INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of UNESCO)

WORKING COMMITTEE ON INTERNATIONAL
OCEANOGRAPHIC DATA EXCHANGE

Ninth session

SUMMARY REPORT

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1. Opening of the session

The session was opened by the Acting Chairman who welcomed the delegates and thanked them for their participation. He also expressed his great appreciation for the first-time presence at an IODE Working Committee meeting of Dr. Czeslaw Druet, IOC Vice-Chairman, and went on to introduce Mr. P. Hansen, Assistant Secretary-General for Programme Planning and Co-ordination of the United Nations. Mr. Hansen welcomed the participants and pointed out those activities of IOC and especially the Working Committee on IODE, which are implemented in co-operation with the United Nations and the UN Agencies, drawing special attention to the ASFIS and MEDI projects. Mr. Hansen emphasized the importance of information services leading to the effective transfer of literature on marine technology. Details of his statement are reproduced in Annex V.

The Assistant Secretary of the Intergovernmental Oceanographic Commission, Dr. A. Tolkachev, expressed deep appreciation on behalf of the IOC to the United Nations for the arrangements made and for hosting the meeting. He wished to point out that WC/IODE has specific functions which are closely related to almost all programmes and projects coordinated by IOC in co-operation with other agencies. The need for strengthening co-ordination between the activities of WC/IODE and other IOC bodies and international organizations was emphasized. Dr. Tolkachev highlighted major developments in IOC programmes since the eight session of the Working Committee. The attention of participants was drawn to the decisions of the XXth session of the Unesco General Conference related to IOC and IODE in particular.

Following the opening of the session, the Second Vice-Chairman of IOC, Dr. C. Druet, speaking on behalf of the Chairman and Secretary of IOC, expressed his regards to the participants and wished them every success with their meeting. His statement emphasized the important present role of the Working Committee on IODE and its subsidiary bodies and drew attention to the role they should play in future IOC activities. He also recalled the essence of resolution IOC-X.2, IOC-X.5, EC-X.6 and EC-X.13 which stressed the necessity of close examination of the contents of resolutions concerning or associated with IODE programme activities.

2. Adoption of the Agenda

The agenda, as shown in Annex I, was adopted by the Working Committee.

3. Report of the Secretariat

The Assistant Secretary of IOC, Dr. A. Tolkachev, informed the session on the implementation of the recommendations of the eighth session of the Working Committee on IODE, which were approved at the IXth session of the IOC Assembly (IX-28, IX-30 and IX-31). Resolutions
of the tenth session of the IOC Assembly related to IODE (res. IOC-X.5 and IOC-X.7) as well as resolutions EC-VII.12 and EC-X.6 and EC-X.13 of the IOC Executive Council were also drawn to the attention of the meeting. In response to resolution EC-VII.13, the Director of WDC-A, in consultation with the Acting Chairman and Secretariat, prepared the report entitled "The Status of International Oceanographic Data Exchange" for submission to the eleventh session of IOC Executive Council. He expressed appreciation to IOC/IODE consultants Dr. J.A. Alvarez (Argentina), Mr. P. Winiarski (Federal Republic of Germany), Mr. R. Geifeld (USA), Dr. P. Grimm (USA), and to the members of an ASIFS Survey Team: Mr. A. Varley (UK), Dr. A. Sandoval (Mexico), Dr. R.R. Lankford (IOCARIIBE Secretariat) and Mr. Michael Brandreth (IDRC, Canada) for their assistance in implementing specific WC/IODE tasks. During the intersessional period, several meetings were held on IODE, namely:

- Ad hoc Group on Marine Pollution Data (May 1977)
- Steering Group on IODE (February 1977)
- Group of Experts on RNOGC (October 1976)
- Group of Experts on MEDI (October 1976 and October 1977)

Several publications on IODE were prepared and issued, in particular the fourth edition of the "Manual on International Oceanographic Data Exchange", published as IOC series Manuals and Guides No. 9.

Dr. A. Tolkachev drew attention of the participants to the resolutions of the twentieth session of the Unesco General Conference (November 1978), and in particular to resolution No. 2/7.4/1 in which the Unesco General Conference "... called upon Member States to co-operate in every possible way in carrying out the programme and projects co-ordinated through the IOC and to strengthen and develop the existing system for exchanging oceanographic data, using facilities offered by the World Data Centres".

The Committee was invited to consider and recommend appropriate actions under specific agenda items on the outcome of the discussions of the tenth session of the IOC Assembly regarding data management arrangements under the UNEP co-ordinated Mediterranean Pollution Monitoring and Research Programme (MEDPOL).

Dr. Tolkachev thanked the Chairman of the Group of Experts on MEDI, Mr. J. Churgin, and the Chairman of the Joint FAO/IOC Panel of Experts on ASIFS, Dr. J. Caponio, for their excellent presentations on MEDI and ASIFS, made at the tenth session of the IOC Assembly.

The need for review of IODE programme priorities, as given in document IOC/IODE-IX/14, was also pointed out, bearing in mind the limited staff and financial capabilities of the IOC Secretariat.
4. **World Data Centres, Oceanography (WDC-A and WDC-B, Oceanography)**

4.1 **WDC-A**

The Director of WDC-A, Oceanography, Mr. J. Churgin, introduced Mr. H. Meyers, representing WDC-A, Solid Earth, and reported on information given in documents IOC/IODE-IX/6 (Report on World Data Centres A and B) and IOC/IODE-IX/INF.6 (WDC-A, Oceanography, Semi-Annual Report, January-June 1978). In addition to the items mentioned in the reports, he noted that incoming data in the latter half of 1978 had increased over the somewhat lower than average statistics shown for 1977. He also stated that although there had been a moderate increase in the number of DNP data submissions since IOE-VIII, much additional data still remain to be received. Furthermore, there had been no noticeable increase in the percentage of data designated as DNP being received by the WDC-A.

It was further noted that the Director WDC-A, Oceanography had assisted the IOC Secretariat in the preparation of a report to the IOC Executive Council on "The Status of International Oceanographic Data Exchange". This report documents the relationship of IOC/IODE and the World Data Centre System. Statistics in the report indicate that there is a positive relationship between actions taken by WC/IODE and the sizeable increase in data received by the WDCs over the past decade.

**WDC-B**

The representative of WDC-B, Oceanography, Dr. V. Alexseev, reported on information given in document IOC/IODE-IX/6, and noted also that during the intersessional period, WDC-B had received data from 42 countries (1800 cruises) and 2709 ROSCOP forms from 25 countries. During this same period, WDC-B issued 5 data catalogues and 5 publication catalogues which were distributed to 400 organizations in different countries. Over 300 data-copying orders were met. WDC-B runs a book exchange scheme with organizations in 50 countries. The total stock of international scientific publications is 6,000 titles, including over 700 acquisitions in the period between the sessions. It was noted, however, that oceanographic data under Declared National Programmes reach WDC-B considerably later than the deadlines envisaged in the Manual on IODE, and that a certain volume of data had not yet been received.

4.2 **Food and Agriculture Organization of the United Nations (FAO)**

Mr. E. Akydz, the FAO representative, presented an overview of the activities of the Fisheries Department in the field of data and information exchange and services offered to the Member States and national and international bodies.

Mr. Akydz reported that FAO collects, analyzes and disseminates fishery and related biological data, mainly for fish stock assessment purposes. The database includes statistical data on fish catches and
landings, fishery commodities, fishermen and fishing fleets. An inventory system, developed jointly with UNEP, is also maintained to provide information on sources of data on contaminants in aquatic organisms.

With regard to information services, the meeting was briefed on the Aquatic Sciences and Fisheries Information System (ASFIS), a United Nations system sponsored jointly by FAO, IOC and UN (OECD). The major component of the system is the bibliographic data-base from which the monthly abstracting journal ASFA 1 and 2 are compiled. The ASFA data-base is accessible through various systems and is expected to reach about 100,000 citations by the end of 1980. The scope of ASFA covers living resources and their environment; physical, chemical and geological oceanography; ocean technology; policy and non-living resources. Other modules of the ASFIS include collection and storage of information and expert registry information through which directories and special expert and institutional lists are compiled. Peripheral services, such as international activities in Marine Affairs, periodical titles and thesaurus of terms on aquatic sciences and fisheries are also available.

World Meteorological Organization (WMO)

The WMO representative, Mr. G. Verploegh, reported on the latest developments regarding the exchange and storage of marine climatological data. He mentioned, in particular, the preparation of a Manual on Marine Meteorological Services by the Commission for Marine Meteorology in which continued procedures for the Marine Climatological Summaries Scheme were outlined. These procedures include provisions for close cooperation with the World Data Centres for Oceanography with respect to data of direct interest to the oceanographic community. Mr. Verploegh also mentioned a number of problems regarding international exchange and storage of meteorological data obtained from different types of sources (buoys, coastal stations, satellites) and, in this connection, explained the present status of the World Climate Programme.

United Nations Environment Programme (UNEP)

The representative of UNEP, Mr. P. Lees, reported that the Governing Council of UNEP had assigned responsibility for the co-ordination of action for the protection and development of the marine environment in coastal areas to the Regional Seas Programme Activity Centre (RS/PAC) of UNEP. The Governing Council designated seven priority areas and specified that for each an action plan be developed with the following aims:

(i) "assessment of the state of the environment including socio-economic development activities related to environmental quality and of the needs of the Region in order to assist Governments to cope properly with environmental problems, particularly those concerning the marine environment;"
(ii) development of guidelines for the management of those activities which have an impact on environmental quality or on the protection and use of renewable marine resources on a sustainable basis;

(iii) development of legal instruments providing the legal basis for co-operative efforts to protect and develop the Region on a sustainable basis;

(iv) supporting measures including national and regional institutional mechanisms and structure needed for the successful implementation of the Action Plan."

In each region, maximum use will be made of existing facilities, existing national and international mechanisms and of the appropriate organizations of the UN system. UNEP is responsible for initial coordination and for preparation of the plan according to the wishes of the Governments involved in each region. The aim is for each region to become self-sufficient in the operation of the plan at the earliest possible date. Mr. Lees reported that the Mediterranean Action Plan is the most advanced and serves as the basic model for all others. The legal instrument for this (the Barcelona Convention) is in force and the first Meeting of the Contracting Parties took place in Geneva from 5-10 February 1979. At this meeting, UNEP was selected as the Secretariat of the Convention and provides a technical unit for the co-ordination of the activities agreed as part of the action plan.

The data handling function of each plan is part of the assessment component and is specifically oriented towards the collection and interpretation of information for concerted regional action to manage the marine and coastal environment and to develop regional marine resources according to environmentally sound principles. The IOC and other bodies of the UN system are fully involved in all aspects of data collection and internationally agreed mechanisms for marine data exchange and archiving are to be observed wherever they are applicable. One result of these action plans will be a considerable build-up of national marine data facilities in each region, particularly in the developing country participants, and a corresponding increase in the rate of generation of oceanographic information and its flow to the appropriate international systems.

The data are oriented towards environmental management and many types of data will be required to form a composite picture and to allow full evaluation of the environmental situation. There can be no guarantee that every item of information used in the assessment procedure can or should be made available to the international marine data community for purposes other than those for which governments provided such data. There is, however, a firm commitment by UNEP to attempt to persuade governments to make all appropriate releasable data available to the World Data Centre, Oceanography system as early as possible. UNEP has no intention to create a restricted duplicate marine data system or to
inhibit the international exchange of such data. On the contrary, the result, as stated above, should be an increase in the flow of well-organized and intercalibrated data to international repositories.

**Engineering Committee on Oceanic Resources (ECOR)**

The representative of ECOR, Dr. K. Okamura, reported on that Committee's third General Assembly held in Washington D.C. from 3-6 May 1978. The main theme of the Assembly was "Critical Elements in the Exchange of Ocean Engineering Technology". Dr. Okamura also reported that the International Workshop on Ocean Instrumentation, held in Washington D.C. from 1-3 May 1978, was organized in response to the international ocean engineering community's concern about instrumentation calibration procedures, long-term reliability, cost effectiveness and the increasing need for data exchange. Emphasis was placed on identifying technical deficiencies in ocean instrumentation, additional or new measurement needs, and a special focus on the problem of facilitating information exchange.

**Permanent Service for Mean Sea Level (PSMSL)**

PSMSL was represented at the session by Dr. M.T. Jones (U.K.) who presented the report on behalf of the Director of PSMSL, Prof. G.F. Lennon (document IOC/IODE-IX/7).

Dr. Jones noted with particular satisfaction that the Service had just completed a major piece of work in publishing the first set of worldwide local reference level data for mean sea level. This work is contained in three volumes: Volume I, printed in 1976 covering stations in Europe, Africa and India; Volume II printed in 1977 covering North, Central and South America; and Volume III sent to press in January 1978, dealing with data from Japan, Australia and the Pacific Islands. Being in loose-leaf form, these volumes are easily updated and it is planned that the publication will be supplemented by update sheets compiled annually. A major effort will be required in the future to identify and acquire new data, to monitor their quality and to prepare them in a form suitable for publication. It was pointed out that there is a continuing difficulty in finding adequate funding to enable the PSMSL to meet the full scope of its responsibility. The Working Committee expressed the view that since the functions of this Service extend to a great variety of users, their activities should be strongly supported.

**Scientific Committee on Oceanic Research (SCOR)**

Dr. M.T. Jones (U.K.) reported on the following items on behalf of SCOR:

a) A Working Group has been set up by SCOR (WG 51) to investigate problems concerned with the collection, processing and archiving of STD/CTD data. A preliminary meeting of SCOR WG51 was held in Copenhagen in September 1978. It appears that STD/CTD data are subject to a number of
serious problems attributable to the performance characteristics of the sensors and that these cannot always be readily compensated for by the various calibration techniques available. The relative effectiveness of the various reduction techniques used for STD/CTD data will also be evaluated and the findings of SCOR WG 51 should be of great interest to those engaged in international oceanographic data exchange.

b) A document has been prepared by the IAPSO Working Group on Symbols, Units and Nomenclature. This document provides a definitive standard for symbols, units and nomenclature to be used in physical oceanography and, if accepted, would be binding on all authors submitting articles to the scientific press. The IOC has already been invited to submit their formal comments on this document. The Secretariat agreed to provide the final revised version to all interested participants for comments, to be received by the summer of 1979.

c) A suggestion was made at the meeting of the ICSU Panel on World Data Centres held in Athens in September 1978, that marine geology and geophysics belonged more naturally to the WDCs (Solid Earth) than to WDCs (Oceanography). The ICSU panel decided that, apart from seeking the views of the Inter-Union Commission for Geodynamics (IGC), it would also solicit the views of SCOR/IAPSO and IOC on this matter. SCOR discussed this at its general meeting in November 1978 and agreed wholeheartedly with views expressed by Mr. J. Crease (its representative on the ICSU Panel on WDCs) and recommended that there be no change made to the present arrangements.

International Council for the Exploration of the Sea (ICES)

The representative for ICES, Mr. J. Smed, reported on some activities of the ICES Service Hydrographique during the intersessional period (document IOC/IODE-IX/INF.9). About 2,000 ROSCOP forms had been received, and edited versions published as 14 volumes of the "ICES Oceanographic Data Lists and Inventories". A list of the data processed and transmitted to the WDCs was presented. Second-level inventories of the oceanographic observations at the NAOS stations have now been issued for the years 1947-1977. Inventories of data from a number of multi-ship expeditions (CINECA, OVERFLOW '73, JONSDAP '76, BOSEX '74) were reported. A list of oceanographic data from the CINECA region available in the ICES Service Hydrographique was presented (document IOC/IODE-IX/INF.8). Mention was made of a number of marine environmental data products prepared and issued regularly by the Service Hydrographique.

5. Co-operative investigations

In opening discussions on this item, the Assistant Secretary IOC introduced the document entitled "Data Management Activities within ongoing and/or Planned International Marine Research and Monitoring Programmes" (document IOC/IODE-IX/16) prepared by the Secretariat with the
objective of providing basic information on existing/planned programmes and IODE related activities within each of them, and drawing the attention of the Working Committee to activities within those programmes which require action on its part and/or which are of interest to its members. As has been indicated in the document, co-ordination between WC/IODE and research and monitoring programmes is provided through three Regional Data Centres for CIM, IOCARIBE and CSK, and through the RNODCs established so far for MAPMOPP, IGOSS-FOY and Wave Data. The WC/IODE was invited to consider possible mechanisms and actions required to strengthen further such co-ordination with these programmes, especially for newly-planned programmes or in areas where no RDC or RNODC has so far been established.

5.1.1 "El Nino"/ERFEN

The session noted that in response to resolution IOC.IX-1 of the ninth session of IOC Executive Council, Dr. J.A. Alvarez, as IOC/IODE consultant, visited data centres in countries participating in the "El Nino" programme and prepared a report on data management which he tabled at the Ad hoc Intergovernmental Working Group on the Investigations of "El Nino" (Callao, Peru, 13-17 December 1976). His report was also considered at the meeting of the IODE Steering Group (February 1977). By resolution X-2, the IOC tenth Assembly established Joint IOC/WMO/CPPS Working Group on the Investigation of "El Nino" and instructed the Secretary to take steps so that pertinent elements of IODE be developed in conjunction with the Joint Working Group activities. The first session of this Joint Working Group took place in Lima, Peru (16-20 October 1978) and adopted Recommendations Nos. 1, 2, 4 and 5 related (although not addressed directly) to the WC/IODE.

The Working Committee on IODE requested its Chairman, in consultation with the Secretariat, to correspond with the Chairman of the Joint Working Group on all questions arising and co-ordination required in relation to data management aspects within the "El Nino" programme.

5.1.2 Co-operative Investigation in the North and Central Western Indian Ocean (CINCWIO)

Recommendations of the Scientific Workshop to initiate planning for CINCWIO (25 March - 2 April 1976, Nairobi, Kenya) related to the activities of WC/IODE, were considered by the IODE Steering Group. The Working Committee was informed on the meeting of the countries of the region scheduled for March 1979 in order to develop the plan for the programme and to consider appropriate co-ordination mechanisms. The Working Committee felt that participation of the representative of WC/IODE in CINCWIO would be desirable in order to assist in planning data management activities within the programme. The Chairman WC/IODE was therefore requested to investigate with the Secretary of IOC the possibility of participation of IODE representatives in CINCWIO meetings.
5.1.3 CCOP-IOC Joint Working Group on IDOE Studies on East Asia Tectonics and Resources (SEATAR) and Committee for Co-ordination of Joint Prospecting for Mineral Resources in South Pacific Offshore Areas (CCOP/SOPAC)

The actions taken by the IOC Secretariat and Mr. P. Grimm, IOC/IDOE consultant, in relation to data management arrangements within the programme on SEATAR, co-ordinated by the Joint CCOP-IOC Working Group, were considered by the Steering Group on IDOE in February 1977.

The Working Committee was informed that the Joint Working Group at its second session concurred with the utilization of the WDC system for the exchange of data other than exploratory petroleum data but deferred action on the RNODC scheme (proposed by IOC/IDOE consultant) pending further study. The Working Committee noted that the Petroleum Data Centre and a centre for geological and marine environmental data were originally considered (by CCOP/SEATAR) as quite separate and distinct centres under the purview of two separate sub-groups.

It was agreed that further advice should be provided to CCOP/SEATAR as needed, jointly by WDCs and the Working Committee on IDOE.

In relation to the Programme on Joint Prospecting for Mineral Resources in South Pacific Offshore Areas, co-ordinated by the Committee for Co-ordination (CCOP/SOPAC), it was noted that the Hawaii Institute of Geophysics (USA) had offered to microfilm and process CCOP/SOPAC bathymetric and geophysical data into a computer-comparable format. Appropriate data would be forwarded to WDC-A. The Working Committee was informed on the intention of CCOP/SOPAC and SEATAR, welcomed by IOC, to strengthen co-operation with WESTPAC in the fields of marine geology and geophysics and this will be discussed at the forthcoming WESTPAC meeting.

Dr. Nitani, representative of Japan, stressed that the petroleum Data Centres in the CCOP are not in the category of IDOE. So far, CCOP (SEATAR) participants wish to concentrate their efforts on the Petroleum Data Centre rather than on a "responsible" scientific centre within the IDOE system. However, CCOP and IOC/WESTPAC will co-operate in the fields of marine geological/geophysical research in future. JODC will act, naturally, as the substantial RNODC for data of CCOP (SEATAR), at least for the data from CCOP/WESTPAC co-operative research, with the necessary assistance of the US NGSOC which has supported SEATAR on behalf of the WDC system, in data handling, through its involvement with the IDOE programme. Also, nearly the same situation pertains for data management of CCOP/SOPAC.

5.1.4 Co-operative Investigations in the Mediterranean (CIM)

Data management activities within the Programme for Co-operative Investigations in the Mediterranean (CIM) were described in document IOC/IDOE-IX/16, prepared by the Secretariat, and in document IOC/IDOE-IX/8 rev. containing the report of the Regional Data Centre for CIM.
The report on the activities of the Regional Data Centre for CIM, during the intersessional period, was presented by the delegate of USSR. In particular, the report indicated that 12 issues of the "Data Reports of CIM" had been distributed to the countries participating in CIM. In the 1975-1977 period, the second and third volumes of the Catalogue of Data for CIM were published and transmitted to the CIM Operational Unit in Monaco. In 1977 a new type of HDC/CIM publication was issued: "Cruise Explorations in the Mediterranean". The Regional Data Centre for CIM has compiled and sent for printing an "Atlas of Oceanographic Study of the Mediterranean". The Centre has provided copies of data to scientists in Italy, Malta, the Federal Republic of Germany, India and Switzerland. It was pointed out, however, that submission of data from countries participating in CIM was still unsatisfactory.

5.1.5 Co-operative Study of the Kuroshio and adjacent regions (CSK)

First of all, the Director of the Kuroshio Data Centre (KDC) reported on activities in the preceding intersessional period, and on all activities since 1985. According to the recommendation of the eleventh session of CSK/ICG (June-July 1977, Nouméa) and to IOC resolution X-11, the field investigation of CSK terminated at the end of 1977, and the full CSK programme will end completely by the time of the fourth CSK Symposium. After the finalization of CSK, the WESTPAC programme will be established. This programme is expected to include the physical/chemical, biological and marine geological/geophysical activities. KDC will continue its activities for two or three years after the end of CSK to complete the necessary publications and to investigate further processing of CSK data. All activities of KDC will cease as of end of 1980. Other than routine publications for CSK, JODC has prepared two volumes on the "Marine Environmental Atlas" and on northwestern Pacific Ocean containing the statistical results for several oceanographic elements. The third volume, which will contain the ocean current obtained by CSK, will be published in March 1979. These atlases are very useful for participants of CSK and those of the envisioned WESTPAC programme.

From 1980 onwards, JODC may also act as the RNODC for WESTPAC, the successor to CSK, if the Working Group on WESTPAC and the IOC so wish. In this case, the JODC will deal with all data resulting from the WESTPAC programme such as physical/chemical, geological/geophysical, biological and marine pollution data.

Lastly, the Director of KDC briefly introduced IOC resolution X-11 related to CSK/WESTPAC.

5.1.6 IOC Association for the Caribbean and adjacent regions (IOCARIIBE)

The Acting Chairman of IODE presented IODE-related developments under IOCARIIBE and on its activities, and reported that he had attended IOCARIIBE-I, -II, and the IOCARIIBE Fisheries Workshop in the Lesser Antilles.
At IOCARIBE-I (Caracas, 1976) it had been recognized that all data resulting from IOCARIBE should, in effect, be considered as DNP data and be exchanged according to IOC procedures through the World Data Centre System. The U.S. NODC agreed to act as a regional centre for IOCARIBE, continuing the function it fulfilled on behalf of the World Data Centre System under CICAR (the Co-operative Investigations of the Caribbean and Adjacent Regions programme). Stress was also laid on developing a system for the exchange of documents and information in coordination with the development of ASFIS. At the fisheries workshop, Colombia made an informal offer to assume gradually the functions of an RNODC for certain types of conventional data, an offer that was received with appreciation.

At IOCARIBE-II, it was reaffirmed that the USA should continue as the Regional Data Centre, in eventual collaboration with the NODC of Colombia when it begins to assume RNODC functions for data in that region. In regard to information, IOCARIBE-II endorsed the ASFIS survey team's report to operate a central ASFIS facility in Mexico. However, much stress was laid on improving document exchange in the area by strengthening the various national scientific libraries and building a network for document exchange. While the concept of a single central repository for documents did not find support by delegates at IOCARIBE-II, it was proposed that a central bibliography of regional document holdings be maintained by Mexico and that a task team under Dr. Rojas of Costa Rica develop both the document exchange network concept and a system for uniform compilation of the central bibliography.

The Acting Chairman of IODE emphasized that it appears that IOCARIBE will consist mainly of biological and geophysical/geological and pollution data gathering programmes and it is precisely in these areas that IODE's guidance has not been well developed. He noted as an example that the flow of geophysical/geological data under CICAR was extremely successful but that for biological data was almost nil.

The activities of the Regional Data Center for IOCARIBE have so far been confined to finishing the work under CICAR and issuing a comprehensive final "Guide to CICAR data". As yet, no data have been collected under the auspices of IOCARIBE and thus none has been acquired by the RDC IOCARIBE.

The head of the ASFIS Survey Team, Mr. A. Varley (U.K.) stated that the ASFIS Mission Report recommended and stressed the need to strengthen local facilities, but also recommended the establishment of a regional centre; it was not a question of one or the other. The Survey Team felt both were needed. The most cost effective way was to link the centre with the existing ASFIS centre in Mexico City. The desperate needs in the region are document delivery and document exchange and the centre would respond to requests for photocopies of scientific publications and reports required by scientists.

In conclusion, Mr. Varley stated that it is gratifying that (at last) information is being generally recognized as a valuable resource, and that serious attention is being given to the advantages of co-operating in information gathering, recording, exchange, dissemination, and analysis - with particular regard, of course, to the role of published and bibliographic information in technology transfer.
5.1.7 International Co-ordination Group for the Southern Oceans (SOC)

The Working Committee was informed of the findings of the third session of the International Co-ordination Group for the Southern Oceans (SOC) held in London (30 August - 2 September 1977).

This third session of ICG for SOC welcomed as an international co-operative study the Biological Investigations of Marine Antarctic Systems and Stocks (BIOMASS) programme and encouraged SCAR and SCOR and their collaborators to continue the scientific planning of the various activities envisaged, paying specific attention to the standardization of methods involved. The recommendation of SOC-III was approved by the IOC Assembly at its tenth session (resolution X-12).

The Working Committee felt that close liaison should be established with ICG for SOC, and SCAR and SCOR experts involved in planning of the BIOMASS Programme, and recommended that such liaison be made through the IOE rapporteur.

Resolution IOE-IX.1 on this matter was adopted.

5.1.8 Marine Pollution Research and Monitoring Programmes

Document IOC/IOE-IX/16 containing information on data management activities within on-going or planned marine pollution research and monitoring programmes, was introduced by the Assistant Secretary of IOC. Particular attention was drawn to the following activities:

i) Working Committee for Global Investigation of Pollution in the Marine Environment (GIPME) and recommendations made at its second session (1-4 May 1978, Paris). The Chairman of the ad hoc Group on Marine Pollution Data, Mr. Kent H. Hughes, acted as consultant to WC/GIPME on data management problems and participated in the second session of WC/GIPME. He also participated in the second session of the GIPME Group of Experts on Methods, Standards and Intercalibration.

On the basis of recommendations of GIPME-II, the IOC Assembly (resolution X-7) requested FAO, within ASFIS, to develop a project inventory register on national marine pollution research and monitoring projects. On this matter, Mr. E. Akyüz informed the session that the development of a register had been initiated and the third session of WC/GIPME (scheduled from 30 May - 15 June 1979) will be informed on the development in this field.

The tenth session of the IOC Assembly also invited Member States and ICES to test the use of the IOC General Format-2 (GF-2) for recording and exchanging marine pollution data, as recommended by WC/GIPME at its second session.

The meeting felt that close contact between WC/IOE and WC/GIPME should be continued and requested the Chairman WC/IOE to correspond with the Chairman WC/GIPME, particularly in connection with the forthcoming third session of WC/GIPME (May-June 1979).
The IGOSS Pilot Project on Marine Pollution (Petroleum) Monitoring (MAPMOPP)

The progress of the IGOSS Pilot Project on Marine Pollution (Petroleum) Monitoring, launched in 1975, was reviewed at the first session of the Joint IOC/WMO Working Committee for IGOSS (Paris, September 1978). It concluded that the visual observations of oil slicks and other floating pollutants and floating tar ball elements of MAPMOPP have been sufficiently developed to allow their inclusion in an IOC/WMO operational Marine Pollution Monitoring Programme (MARPOLMON). It recommended that the IOC and WMO continue the operation of MAPMOPP during the period 1 January 1979 - 30 June 1980 while preparations are being made for the implementation of MARPOLMON. The Working Committee on IODE was invited (recommendation 1 (JWC-IGOSS-I)) to provide an evaluation of the data handling and management during the Pilot Project and to recommend other considerations for effective data management during the operational programme for MARPOLMON.

Two NODCs - of Japan and USA - have accepted to serve as RODOCs for MAPMOPP. Their reports were submitted to the ninth session of WC/IODE as document IOC/IODE-IX/9 rev. and 9 rev.add.1. Data management activities were co-ordinated through the ad hoc Group on Marine Pollution Data and the ad hoc Group on IGOSS Data Archiving and Exchange, whose reports were submitted to IODE-IX as documents 10.4 and 10.5 respectively. The ad hoc Group on Marine Pollution Data recommended in particular a format developed by the ad hoc Group on IGOSS Data Archiving and Exchange, for the exchange, on magnetic tape, of data resulting from MAPMOPP. The report of the ad hoc Group on Marine Pollution Data containing proposals for further action regarding marine pollution data was discussed under agenda item 6.1.4.

The WC/IODE emphasized the need for further close contact with WC/IGOSS, particularly in connection with preparation of a plan for data management programmes for MARPOLMON.

The representative of the Federal Republic of Germany, who participated in the evaluation of MAPMOPP, urged National Co-ordinators for IODE to contact National Co-ordinators for MAPMOPP of their countries with the request to ensure that all the data generated during MAPMOPP be sent to the RODOCs as soon as possible for intersessional evaluation by the IGOSS Sub-group of Experts on MARPOLMON (resolution JWC-IGOSS-I.2).
iii) **UNEP Co-ordinated Mediterranean Pollution Monitoring and Research Programme (MEDPOL)**

Handling of data in MEDPOL, which includes seven marine pollution research and monitoring projects, was discussed at the second session of the WC/GIPME (September 1977) and at the tenth session of the IOC Assembly (October-November 1977).

During the discussions at the above meetings, concern was expressed regarding possible restrictions on distribution of some data within MEDPOL. The IOC Assembly, in its resolution X-7, "endorsed the use of the facilities of IODE for the exchange of marine pollution data resulting from MEDPOL programmes and, in view of the serious danger of a precedent being established in regard to confidentiality of data, recommends the IOC and the ICSPRO agencies to do everything possible to ensure the free exchange of data in the Mediterranean".

In connection with the above resolution, the WC/IODE wished to emphasize that free exchange of data resulting from international programmes is the basic principle of IOC (as outlined in the Manual on IODE) and is essential for success of any international programmes or projects. It felt that the attention of Member States of IOC and other ICSPRO agencies should be brought to this fact and to the existing IOC mechanism and procedures for exchange of oceanographic data.

Recommendations IODE-IX.1 and IODE-IX.2 on this matter were adopted.

5.1.9 **Joint IOC/WMO Activities Relating to Marine Environmental Data**

i) In considering meteorological programmes related to IODE, the Committee noted with appreciation the arrangements made by the WMO Commission for Marine Meteorology (CMM), to ensure that special ship observations of ocean surface characteristics such as surface currents obtained from ships' set and drift, which are collected under a CMM system, are routinely copied by the relevant centre to the World Data Centres for Oceanography. The meteorological observations made by Voluntary Observing Ships are collected and preserved by eight marine meteorological centres, each of which is responsible for a particular ocean or sea area. This system, which is called the Marine Climatological Summaries Scheme, enables ready access to the entire data bank of ship observations.

ii) The Committee noted with satisfaction that there had also been fruitful co-operation between the Working Committee for IGOSS and WMO in the field of environmental data planning and management within the framework of the Joint IOC/WMO Programme on IGOSS and the First GARP Global Experiment.
iii) The Committee considered that this system of ship data collection was of great assistance to ocean research activities and it would welcome greater publicity amongst the oceanographic community of the addresses of the marine meteorological data centres and an inventory of this data holding. The representative of ICES informed the meeting that, by the use of this system, special arrangements have been made for ship observations from the CINECA area to be copied directly to the CINECA Data Centre and this had enabled the centre to complete its data bank with 10,000 ship observations within a comparatively short time.

The Committee agreed that, in general, the lapse of 1.5 to 2 years between observation time and collection by the responsible marine meteorological centre was sufficient for most research purposes, but in special investigations a shorter time would be needed and, as in the case of CINECA, the good relationship with WMO should be used to make the necessary arrangements.

iv) The Committee learned that the CMM had appointed a Rapporteur on Study of Satellite Data Requirements for Marine Meteorological Services and that the report drafted by this Rapporteur had been prepared in close co-operation with IOC Consultant on the use of satellite data for ocean science, Dr. John Apel. The Committee felt that information on marine meteorological data requirements would also be of interest to oceanographers and it requested the Secretariat to keep the Committee informed on the date of publication of the report of the CMM Rapporteur and its availability.

v) The Committee was informed that a World Climate Conference would be convened by WMO in February 1979 and would, among other questions, address itself to the question of data requirements for climate studies. As regards the marine environment, these requirements will obviously increase data both from the oceans and the atmosphere, in real-time or near-real-time as well as historical data. The Committee felt that this Conference would mark an important development in the co-operation between oceanographic and meteorological data centres. Studies of climate and its variations involve air-sea interaction and an increasing demand can be expected for the combined use of data collected either at oceanographic or at meteorological centres. Attention should therefore be given to such problems as compatibility of formats for oceanic and atmospheric data, general accessibility of data required for climate and air-sea interaction studies, quality control procedures, representativeness of data measured or observed by different methods. In addition, a historical data base for both ocean and atmosphere should be developed together with an appropriate referral system. The suitability of the NEDI referral system for this purpose should be investigated.
vi) The Committee felt that these various problems should be studied by IOC/IODE and WMO in close co-operation. However, it was considered not appropriate to recommend the establishment of fixed joint study groups. Instead, the co-ordination mechanism should be kept flexible and it would be more appropriate to arrange for regular consultations between the WC/IODE and WMO, for instance, in the form of informal planning meetings. This kind of arrangement should replace the present joint IOC/WMO ad hoc Group on Air-Sea Interaction Data.

Recommendation IODE-IX.3 was adopted accordingly.

5.1.10 Global Atmospheric Research Programme/Global Weather Experiment (GARP/FGGE)

i) Under this item, the Working Committee was informed by the Project Manager, RNODC-FOY, Mr. R. Dennis, on the development and co-ordination of oceanographic data management for the Global Weather Experiment (FGGE).

The WMO, in conjunction with the First GARP Global Experiment (FGGE) asked IOC to provide data management support for oceanographic data deriving from the Global Weather Experiment (GWE or FGGE). The IOC, in turn, asked Member Nations to volunteer for whatever tasks they felt they could complete. At the tenth session of the IOC Assembly, the United States volunteered, under the auspices of IODE, to provide data management for the oceanographic component of FGGE Level IIc data, through the establishment of a special Responsible National Oceanographic Data Center for FGGE Operational Year (RNODC-FOY).

Considering the extent of the Global Weather Experiment data sets, and recognizing the probable bulk of oceanographic data from the entire world ocean - coincident with the Experiment - the Environmental Data Information Service decided that the FGGE Operational Year (1 December 1978 to 1 December 1979) would provide an opportunity to construct a prototype global oceanographic data base which would serve as a first approach to solving the problems to be expected in future climate work. This opportunity to exercise and extend the IODE functions and to accelerate the exchange of data would provide a data set of known quality to air-sea interaction studies as well as a formulation upon which larger climate data bases could build.

The RNODC-FOY effort has grown now into a collaborative effort between EDIS of the United States and BNDO of France.
5.1.11 Global Ocean Data Inventory (GODI)

The first task of this collaborative project is the development of a Global Ocean Data Inventory (GODI). This inventory will contain directory information to all marine data of any type - physical, chemical, biological or geological - collected anywhere in the world ocean during the FGGE Operational Year. This inventory serves two purposes:

i) The GODI focuses attention on all data to become available for exchange and inclusion in either the FGGE IIc data set or the Global Ocean Climate Data Base,

ii) The GODI allows scientific planners and researchers to determine quickly what data exist, where these data were observed, where the data are available and the observational periods covered. All of this information is available from a single source.

The GODI will be published twice yearly and distributed free to all interested scientists. The inventory will further be available worldwide for quick query via commercial telecommunications system to those users who have access to the system. The Inventory will first be published in June 1979 and will be updated every six months until the final version is issued in December 1982.

5.1.12 Global Ocean Climate Data Base

The second task of the RNODEC-FOY is the construction of a Global Ocean Climate Data Base (GOCDB) of selected physical oceanographic parameters:

a) salinity  
b) temperature  
c) current velocity  
d) sea-level data  
e) oxygen  
f) phosphates  
g) silicates

Those data which are available at the end of 1981 and which fall within the FGGE area of interest (20°N to 20°S) will be sent in December 1981 to the data centre to be designated by the FGGE Panel for inclusion in the FGGE IIc data set. It should be noted that the FGGE IIc data as described by the JDC for GARP are a subset of the Global Ocean Climate Data Base.

i) Status of the Project

The project at present may be designated as progressing well. The full documentation of the effort will eventually be published by the RNODEC-FOY in the form of a project plan. The status may be quickly summarized as follows:
- Co-ordination

Personnel from RNODC-FOY have co-ordinated with SCOR Working Group 47 who are responsible for oceanographic plans within the FGGE area (20°N to 20°S).

Presentation of the project plans has been given to IOC Regional Association at IOCARIBE-II and at "El Nino-I". Each of these groups passed a resolution urging active support of the project through full submission of documentation of data for the GODC and exchange of the data to be included in the GOCDB.

At the Joint IOC/WMO Meeting in Paris in September 1978, a summary paper describing the project as known at that time was presented. Data flow for FOY was approved and adheres to the normal IODE data exchange methods. This document (JWC-IGOSS-1/25) is annexed with appropriate updates.

- Operations

Details of the liaison between BNDO France, and EDIS USA, have been completed.

BNDO will serve as European consultant on GODI usage and will digitize XBT data from the Atlantic ocean for those countries which are unable to do so themselves. BNDO will further interact with data producers in the Atlantic Ocean regarding entry of this directory information into the inventory (GODI).

EDIS will bear responsibility for all software development, maintenance and documentation of the inventory. User guides will be issued. EDIS will be digitizing XBTs from Pacific and Indian Ocean for those countries not able to do so themselves. EDIS will manage the inventory entry for all Pacific and Indian Ocean data.

Further details are being discussed between EDIS and BNDO.

- Mailing to Worldwide Scientists

A letter and survey form was mailed to each of the scientists listed in the FAO/IOC Directory of Marine Scientists in mid-December 1978. At present, we have received replies from more than 150 scientists. The work of these scientists ranges from 84°N to 70°S in all oceans. Twenty countries are represented. The information from these pre-field survey forms is being coded for entry into the inventory (GODI).
- Software development

The computer programmes for the GODI are nearing completion and the inventory was expected to be accessible to users through telecommunications by March or April 1979. The first publication of the inventory will be in June 1979.

ii) Global ocean climate data base and products

The GOCDB and various special products from either the inventory information or from the ocean climate data base are still in planning stages. The RNODC-FOY is consulting with various scientific groups and is soliciting advice and suggestions from the Working Committee on IODE.

The RNODC-FOY respectfully proposed that the members of IODE-IX might wish to consider a number of actions:

a) Recommending that scientists in Member States submit their responses to RNODC-FOY via the pre-field survey form sent to each scientist;

b) adoption of document IOC-WMO/IGOSS-I/25 or an amended version thereof as a description of the project for reference in the interim period prior to issuance of the programme plan by RNODC-FOY;

c) Establish a task team to advise the RNODC-FOY on the operations within IODE network and determination of quality control procedures for the GOCDB.

The Working Committee on IODE urged Member States to support the accelerated IGOSS and IODE flow of oceanographic data and inventories to permit the timely compilation of the FGGE Level II oceanographic and global ocean climate data base.

Recommendation IODE-IX.4 was adopted.

6. Geological/Geophysical Data

The Chairman of the ad hoc Group for the development of Marine Geological/Geophysical Data Management, Mr. D.P. Kohnke (Federal Republic of Germany) presented an extensive report of the ad hoc Group to the session (document IOC/IODE-IX/10.1). In reviewing the progress made during the intersessional period, he presented an analysis of the national comments on the IOC "International Marine Geological/Geophysical Data
Exchange Format. The comments showed that a few geological institutes are prepared to exchange their data in the IOC format, but that the institutions doing the most intensive research work are those which are least prepared to use the IOC exchange format. The Chairman of the ad hoc Group expressed the feeling that for the time being, a large-scale international exchange of marine geological data cannot obviously be realized in a standard format.

As to marine geophysics, the Chairman of the ad hoc Group drew attention to the existence of the U.S. Marine Geological Data Format (MGD77) developed by the USA and used by other countries for the exchange of marine gravimetric, magnetic and bathymetric data. The Chairman then informed the Working Committee that the two IOC ad hoc Groups: (a) Marine Geological/Geophysical Data, and (b) Format Development, suggested the exchange of gravity, magnetics and bathymetry data in the newly developed GF-3 format in order to avoid a proliferation of formats.

Mr. N.S. Loughridge, US member of the ad hoc Group, made comments on some elements of the formats developed by the ad hoc Group and these are reproduced as Annex VII hereto.

The Working Committee recognized that marine geological/geophysical data form an increasingly important part of international programmes and therefore fully agreed with the US member's statement that the WC/IODE must continue (in spite of the difficulties which he outlined) to make every effort to strengthen arrangements to broaden the exchange and subsequent centralization of marine geological data through the WDC system. To this end the Working Committee will maintain close liaison with relevant IOC programmes, and decided to designate two rapporteurs to continue intersessional work.

Resolution IODE-IX.2 on this subject was adopted.

6.1 Satellite and Airborne Sensed Data

Dr. J. Ulizarren, the Chairman of the ad hoc Group on the Exchange of Satellite and Airborne Sensed Data introduced the report of his group (document IOC/IODE-IX/10.2).

Referring to this report, the Chairman noted the work done by the U.S. member of the Group and by the IOC consultant on the use of satellite data, Dr. John Apel (document IOC-X/21 refers). As Chairman of the ad hoc Group on Satellite and Airborne Sensed Data, he pointed out that the terms of reference of the ad hoc Group were to:

a) identify the present and future requirements for remotely sensed oceanographic data;

b) identify suitable formats for such data;

c) identify the types of data obtainable by real-time and conventional methods;
d) make recommendations concerning the archiving and storage of such data.

With respect to the above terms of reference, the Chairman made the following recommendations and suggestions:

i) Insofar as present and future requirements were concerned, he felt that there was a need to inform in a more effective manner present and potential users of remotely sensed data on existing data and data products available for oceanic areas as well as potential uses and limitations of these data. He also stated that there was a need to define more clearly the user community and to specify its needs. With this in mind, he recommended that the IOC Secretariat prepare an illustrated brochure showing the current capabilities and limitations of remote sensing equipment and the information available therefrom.

In addition, he suggested that the Secretariat prepare a questionnaire to determine the needs of Member States for such data.

ii) On the matter of formats, it was suggested that black and white 35 mm and 70 mm film products could be prepared for wide distribution. Some magnetic tapes might be made available on a limited basis; however, the extremely high volume and resulting costs of reproduction would limit such distribution to a few special data sets for local applications.

iii) As to access to real-time data, the Chairman felt that for the time being it is not feasible to consider real-time interchange of data but that this phase could be approached gradually.

iv) Because of the high costs and other problems related to the archiving and retrieval of remotely sensed data from satellites, it may not be possible or practical to archive all recorded data at WDC-A and B. An alternative may be the submission to the WDCs of documents describing data available from existing national archiving facilities. If requested, satellite data could then be provided from the national facility utilizing the WDC mechanism.

The delegate of the Netherlands informed the Working Committee that the European Space Agency (ESA) has regularly made inventories of needs for remote sensing (RS) within Europe during the last 5 to 6 years, and that WMO regularly publishes a list of all planned and present meteorological satellites with complete information on sensors, processing and data availability. The delegate suggested to the Working Committee that aircraft RS data should be considered as a vital support for satellite observations. He expressed the need for the oceanographic community to learn how to use RS data first with images and that the image must be printed so that small contrasts, as found in infrared and visible light wavelengths, are maximized. To support this, NODCs should educate their local oceanographic community with RS applications and establish channels to obtain RS data for application purposes.
Dr. Szekielda, the representative of the UN Centre for Natural Resources, Energy and Transport (CNRET), informed the Committee that the General Assembly, during its thirty-second session, had endorsed the recommendation for the establishment of a remote sensing facility in CNRET. This step would meet a recognized need for a more systematic and intensified effort for current and expanded application of remote sensing particularly in the area of non-agricultural resources and related fields.

These activities are based on recommendations made by the Scientific and Technical Sub-Committee of the Committee on the Peaceful Uses of Outer Space. So far budget provision has been made for a specialist to head this facility and to expand the application of remote sensing. This facility is further developing contacts and co-ordination of activities with the regional economic commissions and regional or interregional remote sensing units the establishment of which, in some areas, is under active consideration by other concerned organizations within and outside the United Nations system and international experts on this subject. The CNRET also plays an active role in the ACC Sub-Committee on space applications and other forms of co-ordination. The United Nations Remote Sensing Unit in CNRET is also integrating satellite data into project planning and is assisting in resource development programmes where satellite data may have a potential for surveying activities.

The Chairman invited Dr. Szekielda to participate in the Task Group on Remote Sensing.

The U.S. member of the ad hoc Group on Exchange of Satellite and Airborne Sensed Data provided the Committee with an update of his report IOC/IODE-IX/10.2, informing the members of the successful launching of SEASAT, TIROS-N, NIMBUS-7, and of the unfortunate loss of communications with SEASAT after only 100 days of operation.

In regard to the overall report of the Group, he added that in his opinion, in the case of satellite data, the idea of "exchange" is not practical because of the tremendous amounts of data being acquired daily. What is really needed, perhaps, is greater international awareness, especially amongst the developing countries, of the availability of remotely sensed data, especially where and to whom they can go to get these data for their particular applications. As a start toward fostering this awareness, his organization (U.S. Environmental Satellite Data Archives) initiated a Satellite Data Users Bulletin in January 1979 and is planning a computerized data dictionary/directory system of all known satellite data as part of the U.S. Climate Programme, for 1980. This system could be shared through mutual exchange of this directory system information by appropriate data centres.

The Working Committee decided to continue this work through the ad hoc Task Team consisting of members from France, Federal Republic of Germany, Japan, Netherlands (Chairman), Norway, USSR and USA. The representatives of UN, ICES and other organizations were invited to join the team. The Working Committee strongly endorsed close collaboration with WMO on this matter.

Recommendation IODE-IX.5 was approved.
6.2 Marine Pollution Data

The report of the ad hoc Group on Marine Pollution Data was submitted to the meeting as document IOC/IODE-IX/10.4.

In almost all cases, this report updates the status of activities begun during the First Special Session of the ad hoc Group on Marine Pollution Data held in Paris in May 1977. Full details of that meeting are contained in its Summary Report (document IOC/IODE-MPD-I/3).

The Group reviewed the capabilities of available inventory systems for marine pollution data. The Marine Environmental Data Information (MEDI) Referral System proved most interesting in that it was seen as the best existing means of cataloguing data files on marine pollution as well as other material of importance which may not be suitable for automatic data processing.

After evaluating numerous magnetic tape formats for the exchange of marine pollution data, the group felt that the IOC General Format should be used experimentally for the upcoming IOC/WMO/UNEP Programme for Monitoring Background Levels of Selected Pollutants in Open Ocean Waters and in the Regional Seas Programme. Although several deficiencies were noted with the General Format reviewed during the first session, subsequent modifications to the General Format (now called GF-3) have eliminated the original objections and GF-3 should not present problems for these programmes.

It was suggested that a seminar or a series should be sponsored by the WC/IODE instructing on the proper use of the latest version of the General Format (GF-3). These seminars might be co-ordinated jointly with the WC/TEMA and in conjunction with the two afore-mentioned programmes.

The ad hoc Group suggested that IODE-IX approve the use of the JODC developed format for the exchange of MAPMOPP data which do not appear to require the capabilities offered by the more flexible, but more complex, GF-3 format.

The monitoring and exchange of data on marine pollution is just in its initial stages. The Chairman of the ad hoc Group recommended that work continue during the coming intersessional period and that the degree of liaison with marine pollution programmes be increased. It was suggested that WC/IODE efforts with these programmes might be most effectively carried out through a rapporteur. The Working Committee fully agreed with this suggestion adding that the rapporteur should utilize the terms of reference of the ad hoc Group itself. It was agreed that a rapporteur be designated by the USA.

6.3 IGOSS Data Archiving and Exchange

The Chairman of the ad hoc Group reported on the principal achievements of the group and, in this respect, also called attention to the reports of the RNODCs for IGOSS. The Chairman noted with gratitude the
opportunity to work with various WMO planning bodies for the First GARP Global Experiment (FGGE). As a result, FGGE formats have achieved maximum compatibility with IODE's SYNDARC format and IODE procedures have been fully taken into account in the FGGE Data Management Plan. Collaboration also took place with the CMM's Working Group on Marine Climatology. Further, a recent decision of the Commission for Basic Systems (CBS) has effectively responded to a necessary modification of code group usage suggested by the Group.

Large volumes of BATHY (~ 80,000) and some TESAC reports have now been archived in SYNDARC format. Exchange among RNODCs has taken place. It must be noted, however, that during the past seven years there have been virtually no users of this type of archived data. Substantial amounts of "visual observation" of oil slicks (MAPMOPP) have been submitted. Only small amounts of "tar ball", "beach tar" and dissolved hydrocarbon data have been exchanged but this principally reflects only the lower level of observational effort within those MAPMOPP programmes. On the initiative of the Japan RNODC for MAPMOPP, a versatile and comprehensive standard IGOS SYNDARC MAPMOPP format for the exchange of all types of MAPMOPP data and accompanying documentation, has been developed, fully tested, and is available for general use by all participants who wish to convert to this new IODE format.

The Working Committee decided to continue the work of the ad hoc group through a rapporteur whom. Member States were invited to designate by correspondence.

Resolution IODE-IX.3 was adopted.

6.4 Format Development

The IOC consultant, Mr. P. Winiarski, presented the reports (documents IOC/IODE-IX/13, 13 add.1 and 13 add.1, corr.1) on the development of a general format for the international exchange of oceanographic data, and strongly recommended that the General Format-3 (GF-3) be adopted as the standard IODE format for international exchange purposes. This format has now been fully elaborated. He stressed the flexibility of the GF-3 format and hoped that it had solved many of the problems apparent in the use of the previous GF-2 format. He pointed out that, in the transition to GF-3, many data centres might find the GF-2 sub-set of GF-3 a useful starting point.

Dr. M.T. Jones (U.K.), on behalf of the Chairman of the ad hoc Group on Format Development, Mr. J. Crease (U.K.), made reference to the Chairman's report and recommendations (document IOC/IODE-IX/10.6) and to a pre-sessional meeting of experts held on January 11-12, 1979 at which items relevant to GF-3 were discussed (document IOC/IODE-IX/17). This informal meeting reviewed the acceptability of the GF-3 format, the need to publish documentation on it, to develop further the parameter code table, and to keep the format under review. Dr. Jones pointed out that GF-3 was more than just a format for physical oceanographic data and could be used, for example, for biological, geophysical, geological, pollution and meteorological data. It was also a tool for the development of standard formats tailored specifically to the individual requirements of the various oceanographic sub-disciplines. He hoped that
whereas some standard formats already in existence obviously had a role to play, if changes were contemplated to these formats, no matter how detailed, then the designers of such formats would seriously consider making such changes within the framework of GF-3.

The representative of ICES stressed the interest which his organization took in the GF-3 format. The ICES formats that had been used for many years for the storage and exchange of classical physical and chemical data could not easily be developed to cover the many types of heterogeneous data now being generated in marine biology and pollution studies. Relevant in this connection was the involvement of ICES in regional pollution investigations, its status as advisory body to the Oslo Commission, and its contact with the Interim Helsinki Commission which is charged with the task of controlling the pollution of the Baltic.

As its meeting in September 1978, the ICES Working Group on Marine Data Management came to the conclusion that the GF-3 format will be entirely suitable for the encoding, archiving and exchange of all types of marine environmental data, as experienced from the handling of the JONSDAP '76 data. The Working Group therefore recommended that ICES accept the GF-3 format as a supplement to the existing ICES formats for use in handling new types of data, such as those generated by pollution studies.

Referring to the report of the ad hoc Group on Format Development and to documentation and user facility, Mr. R. Dennis (USA) stated that the RNODEC-FOY will be preparing the Global Ocean Climate Data Base of physical oceanographic parameters and would use the General Format for exchange of these data to World Data Centres.

Captain J. G. Villanueva (Argentina) stated that in their programme of RNODEC development, their National Centre had had the opportunity to experiment with the new version of GF-2 and the conversion of four data files from different disciplines to a single format disciplinary file had shown that the task, even though not especially complex, is extremely time-consuming for the computer programmers. With this in mind, and in order to ensure the most fluid and efficient operation, he felt that it would be advisable, before deciding on its general use, to establish a changeover period of not less than two years for adaptation to the new system. He also suggested that the possibility of holding a Seminar/Workshop for data processing specialists (computer programmers) with emphasis on future RNODEC implementation of GF-3 be examined.

The delegate of the USSR expressed similar concern concerning the work required for change of the format GF-2 to GF-3.

The Committee felt that further development of the General Format should be kept under its permanent review, and consequently recommended the establishment of a Group of Experts on Format Development. The Committee also invited an NODC to volunteer to act as an RNODEC for information on formats.

Recommendation IODE-IX.6 was adopted.
6.5 Aquatic Sciences and Fisheries Information System (ASFIS)

The meeting considered the report on the Aquatic Sciences and Fisheries Information System (ASFIS) (document IOC/IODE-IX/10.7) and noted with appreciation the progress which had been made since IODE-VIII, including in particular the publication of:

a) "Freshwater and Aquaculture Science Contents Tables"

b) "World List of Aquatic Sciences and Fisheries Serial Titles" and its three supplements

c) "ASFIS Register of Meetings" on a continuing basis

d) The publication and distribution of the ASFIS Brochure

e) The computerization of ASFIS, including the provisions made for on-line service for ASFIS in some areas

f) The addition of the UN Ocean Economics and Technology Office (OETO) as an ASFIS sponsor.

It was further noted that the support by UNEP for ASFIS was to continue until mid-1979. The FAO representative gave details of the activities planned for 1979, including the holding of a workshop/seminar in the IOCARIBE region, and the meeting approved this plan of action. The Committee noted with appreciation resolution IX-31 of the IOC ninth Assembly by which it was decided to give IOC a joint responsibility in the co-ordination of ASFIS, but was somewhat disappointed with the degree of involvement to date of the IOC Secretariat in this matter.

The Committee therefore adopted Recommendation IODE-IX.7, stressing the need for IOC activity in ASFIS, in particular in the area of making ASFIS products and services more readily available and better utilized, especially in the developing countries. In order to facilitate Secretariat action on this matter, a special study will be undertaken by Dr. V.S. Bhatt (India) and his report submitted to the Joint FAO/IOC Panel of Experts on ASFIS.

The Chairman referred to a list of terms in physical oceanography in an IAPSO report. This will be reviewed by some IODE members together with their national experts and returned to the Secretariat well in advance of the IAPSO Symposium scheduled for December 1979 in Canberra.

The need to have access to multilingual glossaries has been re-emphasized both at the Executive Council (document IOC/EC-VIII/15, February 1977) and at the present meeting (through document IOC/IODE-IX/9). The IOC Secretariat, upon the request of the ninth session of its Assembly (resolution IX-32) undertook a feasibility study on the development of a standardized multilingual terminology, and concluded that such a programme at the present time would be beyond the possible financial means of the Commission.
As an alternative, the Secretariat investigated other possible substitutes to glossaries that could readily meet the requirements of the IOC Member States, and concluded that:

a) IOC compile a bibliography of the existing marine science glossaries, in any language, and distribute it to Member States as soon as possible. To this end, a circular letter to identify references to such existing glossaries has already been despatched to Member States;

b) FAO/IOC/UN(OE/O), with the assistance of UNEP, has been developing a thesaurus of terms used for indexing and retrieval of literature in Aquatic Science and Fisheries. The thesaurus is a structured one with broad and associated terms well-identified; supplemented with scope notes where possible ambiguities may exist.

c) IOC negotiate with Member States the possibilities for translation of the enlarged ASFIS that would meet their needs, as expressed in resolution 1.

The Chairman then invited Mr. R. Freeman to give a presentation on his paper (IOC/IODE-IX/INF.3) on computer conferencing systems and this is attached as Annex VIII.

6.6 Marine Information Management

Dr. J. Watson, Chairman of the ad hoc Group on Marine Information Management, stated that although the report was more than fifteen months old, only the section on ASFIS needed up-dating. The sections on:

a) the evaluation of IOC's mandate in marine information management
b) the overview of information services of interest to IOC, and
c) the dissemination of information

should stand as written.

Among the main points stressed by the Chairman of the ad hoc Group was the fact that ASFIS development has accelerated greatly in the past fifteen months, as indicated by Dr. J. Caponio, Chairman of the Joint FAO/IOC Panel of Experts on AFSIS. Dr. Watson stated that in his belief many of the difficulties described in the report have now been addressed but that while ASFIS is now fully operational, IOC still faces certain serious challenges.

First of all, if a proper programme development plan and budget is to be prepared for ASFIS as recommended in the report, then IOC will need to commit additional resources to ASFIS in order to become an equal partner in this system. Up to the present time IOC's contribution of resources to ASFIS has been somewhat modest.
Secondly, IOC and IODE will have to continue to review critically the commitment to information management and dissemination in relation to data. The ad hoc Group on MIM noted that the number two priority for IODE Programme and Budget for 1980, prepared by the A/Chairman of WC/IODE, was information, which was gratifying since the ad hoc Group was of the opinion that non-numerical bibliographical information services are central to any scientific programmes and particularly those of developing nations, such information being often of more direct and immediate use than data per se.

IODE needs to give consideration to the recommendation in the ad hoc Group report which suggests that IODE may not be the correct location for management of ASFIS operations. If information management is to be a part of IODE activities, then recognition should probably be given to this change in orientation and, possibly, in a future plenary session of WC/IODE, the name of IODE should be changed to something like "International Oceanographic Information and Data Exchange".

The opinion of the Working Committee was that it was somewhat premature to recommend such changes. However, it urged the Secretariat to seek ways of achieving greater participation of information specialists at plenary sessions of the Committee.

Dr. Watson also pointed out that the future of the ad hoc Group on Marine Information Management should be considered. Given that IOC was not fulfilling adequately its various mandates in information management at the present time, the Commission was in critical need of advice on information management that was not only readily obtainable but which was also advice provided by recognized information experts. The present group had been fortunate in having three of its members who were also members of the ASFIS Panel of Experts, which had allowed a valid assessment of ASFIS operations. In his opinion, the appointment of a rapporteur would be a flexible mechanism to pursue the mandate before WC/IODE.

The Working Committee noted with appreciation the first report of the ad hoc Group on Marine Information Management (document IOC/IODE-IX/10.8 and add.1) and, recognizing the dynamic nature of information systems and services, confirmed the need for continuing expert advice and guidance. It was felt that a broader consultation than is possible through the ad hoc Group mechanism was essential for the adequate provision of advice and evaluation of information matters, and that a rapporteur on marine information management should be appointed.

Resolution IODE-IX.4 was adopted.
The Marine Environmental Data Information Referral System (MEDI)

The Committee noted with appreciation the progress made in the development of the Marine Environmental Data Information System (MEDI) as described in documents IOC/IODE-IX/10.9, add.1 and add.2, recalling that this rapid development would not have been possible without the financial support of UNEP. The Committee further noted three major actions which were expected to increase the utility and operability of the system:

a) The statement in the Summary Report of the tenth session of the IOC Assembly that "in order to implement MEDI operational functions, as decided by IOC (resolution IX-30), particularly for the next biennium 1979-1980, additional staff support would be required and, therefore, the Secretary IOC should investigate the possibility of obtaining or seconding such staff support";

b) The expressions of support received from the WMO Commission for basic Systems;

c) The recent designation by EUROCEAN of a MEDI point of contact.

The following timetable for MEDI activities was considered and approved by the session:

<table>
<thead>
<tr>
<th>Action</th>
<th>When?</th>
<th>Who?</th>
</tr>
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<tbody>
<tr>
<td>1. Finalization of MEDI computer system</td>
<td></td>
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<tr>
<td>a) Completion of programming</td>
<td>Jan.79</td>
<td>IOC/Unesco</td>
</tr>
<tr>
<td>b) Completion of programme documentation</td>
<td>May 79</td>
<td>&quot;</td>
</tr>
<tr>
<td>c) Finalization of Operations Manual</td>
<td>Aug.79</td>
<td>G. E</td>
</tr>
<tr>
<td>d) Review by MEDI Group of Experts (outputs - &quot;sample catalogue&quot;)</td>
<td>March 79</td>
<td>G. E</td>
</tr>
<tr>
<td>2. Publication of MEDI Operations Manual</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) sources</td>
<td>July 79</td>
<td>IOC</td>
</tr>
<tr>
<td>b) complete</td>
<td>mid-80</td>
<td>&quot;</td>
</tr>
<tr>
<td>3. Publication of MEDI Brochure</td>
<td>July 79</td>
<td>IOC</td>
</tr>
<tr>
<td>4. Publication, Dissemination of MEDI Catalogue I to participants</td>
<td>July 79</td>
<td>IOC</td>
</tr>
<tr>
<td>a) Review and update by participants</td>
<td>Jul.-Dec.79</td>
<td>IOC</td>
</tr>
<tr>
<td>b) Publication of MEDI Catalogue II(1980)</td>
<td>Jan-May 80</td>
<td>IOC</td>
</tr>
<tr>
<td>5. Continuous review/update of MEDI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Third meeting of Group of Experts on MEDI</td>
<td>July 79</td>
<td>G. E</td>
</tr>
</tbody>
</table>

G. E = Group of Experts
Noting that UNEP funding of MEDI, although extended to the end of 1979, was essentially limited to the Pilot Project (i.e. would cease with the distribution of the first edition of the MEDI catalogue), the Committee approved Recommendation IODE-IX.8 calling upon IOC to provide the resources necessary for the operation of MEDI in accordance with the decision of the tenth session of the IOC Assembly. Finally, noting that the immediate need was for increased coverage of marine data holdings of all types and in all locations, the Committee appealed to Member States and participating organizations to accelerate registration in MEDI of such files.

6.8 Responsible National Oceanographic Data Centres (RNODECs)

The Chairman of the Group of Experts on the Development of a Pilot Programme for Responsible National Oceanographic Data Centres (RNODECs), Mr. R.V. Ochisino, presented a report on the activities of the Group. The Group held its first meeting in October 1976. The report of this session was made available to participants of IODE-IX as document IOC/RNODEC-I/3. During the October meeting, the Group prepared the following:

i) first draft of the relationship of RNODEC with other elements of the IODE system;

ii) draft outline of the Concept and Envisioned functions of RNODECs.

In accordance with the action plan prepared at the first session, the following work was accomplished during the intersessional period:

i) Draft Brochure, describing the concept of RNODECs, was prepared and submitted to IODE-IX as document IOC/IODE-IX/15;

ii) Two questionnaires were developed and distributed to obtain information on the types of data management assistance required by various on-going and planned international programmes as well as on the data processing and data product preparation capabilities of the volunteering RNODEC. Collected information was reviewed at the preparatory meeting of the Group of Experts on RNODECs (10-12 January 1979);

iii) Two volunteer NODCs (France and Argentina) tested sets of data, using the GF-2 format, and then putting these data on magnetic tape.

The Group of Experts at this preparatory meeting reviewed the documents on RNODEC prepared for IODE-IX, and made some modifications to the RNODEC brochure (document IOC/IODE-IX/15) as well as to the operational plan developed at its first (1976) meeting.
The Committee noted with satisfaction the work undertaken by the Group of Experts on RNODC. It was pointed out that the RNODC scheme was developed to support the activities of the WDCs system, and international activities either within specific oceanic areas or dealing with specific investigations. The participants felt that information on this element of IODE - RNODC - should be brought to the attention of the ICSU Panel on WDCs scheduled in December 1979, and requested the Chairman Wc/IODE, Member of the ICSU Panel on WDCs, to make such a presentation so that RNODCs be recognized as an element of the ICSU WDC system.

In view of the adoption of General Format-3 (GF-3), the Chairman of the Group of Experts explained that those centres which had already experience with GF-2 would not have difficulties in using GF-3. The Committee invited other centres to test GF-3.

Some delegates stressed the importance of provision of information on the role and relationship of RNODCs with other elements of the IODE system. Early publication of the brochure on RNODCs was therefore found necessary. It was also pointed out that the Group of Experts should prepare a Guide on RNODCs which should include the description of functions of RNODCs, relationship with other elements of IODE and data flow diagrams between various centres. It was understood that preparation of this Guide would be considered by the Group at its second session in September 1979.

Resolution IODE-IX.5 was adopted.

6.9 Wave Data

The Chairman of the Task Team on Wave Data Management (Dr. R.Wilson, Canada), reported on progress during the intersessional period (document IOC/IODE-IX/10.11). The RNODC for wave data established in the United Kingdom following the Steering Committee meeting in Paris in February 1977, completed the development of an inventory form which was circulated to the National Contact Points of the Permanent International Association of Navigational Congresses (PIANC) and to those of IODE. The covering letter called for the appointment of area representatives responsible for submission of wave data inventory information to the RNODC-waves.

Area representatives have been appointed by 23 countries including Australia, Brazil, Belgium, Canada, Denmark, Ireland, France, the Federal Republic of Germany, Iceland, India, Indonesia, Israel, Japan, Mexico, Netherlands, New Zealand, Norway, Portugal, South Africa, Spain, Sri Lanka, Sweden and the United States. In addition to the names of area representatives, about 30 inventory forms have been received.

Present plans call for publication in about one year of the inventory. This catalogue would be circulated to WDCs, NODCs, National Contact Points for PIANC and to area representatives.
Concerning the development of a format under the guidelines of GF-2, guidelines were developed by the Task Team and were circulated. It was recognized that these guidelines were out of date following the recognition of GF-3 but no problems are expected in revising and updating the document for GF-3. Additional parameters to be added to the list for inclusion in the format have been prepared by the Netherlands, the USSR and Japan. The work of the Task Team is essentially complete except for the technical details of assigning parameter codes, incorporating the comments of countries which have not responded as yet to the latest correspondence, and finalizing a set of guidelines for the processing of wave data into GF-3.

The Director of WDC-A, Oceanography mentioned that he had attended a number of national and international gatherings, representing users of oceanographic data for many purposes. At each of these meetings the subject of improving the availability of measured wave data and derived products ranked as the highest priority area in the management of oceanographic data for a broad range of applications.

Mr. H. Meyers, a representative of WDC-A for Solid Earth Geophysics, reported on progress made in responding to guidelines for data exchange established by the Joint IOC/IUGG Committee on Tsunamis.

This Centre is developing several products as follows:

i) tsunamiogenic earthquake parameters

ii) wave heights and run-ups

iii) waveograms for the tsunami interval

iv) seismograms for the tsunami interval

v) photos depicting tsunami damage and tsunamis.

The International Hydrographic Bureau has agreed to inform the Member States of IHO of this activity and is encouraging participation in data exchange. The IOC member States were also encouraged to take part.

The representative of WHO mentioned that as many meteorological services are engaged in the measurement of waves for wave forecasting purposes, the ICM had appointed a special rapporteur on exchange and archiving of measured wave data. This rapporteur, Dr. O. Houmb (Norway) was a member of the IODE Task Team on Wave Data Management. The necessary co-ordination would thus be ensured. The representative of WHO offered the assistance of his organization in the submission of wave data inventory information from meteorological services to the RNODC waves.

The working committee decided to continue this work through means of a rapporteur and approved resolution IODE-IX.6 in this respect.
7. **Declared National Programmes (DNPs)/National Oceanographic Programmes (NOPs)**

The Chairman briefly reviewed the status of DNP/NOP submissions and actions taken during the intersessional period. The Committee approved the draft brochure and requested that it be printed and distributed as soon as possible.

It was noted that improvement is still required in the number of DNP/NOP submissions and data resulting from DNP programmes. Member States not currently providing declarations to the Secretariat are requested to bring this matter to the attention of the appropriate national authorities.

The following documents describing status of submission of DNPs/NOPs were available:

- WDC-A, Semi-annual report (document IOC/IODE-IX/INF.6)
- Status of International Oceanographic Data Exchange (document IOC/EC-XI/14)
- Document on DNP/NOP submissions, prepared by the Secretariat (document IOC/IODE-IX/11 and 11 add.1).

Recommendation IODE-IX.9 was adopted.
8. **Specific requirements of developing countries for training, education and mutual assistance in the field of oceanographic data management**

In response to the request of the Steering Group on International Oceanographic Data Exchange (February 1977), Dr. V.S. Bhatt (India) presented his report highlighting the specific requirements of developing countries related to training, education and mutual assistance in the field of oceanographic data management. The report indicated specific needs for generating trained manpower, essential equipment, literature on processing of oceanographic data, and access to expertise of visiting scientists. The report further indicated a need for creating an environment for mutual assistance in the developing countries and emphasized certain points of management of data, information of the common centres in developing countries. It also expressed a need for seeking assistance under the Voluntary Assistance Programme (VAP) and using a logical criterion for the choice of developing countries for training and assistance in oceanographic data management.

Under this item, the attention of the participants was drawn to the decision of the tenth session of the IOC Assembly (resolution IOC-X-20) on the establishment of a Voluntary Assistance Programme (VAP). The rules for Utilization of the IOC/VAP were made available at the session in document IOC/IODE-IX/12. The Working Committee was also informed on the activities of WC/TEMA, and was invited to decide on future activities of WC/IODE in relation to TEMA and to appoint a TEMA Co-ordinator for the WC/IODE in response to resolution IOC-X-20.

The attention of the Committee was also drawn to the specific request received from the Philippines, Turkey, Malaysia, regarding training of specialists from these countries in the field of oceanographic data handling.

With reference to the proposal made by the IODE Steering Group in February 1977, the Working Committee on IODE strongly supported early preparation of a "Manual on Oceanographic Data Processing" which will be of particular interest for developing countries.

Participants pointed out that more efforts should be devoted to assistance to developing countries in the field of marine information and data management.

Recommendation IODE-IX.10 was approved.

9. **Role of oceanographic data centres in provision of data products (summaries, atlases)**

Various international programmes and projects in the field of marine research and monitoring require different types of data products (processed data in the form of atlases, summaries, catalogues, etc., which can be provided by NODCs). As examples of such products prepared, or being prepared, may be mentioned: "Marine Environmental Atlas for North Western Pacific Ocean" (Japan NODC); "Atlas of Oceanographic Data Coverage of the Mediterranean (CIM Regional Data Centre, USSR NODC); some products prepared by Regional Data Centre for IOCARIPE (formerly CICAR Regional Centre). Participants were invited to exchange views on some other data products which are available or can be made available in support of on-going or planned international oceanographic research and monitoring programmes and to
recommend ways and means for further co-ordination of the service capabilities within IODE.

The Committee felt that this should be considered in connection with the development of a Pilot Programme for RNODCs and Member States were requested to provide additional information on data products to the Secretariat.

10. Review of existing and planned IOC forms and publications relating to IODE

   i) The Working Committee reviewed the existing IODE inventory forms and data formats and made the following conclusions:

<table>
<thead>
<tr>
<th>Proposals of IODE-IX</th>
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<tbody>
<tr>
<td>- IG/GCI : International Geological/Geophysical Cruise Inventory (Appendix 5, Manual on IODE - IOC Manuals and Guides No. 9)</td>
</tr>
<tr>
<td>- RCMBI : Results of Marine Biological Investigation (Appendix 6, Manual on IODE - IOC Manuals and Guides No. 9)</td>
</tr>
<tr>
<td>- IOC &quot;General Format-3&quot;</td>
</tr>
<tr>
<td>- Data format for international exchange of marine geological data (Appendix 7, Manual on IODE - IOC Manuals and Guides No. 9)</td>
</tr>
<tr>
<td>- MEDI Input Registration Form</td>
</tr>
<tr>
<td>- Form for submission of DNPs/NOPs (Appendix 3, Manual on IODE - IOC Manuals and Guides No. 9)</td>
</tr>
</tbody>
</table>
ii) The following publications on IOUE have been issued:

- **Manual on IGOSs Data Archiving and Exchange (IOC Manuals and Guides No. 1)**
  
  - Currently Applicable

- **International Catalogue of Ocean Data Stations (IOC Manuals and Guides No. 2)**
  
  - No plans for revision

- **Marine Environmental Data Information Referral Catalogue (MEDII) Pilot Catalogue (IOC Manuals and Guides No. 8)**
  
  - MEDI catalogue will be published in 1979

- **Manual on International Oceanographic Data Exchange (IOC Manuals and Guides No. 9)**

  - New forms and formats approved by WC/IODE-IX should be incorporated in this Manual

- **Guide for establishing a National Oceanographic Data Centre (IOC Manuals and Guides No. 5)**

  - Currently applicable

- **Guide to International Marine Environmental Data Services (Unesco, Paris, 1975)**

  - No plans for revision

- **Guide on Oceanographic Data Processing**

  - To be prepared in 79/80 and published in IOC Manuals and Guides

- **MEDI Operations Manual**

  - To be published in 1980 as IOC Manual and Guide

- **Brochures currently in preparation**: MEDI, RNODE, DNP/NOP, Satellites, ASFIS (rev.)
11. **IODE work programme priorities and budget**

Under this item, the Committee reviewed the draft programme on IODE for 1979-1980. This plan was prepared by the A/Chairman of WC/IODE in consultation with the Secretariat, reviewed by the IODE Steering Group (February 1977) and submitted to the tenth session of the IOC Assembly. The IOC Assembly concluded that this proposal should be used by the Secretary as a guide for his budget assignments in 1979-1980 for submission to the Unesco General Conference. The XXth session of the Unesco General Conference in 1978 approved the budget of IOC for 1979-1980.

The Committee reviewed the programme for 1979-1980 and agreed with proposed actions with some modifications resulting from the discussions during the session, as shown in Annex IX hereto. It then went on to review the draft programme for 1981-1982 prepared by the A/Chairman WC/IODE in consultation with the Secretariat in accordance with resolution X-27 of IOC Assembly. This draft was discussed at the IOC Planning Team in June 1978. This draft programme, as shown in Annex IX, was incorporated in a document submitted to the eleventh session of the IOC Executive Council held in Mexico City from 26 February - 3 March 1979. The Committee agreed with the proposed programme for 1981-1982 on the understanding that further elaboration will be made by the Chairman and the Secretariat in view of decisions reached by IOC Governing Bodies and further development of IODE programmes.

12. **Election of the Chairman and Vice-Chairman**

Under this agenda item, the Vice-Chairman of IOC, Dr. C. Druet, took the chair. In accordance with previously accepted rules of procedure for IOC subsidiary bodies, he asked the delegates to elect the Chairman and Vice-Chairman of WC/IODE.

Mr. T. Winterfeld (USA) was unanimously elected as Chairman of the Working Committee on IODE and Mr. D. Kohnke (Federal Republic of Germany) as its Vice-Chairman.

13. **Other Business**

The representatives of Trinidad and Tobago pointed out the interest of their country in the meeting and anticipated future participation in the Working Committee's activities.

14. **Next session**

It was decided to have the tenth session of the Working Committee in 1981. In light of previous experience, it was suggested that the duration of the plenary session should be two weeks in order to allow full and active participation in the session drafting teams and in preparatory meetings.
15. **Closure of the session**

In closing the session, the Chairman thanked Dr. Druet for his participation, and expressed gratitude on behalf of the Committee to Dr. A. Tolkachev for his effective assistance in developing the programme during the intersessional period. He also expressed thanks to the United Nations and in particular its Ocean Economics and Technology Office, for the arrangements made for the meeting and for the excellent staff support provided during IODE-IX.
WORKING COMMITTEE ON INTERNATIONAL OCEANOGRAPHIC DATA EXCHANGE

(Ninth Session)
(United Nations, N.Y., 15-19 January 1979)

AGENDA

1. Opening of the session
2. Adoption of the agenda
3. Report of the IOC Secretariat, including proceedings of the meeting of the Steering Group for IODE
4. Report: Related Activities
   4.1 World Data Centres (WDC-A and B, Oceanography)
   4.2 ICES, WMO, PSMSL, FAO, UNEP, ECOR, SCOR and IHO
5. Co-operative Investigations
   5.1.1 El Nino/ERFEN
   5.1.2 CINCWIO
   5.1.3 CCOP (SEATAR) and CCOP/SOPAC
   5.1.4 CIM
   5.1.5 CSK
   5.1.6 IOCARIBE
   5.1.7 SOC
   5.1.8 IDOE projects and programmes
   5.2.1 Marine Pollution Research and Monitoring Programmes
   5.2.2 GIPME and Regional Workshops
   5.2.3 Marine Pollution Monitoring Programmes
   5.3.1 Joint meteorological oceanographic programmes
   5.3.2 GARP/FGGE
   5.3.3 CMM/CBS actions relevant to IODE Programmes
   5.3.4 Joint IOC/WMO activities relating to remote sensed data
   5.3.5 World Climate Conference
6. Reports : IODE Subsidiary Bodies
   6.1.1 Geological/Geophysical Data
   6.1.2 Satellite and Airborne Sensed Data
   6.1.3 Air/Sea Interaction Data
   6.1.4 Marine Pollution Data
   6.1.5 IGOSS Data Archiving and Exchange
   6.1.6 Format Development
   6.1.7 Aquatic Sciences and Fisheries Information System (ASFIS)
   6.1.8 Marine Information Management (MIM)
   6.1.9 Marine Environmental Data Information Referral (MEDI) System
   6.1.10 Responsible National Oceanographic Data Centres (RNODCs)
   6.1.11 Wave Data

7. Declared National Programmes (DNPs)/National Oceanographic Programmes (NOPs)

8. IODE activities in relation to the programmes in the field of training, education, mutual assistance information and technology transfer, within IOC and other United Nations agencies

9. Role of oceanographic data centres in provision of data products (summaries, atlases)

10. Review of existing and planned IOC forms and publications relating to data management

11. IODE Work Programme, priorities and budget

12. Election of the Chairman and Vice-Chairman

13. Other business

14. Next session

15. Closure of the session
LIST OF RECOMMENDATIONS AND RESOLUTIONS ADOPTED BY IODF-IX

RECOMMENDATIONS

No. 1 Participation of International Organizations in the IODE System
No. 2 Marine Environmental Data Availability
No. 3 Co-operation with WMO on Marine Environmental Data Management
No. 4 Oceanographic Data Management during the FGGGE Operational Year (FOY)
No. 5 Exchange of airborne and satellite remotely sensed data
No. 6 IOC General Format for Exchange of Oceanographic Data
No. 7 Aquatic Sciences and Fisheries Information System (ASFIS)
No. 8 Marine Environmental Data Information Referral System (MEDI)
No. 9 Declared National Programmes (DNPs), National Oceanographic Programmes (NOPs)
No. 10 Assistance to Enable Participation of Developing Countries in IODE Programme

RESOLUTIONS

No. 1 Exchange of marine biological data
No. 2 Marine geological/geophysical data management
No. 3 IGSS Data Archiving and Exchange
No. 4 Marine Information Management
No. 5 Development of a Pilot Programme for Responsible National Oceanographic Data Centres (RNODCs)
No. 6 Wave Data Management
RECOMMENDATION IODE-IX.1
PARTICIPATION OF INTERNATIONAL ORGANIZATIONS IN THE IODE SYSTEM

The Working Committee on International Oceanographic Data Exchange,

Noting the highly satisfactory manner in which the international oceanographic data exchange system is operating within IOC,

Recognizing that access to data by all users Members of IOC, and scientists, is a fundamental principle which promotes the development of the international oceanographic data exchange system,

Considering that the existing IOC international oceanographic data exchange system should be a comprehensive system for the collection, storage and exchange of data on the marine environment for all marine programmes, agencies and regions,

Noting also the rapid growth in the number of international and regional organizations engaged in studying the world's oceans,

Requests the IOC Secretariat to prepare, for consideration by the Assembly, a communication from IOC addressed to all international organizations engaged in studying the world's oceans, setting out the possibilities of the existing international oceanographic data exchange system and the desirability of incorporating into this system all oceanographic data on the marine environment obtained by those organizations,

Further requests the Secretary IOC to include the consideration of this subject at the next meeting of ICSPRO.

RECOMMENDATION IODE-IX.2
MARINE ENVIRONMENTAL DATA AVAILABILITY

The Working Committee on International Oceanographic Data Exchange,

In response to discussions at the tenth session of the IOC Assembly (item 7 of the Summary Report of the tenth session of the IOC Assembly),

Appreciating the action taken by UNEP to develop, through the Regional Seas Programme, the capabilities of countries to generate co-ordinated, inter-calibrated and systematic marine data related to pollution and environmental management programmes,

Beering in mind that access to data by all Member States and scientists is the fundamental principle of development of the international data exchange system, which is essential to the success of any marine science programme,
Recommends that all data resulting from marine pollution research and monitoring programmes co-ordinated by IOC and other UN agencies be collected and stored according to IOC/IODE principles and procedures as contained, or to be included in, the Manual on International Oceanographic Data Exchange.

Requests the IOC to consult with UNEP and all other relevant bodies to bring to their attention the internationally agreed principles and procedures of IOC and IODE and to assure maximum possible availability of such data through the World Data Centre System.

Further requests all IOC Member States involved in such co-operative programmes to release relevant data to the World Data Centre System at the earliest possible time.

RECOMMENDATION IODE-IX.3
CO-OPERATION WITH WMO ON MARINE ENVIRONMENTAL DATA MANAGEMENT

The Working Committee on International Oceanographic Data Exchange,

Noting with satisfaction the various forms of co-operation which exist between the IOC/IODE and WMO, and in particular its Commission for Marine Meteorology, regarding international exchange and storage of marine environmental data of interest to both oceanography and marine meteorology,

Expressing further its appreciation of the effective co-operation with WMO on the First GARP Global Experiment (FGGE) oceanographic data management planning and implementation, and on data management activities within the Joint IOC/WMO IGOSS Programme, including the IGOSS Pilot Project on Marine Pollution (Petroleum) Monitoring,

Recognizing that there is a continuing need for the development of procedures for collection, storage and retrieval of oceanic and atmospheric data, which will maximize their utility for studies involving air-sea interaction on both synoptic and climatic time/space scales,

Considering that such procedures should aim at

1) general accessibility of marine environmental data suitable for climate and/or air-sea interaction studies,

2) compatibility of formats for oceanic and atmospheric data,

3) development of, and easy referral to, the historical data base for both ocean and atmosphere,

Realizing that the general problem of coupled data sets is one which requires a co-ordinated and flexible approach by IOC/IODE and WMO, and one which requires a series of discussions between the two organizations,
IOC/IODE-IX/3
Annex II - page 4

Recommend that such consultations be arranged, for instance in the form of informal planning meetings, as a follow-up action of the World Climate Conference (February 1979).

Requests the Secretary IOC to consult with WMO about arrangements for such planning meetings.

Further recommends that the Joint IOC/WMO ad hoc Group on Air-Sea Interaction Data be disbanded.

RECOMMENDATION IODE-IX.4

OCEANOGRAPHIC DATA MANAGEMENT DURING THE FGGE OPERATIONAL YEAR (FOY)

The Working Committee on International Oceanographic Data Exchange,

Recalling the acceptance by the IOC tenth Assembly of the offer of the Environmental Data Information Service (EDIS), USA, to serve as an RNODC for the oceanographic components of the FGGE IIc data sets,

Having received a status report on the RNODC-FOY by the US Project Manager, and

Noting that the activity is progressing satisfactorily and now represents the joint effort of two NODCs of Member States (BNDO of France and NODC of USA),

Noting with satisfaction that IOC Regional Associations for the Caribbean (IOCARIBE-II) and for "El-Nino-I" have adopted resolutions calling for full support of this project by scientists active in the region through data submission and documentation of marine observations,

Further noting that RNODC-FOY continues to seek advice from scientifically qualified bodies such as the Scientific Committee on Oceanic Research (SCOR) for the technical specifications required within the context of this project,

Recognizing that the opportunity afforded by the Global Weather Experiment to construct large oceanographic data sets has been effectively enhanced and developed by plans for the establishment of a global ocean data inventory and a global ocean climate data base,

Further recognizing that such an effort by an RNODC allows both developing and developed countries to have access to a data set far larger than could be constructed unilaterally by any one country and that these efforts serve as a first important step toward a global effort in oceanography so necessary to ocean circulation studies and climate modelling.

Recommends that all Member States encourage full and timely submission by scientists (via NODC to RNODC-FOY, for subsequent submission to the WDCs) of data and documentation for both the global ocean data inventory and the global ocean climate data base, and that these Member State scientists, in turn, avail themselves fully of the services provided by the RNODC-FOY.
Further recommends that the Chairman WC/IODE, in consultation with the Secretariat, designate a rapporteur to work in close contact with the two centres involved, to advise RNODC-FOY on operations within IODE, and to provide scientific guidance where needed as to quality control and products.

RECOMMENDATION IODE-IX.5
EXCHANGE OF AIRBORNE AND SATELLITE REMOTELY SENSED DATA

The Working Committee on International Oceanographic Data Exchange,

Recalling recommendation IODE-VIII.2,

Having reviewed document IOC/IODE-IX/10.2,

Noting the large potential of Remote Sensing (RS) for oceanographic purposes and the need for an increased contact between the RS operators and the user community,

Recognizing that still further development of RS sensors and techniques, as well as of machinery to disseminate the data, is necessary to obtain a useful tool for the oceanographic community,

Considering that the word "exchange" in the present context should be interpreted as dissemination to the user community, because of the financial and physical implications of the extremely high data rates involved,

Considering further that several national and international activities in RS of the oceans have already been performed, are in progress or are planned,

Stressing that a clear distinction should be made between data from experimental and semi-operational RS programmes,

Invites all countries and organizations represented in IODE and operating satellite and/or airborne RS systems, to forward information on the type of systems and the availability of data to the appropriate IODE body; part of this information is available with WMO,

Recommends that a "Task Team for Airborne and Spaceborne Remotely Sensed Oceanographic Data" be established to replace the existing ad hoc Group with the following terms of reference:

1) Identify the needs of present and future uses for remote sensed oceanographic data and for formats for the exchange of such data. To this end the Task Team will review current and future applications in oceanography of satellite and airborne sensed information;
2) Identify the types of data available for real- and non-real-time modes and will make recommendations concerning exchange and archiving;

3) Working in close co-operation with appropriate intergovernmental activities and their scientific advisory bodies, will act, between sessions of the Working Committee, as the focal point of the Working Committee for matters relating to remote sensed oceanographic data;

4) Provide the Secretariat with advice and assistance in the implementation of recommendations of WC/IODE on this matter.

Recommends further that NODCs, RNODCs and similar organizations, in cooperation with appropriate national bodies, give education to their national oceanographic community on possibilities and limitations of existing and planned RS systems (air and spaceborne) and inform that community on the availability of the data from such systems,

Recommends also that WC/IODE, through its Task Team, stimulates the generation of properly prepared data products for oceanographic purposes,

Recommends also that IOC should continue follow-up actions on the development of RS technology and give wide publicity to the use as well as possible applications and limitations of RS systems and techniques,

Recommends further that Member States provide IOC Secretariat with the requirements for RS data,

Recommends further that IOC, with the advice of the Task Team, consider initiating programmes and/or designating bodies that perform a validation of RS data for oceanographic purposes and that it pay attention to the fact that the results of such programmes, e.g. in terms of accuracy, are presented together with the data,

Recommends that IOC urge Member States to support RS programmes with the necessary sea truth measurements, wherever possible,

Recommends that the Secretary IOC consult other organizations regarding their participation in and contribution to the work of the Task Team.

**RECOMMENDATION IODE-IX.6**

**IOC GENERAL FORMAT FOR EXCHANGE OF OCEANOGRAPHIC DATA**

The Working Committee on International Oceanographic Data Exchange,

Recalling recommendation IODE-VIII.6,
Having reviewed documents IOC/IODE-IX/10.6, IX/13, IX/13 Add.1 and IX/13 Add.1., Corr.1, IX/13 Add.2, IX/INF.7 and IX/17,

Noting the continuing need for a common format for international data exchange covering both the data themselves and their associated documentation,

Recommends that the general format designated GF-3 as described in IODE-IX/13 Add.1 and its Corr.1, be adopted for general use in international oceanographic data exchange,

Further recommends that IOC publish this document as the technical specification for GF-3 under an annex to the IODE Manuals and Guides Series No. 9, and

Further recommends that additional annexes be prepared containing

a) Quick Reference Guide for users of GF-3,

b) Introductory User's Guide as an educational document for introducing non-specialists to the utility and structure of GF-3,

c) A set of coding forms defining standard subsets of GF-3 that are discipline oriented,

Urges Member States to utilize GF-3 as the standard international exchange format,

Recommends that a Group of Experts on Format Development be established with the following terms of reference:

1) Keep format under review and recommend enhancements;

2) In conjunction with rapporteurs from the various disciplines, develop the parameter code system;

3) In conjunction with the rapporteurs from the various disciplines, develop standard discipline oriented subsets of the General Format;

4) Establish a mechanism to provide advice and guidance in the use of GF-3;

Further recommends that a NODC be nominated as the RNODC for Formats with the responsibility of maintaining documentation on:

a) Existing IOC formats and relevant WMO and ICES formats,

b) Parameter codes and code table for use by the Working Committee on IODE

and to supply such information to requesting data centres;
Requests the Secretariat, in consultation with the Chairman and Vice-Chairman of the Working Committee on IODE, to investigate the appropriate ways and means of ensuring correct translation of the terms used in the format into other working languages.

RECOMMENDATION IODE-IX.7

AQUATIC SCIENCES AND FISHERIES INFORMATION SYSTEM (ASFIS)

The Working Committee on International Oceanographic Data Exchange,

Having considered the report of the Chairman of the Joint FAO/ICC-UN/OETO Panel of Experts on ASFIS (doc. IODE-IX/10.7) and that of the ad hoc Group on Marine Information Management (doc. IODE-IX/10.8),

Realizing that the development of ASFIS has now reached a stage where the major information requirements of the IOC and other national and international marine programmes, including those for computerized searches of the data base, can be met,

Noting that information support services are of a continuing nature and are expected to meet varying research, management and policy requirements and that, therefore, they necessarily need to service all programme activities in providing the appropriate information support,

Recognizing that the most cost effective information systems to meet such varying requirements can best be managed by a centrally supported network of national information service centres,

Requests that the IOC elevate its activities to a level commensurate with its role as joint co-ordinator of ASFIS,

Further requests that IOC Secretariat investigate means to increase the availability and use of ASFIS products and services in collaboration with the national centres and the relevant organizations of the United Nations system and to pay particular attention to the needs of developing countries in this respect,

Requests the Joint FAO/ICC-UN/OETO Panel of Experts on ASFIS jointly with the Secretariats of IOC and FAO, to design a format for regular information on Declared National Programmes/National Oceanographic Programmes (DNPs/NOPs) submitted to the IOC Secretariat by Member States.
RECOMMENDATION IODE-IX.8

MARINE ENVIRONMENTAL DATA INFORMATION REFERRAL SYSTEM (MEDI)

The Working Committee on International Oceanographic Data Exchange,

Noting that almost all technical works necessary for the implementation of MEDI have been completed,

Noting and approving the action plan and timetable for implementation as formulated and revised by the pre-IODE-IX meeting of the MEDI Group of Experts (IOC/IODE-IX/10.9 add.2),

Expressing its appreciation to the MEDI Group of Experts, the MEDI Consultant and his organization, and to UNEP for their support and efforts in the development of MEDI, as well as to those Centres who have provided input registration forms,

Recalling with satisfaction the Summary Report of the tenth session of the IOC Assembly which stated that "in order to implement MEDI fully, the Secretary of the IOC should investigate the possibility of obtaining or seconding such staff support as required",

Urges the IOC to provide the facilities necessary to meet the suggested implementation deadlines and to provide continuing support for the operation of MEDI,

Expresses particular appreciation of the steps taken by WMO to arrange for contribution of meteorological data to the system, as recorded in Resolution 7 (EC-XXIX) of the XXIXth session of its Executive Committee and in the Summary Report of the Seventh Session of the Commission for Basic Systems;

Invites Member States of IOC and organizations and agencies participating in MEDI to elevate the level of their contribution to the system initially by providing the Secretariat with completed MEDI input forms,

Requests IOC Secretariat to consult with UNEP on the possible modes of future financial support for further systems development,

Recommends that all IODE sub-groups examine the MEDI procedures and report on any inadequacies in these procedures with respect to their particular data files, providing suggestions for improvement.
RECOMMENDATION IODE-IX.9
DECLARED NATIONAL PROGRAMMES (DNPs)/
NATIONAL OCEANOGRAPHIC PROGRAMMES (NOPs)

The Working Committee on International Oceanographic Data Exchange,

Recalling recommendations IODE-VIII.4 and IODE-VIII.5 adopted by the Working Committee on International Oceanographic Data Exchange at its eighth session,

Noting with satisfaction the progress made in bringing about and developing international co-operation with regard to the mutual exchange of oceanographic data, and the widespread interest in the further development of such exchanges,

Emphasizing, however, the present short-comings in connection with Declared National Programmes (DNPs) and National Oceanographic Programmes (NOPs), relating to both the regularity with which annual information on such programmes is distributed among Member States and the recent downward trend in the number of national programmes declared by Member States for the subsequent transmission of data obtained under such programmes in international exchanges,

Realizing that an increase in the contributions of DNPs by Member States might serve as a basis for the development of international data exchange,

Calls upon Member States of IOC to submit to the Secretariat, on a more regular basis, information on DNPs/NOPs and oceanographic data obtained under such programmes,

Requests the Secretariat, until such time as this information is issued within the framework of ASFIS, to continue to publish and distribute information on DNPs/NOPs among Member States on a more regular basis, and to ensure that annual reports are prepared on the submission of DNPs.

RECOMMENDATION IODE-IX.10
ASSISTANCE TO ENABLE PARTICIPATION OF DEVELOPING COUNTRIES
IN IODE PROGRAMMES

The Working Committee on International Oceanographic Data Exchange,

Noting that although developing countries constitute over 64 per cent of the 101 IOC Member States, National Oceanographic Data Centres (NODCs) and Declared National Agencies (DNAs) combined have not been established in more than 17 countries and even among these Data Centres many essential requirements of trained staff, equipment and data management activities are only in an initial stage of development,
Noting that most of the developing IOC Member States are located on
the three main continents of Asia, Africa and Latin America and that
these could be grouped in distinct regions having common interests
for most natural mutual assistance for the benefit of each other,

Noting that although a large number of developing countries have shown
interest in the IOC at the national level by becoming Members of the
Commission, their participation at the scientific/IODE level has not
been equally encouraging due mainly, perhaps, to a lack of intimate
awareness of IODE activities and a lack of trained manpower,

Realizing that the present mechanism used by the IOC for achieving
increased participation of the developing countries in the activities
of the IODE has not achieved the desired results,

A

Recommend that:

1) Training and education on IOC/IODE-related activities be planned
   and organized in co-operation with the IOC Working Committee for
   TEMA, exploring possibilities for short courses, refresher courses,
   Unesco fellowships and visiting scientists' programmes;

2) Necessary measures be taken for the preparation of an "IOC Manual
   on Oceanographic Data Processing" so as to complete this very
   important task at an early date, mainly because a manual of this
   nature would be extremely useful to scientists and data managers in
   developing countries;

3) The regions of common interest to a group of countries in the
   continents of Africa, Asia and Latin America be identified for the
   organization of IODE-related activities;

4) The assistance of other UN agencies and of developed countries
   should be sought within the framework of the Voluntary Assistance
   Programme (VAP) for the organization of data/information centres
   in the developing countries;

5) A circular be sent to all the developing Member States pointing
   out the close relationship of data and information and to examine
   the feasibility of the activities initially at a national centre
   for the best utilization of limited resources (equipment and
   manpower), as well as for necessary co-ordination with the IOC on
   these matters;

6) All subsidiary bodies of IODE take into account the special needs of
   developing countries with regard to the technological level of marine
   data exchange measures,
Recalling IOC resolution X-19 which "recommends that a TEMA co-ordinator be appointed by subsidiary bodies of the Commission",

Calls upon the Chairman of the Working Committee on IODE, in consultation with the Secretariats, to appoint an IODE/TEMA Co-ordinator to:

1) establish liaison with relevant IOC subsidiary bodies on behalf of the Working Committee on IODE;

2) assist in developing TEMA-related components of the IODE programme;

3) report and make recommendations on the requirements for TEMA support to the sessions of the Working Committee on IODE;

4) assist IOC in improving developing country participation in the setting up and operation of marine data exchange mechanisms;

5) investigate methods for the transfer of technology on these matters to the developing countries, with particular emphasis on training, education and mutual assistance.

RESOLUTION IODE-IX.1
EXCHANGE OF MARINE BIOLOGICAL DATA

The Working Committee on International Oceanographic Data Exchange,

Reviewing the findings of the third session of the International Co-ordination Group for the Southern Oceans (SOC),

Noting the need for data management arrangements for the BIOMASS Programme,

Recalling resolution X-12 (SC/MD/60) whereby the IOC requested the ICG for SOC to facilitate exchange of data through the World Data Centre (WDC) system, as well as collection and dissemination to interested countries,

Suggests the appointment of a rapporteur to liaise with the ICG for SOC, with the Scientific Committee on Oceanic Research (SCOR) and the Scientific Committee on Antarctic Research (SCAR) and other relevant organizations, in order that the IODE requirements for data exchange are fully met,

Recommends that the following tasks be undertaken:

1) Identify the biological data requirements of the Antarctic BIOMASS programme;

2) Study existing data reporting forms and identify optimum format(s) and units for approval by the IOGE at its next session. The proposed format(s) must also be acceptable to World Data Centres A and B, Oceanography;
3) Assist the IOC Secretary in finalizing the formats, their printing and distribution to user Member States participating in the BIOMASS programme;

4) Develop means to facilitate the flow of biological data into national centres and into the World Data Centre system within the existing IOC data exchange mechanism.

RESOLUTION IODE-IX.2

MARINE GEOLOGICAL/GEOPHYSICAL DATA MANAGEMENT

The Working Committee on International Oceanographic Data Exchange,

Having received with pleasure the report of the ad hoc Group on Geological/Geophysical Data and proposals on future activities in this field,

Recommends the following:

A

1) Rapporteur

The present IODE ad hoc Group for Development of Marine Geological/Geophysical Data Management be abolished, and that a rapporteur for matters related to international exchange of marine geological and geophysical data be sought. This Rapporteur should focus attention on all those matters formerly addressed by the ad hoc Group on development of marine geological and geophysical data formats, and represent the Working Committee on IODE in meetings involving other scientific organizations concerned with marine geological and marine geophysical international data exchange matters;

2) Marine Geological Data Format

The Rapporteur shall examine all available marine geological exchange and reporting formats and the intensity of their use in the intersessional period, and report his findings;

3) Member States should encourage their respective national data centres to collect marine geological and geophysical data for purposes of international data exchange;

4) Member States should ask their respective national centres to participate voluntarily in the experimental use of the available acceptable exchange formats, particularly the GF-3, for analytical geological data;

5) The IOC requests the respective national data centres to encourage the use of either the GF-3 format (preferably) or the MGD-77 format, for marine geophysical data in international data exchange;
6) Any future amendments to MGD-77 or other formats, or in arrangements for the exchange of other marine geophysical data in the context of international exchanges, should take into account the need for continued compatibility with the GF-3 format and attempt to shape such amendments within the framework of GF-3;

7) The IOC should express its concern to its Member States on the fact that the IG/GCI system appears to have suffered a substantial reduction in receipt of such forms, and National Oceanographic Data Centres (NODCs) should be encouraged to renew and intensify use of the IG/GCI system.

B

Being aware that the ICSU Panel on World Data Centres, in its meeting in Athens (September 1978), considered the structure of the Guide for Exchange of Data through the World Data Centres, and

Noting the opinion expressed by the General Assembly of SCOR that the present WDC arrangements for marine geological and marine geophysical data should remain in force,

Resolves that IOC/IODE reaffirm that IOC is the appropriate international body to represent the marine scientific community and to make recommendations regarding the international exchange of marine geophysical and marine geological data, but that improved co-ordination should be established with appropriate groups such as those within the International Union of Geodesy and Geophysics (IUGG) and the International Union of Geological Sciences (IUGS).

RESOLUTION IODE-IX.3

IGOSS DATA ARCHIVING AND EXCHANGE

The Working Committee on International Oceanographic Data Exchange,

Having received the report and recommendations of the ad hoc Group on IGOSS Data Archiving and Exchange,

Noting that the system of exchange of IGOSS data through the relevant Responsible National Oceanographic Data Centres (RNODCs) is preceding satisfactorily,

Considering further that the chief task of the ad hoc Group - the preparation of a manual on IGOSS data exchange - has been accomplished,

Decides to adopt the IGOSS OCEAN SYNDARC MAPMOPP format for exchange of MAPMOPP and MARPOLMON data on punch cards or magnetic tape and urges the gradual implementation of the format by all participating Member States,
Further decides to dissolve the *ad hoc* Group on IGOSS Data Archiving and Exchange,

Calls for a Rapporteur on the Archiving and Exchange of BATHY/TESAC and related data with the tasks of:

1) keeping the manual under review and updating it in accordance with developments and further implementation of the IGOSS Plan for the intersessional period, including the requirements of the Joint IOC/WMO Working Committee for IGOSS and the IGOSS Data Processing and Services System (IDPSS) development, acting in close co-operation with the relevant RNODCs;

2) serving as the Working Committee on IODE's primary point of contact with the Joint IOC/WMO Working Committee for IGOSS and other related activities under WMO;

3) assigning responsibility for the continued development of data exchange and formatting guidelines for MAPMOPP, MARPOLMON and related regional projects to the IODE rapporteur for marine pollution data exchange;

4) directing the rapporteur for marine pollution data to work in consultation with the relevant Responsible National Oceanographic Data Centres (RNODCs) and establishing a working relationship on MAPMOPP/MARPOLMON data matters with regional bodies.

**RESOLUTION IODE-IX.4**

**MARINE INFORMATION MANAGEMENT**

The Working Committee on International Oceanographic Data Exchange,

Having reviewed the report of the *ad hoc* Group on Marine Information Management (document IOC/IODE-IX/10.8), wherein a number of recommendations are made,

Noting that the *ad hoc* Group on the Future Role and Functions of the Commission, at its second session (Paris, 14-20 December 1978) decided to study the information functions of IOC in an *ad hoc* Group in the near future,

Recognizing that the IOC Secretariat would require advice and assistance in the implementation of these recommendations and decisions,

Proposes the appointment of a rapporteur on marine information management to undertake the following tasks during the intersessional period:

1) In consultation with the joint secretariats of ASFIS, prepare a background document identifying both the information requirements of IOC Member States and the adequacy of the existing Secretariat programmes to meet these requirements;
2) To review, during the intersessional period of the Working Committee on IODE, the progress of international information and referral systems related to marine programmes, such as the Aquatic Sciences and Fisheries Information System (ASF'S), the Marine Environmental Data Information Referral System (MEDI), of INFOTERRA - the International Referral System of UNEP, etc;

3) To report to the Working Committee on the progress of such systems as they affect the Working Committee on IODE and to make recommendations on this matter as required;

4) To advise the Chairman of WC/IODE and the Secretary of IOC during the intersessional period on the development and implementation of information systems,

Decides to dissolve the ad hoc Group on Marine Information Management.

RESOLUTION IODE-IX.5
DEVELOPMENT OF A PILOT PROGRAMME FOR RESPONSIBLE NATIONAL OCEANOGRAPHIC DATA CENTRES (RNODES)

The Working Committee on International Oceanographic Data Exchange,

Noting recommendation IODE-VIII.12 of the eighth session of the Working Committee on International Oceanographic Data Exchange which defines the functions of the Responsible National Oceanographic Data Centres (RNODES) (recommendation IODE-VIII.12, Appendix I) and the Terms of Reference of the IOSE Group of Experts on the Development of a Pilot Programme for Responsible National Oceanographic Data Centres (RNODES) (recommendation IODE-VIII.12, Appendix II),

Having reviewed the activities undertaken by the Group of Experts on RNODES during the intersessional period,

Noting the concern that both IODE-VIII and the ninth session of the IOC Assembly (res. IOC.IX-28) expressed for the timely implementation of the RNODE scheme,

Approves the draft brochure describing the RNODE concept, as prepared by the Group of Experts and submitted to the ninth session of the WC/IODE,

Requests the Secretariat to publish the brochure and to distribute it as broadly as possible,

Approves the revised operational plan as prepared by the second session of the Group of Experts on the Development of a Pilot Programme for RNODES, which includes, inter alia,

a) combining the responses to the Questionnaire addressed to NNODES volunteering to carry out the function of an RNODE in the International Oceanographic Data Exchange System, with a sampler of the products and services available from each RNODE, into a manual for distribution by the IOC Secretariat;
b) continuing the compilation of requirements of international programmes for RNODC support by contacting those programmes listed in the Secretariat in its report on Data Management Aspects Within On-Going and Planned Research and Monitoring Programmes of IOC and other organizations (document IOC/IODE-IX/16);

c) continuing the coding and reformatting of a test set of multidisciplinary data into IOC General Format-2, intercomparing the results submitted by the volunteer RNODCs and submitting comments and suggestions based on this review to the Chairman of the IOC Working Committee on IODE's ad hoc Group on Format Development,

Recommends that the Group of Experts on RNODCs, in conjunction with an IODE/TEMA Co-ordinator, review during the intersessional period, possible ways and means towards emphasizing the service that IODE activities can provide from data banks including training in their utilization as well as reviewing the special needs of developing countries for data products of various kinds,

Approves the suggestion of the Group of Experts for RNODCs that the publication "Concept and Envisioned Functions of RESponsible National Oceanographic Data Centres (RNODCs)", described in the Report of the first session of the Group of Experts (Annex III), be deferred until the fourth quarter of 1979 so as to give the volunteer RNODCs time to gain necessary RNODC experience,

Requests the Secretariat of the IOC to distribute the report of the first and second sessions of the Group of Experts to the Director of National, Regional, Responsible and World Data Centres and Designated National Agencies as well as to National Co-ordinators for IODE for their review and possible comment,

Requests also that the Secretariat of IOC draw the attention of the Directors of National Oceanographic Data Centres and Designated National Agencies to the importance of gaining familiarity in working with the IOC General Format-3 (GF-3), which supersedes previous versions of the General Format and, for those Centres which have volunteered to serve as an RNODC, in developing and applying a suite of products and services, such as summaries, atlases, displays, etc. so as to be prepared to meet the RNODC requirements when the scheme becomes operational in January 1980.

**RESOLUTION IODE-IX.6**

**WAVE DATA MANAGEMENT**

The Working Committee on International Oceanographic Data Exchange,

Having reviewed the work of the Task Team on Wave Data Management during the past intersessional period,
Being cognizant of the developments resulting from the work of the ad hoc Group on Format Development,

Recognizing the requirements for a variety of initiatives in order to implement fully the exchange of instrumented wave data,

Noting the interest of the WMO in the subject of instrumented wave data,

Decides to dissolve the Task Team and Wave Data Management, and

Recommends the nomination of a rapporteur on this subject who will work in co-operation with the Group of Experts on Format Development, the RNODC (Waves), the WMO/CMM Rapporteur on Exchange and Archiving of Instrumented Wave Data, and other experts as appropriate in carrying out the following tasks:

a) Up-dating the list of wave parameters for international exchange;

b) Developing the set of parameter code tables for exchange of wave data under GF-3;

c) Developing and publishing, as appropriate, of suitable guidelines for processing of wave data into the GF-3 format;

d) Investigating the necessity of including environmental parameters other than wind speed and direction in the format;

e) Initiating necessary actions in order to expedite the deposit of processed wave data in the RNODC waves.
WORKING COMMITTEE ON INTERNATIONAL OCEANOGRAPHIC DATA EXCHANGE

(Ninth Session)
(United Nations, N.Y., 15-19 January 1979)

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Information documents

IOC/IODE-IX/INF.1  IODE Handbook
IOC/IODE-IX/INF.3  Application of Computer Conferencing to Improving IOC Communications
IOC/IODE-IX/INF.4  Provisional List of Participants
IOC/IODE-IX/INF.5  Report on National Co-ordinators for International Oceanographic Data Exchange
       - USA
IOC/IODE-IX/INF.5 add.1  - USSR
IOC/IODE-IX/INF.5 add.2  - Mexico
IOClODEXIX/INF.6  Semi-annual report of oceanographic data exchange through 30 June 1978
IOClODEXIX/INF.7  Compatibility of GF-3 with AGD77
IOClODEXIX/INF.8  Oceanographic Data from CINECA
IOClODEXIX/INF.9  Report on some Activities at ICES Service Hydrographique since IODE-VIII
IOClODEXIX/INF.10 Data Products by Japan Oceanographic Data Center (JODC)
IOClODEXIX/INF.11 Report of World Data Center A for Solid Earth Geophysics

Reference documents
- Manual on International Oceanographic Data Exchange, 4th Edition (IOClODC Manuals and Guides No. 9)
- IOClODC-VIII/3 Summary Report of the Eighth Session of WC/IOClODC
- IOClODC/SG.I/3 Summary Report of the Meeting of the Steering Group on IOClODC
- Manual on IGOS Data Archiving and Exchange (IOClODC Manuals and Guides No. 1)
- IGOS General Plan and Implementation Programme, 1977-1982 (IOClODC Technical Series No. 16, WMO No. 466)
- IOClODC/TEMA-II/3 Report of the Second Session of the Working Committee for TEMA
- IOClODC-MPD-I/3 Summary Report of the First Special Session of the ad hoc Group on Marine Pollution Data
- IOClODC/MEI2-II/3 Summary Report of the Second Session of the Group of Experts on MEDI
- IOClODC/WC-GIPME-II/3 Summary Report of the Second Session of WC/GIPME
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Mr. Chairman, Distinguished Delegates, Representatives of UN and other organizations and members of the IOC Secretariat, I have the pleasure of welcoming you to UN Headquarters on the occasion of the ninth session of the Working Committee on International Oceanographic Data Exchange of the Intergovernmental Oceanographic Commission.

The Intergovernmental Oceanographic Commission was established within the United Nations Educational, Scientific and Cultural Organization (Unesco) in 1960, with the purpose of promoting scientific investigations with a view to learning more about the nature and resources of the oceans through the concerted action of its members. The membership of IOC has considerably expanded since then: to 55 in 1966 and to 101 in 1978 (as of 15 November 1978). This reflects an ever-growing interest of various countries in the oceans, the exploration and exploitation and rational use of their resources (mineral, biological, energy, etc.) and protection of marine environment from pollution. IOC activities now include such programmes as exploration of specific oceanic regions which are of particular interest from the scientific point of view as well as of potential practical interest for the economic development of coastal countries. These areas include the Caribbean and adjacent regions, Kuroshio and adjacent regions, the North-western part of the Indian Ocean, the Southern Ocean, the "El Nino" area, and others. During the last few years, particularly after the Stockholm Conference on the Human Environment, considerable efforts have been devoted by IOC to the problem of the marine pollution. A "Plan for the Global Investigation of Pollution in the Marine Environment (GIPME)" has been prepared and a number of projects on marine pollution monitoring have been initiated. IOC, jointly with WMO and other international organizations, takes part in programmes of a global nature such as the Integrated Global Ocean Station System (IGOSS) and the First GARP Global Experiment (FGGE).

It is necessary to note that almost all the existing or planned projects and programmes have been developed in close collaboration with other UN Agencies and non-UN international organizations - the UN itself, WMO, FAO, UNEP, IHO, IAEA, ICES, ICSU, etc. Article I of the IOC Statutes states that "the Commission shall seek to collaborate with all international organizations concerned with the work of the Commission ...". To strengthen further co-operation between UN agencies in the field of marine science, the Intersecretariat Committee on Scientific Programmes Relating to Oceanography (ICSPRO) was established. The objective of ICSPRO is to contribute to the development of effective forms of co-operation between organizations of the UN system concerned substantially with oceanic programmes and thus to avoid duplication and overlapping in the planning and implementation of an expanded programme of international co-operation in marine science. Within the UN, which is a member of ICSPRO, OETO has a special relationship with
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IOC. UN OETO had in fact hosted the VIIth session of the Working Committee for IODE in 1973 and since that time its ties with IOC/IODE have been strengthened and consolidated. Recognizing the growing challenge facing mankind in the rational management of the resources of the oceans, Unesco at its 20th session (November 1978) expressed its intention to strengthen the role of IOC still further. This 20th session of the Unesco General Conference recommended in particular that "... the present functions of the IOC Secretariat as a specialized mechanism in the co-ordination of the marine science activities of the Specialized Agencies of the United Nations be developed further".

While the Working Committee on International Oceanographic Data Exchange is one of the four specialized Working Committees of IOC, its particular activities are actually closely related to almost all the programmes and projects of IOC. From the provisional agenda we can see the wide variety of subjects to be discussed during this session. Exchange of data obtained from international projects is an integral element of each project, based on voluntary participation of countries in those projects or programmes. An efficient world-wide system of oceanographic data exchange is essential to the success of any marine science programme be it global, regional or local. The Working Committee on International Oceanographic Data Exchange has developed a Manual on International Oceanographic Data Exchange which provides a description of the IODE system and procedures to be applied for participation in IODE. It also provides guidance for the exchange of marine environmental data through the ICSU's World Data Centers. These are perhaps one outstanding example of international co-operation in science and voluminous data holdings have been acquired, centralized and are available for the benefit of all scientists world-wide. One major task of the Committee is to keep abreast of the constantly expanding observational effort and to provide appropriately modernized guidelines for data exchange. The Committee is also responsible for standardization of data reporting and coding procedures, preparation of marine data inventories and the provision of advice on the development of National Oceanographic Data Centres. Of particular interest for developing countries is the "Guide for the Establishment of National Oceanographic Data Centres" prepared by the Working Committee on International Oceanographic Data Exchange.

Activities initiated by this Committee on the establishment of Marine Environmental Data Information (MEDI) Referral System in IOC, in co-operation with UNEP, WHO, FAO, IAEA, ICES and IHO, will be of great value for all the countries and participating organizations. When fully operational, this system will provide information on availability, location and characteristics of all types of marine environmental data stored in a great variety of depositories.

During the last few years, IOC has undertaken vigorous steps through this Working Committee to increase its role in the field of information
services, leading, eventually, to the effective transfer of literature on marine technology.

Developing countries need information urgently and various types and requirements have to be addressed.

IOC has joined FAO in developing the FAO-IOC-UN Aquatic Sciences and Fisheries Information System (ASFIS) in order to broaden its scope and coverage. Here, progress has been considerably accelerated by the addition of the United Nations Ocean Economics and Technology Office (OETO) as an ASFIS partner. Through their MACTIS (Marine and Coastal Technology Information Service) programme, a number of subject areas related to non-living resources and coastal technology will be given in-depth coverage within ASFIS.

These activities regarding marine information management will be given further consideration at this session of the Working Committee and this is of particular value for the majority of countries which have recently begun activities in the field of exploration and exploitation of the resources of the oceans and may well prove to be of importance in connection with certain aspects of the Law of the Sea Conference.

In closing, I wish you every success in your deliberations."
FLOW OF OCEANOGRAPHIC DATA DURING THE
FGGE OPERATIONAL YEAR (AN OVERVIEW)

Figures 1 and 2, box labelled RNODC For FOY (USA) should be corrected as shown below:

RNODC-FOY

EDIS in USA

- Compile Global Ocean Data Inventory plus edit Pacific Indian Ocean entries
- XBT Digitization for Pacific Indian Oceans *
- Compilation of Data Base

EDNO in France

- Edit inventory data for Atlantic
- XBT Digitization for Atlantic *
- Consultant on Inventory usage for European users.

Types of Data

(as original)

*Digitization is provided for those countries which cannot do so for themselves.
**Summary**

This document and the appended Data Flow charts are intended to serve as a supplement to the FGGE Data Management Plan by outlining IGOSS and IODE data exchange arrangements during the FGGE Operational (Global Experiment) Year. In particular it highlights the role and functions of the "Responsible" National Oceanographic Data Center (RNODC) for the FGGE Operational Year (FOY) in the U.S.A. in compiling, on behalf of the World Data Center, Oceanography System, a Global Ocean Climate Data Base and Global Ocean Data Inventory. The session is invited to note the relationship between the RNODC for FOY and existing IGOSS and IODE activities and to support the accelerated IGOSS and IODE flow of oceanographic data and inventories to permit the timely compilation of the FGGE Level IIc Oceanographic and Global Ocean Climate Data Base.
INTRODUCTION

1. The various planning bodies developing the FGGE operational programs and the FGGE data management plans had recognized early on that there would be much data collected during the FGGE Operational Year (FOY) (also called the Global Experiment Year) which would not be available in time for FGGE operational purposes (i.e., within 3 to 6 months), but that should nevertheless be extremely valuable for subsequent studies of climate and should be preserved and centrally archived. Such data are classified as level IIc data. Initially, the oceanographic component of FGGE level II data was not well defined. However, largely due to the efforts of SCOR WG 47 and its area panels, the oceanographic component of FGGE, which other than IGOSs is largely contributory to the level IIc type of effort, took on better defined dimensions.

2. The sixth session of the WMO EC Intergovernmental Panel on FGGE has recently (June 1978) accepted certain definite elements for level IIc oceanographic data base management. Actually, as early as October 1977 (during IOC X), the U.S.A. proposed to take on the responsibility for most of the anticipated level IIc oceanographic data functioning as a "Responsible" National Oceanographic Data Center within the framework of IOC's IODE-WDC, Oceanography, System. The offer by the U.S.A. for the establishment of an RNODE during FOY was accepted by the IOC X in Resolution V.

3. Subsequent to IOC X and taking into account the unique opportunity furnished by the intensification of oceanographic observational programs during FOY for the compilation of a global oceanographic data base to serve as an attempt at a pilot program for large-scale programs envisioned for the 1980's, the U.S. plans for the RNODE were somewhat broadened beyond the level IIc objectives to include:

   i) The establishment of a Global Ocean Climate Data Base for FOY comprised of all globally collected oceanographic data of certain types available for international exchange; and

   ii) A comprehensive global ocean data inventory of all marine data reported to have been collected, whether or not centrally archived.

4. This document and the scheme shown in Figure 1, "Flow of Oceanographic Data and Inventory to the RNODE in the U.S.A. during the FGGE Operational Year," are specifically designed to acquaint IGOSs and IODE activities with suggested procedures in context with existing IGOSs and IODE data exchange practices for interaction with and support of the RNODE's for FOY in the U.S.A. in order to facilitate the timely establishment of the global ocean data base and related inventory and briefly outlines the basic functions of the RNODE as presently defined. It should be emphasized that the IGOSs and IODE procedures shown in Figure 1 and the relation of other ancillary data collected under FGGE itself, while meant to be supplement to the FGGE data management plan from the perspective of the IGOSs and especially IODE activities, are in no way to be understood to modify or supersede the official ICSU/WMO FGGE data management plan.
OUTLINE OF BASIC FUNCTIONS OF RNODC-FOY (U.S.A.)

5. The concepts of the RNODC scheme as such were developed by the WC IODE, accepted in principle by the IOC VIII, and their implementation is proceeding under the continuing review of the WC IODE. The intent of the RNODC scheme is to utilize the capabilities of the better-equipped NODC's, which have emerged during the past decade and a half, to aid exchange of data through the ICSU/IOC World Data Center, Oceanography, system. Such assistance falls mainly into two broad categories:

   i) Assistance on a voluntary basis to requesting IOC Member Nations with the processing of oceanographic data and the placing of such data on modern technical carriers and standard IOC formats for subsequent transmission to the WDC's Oceanography; and

   ii) Provision of special services generally for specific ocean areas, such as data summaries, statistical presentations, analyses, charts, etc.

   These functions may be performed for either oceanographic data in general, for data resulting from specific projects, or specialized data (e.g., instrumented wave data). The first RNODC's established (by Japan, France, U.S.S.R., and U.S.A.) were those for the archiving and non-real-time exchange of IG OSS BATHY and TESAC data. The RNODC-FOY is thus in a sense a project supportive RNODC and operates entirely within the functions accredited to such an RNODC under the IODE guidelines.

6. Specific functions which the RNODC-FOY (U.S.A.) has declared itself willing to perform include (see Figure 1): (Note that these may be subject to some modifications in response to guidance received from advisory bodies.)

   i) Accessioning, compilation, maintenance, updating, and periodic publication of a global ocean data inventory of all marine data collected during FOY. This activity has been recently identified as being of special value to the research community by FGGE planning bodies. The inventory will be based primarily on the IOC/IODE ROSCOP inventory form but also by announcement of oceanographic planned observational programs and data actually accessioned by the RNODC-FOY and other repositories.

   ii) Acquisition, chiefly through existing IG OSS and IODE channels of BT data (including FGGE, formatted level IIb BATHY and TESAC data), serial depth data, CTD/STD data, data from horizontal tows (''bat fish''), oxygen, silicate, phosphate, currents and tidal sea-level data. The RNODC-FOY will assist in the digitization of XBT strip charts for those activities unable to do so on an accelerated basis.

   Unless already accessioned in the IOC "General Format" all data received will be converted to the IOC General Format and will be subject to some degree of quality review. All accessioned and processed data will be transmitted in the General Format to the World Data Centers, Oceanography, for permanent archiving within less than 18 months from the completion of the FOY. Special priority will be given to the rapid processing of level IIc data; i.e., oceanographic data collected in the Tropics by FGGE participants. The above listed data comprise the Global Ocean Climate Data Base for the FOY.
iii) Depending on future requirements of the research community, the RNODC - FOY may acquire copies of certain types of marine data collected during FGGE and stored in FGGE formats by the World Data Center, Meteorology. Such data may include surface temperature observations, data from drifting buoys, and satellite-sensed data.

FLOW OF OCEANOGRAPHIC DATA THROUGH IODE CHANNELS DURING FOY (Figure 2)

7. Basically, IODE activities should follow the normal exchange procedures contained in IOC Manual No. 9, "International Oceanographic Data Exchange," and the ICSU Guide to World Data Centers. However, in order to accelerate the flow of data and inventories, some minor modifications are recommended. Figure 2 outlines both the normal IODE exchange and special adaptations during FOY.

8. One special element within IODE during FOY is the request for "cruise plans." The "cruise plan" questionnaire has been widely disseminated by the IOC and the RNODC - FOY to a broad range of scientists and activities who may collect oceanographic data during FOY. It is intended for use by all activities wishing to cooperate in establishing the global marine data inventory for FOY whether or not they are actually participating in FGGE. It is hoped that, after coordination with their appropriate national authorities, the completed questionnaires will be expeditiously forwarded to the RNODC - FOY, either before the beginning of FOY (December 1978) or as early as possible during FOY. It should be noted that the "cruise plan" questionnaire is not intended as a substitute for the formal declaration of the DNP to the IOC and may encompass some observational efforts which have not been included in the categories of data reported under the DNP.

9. It is extremely important that all activities prepare and submit the standard IOC/IODE ROSCOP II inventory form immediately upon completion of an observational program, cruise, or leg of a cruise. During FOY liberal use may be made of the "Remarks" space on the ROSCOP II form in order to document data as completely as desired. While national inventory forms other than ROSCOP may be accepted in certain cases, ROSCOP II is preferred to assure uniformity in the inventory information processed by the RNODC. ROSCOP's (or copies thereof) should be sent either directly to the RNODC - FOY or through NODC's where so required. Under IODE practice, it is also permissible to send the ROSCOP II form to the WDC, Oceanography.

10. During FOY XBT strip charts (originals are needed) may be sent to the RNODC - FOY in the U.S.A. for digitization to high resolution and accuracy according to IODE standards, if such work cannot be done rapidly at the national level. It is possible that in accordance with the IODE RNODC scheme one or more RNODC's outside the U.S.A. may wish to assist in this and other processing tasks during FOY prior to submission of the data to the RNODC - FOY (U.S.A.). Availability of such additional processing assistance will be announced by IOC and the RNODC as the project develops.

11. Mechanical BTs must be processed and digitized at the national laboratory or NODC level before transmission to the RNODC. Digitization interval should be 5-meter increments or better, on one of the national formats acceptable for IODE exchange purposes (e.g., NODC of the FRG, U.S.A., etc.).
12. For both XBT and mechanical BT data the IOC SYNDARC format, while basically intended for the low-resolution shipboard encoded BT data obtained under the GOSS program, may also be used for transmittal of fully processed, high-resolution BT data processed to IOE standards, if no suitable national format exists.

13. All other oceanographic data accepted by the RNODC-FOY (i.e., serial depth, CTD/STD, chemistry, and currents) should follow normal IOE processing, formatting, and exchange procedures prior to transmittal to the RNODC-FOY, but whenever possible at a greatly accelerated time frame. Additionally, it is recommended that all fully processed data be sent directly from the national level to the RNODC. All data reduction, initial quality control, transcribing of oceanographic data onto magnetic tapes in formats normally used for exchange under IOE must be performed prior to submission to the RNODC. However, by special arrangement the RNODC may accept certain types of reduced data in "hard copy" form or on coding forms if there is no other way to obtain the data within the 18-month time frame. It is also possible that there may be one or more RNDC's outside the U.S.A. to assist with data processing and transcription onto magnetic tape.

14. Special arrangements will be implemented for the acquisition of tidal and sea-level data by the RNODC-FOY.

15. The RNODC-FOY will convert all data received in national IOE-compatible formats into the standard IOC "General Format." The precise definition of the IOC General Format will not be generally available until early in 1979 subsequent to its approval by the Ninth Session of IOE (January, 1979). However, after its distribution to NODC's and IOE activities, use of the General Format for data transmittal to RNODC-FOY, while not mandatory, would be highly desirable.

16. Throughout FOY all normal IOE exchange procedures for oceanographic data continue to be in full force. Thus, internationally exchangeable oceanographic data not of interest to the RNODC-FOY (e.g., biological and geological data, wave data, etc.) should continue to be sent to the WDC's Oceanography (or other specialized RNODC's) in customary formats, report, or manuscript publication form. Furthermore, any data may at the option of the originator be addressed to the WDC's Oceanography rather than to the RNODC-FOY, if so desired. The RNODC's, being by definition a component of the WDC, Oceanography system, will submit all their holdings to the WDC's and conversely have access to the holdings of the latter.

FLOW OF REAL-TIME AND DELAYED-MODE IOE DATA DURING FOY (Figure 3)

17. IOE data (i.e., vertical profiles of ocean temperature and salinity obtained by XBT, PT, CTD/STD, and some buoys), shipboard encoded on standard WMO/IOC IOE BATHY and TESAC logs and transmitted through telecommunications and GTS as BATHY (FM63) and TESAC (FM64) reports, will be a major component of the oceanographic program of FGGE.

18. During FOY the real-time transmission of BATHY and TESAC data will proceed in accordance with established practices, but with the intention of intensifying the number of observations made, especially in the Tropics, and in making every effort to
increase the percentage of radio reports that are received by IG OSS-identified shore stations and subsequently entered into the GTS through national and supplemental telecommunications channels.

19. Prior to FOY the normal flow of IG OSS data into archives depended almost entirely upon BATHY and TESAC reports received via GTS by the NMC's (and WMC's). The NMC's, besides supplying the data to any "real-time users," record these data on tape in the message format and at regular intervals supply these tapes to an IG OSS RNODC. In turn the IG OSS RNODC's process the BATHY and TESAC data into the IOC IODE standard IG OSS exchange format, SYNDARC, for subsequent merging into the IG OSS data bases and service to requesters.

20. During FOY an intense effort will be made to augment the IG OSS data archives through the processing of shipboard encoded data on IG OSS logs but either not transmitted or not captured by the radio message-GTS network. The percentage of such non-telecommunicated IG OSS data is believed to be substantial. This was recognized in the beginning of IG OSS, and the processing of IG OSS logs by NODC's and RNODC's has been recommended procedure (IOC Manual and Guides No. 1). However, mainly for reasons of economy the processing of the IG OSS logs has not been generally implemented.

21. To obtain the benefit of the additional data contained on the IG OSS logs within the operational requirement of the level IIb center (Sweden), it is most important that all IG OSS logs be forwarded by observing activities either directly or through established national channels to an IG OSS RNODC within less than 2 months from the time of observation. The IG OSS RNODC's will immediately forward these logs to the FGGE Special Oceanographic Data Center (SODC) in the U.S.A. at Monterey, California.

22. BATHY and TESAC bulletins and reports will, during FOY, be accessioned via GTS, quality controlled, and encoded on magnetic tape by the FGGE SODC in FRG (DHI, Hamburg). The SODC in the U.S.A. will merge the GTS-accessioned data received from the SODC, FRG with the IG OSS log-derived data, apply additional quality control, convert the data into the FGGE oceanographic level IIb archive format, and transmit the resultant magnetic tapes to the level IIb center in Sweden. A copy of the IG OSS data tapes in the FGGE format, which by prior design is easily convertible to the IOC SYNDARC format, will be given to the RNODC-FOY in the U.S.A. The latter, which is organizationally collocated with the IG OSS RNODC in the U.S.A., will take responsibility for the subsequent normal IG OSS exchange of the data in SYNDARC format.

23. Any IG OSS logs which cannot be forwarded within less than 2 months of the time of observation should be sent, nevertheless, to the IG OSS RNODC's as stipulated by existing IG OSS manuals. As future requirements for the use of delayed-mode IG OSS data are established, these logs may constitute a valuable source of data, especially in areas where radio transmission of oceanographic data is unpractical.

ANCILLARY OCEAN DATA OF POTENTIAL INTEREST TO CLIMATE AND AIR-SEA INTERACTION RESEARCH (Figure 4)

24. Much marine environmental data collected during and as part of the FGGE program will be rapidly processed by various specially designated FGGE activities. These data will be archived in FGGE formats by the WDC-A, Meteorology. Among
these data are sea-surface temperatures from ships, trajectories and temperature data from drifting buoys, and the specially processed FOY "satellite-sensed" sea-surface temperature data files.

25. Provision of service in accordance with the FGGE data management plan is a responsibility of the WDC, Meteorology. However, it is quite conceivable that the RNODC-FOY may wish to acquire subsets of some of these data for internal purposes (e.g., quality control). Additionally, although it is not one of the presently defined functions of the RNODC-FOY in the U.S.A., there may well be future requirements from the research community for specially sorted subsets of the FOY surface data to be available in a standard format along with oceanographic data normally stored by the IODE WDC system. It is within the scope of the functions of the RNODC's, if suitable arrangements can be made, to provide such services on a voluntary (but not necessarily cost-free) basis.
## LIST OF ACRONYMS AND ABBREVIATIONS
### USED ON FLOW DIAGRAM

**FLOW OF OCEANOGRAPHIC DATA AND INVENTORIES TO THE RNO DC IN THE U.S.A. DURING THE FGGE OPERATIONAL YEAR**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>BATHY</td>
<td>Temperature-depth values generally obtained from BT's or X-BT's and encoded for IGOSS telecommunications. BATHY Reports: Temperature-depth values reported via radio and GTs in WMO Code Form 63; BATHY LOGS: for standard IOC/WMO LOGS shipboard encoding of temperature-depth and surface environmental data.</td>
</tr>
<tr>
<td>BT</td>
<td>Bathythermograph (mechanical), analog profiles of temperature against depth. BT is data transmitted under IGOSS to low-depth resolution or standard depth, under IODE digitized to 5 meter increments or better (high-depth resolution).</td>
</tr>
<tr>
<td>CTD/STD</td>
<td>Conductivity-temperature-depth or salinity-temperature depth profilers (also sound velocity profilers and combinations of the above). Data obtained in the form of analogue strip charts and/or in digitized form.</td>
</tr>
<tr>
<td>DHI</td>
<td>German Hydrographic Institute</td>
</tr>
<tr>
<td>DNA</td>
<td>Designated national agency. IODE term for an agency or activity within an IOC member country not possessing an NODC which serves as the focal point for oceanographic data exchange.</td>
</tr>
<tr>
<td>DRIBU</td>
<td>Data resulting from the drifting buoy experiment under FGGE recorded in the FGGE standard DRIBU format (includes SST and LA GRANGIAN current data).</td>
</tr>
<tr>
<td>FGGE</td>
<td>First GARP (Global Atmospheric Research Program) Global Experiment. FGGE format = A standard magnetic tape format designed to handle exchange of all data collected under FGGE.</td>
</tr>
<tr>
<td>FOY</td>
<td>FGGE Operational Year: December, 1978 through November 30, 1979; also referred to as the Global Experiment Year.</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>GAO</td>
<td>Garp Activity Office (of WMO)</td>
</tr>
<tr>
<td>GF</td>
<td>General Format. A standard but flexible format developed by the WC IODE for the international exchange on magnetic tape and encoding of most types of marine environmental data. To be used as the standard archive format for oceanographic data accessioned by the RNODC for FOY in the U.S.A. (GF differs from FGGE format)</td>
</tr>
<tr>
<td>GLOBAL EXPERIMENT YEAR</td>
<td>Alternate designation for the FGGE Operational Year</td>
</tr>
<tr>
<td>GTS</td>
<td>Global Telecommunication System (of World Weather Watch)</td>
</tr>
<tr>
<td>IDPSS</td>
<td>IDPSS of IGOSS: IGOSS Data Processing and Service System</td>
</tr>
<tr>
<td>IGOSS</td>
<td>IOC/WMO Integrated Global Ocean Station System</td>
</tr>
<tr>
<td>IMMPC</td>
<td>International Marine Meteorological Punch Card (format). Standard format for the non-real time exchange of marine meteorological data obtained by utilizing prescribed WMO codes.</td>
</tr>
<tr>
<td>IODE</td>
<td>International Oceanographic Data Exchange. WC IODE = IOC Working Committee on IODE. Principal participants in IODE utilizing standard guidelines for data exchange and formatting of the IOC WC IODE are NODC's, RNODC's, DNA's, national activities and NGO and the World Data Center, Oceanography System.</td>
</tr>
<tr>
<td>LEVEL IIb</td>
<td>Level IIb center(s) (FGGE) stores data acquired in delayed mode but suitable for input to gridded analysis within 6 months of time of collection.</td>
</tr>
<tr>
<td>LEVEL IIc</td>
<td>Level IIc centers (FGGE) store data submitted in &quot;delayed&quot; mode. These data will be used for investigations of climate and may be subject to more than 6 months delay.</td>
</tr>
<tr>
<td>NMC</td>
<td>National Meteorological Center</td>
</tr>
<tr>
<td>NODC</td>
<td>National Oceanographic Data Center (part of IODE network)</td>
</tr>
<tr>
<td>PMO</td>
<td>Port Meteorological Office</td>
</tr>
<tr>
<td>PSMSL</td>
<td>Permanent Service for Mean Sea Level (a specialized World Data Center)</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>QC</td>
<td>Quality Control</td>
</tr>
<tr>
<td>RNODC</td>
<td>A &quot;Responsible&quot; National Oceanographic Data Center: an NODC which, on behalf of the World Data Centers, Oceanography, voluntarily assists IODE participants with specified data processing and standard formatting tasks and provision of data services. All data held by RNODC's are made available to the World Data Centers Oceanography on optimum technical carriers.</td>
</tr>
<tr>
<td>ROSCOP</td>
<td>Report of Observation/Samples Collected by Oceanographic Programs. The principal, standard IODE &quot;early&quot; inventory form.</td>
</tr>
<tr>
<td>SATOBS</td>
<td>Remote sensed data stored in standard FGGE format</td>
</tr>
<tr>
<td>SODC</td>
<td>Specialized Oceanographic Data Center (for FGGE) SODC (FRG) = the SODC in the Federal Republic of Germany (DHI) for BATHY and TESAC GTS report processing.</td>
</tr>
<tr>
<td>SOS</td>
<td>Space-based and special observing system data center. FGGE Level IIb center, Sweden.</td>
</tr>
<tr>
<td>SST</td>
<td>Sea Surface Temperature (data)</td>
</tr>
<tr>
<td>SYNDARC</td>
<td>IGOSS/IODE format for non-real-time exchange and archiving BATHY, TESAC and other IGOSS data. Differs from, but can be directly derived from, FGGE BATHY and TESAC data format.</td>
</tr>
<tr>
<td>TESAC</td>
<td>Temperature, Salinity and Current Data. IGOSS/IODE shipboard coding form and WMO Code Form (64) for telecommunication of surface temperature and subsurface temperature—salinity data generally obtained from vertical profiling devices and for current measurements.</td>
</tr>
<tr>
<td>WDC</td>
<td>World Data Centers (of ICSU). World Data Center for Oceanography operates under both ICSU and IOC/IODE guidelines.</td>
</tr>
<tr>
<td>X-BT</td>
<td>Expendable Bathythermograph. Initial data recording format is generally on analogue chart.</td>
</tr>
</tbody>
</table>
Comments on some elements of the formats developed by
the ad hoc Group for the Development of Marine Geological/
Geophysical Data Management

Mr. Michael S. Loughridge, US member of the above-mentioned ad hoc Group, made the following comments on the formats which he had developed.

"A key point that must be emphasized and injected into the discussion can be best stated in the form of a question: "Will the involved scientists fill out the forms and agree to submit data in that way". The indications are that they will not, or will do so only with great reluctance!

The experience at the U.S. National Center was that the only formats that are routinely submitted are those which are mandated by funding organizations or those whose development directly involved the scientists (or groups of scientists) who would later be called upon to supply information and fill out the forms.

These points and others have been discussed in a workshop on marine geological data management hosted in May 1978 by the U.S. National Center and sponsored by the Office of the International Decade of Ocean Exploration of the U.S. National Science Foundation. At this workshop there was not a good agreement on what types of marine geological data should be exchanged.

There were two examples of the second type of format whose development involved potential contributing scientists which we use at the U.S. National Center. One is the marine geophysical data exchange format "NGD 77" (previously referred to by Mr. Kohnke in his report), published in English, and available in other languages. The other was the "INDEX to Marine Geological Samples" more commonly known as the "Core Curator's Format".

This latter format was especially notable in that the U.S. National Center was requested by the group of curators of cores to become involved as the collectors, managers and maintainers of the file after the format was developed. The core curators format has two unique features - it speaks to the present location of the sample materials and their state of preservation. Both of these parameters are of keen interest to marine sedimentologists.

A second comment I would make was one passed to me by the manager at the Scripps Institution of Oceanography, Mr. Stuart Smith. That is, any exchange format one expects to be successful must take into account both the present format of the preponderance of the existing data, the labour necessary to convert it to any other format and the willingness of the supplying institution to supply information addition to that contained in their original data submissions if such new data are required to comply with a new format!"
"Within one year, we at the U.S. National Center hoped to be fully converted to the MGD 77 geophysical data exchange format and would hope at this time to be able to limit our responses to data requests for the extremely large amounts of U.S. Data to the MGD 77 format. The resource implications of doing otherwise could not be ignored.

Both of the proposed IOC formats principally address digital data. There is a huge exchange problem associated with analog data in geophysics such as seismic profiling data. MGD 77 provides a mechanism for documentation of these data and their associated navigational data.

It is generally recognized that any new format's deficiencies will soon be recognized after its adoption or publication. There have been some deficiencies noted already for the proposed IOC format as well as some for the MGD 77 format.

One suggestion made which I heartily recommend is to allow both formats to co-exist but to encourage the use of MGD 77 for routine exchanges of navigation depth, magnetics and gravity data and the use of the proposed IOC format for new and unique data sets or for use in or between those institutions where the computer facilities have difficulty with some elements of the MGD 77 format."
Comments on computer conferencing systems

Mr. R. Freeman, Deputy Director, US Environmental Science Information Center, made the following comments on computer conferencing systems:

"Computer conferencing is a new method of group communication. It uses a computer to store and disseminate messages to members of a conference via computer terminals. A conference is defined as a group of individuals who wish to communicate among themselves about a definite topic without the constraints of being in the same place at the same time. Members of a computer conference may exchange messages in unstructured note form, conduct seminars or meetings, develop jointly-authored reports, and elicit information in questionnaire style. The style of communication may be collegial or there may be definite preassigned roles for participants. Some typical applications are computer-managed conferences, message transmission and switching, and multi-party development of textual material. Computer conference systems are easy to use and accessible today from most places in western Europe, North America and Mexico. Access from other locations is technically feasible and awaits only the installation of low-cost data communication facilities. Possible uses and benefits for IOC are:

i) More rapid communication among ASFIS Centres

ii) Speed-up international committee work and communication with foreign counterparts and international agencies

iii) Development and review of special ad hoc studies requiring several rounds of communication

iv) Facilitate communication between regional centres and liaison officers and IOC.

As an experiment to demonstrate the uses of computer conferencing, ASFIS participants and the IOC Secretariat have taken part in this test since the Spring of 1978 within the framework of its participation in ASFIS. Member States were encouraged to become informed as to the potential of this new tool and to support the exploration of its uses and applications for IOC purposes.

To this end, the Secretary of IOC will be requesting the co-operation of Member States to translate the thesaurus into the official IOC languages utilizing, where possible, the expertise available in the ASFA centres which may already exist in certain cases, e.g. USSR, France."
DRAFT IOC PROGRAMME AND BUDGET FOR 1979/1980

Programme Action

Regular Programme:

- IXth session of the Working Committee on IODE and preparatory meetings (1979)
- A meeting of the Group of Experts on MEDI (1980)
- A meeting of the Joint FAO/IOC Panel on ASFIS (1980)
- A meeting of the Group of Experts on RNODCs (1979)
- Consultants will assist in the preparation of a report on Marine Science Information programmes (1979) jointly with WC/TEMA, and on marine biological data information management (1980)
- WC/IODE officers and staff will consult with other IOC bodies and other organizations (1979-1980)
- IODE experts will assist in developing MEDI, ASFIS and other marine information projects (1979-1980)
- IODE experts will assist in developing data management activities within planned or on-going regional programmes, and in the preparation of data formats
- A meeting of the Group of Experts on Format Development

The following publications will be prepared and published:

- Guide on RNODCs (1980)
- Brochures on DNP/NOP, RNODC, MEDI, etc. (1979)
- Guide on Oceanographic Data Processing (1980)

TOTAL Regular Programme = $55,000
PROPOSED PROGRAMME AND BUDGET FORECAST 1981/1982

1) Session of the Working Committee on International Oceanographic Data Exchange (IODE) (1981)

2) Session of the Joint FAO/IOC Panel of Aquatic Sciences and Fisheries Information System (ASFIS)

3) Session of the Group of Experts on Marine Environmental Data Information Referral System (MEDI)

4) Session of the Group of Experts on Responsible National Oceanographic Data Centres (RNODCs)

5) Session of the Group of Experts on the Format Development

6) Meetings of experts (expert groups) on other specific aspects, and staff travel

7) Consultant services (6 months)

8) Publications and their preparation, including ASFIS registers and tables; MEDI catalogues and manuals; formats; guides

9) Projects supported by UNEP

Total required for RP $ 85,000

10) TEMA/IUDE (training courses, consultants and publications

Total required for RP $ 15,000

RP = Regular Programme
1. The proposals for the work plan and priorities for 1981/82 were presented by the A/Chairman IOC to the meeting of the Budget Planning Team (Rome, 16 June 1978). The A/Chairman held prior consultations with the Chairman (or key members) of the following subsidiary bodies: GE on MEDI, Joint Panel on ASFIS, Ad Hoc Groups on Marine Pollution data and Marine Information Management, and the Task Team on Wave data. The requirements of IOC's other subsidiary bodies were taken into account at the initiative of the A/Chairman relying on comments expressed during the IOC SG meeting (Feb 1977) and some subsequent personal contacts.

2. In introduction to the future programme priorities of IOC, the A/Chairman stated that two major factors, which also have an important bearing on the budget, would need to be considered:

   (a) During the past 17 years of the WC IOC's work, the chief emphasis had been placed on the development of arrangements and formats for data exchange, especially through National Centers and the WDC, Oceanography system. Although this aspect of IOC's work is by no means completed, much has been accomplished and for certain types of data, large data bases of multi-national origin have been compiled and the arrangements are functioning well. The development of services from these data banks received far less consideration. The time has now come to emphasize that the IOC activities can provide from data banks including training in their utilization and to address the special needs of developing countries for data products of various kinds. The development of the RNOOC scheme is the first step in that direction. In many ways, access by developing countries to scientific information resulting from oceanographic investigations is of at least equal importance and IOC must redouble its efforts to continue the difficult task of developing arrangements for the international and regional exchange of documents, publications and other types of information.

   (b) Throughout its life, the WC IOC has depended very heavily for the conduct of its work during its intersessional periods on national contributions. These have taken the form mainly of substantial amounts
of the time of many experts in many countries working at national expense as members of ad hoc groups and task teams. During that time, utilization of groups of experts, with travel provided by the IOC and the use of IOC funded consultants, has been kept to a minimum. Indications are that this type of national support cannot realistically be expected to continue to keep pace with the requirements of difficult tasks before IODE in the coming decade. It is becoming increasingly difficult for experts to divert attention from the national tasks to work on IODE problems for concentrated periods of time. Thus IODE must look to much expanded utilization of directly or indirectly IOC funded expert consultant services as a mechanism to work on special problems requiring a high degree of expertise. Recent experiences have shown this to be a highly effective approach. Also, more travel support must be made available so that experts from developing countries have better opportunity to participate in some of the special intersessional meetings of subsidiary bodies of IODE.

3. Program Priorities - 1981-82

The following is a brief description of the most important tasks before IODE during 1981-82. In listing these projects, it is assumed that by that time the priority projects for 1980-81 have been either accomplished or are well in hand; otherwise some may have to be reincluded as high priority programs in the 1981-82 Biennium. On the other hand, some of the 1981-82 programs may make a modest start during the 1980-81 period.

The programs are ranked in order of priority but it is most important to note that by any rating system these rank very closely together and none can be considered as non-essential.

(i) RNODE data product services. Develop regionally (or globally) standardized "climatological" and statistical presentations of oceanographic data in the form of computer produced atlases, summaries, charts, etc., utilizing the large data banks of "historical or climatological data" that have accrued in the World Data Center-Oceano-graphy. The scheme would be somewhat analogous to the climatological atlas scheme of the WMO's CMM. Such work would be performed mainly by certain RNODEs, taking into account the regional needs and circumstances and any special requirements of developing countries for "baseline" and reference material. Formulation of such a more or less standardized data service system would be conducted by a small IODE Task Team aided by a consultant working closely with the GE on the RNODEs (and directors of RNODEs) and bodies concerned with climate and air-sea interaction studies. Note: This IODE initiative may compliment but will in no way
duplicate the real-time and delayed mode services of the IGOSS IDPSS. The development of these IODE product service capabilities, especially in respect to "baseline" conditions in physical and chemical oceanography, will call for support from UNEP.

(ii) IODE Support to Studies of GARP (Climate) and Air-sea Interaction. This task will take two forms: (a) The acceleration of the ingathering of oceanographic data collected in conjunction with programs such as GARP and FGGE and their storage in IOC standard formats at the WDCs Oceanography. This will be done mainly through further strengthening and development of the RNOOC scheme and of the IOC standard data exchange format (General Format) GF2/3. (b) Intensification of the development of the MEDI data bank and of its operation and service capabilities during the early 1980s. MEDI must become a reasonable inclusive index to marine data, especially of meteorological and man-made chemical data held by conventional oceanographic repositories.

(ii,a) Will require only modest budget support but (ii,b) can only be accomplished through intense liaison with other UN and national agencies and through adequate IOC staff support. (An RNOOC for MEDI may be a possible approach if a volunteering activity can be found to work at national expense.)

(iii) Document and Information Exchange. Implementation of regional infrastructures for the exchange of documents in the marine sciences is of great importance. National library facilities at marine research institutes in developing countries need to be strengthened through acquisition of current literature and establishment of document exchange networks. Comprehensive bibliographies of the holdings of national institute's libraries within regions of common interest, need to be compiled and a network for the exchange and/or reproduction of scientific literature established. IODE, as a first step, must prepare a manual or guide on international information exchange recommending practical procedures and guidelines for implementing the above (IOCARIPE may furnish a pilot study in this regard). A consultant working with MIM/ASFIS (and in consultation with UNISIST, OETO, UNEP, UNDP) will prepare first draft of such a manual. IODE should act, in collaboration with regional groups, as a catalyst in the provision of documents to national activities through the mechanism of VAP, UNDP, international development corporations (e.g. Canada, Sweden) and UNEP.

(iv) TEMA/IODE. IODE will have a framework for systematic training activities, preparatory work beginning in the 1980-81 period,
of experts from developing countries with emphasis on the following areas: Operation of data centers and automated processing facilities supportive of the RNODC/WDC-Oceanography system; utilization of existing data banks; technical and subject oriented requirement of exchange of data in the IOC General and other standard formats; participation in the ASFIS scheme and its services; participation in networks for the exchange of documents in marine science. It is expected that the RNODCs will contribute to TEMA/TATT in conjunction with visits of scientists, workshops and bilateral arrangements.

(v) Continued Development of IODE Exchange Arrangements. These will include formulation of special procedures that may be needed to be responsive to implication of the LOS; continued development of the IOC GF to encompass a greater diversity of marine data and guidelines for the selective archiving and exchange of data products with special attention to remote sensed data.