Intergovernmental Oceanographic Commission
Reports of Governing and Major Subsidiary Bodies

IOC Working Committee on International Oceanographic Data Exchange

Twelfth Session

Moscow, USSR, 10-17 December 1986

Unesco

IOC/IODE-XII/3
Paris, 30 January 1987
Original: English

In this Series

Reports of Governing and Major Subsidiary Bodies, which was initiated at the beginning of 1984, the reports of the following meetings have already been issued:

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- Fourth Session of the Working Committee for Training, Education and Mutual Assistance
- Fifth Session of the Working Committee for the Global Investigation of Pollution in the Marine Environment
- First Session of the IOC Sub-Commission for the Caribbean and Adjacent Regions
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1. ORGANIZATION OF THE SESSION

1.1 OPENING OF THE SESSION

1 The Chairman of the IOC Working Committee on International Oceanographic Data Exchange, Prof. D. Kohnke, opened the Session at 10.00 on 10 December 1986 by welcoming the participants to the Twelfth Session of the Working Committee. He noted that the presence of numerous Delegations of Member States and of Representatives/Observers of many organizations that co-operate with the Committee testifies to the importance attached to its work and to the role it plays in international data exchange. (The List of Participants is given in Annex III).

2 He then welcomed the Deputy Chairman of the State Committee of the Soviet Union for Science and Technology, Dr. K. Dumaev, and the Member of the State Committee, Head of the World Ocean and Atmosphere Department, Dr. A. Metalnikov. He called on Dr. Dumaev to address the Working Committee.

3 Dr. Dumaev expressed his pleasure at having an opportunity to welcome the participants in Moscow. He emphasized the importance the Soviet Union attaches to the investigation of the World Ocean and particularly to international co-operation in the field of oceanographic data and information management. He recalled that for almost 25 years the Working Committee on IODE had contributed to the development of friendly contacts and mutual trust between scientists which had led to the establishment of an effective system for data exchange. Dr. Dumaev expressed a strong hope that established mechanisms and procedures for data and marine information exchange will be used successfully for a new international programme - the World Climate Research Programme. Collected data will be widely used to solve many economic problems which humanity faces at present.

4 Mr. I. Beljaev, Deputy Director of the Marine, Arctic and Antartic Department of the State Committee of the Soviet Union for Hydrometeorology and Control of Natural Environment addressed the Working Committee and stressed the State Committee's fundamental role on the national level in data collection and management and in providing services to different groups of users in the meteorological and oceanographic communities. He emphasized that the State Committee was an active participant in many important international scientific and monitoring exercises In this regard he particularly referred to GATE, IGOSS, MONOC and the WCP. He looked forward to a continuation and an expansion of the fruitful co-operation between the IOC and the State Committee. Finally Mr. Beljaev wished all participants of the Session a pleasant stay in Moscow and every success in their work.

5 The Chairman thanked Dr. Dumaev and Mr. Beljaev for their kind words and for the importance they attached to the further development of the IODE system. The Chairman expressed his gratitude for the provision of excellent working conditions and for the warm welcome given to the participants by the organizers.

6 In the absence of Dr. M. Ruivo, Secretary IOC, Dr. I. Oliounine, IOC Senior Assistant Secretary, welcomed those present at

the Session on behalf of the Chairman of the IOC, Prof. I. A. Ronquillo, and the Secretary IOC.

7 He stressed that the IOC was expecting the Session to propose mechanisms and procedures for making the IODE system more effective and more able to cope with the increasing demands and new requirements for oceanographic data. These requirements include the ability to handle the immense volume of data, the capability of rapidly disseminating the data, a wide geographic coverage, the ability to merge data sets so as to produce useful products for different user groups, the application of marine scientific and technical information for the effective management and development of the resources that the seas and oceans provide for humanity, etc.

8 He called on the Committee to make recommendations which would provide a basis for evolving a sound and workable strategy both to guide the IOC's own direct activities in marine data and information management and to enable IOC to fulfill its role in the field as a joint specialized mechanism within the United Nations System. He assured the Committee that the IOC is, and will always be attentive to the needs of the Working Committee on IODE and remains receptive to its aspirations.

9 In closing the Chairman reminded the Committee that it was exactly 25 years ago that IOC had established the Working Group on IODE. Since then the IODE system has developed very favourably - large amounts of oceanographic data have been assembled by the system; 40 Member States have established their own NODCs or DNAs; more than 50 countries have contributed data to the system; international standards have been set for processing, quality control and exchange of data; and the data are frequently used by customers.

10 He emphasized, however, that the IODE mechanisms and procedures do not yet fully meet the requirements which have been circulated by regional or scientific programmes. The major future tasks facing the Committee include:

- more complete accession of oceanographic data;
- acceleration of the data flow;
- improvement of the monitoring of the data flow;
- inclusion of data generated by the use of new technologies;
- adaptation of the IODE System to new computer and communication systems.

11 Prof. Kohnke expressed his confidence that with the expertize of the Committee and with its readiness to work closely together with respective international organizations and programmes it will be possible to achieve this goal. He also stressed that success depends very much on the readiness of Member States to allocate more resources to their Data Centres. He finished his welcome by wishing the Session a good spirit of collaboration and every success.

1.2 DESIGNATION OF THE RAPPORTEURS

Mr. A. Varley (UK) and Mr. H. Jones (Canada) were designated Co-rapporteurs for the Session. 12

1.3 ADOPTION OF THE AGENDA

The Chairman invited comments on the Provisional Agenda (Document IOC/IODE-XII/1 prov.) 13

The Delegate of the USSR proposed the inclusion of a new sub-item under Agenda Item 6 - "Unified Procedures for Quality Control of Oceanographic Data". The Delegate of the UK proposed the combination of sub-items 6.3 and 6.6 under one title "Format Development and Adapting IODE to Developments of Computers and Communication Technologies". 14

The Committee accepted these proposals and adopted the Agenda as given in Annex I. 15

1.4 ARRANGEMENTS FOR THE SESSION

The IOC Senior Assistant Secretary, Dr. I. Oliounine introduced the proposed time schedule, identified changes in the list of documents and informed the Committee on administrative arrangements. 16

Though it was expected to work in plenary, the Committee recommended the establishment of a number of ad hoc drafting groups to deal with specific agenda items. 17

The Representative of the Local Organizing Committee informed the Committee of the local arrangements. 18

2. WORK ACCOMPLISHED DURING THE INTERSESSIONAL PERIOD

The Chairman, Prof. D. Kohnke, presented his report (Document IOC/IODE-XII/7), covering the activities of the Committee from January 1984 to December 1986. He stressed that he would not go into detail on its content as that could be discussed at length under the various Agenda Items. He informed the Committee about the intersessional activities, the development of the programme and proposed priorities of the future work of the Committee and its Subsidiary Bodies. 19

The Chairman specifically mentioned that in response to the request of the Thirteenth Session of the IOC Assembly (Paris, 12-28 March 1985) a study was made and recommendations were proposed on the ways to meet effectively and efficiently, new data requirements arising from technology developments (Document IOC/INF-655). 20

The Committee accepted the Report of the Chairman and agreed with the importance of new challenges identified by the Chairman. 21

The Committee expressed its satisfaction with the information on the development of the Data Centre System noting that new centres had been established in Bulgaria, the German Democratic Republic, 22

Greece, Portugal, Uruguay and Venezuela. It noted that some IOC Member States, among them Greece and Yugoslavia had nominated national co-ordinators for IODE. The Committee expressed appreciation for the efforts made by the IODE Officers and the Secretariat in this regard.

23 After being informed by the Heads of the Centres on the activities of the WDC-A and B, Oceanography during the intersessional period (Document IOC/IODE-XII/9), the Committee noted that the flow of marine scientific data into World Data Centres has continued at a steady pace. Data received during the intersessional period totalled more than 270,000 observations, received from 33 countries. The international marine data base now contains data from more than 2,000,000 observations. Included in the data totals received by the Centres during the intersessional period, were data from more than 80,000 oceanographic stations; the number of oceanographic stations for which data held by the centres now exceeds 900,000 and 400,000 bathythermograph profiles are being archived. Other data holdings at the centres include biological observations, series of current observations, geological, geophysical measurements and others.

24 All data holdings are identified and described in the Catalogues of Data which are being issued by the Centers on an annual basis and are available free of charge to qualified requesters in the scientific community.

25 The Committee welcomed the activities of the Centres and paid special tribute to the WDC-A for the preparation and dissemination of Change Notices to the Catalogue of Data and Oceanographic Data Exchange Reports as well as for the augmentation of XBT data bases which were increased by more than 60%, and for the compilation of an inventory of time series, sections and fixed stations (oceanographic station and CTD data) that have been repetitively sampled in the North Pacific for periods of five years or more; and to the WDC-B for the preparation of time series of oceanographic observations made at ocean weather stations in the North Atlantic as well as for its readiness to collect, preserve, archive and duplicate all types of data obtained during the implementation of the WCRP.

26 The Delegate of the USSR expressed concern that there is a notable decline in the submission of biological and geological-geophysical data to the WDC-B, Oceanography.

27 The Committee agreed to study this problem in detail under relevant Agenda Items in order to find out the reasons for and to propose ways to overcome this deficiency.

28 The Committee recommended that the Directors of WDCs, Oceanography should study the possibility of making their annual Catalogues of Data more comparable and that they should investigate ways of broadening the types of services which can be provided by the WDCs so as to meet new requirements from different groups of users.

29 The Committee identified some goals and objectives to meet which the WDC system will need the assistance of supporting centres for collection, quality control analysis and dissemination of data:

- data must be made available in terms of months after initial collection rather than years;

- catalogues of data must be made available more quickly and easily, perhaps online;

- satellite derived values and other data resulting from new technology must be included in the system;

- data storage and exchange techniques must be improved;

- the Centres must investigate, use and disseminate information on new technologies e.g., optical disks storage, computer to computer links, digital communication networks.

30 The Committee requested its Chairman to bring this view to the attention of the ICSU Panel on World Data Centres at its next session in March 1987 and recommended that the ICSU Users Guide on World Data Centres should be revised accordingly.

31 The Committee agreed that the data management and communication procedures of IODE and the WDCs, developed in the early 1960's are inadequate to meet the needs of the 1980's. There is a need to modernize the system substantially in view of the demands of all IODE user groups and to acheive much closer co-operation between scientific planning and data centre operations.

32 The Committee considered carefully the reports of National Co-ordinators for IODE (Document IOC/IODE-XII/10) and noted an increased interest of the Member States in oceanographic data exchange.

33 The Committee felt that more specific information is needed from National Co-ordinators for IODE. Several participants recommended that the ICES brochure on Oceanographic Data Centres in the ICES Community would be a good model for the basic kinds of information needed. The Committee recommended that the reports of NODCs should include a one-page standard summary of resources, staff and computing facilities. The IODE Officers were requested to prepare a draft form of this summary in consultation with the IOC Secretariat and ICES.

34 The Committee reiterated the importance of national reports and requested Member States - participants of the IODE system, to keep strictly to the agreed schedule for their preparation and submission to the IOC Secretariat.

3. DEVELOPING SERVICES IN SUPPORT OF GLOBAL OCEANOGRAPHIC PROGRAMMES

3.1 IODE SUPPORT OF THE WCRP

35 The Secretary of the Joint SCOR-IOC Committee on Climatic Changes and the Ocean (CCCO) reviewed the data management plans for an implementation of the Tropical Ocean Global Atmosphere (TOGA) Programme

and the World Ocean Circulation Experiment (WOCE) (Document IOC/IODE-XII/8 Annex 2 Suppl. 1). These activities will require a variety of data assembly and quality control centres and special analysis centres to generate data sets and regional and global analyses for climate research.

36 Three data centres have been established for TOGA: Sea Surface Temperature - Climate Analysis Centre, Washington D.C.; Subsurface Data Centre - IFREMER, Brest, France; Sea Level Data Centre - University of Hawaii; Honolulu. These centres will operate to at least 1995, the end of TOGA. To be effective and to meet the requirements to TOGA, they will require the full support of the ocean science and service communities. In this respect, the Secretary CCCO suggested that NODCs and RNODCs arrange to co-operate on a bilateral basis with these centres, particularly the Subsurface and Sea level centres. Some NODCs were already doing so.

37 The Secretary CCCO further suggested that the Working Committee take all possible steps to accelerate and distribute data in support of TOGA. The Committee noted that the Joint SCOR/IOC CCCO realized that scientists were often the cause of late data submissions and that it was working with the Scientific Committee on Oceanic Research (SCOR) of ICSU on the problem. A review was conducted of drifter data submission to determine the reasons for the reluctance of some scientists to submit data to the RNODC for Drifting Buoys in Canada.

38 The data management plans for WOCE (See Scientific Plan for WOCE, Chapter 7, WMO/TD-No. 122, July 1986) are not as well defined as those for TOGA but the general concept of utilizing Assembly Centres, Special Analysis Centres (SAC) and the WDCs is well accepted. An essential aspect is that WOCE scientists will be directly involved with the SACs where the WOCE research data sets and analyses will be prepared.

39 The number of Assembly Centres and SACs required will be determined by the WOCE Scientific Steering Group during the next 12 to 18 months and they will be described in the WOCE Implementation Plan to be submitted to Member States and to an International Conference for WOCE in 1988 sponsored by the IOC.

40 The activities of an Assembly Centre are similar to those normally performed by RNODCs. For this reason, the Committee recommended that the IODE should review the possibility of supporting WOCE through the establishment of RNODCs.

41 The National Co-ordinator for IODE of the USA described a national interpretation of the concepts of assembly and analysis centres in the field of ocean sub-surface thermal data. Responsibility for assembly and initial quality control of Pacific TOGA sub-surface thermal data rests with the NODC and for the overall quality control analysis with the Scripps Institute of Oceanography. An important element of the system is the close working relation between scientists and the data centre. (See Figure, page 43).

42 National Co-ordinators from Canada, France and the USSR indicated that their countries are developing similar operations. The

Chairman of the Task Team on Ocean Data Management for Climatic Studies reported that the WOCE Scientific Steering Group regarded these developments as excellent models for data management systems for other parameters.

The Committee agreed with these views. 43

The ocean satellites to be launched in the 1990s are a specific promising data source for WOCE. The Committee noted plans to launch ESA's ERS-1 in 1990, and the French/USA TOPEX-POSEIDON Mission in 1992. The Joint SCOR/IOC CCCO is relying on national or multi-national projects (CERSAT and AVISO in French for example) to provide data in a usable form to the WOCE Assembly Centres. This data will be subsequently submitted to WDCs along with other WOCE data in accordance with the WOCE data management plan. 44

The Committee decided to consider this information under Agenda Item 6.4. 45

Finally, the Secretary CCCO informed the Committee that a Pilot Data Information Unit was being established to keep track of and to foster the exchange of WOCE (and eventually TOGA) data. This pilot effort will be undertaken by the UK Institute of Oceanographic Sciences. The unit will also investigate and test the use of on-line data tracking and exchange systems. 46

Introducing both the Task Team Report (Document IOC/IODE-XII/14) and Document IOC/IODE-XII/8 Annex 2 the Chairman of Task Team on Ocean Data Management for Climatic Studies first indicated by example the diversity and scale of the data types that would be acquired by WOCE and TOGA (hydrography, currents, sea-level, tracers, altimetry, scatterometry, etc). 47

The Committee approved the report of the Task Team. The Committee believed that IODE must state clearly and unequivocally that it intends to develop all the organizational structure needed to interact in a timely way with the WCRP. 48

The Director of WDC-B indicated that his Centre, whose facilities have recently been significantly upgraded, looked forward to supporting the WCRP in several ways including the final archiving of the data. He cautioned however, that the great importance of the WCRP should not lead to the neglect of other important Data Centre services within IODE. 49

Prof. F. Webster, Delegate of the USA, referred to the rapidly developing area of data networks, typified by the 56K baud SPAN (Space Physics Analysis Network) in the United States, with some links at present to Europe. He looked forward to the increasing use of such systems in oceanographic data exchange and invited IODE to consider sponsoring wider participation in such networks. 50

Realizing that the information and proposals contained in the reports of speakers under this agenda item require urgent and effective measures, the Committee adopted Resolution IODE-XII.1 which is directed towards increasing IODE involvement in climate data management and 51

helps to identify the role and place of the IODE system in the data management schemes of TOGA and WOCE (see also Agenda Item 6.2). The Committee instructed the Secretary IOC to make this Resolution known to WMO, ICSU and other international bodies involved in climate research and to stress that through this action the Working Committee on IODE has developed an organizational structure that will interact in a timely way with the oceanographic component of the World Climate Research Programme.

52 The Committee strongly recommended further co-operation and close collaboration with the data management units of other organizations supporting the oceanographic components of the WCRP and urged the Chairmen of the IOC Subsidiary bodies and others concerned to continue the practice of holding Joint CCCO-IODE-WCDP experts meetings on oceanographic data management.

53 The Committee requested that the IOC Secretary works with the Chairman of the GE on RNODCs and Climate Data Services to organize a Workshop on Ocean Climate Data Management during the intersessional period. It was proposed the workshop should include both data management experts and scientists planning for, or working on, ocean related aspects of the WCRP and that the topics to be discussed include the status, requirements, and data processing procedures necessary for:

- processing and analysis centers,
- data set development,
- data products and services,
- quality control,
- catalogues and inventories,
- high speed communication and data transfer.

54 Reports on long time-series with special reference to climate data sets were available at the Session. One was a draft revision of Manuals and Guides No. 2, the second an Inventory of Long Time-Series of Observations in the Pacific prepared by WDC-A, Oceanography from its data holdings.

55 The Committee requested the Group of Experts on RNODCs and Climate Data Services to review both documents and to advise the Secretariat and the Director WDC-A, Oceanography on the usefulness of these documents, on recommendations for improvements and on the next steps to be taken in publicizing the information contained in these documents.

3.2 MANAGEMENT OF MARINE BIOLOGICAL DATA TO MEET THE NEEDS OF THE IOC PROGRAMME ON OCEAN SCIENCE IN RELATION TO LIVING RESOURCES (OSLR)

56 The Chairman of the Task Team on Marine Biological Data Management presented his report (Document IOC/IODE-XII/16). The intersessional activities have been applied to individual marine

biological data problems, and could only help the exploitation of living resources indirectly.

The Committee noted that the development of new techniques in the collection of biological data had stimulated co-operation between international biological scientific programmes and agencies and IODE and its subsidiary bodies. *57*

There are problems inherent in the process of formatting, quality control and coding of biological data. The exchange of marine biological data internationally has been little developed up to now, although effective exchange of biological data is reported within specific projects. The Committee noted considerable experience available at the Biomass Data Centre concerning formatting biological data in the international Biomass format as well as archiving a wide spectrum of biological data in a relational data base system (Oracle/SQL). *58*

The Committee recommended the setting up of a test to format a certain subset of the biological data held at the Biomass Data Centre in GF3. This test should provide experience of the ability of GF3 to serve as a future vehicle for biological data transfer. *59*

The Committee urged the Chairman of the Group of Experts on Technical Aspects of Data Exchange to establish a close link at a working level with the manager of the Biomass Data Centre in order to realize the technical aspects of such a test. The Committee requested the IOC Secretariat to provide support as necessary for the implementation of this test. *60*

The Committee welcomed the willingness of the Soviet Union to contribute to this exercise based on the experience gained in converting their international biological format to GF3. *61*

The Committee acknowledged that the process of a complete coding of biological species is a complicated and time-consuming one. The difficulties in establishing a unique taxomonic identification scheme will have to be faced when the complete GF3 coding for biological data is tackled. As a practical solution a translation table will have to be included in biological data bases mapping the different existing coding schemes on to each other and guidelines for coding biological data should be provided. *62*

It is anticipated that besides the Latin name and coding schemes like the Rubin Code, ICES Code, US-NODC Code and USSR Code and others in the future one global coding scheme will emerge. The Committee noted the ICES experience gained in working towards a solution of this problem and requested the Task Team to co-operate with ICES. *63*

There was a general agreement that an inventory of the types of biological data for which a need for exchange exists, together with the existing methods of quality control, taxonomic coding and formatting systems, would be especially useful. A questionnaire should be designed and circulated to establish requirements and format of the inventory. *64*

65 The Committee approved the Report of the Chairman of the Task Team on Biological Data Management and expressed strongly the need for a continuation of its work with revised Terms of Reference. The Committee adopted Resolution IODE-XII.2. The Committee emphasized that the Task Team should also be the functional unit to which information from the different international biological programmes should be directed, and advised that the Task Team should work in close contact with SCAR and the ICES Working Group on Marine Data Management.

66 The SCAR Representative proposed the invitation of an IODE representative to a Workshop planned at the Biomass Data Centre.

67 The Committee thanked the SCAR Representative for this kind invitation and requested the Secretary IOC to make the necessary arrangements.

3.3 GEOLOGICAL AND GEOPHYSICAL DATA MANAGEMENT AND THE IOC PROGRAMME ON OCEAN SCIENCE IN RELATION TO NON-LIVING RESOURCES (OSNLR)

68 The Chairman of the Task Team on Exchange of Marine Geological and Geophysical Data reported substantial progress under all terms of reference with major contributions to the work of the Task Team from members in Japan, UK, Thailand and China, from GEBCO Officers and from the Secretariat of CCOP/SOPAC (Document IOC/IODE-XII/17).

69 The Chairman of the GEBCO Sub-Committee on Digital Bathymetry presented a report on the work of the Sub-Committee and highlighted a number of activities relevant to IODE. The Bureau Gravimetrique Internationale, Toulouse is preparing a digitized version of the bathymetric contours of the GEBCO charts (5th Edition). It is anticipated that by the spring 1987 a magnetic tape will be available in GF3 format covering the five southern sheets around the Antarctic. Work will then commence on preparing the digitized contours for the Atlantic Ocean. In close collaboration with the Group of Experts on Format Development, and the Task Team Exchange of Marine Geological and Geophysical Data, the Sub-Committee has developed a number of GF3 subsets dealing with digital bathymetry e.g., underway magnetics, gravity and bathymetry data, multibeam echosounding data and digital bathymetric contours. As magnetic field and gravity data are often collected simultaneously with echosounder data, it is recommended that these data be stored together with the bathymetric and navigation data. It is anticipated that a decision on the establishment of an international centre for digital bathymetry will be made at the next Conference of the IHO in May 1987.

70 The representative of the IHO pointed out the value of digital bathymetric data in planning and carrying out ocean research. He reported on IHO work on suitable exchange formats for digital hydrographic data, the production of GEBCO charts and the concept of the electronic chart.

71 The Permanent Secretary for GEBCO reported substantial progress in the digitization of contours from GEBCO charts from the Southern Oceans and in providing some of these digital contours to the Alfred Wegener Institute for Polar Research, FRG for use aboard their Antarctic research ship POLAR STERN during its next cruise.

72 The Director of the WDC-A for Marine Geology and Geophysics (WDC-A,MGG) delivered his report of activities of the center during the intersessional period (Document IOC/IODE-XII/18). During the intersessional period WDC-A, MGG had enjoyed major growth of data bases and an expansion of data exchange. Holdings in marine geophysics had increased by almost 25% and in marine geology by 10%. New exchange with Canada, China, France, Japan, New Zealand, UK, USSR was noted. The Director reported major progress in development of a digital boundary file to facilitate searches for data from regions with complex boundaries. Work on marine minerals data bases and bibliographies now includes information for manganese modules and crusts, polymetallic sulfides, phosphorites and placers/heavy minerals. The Director announced the availability of a new worldwide gridded bathymetric data set at a spacing of 5-minutes of latitude and longitude. Publications currently available from WDC-A, MGG now number two with number three in the series expected within the next few months. This series of publications provides a new mechanism for disseminating summary data and products of general interest to marine geoscientists.

73 The Director of the Center of Marine Geological Survey Data (CMGD) of Soviet Union, reported active use within his country of data from the Deep Sea Drilling Project and substantial work with GF3 for marine geological and geophysical data. The Center carries out research and applied activities in the field of data collection, computer processing, archiving and dissemination of the results of the geological and geophysical observations from the World Ocean. Procedures and software for data base compilation and data processing have been developed.

74 To support international data exchange, a GF3 subset for recording marine geological and geophysical data and software for checking GF3 formatted data have also been developed. A booklet entitled "Control of Marine Geological and Geophysical Data Recorded in the International Format" (1986) has been prepared and published and copies were distributed among the IODE-XII participants.

75 The Committee welcomed the plans for the future of WDC-A, MGG which include expansion of exchange activities, greater participation in major international projects, expansion of the use of GF3, including installation of GF3-Proc, and greater utilization of services available from the Centre.

76 The Representative of the UN(OETB) informed the Committee that plans to up-date the seabed minerals component of the marine minerals data base of the UN and to expand the data base to include nearshore hard minerals data had been stalled for the past one and a half years mainly because of the financial restrictions at the United Nations. In view of this delay and of the capabilities of WDC-A, MGG, his Office would have to carefully review its role as a disseminator of marine minerals data. He also noted that his office was working closely with the Canadian Department of Energy, Mines and Resources and the IOC in organizing the ICOD funded training course on non-fuel minerals, which would include a prominent data component.

77 The Committee thanked the Chairman of the Task Team for his work and noted that further actions should be taken to increase

co-operation between all international agencies involved in geological and geophysical data management. The Committee expressed its thanks to the international agencies present at the session for their good will and colaboration with the IODE in geological and geophysical data management. The Committee recommended that necessary measures should be taken to facilitate the exchange of data on marine geology and geophysics between the WDCs and requested the Chairman of the Task Team to consider this issue carefully.

78 The Committee approved the Report the Chairman of the Task Team and decided to continue the work of the Task Team with Revised Terms of Reference. The Committee adopted Resolution IODE-XII.3.

3.4 DATA MANAGEMENT AND PRODUCT PREPARATION REQUIREMENTS OF GIPME AND MARPOLMON

79 Speaking on behalf of the Chairman of the Task Team on Marine Pollution Data the National Representative of the Netherlands, Mr. P. Geerders, presented a general picture of the marine pollution programme taking into account the recommendations of the Fifth Session of the IOC Working Committee for GIPME (Paris, September, 1986). He noted that techniques and methodologies for acquisition, preservation and storage of samplings and analysis techniques were rapidly improving. The complexity of the issue would certainly have an impact on the involvement of the Working Committee of IODE with this type of data. To obtain a global picture of marine pollution which is one of the objectives of the MARPOLMON programme the development of regional components was proposed.

80 In response to the IOC request, two applications for regional RNODCs for MARPOLMON data were received from Japan for WESTPAC and the USSR for the North Atlantic, Mediterranean and Baltic Seas. A letter of intent to take the responsibility for the Caribbean is expected from the USA.

81 The Committee urged the Secretary IOC to continue efforts to invite other countries to take RNODC-MARPOLMON responsibilities for other regions so as to obtain global coverage. The Committee requested its Chairman to finish the accreditation of the above-mentioned RNODCs-MARPOLMON as soon as possible in accordance with the procedures for accreditation presented in the Guide on RNODCs.

82 The attention of the Committee was drawn to the Recommendations of an Interagency Consultation on Marine Pollution Data Management (September 1986, Copenhagen), organized by IOC, at which an exchange of experiences was made between several international groups and organizations at existing and new marine pollution data centres.

83 The Committee supported the views of the Interagency Consultation and requested its Chairman to take them into account when preparing the plans for intersessional activities.

84 The Committee approved the report of the Chairman of the Task Team.

85 The Committee welcomed the idea of a Joint GIPME-IODE Task Team and proposed the following Terms of Reference:

- Develop, in close conjunction with the effort to redesign the MEDI system, the possibility of using MEDI also for marine pollution data references,

- Investigate, in close collaboration with the relevant bodies, the state-of-the-art in marine pollution analysis and determine if the necessary criteria for baseline studies and trend analysis are fulfilled,

- Maintain, with regard to positive GF3 subsets for specific types of marine pollution, a close contact with the IGES effort on this subject, as well as with other relevant bodies outside the WC-IODE,

- Determine, based upon the results of the foregoing recommendation, which type of marine pollution data are ready for information exchange and work in close contact with the GE on Technical Aspects of Data Exchange to develop specific GF3 subsets.

86 The Committee urged its Chairman to inform the Chairman of the Working Committee for GIPME on the deliberations of the Session on marine pollution data management and recommended the establishment of the Joint GIPME-IODE Task Team in the first half of 1987.

87 The Committee accepted the proposal made by the Soviet Union to develop the GF3 sub-set for petroleum pollution data and to submit this proposal for consideration by the Joint GIPME-IODE Task Team and the Group of Experts on Technical Aspects of Data Exchange.

4. IGOSS-IODE DATA FLOW

88 The National Co-ordinator of the USA informed the Committee of the main outcomes of the Joint IOC-WMO Meeting of Experts on IGOSS-IODE Data Flow held in Tokyo, Japan, 12-16 November 1984. The Meeting came to important conclusions on the ways to the improve existing IGOSS-IODE interface. Terms of Reference of existing Specialized Oceanographic Centres of IDPSS and RNODCs-IGOSS were modified to meet new requirements and the monitoring and reporting procedures of IGOSS-IODE data flow were reviewed. Specific guidelines were developed for the timely submission of IGOSS data to the RNODCs-IGOSS and for the provision of data to secondary users. The Meeting agreed that data sets would be available to users from SOCs within two months of receipt of observations and from RNODCs-IGOSS not later than one month after receipt of data from SOCs, preferably in GF3 format.

89 The Committee noted with satisfaction the progress which has been made on the implementation of the Recommendations of the Meeting, reflected in the increase of IGOSS data in RNODCs-IGOSS. The Committee approved the revised Terms of Reference of RNODCs-IGOSS and requested the Secretary IOC to inform IOC and WMO Member States of this decision.

90 The Committee noted the usefulness of joint meetings of experts drawn from IODE and IGOSS and recommended that this practice should be continued in future to ensure an effective IGOSS-IODE interface.

91 The Representative of WMO introduced the Final Report of the Fourth Session of the Joint IOC-WMO Working Committee for IGOSS (11-20 November 1985, Geneva) and highlighted the main findings of the Session particularly relevant to the IGOSS Data Processing and Services System (IDPSS). He overviewed the status of existing IGOSS data collection and processing centres - NOCs, SOCs and WOCs and paid special attention to the quality control of IGOSS data, preparation of IGOSS products and archiving and exchange of IGOSS data.

92 The Committee concurred with the view of the Joint IOC-WMO Working Committee for IGOSS on the importance of publicizing the availability of existing IGOSS data sets in RNODCs-IGOSS and WDCs-A and B, Oceanography. The Committee welcomed the decision of WDC-A to accept the responsibility for publicizing the availability of existing IGOSS data sets in RNODCs-IGOSS.

93 The Committee expressed its appreciation to Dr. R. Wilson for finalizing the Guide to IGOSS Data Archives and Exchange (BATHY and TESAC). This Guide documents the procedures to be followed in processing and archiving BATHY/TESAC data in the RNODCs for IGOSS and the World Data Centres for Oceanography. It also provides information on IGOSS data collection, data flow and data archival. The Guide has proved to be useful not only for data managers but also for scientists and engineers who wish to use the data and who are not very familiar with the System.

94 The IOC Senior Assistant Secretary informed the Committee that the Draft of the IGOSS Guide on Specialized Oceanographic Centres has been finalized and is now available at the IOC and WMO Secretariats. The Committee thanked the National Co-ordinator of Canada for his generous efforts in the preparation of this document.

95 The Committee noted the decision of the Fourth Session of the Joint Working Committee for IGOSS to nominate an IGOSS-IODE Rapporteur and was pleased to accept the proposal of its Chairman to nominate Mr. G. Withee to serve as IODE-IGOSS Rapporteur. The nomination of the Rapporteurs by the Working Committees on IODE and for IGOSS will certainly be useful to meet increased requirements for IGOSS data and products.

5. REQUIREMENTS OF IOC REGIONAL SUBSIDIARY BODIES (Document IOC/IODE-XII/20)

5.1 IOC SUB-COMMISSION FOR THE CARIBBEAN AND ADJACENT REGIONS (IOCARIBE)

96 The IOC Assistant Secretary informed the Committee of a number of significant developments in the Caribbean that coincided with the Session.

97 The first was the Second Session of the Sub-Commission for IOCARIBE held from 8-13 December 1986 in Havana, Cuba. The Session made a general review of marine information needs in the region and encouraged the development and use of the IODE System in the area. In

order to assist with the discussions on ASFIS and with the identification of possible regional co-operation in marine information management an expert from Mexico was attending the Session.

98 The second development was a recently concluded expert mission, supported by IOC as a part of the Caribbean Scientific and Technical Information Network (CARSTIN) project, to promote implementation of the IODE System and ASFIS within selected anglophone Caribbean island states, using a network centred on the Institute of Marine Affairs, Port-of-Spain, Trinidad.

99 Thirdly, both the University of Miami and the International Association of Marine Science Libraries and Information Centres have plans to set up networks for marine science information in the region.

100 The Committee noted that the number of different initiatives in this region for ocean data and marine information management made co-ordination most essential and called on the Secretary IOC to continue efforts to this end and to encourage Member States to use IODE and ASFIS standards and methods throughout the Region.

101 The Committee reviewed the RNODC activities in the Caribbean. In spite of the efforts of the IOC Secretariat the submission of data to the RNODC-IOCARIBE was very low. The Committee recalled that the US had been designated as an interim RNODC-IOCARIBE with the hope that Member States of the region would be able to house a permanent RNODC-IOCARIBE. To this date only Trinidad and Tobago had expressed interest and readiness to study the possibility of undertaking this task. The Head of RNODC-IOCARIBE informed the Committee of real progress in the area of pollution data exchange in co-operation with the countries of the region.

102 The Committee considered that in view of the lack of activity other than with pollution data, the interim RNODC-IOCARIBE should be discontinued and welcomed the plans of the USA to seek accreditation for the operation of an RNODC-CARIPOL (see also Agenda Item 3.4).

5.2 IOC PROGRAMME GROUP FOR THE WESTERN PACIFIC (WESTPAC)

103 The IOC Assistant Secretary drew the Committees' attention to the report of RNODC-WESTPAC, which has continued to function actively (Document IOC/IODE-XII/10).

104 The Committee noted with concern that in spite of numerous efforts by the Head of the RNODC and the IOC Secretariat not much improvement had been observed in data submission to the RNODC and requested the Secretary IOC to bring this problem to the attention of the IOC Governing Bodies. The Committee reiterated the view of its last Session that the RNODC-WESTPAC should consider ways to improve the transfer of data from scientists to the RNODC-WESTPAC and to WDCs.

105 The Committee noted with interest the establishment of a national regional data bank for the Indian and Pacific Oceans within the Far East Scientific Research Institute of Automation and Process Control of the USSR Academy of Sciences to store the large volume of historical data which is used to plan the scientific objectives and the

logistics of Soviet expeditions. A relational database management system and a variety of software packages for oceanographic data processing and presentation are in use and data can be exchanged in GF3.

106 The Committee was informed that in 1984-1985 the field-phase of the bilateral Indonesian-Dutch Snelius II Expedition took place. It is expected that this research project will provide the opportunity to assist Indonesia in managing ocean data following IODE guidelines. A special session on data and information management is planned at a Scientific Symposium on the Snellius II results, to be held in Jakarta, late 1987. It has been agreed between the participants of this project that, six months after this Symposium, in principle, all data of the expedition will be made available to the IODE system for internatinal exchange.

107 The Committee noted an increased interest in Indonesia in oceanographic data and information management and recommended the Secretary IOC to assist the country if requested in the establishment of the necessary infrastructure.

108 The Committee noted the growth of the marine information management in the ASEAN region with individual fisheries information systems, based on ASFIS methodologies, in Indonesia, Malaysia, the Philipines and Thailand linked to the South East Asian Fisheries Information System (SEAFIS) at the South East Asian Fisheries Development Center (SEAFDEC), Bangkok, which will provide ASFA input.

109 The Committee stressed the importance of the links between these systems and ASFIS and requested the Secretary IOC to act as necessary to develop these links further.

5.3 IOC AND CO-OPERATIVE INVESTIGATION OF THE INDIAN OCEAN (IOCINCWIO AND IOCINDIO)

110 The Committee was informed of the Regional Workshop on Handling and Dissemination of Oceanographic Information and Data held at NIO, Goa, India, 17-21 March 1986, attended by 20 data and information specialists from the region. At the workshop both the IODE system and ASFIS were presented and the needs and opportunities for further developments of data and information systems were discussed.

111 The Committee noted that as a result of the IOC-Unesco project at NIO, the Indian NODC was now well-established and the project would now be concentrating on building up the bibliographic information handling ability of NIO so that it would become an ASFA input centre and provide enhanced information services to the region.

112 The Committee noted with interest that a Joint UNEP-ROPME Workshop on Marine Data and Information Management will be held on 11-14 January 1987 in Kuwait for countries of that region and that the Delegate of the Netherlands had been invited by the organizers to present the activities of IODE.

113 The Committee supported the conclusion of the IOC-Unesco Workshop on Regional Co-operation in Marine Science in the Central

Indian Ocean and Adjacent Seas and Gulfs (Colombo, Sri Lanka, 8-13 July) that the establishment of NODCs would be of high benefit for the region, and that a need exists to assist institutions in building up their libraries and information/documentation services and to promote the regional exchange of information and documents.

114 The Committee recommended that to promote awareness of IODE activities and to assess the needs for infrastructure development and the possibilities for regional co-operation, an IODE mission be planned to the region.

5.4 IOC PROGRAMME GROUP FOR THE SOUTHERN OCEANS (SOC)

115 The IOC Senior Assistant Secretary informed the Committee about the activities of the IOC Programme Group for SOC since March 1983 when the Fourth Session of the Programme Group was held in Paris. He recalled the discussions held during the Eleventh Session of the Working Committee relevant to this Item and the deliberations of the SOC ad hoc Task Team on Data Management connected with the need and Terms of Reference for an RNODC(s) in the region.

116 The Chairman of the Working Committee then drew the attention of the Committee to the discussions he had held with the Chairman of the Programme Group, Prof. D. Sahrhage, on the assistance IODE can provide for the successful implementation of research and monitoring activities in the region. He reported that from the point of view of the Chairman of the Programme Group, although there are two data centers collecting data from the Southern Oceans: one in Cambridge, UK, for Biomass data and another one in Hobart, Australia, for CCAMLR data, neither of them are handling physical and chemical oceanographic data. The Committee agreed that there is an urgent need for a centre to close this gap.

117 The Delegate of Argentina reminded the Committee of the long-standing offer of his country to become an RNODC for Southern Oceans with the responsibility of managing classical oceanographic data. He reiterated the interest of his country in taking on this task. The members of the IOC Mission on IGOSS and IODE matters, who visited the NODC in Argentina in October 1986 presented a favourable view on the readiness of the NODC to take on an RNODC responsibility in a most efficient manner.

118 The Committee concurred with the view of the Mission and recommmended that the RNODC for Southern Oceans should be established in Argentina in accordance with existing procedures for the accreditation of an RNODC. The Committee agreed not to limit at present the responsibility of the Center to a particular geographical area or data types within the Southern Ocean. However, if new offers are submitted to the Committee to become an RNODC-SOC for specific geographical areas or data types the Committee may re-examine the area of responsibility of the RNODC-SOC in Argentina.

119 The Committee adopted Recommendation IODE-XII.1 which contains Terms of Reference for the newly-established RNODC. Noting that the next Session of the Programme Group for SOC will be held in June, 1987 the Committee requested its Chairman and the Secretary IOC to bring this decision to the attention of the Programme Group and to urge the Programme Group to review carefully the Proposed Terms of Reference.

5.5 MEDITERRANEAN ALPINE EXPERIMENT (MEDALPEX) AND FUTURE DEVELOPMENT

120 The IOC Senior Assistant Secretary informed the Committee on the scientific programmes which have been, are being and will be implemented in the Mediterranean Sea, paying special attention to the activities provided by or related to IODE.

121 MEDALPEX was an oceanographic experiment which took place from 1 September 1981 to 30 September 1982. National contributions to MEDALPEX were provided by 7 IOC Member States. Two RNODCs were established to handle oceanographic data, one in the Soviet Union for physical and chemical data, and the other in the UK for sea level data. Reports of these centers were presented for discussion (Document IOC/IODE-XII/10).

122 As of the middle of 1986 RNODC-MEDALPEX in the Soviet Union had compiled and transferred on to magnetic tape in GF3 the data resulting from 2000 oceanographic stations. Six issues of data reports had been published and distributed among participating countries. All data had been checked for the confidence limits of the measured parameters and there were no reservations as to the quality of the submitted data. Due to the fact that part of the data from France, Italy and Spain is still missing the Head of the RNODC-MEDALPEX expressed readiness to continue the RNODC's activities in order to supplement the MEDALPEX database with missing data, to issue a Supplement to the Catalogue and to distribute it among the participants.

123 The Representative of the RNODC-MEDALPEX for sea level data informed the Committee that the total amount of data acccumulated by the RNODC is approximately 22 site years. Data have been received from 29 sites of which about 80% cover the entire period of the experiment. The data submitted to the RNODC have in general been of good quality. The data series have been translated to a common format and plotted in the form of a time series plot for each site; the data cycles have been screened and the series header-information has been checked for irregularities and inconsistencies. Thirty copies of the data report have been distributed and services provided upon request. Data products include a data report which was presented at the IOC Workshop on the results of MEDALPEX and Future Oceanographic Programmes in the Western Mediterranean (Venice, Italy, 23-25 October 1985), and a magnetic tape of the data in GF3.

124 The Committee appreciated the efforts of the RNODCs in support of the objective of MEDALPEX and the co-operation of the Member States in data submission. However, the Committee decided to maintain the RNODC-MEDALPEX to the end of 1987 with the aim of obtaining a complete set of the MEDALPEX oceanographic data. The Committee urged the national co-ordinators for IODE from France, Spain and Italy to take urgent steps in order to complete the preparation and submission of oceanographic and marine meteorological datasets before the middle of of 1987.

125 The Committee reiterated the importance of keeping strictly to the schedule of data submission. The Committee agreed to terminate the activities of the RNODC-MEDALPEX for sea level data in view of the completion of its Terms of Responsibility and the submission of the sea level data tape in GF3 to WDCs-A and B, Oceanography.

The Committee was then presented with information on the objectives and the status of implementation of the research programme Physical Oceanography of the Eastern Mediterranean (POEM) which has been in course of implementation since 1985. Although it is a multi-national/institutional not an international programme IOC is providing substantial support to this scientific experiment. Among other supporting activities the IOC mission on IGOSS-IODE matters to a few eastern Mediterranean countries was described. An objective of the mission was to promote the participation of Member States of the region in IGOSS and IODE systems, to identify existing and operational problems and to recommend ways to improve the systems in the countries visited so as to respond to global and regional needs. *126*

The Committee recommended that the rules and procedures of IODE should be followed by POEM participants as far as possible and welcomed the decisions of the POEM Steering Committee Meeting (Paris, June 1985) to use the GF3 format in formatting the POEM field data and to use the ROSCOP questionnaires for the exchange of general information on the work carried out on each cruise. *127*

The Committee supported the request of the Steering Committee that training in GF3 should be arranged for experts from POEM participating countries and requested the Secretary IOC to make the necessary arrangements. The Committee welcomed the readiness of the Soviet Union to convert its RNODC-CIM, the activities of which the Committee agreed to terminate (see Agenda Item 6.2), to support POEM thus taking advantage of the present infrastructure. *128*

The Committee recommended the Secretary IOC to pass this offer to the POEM Steering Committee for information. The Committee noted the request to the PSMSL from POEM to carry out the task of POEM sea level data management and the problems relevant to the implementation of this request. The Committee recommended the Secretary IOC jointly with the Head of PSMSL to study these problems and to find an acceptable solution. *129*

The Delegates from Greece and Turkey stressed the importance of the IGOSS-IODE Mission for the development of the relevant marine infrastructures in their countries. *130*

The Committee expressed thanks to the Members of the IGOSS-IODE mission, noted with appreciation the immediate follow-up of the mission, e.g., the establishment of an NODC in Greece, the nomination of IODE Co-ordinators and IGOSS National Representatives, and recommended the circulation of the Mission Report to potential donor countries so as to give an opportunity to mobilize their support for the implementation of the recommendations contained in the Report. *131*

5.6 JOINT IOC/WMO/CPPS WORKING GROUP ON THE INVESTIGATIONS OF "EL NINO"

The IOC Senior Assistant Secretary introduced the decisions of the Fourth and Fifth Sessions of the Joint IOC-WMO-CPPS Working Group on the Investigations of "El Nino" held in May-June 1984 and in November 1986, respectively. He stressed that the improvement in the exchange of oceanographic and meteorological data among countries of the region was one of the main issues considered by the Working Group. The Working Group had recommended that the countries of the ERFEN *132*

region give high priority to submitting for publication selected sets of oceanographic data according to requirements in the region and to establishing an electronic mail system to facilitate data exchange.

133 The National Co-ordinator for IODE of the United Kingdom reported on the results of the Joint IOC-WMO mission on IGOSS and IODE Matters to the South Eastern Pacific countries which took place in April-May 1984. He felt that this Mission was exceptionaly successful because of the high level of interest shown by all countries visited. The Committee emphasized that the implementation of the Recommendations of the Mission will imply substantial resources and improved co-operation.

134 The Committee supported the Recommendation of the Working Group on the Investigations of "El Nino" to use the conclusions of the Mission as the guidelines for the improvement of the oceanographic data management system in the region. Noting the view of the Working Group on the need for a Regional Data Center the Committee agreed with the Recommendation of the Mission that it would be better to wait a few years until the Member States of the region consolidate their national research and monitoring activities so as not to divert attention from the essential preliminary step of building up national archives. The Committee recommended its Chairman to review the state of implementation of Recommendations contained in the Mission Report jointly with the National Co-ordinator of ERFEN Countries and with the IOC Secretariat.

6. DEVELOPMENT OF THE IODE SYSTEM

6.1 MONITORING OF IODE DATA FLOW

135 The IOC Assembly, at its Thirteenth Session "requested the Working Committee to consider arrangements for improving the monitoring of data flow in the IODE system and for distributing widely the results of such monitoring".

136 The Committee Chairman introduced this topic (Document IOC/IODE-XII/8 Annex 3). He described the present situation and made several proposals for an improved monitoring of data from their collection to their final archiving in the WDCs, Oceanography.

137 The Committee concluded that there are two aspects to the problem. The first aspect is making available information on what is presently available in WDCs. The World Data Centers produce catalogues of their holdings which are updated on a regular basis. There is therefore delayed but good knowledge of the WDC data holdings (see also Agenda Item 2). The second aspect is to inform on data holdings in NODCs and those data which are not available to the WDCs for different reasons. This can be monitored by the timely submission of ROSCOP forms, information on National Oceanographic Programmes and providing inputs to the MEDI Systems.

138 The ICES Hydrographer, who had analysed the problems in the use of the ROSCOP form, examined current experience and prepared a draft proposal for a revised version, presented his report on the revision of the form (Document IOC/IODE-XII/21 Sup. 2).

139 The Committee expressed its thanks to ICES for this activity and reiterated the importance of the ROSCOP as the recommended method of notifying the collection of oceanographic data. The Committee agreed that there will be much benefit in a simplified ROSCOP form and thanked the Delegate of India for the offer provide the IODE network with software for ROSCOP form monitoring.

140 The Committee noted that for many years Member States had been urged to complete ROSCOP forms and to forward them to the World Data Centers, Oceanography, without much improvement in submission. The Committee requested the Secretary IOC to bring this matter to the attention of Member States at the highest levels in order to encourage Member States to comply with the agreed procedures for the international exchange of oceanographic data.

141 The Committee established an ad hoc Task Team with the responsibility of completing the revision of the ROSCOP form and of considering the possibility and utility of putting the ROSCOP form online as an inventory which can be searched by all scientists requiring data.

142 The Committee considered the Report of the Chairman of the Task Team on Review of DNP/NOP Announcements (Document IOC/IODE-XII/21). The Committee agreed that it was important to strengthen and simplify the procedures for announcing cruises in advance, and reporting results afterwards. To this effect there would be only one type of advance notification, entitled an NOP Announcement, which should be submitted to the IOC Secretariat well in advance of a cruise. Results of cruises should be reported through ROSCOP immediately after the completion of the cruise. The DNP Announcements would be terminated internationally.

143 The Committee recommended the Secretary IOC to take a lead in offering an electronic bulletin board based on which NOP announcements will be printed and distributed. The printing of the contents of the bulletin board should be on a regular basis. The practice of mailing NOPs to these countries which do not have access to the bulletin board should be continued. Mr. J. Crease of the United Kingdom offered to co-ordinate the implementation of the bulletin board. The Committee recommended further that the Secretary IOC will consider the possibility of providing support to the operations of the electronic bulletin board. The Committee adopted Resolution IODE-XII.4. The Committee decided that the Task Team on Review of DNP/NOP Announcements should be disbanded in view of the completion of the responsibilities identified by its Terms of Reference and thanked the Chairman and Members of the Task Team for their work.

6.2 IMPROVEMENT OF THE RNODC NETWORK TO MEET NEW REQUIREMENTS

144 The Report of the Chairman of the Group of Experts on RNODCs (Document IOC/IODE-XII/11) was considered by the Committee in conjunction with the Summary Report of the Fifth Session of the Group of Experts on RNODCs (15-19 October 1984, Moscow, USSR). During the intersessional period, one of the most important tasks continued to be the translation of requirements from the global programmes such as the World Climate Research Programme, GIPME and regional activities, such as in WESTPAC, IOCARIBE, El Nino and the Southern Oceans, into

meaningful and supporting activities of the RNODCs and the WDC System: two RNODCs, for JASIN (UK) and for Drifting Buoys Data (Canada), have been accredited and RNODCs-MARPOLMON for different regions selected. The Guide on RNODCs was amended by adding a new chapter.

145 The Committee thanked the Chairman of the Group for the work implemented and accepted his Report on intersessional activities.

146 The Committee noted that the RNODC-FOY completed the FGGE-FOY Global Ocean Climate Data Base which includes over 10,000 oceanographic hydrocasts, nearly 29,000 upper ocean thermal profiles and 278 months of current meter data. The data base resides on eight magnetic tapes and is recorded in GF3. The RNODC-CIM has completed its work in 1985 by compiling data from 47 cruises carried out by 24 countries participating in CIM. Based on the data collected during the implementation of the programme the Oceanographic Atlas for the Mediterranean Sea was prepared and widely distributed among the participants of the programme. The Atlas contains chapters on physical oceanography, marine biology and marine geology.

147 The Committee noted with satisfaction that the RNODCs for CIM and FOY have fulfilled their obligations and should be disbanded as soon as it is confirmed that the data have been transferred to and received by WDCs-A and B, Oceanography. The Committee requested the Heads of WDCs to inform the IOC Secretariat on the availability of data so that necessary follow up actions could be taken.

148 The Committee stressed the importance of the brochure on RNODCs and requested the Secretary IOC to make necessary arrangements for its preparation and publication in 1987-1988.

149 Now that exchange of computer compatible data has become widely used to build national and international data bases and computer techniques and software have developed the Committee agreed on the need to modify the network of IODE data centers and its concept and to pay more attention to the preparation of products and the extension of the types of services provided by the data centers (Document IOC/IODE-XII/15). The Committee recognized a need for centres which could take the responsibility for preparing products and providing services. It was recognized that the formation of RNODCs must not be dominated exclusively by the needs of the climate programme and that the requirement of other scientific and monitoring programmes must be met. The Committee recommended the continuation of the activities of the Task Team on Development of Data Centre Services with revised Terms of Reference and adopted Resolution IODE-XII.5.

150 The Committee decided to restructure the Group of Experts on RNODCs and to change its Terms of Reference so as to combine the objectives of supporting global research programmes with that of improving the RNODC network. The Group will also be responsible for studying the development of broad band communication between different types of data centers, to provide a facility for on line search of

inventories and for other purposes, taking into account the results of pilot projects on high speed data links which are presently under consideration.

151 The Committee agreed that the new title of the Group of Experts will be the Group of Experts on RNODCs and Climate Data Services. The Committee recommended the Secretary IOC to request Member States to update their nominations to the GE on RNODCs in order to have an up-to-date list of available experts covering the scope defined by the revised Terms of Reference. The Committee adopted Resolution IODE-XII.1 (see also Agenda Item 3.1).

152 The Committee noted the guidelines followed by the WC-GIPME as they are presented in the IOC Manual:

"Membership will consist of up to (authorized number inserted) from a pool of experts, depending on the subjects taken at each session"

and recommended the use of the same practice for IODE Groups of Experts. The Committee requested the National Co-ordinator of the USA to assist the present Chairman of the Group of Experts on RNODCs and the Secretary IOC in the selection of experts and the planning for the next meeting. The Committee noted that the Group of Experts will elect a new Chairman at its next session.

153 The Committee recognized it was essential for the Group to meet at an early date to ensure the successful implementation of its new work programme and requested the Secretary IOC to arrange for a Session of the Group to be held the first half of 1987. The Committee welcomed the offer of the UK to host this Session probably in conjunction with a Meeting of the WOCE Scientific Steering Group.

154 Under this Agenda Item the Committee considered also (Document IOC/IODE-XII/8 Annex 7) on the management of large data sets, and a list of outstanding data types requiring improved data management. These data types have been identified from documents and meetings in which experts have stated the requirements for specialized data management, and have usually requested that IODE should accept the responsibility. The Committee requested the Group of Experts on RNODC and Climate Data Services to take into account these papers when formulating the agenda of the future meeting of the Group.

155 The Committee welcomed the offer made by the Soviet Union to provide developing countries with the following services and products based on agreed upon procedures:

- development of the technology for data collection and writing on technical carriers for Member States without an NODC or DNA;
- establishment of project or model oriented data bases;
- development of the software for statistical analysis;
- fulfillment of statistical analysis;

- preparation of climatic descriptions of selected areas of the World Ocean and ship routes, etc.

156 The Committee recognised the need for a data expert to progress the activities of RNODCs, to support the Data Information Unit of WOCE, and to assist in monitoring the flow of data through NODCs. The Committee recommended that IOC Member States consider seconding such an expert to be located in a place where global communications and data management facilities can be used to assist in the important monitoring and data tracking activities. IOC may be considered as a possible site.

6.3 FORMAT DEVELOPMENT AND ADAPTING IODE TO DEVELOPMENTS OF COMPUTERS AND COMMUNICATION TECHNOLOGIES

157 In presenting the Summary Report of Third Session of the Group of Experts on Format Development held 16-20 September 1985, ICES, Copenhagen and the intersessional report, the Chairman of the Group of Experts emphasized the many positive results achieved including the approval of GF3 subsets for digitized contour charts and for IGOSS BATHY/TESAC data (Document IOC/IODE-XII/12).

158 Work is nearing completion on further subsets for sea level data, XBT data , multi-beam echo-sounding data, underway geophysics data, moored thermistor chain data, directional wave spectra and water bottle data. The necessary subsets for the TOGA Subsurface Data Centre will be defined in time to allow data transfer to start on 1 July 1987 as planned.

159 The Committee noted the increase in the number of laboratories and data centres able to process data in GF3 and in the now-widespread use of the format for both data exchange and for data archiving on both magnetic tape and magnetic disk devices.

160 The Committee noted with satisfaction the publication of the GF3 brochure and the work now in progress to prepare a revised series of GF3 documentation under the overall title IOC Manuals and Guides No. 17, GF3 - A General Formatting System for Geo-Referenced Data. This series of volumes would provide up-to-date information in a comprehensible and attractive form to help those working both in oceanography and in related sciences to use GF3 and the GF3-Proc software package. Camera ready copy for Volume 2, Technical Description of the GF3 Format and Code Tables, is being prepared with contractual support from the IOC and publication is expected during mid-87. Volume 3 covering the standard subsets of GF3 will be prepared in the first half of 1987 with a planned publication data in the summer 1987. A similar schedule is envisaged for Volume 1 - Introductory Guide to the GF3 Formatting System.

161 The Committee requested the Secretary IOC to make appropriate financial provision for the preparation and publication of these volumes. Volumes 4 and 5, the Users Guide and the Reference Manual for the GF3-Proc software, are already available in draft form but their publication is being deferred pending enhancement of the GF3-Proc software so as to be fully compatible with Fortran 77.

162 The Committee supported this publication programme.

163 The Committee expressed its appreciation to Argentina for translating the GF3-Proc Manuals into Spanish and to the experts from the UK Marine Information and Advisory Service (MIAS) for their excellent work in the technical development of GF3 and the GF3-Proc software package. The Committee thanked the UK for the committment, initially for 5 years, to assist the RNODC (Formats) by the provision of technical support and advice on the use of GF3.

164 The Committee was informed that in the pilot phase of distribution of the GF3-Proc software package, the NODCs of Canada, France, FRG, USA and USSR had successfully implemented and tested the package and that a copy of the software had recently been delivered to Argentina. About 15 other laboratories had also received the package which was now successfully operating on about 10 different computer systems.

165 The Delegate of the UK explained that use of the Fortran 1977 language standard was now near-universal and that a version of GF3-Proc using the full facilities of Fortran 77 would be both easier to install on different types of computer system and would use substantially less main memory, a important factor in using the package on micro and super-micro computer systems. The UK planned to develop such a Fortran 77 version incorporating a few other improvements during 1987. It was emphasized that this version would maintain compatibility with the user interface provided in the Fortran 1966 version.

166 The Committee welcomed the renewed offers by Argentina and the USSR to hold training courses on the use of GF3 and recommended that in view of the software development planned for 1987, these courses should be planned for 1988. The Delegate of the UK indicated the willingness of his country to provide the necessary technical support for these courses.

167 The Committee approved the Report of the Chairman of the Group of Experts on Format Development and thanked the Chairman and the former Chairman for their efforts.

168 The Committee recognized the need to use the opportunities provided by high-speed data communications such as the experimental SPAN-OCEAN network, and by other new computing equipment and methods, to improve exchange and archiving of data files and inventory data within the IODE system.

169 The Committee, noting the widespread use of personal computers among marine scientists in some countries, recognized that this situation both required the adaptation of data submission and data service methods and presented the possibility of new user services (Document IOC/IODE-XII/8 Annex 6).

170 The Committee emphasized that magnetic tape would continue to dominate as the medium for international data exchange and that GF3 will play an important role in oceanographic data management for many years to come.

171 The Committee also noted that use of micro-computers to hold databanks from small marine science projects, for example, coastal resource management or marine pollution studies particularly in developing counties. Although those projects employ a different style of computing using proprietary microcomputer database software, they should benefit from the experience of the IODE community in such matters as standardization of units and series identifiers, storage of documentation, use of quality flags, etc., and that the data from these sources should be fed in to the IODE system.

172 In order to address these issues the Committee decided to broaden the scope of the Group of Experts on Format Development to cover other technical aspects of data exchange and to change its name and terms of reference accordingly. The Committee adopted Resolution IODE-XII.6.

173 The Committee agreed that one session of the Group of Experts on Technical Aspects of Data Exchange should be held during the intersessional period preferably in 1988 and noted with appreciation the invitation to hold this at MEDS, Ottawa, Canada.

174 The Committee agreed that membership would be determined in accordance with the guidelines as quoted under Agenda Item 6.2.

175 In order to prepare for the expanded scope of activities of the Group of Experts, the Committee recommended that a small workshop be held in late 1987 to review the potential application of modern computer technology and telecommunications to the management, exchange and user servicing of oceanographic data. The following provisional list of topics was proposed:

- electronic mail,
- file transfer using networks, particularly for the submission of data to analysis/data centres,
- remote access to computerized inventories,
- storage technology (e.g., optical disc, CD-ROM, laser magnetic devices),
- gateways between networks and a summary of existing and planned network capability,
- telecommunicated graphics,
- access to new systems by developing countries.

176 The Committee agreed that attendance at the Workshop would be decided upon by the Chairman of the Group of Experts in consultation with the IOC Secretariat. The Delegate of the USA announced a tentative offer to host the Workshop.

6.4 MANAGEMENT AND EXCHANGE OF AIRBORNE AND SATELLITE REMOTELY SENSED OCEANOGRAPHIC DATA

177 The Chairman of the Task Team on Management and Exchange of Airborne and Satellite Remotely Sensed Data reported on its activities, noting that the Task Team has worked to distribute information on relevant remote sensing operations to the IODE community (Document IOC/IODE-XII/22), and on the incorporation of remotely sensed data in the IODE system. The Chairman of the Task Team illustrated how GF3 can be used effectively to hold data both from non-imaging sensors (like altimeters) and from imaging sensors (like thermal infrared scanners). He described the need to persuade satellite operators to co-ordinate their plans e.g., to have complementary orbit patterns, and to provide compatible data to oceanographers.

178 The Committee noted that the production of Sea Surface Temperature (SST) data is sufficiently advanced for co-ordination to be required and requested the Secretary IOC to consider holding an IOC Workshop on satellite derived SST data in 1987-1988 where representatives of organizations producing such data could exchange information on their processing algorithms and products.

179 The Committee recommended that whenever possible NODCs should establish co-operation with national remote sensing centres. A high priority for co-operation is the provision of *in situ* quality controlled oceanographic data for calibration of satellite sensors in the few months immediately after launch.

180 The Committee advised NODCs to plan to obtain resources and to implement processing systems in order to receive, process and archive level 2 satellite oceanographic data and to provide data services and produce level 3 data products. It should be noted that although data rates are not excessive, the continuous flow of satellite data makes it essential to thoroughly test all aspects of system operation before the satellites are launched. The Committee was informed of the plans of the NODCs of France, UK, USA and USSR in this regard.

181 The Committee stressed its responsibility to co-ordinate handling of satellite derived oceanographic data in data centres of the IODE system, and to initiate the development of internationally recognized methods and procedures in this field.

182 The Committee believed that GF3 may be appropriate for the exchange and archiving of certain reduced volumes of oceanographic data from remote sensed systems, including both non-imaging and imaging level 2 data and also some level 3 data products. The Committee requested the Task Team to work closely with the Group of Experts on Technical Aspects of Data Exchange to prepare the GF3 subsets needed.

183 The Committee decided to continue the Task Team with a new title and updated Terms of Reference and adopted Resolution IODE-XII.7.

184 In view of the increased importance of remote sensing for IODE the Committee requested the Secretary IOC to organize, possibly in the summer of 1987, an *ad hoc* Consultation of relevant experts to specify immediate actions to be taken by IODE and its subsidiary bodies within the framework of the Terms of Reference of the Task Team.

185 The Committee noted with appreication the offer of Argentina to host a training course on the use of Remote Sensing in oceanogrpahic applications for Member States of South and Central America, and requested the Secretary IOC to mobilize support for the organization of such a training course in 1988.

6.5 MANAGEMENT AND EXCHANGE OF DATA FROM NEW TYPES OF SEA AND SHORE BASED SENSORS

186 The Committee noted the overall requirements in this field contained in the Report on Oceanographic Data Management in the Framework of IGOSS and IODE, submitted by the Chairman of the Committee and the IOC Secretariat.

187 Introducing his Report, the Chairman of the Task Team on Measured Wave Data (Document IOC/IODE-XII/23) informed the Committee that the "User Guide for the Exchange of Measured Wave Data" was ready for publication and that it would hopefully be published by the IOC in time for the Fourteenth Session of the IOC Assembly in March 1987. The Committee was informed that a draft of a GF3 Subset for directional wave data had also been completed and passed to the Group of Experts on Format Development. The Committee expressed appreciation for the work of MEDS, Canada in support of the Task Team.

188 The Task Team had defined a need to identify present and proposed satellites producing wave data and the resulting data parameters and data volumes. As this question fell within the Terms of Reference of the Task Team on Remotely Sensed Data the Committee decided to refer it to the Task Team and discharge the Task Team on Measured Wave Data.

189 The Representative of the WMO informed the Committee of major elements in the WMO Wave Programme designed to assist the provision of sea-wave analysis and forecast servcies in WMO Member States. They include:

- preparation of a WMO Catalogue of Numerical Wave Models, to be regularly updated;
- a complete revision of the WMO Guide to Wave Analysis and Forecasting is being prepared;
- starting from 1985 reports of WMO focal points for waves on methods used for wind and wave measurement and on observing network system experiments have been published and are being updated regularly;
- WMO Members States have been encouraged to provide site information input for RNODC-Waves;
- an ad hoc Group of Rapporteurs on Numerical Wave Modelling has been set up.

190 The Director of RNODC-Waves reported (Document IOC/IODE-XII/10) that in order to assist in designing a calibration programme for ERS-1 the RNODC has supplied the quality control experts with copies of the Wave Data Catalogue, catalogues of fixed buoys and platforms and track

charts of research ship movements in past years. The RNODC is ready to supply information needed to plan orbit patterns which will pass directly over the maximum number of in situ sensors.

The RNODC, through the British National Space Centre had acquired precise lists of planned data products from ERS-1 at Level 2. From this the RNODC has developed procedures for receiving, processing and storing all the low-bit-rate data products on waves, and for preparing data products, such as time series for small regions. The RNODC has also made preliminary plans to cope with the data flow which will result from several satelites simultaneously and from swath instruments which will be launched in about 1995. *191*

The Committee expressed its satisfaction with the activities described in the WMO and RNODC-Waves reports and encouraged the continuation of this work. *192*

The Director of RNODC-Drifting Buoys reported (Document IOC/IODE-XII/10) that during the past year the RNODC has received and processed 50,000 to 60,000 reports per month. In October 1986, data was received at the GTS from 224 buoys. The RNODC has implemented the second phase of quality control and will quality check the 1986 data and supply it to the WDCs in April 1987. In 1987 the RNODC will concentrate its efforts on acquiring from service ARGOS and from principal investigators data from the buoys that do not report on the GTS. The Centre will continue to receive and process all DRIBU data flowing on the GTS. *193*

The Secretary CCCO reported the results of a questionnaire sent to drifting buoy users on data submission to RNODC-Drifting Buoys. Thirty-five responses have been received. One reason for non-submission of data was ignorance of RNODC-Drifting Buoys in MEDS. The Committee recognized a need for wider advertisement of the RNODCs. Other reasons for not submitting data include data confidentiality, Service Argos charges (for locating buoys) and the fact that some of the data needed further calibration before submission. Several users would submit data if access to it could be withheld for a period. *194*

The Committee commended RNODC-Drifting buoys for its efforts and requested it and the Joint SCOR-IOC/CCCO to continue to work together to resolve the problems raised. *195*

The Committee noted that the support requirements for the oceanographic components of the WCRP pointed to the need for one or more RNODCs for current measurements, able to act as centres of expertize on the processing, quality control and formatting of the different types of current measurement, including current meters and Sofar floats, on building up current data inventories and measured current data banks and on developing data products. *196*

The Committee recommended that the Secretary IOC, in consultation with the Chairmen of the Committee, and the Joint SCOR-IOC/CCCO should take the necessary actions to prepare and circulate draft Terms of Requirements and to invite offers from IOC Members States to act as an RNODC-Currents following the agreed procedure for the establishment of RNODCs. As an initial response to *197*

this urgent need, the Committee requested the UK data centre to implement its renewed offer to extend the present European Current Meter Inventory to have global coverage and called on the Secretary IOC to give necessary assistance.

198 The Delegate of the UK informed the Committee that his centre was experimenting with the handling of acoustic doppler current profiler data and invited any other centres also considering this problem to share their experience informally.

199 The Committee reviewed a Report on the Banking of Marine Chemical Data (Document IOC/IODE-XII/26), noting that the planned observation of chemical tracers in the WOCE experiment had given a new importance to this topic. The Committee considered that standards for the storage, exchange and archival of this data in the IODE system should be developed in parallel with the work by marine chemists to improve measurement methods, standards and intercalibrations.

200 The Committee agreed that this issue should be addressed through a Rapporteur and requested the Secretary IOC to consider convening an ad hoc Meeting of Experts in marine chemistry.

201 The Committee adopted Resolution IODE-XII.8.

6.6 UNIFIED PROCEDURES FOR QUALITY CONTROL OF OCEANOGRAPHIC DATA

202 The Committee expressed satisfaction with the Report submitted by the NODC of the Soviet Union on the quality control of large oceanographic data sets which are used to meet scientific requirements.

203 The National Co-ordinator for Canada reported on a method of describing the quality of the documentation of data which is beginning to be used in Canada. A quality index is assigned to a data set based on such factors as whether the type of instrument is known, whether there is a recent calibration available for that instrument, and whether the data analysis and quality control procedures used are documented. This index is fairly useful in forming a preliminary assessment of data quality. This does not replace the traditional methods of quality control but rather complements them.

204 The Committee pointed out that the quality control should be an obligatory procedure in data processing without any excuses about the lack of manpower. The quality control must be done before the data move into the international sphere.

205 The Committee stressed the need to have unified procedures for quality control. The Committee agreed in principle with the draft of a Handbook on Algorithms for Quality Control also submitted by the Soviet Union and fully supported the need for the preparation of a Handbook to be developed based on this draft.

206 The Committee noted that the same issue was heavily discussed during Interagency Consultations on Marine Pollution Data Management (September 1986, Copenhagen) and requested that proper reference is made to the results of these Consultations.

207 The Committee decided to establish a Task Team on Oceanographic Data Quality Control. Resolution IODE-XII.9 was adopted.

208 The Committee requested the Task Team on Oceanographic Data Quality Control to finalize the Handbook on Algorithms for Quality Control during the intersessional period.

7. DEVELOPMENT OF MARINE INFORMATION MANAGEMENT

7.1 DEVELOPMENT OF THE MEDI SYSTEM

209 The Committee was informed of the publication and distribution of IOC Manuals and Guides No. 16, the Second Edition of the MEDI Catalogue, further copies of which are available through the IOC Secretariat.

210 Noting that the Remote Sensed data subset of the MEDI Catalogue had not yet been provided, the Committee requested that priority be given to it in view of the rapidly increasing needs for referral information on the remote sensing data of the oceans.

211 The Committee urged the Secretary IOC to issue this special part of the MEDI Catalogue not later than March 1987.

212 The Chairman of the Group of Experts on Marine Information Management introduced the views of the Group's Second Session on this topic.

213 The Committee recognized the strong interest in "information about data" within oceanographic data centres and noted the emergence of new mechanisms such as the US National Aeronautics and Space Administrations Global on Line Data (GOLD) inventory system and the proposed WOCE Data Information Unit that track oceanographic data including satellite data, to meet the growing demand of scientists working on large scale programmes such as the WCRP for this information.

214 The Committee considered that there is a need for an overall data referral system, but that the present MEDI system conceived in the mid-70s does not meet present user demands. MEDI requires major revision to take account of the experiences of developing the system over more than a decade, the growth in the volume and variety of oceanographic data holdings, recent advances in computer technology and the changing requirements of the scientific community.

215 The Delegate of the USA volunteered that his country would undertake a pilot project with the objective of providing an improved Directory of Data Files. The pilot project will focus on data types required by the climate research community in order to meet an immediate need, but the system design may be used for other oceanographic data types. The pilot exercise will investigate user reaction to information input and output presentation in order to achieve a user-friendly design. On completion, the results of the project will be made available to the Committee through the IOC Secretariat.

216 The Delegate of the USSR, noting the need for users to know where information is kept, and to know the characteristics of oceanographic data sets, offered to prepare a model of an inventory with descriptions of the catalogues of the WDCs and RNODCs as well as those of the international referral information systems, related to marine sciences. The inventory is to be updated as new projects and programmes are implemented.

217 The Representative of the WMO informed the Committee of the publication in June 1985 of the first (interim) INFLOCLIMA catalogue of climate-related datasets which would be updated in the future. The total number of data set descriptions in all categories is at present 604 from 139 centres in 82 countries.

218 The Committee welcomed the offers made by the USA and USSR as these studies would provide essential input for the future revision of MEDI.

219 The Committee noted that as the strongest demand for oceanographic data referral services now comes from scientists and data managers, the revised MEDI system should be operated within the framework of the IODE system. The Committee considered that primary responsibility for providing advice on MEDI should be assigned to the Group of Experts on RNODCs and Climate Data Services. The Group of Experts on MIM should continue to provide advice on information service aspects of the system.

220 The Committee adopted Recommendation IODE-XII.2.

7.2 IODE AND THE FAO-IOC-UN(OETB) ASFIS SYSTEM

221 The past Chairman of the Group of Experts on Marine Information Management Dr. J. Watson reviewed current ideas on the future development and expansion of ASFIS noting the importance of preparing suitable project proposals for extrabudgetary funding to support this development (Document IOC/IODE-XII/8 Annex 5).

222 The Representative of the FAO informed the Committee of the steady growth of the ASFA activity noting that the cumulative total of abstracts was now 240,000 produced by the combined efforts of 3 sponsoring UN agencies (FAO, IOC and UN(OETB), with the addition of a fourth, UNEP, now being negotiated) and 11 Member States or regional organizations in collaboration with a commercial publisher. ASFA is available as a printed journal, on magnetic tape, through on-line systems and now on CD-ROM laser compact disk. This last technique offers exciting possibilities, particularly for developing countries as the successful installation of a system in China had proved. The long awaited ASFA Thesaurus has at last been published. The costs of ASFA are increasing and there is some decline in printed product sales. This will demand an increased subsidy from the UN Agencies.

223 The Committee noted with interest a draft proposal submitted by FAO for a new structure for ASFIS and recommended that the sponsors of ASFIS (FAO, IOC, UN(OETB)) continue to study this proposal.

224 The Representative of UN(OETB) reaffirmed the strong support of his organization for ASFIS and stated that despite a difficult budgetary situation, they would continue to meet their present obligations within ASFIS although regrettably they could not expand their activities as had been hoped. He offered to arrange for the preparation and publication of a UN "fact sheet" on ASFIS.

225 The Committee gratefully accepted this offer.

226 The Committee stressed the demand for the ASFIS registers and reference tools, particularly the Institutions Register and the International Directory of Marine Scientists. The Committee noted with appreciation the recent publication by the Peoples Republic of China with support from FAO and Unesco of a supplement to the Third Edition of the International Directory of Marine Scientists listing Chinese Marine Scientists. The Committee urged that priority should also be given to updating the List of Acronyms and Abbreviations as there was a demand for this product for use both in ASFA input centres and within IODE data centres. The Committee requested that in making this revision, the ASFIS sponsoring agencies investigate the particular needs of NODCs and WDCs to ensure that acronyms and abbreviations used in the data management community are covered.

227 The Committee noted that a coherent strategy, adequate resources and a carefully planned and continuing data collection effort are needed to create and maintain these products. The Committee recognized that to produce and run an effective, economic and flexible system for the ASFIS registers would require both professional information design skills and a well-managed operational unit.

228 The Committee considered that collaboration with the FAO remained the most effective approach unless a full-scale operational information unit could be established by IOC, but noted that FAO was also facing an insufficency of resources which was restricting its capabilities to undertake this work.

7.3 OTHER MARINE INFORMATION MANAGEMENT ACTIVITIES

229 The Chairman of the Group of Experts on MIM presented his Report on intersessional activities (Document IOC/IODE-XII/13) and the Summary Report of the Second Session of the Group which had preceded the present Session of the Working Committee for consideration and approval. He highlighted the progress made and presented several ideas for MIM publications which included:

- Annotated bibliography on Marine Information Management,

- Manual on how to establish and maintain a marine information centre,

- Volume of key papers in MIM.

230 The Committee urged the Group of Experts on MIM to determine the requirements for these publications and the work needed to prepare

and publish them as a basis for seeking the necessary resources, noting that they could be considered within the framework of the proposed strategic plan for MIM.

231 The Committee noted with interest that ICLARM is intending to produce a Tropical Fisheries Information Sourcebook. The Committee was informed that possible new serial publications being considered within ASFIS are Marine Technology Contents Tables, a Marine Information Newsletter and a Marine Affairs part of ASFA.

232 The Committee agreed that a world-wide grouping of marine science libraries was desirable following the model of the Intenatinal Association of Agricultural Librarians and Documentalists, but recognized that much time, effort and enthusiasm would be needed to establish it.

233 The Committee recommended that the establishemnt of regional networks be included within the proposed strategic plan for MIM development, but recognized that more than one network model is needed in view of variations from one region to another.

234 The Committee approved the Summary Report and Recommendations of the Second Session of the Group of Experts on Marine Information Management.

235 The Committee reviewed a paper on a New Approach to the Development of a Programme Development Plan for Marine Information Management (Document IOC/IODE-XII 13 Suppl. 1). This pragmatic approach should be commenced through an ad hoc Expert Consultation to be held in 1987 which will act as a "think-tank" for the Plan. The Committee considered that such a plan remains essential to provide a strategy for further advances, to give an overall sense of direction to IOC's MIM activities and to attract extra-budgetary funding.

236 The Committee adopted Recommendation IODE-XII.3.

237 The Chairman of the Group of Experts on MIM outlined the history of the project to produce a Handbook of Marine Scientific and Technological Information Resources (MASTIR) and reported that following the receipt of comments on the draft circulated in February 1986 the consultant had produced a final draft in time for the Session. First reviews of this draft indicate a substantial improvement but comprehensive editing will be required. The new draft will be reviewed by Members of the Group of Experts on MIM. Outstanding committments to provide additional information will be fulfilled before the IOC Assembly.

238 Provided that this review is favourable the Committee agreed that the Handbook should be reproduced cheaply and circulated widely on a trial basis for a period of one year, especially to potential users in developing countries. Following this, a decision on publication should be taken by the Secretary IOC in consultation with the Chairman of the Group of Experts on MIM and with IDRC, Canada who had funded the project.

7.4 ROLE AND PLACE OF MARINE INFORMATION PROGRAMME IN THE IODE SYSTEM

239 The Chairman of the Committee introduced the proposal to change the name of the Committee to reflect its current spectrum of activities which included both data and information management. Several delegates wished to retain the word international in the title and the Committee agreed that the new name be the IOC Working Committee on International Oceanographic Data and Information Exchange. The Committee noted that there would be a proposal before the Fourteenth Session of the IOC Assembly to change the categories of subsidary bodies and Working Committees would be renamed Technical Committees.

240 The Committee did not decide on an acronym but noted that an acronym did not necessarily have to reflect the name exactly and that without this constraint, the same acronym could be used in English, French and Spanish and transliterated into Russian.

241 The Committee adopted Recommendation IODE-XII.4.

8. TRAINING AND MUTUAL ASSISTANCE ACTIVITIES IN MARINE INFORMATION AND DATA MANAGEMENT

242 The Committee agreed that, as recommended by the Chairman, Agenda Item 8 should be taken without Sub-Items. As the Chairman of the Task Team on TEMA had resigned and was not present at the Session, the IOC Assistant Secretary introduced the report of the Task Team on intersessional activities (Document IOC/IODE-XII/24).

243 The Committee noted that three marine information workshops had been supported, the annual WESTPAC data management course at the JODC, Tokyo had continued, individual training in both data and information management had been provided by Argentina, FRG, UK, USA and USSR and three regional missions on oceanographic data management had visited southeastern Pacific, eastern Mediterranean/Black Sea and southwestern Atlantic countries, in each case with positive and constructive results.

244 The Principal of the Leningrad Hydrometeorological Institute informed the Committee on the experience of his Institute in training experts in oceanography and marine meteorology. At present 135 foreign students, including post-graduates from 44 countries are being trained. The training programme includes a course on the usage of computers for data management.

245 The Committee showed concern that despite the efforts made the Task Team had not been active. Following some discussion during which the Senior Assistant Secretary pointed out a need for a contact point within IODE on TEMA matters, the Committee decided to maintain the responsibility of the Vice-Chairman of the Committee for assistance activities and to disband the Task Team. In fulfilling the duties the Vice-Chairman was requested to establish close contacts with the experts from the IOC Regional Bodies responsible for TEMA. The IODE Consultative Meeting will continue to review TEMA activities.

246 The Senior IOC Assistant Secretary described planned future TEMA activities and among them requests for assistance for establishing NODCs received from Ireland, Iraq and Thailand, a request for provision of a Microvax-II type computer system for the NODC planned in Yugoslavia, a training course in oceanographic data management in Japan, a training course in sea level data management in the UK and a summer school in oceanographic data collection and exchange in Turkey.

247 The Chairman of the Group of Experts on MIM introduced the TEMA aspects of the conclusions of the Second Session of the Group and underlined that as publication services are vital to scientific communication and are needed to serve developing country scientists, TEMA support for these services must not be overlooked.

248 Noting that it was not yet known whether all the priority TEMA items for 1987 could be funded, the Committee discussed the problem of obtaining resources for TEMA needs and considered that it was essential to seek more funding including extrabudgetary support.

249 The Committee was informed that both ICOD and IDRC, the relevant Canadian Technical Assistance agencies, take a broad view of information and may be prepared to support suitable projects concerned with data management while continuing their existing support for Marine Information projects. The Observer from ICOD described the positive policy of his organization towards marine information projects but cautioned that ICOD was not able to fund major capital expenditure.

250 The Observer from ICLARM made a plea for support for the provision of marine information to developing countries that really need it to improve the everyday life of their people. She expressed her appreciation to the Members of the Group of Experts on MIM for their genuine concern for developing country problems.

251 The Committee identified a need to provide a training course on data processing methods for oceanographic data management to assist NODCs especially in developing countries to enhance their data processing abilities and a need to define standard data products for different types including the new types of data and to give assistance to NODCs in implementing the computer software needed to produce them.

252 The Committee recommended that the practice of IOC Missions should be continued and scheduled in a planned way, taking into account regional needs.

253 The Committee supported the holding of oceanographic data management courses and requested the Secretary IOC to continue to arrange training visits and fellowships to meet individual needs. The USSR offered to carry out training at first degree and post graduate levels in oceanographic data and information management.

254 The Committee appreciated the readiness of the USSR to train 2-3 experts in the use of GF3 and to provide 2-3 months of training for 2-3 people in oceanographic data and information management.

255 The Committee noted that the proposed Strategic Plan for MIM would cover TEMA issues and recommended that the guidelines provided by

the Group of Experts on Marine Information Management should be followed in any plans for training activities and should be used as input when this element of the Strategic Plan is being formulated.

9. PUBLICATIONS

256 The Committee considered a long list of publications scattered under different Items of the Agenda. Under this Agenda Item the Committee discussed only publications of a general nature within the IODE context.

(i) Popular Brochure on IODE

257 The Committee thanked the National Co-ordinator of the Netherlands for the preparation of the first two drafts of the Brochure and agreed that the final version will be prepared by him jointly with the Chairman and the Vice-Chairman of the Working Committee and experts from the Group of Experts on MIM in consultation with the IOC Secretariat during 1987.

(ii) Manual on Intenational Oceanographic Data Exchange (IOC Manual and Guides No. 9)

258 The Committee noted with concern that the preparation of the revised version of the Manual, the last edition for which was published in 1974, had taken more time than had been envisaged. The Committee noted also that the ICSU Panel on World Data Centers is now making a revision of the Guide to the WDCs and is expecting from the IODE a chapter on oceanographic data management. The Committee appreciated the offer of Canada and UK to provide a draft of the manual by March 1987 to be presented to the coming session of the ICSU Panel on WDCs and a loose-leaf version of the final text which will reflect new tendencies in the development of the IODE system by September 1987. The Committee urged the Secretary IOC to fund an ad hoc Meeting of 3-4 experts to finalize and approve the text, in order to publish the Manual in a final form by the end of 1987. The Committee also requested the Chairman to bring this decision to the attention of the ICSU Panel and to explain to the Panel the reasons for the delay in the publication of the Manual on IODE.

(iii) IODE Handbook

259 The Committee re-emphasized the importance of this document, thanked the IOC Secretariat and requested the continuation of this publication with some modifications. The list of IODE National Co-ordinators and those of experts should include electronic mail identifiers, telex addresses and telephone numbers whenever possible.

(iv) Slide-Tape Presentation

260 Dr. Paul Geerders from the Netherlands presented a set of slides and the accompanying text which after some revision will be recommended for use for advertising the IODE system along the same lines as the ASFIS presentation.

261 The effort made by Dr. Geerders was well received and the Committee recommended that an ad hoc Group should prepare the final version of the set taking into account that the slides should be more IODE oriented and the background of audience considered. The Committee requested its Chairman, Dr. Geerders, and the IOC Secretariat to finalize the preparation of a slide/tape presentation before the IOC Assembly.

(vi) IODE Posters

262 The Committee acknowledged the efforts of the USA and USSR in the preparation of a set of seven posters describing the activities and structure of the IODE system.

10. CO-OPERATION WITH INTERNATIONAL ORGANIZATIONS AND OTHER BODIES IN OCEAN DATA AND INFORMATION MANAGEMENT

263 The Chairman of the Committee presented the views of the Representatives of International Bodies attending the Twelfth Session of the IOC Working Committee who had met prior to the Session to discuss the importance of co-operation and collaboration in the field of oceanographic data and information management.

264 It was stressed that the objectives facing any data management system can only be achieved by joint efforts dominated by the goodwill of everyone concerned.

265 The Committee noted with satisfaction the effective working arrangements existing with a number of other organizations:

- WMO: specially through the extensive joint work on IGOSS and the World Climate Data and Research Programmes;
- FAO: particulary through participation in marine information management;
- UN:(OETB): in the field of marine information management;
- IHO: particularly through participation in the work on digital bathymetry;
- ICES: through close collaboration in format development including the revision of the ROSCOP form;
- UNEP: through co-operation in marine information and marine pollution data management;
- ICSU: through its SCOR, SCAR and its World Data Centres System which is continuing to play an important role in providing a focus for co-operation in data exchange;
- CCOP/SOPAC: through links established with the WDC-A and RNODC-WESTPAC.

266 The Committee expressed its thanks to the funding agencies, such as IDRC, for providing continuous support to implement projects in data and information management.

267 The views of the Representatives of international agencies on the role of the Committee on IODE as a useful and valuable service in oceanographic data management which provides a unique opportunity for co-operation were met with appreciation. The Committee expressed its readiness to continue efforts to strengthen links with international organizations in the fields of its competence so as to respond efficiently to requests for collaboration and assistance coming from international, regional and national sources.

268 The Committee recommended that reports of international organizations for the Working Committee sessions covering co-operative activities with the IODE would be very useful for the improvement of collaboration with these organizations. The Committee emphasized that an intersessional report from ICES would be of special interest.

269 The Committee welcomed the decision of the Interagency Meeting to keep in force the principles of co-operation in ocean data and marine information management between international organizations specified by the First Interagency Meeting on Oceanographic Data and Information Management held in 1984.

270 The Committee recommended the Group of Experts on Technical Aspects of Data Exchange and the Secretary IOC to investigate the possibility of establishing better mechanisms for communications between international organizations, various IOC subsidiary bodies and individual members. Such investigations should include methods by which those communication mechanisms can be funded particularly in developing Member States.

271 The Committee further requested that these investigations cover modern methods of electronic mail (i.e. TELEMAIL and similar networks) and, as a minimum, expansion of availability of Telex terminals in Member State institutions. The Committee expressed the view that the work of the Committee and its subsidiary bodies could be substantially accelerated by use of these modern systems.

11. IODE WORK PLAN FOR THE NEXT INTERSESSIONAL PERIOD

272 The Committee urged its Chairman and Vice-Chairman in consultation with the IOC Secretariat to review the Summary Report and the Resolutions and Recommendations adopted at the Twelfth Session in order to make an Action Plan consistent with the actions proposed for the future activities of the Committee taking into account available resources. After the Action Plan has been made final the IOC Secretariat will distribute it for follow up according to the established procedures.

273 The Committee emphasized the role of NODCs in the effectiveness of the IODE system and considered the ways of making NODCs support the system more actively (Document IOC/IODE-XII/8 Annex 4). The need for assistance by countries to their respective NODC activities was

stressed, especially the need to enhance their capabilities in handling oceanographic data so as to fulfill effectively their international obligations. Only if NODCs have strong and well-equipped facilities can they meet the requests of users for appropriate data products and effectively support global oceanographic programmes. To encourage scientists and data originators to submit data to an NODC, NODCs should have a capability to provide users with good quality controlled data and data products. With more data in hand NODCs could easily increase their participation in international data exchange.

274 It is apparent that the global network of international data transmission in support of the WDCs and international oceanographic programmes will only be successful if all Member States contribute at an appropriate level through the support of their NODC or DNA. It is not reasonable for a small number of countries to request their NODCs or DNAs to devote a large effort to international data management if most other countries do not do so at the same time. It might be practical to consider a form of agreement or protocol or any other mechanism whereby Member States make a committment to increase resources for their NODC or DNA specifically to enable participation in international data exchange.

275 Under this Agenda Item the Committee also considered ways of improving the preparation and conduct of the Session and emphasized the importance of making all working documents available well in advance of the Session. Instead of writing many lengthy documents, key issues and common aspects of problems should be identified, possibly at a Meeting of IODE Officers. This preparatory work should allow for more informed discussions of important IODE matters and may lead to more decisive action.

276 The Committee recommended that IODE Officers and Representatives of international organizations while writing their reports on intersessional activities should include a half page/one page summary including suggested future actions which they would like to be included in the Summary Report of the Committee Session plus the Recommendations and Resolutions which they may wish to put to the Plenary. The Committee itself would only discuss substantive issues, together with the Recommendations and Resolutions.

277 The above procedure would give an opportunity to shorten the Agenda and give time in the Meeting for major policy issues and recommendations. Plenary discussions would be devoted to matters requiring decision not to hearing presentation of reports. Work should be conducted either in ad hoc drafting groups addressing particular items, or in Plenary to accept recommendations. The Committee was of the firm opinion however that the same duration for IODE Sessions as at present would be needed for the Committee to deal effectively with the many issues for which it is responsible.

12. REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE WORKING COMMITTEE ON IODE AND OF RELEVANT RESOLUTIONS OF THE IOC GOVERNING BODIES

278 Following the Recommendations of the IOC Assembly, the Committee reviewed all Resolutions and Recommendations of the IOC Working Committee on IODE as well as the relevant Resolutions of the IOC Governing Bodies with a view to deciding which should be kept in force and which should be considered out of date.

279 Resolution IODE-XII.10 and Recommendation IODE-XII.5 were adopted.

13. ELECTION OF THE CHAIRMAN AND THE VICE-CHAIRMAN

280 Dr. Nicolas Flemming from the United Kingdom was the sole candidate for the Chairmanship and Dr. V.I. Smirnov from the Soviet Union for the Vice-Chairmanship. They were unanimously elected.

14. ADOPTION OF THE SUMMARY REPORT

281 The Committee adopted the Draft Summary Report of the present Session and the Resolutions and Recommendations (Annex II). It instructed the Secretary IOC and the Chairman to make the necessary editorial corrections and improvements in the final version.

15. DATE AND PLACE OF NEXT SESSION

282 The IOC Senior Assistant Secretary introduced this Item. He suggested that the Thirteenth Session of the IOC Working Committee on IODE should take place in the first quarter of 1989 at Unesco Headquarters or at the headquarters of one of the ICSPRO agencies.

283 The Committee supported this proposal and instructed the Secretary IOC when starting the preparation for the next Session to take into account the discussions held at the Session on ways of increasing the effectiveness of the Sessions of the Committee.

16. CLOSURE

284 The Chairman closed the Twelfth Session of the Working Committee on International Oceanographic Data Exchange at 15.00 hrs on 17 December 1986.

285 In closing the Session, the Chairman, Prof. D. Kohnke, thanked all participants for their friendly co-operation and assistance which had contributed so much to the success of this very important Session for IODE. He paid tribute to the Government of the Soviet Union and its State Committee for Hydrometeorology and Control of

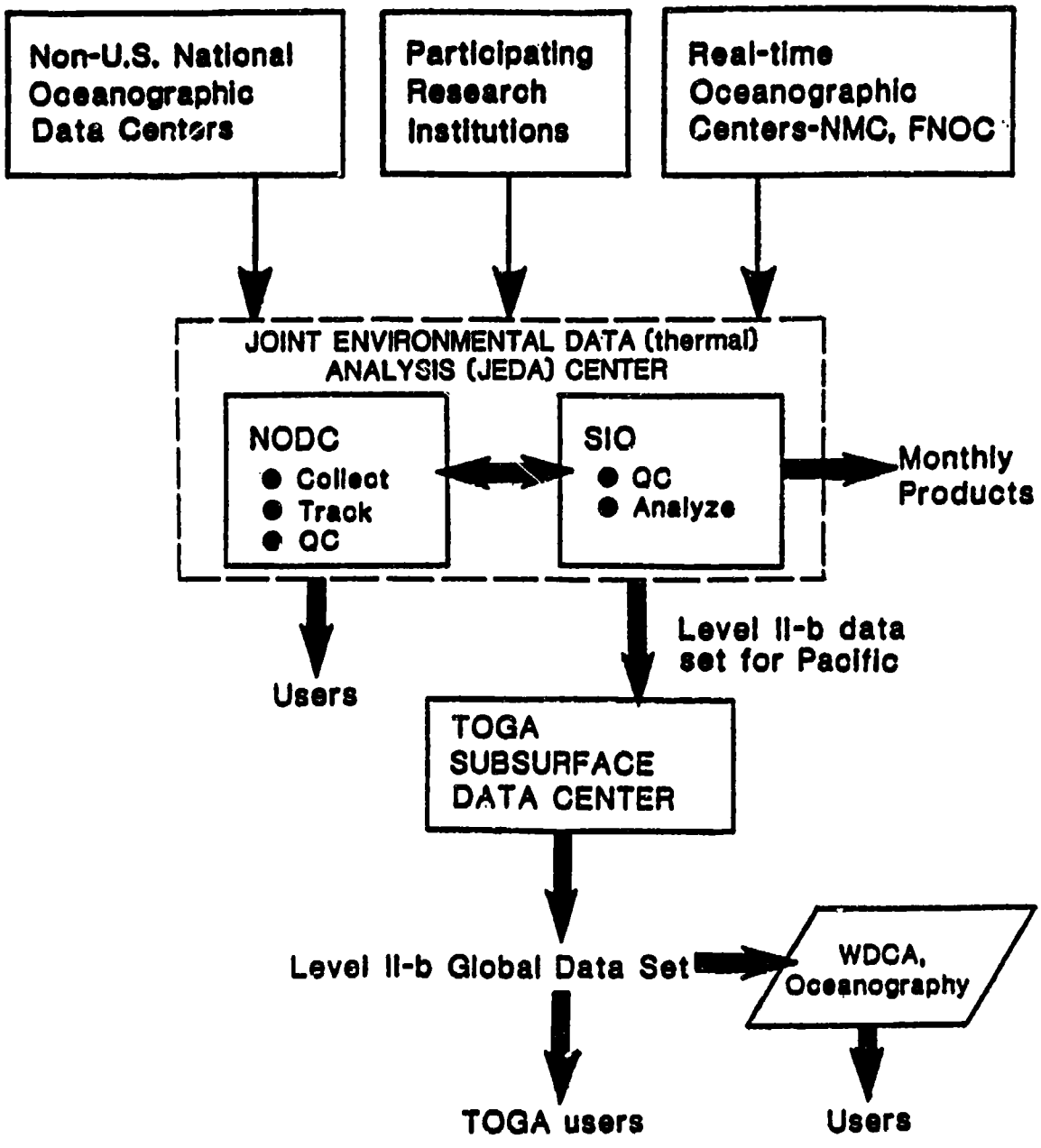
Natural Environment which had arranged the Session. He expressed special pleasure that the Session had been held in a country which had been one of the "founding members" of the IODE and which plays an active role in data and information management. He also thanked the technical staff and the interpreters for their efforts in helping in the smooth running of the Session and for the warm hospitality extended to all participants.

286 As retiring Chairman, Prof. Kohnke was encouraged by the progress that the IODE community was making in meeting the challenges it faced. Much remained to do, but he was confident that under the energetic leadership of the new Chairman and with the spirit of enthusiasm and mutual trust so evident in the Session the IODE system would continue to thrive, growing and adapting to meet the changing needs of scientists and ocean users.

287 In his work with IGOSS he was looking forward to maintaining links with the many friends he had made through IODE.

288 A number of Delegates expressed their thanks to Prof. Kohnke for the firm leadership he had given the Committee during his 5 years as Chairman, for the enthusiasm and hard work he had put into all his many IODE tasks, and not least for the example of friendliness and kindness that he had set.

Pacific TOGA Data Flow



NODC - National Oceanographic Data Center
SIO - Scripps Institution of Oceanography
FNOC - Fleet Numerical Oceanography Center (Navy)
NMC - National Meteorological Center (NOAA)
WDCA - World Data Center A, Oceanography

ANNEX I

AGENDA

1. ORGANIZATION OF THE SESSION
   - 1.1 Opening of the Session
   - 1.2 Designation of the Rapporteurs
   - 1.3 Adoption of the Agenda
   - 1.4 Arrangements for the Session

2. WORK ACCOMPLISHED DURING THE INTERSESSIONAL PERIOD

3. DEVELOPING SERVICES IN SUPPORT OF GLOBAL OCEANOGRAPHIC PROGRAMMES
   - 3.1 IODE Support of the WCRP
   - 3.2 Management of Marine Biological Data to meet the needs of the IOC Programme on Ocean Science in Relation to Living Resources (OSLR)
   - 3.3 Geological and Geophysical Data Management and the IOC Programme on Ocean Science in Relation to Non-Living Resources (OSNLR)
   - 3.4 Data Management and Product Preparation Requirements of GIPME and MARPOLMON

4. IGOSS/IODE DATA FLOW

5. REQUIREMENTS OF IOC REGIONAL SUBSIDIARY BODIES AND EXPERIMENTS
   - 5.1 IOC Sub-Commission for the Caribbean and Adjacent Regions (IOCARIBE)
   - 5.2 IOC Programme Group for the Western Pacific (WESTPAC)
   - 5.3 IOC and Co-operative Investigation of the Indian Ocean (IOCINCWIO and IOCINDIO)
   - 5.4 IOC Programme Group for the Southern Oceans (SOC)
   - 5.5 Mediterranean Alpine Experiment (MEDALPEX) and Future Development
   - 5.6 Joint IOC-WMO-CPPS Working Group on the Investigations of "El Nino"

6. DEVELOPMENT OF THE IODE SYSTEM
   - 6.1 Monitoring of IODE Data Flow
   - 6.2 Improvement of the RNODC Network to meet new Requirements
   - 6.3 Format Development and Adapting IODE to Developments of Computers and Communication Technologies
   - 6.4 Management and Exchange of Airborne and Satellite Remotely Sensed Oceanographic Data
   - 6.5 Management and Exchange of Data and New Types of Sea- and Shore-based Sensors
   - 6.6 Unified Procedures for Quality Control of Oceanographic Data

7. DEVELOPMENT OF MARINE INFORMATION MANAGEMENT
   - 7.1 Development of the MEDI System
   - 7.2 IODE and the FAO-IOC-UN(OETB) ASFIS System
   - 7.3 Other Marine Information Management Activities
   - 7.4 Role and Place of Marine Information Programme in the IODE System

8. TRAINING AND MUTUAL ASSISTANCE ACTIVITIES IN MARINE INFORMATION AND DATA MANAGEMENT

9. PUBLICATIONS

10. CO-OPERATION WITH INTERNATIONAL ORGANIZATIONS AND OTHER BODIES IN OCEAN DATA AND INFORMATION MANAGEMENT

11. IODE WORK PLAN FOR THE NEXT INTERSESSIONAL PERIOD

12. REVIEW OF PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE WORKING COMMITTEE ON IODE AND OF RELEVANT RESOLUTIONS OF THE IOC GOVERNING BODIES

13. ELECTION OF THE CHAIRMAN AND THE VICE-CHAIRMAN

14. ADOPTION OF THE SUMMARY REPORT

15. DATE AND PLACE OF NEXT SESSION

16. CLOSURE

ANNEX II

ADOPTED RESOLUTIONS AND RECOMMENDATIONS

Resolution number	Agenda Item	Title
IODE-XII.1	3.1	Group of Experts on RNODCs and Climate Data Services
IODE-XII.2	3.2	Biological Data Management
IODE-XII.3	3.3	Exchange of Marine Geological and Geophysical Data
IODE-XII.4	6.1	Termination of DNP Announcements
IODE-XII.5	6.2	Development of the IODE Data Centre Services
IODE-XII.6	6.3	Group of Experts on Technical Aspects of Data Exchange
IODE-XII.7	6.4	Remotely Sensed Data Management
IODE-XII.8	6.5	Banking of Marine Chemical Data
IODE-XII.9	6.6	Oceanographic Data Quality Control
IODE-XII.10	12.	Review of the Previous Resolutions and Recomendations of the IOC Working Committee on IODE

Recommendation Number	Agenda Item	Title
IODE-XII.1	5.4	RNODC - Southern Ocean (SOC)
IODE-XII.2	7.1	Revision of MEDI
IODE-XII.3	7.3	IOC Role in Marine Information Management
IODE-XII.4	7.4	Title of the Working Committee
IODE-XII.5	12.	Review of Previous Resolutions of the IOC Executive Councils Relevant to the Field of Activity of the Working Committee on IODE

Resolution IODE-XII.1

GROUP OF EXPERTS ON RNODCs AND CLIMATE DATA SERVICES

The Working Committee on International Oceanographic Data Exchange,

Recognizing that the Group of Experts on RNODCs has done an excellent job of defining the procedures to establish RNODCs and in establishing a firm foundation for the RNODCs concept,

Recognizing further that the future work of this Group should be concerned with a review of existing RNODCs and with activities to meet the requirements of new programmes,

Being aware of the concern expressed by the Joint SCOR-IOC/CCCO that there be an effective data management strategy for the WOCE and TOGA programmes involving close interaction between data centres and scientists and its wish to use existing arrangements whenever practical and effective,

Decides to rename the Group of Experts on RNODCs as the Group of Experts on RNODCs and Climate Data Services and revise the Terms of Reference in order to reflect the particular emphasis needed at this time on activities related to climate services:

- Establish RNODCs as necessary to meet IODE responsibilities in accordance with the Guidelines specified in the IOC Guide on RNODCs (IOC Manual and Guides No. 9 Annex 2);

- Develop and implement criteria based on scientific requirements of the research programmes, under which climate related RNODCs will operate;

- Monitor the performance of the Centres and co-ordinate the international tracking of climate data sets;

- Propose policies to enhance submission and exchange of ocean climate research data.

Recommends that the Group should include scientists and observers from IGOSS and the WMO as appropriate,

Instructs the Secretary IOC to request Member States to update their nominations to the original Group of Experts on RNODCs in order to have an up-to-date list of available experts whose knowledge and experience meet the revised Terms of Reference,

Further instructs the Secretary IOC to make this Resolution known to international groups involved with climate studies, specially the WMO and ICSU pointing out that through this action the Working Committee on IODE has developed an organized structure that will interact in a timely way with the WCRP.

Resolution IODE-XII.2

BIOLOGICAL DATA MANAGEMENT

The Working Committee on International Oceanographic Data Exchange,

Noting the growing interest in enhancing the exchange of biological data,

Recognizing the diversity and complexity of marine biological data in general,

Confirming that GF3 is a potential vehicle for the exchange of alphanumeric marine biological data,

Requests NODCs, RNODCs and similar organizations, in co-operation with appropriate national bodies, to promote, within their national oceanographic communities, the archiving and exchange of marine biological data,

Decides to renew the Task Team on Marine Biological Data with the following Terms of Reference:

- Prepare inventory list with information on the various types of biological data that there is a need to exchange, together with their methods of quality control, taxonomic coding and formatting,

- Provide guidelines for the selection of a future global taxonomic coding scheme, and also prepare, in close collaboration with ICES, translation tables which cross reference the major taxonomic coding schemes now in use,

- Provide guidance for a pilot test of coding selected marine biological data from the SCAR/Biomass Data Centre into GF3, and compile and report on the experience gained;

- Develop guidelines for a future inventory of biological data suitable for international exchange to be compiled by NODCs, RNODCs and similar organizations.

Resolution IODE-XII.3

EXCHANGE OF MARINE GEOLOGICAL AND GEOPHYSICAL DATA

The Working Committee on International Oceanographic Data Exchange,

Noting the continuing need for improvement in the flow of marine geological and geophysical data and the rapid advance in technology,

Decides that the Terms of Reference of the Task Team on Exchange of Marine Geological and Geophysical Data be revised in the following way;

- Keep under review the most pressing needs of the international community for marine geological and geophysical data exchange;
- Continue to review the status of existing data management systems, including inventories, with regard to marine geological and geophysical data, including resource orientated data;
- Advise the Committee and the Group of Experts on Technical Aspects of Data Exchange on newly developed technology in marine geology and geophysics and on the need for, and contents of, additional standard subsets of GF3 for marine geology and geophysical data;
- Advise the Committee on ways to encourage and increase the international exchange of such data, particularly between World Data Centres.

Resolution IODE-XII.4

TERMINATION OF DNP ANNOUNCEMENTS

The Working Committee on International Oceanographic Data Exchange,

Noting the recommendations of its Tenth and Eleventh Sessions on the need to review DNP/NOPs announcement procedures,

Noting further the recommendations contained in the report of the Chairman of the Task Team on Review of DNP/NOP Announcements,

Realizing the importance of the timely submission of ROSCOP forms to the IODE system and of the announcement of NOPs well in advance of data collection,

Realizing further that there exists duplication of information between the ROSCOP form and the DNP announcement and that the declaration of data availability for international exchange made well before the scientific cruise is very often not implemented,

Recommends that the DNP announcement be discontinued and only one type of advance notification entitled an NOP Announcement be kept in force,

Recommends further that the IOC take the lead in offering and financially supporting an electronic bulletin board for NOP announcements,

Urges all Member States to report results of cruises through ROSCOP immediately after the completion of the cruise and to provide NOP announcements in a timely manner.

Resolution IODE-XII.5

DEVELOPMENT OF THE IODE DATA CENTRE SERVICES

The Working Committee on International Oceanographic Data Exchange,

Considering the recommendations formulated by the Task Team on IODE Data Centre Services concerning the centres' output products in support of WCRP (Document IOC/IODE-XII/15),

Realising the increasing needs of IOC Member States for the effective use of data accumulated through the international oceanographic data exchange scheme to meet national economic needs,

Taking into account the experience gained by a number of countries in tackling similar problems,

Decides to continue the activities of the Task Team on the development of IODE Data Centre Services with new Terms of Reference:

- Examine the types of products produced by the IODE centres and prepare proposals for their improvement to meet the needs of national economic activities and industry;

- Prepare proposals for the development of data centre services and organize this work within the IODE system in co-operation with the Group of Experts on Marine Information Management;

- Recommend on the organization of training of specialists and of workshops on the exchange of expertize in providing data centre services.

Requests the IOC Secretary to organize an ad hoc consultation in early 1988 in order to prepare recommendations for the further development of the IODE Data Centre Services to the benefit of the economies of the IOC Member States.

Resolution IODE-XII.6

GROUP OF EXPERTS ON TECHNICAL ASPECTS OF DATA EXCHANGE

The Working Committee on International Oceanographic Data Exchange,

Considering that the role of the Group of Experts on Format Development should be expanded to take account of the broader issues of technology and communications,

Resolves that to reflect its broader duties the Group be renamed as the "Group of Experts on Technical Aspects of Data Exchange" and endorses the following revised Terms of Reference:

- Keep under review the GF3 format, its utilization and software and update these and the GF3 documentation as appropriate;

- Recommend on ways to use computer technology and telecommunication networks to improve the effectiveness of data exchange in IODE and to carry out pilot projects;

- Monitor the impact of changing computer technology on IODE activities and propose action as appropriate.

Resolution IODE-XII.7

REMOTELY SENSED DATA MANAGEMENT

The Working Committee on International Oceanographic Data Exchange,

Noting the urgent need for remotely sensed oceanographic data in various international programmes, such as the WCRP, ERFEN, OSLR, GIPME,

Noting further the rapid development of remote sensing technology,

Decides to continue the Task Team on Exchange of Airborne and Satellite Remotely Sensed Oceanographic Data with a new name "Task Team on Remotely Sensed Oceanographic Data",

Decides to revise the Terms of Reference of the Task Team to be as follows:

- Establish contacts with satellite operators and offer the services of IODE in the provision of oceanographic in situ data in support of satellite programmes;

- Develop in close collaboration with the Group of Experts on Technical Aspects of Data Exchange GF3 subsets for non-imaging and (for some selected types) imaging remote sensing data;

- Compile and list in co-operation with the RNODC-Waves, the characteristics of wind/wave data sets to be produced by satellites planned for launch in 1987-1992;

- Assist in convening a workshop on satellite derived sea-surface temperature data, where the satellite data operators could exchange their processing algorithms and products, in order to reach a common product for the end-users;

- Provide the Secretary IOC with advice and assistance in the implementation of Recommendations of WC-IODE on this matter and act as a focal point within WC-IODE on remote sensing;

- Encourage and assist NODCs to develop the capability for acquiring level 2 and higher level remote sensing data sets and for procesing them for the benefit of oceanographic programmes and experiments.

Resolution IODE-XII.8

BANKING OF MARINE CHEMICAL DATA

The Working Committee on International Oceanographic Data Exchange,

Resolves to appoint a Rapporteur for the Banking of Marine Chemical Data with the following Terms of Reference:

- Establish in co-operation with the Group of Experts on RNODCs and Climate Data Services a list of chemical data types which are most important as tracers of oceanic water movements;

- Identify priorities in the data banking of marine chemical tracers in consultation with the Joint SCOR-IOC/CCCO;

- Prepare a report with a list of important tracer chemicals, identifying their use in ocean climate studies, defining the quality control procedures needed in each case, identifying the documentation on analytical procedures needed with each data type, and examining the suitability of GF3 to handle these data;

- Assist in convening an ad hoc meeting on the subject of marine chemical tracers during the intersessional period, and report to IODE-XIII on the recommendations of the meeting;

- Assist in identification if needed of an NODC or other specialized data centre which would be prepared to provide services as an RNODC-Chemical Tracer Data.

Resolution IODE-XII.9

OCEANOGRAPHIC DATA QUALITY CONTROL

The Working Committee on International Oceanographic Data Exchange,

Taking into account that the data quality control procedures of IOC Member States differ significantly,

Noting the importance of and the need for unified quality control procedures to increase the reliability of data,

Decides to establish a Task Team on Oceanographic Data Quality Control with the following Terms of Reference:

- Study national algorithms, quality control procedures, standards and software for oceanographic data and make analytical reviews;
- Prepare a Manual of Data Quality Control Algorithms and Procedures for publication and keep track of any changes in the algorithms;
- Advise NODCs on the application of international quality control algorithms and procedures and give practical assistance;
- Collaborate with national and international scientific organizations in reviewing quality control algorithms and procedures.
- Develop and obtain international agreement on the requirements for the quality control of oceanographic data,
- Approve and recommend for international use appropriate data quality control procedures for a variety of observations in physical oceanography;

Resolution IODE-XII.10

REVIEW OF THE PREVIOUS RESOLUTIONS AND RECOMMENDATIONS OF THE IOC WORKING COMMITTEE ON IODE

The Working Committee on International Oceanographic Data Exchange,

Considering that Resolution IODE-X.2, IODE-XI.3, IODE-XI.6, IODE-XI.7 adopted prior to its Twelfth Session have been revised and incorporated in the decisions taken by the Twelfth Session and are now superseded,

Considering further that Resolutions IODE-X.7, IODE-X.10, IODE-XI.2, IODE-XI.4, IODE-XI.5, IODE-XI.8 adopted prior to its Twelfth Session are now obsolete,

Noting the action taken on the Recommendations adopted at the Tenth and Eleventh Session of the Committee

Decides:

(1) To keep in force Resolutions IODE-X.3, IODE-XI.1;

(2) Not to keep in force Resolution IODE-X.2, IODE-X.7, IODE-X.10, IODE-XI.2, IODE-XI.3, IODE-XI.4, IODE-XI.5, IODE-XI.6, IODE-XI.7, IODE-XI.8;

(3) To keep in force Recommendations IODE-X.1, IODE-X.6.

Recommendation IODE-XII.1

RNODC - SOUTHERN OCEAN (SOC)

The Working Committee on International Oceanographic Data Exchange,

Noting the need for an RNODC to be established to manage oceanographic data collected in the Southern Oceans,

Having reviewed the offer of Argentina to become an RNODC for the Southern Oceans,

Recommends that the RNODC for the Southern Oceans be established with the following responsibilities:

- Receive, control the quality and store in standard format the physical and chemical data obtained by the international scientific community from cruises and research programmes carried out in the Southern Oceans, and distribute, on request, the information contained in such files;

- Co-operate closely with WDCs-Oceanography, sending regular shipments (at least once a year) free of charge of complete sets of physical and chemical data stored on magnetic tapes and in GF3, inventories, data summaries and other data products related to the physical and chemical data from the Southern Oceans;

- Assist the World Data Centres by sending copies to them of any ROSCOP forms submitted to the RNODC/SOC.

Requests the Secretary IOC to bring this decision to the attention of the IOC Programme Group for the Southern Oceans (SOC) and to urge the Programme Group to review carefully the proposed responsibilities so that the accreditation of an RNODC can be made during the middle of 1987 in accordance with the existing procedures.

Recommendation IODE-XII.2

REVISION OF MEDI

The Working Committee on International Oceanographic Data Exchange,

Recognizing that there is a growing demand among scientists and data managers for information about the location and availability of oceanographic data sets,

Considers that a major revision of MEDI to meet these demands is needed,

Welcomes the offer made by the USA to undertake a pilot project on the design of a revised catalogue, taking into account user needs and possible data collection procedures, and the offer made by the USSR to prepare a model for an inventory of descriptions of other data catalogues and referral systems,

Invites the USA and the USSR to implement these offers, taking into account the existing links between MEDI and the INFOCLIMA and INFOTERRA systems,

Requests the Secretary IOC to call a small ad hoc consultation of experts during the intersessional period to review the results of these studies and to make detailed proposals on the future design and operation of MEDI.

Recommedation IODE-XII.3

IOC ROLE IN MARINE INFORMATION MANAGEMENT

The Working Committee on International Oceanographic Data Exchange,

Noting Resolution XIII.9 of the IOC Assembly and the decision of the Seventeenth Session of the IOC Executive Council that the role of the Working Committee in marine information management should be enlarged, giving particular attention to the needs and participation of the developing countries,

Taking into account that circumstances require that IOC take a pragmatic approach towards new and expanded activities,

Noting with interest the Report and Recommendations of the Second Session of the Group of Experts on Marine Information Management and the associated report on Marine Information Management in the Developing World - A perspective,

Considers that IOC's role in information management should be to:

- Assess the needs of the oceanographic community and other potential users, for marine information, and seek ways and means through the Working Committee on IODE of responding to these needs, within the framework of the proposed Strategic Programme Development Plan;

- Identify the efforts being made to provide various marine information services and products within ASFIS and other information systems, and ensure co-ordination;

- Promote regional co-ordination in marine information management through IOC regional bodies in co-operation with appropriate regional organizations and regional bodies of other international organizations;

- Work in co-operation with technical assistance and funding agencies that can offer financial, human and material resources.

Requests the Secretary of IOC to strengthen existing collaboration with the ASFIS Co-ordinating Centre in FAO, and to urge the organizations members of ICSPRO and UNEP to agree to a common approach and to investigate sources of additional funding.

Recommendation IODE-XII.4

TITLE OF THE WORKING COMMITTEE

The Working Committee on International Oceanographic Data Exchange,

Recalling the decisions of the Twelfth Session of the Assembly and of the Seventeenth Session of the Executive Council that the role of the Working Committee on International Oceanographic Data Exchange in marine information management be enlarged,

Recommends that the name of the Working Committee be changed to the Working Committee on International Oceanographic Data and Information Exchange.

Recommendation IODE-XII.5

REVIEW OF PREVIOUS RESOLUTIONS OF THE IOC EXECUTIVE COUNCILS RELEVANT TO THE FIELD OF ACTIVITY OF THE WORKING COMMITTEE ON IODE

The Working Committee on International Oceanographic Data Exchange,

Noting with satisfaction the action taken by the IOC Governing Bodies on the previous Recommendations of the Committee;

Considering that the Recommendations adopted by its Tenth and Eleventh Sessions have become redundant, except for Recommendation IODE-X.1, IODE-X.6.

Recommends:

(1) That the following Resolution of the IOC Governing Bodies be no longer necessary EC-XI.4, EC-XIV.11, XII.6,

(2) That the following Resolutions of the IOC Governing Bodies be Maintained in force: EC-XIV.17, EC-XVII.5, XIII.8, XIII.9.

ANNEX III

LIST OF PARTICIPANTS / LISTE DES PARTICIPANTS/ LISTA DE PARTICIPANTES/ СПИСОК УЧАСТНИКОВ

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II. REPRESENTATIVES OF ORGANIZATIONS

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UNITED NATIONS OCEAN ECONOMICS AND TECHNLOGY BRANCH (UN(OETB))	Mr. R. Gruszka Senior Economic Affairs Officer and Officer in Charge 2, United Nations Plaza Room DC2-2048 New York, NY 10017 Tel: (212) 754-3926
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WORLD METEOROLOGICAL ORGANIZATION (WMO)	Dr. V. Loguinov Representative Geneva - 20 Switzerland

OTHER ORGANIZATIONS

COMMITTEE FOR CO-ORDINATION OF JOINT PROSPECTING FOR MINERAL RESOURCES IN SOUTH PACIFIC OFFSHORE AREAS (CCOP/SOPAC)	Dr. L. D'Ozouville Head, Data Management c/o Mineral Resource Department P.M. Bag Suva Fiji
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INTERNATIONAL CENTRE FOR OCEAN DEVELOPMENT (ICOD)	Dr. J. Watson International Centre for Ocean Development 5670 Spring Garden Road 9th Floor Halifax N 5 Canada B3J ING
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III. IOC SUBSIDIARY BODIES

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JOINT IOC-IHO GUIDING COMMITTEE FOR THE GENERAL BATHYMETRIC CHART OF THE OCEANS (GEBCO)	Mr. D.P.D. Scott Permanent Secretary St. Faiths House The Close Chichester, West Sussex PO19 1OB United Kingdom
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ANNEX IV

LIST OF DOCUMENTS

Document Code	Title of Document
IOC/IODE-XII/1	Agenda
IOC/IODE-XII/1 Add.	Meeting Schedule
IOC/IODE-XII/2	Annotated Agenda
IOC/IODE-XII/3	Summary Report
IOC/IODE-XII/4	List of Documents
IOC/IODE-XII/5	List of Participants
IOC/IODE-XII/6	Review of Previous Resolutions and Recommendations of the Working Committee on IODE and of Relevant Resolutions of IOC Governing Bodies
IOC/IODE-XII/7	Report of the Chairman of WC/IODE on Intersessional activities and on the Challenges that the Committee may face in the Future
IOC/IODE-XII/8	Action Paper
IOC/IODE-XII/8 Annex 1	Draft Work Plan for the next Intersessional Period
IOC/IODE-XII/8 Annex 2	IODE Support of the WCRP
IOC/IODE-XII/8 Annex 2 Suppl. 1	WCRP Ocean Data Management
IOC/IODE-XII/8 Annex 3	Overall Concept for Monitoring the Whereabouts of Oceanographic Data after their Collection
IOC/IODE-XII/8 Annex 4	Proposals for the Effective Use of the Resources Available to IODE and for Mechanisms to Strengthen the International System of Data Exchange
IOC/IODE-XII/8 Annex 5	Marine Information Management in the Developing World - A Perspective

IOC/IODE-XII/8 Annex 6	Proposals to Examine the Implications of Changing Capabilities in Computing and Communications Technologies for the IODE System
IOC/IODE-XII/8 Annex 7	Management of Large Data Sets
IOC/IODE-XII/9	Reports of WDCs A and B Oceanography
IOC/IODE-XII/10	Reports of National Co-ordinators and Heads of RNODCs
IOC/IODE-XII/11	Report of the Chairman of the Group of Experts on RNODCs
IOC/IODE-XII/12	Report of the Chairman of the Group of Experts on Format Development
IOC/IODE-XII/13	Report of the Chairman of the Group of Experts on Marine Information Management
IOC/IODE-XII/13 Suppl. 1	New Approach to the Development of PDP
IOC/IODE-XII/14	Report of the Chairman of the Task Team on Ocean Data Management for Climatic Studies
IOC/IODE-XII/14 Suppl. 1	Draft Manual on Long Oceanographic Time Series
IOC/IODE-XII/15	Report of the Chairman of the Task Team on the Development of IODE Data Centre Services
IOC/IODE-XII/16	Report of the Chairman of the Task Team on Marine Biological Data
IOC/IODE-XII/17	Report of the Chairman of the Task Team on Exchange of Marine Geological and Geophysical Data
IOC/IODE-XII/18	Report of the Director of WDC-A MGG
IOC/IODE-XII/19	Report of the Chairman of the Task Team on Marine Pollution Data Exchange
IOC/IODE-XII/20	Compilation of Recommendations of IOC Regional Subsidiary Bodies Relevant to Data and Information Management
IOC/IODE-XII/21	Report of the Chairman of the Task Team on Review of DNP/NOPs Announcements
IOC/IODE-XII/21 Suppl. 1	Status of DNP/NOPs submission
IOC/IODE-XII/21 Suppl. 2	Proposals for the Revised Version of the ROSCOP Form

IOC/IODE-XII/22	Report of the Chairman of the Task Team on Exchange of Airborne and Satellite Remotely Sensed Data
IOC/IODE-XII/22 Add.	Report of the Chairman of the Task Team on Exchange of Airborne and Satellite Remotely Sensed Data
IOC/IODE-XII/22 Suppl. 1	Report of the Task Team Expert from Argentina
IOC/IODE-XII/23	Report of the Chairman of the Task Team on Measured Wave Data Management
IOC/IODE-XII/23 Suppl. 1	User Guide for the Exchange of Measured Wave Data
IOC/IODE-XII/24	Report of the Acting Chairman of the Task Team on Training, Education and Mutual Assistance
IOC/IODE-XII/25	Summary of Actions taken or being Planned for Producing IODE Publications
IOC/IODE-XII/25 Suppl. 1	Manual on International Oceanographic Data Exchange (IOC Manuals and Guides No. 9, Final Draft of the Revised Version)
IOC/IODE-XII/26	Banking of Marine Chemical Data

N.B. THIS LIST IS FOR REFERENCE ONLY. NO STOCKS OF THESE DOCUMENTS ARE MAINTAINED.