Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean

Fourth Session

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1. OPENING OF THE SESSION

Dr. Dmitri Travin, IOC Technical Secretary for the Session, opened the Fourth Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean (IBCWIO) at 09.30 in the Officers' Club of the South African Navy. He welcomed all the members on behalf of the IOC Executive Secretary, Dr. Gunnar Kullenberg, and stated that he hoped this meeting would be productive and successful. Since the last meeting the project has advanced well and has also received financial support from IOC and SAREC funds. He expressed his gratitude for this support over the last three years and also the progress that has been achieved. He concluded by saying that the next step would be to produce the first IBCWIO sheet. Dr. Travin then handed over to the Chairman of the IBCWIO, Prof. Werner Bettac, Chief Editor.

Prof. Bettac thanked the South African Navy, Hydrographer Capt. B. Derek Law and Lt. Cdr. Barry Vine for providing facilities to host this Session. He reported that much work had been done and that the project was now in its production stage. He stated that the session would now decide on how to continue.

The delegates introduced themselves to the meeting. No absence was noted. A full list of participants is attached as Annex VII.

2. ADOPTION OF THE AGENDA

Prof. Bettac presented the Agenda and asked for any comments.

a. Instead of presenting a verbal report as per Item 5 of the agenda, Mr. Sidney Osborne (South Africa) informed the meeting that a tour to the hydrographic office would be more informative. It was proposed and accepted that Mr. Peter Hunter (UK) provide instead, a brief on his experience in the field of bathymetric mapping.

b. Mr. Hunter requested that Item 5 be dealt with at the end of the meeting.

c. Mr. Osborne suggested that Item 3 of the Report of the previous meeting (3rd Session) was incorrect as South Africa had replied in writing to Dr. Travin's invitation that due to other commitments South Africa could not attend. Dr. Travin stated that this would be mentioned in the summary report of this Session.

Mr. Huet (IHB) proposed that the revision of the Terms of Reference be added to the Agenda. It was adopted as Item 10.1 "Terms of Reference" (see Annex II).

The Agenda was adopted by the Session. The revised agenda is at Annex I.

3. CONDUCT OF THE SESSION AND DOCUMENTATION

The Chairman outlined the conduct of the Session. He informed the participants that he would not necessarily adhere to the order of the Agenda Items as listed.

4. EXCHANGE OF THOUGHTS AND EXPERIENCES IN EVALUATING PLOTTED DEPTHS FOR BATHYMETRIC CHARTS

4.1 EXPERIENCE OF THE USA

Dr. Troy Holcombe, NGDC, gave a presentation on the method used by National Geophysical Data Center (NGDC) to produce a new map "Bathymetry of Lake Erie and Lake St. Clair". He explained how they had processed depth data which had been collected over a long period of time and had never been used for contouring at the highest level of detail. These data from the USA and Canada included digital and analogue data at different scales and units of measure.

He described how different software such as ArcEdit, GMT, Adobe Illustrator and line smoothing software were used to prepare and print the final map on an inkjet plotter.

4.2 EXPERIENCE OF THE UK

Mr. Hunter (SOC) gave a presentation on structuring and evaluating data and the method used in the production of bathymetric maps. He summarized by saying that the following points should be considered:

a. Keep data from different sources on separate overlays. For instance digital data from TRKDAS, digitized data from the analogue GEBCO OPS and data from a particular agency, i.e., SOC or HNDO.

b. Make colour coded plots. Use existing data sets such as the contours from the GEBCO Digital Atlas as a further check on the same plot to indicate the general bathymetry.

c. Make plots at scales which suit the density of the data.

d. Use a griding package to make contour plots and 3D views. These will help to identify anomalous tracks and aid later hand contouring of the data.

e. Obtain representative depth profiles with which to construct a morphological map.

f. Obtain existing maps of the region.

g. Correct data if possible, but be prepared to exclude data.

h. Do not ignore data just because they are analogue or very old.

I. Identify any multibeam tracks. Obtain the contours from the original surveys. Do not attempt to replace a multibeam map with your own hand contoured version.

j. Generalize complex contours if necessary, but do it carefully. Small relief bathymetric features such as sea floor channels should not be lost.

k. Make use of other data sets such as, satellite altimetry and sidescan sonar images and maps showing the seismicity, gravity, geological structure and magnetic anomalies of the region.

5. PRESENTATION OF THE METHODS USED BY THE HYDROGRAPHIC OFFICE OF SOUTH AFRICA

Mr. Osborne informed the meeting that they would present a practical demonstration on GEBCO activities within the South African Hydrographic Office during a visit to their office.

The South African Hydrographic Office is in the stage of creating a digital database of the analogue bathymetry for their sheets of responsibility in the IBCWIO as well as 20 other bathymetric plotting sheets of their IHO area of responsibility. The bathymetric data dates from 1945 of which 100 cruises are of South African origin. The Hydrogapher will endeavor to support this project to the fullest.

Mr. Osborne stated that the Hydrographic Office has recently upgraded their computerized cartographic system. The IBCWIO project has come at a difficult time as they are in the process of developing a new database structure, however, South Africa is enthusiastic about participating but would require all the necessary information for this project As the Session progressed he hoped to get a better understanding as to what is required.

In reply to a question from Ms. L. Sawyer (South Africa) on time scales for this project, Dr. Travin stated that, for example, the International Bathymetric Chart of the Mediterranean (IBCM) was one of the more successful projects which has been in existence for more than 20 years and is now nearing completion. It has not only produced bathymetric charts but also geological and geophysical overlays. Several sheets of the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico (IBCCA) have also been produced. In the International Bathymetric Chart of the Central Eastern Atlantic (IBCEA), France has completed three sheets and Portugal has completed two plotting sheets.

He further stated that the contributions of all participating countries are important as it is not possible for one country to carry out this project alone.

6. INFORMATION ON CURRENT IOC OCEAN MAPPING ACTIVITIES.

Dr. Travin stated that this item had already been partially dealt with during other agenda items. He provided members with a copy of the Report of the Chairman of the IOC Consultative Group on Ocean Mapping (CGOM) to the Nineteenth Session of the Intergovernmental Oceanographic Commission (IOC) Assembly.

Mr. Hunter had given a demonstration of the revised GEBCO Digital Atlas CD-ROM, GDA97 earlier to the meeting. During the demonstration he had also outlined progress and the policy for updating its contents.

7. PRESENT SITUATION OF DISTRIBUTION OF COLLECTED DATA TO PARTICIPANTS IN THE IBCWIO PROJECT

Prof. Bettac asked the members of the Editorial Board if they had received the plotted depth sheets and CDs which had been sent recently by Dr. Schiffner of BSH, Germany. He also stated that the diagram showing the layout of the sheets in the report of the last Session did not coincide with the list of countries. He stated that he had requested from each participant a reply to the changes, but had not yet received any as to what sheets they would do.

a. Capt. Michael Rosette (Seychelles) stated that he had not received the CD and agreed to do sheet 1.05.

b. Dr. L. Nyandwi (Tanzania) stated that he had only received some of the sheets (he would check which ones) and agreed to do sheet 1.07. Dr. Nyandwi stated that on sheets 1.04 and 1.07 the Zanzibar Channel had been left out. Prof. Bettac explained that the reason for this was that it lay above the 200 m contour line. He said that he would send the necessary data to Tanzania.

c. Mr. Benjamin Murimi Kumunga (Kenya) informed the meeting that his organization had received the GEODAS 3.0 CD-ROM software and data. He agreed to do sheet 1.04 and hoped that some plotting sheets would be ready by June 1998.

d. Mr. Darmalingum Ramasawmy (Mauritius) said that to date he had not received any data. He agreed to do sheets 1.08 and 1.12. He stated that he will begin sheet 1.08 at the beginning of 1998.

e. Mr. Estevao T. James (Mozambique) informed the meeting that he had only received some of the plotting sheets (21 sheets), and not the CD. He also added that sheets 1.10 and 1.13 will be prepared by the end of 1998 and that sheet 1.16 could be prepared during the first half of 1999 in conjunction with South Africa.

f. Mr. Richard Raharijaona (Madagascar) stated that nothing had been received yet, but that he would do sheet 1.11. He also stated that although he had not much to contribute at this stage he would be willing to be co-operate with France.

g. Mr. Osborne (South Africa) stated that he had received paper copies of sheets 1.13-1.21 but no CD.

h. Mr. Jean-Louis Bouet-Leboeuf (France) stated that he had received no data. He agreed to do sheet 1.15 and was prepared to co-operate with Madagascar on sheets 1.11 and 1.14.

i. Mr. Hunter (United Kingdom) stated that he had received the CD but no sheets. He would produce sheets 1.01 and 1.02.

j. Dr. Holcombe (USA) stated that they would be willing to co-operate with Seychelles on sheet 1.05. Seychelles accepted this offer.

A new version of the layout of the IBCWIO describing the above agreements is shown as AnnexV.

8. STATE OF NATIONAL PARTICIPATION IN THE PROJECT

Prof. Bettac asked the participants to inform the meeting of their progress in the project :

Mr. Hunter reported that the United Kingdom's Southampton Oceanography Centre (SOC) is responsible for the contouring of IBCWIO sheets 1.01 and 1.02. It has been carrying out the following tasks within the work programme of the GEBCO Bathymetric Editor who is now based there. Work has started on the western half of sheet 1.01.

Colour coded plots have been made of digital depths derived from the Marine Trackline Geophysics Database on GEODAS 3.3, at scales of 1:500 000 and 1:1 000 000 on the Mercator projection. Other depth data from cruises carried out by the UK's Institute of Oceanographic Sciences (IOS), have been digitized and plotted out at the same scales as above. The old analogue Ocean Plotting Sheets (OPS) compiled for the GEBCO have been enlarged to the same scales. Sections of these OPS may be digitized in the course of carrying out the contouring work. Recently received data has been included from a CD ROM prepared by BSH. No other data have been identified. No request has yet been made for any Russian data.

Preparatory work for contouring is underway. 3D plots have been created to help identify bad data and to show topographic trends. SOC intends to draw contours at 200 m and at other relevant intervals, but in addition each 500 m interval will also be shown for the purpose of the GEBCO digital reference.

Future work will include plotting contours derived from a gridded predicted bathymetry prepared from satellite altimetry data by Walter Smith, NOAA and David Sandwell, SIO, USA. These plots will be used to guide contouring and to provide information on bathymetric features in regions of sparse depth data coverage.

The first drafts of bathymetric contours are expected by mid-1998 and final versions by early 1999.

Capt. Rosette informed the meeting that the Seychelles has a very small office with limited personnel. They would require equipment and assistance to carry out the project.

Mr. Kumunga informed the meeting that the computer systems with CD drives available to them are UNIX and Macintosh platforms. Since GEODAS 3.0 runs on DOS system, they planned to obtain a CD drive for a PC working under DOS. He was informed that it may be possible to run GEODAS 3.3 on the UNIX platform.

Dr. Holcombe provided a copy of GEODAS 3.3 to the Chief Editor and offered to inform him of new bathymetric sounding data affecting the IBCWIO area. He also offered to make available, via FTP transfer, data files of the Smith & Sandwell "Measured and Estimated Sea Floor Topography".

Mr. Bouet-Leboeuf reported that work would not be able to begin until 1999 owing to other priorities. He will also be having discussions with Madagascar as to how to assist them with this project. Dr. Travin suggested to Mr. Bouet-Leboeuf that France review their priorities with regard to IBCCA and maybe delay work on that project in favour of the IBCWIO project.

Mr. Osborne reported that South Africa had not yet commenced work on their sheets. He said that he would provide a report to the Chairman on South African data holdings not included in GEODAS 3.3. South Africa can process, receive and supply data in digital and analogue formats.

Capt. Valery Fomchenko (Russian Federation) supplied the Chief Editor and other participants with digital data for the sheets 1.10 and 1.13 which are available in the Head Department of Navigation and Oceanography (HDNO). He reported that since the Third Session of the IBCWIO, all bathymetric data available at the HDNO for sheets 1.03, 1.06 and 1.09 have been gathered and analyzed. By the end of this year they shall complete the digitizing of these data and they shall be ready to be passed to the joint database of the IBCWIO.

They have adopted a scale of 1:500 000, for producing these sheets. He recommended that the choice of scale for the source plotting sheet be left to each Sheet Co-ordinator's discretion and that an appropriate correction to IBCWIO specifications be made. He recommended that a reference to scales of 1:250 000 and/or 1:500 000 be added (see also Item 10.4).

As he had only received the precise coordinates of the sheet scheme this year, the compilation of the source plotting sheets had begun only recently.

Nevertheless, for 1998, HNDO plan to compile 12 source plotting sheets at a scale 1:500 000 for sheets 1.03, 1.06 and 1.09 and at a scale 1:1M for sheet 1.03, all of which contain sufficient bathymetric data.

The HDNO does not possess sufficient bathymetric data sets to compile sheets 1.06 and 1.09. Therefore the compilation of these would be successful only if additional data was forthcoming from other participants of the project.

Dr. Nyandwi requested that the Chairman asks IOC and IHB to write a formal letter to the governments of the participating members seeking their co-operation in this project.

Dr. Holcombe informed the meeting that he would establish, at NGDC, an Internet site containing general introductory information about the IBCWIO project. This site would also include a bulletin board which will provide information regarding new data coming into the Center.

Mr. Albano Gove (Mozambique) informed the meeting that, if resources improved in Mozambique, they could put more people onto this project. He is in the process of looking for suitable software and would value the co-operation of South Africa.

Mr. M. W. L. Chodota (Kenya) stated that the RCSS, MRS treats this project as one of the regional projects and that the recommendations of this meeting would be presented to the Governing Council in December 1997. All member States which participate in this project would be urged to support the project activities. South Africa would be approached to assist due to their advanced charting facilities and experience.

Prof. Bettac stated that he is hoping that some members would be able to produce a contour sheet by late 1998 to show financial supporters that the IBCWIO project is active.

Dr. Robert Fisher (USA) has agreed to compare the plots of track charts, which will be sent to him by the Chief Editor, with his data.

After an introduction by Dr. Holcombe, Messrs. Osborne and Hunter gave a demonstration of the CD-ROM based GEODAS 3.3, produced by NGDC. They explained how depths and depth header records could be selected, extracted and exported to a graphics package such as Corel Draw.

After the demonstration, Dr. Holcombe:

a. Stated that he will inform the Chairman and the Sheet Co-ordinators, via the Internet, of new data coming into the NGDC and will establish an Internet facility so that they may monitor the availability of new data. He also provided the Chairman with source references to cruises with collected multi-beam data. The Chairman will distribute this information to the relevant countries.

b Requested that if in the course of compilations, sounding data is adjusted and corrected, this information should be forwarded to NGDC as part of data validation.

c. Informed the meeting that header information from cruises and seismic reflection data is important for source assessment.

d. When requesting multibeam data independently, it is only necessary to ask for the contour data.

Mr. Hunter suggested that it would be a good idea if those countries with expertise to carry out GEODAS searching and plotting could help countries without the necessary resources.

It was proposed that with respect to GEODAS plots, cruise information and sounding data, that the USA (NGDC) support Seychelles, South Africa support Mozambique, France support Madagascar, Russian Federation support Kenya, the UK support Mauritius and Germany support Tanzania. This was accepted by the meeting.

9. FURTHER DEVELOPMENT OF ON-GOING WORK ON THE IBCWIO

Mr. Hunter stated that the British Oceanographic Data Centre (BODC) has offered to digitize the contours of the IBCWIO as the sheets become available, as it has been found that sorting problems with digitized data from other sources usually takes longer.

Prof. Bettac gave a summary of the history and progress of the IBCWIO project. He outlined the various financial difficulties that he had encountered, but reported that money was available from the German Government to carry out the preparation and printing of some sheets. He encouraged the meeting, in particular South Africa, Russia and the UK, to promote the preparation of contours to enable this money to be used by the end of 1998.

He confirmed that once he has received contours from the Sheet Co-ordinators, he would be responsible for seeing to the preparation of all the other information including the land topography and printing. He undertook to investigate the available sources of topography.

In answer to a question on the further duties of the Sheet Co-ordinators, he said that they would be consulted on any changes and comments arising from appraisal of the proofs and would be required to help in the preparation of geological and geophysical overlays.

Prof. Bettac added that Dr. Fisher would be asked to carry out a scientific review of the contours.

He concluded by expressing the hope that copies of a first proof will be ready for the next meeting of the IBCWIO. If sheets are ready earlier then they will be circulated to the Editorial Board members for their comments.

The Session thanked Prof. Bettac for his efforts and leadership in the project.

10. OTHER BUSINESS

10.1 REVISION OF THE TERMS OF REFERENCE

The Chairman referred to a fax from Mr. Desmond Scott, Chairman of the IOC Consultative Group on Ocean Mapping (CGOM), which asked the Session to consider revising its Terms of Reference in view of comments made at the last meeting of the GEBCO Guiding Committee in Southampton. At that meeting it had been noted that no reference had been made to the incorporation of the contours of the IBCWIO into the GEBCO Digital Atlas.

The Terms of Reference were amended to show this and other developments (see Annex II).

10.2 COASTLINE

Mr. Osborne informed the Chairman that the South African Hydrographic Office have a coastline at a scale of 1:150 000. The Chairman thanked South Africa for the offer of this data but felt that the World Vector Shoreline (WVS) would be adequate for this project.

10.3 TRAINING

A certificate of training on board R/V *METEOR* was handed to Messrs. James and Ramasawmy for completion of the course. Mr. Osborne was requested to give Mr. Louis Lenhoff his certificate.

Mr. Osborne asked if there would be any further training as defined by Item 2.4 of the Terms of Reference. In reply, Dr. Travin reminded the meeting of the earlier training courses (see previous minutes

of the IBCWIO). He also said that if the financial situation at IOC improved and the German Government were willing to co-operate again, there was the possibility of having another course during the next two years.

Mr. Huet referred to the IHO and IMO-sponsored training course at the IMA, Trieste, Italy. Copies of an IHB Circular Letter providing details on the course which will be held during 1998 were distributed to participants.

10.4 REVISION OF THE SPECIFICATIONS

The Chairman informed the Session of a further comment by Mr. Desmond P.D. Scott (see Item 10.1) which asked that the IBCWIO should provide contours at each 500 metre interval for use in the GEBCO Digital Atlas.

The Session accepted this and other changes to the IBCWIO specifications as follows :

a. 401 First paragraph to read:

"1:250 000, 1:500 000 and or 1:1 000 000 plotting sheets prepared ....."

b. 401 Second paragraph to read:

"....to the Appendix of Annex II to these....."

c. 403 A to read:

"....intervals, however all the 500 m contour intervals will be also be prepared for use in the Gebco Digital Atlas (GDA)."

d. 403 C to read:

"....for enhancing continental shelf areas, and also include additional contours to define the bottom of basins etc..

The revised IBCWIO specifications are at Annex IV.

10.5 IBCWIO WORKPLAN

A small sub-group undertook to update the IBCWIO workplan which was elaborated at the previous meeting. The revised workplan is at Annex III.

10.6 UNDERSEA FEATURE NAMES

Mr. Hunter reminded the meeting that in order to allow speedy completion of the sheets, the Sheet Co-ordinators should submit any proposals for new undersea feature names to the GEBCO Sub-Committee on Undersea Feature Names.

Mr. Huet distributed a list of names that could appear on the IBCWIO (see Annex VI). The list was derived from the GEBCO Digital Gazetteer of Undersea Feature Names which is maintained at the IHB.

11. PLACE AND DATE OF THE NEXT SESSION

Capt. Rosette proposed that the next Session be held in the Seychelles subject to the approval of his Government. Mr. James also offered Mozambique as an alternative venue.

The Chairman thanked them for their proposals and asked Dr. Travin that IOC should make the arrangements.

It was proposed and agreed that the next Session should be held at the beginning of 1999.

12. ELECTION OF THE VICE-CHAIRMAN OF THE IBCWIO

The Chairman expressed his appreciation of the hard work undertaken by Mr. James on behalf of the IBCWIO and proposed that he should continue as Vice-Chairman until the next Session. This was agreed by the meeting and accepted by Mr. James.

13. APPROVAL OF THE DRAFT SUMMARY REPORT

The Draft Summary Report was approved.

14. CLOSURE OF THE SESSION

Captain Law and his staff were thanked for their generous hosting of the Session.

Prof. Bettac closed the meeting at 15.35 on 10 October 1997 and thanked all the participants for the work in progress and looked forward to the next session in 1999.

ANNEX I

AGENDA

SUMMARY REPORT

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ANNEX II

TERMS OF REFERENCE OF THE EDITORIAL BOARD FOR THE INTERNATIONAL BATHYMETRIC CHART OF THE WESTERN INDIAN OCEAN

(Accepted as proposal for revision)

Note : Proposed changes have been shown in italic characters.

The IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean shall:

1. BASIC FUNCTIONS

Supervise the preparation and publication of the IOC International Bathymetric Chart of the Western Indian Ocean (IBCWIO) using all available bathymetric data as input to the series, taking into account, in particular, the holdings in the ***IHO Data Centre for Digital Bathymetry (DCDB)*** and subsequently consider the preparation and publication of overlay sheets of geological and geophysical parameters.

2. PROGRAMME DEVELOPMENT

2.1 PLANNING

Prepare a detailed plan of action for carrying out the project to be submitted to the IOC Consultative Group on Ocean Mapping (CGOM) for its consideration.

2.2 PROMOTION

Promote the IBCWIO and related supporting activities in the Member States of the IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean (IOCINCWIO) and in their marine scientific communities.

2.3 CO-ORDINATION

Identify the participating entities (institutions, individual scientists and experts), keep them informed of the actions that each of them is expected to undertake in the implementation of the IBCWIO and on activities being undertaken by the other participating entities, so as to avoid unneccesary duplication of effort and to optimize results.

2.4 SCIENTIFIC AND TECHNICAL ADVICE

Advise the participating entities, as appropriate, of the methods and procedures to be used in carrying out the work related to the agreed project and activities and on any methodological questions falling within the Editorial Board's competence.

Advise the Member States of the Regional Committee for IOCINCWIO on the requirements for Training, Education and Mutual Assistance in the Marine Sciences (TEMA) related to the IBCWIO and advise the IOC of these requirements.

2.5 COLLABORATION

Collaborate with the IOC Consultative Group on Ocean Mapping concerning the technical specifications for the IBCWIO, taking into account the specifications for "International Bathymetric Charts" produced under Regional Mapping Projects (Annex IV to Document IOC/CGOM-II/3) and, when appropriate, with similar Editorial Boards and other expert groups active in the field of ocean mapping ***in particular the GEBCO Guiding Committee with a view to incorporating IBCWIO contours into the GEBCO Digital Atlas.***

2.6. EVALUATION

Evaluate progress in the implementation of the agreed project and activities, with a view to proposing new approaches or new directions in the light of results achieved.

3. OTHER FUNCTIONS

3.1 TECHNICAL POLICY

Advise the Member States participating in the IBCWIO on technical requirements for the effective implementation of the agreed project and activities for the achievement of the Editorial Board's objectives in this field.

3.2 REPORTING

Present a report on its activities and progress to each session of the Consultative Group on Ocean Mapping and inform the Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean (IOCINCWIO) on scientific and technical aspects of its activities.

ANNEX III

WORKPLAN FOR THE INTERNATIONAL BATHYMETRIC CHART OF THE WESTERN INDIAN OCEAN

(Updated to October 1997)

1. DEFINITION OF SHEET CO-ORDINATES
(by January 1995)

Accurate determination of the geographical limits for each IBCWIO sheet, according to the specifications, by the Chief Editor and distributed to the Sheet Co-ordinators.

2. DATA COLLECTION
(Initial distribution by January 1997)

Collection by the Chief Editor of all available data for each sheet and distribution of relevant data to each IBCWIO Sheet Co-ordinator, including soundings, digital and analogue, existing bathymetric contours, relevant literature describing the morphology of the area, geographical names and any other useful information. However, in some circumstances, a Sheet Co-ordinator may receive bathymetric data directly from a source, they should inform the Chief Editor accordingly. Data will continue to be distributed as it received by the Chief Editor.

3. DATA PREPARATION AND EVALUATION
(first sheets by July 1997)

Preparation of data to a common scale by the Sheet Co-ordinator. This scale will preferably be 1:250 000. During this phase a selection process may begin. Sound velocity corrections will be accounted for by digital Carter's tables, to be provided.

*Note: **Sheet Co-ordinators will need plotting software.***

4. DATA COMPILATION
(first sheets by January 1998)

Drawing of contours from bathymetric data at same scale as above.

5. TECHNICAL REVIEW
(first sheets by July 1998)

Review of contour overlay by the Chief Editor. Comments will be sent to the relevant Sheet Co-ordinator for correction.

Notes:

1. Iterations of steps 3 and 4 may take place
2. New undersea feature names may be proposed as a result of the compilation work.

6. PREPARATION OF 1:1 MILLION SCALE SHEETS
(first sheets by September 1998)

Assembling of the contour overlays contained in the concerned sheet, either by the co-ordinator or the Chief Editor.

7. SCIENTIFIC REVIEW
(first sheets by October 1998)

The 1:1 Million sheet will be sent for review to a scientific expert by or via the Chief Editor. The resulting comments are addressed to the Chief Editor who may then consult with the expert and/or the co-ordinator for further clarification.

8. CORRECTION OF CONTOUR OVERLAYS
(first sheets by November 1998)

Collaboration between the Chief Editor and the Sheet Co-ordinator for revision of the contour overlays.

9. PREPARATION OF A PROOF FOR THE EDITORIAL BOARD
(first sheets by December 1998)

Combination by the Chief Editor or by the Co-ordinator in liaison with the Chief Editor, of the final contours and other map elements (land, geographical names, spot depths, legend ... etc.), in a (colour) proof of the sheet for review by the Editorial Board.

10. PRINTING AND PUBLISHING OF THE IBCWIO
(first sheets by end of 1998)

Preparation of colour plates, printing and distribution by the Chief Editor.

ANNEX IV

REVISED SPECIFICATIONS FOR THE INTERNATIONAL BATHYMETRIC CHART OF THE WESTERN INDIAN OCEAN

SECTION 100 - GENERAL

101 - Introduction

The International Bathymetric Chart of the Western Indian Ocean is a continuation and further development of the General Bathymetric Chart of the Oceans (GEBCO), under the general guidance of the IOC Consultative Group on Ocean Mapping. This chart is prepared and published with the co-operation of volunteer Hydrographic Offices and/or groups of scientists from appropriate institutions.

The Editorial Board for the International Bathymetric Chart of the Western Indian Ocean was established by Resolution of the Twenty-first Session of the IOC Executive Council (Paris, 7-15 March 1988), for the purpose of technical direction of its compilation and publication.

SECTION 200 - BASIC SPECIFICATION

201 - Projection

A. Sheets for IBCWIO will be portrayed in Mercator Projection using the WGS-84 reference ellipsoid.

202 - Scale

A. A scale of 1:1 000 000, using the Equator as a reference parallel, will be used.

203 - Graticule

A. A scaled border of each sheet shall be shown subdivided into 1 minute increments of latitude and longitude.

B. Meridians and parallels shall be drawn every 2°.

C. Labelling of the graticule shall be every 1°.

D. The tropic of Capricorn shall be shown.

204 - Size

The neat line size of each sheet shall not generally exceed 740 x 900 mm.

205 - Numbering

A. For each chart a consecutive sheet number shall be used as shown in the Assembly Diagram.

B. Sheet numbers shall be printed in 8 mm Arabic figures in the lower right-hand and top left-hand corner of each sheet.

206 - Dating

The date of the chart publication to be shown on each sheet shall be the date of going to press.

207 - Units of measurement

Depths and topographic heights shall be shown in metres. Depths should be corrected from the last edition of the Echo-Sounding Correction Tables, published by the United Kingdom Hydrographic Department, and this should be stated on the face of the chart.

208 - Marginal information

A. All marginal information shall be in English (or bilingual if appropriate).

B. This shall include:

1. The general title of the chart.
2. Sheet number.
3. Projection, ellipsoid and scale (see 201, 202).
4. Unit of measurement used for depths and heights.
5. Code of colours used to portray hypsometry.
6. Code of colours used to portray bathymetry.
7. An index of areas and names of countries whose Hydrographic Offices or groups of scientists prepared plotting sheets for the sheet.
8. The names of scientific co-ordinators of the chart series and of scientists responsible for the scientific content of the sheet.
9. The logo of the Intergovernmental Oceanographic Commission (IOC) of UNESCO.
10. Edition number and date of publication (see 206) followed by the statement: "Published by the ..... (name of printer) under the authority of the IOC (of UNESCO)".
11. List of the sources of the data used.

SECTION 300 - TOPOGRAPHY

301 - For the land part, topographic maps shall be used.

302 - The best available agreed upon coastline shall be used. The coastline shall be shown as a firm line in black.

303 A Contours on land shall be at 200 m intervals.

B. The thicker lines shall be at 200, 1 000, 2 000, 3 000 m etc., intervals.

C. Additional contours which may be required by the data must be shown.

D. Colour change for hypsometry shall be used at the following intervals: 0-200, 200-1 000, 1 000-2 000, 2 000-3 000 m etc.

E. Glaciers shall be shown by contours or by symbols. The significant heights shall be shown.

304 - Hydrology of the land

On the chart shall be shown:

- rivers and channels;
- lakes;
- lagoons.

305 - Major cities and towns, priority being given to those on the coast.

SECTION 400 - BATHYMETRY

401 - The 1:250 000, 1:500 000 and or 1:1 000 000 plotting sheets prepared by the participants in the Project, according to their zones of responsibility, shall form the basic bathymetric data to be used for the compilation of the chart.

The plotting sheets shall be prepared according to the Appendix to Annex II to these Specifications.

402 - Soundings

A. A sparse pattern of numerical soundings shall be shown to indicate maximum and minimum (and other significant) depths, where known, over major undersea features in such a way as not to detract from the paramount objective of indicating sea floor relief by means of contours.

B. The exact position of all numerical soundings shown shall be indicated by a dot. The depth shall be written as cartographically convenient against the dot using 1.5 mm sans serif figures. Where space does not permit the juxtaposition of the figures they may be offset and linked by a fine line to the dot placed in the exact position.

C. Actual data control will be shown as data representing discrete soundings or as lines representing continuously sounded traverses. Areas of detailed surveys where sounding lines are closely spaced may be delineated using numbered boxes which are referenced in the margin. Margin reference information will include average spacing of ship traverses together with essential information regarding the source of the data such as collecting institution, ship and cruise, and date of survey.

403 - Depth contours and colours

A. Basic contours shall be at 200 m intervals, however all the 500 m contour intervals will also be prepared for use in the GEBCO Digital Atlas (GDA).

B. The 200 m contour line and all contours at 1 000 m intervals shall be drawn using thick lines.

C. 20, 50 and 100 m contours, if necessary, shall be drawn using thin lines for enhancing continental shelf areas, and also include additional contours to define the bottom of basins etc.

D. A colour change for the bathymetry shall be used at the following intervals: 0-200, 200-1 000, 1 000-2 000, 2 000-3 000 m etc.

SECTION 500 - NOMENCLATURE AND GEOGRAPHICAL NAMES

501 - A. A proposed list of names for inclusion on each sheet will be submitted for approval to the GEBCO Sub-Committee on Geographical Names and Nomenclature of Ocean Bottom Features. In preparing this list, account should be taken of the guidelines contained in the GEBCO publication "Standardization of Undersea Feature Names". Names already in use, referring to the GEBCO Gazetteer, will be accorded preference, with new names being given only to previously unnamed features.

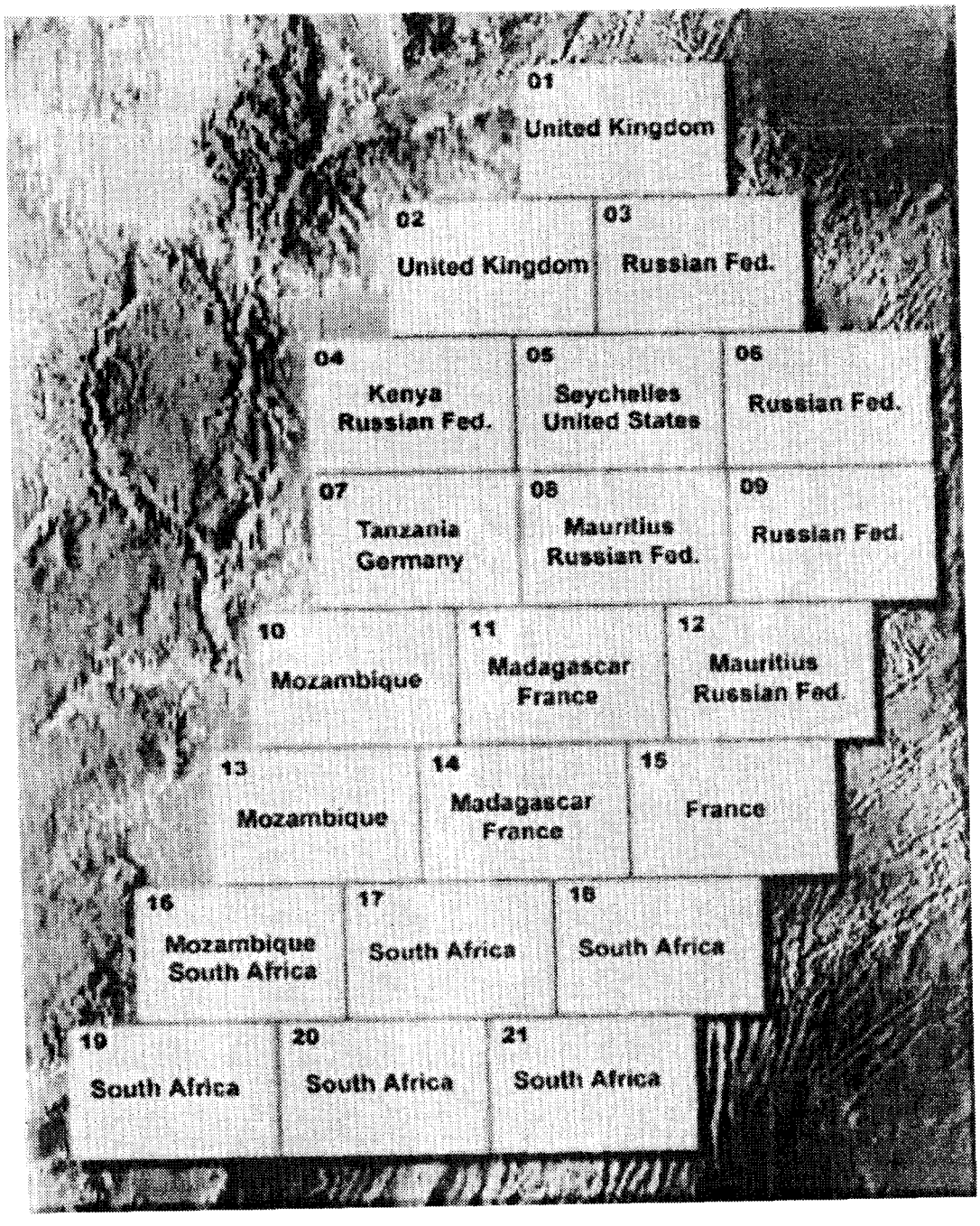
B. As a general policy, local names (cities, towns, mountain ranges, rivers, etc;) shall be in exact agreement with the form prescribed by the most authoritative national source. However, in those cases where the national names differ substantially from the normal English usage, the English version shall be shown alongside in parenthesis.

C. The nomenclature for undersea features shall be shown in the English language.

ANNEX V

ASSEMBLY DIAGRAM OF THE INTERNATIONAL BATHYMETRIC CHART OF THE WESTERN INDIAN OCEAN (IBCWIO)

(Revised)



ANNEX VI

UNDERSEA FEATURE NAMES

List of names in the IHB GEBCO Gazetteer Database, covering the IBCWIO area

Limits of search area : 36°S to 13°N / 28°E to 69°E

Name	ADELAIDE
Feature	Bank
Position 1	S 6°35'00" E 56°47'00"
Referenced	INT 70, 71, 73, 702, 703
Remarks	Noted on INT Charts as "(ED-1879)", i.e., existence doubtful.

Name	ALIX
Feature	Seamount
Position 1	S 17°30'00" E 61°20'00"
Referenced	GEBCO 5.09, INT 70, 71, 72, 702

Name	ALMIRANTE LEITE
Feature	Bank
Position 1	S 26°10'00" E 35°03'00"
Referenced	INT 70, 72, 701
Remarks	Shown as Knolls in ACUF Gazetteer.

Name	AMIRANTE
Feature	Bank
Position 1	S 5°45'00" E 53°15'00"
Referenced	GEBCO 5.09

Name	AMIRANTE
Feature	Basin
Positioln 1	S 7°00'00" E 54°30'00"
Referenced	INT 702, 703

Name	AMIRANTE
Feature	Trench
Position 1	S 8°00'00" E 52°40'00"
Discoverer	H.M.S. Owen (UK)
Referenced	GEBCO 5.09, INT 701, 702

Name	ANDREW
Feature	Tablemount
Position 1	N 6°45'00" E 50°30'00"
Referenced	INT 71, 72, 703

Name	ANTON BRUUN
Feature	Ridge
Position 1	S 9°00'00" E 52°30'00"
Referenced	GEBCO 5.09

Name	ARABIAN
Feature	Basin
Position 1	N 12°00'00" E 65°00'00"
Referenced	GEBCO 5.05, INT 71, 72, 73, 703, 705

Name	ARGO
Feature	Fracture Zone
Position 1	S 16°00'00" E 63°00'00"
Position 2	S 11°00'00" E 69°00'00"
Referenced	GEBCO 5.09

Name	ASQUITH
Feature	Bank
Position 1	S 8°45'00" E 47°10'00"
Referenced	GEBCO 5.09, INT 701, 702
Accredited	SCGN/6-04/1985
Remarks	Replaced WILKES Rise at GEBCO-SCGN/6.

Name	ATLANTIS II
Feature	Fracture Zone
Position 1	S 29°30'00" E 57°30'00"
Position 2	S 37°00'00" E 57°15'00"
Referenced	GEBCO 5.09

Name	BARDIN
Feature	Seamount
Position 1	S 13°55'00" E 53°40'00"
Referenced	GEBCO 5.09, INT 70, 71, 72, 702

Name	BULLDOG
Feature	Bank
Position 1	S 10°02'00" E 50°45'00"
Referenced	GEBCO 5.09

Name	CARGADOS CARAJOS
Feature	Bank
Position 1	S 16°30'00" E 59°30'00"
Referenced	GEBCO 5.09

Name	CARLSBERG
Feature	Ridge
Position 1	N 10°00'00" E 58°00'00"
Position 2	N 0°00'00" E 67°00'00"
Referenced	GEBCO 5.05, INT 71, 72, 73, 703

Name	CENTRAL INDIAN
Feature	Ridge
Position 1	S 5°00'00" E 68°00'00"
Position 2	S 25°00'00" E 70°00'00"
Referenced	GEBCO 5.09, INT 70, 71, 72, 73
Remarks	Shown as "MID-INDIAN Ridge" in the ACUF Gazetteer.

Name CHAIN
Feature Ridge
Position 1 N 5°00'00" E 53°30'00"
Referenced GEBCO 5.05, INT 71, 72, 703

Name COMORO
Feature Basin
Position 1 S 14°00'00" E 44°00'00"
Referenced INT 701, 702

Name CORREIRA
Feature Bank
Position 1 S 6°30'00" E 57°10'00"
Referenced INT 702, 703
Remarks Shown as "Guyot" in the ACUF Gazetteer.

Name DAVID
Feature Seaknoll
Position 1 N 6°24'00" E 50°15'00"
Referenced INT 703
Remarks Shown as "Knoll" in the ACUF Gazetteer.

Name DAVIE
Feature Ridge
Position 1 S 18°00'00" E 41°45'00"
Referenced GEBCO 5.09

Name D'ESTAING
Feature Bank
Position 1 S 18°10'00" E 43°17'00"
Referenced INT 701

Name DUPONT
Feature Shoal
Position 1 S 4°15'00" E 54°25'00"
Referenced INT 702, 703

Name EGERIA
Feature Fracture Zone
Position 1 S 21°00'00" E 65°00'00"
Position 2 S 19°00'00" E 68°00'00"
Referenced GEBCO 5.09

Name FARQUHAR
Feature Ridge
Position 1 S 11°10'00" E 50°00'00"
Position 2 S 8°45'00" E 51°45'00"
Referenced INT , 701, 702

Name FORTUNE
Feature Bank
Position 1 S 7°15'00" E 57°00'00"
Referenced GEBCO 5.09, INT 70, 71, 72, 702, 703

Name	FRED
Feature	Seamount
Position 1	S 6°15'00" E 54°25'00"
Referenced	GEBCO 5.09, INT 702, 703

Name	GALLIENI
Feature	Fracture Zone
Position 1	S 41°30'00" E 51°30'00"
Position 2	S 32°00'00" E 52°45'00"
Referenced	GEBCO 5.09, INT 70, 72
Remarks	Shown as Tablemount in ACUF Gazetteer.

Name	GEROEVKA
Feature	Bank
Position 1	S 35°55'00" E 53°14'00"
Proposer	Dr. Galina V. Agapova
Discoverer	F/V Geroevka
Referenced	GEBCO 5.09
Accredited	SCGN/7-04/1987

Name	GIRAUD
Feature	Seamount
Position 1	S 9°55'00" E 46°55'00"
Referenced	GEBCO 5.09

Name	HALL
Feature	Bank
Position 1	S 21°52'00" E 39°00'00"
Referenced	INT 701
Remarks	Shown as Tablemount in ACUF Gazetteer.

Name	HYDRA
Feature	Seamount
Position 1	S 11°00'00" E 50°35'00"
Referenced	GEBCO 5.09, INT 70, 71, 72, 702

Name	INDOMED
Feature	Fracture Zone
Position 1	S 42°30'00" E 45°30'00"
Position 2	S 35°00'00" E 48°00'00"
Referenced	GEBCO 5.09, INT 70, 72

Name	JAGUAR
Feature	Seamount
Position 1	S 21°55'00" E 39°27'00"
Referenced	INT 70, 71, 72, 701

Name	KURCHATOV
Feature	Seamount
Position 1	S 5°25'00" E 68°27'00"
Referenced	INT 70, 702, 703, 71, 72, 73

Name LA JUNON
Feature Bank
Position 1 S 5°15'00" E 57°00'00"
Referenced INT 702, 703

Name LA PERLE
Feature Reef
Position 1 S 6°00'00" E 55°20'00"
Referenced INT 702, 703

Name LAPEROUSE
Feature Seamount
Position 1 S 19°40'00" E 54°10'00"
Referenced GEBCO 5.09, INT 71, 72

Name LE CONSTANT
Feature Bank
Position 1 S 6°20'00" E 56°20'00"
Referenced INT 702, 703

Name LEVEN
Feature Bank
Position 1 S 12°30'00" E 47°45'00"
Referenced GEBCO 5.09

Name MABAHISS
Feature Fracture Zone
Position 1 S 3°00'00" E 67°30'00"
Referenced GEBCO 5.09

Name MADAGASCAR
Feature Basin
Position 1 S 27°00'00" E 54°30'00"
Referenced GEBCO 5.09, INT 70, 72, 700, 701

Name MADAGASCAR
Feature Ridge
Position 1 S 27°00'00" E 46°00'00"
Position 2 S 34°00'00" E 45°00'00"
Referenced GEBCO 5.09, INT 70, 72, 700
Remarks Shown as Plateau in ACUF Gazetteer.

Name MADINGLEY
Feature Rise
Position 1 S 4°30'00" E 61°00'00"
Referenced GEBCO 5.09, INT 70, 72, 702

Name MARIE CELESTE
Feature Fracture Zone
Position 1 S 18°45'00" E 63°00'00"
Position 2 S 15°00'00" E 69°30'00"
Referenced GEBCO 5.09

Name	MASCARENE
Feature	Basin
Position 1	S 13°00'00" E 57°00'00"
Referenced	GEBCO 5.09, INT 70, 71, 72, 701, 702
Remarks	Shown at position 15°S - 56°E in ACUF Gazetteer.

Name	MASCARENE
Feature	Plain
Position 1	S 19°00'00" E 53°00'00"
Referenced	GEBCO 5.09

Name	MASCARENE
Feature	Plateau
Position 1	S 6°00'00" E 58°00'00"
Position 2	S 17°00'00" E 59°30'00"
Referenced	GEBCO 5.09, INT 71, 72, 702

Name	MAURICE HILL
Feature	Ridge
Position 1	S 3°30'00" E 53°10'00"
Referenced	GEBCO 5.09
Remarks	Formerly M.N. HILL Ridge

Name	MAURITIUS
Feature	Trench
Position 1	S 24°00'00" E 54°50'00"
Referenced	GEBCO 5.09

Name	McLEOD
Feature	Bank
Position 1	S 9°54'00" E 50°20'00"
Referenced	INT 701, 702

Name	MOUNT ERROR
Feature	Guyot
Position 1	N 10°17'00" E 56°01'00"
Referenced	GEBCO 5.05, INT 71, 72, 703
Accredited	SCGN/6-04/1985
Remarks	Shown as ERROR Tablemount in ACUF Gazetteer.

Name	MOZAMBIQUE
Feature	Basin
Position 1	S 29°00'00" E 40°00'00"
Referenced	GEBCO 5.09, INT 70, 72, 700
Remarks	Shown as NATAL Basin in ACUF Gazetteer.

Name	MOZAMBIQUE
Feature	Plateau
Position 1	S 27°00'00" E 36°00'00"
Position 2	S 34°30'00" E 34°00'00"
Referenced	GEBCO 5.09, INT 70, 72, 700

Name	MOZAMBIQUE
Feature	Scarp
Position 1	S 29°00'00" E 37°00'00"
Position 2	S 40°00'00" E 33°45'00"
Referenced	GEBCO 5.09
Remarks	Shown as Escarpment in ACUF Gazetteer.

Name	NATAL
Feature	Valley
Position 1	S 32°00'00" E 32°30'00"
Referenced	GEBCO 5.09, INT 700

Name	NAZARETH
Feature	Bank
Position 1	S 14°30'00" E 60°45'00"
Referenced	GEBCO 5.09, INT 702

Name	OWEN
Feature	Fracture Zone
Position 1	N 5°00'00" E 53°30'00"
Position 2	N 23°00'00" E 62°45'00"
Referenced	GEBCO 5.05, INT 71, 72, 703, 705

Name	PAISLEY
Feature	Seamount
Position 1	S 14°05'00" E 41°30'00"
Referenced	GEBCO 5.09, INT 70, 71, 72, 701
Accredited	SCGN/7-04/1987

Name	POYDENOT
Feature	Shoal
Position 1	S 9°50'00" E 62°00'00"
Referenced	INT 702

Name	PROVIDENCE
Feature	Reef
Position 1	S 9°30'00" E 51°15'00"
Referenced	GEBCO 5.09

Name	REUNION
Feature	Trench
Position 1	S 24°00'00" E 53°00'00"
Referenced	GEBCO 5.09

Name	RODR IGUES
Feature	Ridge
Position 1	S 19°30'00" E 61°50'00"
Referenced	GEBCO 5.09, INT 70, 71, 72, 702
Accredited	SCGN/6-04/1985
Remarks	Shown as RODRIGUES in ACUF Gazetteer.

Name ST. LAZARUS
Feature Bank
Position 1 S 12°15'00" E 41°30'00"
Referenced GEBCO 5.09, INT 70, 71, 72, 701

Name SAYA DE MALHA
Feature Bank
Position 1 S 8°20'00" E 60°10'00"
Position 2 S 11°15'00" E 61°50'00"
Referenced GEBCO 5.09, INT 702

Name SEAGULL
Feature Shoal
Position 1 S 4°45'00" E 54°10'00"
Referenced INT 702, 703

Name SEALARK
Feature Fracture Zone
Position 1 S 7°30'00" E 65°30'00"
Position 2 S 2°30'00" E 69°30'00"
Referenced GEBCO 5.09

Name SEYCHELLES
Feature Bank
Position 1 S 5°00'00" E 56°00'00"
Referenced GEBCO 5.09, INT 70, 71, 72, 702, 703

Name SOMALI
Feature Basin
Position 1 N 0°00'00" E 51°00'00"
Referenced GEBCO 5.05, 5.09, INT 71, 72, 701, 702, 703

Name SOMALI
Feature Plain
Position 1 N 5°00'00" E 52°30'00"
Referenced INT 703

Name SOMERVILLE
Feature Bank
Position 1 S 12°40'00" E 60°50'00"
Referenced GEBCO 5.09

Name SOUDAN
Feature Bank
Position 1 S 18°35'00" E 58°45'00"
Referenced INT 70, 71, 72, 702

Name SOUTHWEST INDIAN
Feature Ridge
Position 1 S 27°00'00" E 66°30'00"
Position 3 S 54°45'00" E 0°00'00"
Referenced GEBCO 5.09, 5.13, 5.16, INT 21, 70, 72, 700

Name	SWAN
Feature	Shoal
Position 1	S 4°00'00" E 54°30'00"
Referenced	INT 702, 703

Name	TADJURA
Feature	Trough
Position 1	N 12°00'00" E 44°30'00"
Referenced	INT 705

Name	TOPAZE
Feature	Bank
Position 1	S 4°35'00" E 56°25'00"
Referenced	INT 702, 703

Name	TRANSKEI
Feature	Basin
Position 1	S 35°00'00" E 30°00'00"
Referenced	GEBCO 5.09, INT 70, 72, 700

Name	VEMA
Feature	Trench
Position 1	S 9°00'00" E 67°25'00"
Discoverer	R/V Vema, L-DGO
Referenced	GEBCO 5.09, INT 70, 71, 72, 73, 702

Name	VINES
Feature	Bank
Position 1	S 18°50'00" E 42°58'00"
Referenced	INT 701

Name	VITIAZ
Feature	Fracture Zone
Position 1	S 5°30'00" E 68°30'00"
Referenced	GEBCO 5.09

Name	WALTERS
Feature	Shoals
Position 1	S 33°12'00" E 43°50'00"
Referenced	GEBCO 5.09, INT 70, 72, 700
Remarks	Shown as Shoal on GEBCO and in ACUF Gazetteer.

Name	WILSHAW
Feature	Ridge
Position 1	S 16°30'00" E 57°15'00"
Position 2	S 21°00'00" E 53°45'00"
Referenced	GEBCO 5.09

Name	WORMLEY
Feature	Seamount
Position 1	S 13°45'00" E 57°55'00"
Referenced	GEBCO 5.09, INT 71, 72

Name	ZAMBEZI	
Feature	Canyon	
Position 1	S 20°00'00"	E 41°30'00"
Referenced	GEBCO 5.09	

Name	ZELEE	
Feature	Bank	
Position 1	S 12°30'00"	E 46°10'00"
Referenced	INT 701, 702	

Name	ZOROASTER	
Feature	Shoal	
Position 1	S 5°00'00"	E 56°40'00"
Referenced	INT 702, 703	

Name	BUNCE	
Feature	Seamounts	
Position 1	N 7°00'00"	E 55°30'00"
Position 2	N 8°00'00"	E 56°00'00"
Proposer	Dr. R.L.Fisher, SIO, USA	
Referenced	GEBCO 5.05	
Accredited	SCGN/8-05/1989	

Name	CERF	
Feature	Ridge	
Position 1	S 2°35'00"	E 57°55'00"
Position 2	S 4°50'00"	E 58°40'00"
Proposer	Dr. R.L.Fisher, SIO, USA	
Referenced	GEBCO 5.09	
Accredited	SCGN/8-05/1989	

Name	GASKELL	
Feature	Ridge	
Position 1	S 2°30'00"	E 59°42'00"
Position 2	S 4°30'00"	E 59°20'00"
Proposer	Dr. R.L.Fisher, SIO, USA	Date 05/1991
Discoverer	R/V Galathea	
Referenced	GEBCO 5.09	
Accredited	SCGN/8-05/1989	

Name	OMMANNEY	
Feature	Seamount	
Position 1	S 7°22'30"	E 46°19'00"
Proposer	Dr. R.L. Fisher, SIO, USA	
Referenced	GEBCO 5.09	
Accredited	SCGN/8-05/1989	

Name	RURIK	
Feature	Seamount	
Position 1	N 9°15'00"	E 53°28'00"
Proposer	Dr. R.L.Fisher, SIO, USA	
Discoverer	R/V Rurik	
Referenced	GEBCO 5.05	
Accredited	SCGN/8-05/1989	

Name	SADKO
Feature	Seamount
Position 1	N 12°20'00" E 61°15'00"
Referenced	GEBCO 5.05
Remarks	Formerly MGU Seamount.

Name	SARANDIE
Feature	Seamount
Position 1	N 8°17'00" E 54°43'00"
Proposer	Dr. R.L.Fisher, SIO, USA
Referenced	GEBCO 5.05
Accredited	SCGN/8-05/1989

Name	TCHERNIA
Feature	Seamount
Position 1	S 10°31'30" E 47°07'30"
Proposer	Dr. R.L.Fisher, SIO, USA
Referenced	GEBCO 5.09
Accredited	SCGN/8-05/1989

Name	MELVILLE
Feature	Fracture Zone
Position 1	S 26°00'00" E 61°20'00"
Position 2	S 34°00'00" E 60°00'00"
Referenced	GEBCO 5.09

Name	MORPHEY
Feature	Guyot
Position 1	S 4°27'00" E 58°30'00"
Proposer	Dr. R.L.Fisher, SIO, USA
Referenced	GEBCO 5.09
Accredited	SCGN/8-05/1989

Name	CAMOENS
Feature	Seamount
Position 1	N 8°18'30" E 53°11'00"
Proposer	Dr. R.L.Fisher, SIO, USA
Referenced	GEBCO 5.05
Accredited	SCGN/8-05/1989

Name	BULPIN
Feature	Seamount
Position 1	S 19°45'30" E 55°16'30"
Proposer	Dr. R.L. Fisher, SIO, USA
Referenced	GEBCO 5.09
Accredited	SCGN/9-06/1991

Name	HASLAM
Feature	Seamount
Position 1	S 5°55'36" E 47°42'54"
Proposer	Dr. R.L. Fisher, SIO, USA
Discoverer	HMS Owen
Referenced	GEBCO 5.09
Accredited	SCGN/9-06/1991
Remarks	Summit depth 2903m, Relief 1700m.

Name	BAISSAC
Feature	Bank
Position 1	S 17°15'00" E 58°41'30"
Proposer	Dr. R.L. Fisher, SIO, USA
Discoverer	HMS Owen
Referenced	GEBCO 5.09
Accredited	SCGN/9-06/1991

Name	COCO-DE-MER
Feature	Ridge
Position 1	N 1°40'00" E 57°00'00"
Position 2	S 0°40'00" E 54°50'00"
Proposer	Dr. R.L. Fisher, SIO, USA
Discoverer	IIOE
Referenced	GEBCO 5.05, 5.09, INT 71, 72, 703
Accredited	SCGN/9-06/1991
Remarks	Previously named "COCO-DE-MER Seamounts".

Name	LE VASSEUR
Feature	Seamount
Position 1	S 7°56'54" E 55°41'48"
Proposer	Dr. R.L. Fisher, SIO, USA
Discoverer	R/V Horizon (SIO)
Referenced	GEBCO 5.09
Accredited	SCGN/9-06/1991

Name	MAUGHAM
Feature	Seamount
Position 1	S 0°57'12" E 55°45'12"
Proposer	Dr. R.L. Fisher, SIO, USA
Discoverer	HMS Vidal
Referenced	GEBCO 5.09
Accredited	SCGN/9-06/1991

Name	REVELLE
Feature	Rise
Position 1	S 6°45'00" E 49°30'00"
Proposer	Dr. R.L. Fisher, SIO, USA
Discoverer	HMS Owen (IIOE)
Referenced	GEBCO 5.09
Accredited	SCGN/9-06/1991

Name	ST. MAUR
Feature	Seamount
Position 1	S 14°38'00" E 54°23'00"
Proposer	Dr. R.L. Fisher, SIO, USA
Discoverer	R/V Marion Dufresne
Referenced	GEBCO 5.09
Accredited	SCGN/9-06/1991

Name	SURCOUF
Feature	Seamount
Position 1	S 9°17'00" E 53°04'30"
Proposer	Dr. R.L. Fischer, SIO, USA
Discoverer	Various (IIOE)
Referenced	GEBCO 5.09
Accredited	SCGN/9-06/1991

Name	NOVARA
Feature	Fracture Zone
Position 1	S 28°00'00" E 58°50'00"
Position 2	S 36°00'00" E 57°54'00"
Proposer	Dr. R.L.Fisher, SIO, USA Date 10/1992
Discoverer	Various
Referenced	GEBCO 5.09
Accredited	SCGN/10-05/1993

Name	GAUSS
Feature	Fracture Zone
Position 1	S 32°00'00" E 54°00'00"
Position 2	S 40°00'00" E 52°15'00"
Proposer	Dr. R.L.Fisher, SIO, USA Date 10/1992
Discoverer	Various
Referenced	GEBCO 5.09
Accredited	SCGN/10-05/1993

Name	CIRCE
Feature	Peak
Position 1	S 18°03'12" E 65°33'54"
Proposer	Dr. R.L. Fisher, SIO, USA Date 02/1993
Discoverer	R/V Argo Date 08/1968
Referenced	GEBCO 5.09
Accredited	SCGN/10-05/1993

Name	BAO CHUAN
Feature	Fracture Zone
Position 1	N 1°30'00" E 64°15'00"
Position 2	N 3°00'00" E 65°10'00"
Position 3	N 5°30'00" E 67°15'00"
Proposer	Dr. R.L.Fisher, SIO, USA Date 04/1993
Discoverer	R/V Willebrod Snellius
Referenced	GEBCO 5.05
Accredited	SCGN/10-05/1993, SCUF/11-05/1995
Remarks	Formerly SNELLIUS Fracture Zone, renamed BAO CHUAN.

Name	SEYMOUR SEWELL	
Feature	Seamount	
Position 1	S 2°57'48" E 65°43'24"	
Proposer	Dr. R.L. Fisher, SIO, USA	Date 04/1993
Discoverer	R/V Robert Conrad	
Referenced	GEBCO 5.09	
Accredited	SCGN/10-05/1995	

Name	FLINDERS	
Feature	Fracture Zone	
Position 1	S 21°53'00" E 64°45'00"	
Position 2	S 19°00'00" E 69°20'00"	
Proposer	Dr. R.L.Fisher, SIO, USA	Date 04/1993
Discoverer	R/V Argo	
Referenced	GEBCO 5.09	
Accredited	SCGN/10-05/1993	

Name	IZEVSKIJ	
Feature	Seamount	
Position 1	S 35°11'00" E 54°19'00"	
Proposer	Dr. G.Agapova, Moscow, Russ.	Date 04/1993
Discoverer	R/V "Geroevka"	Date 08/1980
Referenced	GEBCO 5.09	
Accredited	SCGN/10-05/1993	

Name	TUGELA	
Feature	Canyon	
Position 1	S 29°30'00" E 32°00'00"	
Position 2	S 30°30'00" E 32°50'00"	
Referenced	GEBCO 5.09	

Name	ZHENG HE	
Feature	Seamount	
Position 1	N 11°44'18" E 55°08'18"	
Proposer	Dr. R.L.Fisher, SIO, USA	Date 05/1995
Discoverer	HMS Scylla	
Referenced	GEBCO 5.05	
Accredited	SCUF/11-05/1995	

Name	SERANDIB	
Feature	Seamount	
Position 1	N 8°17'00" E 54°43'05"	
Proposer	Dr. R.L.Fisher, SIO, USA	
Referenced	GEBCO 5.05	

Name	GAZELLE	
Feature	Fracture Zone	
Position 1	S 39°00'00" E 52°45'00"	
Position 2	S 35°30'00" E 53°30'00"	
Position 3	S 32°00'00" E 53°50'00"	
Proposer	Pr.J.R. Vanney, Paris U, FRANCE	Date 01/1996
Discoverer	L'Atalante	Date 10/1995
Referenced	GEBCO 5.09	
Accredited	ACUF/267-06/1996, SCUF/12-06/1997	

Name	LA FEUILLEE	
Feature	Bank	
Position 1	S 15°56'00" E 54°31'00"	
Proposer	Ing. en C. Le Gouic, SHOM	Date 04/1996
Discoverer	R/V D'Entrecasteaux	Date 04/1995
Referenced	IBCWIO 1.11	
Accredited	SCUF/12-06/1997	
Remarks	Detection by Raytheon deep sea echosounder and fixing by GPS.	

Name	LA BOURDONNAIS
Feature	Ridge
Position 1	S 21°00'00" E 57°27'00"
Position 2	S 21°35'00" E 57°00'00"
Position 3	S 22°30'00" E 56°18'00"
Proposer	Dr. R.L.Fisher, SIO, USA
Referenced	GEBCO 5.09
Accredited	SCUF/12-06/1997
Remarks	Shoal depth: 2260 m.

Name	ST GERAN
Feature	Ridge
Position 1	S 18°07'00" E 59°22'00"
Position 2	S 18°45'00" E 59°15'00"
Position 3	S 19°20'00" E 58°48'00"
Proposer	Dr. R.L.Fisher, SIO, USA
Referenced	GEBCO 5.09
Accredited	SCUF/12-06/1997
Remarks	Shoal depth: 820 m.

Name	TRAVIN	
Feature	Bank	
Position 1	N 0°26'00" E 56°00'00"	
Proposer	Dr. G. Udintsev, RAS, RU	Date 05/1997
Discoverer	RTMS Geroevka	Date 03/1980
Referenced	GEBCO 5.05	
Accredited	SCUF/12-06/1997	
Remarks	Least depth: 187 m.	

ANNEX VII

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ANNEX VIII

LIST OF ACRONYMS

BODC	British Oceanographic Data Centre
BSH	Bündesamt für Seeschiffahrt und Hydrographie (Germany)
CGOM	Consultative Group on Ocean Mapping (IOC)
DCDB	Data Centre for Digital Bathymetry (NGDC, USA)
EB	Editorial Board
GDA97	GEBCO Digital Atlas (97)
GEBCO	General Bathymetric Chart of the Oceans
GMT	Greenwich Meridian Time
HDNO	Head Department of Navigation and Oceanography (Russian Federation)
IBCCA	International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico
IBCEA	International Bathymetric Chart of the Central Eastern Atlantic
IBCM	International Bathymetric Chart of the Mediterranean
IBCWIO	International Bathymetric Chart of the Western Indian Ocean
IHB	International Hydrographic Bureau (Monaco)
IHO	International Hydrographic Organization (Monaco)
IMA	Institute of Applied Mathematics (Italy)
IMO	International Maritime Organization
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IOCINCWIO	IOC Regional Committee for the Co-operative Investigation in the North and Central Western Indian Ocean
IOS	Institute of Oceanographic Sciences (UK)
NGDC	National Geophysical Data Center (USA)
NOAA	National Oceanic and Atmospheric Administration (USA)
OPS	Ocean Plotting Sheet
RCSS/MRS	Regional Centre for Services in Surveying, Mapping and Remote Sensing (Kenya)
SAREC	Swedish Agency for Research Co-operation with Developing Countries
SIO	Scripps Institution of Oceanography (USA)
SOC	Southampton Oceanography Centre (UK)
TEMA	Training, Education and Mutual Assistance in the Marine Sciences (IOC Committee for)
WVS	World Vectore Shoreline