Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

Group of Experts on Format Development of the Working Committee on International Oceanographic Data Exchange

Third Session

Copenhagen, 16-20 September 1985

Unesco

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In this Series

Reports of Meetings of Experts and Equivalent Bodies, which was initiated in 1984, the reports of the following meetings have already been issued:

- Third Meeting of the Central Editorial Board for the Geological/ Geophysical Atlases of the Atlantic and Pacific Oceans
- Fourth Meeting of the Central Editorial Board for the Geological/ Geophysical Atlases of the Atlantic and Pacific Oceans
- Fourth Session of the Joint IOC-WMO-CPPS Working Group on the investigations of «El Niño»
- First Session of the IOC-FAO Guiding Group of Experts on the Programme of Ocean Science in relation to Living Resources
- First Session of the IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in relation to Non-Living Resources
- First Session of the Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
- First Session of the Joint CCOP (SOPAC)-IOC Working Group on South Pacific Tectonics and Resources
- First Session of the IODE Group of Experts on Marine Information Management
- Tenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies in East Asian Testonics and Resources
- Sixth Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
- First Session of the IOC Consultative Group on Ocean Mapping
- Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ships-of-Opportunity Programmes
- Second Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
- Third Session of the Group of Experts on Format Development of the Working Committee on International Oceanographic Data Exchange

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1. OPENING OF THE SESSION

The Session was opened on 16 September 1985 in Copenhagen by the Chairman of the Group, Mr. J. Crease who thanked the International Council for the Exploration of the Sea (ICES) for inviting the Group to ICES Headquarters. Dr. H. D. Dooley, the Hydrographer of ICES, welcomed participants on behalf of the General Secretary of ICES and expressed his pleasure that the Group was able to meet in Copenhagen. It was appropriate that the Group should meet in ICES bearing in mind that the ICES Service Hydrographique had been involved in the development of one of the first formats to be used internationally in the exchange of oceanographic data in computer compatible form. At the present time the Service Hydrographique fulfills the role on behalf of IOC as the RNODC for Formats.

In welcoming participants the Chairman noted with appreciation the presence of two experts new to the activities of the Group: - Mr. Horst Hecht, the recently appointed Director of the Deutsches Ozeanographisches Datenzentrum (DOD), Hamburg, Federal Republic of Germany and Dr. Vlado Dadic from the Oceanographic Institute at Split, Yugoslavia.

2. ADMINISTRATIVE ARRANGEMENTS FOR THE SESSION

The Agenda was adopted as given in Annex I.

Mr. D. R. Hamilton and Dr. M. T. Jones volunteered to act as Rapporteurs.

In reviewing the work in front of the Session, the Chairman emphasized the importance of evaluating the software package GF3-Proc and of developing mechanisms for ensuring its availability and support to the international community. He further emphasized the need to continue work with the development of new standard subsets of GF3. The Group would need to be alert to new developments in computer technology and to anticipate the impact of such technology on future exchanges of oceanographic data. As a support to these activities it was important that good documentation was made available to GF3 users and that adequate training activities were planned.

The IOC Assistant Secretary, Dr. I. Oliounine, introduced the list of documents, identified changes and informed the meeting of the administrative arrangements. Dr. Dooley provided information on local arrangements. The List of Participants is presented as Annex II.

3. WORK ACCOMPLISHED DURING THE INTERSESSIONAL PERIOD

3.1 NATIONAL REPORTS ON THE UTILIZATION OF GF3 AND DISCUSSION OF USERS EXPERIENCE

The Assistant Secretary reported on the results of a survey on the utilization of GF3 in the National Oceanographic Data Centres of the IODE community. It was encouraging to note the positive commitment to GF3 in a number of countries.

The Group appreciated the efforts that had already been made in developing the ability to read and write GF 3 tapes. It was agreed to include a compilation of the NODC's reports as Annex III to the Summary Report and to respond to any specific problems raised by these Centres.

In reviewing the information provided by the survey the Group noted the commonly stated requirement for a general purpose software package to be made available to simplify the reading and writing of data in GF 3. The Group agreed that this was of the highest importance and indeed expected that the GF3-Proc package developed by MIAS*would satisfy the requirements expressed by the NODCs (see Agenda item 4). The survey also showed the importance and urgency of continuing the development of new standard GF-3 sub-sets, particularly for water bottle, BT and gridded data. The Group noted the need expressed by countries around the North Sea and the Baltic for sub-sets to cover biological and pollution data.

The Group noted and agreed the following statements on specific items raised by the various national reports:

Argentina:

(a) In view of Argentina's practical interest in implementing GF 3 software, the Group proposed that Argentina should be invited to participate in the Pilot Phase of GF3-Proc distribution and installation at the end of 1985 (see Agenda item 4.2).

(b) Positive action is required by the Group to ensure the rapid and effective dissemination of up-to-date information on GF 3 developments (see Agenda item 8).

Brazil

(a) Mr. Hamilton reported that WDC-A (Oceanography) had little problem in handling the GF 3 tapes submitted to them by Brazil.

(b) The Group concurred with the general requirement and suggestion for the continued development of GF 3 sub-sets and the parameter code table. In view of the nature of the data currently being submitted to WDC-A by Brazil, it was assumed that action was required by the Group to proceed with the development of sub-sets for water bottle and XBT-data including the assigment of parameter codes for surface meteorological data and more commonly measured chemical parameters (see Agenda item 5).

Chile

The Group suggested that CENDOC should investigate the possibility of creating their GF 3 files directly from their own computer data files and so minimize the manual input of information. If data mapping problems exist, between GF 3 and the in-house data files, CENDOC is encouraged to make these problems known to MIAS.

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*MIAS - Marine Information and Advisory Service, Institute of Oceanographic Sciences, Bidston Observatory, Merseyside, U.K.

Federal Republic of Germany

GF3-Proc will be supplied to DOD before the end of 1985.

Japan

The Group was concerned about the problems perceived in Japan about the complexity of GF 3 and felt that some form of practical demonstration was required to illustrate the simplicity of GF-3 when applied to specific types of data. Dr. Jones reported that MIAS had received digitized bathymetric contour charts on magnetic tape from the Japanese Hydrographic Office and that MIAS had converted these data in to GF 3. It was agreed that a copy of the GF-3 tape should be sent to JODC together with the GF-3 tape inspection utilities as soon as possible in order that they might compare the format with their own internal format. It was suggested that it would also be helpful to provide the JODC with copies of the water bottle and BT data sub-sets when available.

Netherlands

The Group was pleased to note the work being carried out by NCOD and KNMI in installing the GF3-Proc package on their Burroughs computer. The difficulty of installing 'portable' software on Burroughs machines was recognized and the Group looked forward to receiving a report from NCOD and KNMI on their experiences.

USA

(a) GF3-Proc software will be supplied to NODC before the end of 1985.

(b) The Group was optimistic that many of the minor errors currently being detected by WDC-A (Oceanography) in the GF 3 tapes they receive may well disappear when the GF3-Proc package comes into more widespread use. Nevertheless it was felt important that the Group should be kept regularly informed about the types of error that do occur in order that steps might be taken to eliminate their occurrence.

USSR

(a) Mr. Hamilton reported that WDC-A (Oceanography) had read the deep water oceanographic data submitted to them in GF 3 by the USSR

(b) The Group requested Dr. M. Jones to supply a reivsed tape of the tape inspection untilities software to the USSR (see also Agenda item 4.2).

(c) The Group would welcome receiving information on the GF 3 sub-sets developed by the USSR for geological-geophysical data and for deep-water oceanographic observations.

Yugoslavia

(a) Dr. Jones reported that MIAS had incorporated the GF 3 tape of Medalpex sea level data submitted by Yugoslavia into the Medalpex data base.

(b) The Group was particularly pleased to note the progress made at Split for converting many different types of data into GF 3 and recommended that consideration should be given to installing GF3-Proc at the Split laboratory once their new computer had been installed.

3.2 REPORT OF THE CHAIRMAN AND THE ASSISTANT SECRETARY IOC ON INTERSESSIONAL ACTIVITIES, THE IMPLEMENTATION OF RECOMMENDATIONS OF THE SECOND SESSION OF THE GE ON FORMAT DEVELOPMENT AND OF THE ELEVENTH SESSION OF THE IOC/WC ON IODE

A detailed report was made on the state of implementation of these Recommendations. The Group noted with satisfaction that considerable progress had been made in nearly all areas during the intersessional period. The Group believed that the time was now appropriate to make known to meteorological and other scientific communities the benefits of utilizing GF 3 in appropriate applications. The representative of the WMO invited the Group to publish information on GF 3 in the WCP Newsletter. The Group very much appreciated this offer.

3.3 STATUS REPORT ON THE RNODC-FORMATS

The RNODC-Formats reported on its activities during the intersessional period. It noted that few request for assistance or information on GF-3 were received during that period. The RNODC-Formats pointed out that due to other priorities it is unlikely to acquire the know-how and expertise to address fully all items in it terms of reference in the foreseeable future.

The Group, recognising the potential additional work generated by the installation of GF3-Proc at several centres, urged that the Secretary IOC should write to the UK requesting MIAS to assist the RNODC Formats on technical matters relating to GF3 and its software, emphasing the need for a continued commitment for at least 5 years. This will provide confidence among users in the stability of the support of GF 3. The Chairman of the Group of Experts on RNODCs should be informed of this.arrangement to assist RNODC-Formats and he should be requested, in agreement with ICES, to add a footnote of future statements about RNODC-Formats to indicate that technical support and advice is available from MIAS.

4. DEVELOPMENT OF GF 3 SOFTWARE

4.1 GF3-PROC PACKAGE

Dr. Jones introduced the general purpose software package GF3-Proc and its documentation. GF3-Proc provides a simple and yet complete software interface for reading and writing data in GF3. It is a collection of FORTRAN subroutines which provides several benefits to users. These benefits and characteristics of the package are introduced in the"User's Guide to GF3-Proc". The Group reviewed the draft version of"User's Guide to GF3-Proc"and recommended that it be developed into a form suitable for publication by the IOC in support of the GF 3 system. The Chairman recommended that a further

review of the "User's Guide to GF3-Proc" be made before publication by IOC. The document should be distributed to several experts not present at the sesssion for their review and comments, as well as those of the Group. Comments are to be made to the Chairman of the Group by March 1986.

The Group also noted the usefulness of three additional documents being prepared in support of GF3-Proc, i.e., GF3-Proc User's Reference Manual, GF3 Proc User's Reference Sheets, and Worked example programs demonstrating the use of GF3-Proc. It was agreed that when finalized, IOC should be invited to publish these documents. Maintenance of GF3-Proc was discussed in more detail under Agenda Item 4.3.

The Group noted its appreciation to MIAS for the considerable effort devoted to the development of GF3-Proc and its documentation.

The Group agreed that the GF3-Proc software should be made readily available to those actively involved in international oceanographic data exchange using GF 3 (see Agenda item 4.2). It was further agreed that software of such general usefulness must be maintained and upgraded with time. The Group recommended that the recipients of the software should be obliged to report system implementation and operation problems to MIAS so that they can improve and maintain the software.

The Group reviewed and accepted two minor amendments to GF 3. They are:

> "In normal use GF 3 is mapped with one logical record (fixed length 1920 Characters) per physical record. However, if tape usage is found to be critical, an increased blocking factor may be used by agreement between exchanging parties".
>
> "So as to preserve the file independence of the last data file, a dummy file header record (i.e. with dummy entries) has been inserted in the front of the end of the tape record in the tape terminator file".

The IOC Secretariat is requested to circulate the consolidated revisions of GF3 made since the Publication of Parts 1 and 2 of Annex 1.

4.2 DISCUSSION OF THE MOST SUITABLE MECHANISMS FOR DISTRIBUTION AND INSTALLATION OF SOFTWARE

GF3-Proc has now been installed and tested on a variety of computer systems in the U.K. and Europe. Implementations are already available on some operating systems on CDC, GEC, Honywell and Burroughs computers. Work has started on versions for VAX and a Motorola 68000 system using UNIX. The Group agreed that initial

distribution of the package and its associated documentation be made to selected IODE centers near the end of December 1985. For this Pilot Phase of GF3-Proc distribution and installation it was recommended that the centres in Argentina, Federal Republic of Germany, France, Canada, USA and USSR should be invited to participate. In accepting this invitation the centres would be expected to commit resources to install and test the software and to work with MIAS personnel if problems are encountered. Each center is to designate a competent computer programmer or systems analyst to perform those functions. In the spring of 1986 the centres evaluating the software are encouraged to accept an IOC consultant in order to evaluate the centre's experiences in implementing the software and to document installation procedures for future distribution of the software. The IOC is requested to provide support for the consultant.

4.3 SOFTWARE MAINTENANCE

The Group under various Agenda Items have expressed concern that maintenance of the software should be ensured. Specific proposals for this are included in agenda item 3.3. Although much of the technical know-how lies with MIAS other centres are encouraged to develop expertise in the installation of GF3-Proc on their systems and to lend support where possible.

The Group urged the Secretary IOC to arrange for consultant assistance on the installation of GF3-Proc in National Centres on a case-to-case basis as required.

5. DEVELOPMENT AND APPROVAL OF NEW STANDARD SUBSETS OF GF3 FORMAT

5.1 IGOSS BATHY/TESAC

In response to the need for a format for operational delivery of IGOSS BATHY/TESAC message data from IGOSS specialized Oceanographic Centers (SOC) to IODE RNODCs-IGOSS, a subset of GF 3 was developed based on the requirements reviewed at the Joint IOC/WMO Meeting of Experts on IGOSS/IODE Data Flow held in Tokyo, 12-16 November 1984. The Group noted an ample review of the BATHY/TESAC subset made by the IGOSS and IODE community. The Group then approved the subset and its associated parameter codes.

The Group expressed an interest in the offer made at the Tokyo Meeting by the Marine Environmental Data Service (MEDS) of Canada to prepare a suitable subroutine package, including the computer software and instructions to facilitate the reading and writing of the BATHY/TESAC data in GF 3 in SOCs and RNODCs-IGOSS. The Group looked forward to a report by the SOCs and RNODCs-IGOSS on the use of this software.

5.2 WATER BOTTLE DATA

The Group reviewed a subset for water bottle hydrocast data. It was noted that some water bottle data are now being exchanged in GF 3 and therefore a standard subset is needed to ease that exchange. The proposal generated considerable discussion about the usefulness of surface meteorology data in this subset. It was decided to make the inclusion of surface meteorology data optional. It was felt that the standard water bottle subset should not include those parameters, but that an optional series head record which includes surface meteorology data be attached to the subset description for those who wish to use it.

Further discussion was generated by the list of chemical parameters in the subset. The Group agreed that the user should have considerable flexibility in recording chemical parameters in a water bottle data set. Therefore, it was recommended that the water bottle subset data cycles be made up of a core set of parameters including pressure and/or depth, temperature and salinity. To give users the flexibility they need, a list of a number of chemistry parameter codes will accompany the subset and a demonstration of mapping those into data cycles will be attached. Dr. Jones agreed to draft a water bottle data subset to meet those requirements.

The Group approved a list of parameter codes which accompanied the proposed subset and offered them to those who are now putting water bottle data into GF 3.

5.3 MARINE GEOPHYSICAL DATA

Dr. Jones reported on the work being carried out by the IHO/IOC GEBCO Sub-Committee on Digital Bathymetry concerning formats for the exchange of bathymetric data. The Sub-Committee had agreed to concentrate those formats around GF3 and MGD77 and were developing subsets of GF3 to cover:

- digitized bathymetric contour charts,
- sea beam data
- gridded bathymetric data
- digital sounding data

5.3.1 Digitized Contour Charts

A proposal for a GF3 subset to cover digitized contour charts of marine geophysical data was prepared by the GEBCO Sub-Committee and submitted to the Group for approval. It was reported that a test tape of bathymetric charts for the North Atlantic and sea areas around Japan had been created according to the proposed subset and evaluated by 3 centers in North America and 2 in Europe. The evaluation had shown that the GF3 subset provide a simple and convenient method for exchanging bathymetric contour charts in digital form. It was agreed that a note should be included in the subset explaining how the subset might be adopted for charts with resolution in excess of 0.001 degrees of latitude/longitude.

The Group recognized its potential value to other types of marine data and formally approved its acceptance as a standard subset of GF3. The Chairman pointed out that with minimal adaptation, the subject might also be used for more complex types of data e.g. synoptic contours of salinity/temperature on a pressure surface.

5.3.2 Sea Beam Data

A draft GF3 subset for Sea Beam data had been prepared for consideration by the U.S. Office of Naval Research's Sea Beam Data Format Committee under the chairmanship of Dr. M. S. Loughridge. The Committee had some 18 members who were either collectors or users of Sea Beam data drawn primarily from the U.S. but with links to the Sea Beam data collecting groups in both Brest and Bremenhaven. At its meeting in San Francisco in late 1984 the Committee had endorsed the use of GF3 for the exchange of Sea Beam data within the U.S. and were currently collaborating with Dr. Jones in finalizing an appropriate subset.

The Group noted this activity with enthusiasm and looked forward to hearing about further progress.

5.3.3 Gridded bathymetric Data

Dr. Jones reported that the GEBCO Sub-Committee had plans to commence the development of a subset of the GF3 format tailored to gridded bathymetric data. The Group stressed the importance of systematically developing GF3 subsets for gridded data in many other areas of marine science particularly in the context of modelling and climate related studies.

5.3.4. Digitial Sounding Data

The value of including bathymetric data with other types of underway measurements such as magnetic and gravity data was clearly recognized by the GEBCO Sub-Committee who affirmed its support of the use of MGD77 for the exchange of these types of data. It was reported that the Sub-Committee was developing a GF3 version of the MGD77 format so as to provide a compatible GF3 alternative for those wishing to use it. A draft GF3 subset had already been formulated and a test tape was being prepared by MIAS for evaluation by the WDC-A Marine Geology and Geophysics and by members of the GEBCO Sub-Committee. Dr. Jones was requested to report the outcome of this work to the Group in due course.

In the meantime, it was agreed that standard GF3 parameter codes should be given to those parameters identified in a draft proposal submitted to the Group.

5.4 MARINE BIOLOGY DATA

The Group reviewed a paper on mapping marine biology data into GF-3, submitted by Mr. D. Hamilton. The paper proposed the addition of a new GF 3 record type - a code table record - as a solution to several unique aspects of recording marine biology data in GF 3.

The Group agreed that there seem to be advantages to having such a record and indeed such a concept applied to other disciplines requiring code tables (meteorology, chemistry, pollution etc...). However, in view of plans to distribute the software package GF3-Proc in the near future, it was felt that some stability in GF 3 is needed. Therefore, the Group recommended that the paper be referred to the Task Team on Marine Biology Data for their expert review. It was felt that it may be possible to accomplish objectives outlined in the paper in the context of GF-3 as it exists at present though not so elegantly. The Group thanked Mr. D. Hamilton for his efforts.

5.5 WORLD CLIMATE DATA

Several reports were brought to the attention of the Group in which needs for format development are stated. The Group wished to assure members of climate-related planning groups that it was aware of the needs of the climate research community. Discussion supported the belief that the flexibility of GF 3, coupled with substantial support of software package GF3-Proc and extensive documentation all contribute to a system that can significantly assist in managing climate data sets. It was pointed out, for example, that data (level 2 or 3) from satellite sensors, atmospheric sounders, ocean profilers, and time series instruments can all be put into one project data set in the GF 3 format. Furthermore, the software in GF3-Proc gives considerable power in manipulating data from such diverse sources for scientific purposes.

The Chaiman reported that the U.S. national TOGA/WOCE Data Management Committee has identified several diverse data types necessary for objectives of the climate program. The Group noted concern expressed by the Committee about using GF 3 for geographically sorted or for gridded fields.

The Group disagreed strongly with the idea that GF 3 is not well adapted to the description of gridded and geographically sorted data. On the contrary within the confines of a character format it is extremely economical (see for example Agenda items, 5.3.1 and 5.3.3).

The Group reviewed the requirement for data to be used by the scientific community stated by the CCCO/IGOSS/IODE ad hoc Meeting on WCRP Ocean Data Management (October 1984, Paris) which states: "Data formats should strike a balance between flexibility and the economics of nonchanging record structure. They should be designed for ease of use by the scientist. The ability to compare diverse data sets in compatible form may be vital to a successful research effort".

The Group agreed that this provided a good description of the GF 3 format system.

5.6 SATELLITE DATA

The Group noted the information provided by Mr. P. Geerders from the Netherlands related to ESA/ERS-1 remote sensing data. This data will be extremely important to many oceanographic disciplines (e.g. climate data, wave data). The Group noted the recommendation (document IOC/INF-651, para 4.3) of the Meeting of Experts on Climate Data Management (Beijing, China, 22-26 April 1985) that the IODE system should be prepared to exchange Level III satellite data products. The Group wished to point out that such data products can be effectively accomodated within the framework of GF3 as it is presently developing.

6. GF3 AND THE USE OF MICROCOMPUTERS

In view of rapidly changing capabilities in computing technologies, the Chairman recommended that the Group considered the advantages of using GF3 on microcomputer systems. The Chairman

pointed out, for example, that the combination of GF3 and microcomputers could well serve the needs of scientists for data of different types but in a common format. Such a combination could be useful in, for example, downloading data from diverse systems, in creating on ship a working project data set, in taking historical data along on a cruise and in data exchange.

The Group agreed to investigate, during the intersessional period, those and other possible functions. In addition, opportunities created by evolving technology will be watched. For example, the Group will consider possible advantages of using, in GF3 work, powerful software packages (e.g. data base) now available for microcomputer systems.

Dr. S. Unninayar, the Observer from the WMO, described to the Group a microcomputer based system being developed by the World Climate Programme to capture meteorological data. He offered to provide copies of the WCDP survey of information packages and also of the CLICOM specification to the Group. That information was very useful to the Group, who will be watching with interest results of that project.

The Group requested the Secretary IOC to consider the possibility of arranging in 1987 a meeting of technical experts to provide expertise to the WC/IODE in considering future applications of GF3 on microcomputers. The Agenda and List of Experts will be identified by the Chairman in consultation with the Members of the Group and the IOC Secretariat.

7. REVIEW OF THE ROSCOP FORM

Dr. Dooley reported on recent developments at ICES in computerizing information from the ROSCOP forms and gave an on-line demonstration of the selection and retrieval of information from his system. He explained that the system was simple in concept and was written in Basic. He emphasized that it was now being used as an effective data management tool in tracking the availability of data. The Group was impressed by the rapid access given to ROSCOP information by the system and thanked the ICES Hydrographer for his demonstration.

It was reported that the ICES Working Group on Marine Data Management had held discussions reviewing problems concerning the design and content of the ROSCOP form. These discussions had centred around experience in the data centres in the USA, France, Federal Republic of Germany, Netherlands, UK, ICES and the Scandinavian countries. There was a general concensus in the ICES community that the form was working reasonably well but there was a need to improve its physical layout, to bring it up-to-date (removing obsolete entries and introducing some new entries), to clarify/redefine certain entries and to have another look at how positional information was recorded on the form. It was felt that the form contained about the right level of detail bearing in mind that requests for more detailed reporting would be likely to be counter productive and require more resources. It was also felt that the form should be made more user friendly but that any revisions made to content should be designed to ensure compatibility with the existing form.

The Group was in general accord with the statements made by the ICES Working Group but felt that further comments should be solicited from other data centres in the IODE community particularly from Canada, USSR and those centres active in submitting ROSCOP forms to the WDCs (Oceanography). Dr. Dooley reported on an analysis of the frequency of entries in the various data sections of the ROSCOP forms based on some 2500 forms received by the Service Hydrographique for the years 1975, 1981-84.

The Group agreed that the usefulness of the ROSCOP form for data management purposes was considerably enhanced by the increasing tendency for data centres to computerize the forms. It would not be appropriate to consider major revisions of the form at this stage - in any case present experiences with ROSCOP suggest that only a fine tuning of the system is required.

In considering a possible revision of the ROSCOP form it was recognised that consideration should also be given to the inventory requirements of the climate program.

The Group agreed that the ICES Hydrographer should be invited to prepare a review of current experiences with the ROSCOP form, to analyse the problems encountered and to draft a proposal for revising the ROSCOP form for submission to IODE XII.

The Group invited the Secretary IOC to request the above-mentioned Centres to submit their comments to RNODC-Formats for the preparation of this review. The Group requested its Chairman to keep the Chairman of the Task Team on DNP/NOPs Announcements informed of developments.

8. PUBLICATIONS

The Chairman introduced the list of publications presently available and planned for the near future. These are reproduced in Annex IV together with information on original publication date, dates for the next publication and titles for future publications.

(i) GF 3 Brochure

The draft of the GF-3 Brochure prepared by Dr. N. Flemming and Mr. Hamilton was reviewed by the Group. The Group noted and concurred with the comments made at the Fourth Session of the IODE Consultative meeting (Paris, 28-30 March 1985) and with those received by Dr. Jones after this meeting.

Mr. Hamilton agreed to prepare a revised version of the Brochure taking into account comments made for consideration at the next consultative meeting planned for February 1986. The revision became essential due to the change of emphasis resulting from the developments in GF 3 software.

(ii) RNODC-Formats Newsletter

It was agreed that the time is ripe to start preparations, by the Chairman of the Group and the ICES Hydrographer, of a new issue of the Newsletter in order to have it published well in advance of the next session of the Working Committee on IODE. The proposed suggestions for contents and authors were as follows:

- reports on the use of GF 3 by MEDS, PSMSL, NODC of the USA, NODC of the Soviet Union (RNODC-Medalpex), NODC of the UK and by Yugoslavia (the Heads of the respective centers or services);

- software and maintenance support for GF 3 (M. Jones);

- report on installation of GF 3 on various machines and systems (M. Jones);

- available documentation on GF 3 and other formats (H. Dooley).

(iii) GF3-A Formatting System for Earth Sciences Data

The Group considered the ways of advertizing GF 3 among other scientists than oceanographic groups of scientists. The Group was in full agreement that the volumes containing information on GF 3 (see Annex IV) should be published in a new series, agreeably presented and printed with the aim of making this publication attractive to other earth sciences and widening its impact beyond oceanography.

The Group recomended that the Chairman address the Secretary IOC to study the possibility of publishing GF-3 in a uniform series and requested the Chairman to consider, in consultation with other experts, the design of a new cover and a new title, for example "GF 3 - A Formatting System for Earth Sciences Data" and volumes and sub-titles corresponding to those proposed in Annex IV. It was recommended that the consultancy support for the preparation of Volumes 1 and 5 would be required to meet the proposed schedule (see Annex IV) and that Volume 2 had the highest priority as it was vital to integrate the corrigenda and addenda, from 1980 onwards, into a uniform volume.

(iv) Users Guide for Exchange of Measured Wave Data

The Group discussed in detail the "Users Guide for the Exchange of Measured Wave Data" and requested Mr. Crease to convey some of the comments, made on this excellent draft, to the Chairman of the Task Team on Wave Data Management.

(v) GF 3 Reference Sheets

The Group reveiwed the GF-3 Reference Sheets as they were presented in Doc.IOC/IODE-GFD-III/11 and approved their content.

These sheets provide a quick and easy reference to GF 3. They are based on the information published in IOC Manuals and Guides N° 9 Annex 1 and on minor amendments to the format agreed upon in IODE-XI. This amended version of the format, referred to as GF3.2 was developed for the purpose of simplifying and expediting the implementation of GF 3 in the international community.

The Group requested its Chairman and the IOC Secretariat to publish the sheets and distribute them early in 1986.

9. TRAINING ACTIVITIES

The Group was pleased with the offers of several countries to participate in GF3 training activities. It noted in particular the ongoing data management training being provided to Uraguayan experts by Argentina and the proposals of the U.S.S.R., Chile, and India to host GF3 training sessions.

The Chairman pointed out that GF3-Proc is undergoing tests in the near future and that training courses will be more appropriate after some experience with it. Therefore, the Group agreed that training should be planned for 1987-88.

10. ELECTION OF THE CHAIRMAN

The IOC Assistant Secretary reviewed for the Group the procedure for the election of the Chairman, after which Dr. M.T. Jones was nominated and elected unanimously. The Group expressed its thanks to Mr. J. Crease for the energy and direction he had supplied to the work of the Group.

11. REVIEW OF EXISTING TERMS OF REFERENCE OF THE GROUP AND THE GROUP MEMBERSHIP

The Group reviewed its Terms of Reference as established by Recommendation IODE-IX 6 of the Ninth Session of WC/IODE, New York, 1979 and approved by the IOC Executive Council. that, in the light of developments over the past six years, there was a need to revise the Terms of Reference of the Group, as given below,and that these revisions should be submitted to the Working Committee on IODE for approval:-

(i) keep GF3 format under review and recommend improvements particularly in the light of advances in technology;

(ii) in conjunction with IODE Task Teams from the various disciplines develop the GF3 parameter codes;

(iii) in conjunction with IODE Task Teams from the various disciplines develop standard discipline - orientated subsets of GF3;

(iv) establish ways and means of providing advice and guidance in the use of GF3;

(v) initiate and provide guidelines for the development of protable software for GF3;

(vi) promote the distribution and installation of GF3 software.

The Group reviewed its membership and noted that certain members were in the process of resigning. This would provide a natural rotation in membership and it was suggested that Bob Keeley of MEDS, Ottawa and Horst Hecht of the DOD, Hamburg would prove valuable additions to the Group as vacancies occurrred. The Group also looked forward to the appointment of an active expert from the USSR. The Group regretted that Soviet experts were again not able to attend a Session of the Group. It further recomended that a CCCO representative be invited to join the Group as an official and valued observer. It was felt that it may also be appropriate in the near future to invite an expert from the South American region to join the Group.

12. DRAFT ACTION PLAN FOR THE NEXT INTERSESSIONAL PERIOD

The Group considered and approved the Action Plan for 1986-1987 as it is presented in Annex V. The Group urged its Chairman to bring this Plan to the attention of the Secretary IOC and the Chairman of the Working Committee on IODE with the request to provide the necessary support for successful implementation.

13. DATE AND PLACE OF THE NEXT SESSION

The Group appreciated the kind invitation made by MEDS of Canada to host the next Session in Ottawa and recommended that the next Session take place at the end of 1987, beginning 1988.

14. ADOPTION OF THE SUMMARY REPORT

The Group adopted the Summary Report with all recommendations contained therein.

15. CLOSURE OF THE SESSION

The retiring Chairman in closing the Session expressed his thanks to the Members of the Group and emphasised that he looked forward to keeping in touch with the Group through the new Chairman. He assured the Group that he was confident that all the hard work on GF3 was beginning to pay off and what was now required was some sustained efforts by a number of committed centres. It was pleasing that also by a parallel effort, for example in ICES, the ROSCOP was being turned into a useful, first-line computerised management tool and that after a number of years only a 'fine tuning' was deemed appropriate.

Turning to local arrangements, the retiring Chairman expressed the Group's appreciation to the Secretary General, and to the Hydrographer, for the efforts made by ICES and its staff to provide a relaxed and supportive environment for the meeting.

He concluded by thanking the Assistant Secretary IOC to whom the Group owed a special debt of gratitude for the preparation of the documentation as well as for having the right papers at hand so that the meeting could be conducted correctly and successfully.

ANNEX I

AGENDA

1. OPENING OF THE SESSION

2. ADMINISTRATIVE ARRANGEMENTS FOR THE SESSION

3. WORK ACCOMPLISHED DURING THE INTERSESSIONAL PERIOD

   3.1 NATIONAL REPORTS ON THE UTILIZATION OF GF-3 and DISCUSSION OF USERS EXPERIENCE

   3.2 REPORT OF THE CHAIRMAN AND THE ASSISTANT SECRETARY IOC ON INTERSESSIONAL ACTIVITIES, THE IMPLEMENTATION OF RECOMMENDATIONS OF THE SECOND SESSION OF THE GE ON FORMAT DEVELOPMENT AND OF THE ELEVENTH SESSION OF THE IOC/WC ON IODE

   3.3 STATUS REPORT OF RNODC-FORMATS

4. DEVELOPMENT OF GF 3 SOFTWARE

   4.1 GF 3-PROC PACKAGE

   4.2 DISCUSSION OF THE MOST SUITABLE MECHANISMS FOR DISTRIBUTION AND INSTALLATION OF SOFTWARE

   4.3 SOFTWARE MAINTENANCE

5. DEVELOPMENT AND APPROVAL OF NEW STANDARD SUBSETS OF GF-3 FORMAT

   5.1 IGOSS BATHY/TESAC DATA

   5.2 WATER BOTTLE DATA

   5.3 MARINE GEOPHYSICAL DATA

   5.4 MARINE BIOLOGY DATA

   5.5 WORLD CLIMATE DATA

   5.6 SATELLITE DATA

6. GF-3 AND THE USE OF MICROCOMPUTERS

7. REVIEW OF THE ROSCOP FORM

8. PUBLICATIONS

9. TRAINING ACTIVITIES

10. ELECTION OF THE CHAIRMAN

11. REVIEW OF EXISTING TERMS OF REFERENCE OF THE GROUP AND THE GROUP MEMBERSHIP

12. DRAFT ACTION PLAN FOR THE NEXT INTERSESSIONAL PERIOD

13. DATE AND PLACE OF THE NEXT SESSION

14. ADOPTION OF THE SUMMARY REPORT

15. CLOSURE OF THE SESSION

ANNEX II

LIST OF PARTICIPANTS

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ANNEX III

NATIONAL REPORTS ON THE UTILIZATION OF GF 3

ARGENTINA

The experience on using the GF 3 included receiving tapes containing physical and chemical data (including oceanographic parameters of the station). Unfortunately, up to this moment, there has been no data exchange on standard subsets of GF 3:

- moored current meter
- mean sea level data
- drifting buoy data.

The reading and retrieval of information on the standard subset of GF-3 (CTD data) were carried out by means of utilities available in the data centre as well as by means of simple programmes which were made as they were deemed necessary, thus enabling files designs to be reformatted in accordance with the information we possessed.

Presently we are not in possession of a software of general use which could be flexible enough to let us read and record any type of information to or from GF-3. (Our experience on the subject has caused us to make programmes in order to solve problems when reading and reformatting). As we consider that this software is very useful, we would like to be able to dispose of it as soon as GF3-Proc is released for use.

The programme for the training of data centre on the development of a format for the exchange of data in magnetic tape has given as a result that in 1978 we use the GF-2 (at the experimental level), and from then on the data centre has followed the improvements achieved by GF-3. The reference as well as the publications which we possess are contained in the "List of Publication and Documentation of GF-3" prepared by Jens Smed and published in "Formats for Oceanography, An Occasional Newsletter of IOC Working Committee on International Data Exchange" N° 1 - January 1984. In case this list has been extended and/or modified, it would be interesting for us to be informed about the new amendments.

Up to this moment we have not come across technical difficulties when using GF-3. When the scope of information becomes wider, we will perhaps need the assistance of experts.

BRAZIL

Number of tapes received: 2 (two)

Number of tapes forwarded: 7 (seven)

Identified difficulties:

- The flexibility of the GF-3 system makes it difficult to create programmes for those who receive the tape, the data included in the receiving programmes, which will be tested and checked upon completion, are taken from the information contained in the tape header;

- Under a single discipline, it is possible to receive two different tapes from the same country, so forcing the development of specific programmes for each tape and,

- The Code Tables (part II of GF 3) present few parameters with standard codes.

Suggestions:

- Once a programming structure is adopted for a particular subset, that it be maintained in order to facilitate the work of the receptor and,

- Development of larger and more comprehensive code table, (part II of GF 3 Manual).

CANADA

Canada has a growing commitment to GF-3 for both domestic and international use. Several subsets have been developed for domestic use, as the format for submission of national data to MEDS. Software for reading GF-3 tapes is growing. Within the next year we hope to begin to routinely exchange data internationally in GF 3.

We shall also be submitting national data to WDCs-Oceanography in this format. Revised DRIBU format is under development for use of distributing data from the RNODC for Drifting Buoys Data if arrangements can be suitably concluded from MEDS to assume that function.

CHILE

National Oceanographic Data Center (CENDOC) has developed a computerized system capable to handle the GF 3 tapes as follows:

The system can read and validate a tape recorded by another NODC, convert it to a national format, and list its content;

The system can read a tape recorded in a national format by any oceanogrpahic activity, and convert into the GF 3 Format;

The system can verify that the GF 3 tape has been properly recorded according to specifications.

So far, the Center can handle STD, MBT and XBT data. Further software development is necessary to handle Marine Climatology, Mean Sea Level and Ocean Waves data.

Regarding the experience gained by CENDOC in handling GF 3 tapes, there was a regret expressed that no GF 3 tapes from any NODC or WDC, with the exception of a MIAS tape that Dr. M. Jones sent to use for checking our software have been received by the Center.

Conversely, ro GF 3 tape has been generated by CENDOC due to the low oceanographic activity seen in Chile during the last two years. Better software is needed for the preparation and coding of the input data according to GF-3 specifications. At present, this step is being made by hand filling several coding forms that makes the job a very time consuming one.

FEDERAL REPUBLIC OF GERMANY

Neither GF 3 formatted data nor suitable GF 3 software is currently in use at the Deutsches Ozeanographisches Datenzentrum, so that there is no practical experience in GF 3 utilization available so far.

Nevertheless, there is a high interest in adopting GF 3 on a routine basis as much as possible. The software documentation of the GF 3 software developed by MIAS is currently under study. This software package appears to be well organized meeting the general requirements of processing GF 3 data. The Center plans to get in contact with MIAS in the near future with a request to have a copy of the programme. IOC is kindly requested to study the possibility of providing expert assistance through MIAS for the installation or utilization of the GF 3 software.

FRANCE

The BNDO has participated in the working groups of the IOC and ICES which deal with the development of different components of GF 3 format, particularly in the preparation of GF 3 subsets for geophysical data and sea beam data.

From our experience we expressed concerns as to the clumsiness in using this system and intent not to use GF-3 widely until the main data centers complete the adoption of this format. As the first step in using GF-3 in the BNDO, we plan to accommodate it for hydrological data within the data management plan of FOCAL-SEQUAL during 1987.

JAPAN

IOC Manual and Guide N° 9 describing technical specifications has been translated into Japanese and published by the JODC in Japan. The format GF-3 gives Japanese experts the impression that it is too sophisticated to describe sets of data cycles, and it may impose heavy burdens on voluntary data-suppliers. The JODC would ask the Group of Experts on Format Development to simplify the format GF 3.

NETHERLANDS

The Netherlands Centre for Oceanographic Data does not have its own facilities to read or write GF 3. Through the facilities of the KNMI, where the Centre is housed, trials runs were performed on reading GF-3 tapes in the CTD-format; processing of the data has proven to be possible. At present, activities are underway to get the GF 3-Proc; package implemented at the KNMI as a first step for further implementation also at other institutions in the

Netherlands that perform oceanogrpahic research work. It is expected that this process will be completed in 2 or 3 months. Contacts with MIAS will be made whenever necessary. The Netherlands Centre for Oceanographic Data will naturally profit from the facilities thus created at the KNMI, enabling us to exchange oceanographic data in GF 3.

No specific assistance from IOC or IODE as a whole is needed. It seems clear, however, that rapid development of appropriate subsets for specific parameters will support the implementation process of GF-3. Especially, there seems a need for GF 3 subsets for biological and contaminants data.

USA

The U.S. NODC has had experience in both creating GF 3 tapes and reading GF 3 tapes from other centers. The principal activity at NODC has been the development of software to convert internal files to GF-3 format. At the time that was being done proposed standard subsets of GF-3 for current meter and CTD data were used by NODC. Subsets of GF 3 for water bottle and XBT data were not available then. However, there was no difficulty in placing those data types in GF 3, thanks to its flexibility.

Data have been received by NODC in GF 3 format from other national centers. It is encouraging to see actual data exchange being made in GF-3 format. However, it should be noted that nearly every GF-3 tape received required some modification to put it into correct GF-3 format. That is not a criticism, but is stated to highlight a possible problem as generalized GF-3 software comes into use.

Difficulties in using GF 3 have been both administrative and technical. The development of software to create GF 3 tapes took valuable computer programmer resources from other tasks. In addition, some technical difficulties were experienced in creating tape files. For example, to gather the summary information needed in the file header record, it has been necessary to read some data files twice.

NODC plans to implement the generalized GF 3 subroutines in the near future. There was a belief expressed that package will increase our data exchange capability and reduce costs in computer programming resources.

USSR

During the period between the Second and the Third Sessions of the Group of Experts on Format Development (1983-1985) the following work has been carried out:

A version of the GF 3 subset for deep-water oceanographic observations was developed. Software for converting oceanographic observation data from the national format into the format of the GF 3 subset was developed. The USSR exchanges deep-water observation data in the GF 3 format. Three magnetic tapes with deep-water observation data in GF 3 were delivered to the WDC-A.

A package of programmes for reading magnetic tapes prepared in GF 3 was verified, revealing an overflow of the constant KTEST in the sub-programme GFLSTT. As a new version of this programme package has been prepared in the UK (MIAS), it is necessary to receive it and make a second verification.

Software for recording the geological-geophysical observation data on magnetic tape in the standard GF 3 subset was developed and a test magnetic tape was prepared.

NODC of the USSR took part in reviewing the draft User Guide to GF 3 (part III, Annex 1 to the IOC Manuals and Guides N° 9) as well as the GF3-Proc. User Guide.

YUGOSLAVIA

The data centre of the National Institute of Oceanography and Fisheries has experience in GF 3 format data management. The software for conversion data files from internal format to GF 3 and back was developed. GF 3 subsets for sea level data, digital sampling wave data, current-meter data with pressure and donductivity, bathychermograph data and for climatological data were prepared by the experts of the centre for national use.

In connection with international project MEDALPEX, we sent 3 magnetic tapes with data in GF 3 format to relevant RNODCs but received no tape back. At present, the data centre has problems with computer facility, and therefore our activity on GF 3 format has been decreased.

UNITED KINGDOM

During the early part of 1985 MIAS completed work on the design, coding and testing of a general purpose software package for reading and writing GF-3 tapes. The package, GF 3-Proc., is written in Fortran and provides a simple and yet complete software interface to the GF 3 format. It exploits the full flexibility of GF 3 and has been designed for portability between different computer systems. The package is currently being used at MIAS to generate GF 3 tapes of digitized bathymetric contour maps and to service requests for mean sea level data on behalf of the Permanent Service for Mean Sea Level (PSMSL). Over the past three years MIAS has supplied GF 3 tapes of mean sea level data to some 22 different institutions worldwide. In the near future GF 3-Proc. will be used by MIAS to prepare a GF 3 tape of the MEDALPEX sea level data set for transmission to MEDALPEX participants on request and to WDC's (Oceanography). GF 3-Proc. will also be used in the preparation of GF 3 archive data sets for the JASIN 78 project. Experience in MIAS to date in the use of GF 3-Proc. has shown that only a couple of days work are required to translate specific user formats into GF 3 - the bulk of the programming effort is usually required to service the user format itself.

During 1984 the Marine Physics Group of the Institute of Oceanographic Sciences (IOS) decided to adopt the GF 3 format as their standard internal format for archiving data. Although their previous systems had been based on binary archive formats these had been found to be not readily transportable. Each time work was transferred to a new computer (every 4-5 years) unnecessarily time consuming effort was required to modify the binary formats. The Group recognized the value of GF 3 as an archive format not only because of its character form but also because of its self-documenting and self-defining characteristics. The GF 3-Proc. software is now in full operational use in support of the Marine Physics Group archives on both Honeywell and GEC computers. Current work is directed at installing the GF 3-Proc. package on the shipboard computers (based on a Motorola 68020 processor) so that scientists may take their data off the ship in GF 3 format.

ANNEX IV

GF3 PUBLICATIONS LIST

Present title	Original Publication	New Sub-title	Next Publication
1. GF 3 Brochure	-	GF3-A Data Formatting system for the Earth Sciences	March 1986
2. Formats for Oceanography (Newsletter)	Jan. 84	Formats for Oceanography	May 1986 (By RNODC)
3. Manuals & Guides No. 9 Annex 1 - Pt. 3	1984	Vol. 1 - Introduction to the Format & the Software (GF 3-Proc.)	Aug. 1986
4. User Guides to GF 3-Proc.	-		
5. Manuals & Guides No. 9 Annex 1 - Pt. 1	1980	Vol. 2 - Technical Description of the Format	Jan. 1986
6. Manuals & Guides No. 9 Annex 1 - Pt. 2	1982		
7. GF 3-Proc. Reference Manual	-	Vol. 3 - Software Reference Manual and Programming Examples	1987
8. GF 3-Proc. Programme examples	-		
9. Installation & Maintenance Guide	-	Vol. 4 - Software Installation & Maintenance	Late 1987
10. Standard GF 3-subsets	1983, 85	Vol. 5 - Standard Sub-sets of the Format	Aug. 1986
11. Reference Sheets for GF 3	-	- as before -	Feb. 1986
12. Reference Sheets for GF 3-Proc.	-	- as before -	1987

ANNEX V

ACTION PLAN FOR 1986-1987

Applications

1.	Further development of GF3 subsets, in particular those for XBTs, sea-level data, gridded data and contour charts.	1986-1987
2.	Review GF3 applications to biological, chemical and pollutant data	1986-1987
3.	Investigate the application of GF3 in the context of distributed data mangement systems on microcomputers	1986-1987
4.	Arrange a meeting of technical experts to provice advice to the WC/IODE taking into consideration future applications of GF3 on microcomputers	beg. 1987

Software

5.	Install GF3-Proc in selected centres	end 1985/ beg. 1986
6.	Arrange upon request the Consultant mission to a selected number of data centres where GF3-Proc testing has been carried out.	March/April 1986
7.	Install GF3-Proc in data centres not involved in pilot phase	1986

Publications

8.	Prepare revised draft for GF3 brochure	Jan 1986
9.	Publish an article on GF3 in the WCP Newsletter	beg. 1986
10.	Invite a consultant for the preparation of Vol. 1 and Vol. 5 of new "GF3 Series".	beg. 1986
11.	Prepare GF3 documents for publication	See GF3 publications list (Annex IV)

Other Actions

12.	Prepare proposals on ways of revising the ROSCOP form	Mid 1986
13.	Arrange the Fourth Session of the Group	Late 1987
14.	Arrange a training course of GF3	End 1987