAN MAPPING PROGRAMME

The Intergovernmental Oceanographic Commission,

Noting that the Assembly at its Seventeenth Session (March 1993) stressed that the Ocean Mapping Programme is a priority action of the IOC and should be provided with necessary support,

Recognizing that the demand for an authoritative and global description of the bathymetry of the world's oceans from physical and biological oceanographers who are involved in modelling the ocean environment and predicting changes in global circulation, is steadily becoming more insistent, in addition to the increasingly fine resolution requirements of marine geologists and geophysicists,

Recognizing also that on a global scale, existing bathymetric data are widely scattered and of very variable quality in depth and position, but that there are now available high quality multi beam swath-sounding techniques and accurate position control systems,

Emphasizing also that repeated routine ocean observations, as anticipated in the IOC's Global Ocean Observing System (GOOS), will be required to monitor oceanic change, and that this will require a secure framework of global bathymetry,

Acknowledging that the entry into force of the UN Convention on the Law of the Sea (UNCLOS) in November 1994 brings into focus the needs of coastal states to define and possibly exploit resources within national jurisdiction, and hence the requirement for detailed and accurate bathymetry of the margins,

Thanks the Russian Federation for seconding staff to support the Ocean Mapping Programme;

Instructs the Executive Secretary IOC:

(i) to initiate discussions on how to establish scientific priorities for bathymetric surveys of the world's oceans and then, in collaboration with the International Hydrographic Organization, to establish a well co-ordinated and comprehensive plan for the coming decade;

ii) in the interim, to investigate the possibility of improving the level of funding in the regular programme for Ocean Mapping, with a view to ensuring that the biennial cycle of meetings of the Consultative Group on Ocean Mapping (CGOM) and the Regional Ocean Mapping projects is maintained, in order to retain the necessary impetus in the various activities of these bodies, with, in particular, the paramount requirement for meetings of the Editorial Board for the International Bathymetric Chart of the Central Eastern Atlantic (IBCEA) (possibly in Lisbon or Brest) in 1996, of the Editorial Board for the International Bathymetric Chart of the Western Pacific (IBCWP) by 1996, and of CGOM early in 1997;

Invites the Director-General of UNESCO to establish one professional post for the Ocean Mapping Programme as of 1996;

Invites the International Hydrographic Organization to consider the above proposal, and assist with the development of a plan for the proposed co-ordinated bathymetric surveys.

ANNEX VII

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ANNEX VIII

LIST OF ACRONYMS

ACUF	Advisory Committee on Undersea Features (of BGN)
AGSO	Australian Geological Survey Organization
AGU	American Geophysical Union
AWI	Alfred-Wegener-Institut fur Polar- und Meeresforschung (Bremerhaven, Germany)
BAS	British Antarctic Survey
BGN	Board on Geographic Names (USA)
BODC	British Oceanographic Data Centre (Bidston Observatory, Birkenhead, UK)
CAP	Circum-Atlantic Project (of IUGS)
CD-ROM	Compact Disc - Read Only Memory
CEDD	Committee on Exchange of Digital Data (IHO)
CGM	Carte générale du monde (IGN)
CGOM	Consultative Group on Ocean Mapping (of IOC)
CHS	Canadian Hydrographic Service
CICESE	Centro de Investigación Científica y Educación Superior de Ensenada (Mexico)
CLCS	Commission on the Limits of the Continental Shelf (UNCLOS)
CMG	Commission for Marine Geology (IUGS)
CoE	Committee on Electronic data (IHO) (formerly Committee on ECDIS)
CSIRO	Commonwealth Scientific and Industrial Research Organization (Australia)
DBWG	Data Base Working Group (IHO)
DCDB	Data Centre for Digital Bathymetry (IHO - at NGDC, Boulder, Colorado, USA)

DMA	Defense Mapping Agency (USA)
EB	Editorial Board
ECDIS	Electronic Chart Display and Information System (IHO)
EPSHOM	Etablissement Principal du Service Hydrographique et Océanographique de la Marine
GBE	GEBCO Bathymetric Editor
GDA	GEBCO Digital Atlas
GEBCO	General Bathymetric Chart of the Oceans (IOC/IHO)
GEODAS	Geophysical DAta System for Marine Geophysical Data (NGDC)
GOOS	Global Ocean Observing System (IOC)
HDNO	Head Department of Navigation & Oceanography (USSR Ministry of Defence, Leningrad)
HYDAS	HYdrographic DAta System for Marine Geophysical Data (NGDC)
IASC	International Arctic Science Committee
IBCCA	International Bathymetric Chart of the Caribbean Sea and Gulf of Mexico (IOC)
IBCEA	International Bathymetric Chart of the Central Eastern Atlantic (IOC)
IBCM	International Bathymetric Chart of the Mediterranean and its Geological/Geophysical Series (IOC)
IBCWIO	International Bathymetric Chart of the Western Indian Ocean (IOC)
IBCWP	International Bathymetric Chart of the Western Pacific (IOC)
ICA	International Cartographic Association
ICSU	International Council of Scientific Unions
IFREMER	Institut Français de Recherche pour l'Exploitation de la Mer
IGN	Institut géographique national (Paris, France)
IH	International Hydrographic (Review and Bulletin)

IHB	International Hydrographic Bureau
IHO	International Hydrographic Organization
INEGI	Instituto Nacional de Estadística, Geografía e Informática (Mexico)
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IOSDL	Institute of Oceanographic Sciences, Deacon Laboratory (U.K.)
IUGS	International Union of Geological' Sciences
NATO	North Atlantic Treaty Organization
NERC	Natural Environment Research Council (Swindon, UK)
NGDC	National Geophysical Data Center (Boulder, Colorado, USA)
NGS	National Geographic Society (USA)
NMDIS	National Marine Data and Information Service (China)
NOAA	National Oceanic and Atmospheric Administration (USA)
NRL	Naval Research Laboratory (USA)
NUTIS	NERC Unit for Thematic Information Systems (NERC at Reading University, UK)
NZOI	New Zealand Oceanographic Institute (NIWAR)
OMG	Ocean Mapping Group (University of New Brunswick, Canada)
RAN	Royal Australian Navy
R/V	Research Vessel
SACLANT	Supreme Commander Allied Command Atlantic (NATO)
SCAR	Scientific Committee on Antarctic Research (ICSU)
SCDB	Sub-Committee on Digital Bathymetry (GEBCO)
SCOR	Scientific Committee on Oceanic Research (ICSU)
SCUFN	Sub-Committee on Undersea Feature Names (GEBCO)
SIO	Scripps Institution of Oceanography (La Jolla, USA)

SOPAC	South Pacific Applied Geoscience Commission
UNCLOS	United Nations Convention on the Law of the Sea
UNESCO	United Nations Educational, Scientific and Cultural Organization
USGS	United States Geological Survey
VHO	Volunteering Hydrographic Office (IHO)
WDC	World Data Centre
WGS	World Geodetic System

82. Second Meeting of the UNEP-IOC-ASPEI Global Task Team on the Implications of climate Change on Coral Reefs
83. Seventh Session of the JSC Ocean Observing System Development Panel
84. Fourth Session of the IODE Group of Experts on Marine Information Management
85. Sixth Session of the IOC Editorial Board for the International Bathymetric chart of the Mediterranean and its Geological/Geophysical Series
88. Fourth Session of the Joint IOC-JGOFS Panel on Carbon Dioxide
87. First Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Pacific
88. Eighth Session of the JSC Ocean Observing System Development Panel
89. Ninth Session of the JSC Ocean Observing System Development Panel
90. Sixth Session of the IODE Group of Experts on Technical Aspects of Data Exchange
91. First Session of the IOC-FAO Group of Experts on OSLR for the IOCINCWIO Region
92. Fifth Session of the Joint IOC-JGOFS $C0_2$ Advisory Panel Meeting
93. Tenth Session of the JSC Ocean Observing System Development Panel
94. First Session of the Joint CMM-IGOSS-IODE Sub-group on Ocean Satellites and Remote Sensing
95. Third Session of the IOC Editorial Board for the International Chart of the Western Indian Ocean
96. Fourth Session of the IOC Group of Experts on the Global Sea Level Observing System
97. Joint Meeting of GEMSI and GEEP Core Groups
98. First Session of the Joint Scientific and Technical Committee for Global Ocean Observing System
99. Second International Meeting of Scientific and Technical Experts on Climate Change and the Oceans
100. First Meeting of the Officers of the Editorial Board for the International Bathymetric Chart of the Western Pacific
101. Fifth Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico
102. Second Session of the Joint Scientific and Technical Committee for Global Ocean Observing System
103. Fifteenth Session of the Joint IOC-IHO Committee for the General Bathymetric Chart of the Oceans