

Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies



**IOC Editorial Board for the
International Bathymetric Chart
of the Mediterranean and its
Geological/Geophysical Series**

Eighth Session

World Ocean Museum, on board RV *Vityaz*
Kaliningrad, Russian Federation
1-4 September 1999

Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

**IOC Editorial Board for the
International Bathymetric Chart
of the Mediterranean and its
Geological/Geophysical Series**

Eighth Session

World Ocean Museum, on board RV *Vityaz*
Kaliningrad, Russian Federation
1-4 September 1999

UNESCO

IOC/EB-IBCM-VIII/3
Paris, 10 March 2000
English only

TABLE OF CONTENTS

	Page
1. OPENING	1
2. ADMINISTRATIVE ARRANGEMENTS FOR THE SESSION	1
2.1 ADOPTION OF THE PROVISIONAL AGENDA	1
2.2 DESIGNATION OF THE RAPPORTEUR	1
2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION	1
2.4 ELECTION OF THE VICE-CHAIRMAN	1
3. EXPLANATORY BROCHURES-LEAFLETS FOR THE IBCM GEOLOGICAL/GEOPHYSICAL SERIES	2
3.1 ELECTRONIC PUBLISHING VIA THE INTERNET	2
3.2 BATHYMETRY	2
3.3 IBCM-G (GRAVITY)	2
3.4 IBCM-PQ (PLIO-QUATERNARY SEDIMENT THICKNESS)	2
3.5 IBCM-S (SEISMICITY) - PREPARATION OF THE SEISMICITY CATALOGUE	2
3.6 IBCM-SED (RECENT SEDIMENTS)	3
3.7 IBCM-M (MAGNETIC ANOMALIES)	3
3.8 GENERAL DISTRIBUTION OF THE BROCHURES	3
4. COMPLETION OF THE GEOLOGICAL-GEOPHYSICAL SERIES	3
4.1 IBCM-M (MAGNETIC ANOMALIES) – 1:1M	3
4.2 IBCM-M (MAGNETIC ANOMALIES) – 1:5M	3
4.3 DIGITIZATION OF THE GEOLOGICAL-GEOPHYSICAL SERIES	4
5. SECOND EDITION OF IBCM	4
6. COPYRIGHT, ADVERTIZING AND SALE OF IBCM PRODUCT	6
6.1 ADVERTIZING, SALE AND DISTRIBUTION OF IBCM	6
7. OTHER MATTERS	6
7.1 SEDIMENTOLOGICAL MAPS OF THE ATLANTIC OCEAN	6
7.2 GEOLOGICAL/GEOPHYSICAL MAPS OF THE BLACK AND AZOV SEAS	6
7.3 GEOLOGICAL/GEOPHYSICAL MAPS OF THE BALTIC SEA	7
7.4 LITHOFACIAL MAPS FOR THE MEDITERRANEAN AND BLACK SEAS	7
7.5 USE OF GEOGRAPHICAL NAMES ON IBCM PRODUCTS	7

	Page
8. DATE AND PLACE OF THE NEXT SESSION	8
9. ADOPTION OF THE DRAFT SUMMARY REPORT	8
10. CLOSURE	8

ANNEXES

- I. AGENDA
- II. LIST OF PARTICIPANTS
- III. MEDITERRANEAN AND BLACK SEAS HYDROGRAPHIC COMMISSION (MBSHC)
11TH CONFERENCE, SPLIT, CROATIA, 7-11 JUNE 1999 – EXCERPT FROM THE
SUMMARY REPORT
- IV. DISTRIBUTION OF IBCM PRODUCTS
- V. PROPOSAL FOR COMPILATION OF THE ATLAS OF THE GEOLOGICAL/
GEOPHYSICAL CHARTS OF THE BLACK AND AZOV SEAS REGION
- VI. PROPOSAL FOR THE CONSTRUCTION OF THE INTERNATIONAL MAP OF
NEOCENE/QUATERNARY TECTONICS OF THE MEDITERRANEAN
- VII. LIST OF ACTIONS
- VIII. LIST OF ACRONYMS

1. OPENING

The Chairman, Prof. Carlo Morelli, opened the 8th Session of the Editorial Board for the International Bathymetric Chart of the Mediterranean (EB-IBCM-VIII) at 09:00 on Wednesday, 1 September 1999. The Session was held at the World Ocean Museum, on board of the renown research vessel “VITYAZ”, Kaliningrad, Russian Federation.

Also in attendance were Prof. Emelyan M. Emelyanov (ABIORAS), Ing. en chef Michel Huet representing the International Hydrographic Bureau (IHB), Capt. 1st rank Andrei V. Popov (Chief Editor, HDNO), Ing. général Patrick Souquière (SHOM), Mr. Giannis Papaioannou (HNHS), Dr. Troy Holcombe (NGDC), Dr. Dmitri Travin (IOC), Prof. Pavel N. Kuprin (MSU) and Dr. Kazimeras M. Shimkus (SBIORAS). A list of participants, together with the full name of their institutions, appears in Annex II. A list of acronyms is also provided in Annex VII.

The Chairman welcomed the participants, giving a brief history of IBCM. He noted that the session would be fruitful in that the IBCM-M (Magnetic Anomalies) sheets colour proofs were printed and available for reviewing. He also informed the participants that Prof. John K. Hall, Geological Survey of Israel and IBCM-EB Vice-Chairman, could not attend the session because of a health problem. It was suggested that participants send a fax to Prof. Hall to thank him for his very important contribution and wish him all the best. This proposal was accepted with enthusiasm.

2. ADMINISTRATIVE ARRANGEMENTS FOR THE SESSION

2.1 ADOPTION OF THE PROVISIONAL AGENDA

As there were no issues for discussion on the item 6.1 “Copyright and Wording of Credit Line”, it was agreed to delete this item from the agenda.

The following additions to the agenda were accepted under item 7 “Other Matters”:

- From P. Kuprin: “Geological and Geophysical Atlas of the Black and Azov Seas Regions”
- From E. Emelyanov: “Geological and Geophysical Maps of the Baltic Sea”

The agenda was then approved as in Annex I.

2.2 DESIGNATION OF THE RAPPORTEUR

E. Emelyanov proposed Dr. V. Kravtsov (Atlantic Branch, Institute of Oceanology, Russia), as rapporteur for the meeting. This was unanimously agreed.

2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

E. Emelyanov provided to the participants the timetable of the meeting, together with all appropriate documentation.

2.4 ELECTION OF THE VICE-CHAIRMAN

Noting that Hydrographic Offices play a key role in the provision of bathymetric data for IBCM, M. Huet conveyed the strong support of the International Hydrographic Bureau to the nomination of Ing. général Patrick Souquière, SHOM, for IBCM vice-chairmanship. The IHB believes that this will contribute to strengthening the relationships between IHO and IOC, and facilitating the participation of the Volunteering Hydrographic Offices (VHOs) in the IBCM project.

Five members of the Editorial Board (EB), representing a quorum of the nine members of the IBCM-EB, met to elect the Vice-Chairman. D. Travin informed the EB that all requests from the

7th Session of the IBCM-EB, related to this nomination, were satisfied. In addition, the nomination of P. Souquière for IBCM vice-chairmanship was approved by CGOM and the IOC Assembly. After a short discussion, he was unanimously elected as Vice-Chairman of the IBCM-EB.

3. EXPLANATORY BROCHURES-LEAFLETS FOR THE IBCM GEOLOGICAL/ GEOPHYSICAL SERIES

3.1 ELECTRONIC PUBLISHING VIA THE INTERNET

T. Holcombe reported that the National Geophysical Data Centre (NGDC) has prepared a provisional web site for the IBCM project. Copies of a CD-ROM containing the draft web pages were presented to the Chairman for review and comment. Also it was recommended that these web pages be demonstrated on a PC computer for the EB.

He further reported that the bathymetry, seismicity, bouguer gravity, and sediment thickness maps were raster scanned in color by NGDC. The resulting picture files are included on the CD-ROM containing the web pages. Version of this image can be made available on-line for downloading via the Internet.

It was recommended that the Chairman interact with NGDC with the objective of improving and completing the draft web pages. Once these web pages are finally approved, the IBCM web site will be made accessible to the public by formally linking the web site to NGDC, IOC, IHO and GEBCO web pages.

3.2 BATHYMETRY

The Chairman reported that the bathymetric brochure was published first in 1988, and was reprinted with updated information in 1997 (3,500 copies for IOC) by J. Hall.

3.3 IBCM-G (GRAVITY)

The Chairman reported that the Osservatorio Geofisico Sperimentale (OGS) in Trieste has resumed publication of the *Bollettino di Geofisica Teorica e Applicata*, with a new International Editorial Board and Referees and with E. Klingele of Zurich as editor-in-chief. This journal offered to publish the IBCM-G, IBCM-M, IBCM-PQ, and IBCM-S brochures in a professional and timely manner. The peer-reviewed articles have the colour centerfolds of each series at 1:10M scale prepared by J. Hall and an appropriate number of reprints were printed carrying the IOC logo.

3.4 IBCM-PQ (PLIO-QUATERNARY SEDIMENT THICKNESS)

This IBCM-PQ brochure was published in the *Bollettino di Geofisica Teorica e Applicata* (see 3.3)

3.5 IBCM-S (SEISMICITY) - PREPARATION OF THE SEISMICITY CATALOGUE

This IBCM-S brochure was published in the *Bollettino di Geofisica Teorica e Applicata* (see 3.3).

The catalogue of seismicity has been completed and will be presented on CD-ROM and made available via the Internet. This data are not only important for the complete information on over 30,000 earthquakes, which occurred in the Mediterranean area, but also for the methodological improvements.

3.6 IBCM-SED (RECENT SEDIMENTS)

The EB asked the Chief Editor and E. Emelyanov to prepare a list of all co-authors of the sediment map, and to send to all of them (through the HDNO) the sheets of the map, in which they are mentioned as co-authors.

The EB further recommended that authors publish a short review about the sediment map in the Russian Scientific journal: *Oceanology, Lithology and Mineral Resource* and other international journals.

K. Shimkus asked about the reasons why the brochure leaflet for IBCM-Sed was not published until now and how could the situation be improved. It was reported that the text of this brochure in English is in the hands of J. Hall. After further discussion D. Travin suggested publishing the leaflet for IBCM-Sed in the IOC technical series.

The Chairman suggested that the authors of this brochure (E. Emelyanov, K. Shimkus and P. Kuprin) prepare an updated version of the brochure, and provide it to D. Travin not later than November 1999, to be included in the IOC publication plan. Reprints of the updated brochure will be also distributed with the scale 1:5M IBCM-Sed map, kindly reproduced by J. Hall from the original map at scale 1:1M.

In addition to E. Emelyanov's report, K. Shimkus emphasized that the IBCM-Sed map is the first large-scale map in the world compiled for a whole modern sedimentary basin.

This map was compiled using international legend and international classification, as well as special methods to harmonize the data obtained by different countries. These methods can be used to create new maps for other sedimentary basins of the World Ocean.

3.7 IBCM-M (MAGNETIC ANOMALIES)

This IBCM-M brochure was published in the *Bollettino di Geofisico Teorica e Applicata* (see 3.3).

3.8 GENERAL DISTRIBUTION OF THE BROCHURES

In agreement with the previous decision of the EB, all the above-mentioned leaflets are sent to Cdr. Desmond P.D. Scott (distributor of the IBCM map series in western countries) for distribution with the maps and for incorporation in the final IBCM volume.

4. COMPLETION OF THE GEOLOGICAL-GEOPHYSICAL SERIES

4.1 IBCM-M (MAGNETIC ANOMALIES) – 1:1M

The Chief Editor informed the EB that the HDNO has printed a color proof of sheets Nos 6 and 9 of the magnetic anomaly series at 1:1M scale.

The EB examined and accepted the above-mentioned color proofs. It was agreed to print 2,000 copies of each of the 10 sheets of the series.

4.2 IBCM-M (MAGNETIC ANOMALIES) – 1:5M

The Chairman passed on to the Chief Editor a diskette with information on the magnetic anomalies map at scale 1:5M, and a color copy, with a view to producing a color proof of this map during the year 2000.

4.3 DIGITIZATION OF THE GEOLOGICAL-GEOPHYSICAL SERIES

The Chairman reviewed the history in which the bathymetry was digitized both by Petroconsultants and the HDNO for distribution to the Board members and interested scientists. The Petroconsultants dataset was later modified and is now available as a separate dataset on the GEBCO Digital Atlas (GDA), a CD-ROM put out by the British Oceanographic Data Centre (BODC).

The preparation of the other geophysical maps was accomplished with digitization for gravity and magnetic anomalies and for the seismicity map. The *Catalogue of Seismicity* is available only on CD-ROM.

It was reported that the digitization of the geological maps (PQ and SED) is beyond the capabilities of the facilities available to the EB.

M. Huet noted that, as most of the IBCM series were available in digital form, albeit in different places, it may be appropriate to group all these data on a single CD-ROM which could be called "IBCM Digital Atlas" by reference to the GEBCO Digital Atlas. Topics concerned would include bathymetry, gravity anomalies, magnetic anomalies and seismicity. T. Holcombe volunteered to investigate the possibility to progress the matter, and this was accepted.

5. SECOND EDITION OF IBCM

P. Souquière summarized the activities in France in reference to digital bathymetry:

- First, SHOM, as a national Hydrographic Office, is creating a digital bathymetric database covering French waters, by digitizing depths on existing survey sheets (essentially post 1970) and compiling survey data in digital form. This database is constantly updated with new digital data resulting from digitizing or surveying; it therefore possible at any time to generate a digital terrain model (DTM) with specified grid size related to density of data existing in the database.
- Second, SHOM, as a VHO, has extended the coverage of its database, from French waters to French areas of responsibility (continental shelf of other countries excluded). All depths shown on "old" GEBCO plotting sheets in French areas of responsibility have been digitized, and "new" plotting sheets are now maintained in digital form. In a similar manner as for French waters, these databases permit at any time generation of digital terrain models with specified grid size related to density of existing data.
- Finally, with regard to multibeam bathymetry, SHOM has an agreement with IFREMER that permits, under some conditions, use of the bathymetric data collected in French waters by IFREMER, and updating of the French national digital bathymetric database.

He added that SHOM is prepared to participate in the second edition of IBCM by releasing a 0.5' grid size digital terrain model in its area of responsibility.

He also pointed out that every Hydrographic Office, and particularly VHOs, should feel responsible for developing digital bathymetric databases covering their waters and areas of responsibility. To conclude, he stressed the fact that the Chief Editor would have to manage a regional digital bathymetric database, and must have the capabilities to do so.

M. Huet reported on the participation of IHO Member States in the development of a 2nd edition of IBCM, which will be entirely digital. IBCM-II Terms of Reference and draft technical specification, as elaborated by J. Hall, were discussed at the last IBCM meeting. As agreed at that meeting, Capt. H. Yüce, Hydrographer of Turkey, subsequently circulated this document to all concerned HOs, asking for their opinion. Comments were provided by France, Greece and Turkey. These comments and the original proposal were then discussed at the CGOM meeting held at the IHB,

Monaco, in April 1999. It was felt that some of the proposed specifications may be difficult to meet. The CGOM Meeting therefore developed, as a substitute to the specifications, General Guidelines for IBCM-II. These Guidelines were favorably considered at the June 1999 Session of the IHO Mediterranean and Black Seas Hydrographic Commission (MBSHC), where the following decision was adopted (see Annex III):

“The Commission accepted the General Guidelines for the product, developed by CGOM they affirm their support for the compilation and trial use of this product the Commission invites the Volunteering Hydrographic Offices to provide releasable bathymetric data to the editor (HDNO Russian Federation), following the above-mentioned technical specifications.”

M. Huet added that the IHB had polled IHO Member States regarding the possibility for HOs to release bathymetric data on continental margins to GEBCO. It resulted that a majority of HOs are prepared to accept that a selection of their bathymetric data be made available to GEBCO (and by extension to the IBC projects).

G. Papaioannou informed the EB that the Hellenic Navy Hydrographic Service, in its capacity as a VHO, is developing its digital bathymetric database. All depth shown on the old GEBCO plotting sheets covering Greek waters have been digitized, evaluated and enriched by new digital data, and are being prepared for maintenance on a continuous basis.

M. Huet noted that IBCM-II participants would include the participating VHOs, to supply the bathymetric data, the Chief Editor (i.e. HDNO, Russia), to collect and manage the data, and scientists (e.g. J. Hall) who should be involved in the quality control of the end product. He added that, whereas it was desirable that VHOs supply validated data, ideally as gridded data sets, this may not be the case for the time being. We may have situations where a selection of digital contours be made available to the chief editor or even where data are made available in analogue form, e.g. plotting sheets or nautical charts.

Therefore, it was important to ascertain whether the chief editor would be in a position:

- to exploit the data provided by VHOs, whether as gridded data sets, digital contours, or in analogue form;
- to manage the resulting IBCM bathymetric database;
- to elaborate the IBCM-II product as a DTM conforming to the agreed guidelines.

He felt that J. Hall's scientific contribution should be sought throughout the process as described above.

He further noted SHOM's intention to release validated bathymetric data to IBCM-II, as 0.5' gridded data sets. In this regard, he pointed out that a 0.5' grid space for IBCM-II, rather than the proposed 0.1' as in the specifications/guidelines, may better reflect the bathymetric data available. He felt that the 0.1' grid space should be limited to some areas with a high density of available bathymetric data.

The EB noted with great satisfaction the very positive attitude of SHOM and other VHOs from countries in the Mediterranean area, in regard to IBCM. The wish was expressed that VHOs' digital bathymetric data would soon reach the Chief Editor, as envisaged, and that these data can be processed at the HDNO so as to have IBCM-II available by 2002.

The EB also accepted the General Guidelines developed by CGOM and already agreed to by the IHO MBSHC. It was further noted that the density of the bathymetric data provided by the VHOs may be compatible with a grid size closer to 0.5' than 0.1', and this was considered acceptable.

6. COPYRIGHT, ADVERTIZING AND SALE OF IBCM PRODUCT

6.1 ADVERTIZING, SALE AND DISTRIBUTION OF IBCM

6.1.1 K. Shimkus proposed that an international symposium be organized about bathymetry, geology and sedimentology of the Mediterranean and Black Seas, highlighting the published series of the IBCM maps (1:1M scale), and the recent results of detailed scientific studies and syntheses.

The Symposium is to be accompanied by publication of the following special issues:

- Scientific reports of the Symposium;
- Maps accompanying detailed studies.

Special publications on the IBCM maps as well as results of detailed studies should be included into the Symposium's agenda.

These publications should be provided by responsible authors and by other well-known specialists in the respective subject areas.

The Symposium could be organized within the framework of the next CIESM's Congress or as a separate geological-geophysical symposium.

The proposal was accepted by the EB, and it was agreed that a recommendation to the IOC would be made accordingly.

6.1.2 It was reported that the existing system for distributing IBCM products was not working satisfactorily, where HDNO in Russia supplies IBCM stocks to D. Scott in UK, who in turn distributes these maps to individuals or institutions on receipt of orders. With a view to making the distribution system more efficient, the Chief Editor proposed two alternative options (see Annex IV). The EB approved the second option, namely, that orders received by D. Scott be communicated to HDNO for implementation and invoicing.

6.1.3 Imaging of Bathymetry and Topography

T. Holcombe proposed further investigation of the possibility of using IBCM bathymetry in publication of images for the Mediterranean region, for broad distribution as an IBCM product. The EB encouraged this endeavor with thanks.

It was noted that, thanks to common effort of IOC and the EB, the number of requests for maps has increased five-fold in the last few years.

7. OTHER MATTERS

7.1 SEDIMENTOLOGICAL MAPS OF THE ATLANTIC OCEAN

E. Emelyanov informed the EB that exist printed and draft hand-made sedimentological maps of the Atlantic Ocean. T. Holcombe and E. Emelyanov think that there is great value to begin the digitizing of some of these maps.

The EB encouraged them to investigate the possibility of preparing a proposal concerning this work for the next IBCM-EB session.

7.2 GEOLOGICAL-GEOPHYSICAL ATLAS OF THE BLACK AND AZOV SEAS

P. Kuprin informed the EB that the Initiative Group of Geophysicists and Geologists of M. V. Lomonosov Moscow State University, P. P. Shirshov Institute for Oceanology (Russian Academy

of Sciences), the geophysical survey company “Yuzhmorgeo”, and other organizations, are asking IBCM-EB to make a positive recommendation for compilation and publication of a Geological-Geophysical Atlas of the Black and Azov Seas region, with financial support provided by IOC (See Annex V).

The proposal was carefully considered by the EB and D. Travin was invited to investigate the possibility of this financial support.

P. Kuprin also informed the EB on the initiative of Dr. A. Limonov of Moscow State University regarding the construction of an “International Map of Neogene – Quaternary Tectonics of the Mediterranean” (see Annex VI).

7.3 BALTIC SEA MAPPING

E. Emelyanov informed the EB that the scientists of the Baltic States are investigating the Baltic Sea very actively. He demonstrated some printed and draft hand-made and digitized bathymetric, geological and sedimentological maps. The international bathymetric and sediment maps in the scale 1:500,000 for the Central Baltic were printed in Sweden and Lithuania under the leadership of Prof. A. Grigelis (Lithuania). The legend of this sediment map is very simple but not unified for all the Baltic.

The EB advised that E. Emelyanov draft a proposal to IOC, with a view to establishing a new IBC project for the Baltic Sea, similar to the IBCM and its geological-geophysical series.

The EB further recommended that scientists from the states bordering the Baltic Sea discuss this issue and send their proposals to their national Commissions for UNESCO.

7.4 LITHOFACIAL MAPS FOR THE MEDITERRANEAN AND BLACK SEAS

As one of the fields of IBCM project development for the future, K. Shimkus suggested to compile some lithofacial maps for the Mediterranean and Black Seas, using data obtained by sediment coring and deep sea drilling, as well as data of seismofacial interpretation of seismoprofiles.

The maps can be constructed for the following stratigraphic stages:

- Mediterranean Sea: Quaternary, Pliocene, Upper Miocene (Messinian) and Middle Miocene.
- Black Sea: Quaternary, Pliocene, Upper-Middle Miocene and Upper Oligocene - Lower Miocene.
- Lithofacial maps and maps of rates of sedimentation based on sediment coring for some stages of Holocene and Würm, are to be additionally compiled for both basins.

The proposals should be discussed and finalized during the International Symposium devoted to IBCM series (see 6.1.1).

7.5 USE OF GEOGRAPHICAL NAMES ON IBCM PRODUCTS

During the discussion concerning the future edition of the IBCM, G. Papaioannou stated that the compilers of the charts should pay special attention to the names used on the charts. More specifically, he noted that, except for the Undersea Feature Names, for the adoption of which the GEBCO Sub-Committee on Undersea Feature Names (SCUFN) has the responsibility, many other geographical names are portrayed regarding countries, cities, seas, gulfs, etc. In many cases these names are not accepted for several reasons, such as political disputes or incorrect transcription from non-roman to roman alphabet. For these reasons, it is necessary to follow the decisions and recommendations of the UN Conferences on the Standardization of Geographical Names and make use of the adopted names, and transliteration tables.

M. Huet, as Secretary of SCUFN, supported the above proposal, inviting participants to contact G. Papaioannou for more information on this topic.

8. DATE AND PLACE OF NEXT SESSION

Following J. Hall's invitation, the next session of IBCM-EB has been planed in Israel (Aqaba), in May or September of the year 2000. In the event that the Aqaba site for the meeting is not practicable, M. Huet proposed that the IHB in Monaco be considered as an alternative location for the meeting.

9. ADOPTION OF THE DRAFT SUMMARY REPORT

The draft summary report was read out by the chairman and was accepted at 15:30 on 4 September 1999.

10. CLOSURE

Before closing the session the chairman acknowledged with gratitude, on behalf of the EB, the IOC for having supported the IBCM programme; and the HDNO and Chief Editor for the printing of the maps. He also drew attention to the list of actions in Annex VII that will have to be undertaken as soon as feasible.

A special thanks was given to the EB Members, with appreciation for their high level scientific contributions; to Prof. E. Emelyanov, who so efficiently organized the meeting; and to the Director of the World Ocean Museum and his staff, for their hospitality.

ANNEX I

AGENDA

- 1. OPENING**
- 2. ADMINISTRATIVE ARRANGEMENTS FOR THE SESSION**
 - 2.1 ADOPTION OF THE PROVISIONAL AGENDA
 - 2.2 DESIGNATION OF THE RAPPORTEUR
 - 2.3 CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION
 - 2.4 ELECTION OF THE VICE-CHAIRMAN
- 3. EXPLANATORY BROCHURES-LEAFLETS FOR THE IBCM GEOLOGICAL/GEOPHYSICAL SERIES**
 - 3.1 ELECTRONIC PUBLISHING THROUGH INTERNET
 - 3.2 BATHYMETRY
 - 3.3 IBCM-G (GRAVITY)
 - 3.4 IBCM-PQ (PLIO-QUATERNARY SEDIMENT THICKNESS)
 - 3.5 IBCM-S (SEISMICITY) (PREPARATION OF CATALOGUE)
 - 3.6 IBCM-SED (RECENT SEDIMENTS)
 - 3.7 IBCM-M (MAGNETIC ANOMALIES)
 - 3.8 GENERAL DISTRIBUTION OF THE BROCHURES
- 4. COMPLETION OF THE GEOLOGICAL-GEOPHYSICAL SERIES**
 - 4.1 IBCM-M (MAGNETIC ANOMALIES) – 1:1M
 - 4.2 IBCM-M (MAGNETIC ANOMALIES) – 1:5M
 - 4.3 DIGITIZATION OF THE GEOLOGICAL-GEOPHYSICAL SERIES
- 5. SECOND EDITION OF IBCM**
- 6. COPYRIGHT, ADVERTIZING AND SALE OF IBCM PRODUCT**
 - 6.1 ADVERTIZING, SALE AND DISTRIBUTION OF IBCM
- 7. OTHER MATTERS**
 - 7.1 SEDIMENTOLOGICAL MAPS OF THE ATLANTIC OCEAN
 - 7.2 GEOLOGICAL/GEOPHYSICAL MAPS OF THE BLACK AND AZOV SEAS
 - 7.3 GEOLOGICAL/GEOPHYSICAL MAPS OF THE BALTIC SEA
 - 7.4 LITHOFACIAL MAPS FOR THE MEDITERRANEAN AND BLACK SEAS
 - 7.5 USE OF GEOGRAPHICAL NAMES ON IBCM PRODUCTS
- 8. DATE AND PLACE OF THE NEXT SESSION**
- 9. ADOPTION OF THE DRAFT SUMMARY REPORT**
- 10. CLOSURE**

ANNEX II

LIST OF PARTICIPANTS

IBCM Editorial Board Members

Professor Carlo Morelli (*Chairman*)
Universita' degli studi di Trieste
Departmento di Ingegneria Navale
Del Mare e per l'Ambiente
Via Valerio, 10
34127 TRIESTE
Italy
Tel: 39 040 676 7158
Fax: 39 040 676 3497
E-mail: morelli@geodinma.univ.trieste.it

Captain Andrei Popov (*Chief Editor*)
Head Department of Navigation
And Oceanography
8011, Linya V. O. B-34
199 034 SAINT PETERSBURG
Russian Federation
Tel: 7(812) 277 59 00
Fax: 7(812) 277 43 62

Professor Emelyan M. Emelyanov
Head of Atlantic Geology Department
Russian Academy of Sciences
P. P. Shirshov Institute of Oceanology
Prospect Mira, 1,
KALININGRAD 23600
Russian Federation
Tel: 7(0112)215739
Fax: 7(0112)272945
E-mail: abio@baltnet.ru

Ing. en Chef Michel Huet
International Hydrographic Bureau
4 quai Antoine Ier
B. P. 445-MC 98011 MONACO CEDEX
Principauté de Monaco
Tel: (377) 93 10 81 04
Fax: (377) 93 10 81 40
E-mail: pac@ihb.mc

Dr. Troy Holcombe
National Geophysical Data Center
325 Broadway
BOULDER, CO 80303-3328
USA
Tel: 1(303)4976390
Fax: 1(303)4976513
E-mail: tholcombe@ngdc.noaa.gov

Observers

Prof. Pavel Kuprin
M. V. Lomonosov Moscow State University
Faculty of Geology
Chair of Lithology and Marine Geology
Laboratory of Marine Geology
Leninskye Gory
119899 MOSCOW
Russian Federation
Tel: 7(095) 959 12 48
Fax: 7(095) 939 50 00

Dr. Kazimeras Shimkus
Head of Marine Geology Laboratory
Southern Branch of P.P. Shirshov Institute
of Oceanology of Russian Academy of
Sciences
Golubaya Buchta, GELENDZHIK 7,
Krasnodar region, 353470, Russia
Fax: 7 (86141) 23189
E-mail: adm@sdios.sea.ru

Ing. Général Patrick Souquière
Service Hydrographique
et Océanographique de la Marine
3, avenue Octave Gréard-
75007 Paris
B: P: 5-00307 ARMEES
France
Tel: 33 1 44 38 41 16
Fax: 33 140 65 99 98
E-mail: souquiere@shom.fr

Mr. Giannis Papaioannou
Hellenic Navy Hydrographic Service
TGN 1040 ATHENS
Greece
Tel: +30-1-655 1773
Fax: +30-1-65177811
E-mail: hydrose@ath.forthyet.gr for
G.Papaioannou

IOC Secretariat

Mr. Dmitri Travin
Intergovernmental Oceanographic Commission
UNESCO
1, rue Miollis
75732 PARIS CEDEX
France
Tel: 33 1 45 68 40 44
Fax: 33 1 45 68 58 12
E-mail: d.travin@unesco.org

ANNEX III

**MEDITERRANEAN AND BLACK SEAS HYDROGRAPHIC COMMISSION (MBSHC)
11TH CONFERENCE, SPLIT, CROATIA, 7-11 JUNE 1999 – EXCERPT FROM THE
SUMMARY REPORT**

**The Role of the Volunteering Hydrographic Offices on the Collection,
Validation and Provision of Data for the International Bathymetric Chart
of the Mediterranean (IBCM) and other Relevant Issues**

The Chairman stated that, as explained in his report, the 7th Session of the IOC Editorial Board for the IBCM and its geological/geophysical series held in Dubrovnik, Croatia, 2-4 June 1998, considered necessary to have the Terms of Reference (TOR) available for the VHOs (Volunteering Hydrographic Office) in time for the second edition of the IBCM. The Revised TOR which had been accepted during the Tenth Conference of MBSHC, have been introduced, and it was decided the Chairman MBSHC distribute TOR to the VHOs for comments and approval. Following this decision, the TOR have been sent on 17 June 1998 to the VHOs, to submit their comments. Turkey, Greece and France have already sent their replies.

The Representative of Greece indicated that the technical specifications and role of the VHOs for the 2nd edition of IBCM had previously been debated during the Conference of the MBSHC in Istanbul. During the 7th Session of the IOC Editorial Board for IBCM in Dubrovnik, this subject had also been discussed:

In order to avoid further delays, he proposed that the text sent by the Chairman be examined, and every effort be made to decide on the TOR for VHOs and technical specifications, to have them ready for the 2nd edition of IBCM.

The Commission, having noted that the above had been taken into consideration by the Consultative Group on Ocean Mapping (CGOM) as well as the General Guidelines developed by CGOM, adopted Decision 10 appearing in the Report of the CGOM 7th Session:

DECISION 10

The Commission, having noted the following consideration taken by the Consultative Group on Ocean Mapping (CGOM), on the occasion of the meeting of this Group (Monaco, 12-14 April 1999):

The first phase of the IBCM project, started nearly three decades ago, is now drawing to a successful conclusion. Mindful of the technological changes which have taken place since its inception, it is planned that the second phase will incorporate radical new designs in terms of its presentation and resolution. This product will be an experimental prototype not governed by the present GEBCO Guidelines. It is expected that the product will be completed by 2002 and will be available for evaluation during the following two years.

This second phase product will be based entirely upon a digital database. The nature of the database will be raster (a Digital Terrain Model or DEM), consisting of gridded seamless data for land and sea.

accepted the following General Guidelines for the product developed by CGOM.

Grid resolution: The grid will be 0.1" (or 185 m or less, depending upon the latitude).

Horizontal datum: The WGS-84 datum will be used, associated with the GPS navigation system.

Vertical datum: At sea, the vertical datum will be that prevailing for the existing inshore hydrographic data. On land, the vertical datum will be that prevailing for the existing topographic mapping. This is quite acceptable for the Mediterranean area where the tidal range is minimal and the differences between datums are relatively insignificant.

Interpolation techniques: For deepwater swath mapping with better than 0.1" spacing, at 0.1" grid will be interpolated. For areas covered by spot soundings, the interpolation will honour the datapoints. It is not deemed necessary for the Mediterranean area to use satellite altimetry-derived predicted bathymetry.

Data density indicators: Traditional track plots will not be used. A possible solution is a raster file specifying the number of grid nodes to the nearest available data, expressed in a single byte.

Publication media and dissemination conditions: The publication media will initially be a single CD-ROM with the raster data for all the areas covered by the IBCM (including the Black Sea). It is not intended to include any of the original data thus ensuring the protection of intellectual property rights and the detailed survey geometry.

noted the following evaluation of the CGOM about the guidelines:

CGOM has examined the above proposal for the IBCM-II prototype and its guidelines and see in it an innovative step which may have promise for the future.

Accordingly, they affirm their support for the compilation and trial use of this product. This in no way affects the current obligation of the VHOs or the existing GEBCO Guidelines,

The Commission invites the Volunteering Hydrographic Offices to provide releasable bathymetric data to the editor (DHNO Russian Federation) following the above-mentioned technical specifications.

ANNEX IV

DISTRIBUTION OF IBCM PRODUCTS

For: Prof. Carlo Morelli
Universita' degli studi di Trieste
Departmento di Ingegneria Navale
del Mare e per l'Ambiente
Via Valerio, 10
34127 TRIESTE, Italy

Captain 1st Rank Andrey Popov
IBCM Chief Editor
Head, Dept. of Navigation & Oceanography
8, 11 Liniya
199034 St. Petersburg, Russia

cc: Mr. Demond Scott
Former Chairman CGOM
Cumbers
Mill Lane, Siddlesham
Chichester P.O. 207 LX
United Kingdom

Mr. Dmitri Travin
Intergovernmental Oceanographic
Commission (IOC), UNESCO
1, rue Miollis
75732 Paris Cedex 15
France

Ref: Fax CGOM 299 from D. Scott of 27.11.98

Dear Prof. Morelli,

Head Department of Navigation and Oceanography suggests that improvement of the existing system of IBCM sheets delivery should be considered at the forthcoming meeting of IOC Editorial Board on the International Bathymetric Chart of the Mediterranean in Kaliningrad, 1-3 September 1999.

Head Department of Navigation and Oceanography agrees with D. Scott opinion that existing system of IBCM sheets delivery to the customer is ineffective and requires changes. To improve the system, we suggest two ways:

- 1) D. Scott collects request for purchase, informs HDNO on total requirement and we mail necessary charts to him. Moreover, D. Scott covers chart costs together with postage for dispatch from Saint Petersburg to Chichester.
- 2) The following scheme is considered more favorable. D. Scott sends the received requests to HDNO and we send charts directly to the customer who covers chart costs (44US\$ per 1 sheet) plus postage for dispatch from Saint Petersburg to the customer's address.

In both cases, payment should be placed to account of the company that distributes HDNO publications abroad.

Approximate cost of charts delivery by airmail is as follows:

- 1 set of 10 sheets (2 kg) – 6\$USA
- 10 sets (20 kg) – 36\$USA

Admiral A. Komarytsin
Chief of Head Department of Navigation
and Oceanography

Andrey Popov
IBCM Chief Editor

ANNEX V

PROPOSAL FOR COMPILATION OF THE ATLAS OF THE GEOLOGICAL/GEOPHYSICAL CHARTS OF THE BLACK AND AZOV SEAS REGION

by Prof. V.R. Meikhov and Prof. P.N. Kuprin
M.V. Lomonosov Moscow State University

The initiative group of geophysicists and geologists of M.V. Lomonosov Moscow State University, P.P. Shirshov Institute for Oceanology (Academy of Sciences of the Russian Federation). The geophysical survey company “Yuzhmorgeo” and other organizations are asking the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and its Geological/Geophysical Series to make a positive recommendation for a compilation and publishing of an Atlas of Geological/Geophysical Charts of the Black/Azov Seas region of the Mediterranean belt of the Earth, under financial support provided by IOC/UNESCO.

Publishing of the map “Magnetic Field Anomalies (T_A) of the Mediterranean and Black Seas” finalizes the IOC/UNESCO project on the compilation of the International Bathymetric Chart of the Mediterranean and its Geological/Geophysical Map Series of 1:1,000,000 and 1:5,000,000 scales (series include five maps). These six maps may serve as an initial basis for the compilation of geological/geophysical map series that may be used for other purposes. Compilation of these maps is feasible for such regions of the Mediterranean belt that have a key importance, not only in understanding of geological natures of these regions but also in understanding of the geological nature of the entire belt. It is recognized that one of these key regions is the Black/Azov Seas region. Here, the fragments of all large tectonic elements of the Earth crust are located in ancient and young platforms, mountain fold belts, fore deeps and intermountain depressions, heterogeneous depression of existing seas, deep fracture zones and regional fracture systems, etc.

At the present time, favorable conditions exist for a more complete use of actual material that was accumulated by geological and geophysical expeditions not only of scientific research, explanatory, and geological surveying organizations, but also by organizations that are utilizing some of the land and marine mining fields.

The compilation of the Atlas of Geological/Geophysical Charts of the Black/Azov Seas region with an explanatory note represents the best approach in reaching this goal.

The Geological/Geophysical Atlas will serve a traditional purpose. Under the same edition, it is expected that all available to date information on geological and geophysical fields for the Black/Azov Seas region of the Mediterranean belt of the Earth provided by different organizations will be collected.

The Atlas is oriented towards a wide circle of users, geophysicists, geologists, and especially tectonists that are involved in the modeling of a modern structure and in the recreation of history of development of tectonosphere of the Earth. The Atlas provides users with the initial information to form hypotheses, to build case-based or complex models, and also, to numerically validate these models for a compliance with a complex of geological/geophysical parameters. Of course, maps of the Atlas will also have a practical importance, particularly in geological mapping and in a surveying-exploratory work.

The published scale of maps – 1:2,000,000; the working scale of maps during compilation of anomalies in the digital form – 1:1,000,000. Such an over-precision and over-discreetness of digital versions of the maps provide a researcher with an opportunity to use anomalies of geophysical field for stating objectives not only at a regional scale, but also for a solution of more detail tasks of geological mapping, tectonic rationalization, and independent quantitative assessments. Considering this, in our opinion it is feasible to estimate some commonly accepted and widely used filed

transformations beforehand (at the stage of data processing) and to provide these data in the Atlas as an additional interpretation material.

Therefore, the Atlas will consist of two versions of maps – base and supplementary. The base series will include five maps: gravitational field of the Free Air anomalies; gravitational field of the Free Air anomalies; magnetic anomalies of ΔT field; map of anomalies of heat stream; seismic map of depths of acoustic foundation; map of main geological and tectonic elements, established by direct observations. Hence, only objective and experimentally obtained information under a minimal influence of any hypothesis will be included in these series. It is planned to include seven maps in the supplementary series: map of Bouguer gravity anomalies with density of intermediate layer of 2.3 g/sm^3 ; gravimetric map of secondary vertical derivatives of gravitation; map of pseudo-gravitational compiled anomalies based on magnetic fields anomalies in relation to vertical magnetism; map on distribution of indices of magnetism of hypothetical rocks distributed in the magnetically active layer below acoustic foundation; map on distribution of indices of Poisson correlation coefficient between gravitational and magnetic anomalies; map on gravitational effect of sedimentation layer distributed up to the depths of acoustic foundation; map on residual gravitational anomalies obtained after removing the effect of the sedimentary cover. Based on all these data, it is planned to create a most probable model of Earth crust structure within a region under assessment.

Considering the fact that volume of data used in the compilation of all these maps is relatively large and that these data were obtained in different geological/physical organizations of the former Soviet Union, a collective of authors will be relatively large as well. In the compilation of maps of the Atlas, it is anticipated to involve specialists from all countries of the Black/Azov Seas region and also specialists from other Mediterranean countries that have corresponding materials and/or developing other versions of interpretation of geological/geophysical data.

Works on the compilation of each of the above-mentioned maps will be conducted by the appropriate institutions and also by Moscow State University (Geological Faculty) where the bulk of computer data processing is anticipated to be concentrated.

ANNEX VI

PROPOSAL FOR THE CONSTRUCTION OF THE INTERNATIONAL MAP OF NEOCENE/QUATERNARY TECTONICS OF THE MEDITERRANEAN

The speakers of original geological/geophysical data for the Mediterranean Sea reluctantly share them with the IBCM Editorial Board. This is understandable, because these data have been, as a rule, obtained in expeditions financed by National committees. In this relation, the project of construction of the International Map of Neocene/Quaternary Tectonics of the Mediterranean, compiled on the new bathymetric basis, seems to be very promising.

There is a number of reasons favouring this proposal. Firstly, the map might be a logical completion of the series of geological/geophysical charts within the IBCM project. Secondly, up to now the similar international tectonic map has not been constructed. And third, the map does not imply a direct involvement of original data, but only their interpretation, hence it cannot provoke objections from National Committees. The title of the chart was proposed because the whole Western Mediterranean and the majority of structural units in the Eastern Mediterranean came into origin just during this time span.

The above idea and the proposed legend for the map was discussed on board R/V *L'Atalante* in the French expedition (with the participation of an international geological team) within the PRISMED-II Programme in the Eastern Mediterranean more than a year ago. The idea was supported by the chief of the expedition, Prof. J. Mascle (GEOSCIENCES AZUR, Laboratoire de géodynamique sous-marine, Villefranche-sur-Mer; France), Dr. G. Bellaiche (the same address), Dr. J.M. Woodside (Free University, Amsterdam, the Netherlands), Prof. M. Ergün (Izmir University, Turkey), Prof. Y. Mart (Haifa University, Israel) and others. Chief of laboratory, Ph.D L.B. Meisner (NIPIOkeangeofizika, Gelendzhik, Russia) expressed his interest in the construction of the Black Sea part of the map. The participants of the project for the Western Mediterranean are not yet defined. The proposal could be addressed to: Profs. M. Comas, A. Maldonado, J. Galindo-Zaldivar (all from the Granada University, Spain) – for the Gibraltar, Alboran Sea, the area adjoining to the Balearic Islands; Dr. J.P. Rehault (Laboratoire de géodynamique sous-marine, Villefranche-sur-Mer; France) – for the Algerian/Provençal Basin; Prof. I. Finetti (University of Trieste, Italy); Dr. M. Marani (Istituto de Geologia Marina, Bologna, Italy) – for the Tyrrhenian Sea and parts of the Adriatic and Ionian seas; Prof. R. Catalano (University of Palermo, Sicily, Italy) – for the Sicily Strait, and other persons.

The intention is to compile the chart on a kinematics basis, which may represent a unique scientific document for users.

This proposal has been presented by

Dr. Anatoli F. Limonov
Faculty of Geology, Moscow State University
Vorob'evy gory, Moscow 119899, Russia
Tel: (7-95) 939 30 22
Fax: (7-095) 939 49 17
E-mail: fu@geol.msu.ru

ANNEX VII

LIST OF ACTIONS

No	SUBJECT	ACTION BY
1.	Providing HDNO and IOC with information on how to establish a bathymetric database on IBCM, in reference to hardware as well as software aspects, in view of producing IBCM-II.	J. Hall P. Souquiere
2.	Examination with HDNO, and IBCM-EB if necessary, of the possibility and means to support establishing the IBCM bathymetric database.	Chairman
3.	Initiating the establishment of a bathymetric database on IBCM-II.	Chief Editor
4.	Preparation of a one-week scientific symposium on IBCM results (for 2002 – 2003). Speakers: Authors and Eminent Specialists. Place: CIESM Congress, European meetings, national facilities	Chairman, IOC Secretariat
5.	Following-up of the decision by the IHO Mediterranean and Black Seas Hydrographic Commission, concerning the release by VHOs of bathymetric data to IBCM.	IHB
6.	Preparation of the explanatory brochure of IBCM-Sed.	E. Emelyanov, K. Shimkus, P. Kuprin
7.	Inclusion of explanatory brochure on IBCM-Sed in IOC publication plan for 2000.	IOC Secretariat
8.	Preparation of scientific news article for publication in the EOS Journal.	E. Emelyanov
9.	Preparation of color map of IBCM at small scale (transparent version) to insert into the leaflet IBCM-Sed	E. Emelyanov, J. Hall
10.	Reviewing articles in Russian scientific journals	E. Emelyanov
11.	Preparing a list of co-authors of IBCM-Sed and providing them with the relevant IBCM-Sed sheets.	Chief Editor, E. Emelyanov
12.	Preparation of the 9 th EB Meeting in Aqaba.	J. Hall IOC Secretariat
13.	Investigating the possibility and appropriateness of producing a CD-ROM containing all digital IBCM data available (bathymetry, gravity, magnetism and seismicity)	T. Holcombe
14.	Finalizing the IBCM Web pages and implementing the IBCM web site.	T. Holcombe, Chairman
15.	Presenting on CD-ROM and making available on the Internet, of the catalogue of seismicity.	Chairman
16.	Making more efficient the distribution system of IBCM products.	Chief Editor D. Scott
17.	Investigating the possibility of preparing a proposal concerning the digitization of sedimentological maps of Atlantic Ocean.	E. Emelyanov, T. Holcombe
18.	Investigating the possibility of an IOC financial support for compilation and publication of a Geological-Geophysical Atlas of the Black and Azov Seas.	IOC Secretariat

ANNEX VIII

LIST OF ACRONYMS

ABIORAS	Atlantic Branch of Institute of Oceanology Russian Academy of Sciences
CGOM	Consultative Group on Ocean Mapping (IOC)
CIESM	Commission internationale pour l'exploration scientifique de la mer Méditerranée
EB	Editorial Board
GDA	GEBCO Digital Atlas
GEBCO	General Bathymetric Chart of the Oceans
HDNO	Head Department of Navigation and Oceanography (Russia)
HNHS	Hellenic Navy Hydrographic Service (Greece)
IBCM	International Bathymetric Chart of the Mediterranean and its Geological/Geophysical Series (IOC)
IFREMER	Institut français de recherche pour l'exploitation de la mer (France)
IHB	International Hydrographic Bureau (IHB)
MSU	Moscow State University
NGDC	National Geophysical Data Center (USA)
OGS	Osservatorio Geofisico Sperimentale (Italy)
SBIORAS	Southern Branch of Institute of Oceanology Russian Academy of Sciences
SCUFN	Sub-Committee on Undersea Feature Names (GEBCO)
SHOM	Service hydrographique et océanographique de la marine (France)
VHO	Volunteering Hydrographic Service (IHO)
IHO	International Hydrographic Organization (IHO)
IOC	Intergovernmental Oceanographic Commission (UNESCO)
MBSHC	Mediterranean & Black Seas Hydrographic Commission (IHO)