Intergovernmental Oceanographic Commission
Training Course Reports

14

IOC Training Course on Microcomputers and Management of Marine Data in Oceanographic Data Centres of Spanish-speaking Countries in the Caribbean Region

Bogotá, Colombia, 21-30 October 1991

SC-92/WS-35

UNESCO

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1. INTRODUCTION

The Intergovernmental Oceanographic Commission (IOC) has repeatedly emphasized the importance of an adequate infrastructure for the management of marine data and information on the national and regional levels. Such an infrastructure strongly supports research and other activities forming the basis of an effective management of marine resources in the context of a sustainable socio-economic development.

In view of this, the Colombian delegation to the Fifteenth Session of the IOC Assembly (Paris, July 1989) stated its readiness to host a Training Course for experts of Spanish-speaking countries of IOCARIBE aimed at establishing and improving national and regional oceanographic data centres. This offer was welcomed and formally accepted during the Thirteenth Session of the IOC Committee on International Oceanographic Data and Information Exchange (New York, January 1990). Under the form of a Recommendation from IODE-XIII, the offer was finally accepted at the Twenty-Third Session of the IOC Executive Council (Paris, March 1990).

The course was organized in close collaboration between the Secretariats of IOC and IOCARIBE, the General Directorate of Maritime and Port Affairs (DIMAR) and the Colombian Commission of Oceanography (CCO). During the period of preparation, the programme of the course, the technical infrastructure required, the profile of participants and lecturers, the required support and the location of the course were discussed and determined.

2. PARTICIPANTS

Through a letter dated 26 July 1991, the national focal points for IOC/IOCARIBE in the various relevant Caribbean countries were invited to present their candidates for the course. The following basic criteria were proposed for selection of participants: (i) education in marine science or data management; (ii) some experience in use of PCs; (iii) being actively engaged in marine data management, now and preferably some time in the future.

The final selection of participants was carried out by IOCARIBE, DIMAR and CCO. This resulted in the List of Participants, included in this Report as Annex II.

3. INSTRUCTORS

The instructors for the course were: Dr. Paul Geerders, IOC Consultant, and Mr. Alfredo Rolla, Centro Argentino de Datos Oceanograficos (CEADO). Their full addresses are mentioned in Annex II.

During the course, intensive assistance was provided by the staff of DIMAR and of the Colombian National Oceanographic Data Centre (CECOLDO), especially by Lieutenant José A. Cifuentes-Castillo and Mr. Carlos Lozano-López.

4. COURSE PROGRAMME

The final programme of the course is included as Annex I. The course was fully conducted in the Spanish language.

4.1 OPENING

The participants and lecturers were welcomed by Vice-Admiral Miguel G. Ruan Trujillo, Director General DIMAR. He specifically stressed the importance of an adequate management of marine data. He also insisted on the need for an adequate follow-up of the course. He wished the participants every success.

Dr. Fernando L.E. Robles, IOC Senior Assistant Secretary for IOCARIBE, highlighted the global and regional backgrounds for the course in his welcome speech.

4.2 PROGRAMME

4.2.1 Presentations

During the course, presentations were given on the following subjects:

- Importance of data and information management;
- Relations with on-going scientific and monitoring programmes in the region, including those of UNEP, WMO, IMO and others;
- IOC, IODE (including IODE slide show);
- Specific IODE-related matters such as NOP, MEDI, ROSCOP, GF3 and OCEAN-PC;
- Microcomputers;
- Dbase-III+, Lotus 1-2-3, WordPerfect, Surfer;
- Quality control procedures;
- Operation, responsibilities and relations of NODCs;
- Expert systems;
- Remote Sensing (with a video presentation);
- Activities of DIMAR related to Remote Sensing;
- Marine information systems and related matters;
- Electronic mail (with on-line demonstration).

A synthesis of the above presentations has been compiled and mailed to the participants.

4.2.2 Practical Exercises

The participants had ample opportunity to acquire hands-on experience with a great number of software packages. The availability of eight PCs (AT level) and two printers, linked with a local area network, greatly facilitated this part of the course programme.

Not only the above-mentioned general commercial packages were used but also the following, more specific programmes:

- IT: display of the position of earth observing satellites;
- Simulation of the circulation of river inputs in the North Sea (from Delft Hydraulics, The Netherlands);
- Visualization of a world-wide current meter data inventory (from BODC, UK);
- Seaplot: a programme to plot stations and track, coastlines and other information;
- A series of programmes for data validation and presentation, including input and retrieval of ROSCOP forms (from ICES, Denmark);

- NOAAPC: a programme to demonstrate image enhancement techniques on a NOAA Remote Sensing image of the North Sea (from KNMI, The Netherlands);

- Remote Sensing Training Modules on diskettes (from UNESCO, Paris, MARINF/70 and /81);

- RNODCSOC: programme to plot oceanographic stations in polar projection (from CEADO, Argentina);

- MENSAJES: series of programmes to create and manage BATHY, TESAC and TRACKOB messages (from CEADO, Argentina);

- BT: example of a retrieval system for a BT data base (from CEADO, Argentina);

- MARIS Geographic Information Manager (demo), showing the capabilities of this programme as a GIS (= geographic information system) in the North Sea (from MARIS, The Netherlands).

Every participant provided for one of the programmes, an abbreviated description and a first-level manual. These have been compiled and distributed after the course.

4.2.3 Technical Excursion

In view of the growing importance of Remote Sensing data for marine science, this excursion led the participants to the Institute for Geography "Augustin Codazzi". Besides photogrammetry, this Institute has considerable experience in using Remote Sensing data from aircraft and satellites. A practical demonstration was given of various possibilities to process a satellite image, including: contrast enhancement, filtering and classification. In this context, some of the capabilities of the computer programme ILWIS (developed by ITC, Enschede, The Netherlands) were shown.

4.2.4 Case Study/Role Game

The Group was divided in two parts, representing Ministers on one side, and scientists in an hypothetical insular country of the Caribbean on the other hand. The Government had been offered the installation of a nuclear power plant on the island, this in view of the needs in energy of the country. Both groups were requested to give their viewpoint, based upon the different interests and backgrounds, as well as to present a final advice. Then, the two groups retreated for consultations during several hours. The final discussion took place in the "Sala de Juntas" of DIMAR; this discussion was very lively and involved most participants.

The "government" presented a wide-ranged plan for implementation of the power plant, encompassing a medium and long-term plan comprising various aspects of the society.The installation should start, not within the three months' time requested, but rather in six months, to allow initial investigations to be carried out, involving both scientists from the "multinational" offering the power plant, and the local scientific community.

The "scientists" presented a large number of arguments against the installation of the plant, based on possible environmental effects, to be studied more in detail, and on other alternatives, specifically under the form of solar energy.

The discussion on this item reflected the general difference between scientific and political approaches. It clearly illustrated the urgent need for adequate and timely "translation" of scientific viewpoints and findings into policy language.

5. COURSE EVALUATION

An evaluation was carried out by the end of the course. Firstly, there was a written evaluation, then it was followed by an evaluation session during the morning of the last day of the course.

5.1 BY PARTICIPANTS

All participants completed the evaluation form as included in this report as Annex III. The results were very positive. In connection with the positive judgement of the course, several additional suggestions were made for future courses. These have been included in the recommendations under item 7.

5.2 BY LECTURERS

The lecturers estimated this course as very positive. The administrative and technical infrastructure made available was ideal; an excellent support was provided by IOCARIBE and DIMAR, and the group of participants formed a constant source of inspiration and challenge for both.

6. GENERAL CONCLUSIONS

This course has been a great success. A large number of relevant subjects was presented, many of which accompanied by intensive practical exercises in a wide range of fields. The participants were very enthusiastic about the course and material presented.

The strong local support provided by IOCARIBE, DIMAR and the Colombian National Oceanographic Data Centre, have been instrumental for the positive outcome of the course.

The participants received a substantial training, a good part of which may immediately be applied to their working environment. However, a number of follow-up actions, supported by IOC, will be required initially to maintain the present momentum.

7. SPECIFIC RECOMMENDATIONS

7.1 REGIONAL FOLLOW-UP

7.1.1 National Oceanographic Data Centres

The position and performance of National Oceanographic Data Centres depends strongly on national and regional support. Therefore, a close link should be established with on-going and planned marine science and monitoring programmes, both on the national and regional levels. This would avoid double work in developing non-standard formats and procedures within these programmes, where the NODCs could serve providing and developing such formats and procedures, based on their experience and the standards and recommendations of IODE.

In this process, the IOCARIBE Secretariat could play an essential role, initially by diffusing regularly information and involving actively the NODCs already concerned in the planning stage of such programmes. This could also help improving co-ordination between the activities of various international and intergovernmental agencies in the region.

7.1.2 IOC Support

Several participants voiced their requirements regarding specific support from IOC, related to national data management problems (streamlining of present database systems) and to hardware (availability of microcomputers, modems and e.g. CD-ROM units to access ASFA/ASFIS NOAA CD-ROMs). A specification will be compiled by the IOCARIBE Secretariat and submitted to IOC for consideration as possible further action.

7.1.3 Meetings of Officers of NODCs

The participants agreed that the close interaction and exchange of experience and information gained during this course should not be lost. In addition, it was considered essential to review progress realized in every Centre, about one year after the course. It was therefore proposed to hold every year a meeting of Officers of the relevant Data Centres and other relevant people involved in the different marine science and monitoring programmes. Such a meeting would help establishing mutual relationships and realizing practical work on the development of data and information tools (systems, formats, procedures), in support of regional marine science and monitoring programmes. As a first step, it is recommended that IOCARIBE and IOC consider organizing and supporting such a regional meeting during 1992.

7.1.4 Electronic Mail

The participants agreed that electronic mail facilities, including SCIENCEnet, constitute an essential and urgent need for collaboration between NODCs in the Caribbean region. It was therefore recommended to dedicate a specific project aiming at: (i) investigating the present situation; (ii) listing the practical technical options for linking up with electronic mail in the various countries; (iii) proposing solutions regarding financial aspects; (iv) assisting different countries in implementing their electronic mail facilities.

7.1.5 Remote Sensing Data

The importance of remote sensing data for marine purposes is rapidly growing in the region. Close links should be established between NODCs and the regional centres receiving and processing satellite data. Information and data products, intended for the ocean science community, should be developed and implemented. In this context, the possible establishment of a NOAA tracking station for the region, as one of the recommendations adopted during the Course on Remote Sensing held in Caracas in September 1990, should be taken into account.

7.1.6 Individual Training

The participants expressed their need for more specific training opportunities for technical experts in managing GF3 on minicomputers and mainframes. This could be realized by IOC, as happened before, in the form of individual training.

7.2 FUTURE COURSES

Several participants indicated that a period longer than two weeks should be needed for such courses in the future. Some of them expressed that two days should be desirable for each programme package.

Some participants pointed out that all material, programmes, etc. should have been available in Spanish, including the videos shown.

The participants recommended that, regarding future courses, a brief software description and a first level manual (one or two pages A4) should be made available in the local language for each programme presented.

This kind of courses should always deal with the most up-dated programmes: consequently, EXEL, QPro, Windows and new computational programmes should be included in the future.

More attention should be given to exercise practical realization of specific databases for geological and biological data.

Several participants indicated their intention to organize follow-up meetings and courses at the national level, to disseminate the experience gained during the course.

A chronic shortage of equipment and personnel will in different centres, hamper the implementation of the knowledge acquired.

7.3 VARIOUS

The participants were provided with a copy of the present IOC Manual on the Establishment of a National Oceanographic Data Centre. However, this Manual is not up-to-date and it is recommended that a new version be published as soon as possible, to assist present and future NODCs in their establishment and operations.

ANNEX I

COURSE PROGRAMME AND TIMETABLE

21 October	**Location:**	**Auditorium**
08.00-09.00	Registration	
09.00-09.15	Official opening	
09.15-10.15	Introduction of participants and lecturers	
10.15-10.45	Break	
10.45-11.00	Introduction of the aims of the course (P.Geerders)	
11.00-12.30	Value of data and information management in relation with current activities in the Caribbean and the South-East Pacific (F.Robles)	
12.45-14.00	Lunch (location: DIMAR Cafetaria)	
14.00-14.30	IOC, activities and programmes (P.Geerders)	
14.30-15.00	IODE, aims and programmes (P.Geerders)	
15.00-15.30	Break	
15.30-17.00	IODE Slide Show (P.Geerders)	
22 October	**Location:**	**Planning Office**
09.00-09.30	Microcomputers (A.Rolla)	
09.30-10.15	Various archival systems (A.Rolla)	
10.15-10.45	Break	
10.45-11.00	dBase-III+ (A.Rolla)	
11.00-12.30	Lotus 1-2-3 (A.Rolla)	
12.30-14.00	Lunch (location: DIMAR Cafetaria)	
14.00-14.30	WordPerfect (A.Rolla)	
14.30-15.00	Various systems for data exchange, networks (A.Rolla)	
15.00-16.15	Practical work	
16.15-16.45	Break	
16.45-17.30	Practical work	
17.30-18.00	Travel DIMAR-Military Club	
23 October	**Location:**	**Planning Office**
08.30-09.00	Travel Military Club-DIMAR	
09.00-10.15	IODE specifics: NOP, MEDI, ROSCOP/CSR (P.Geerders)	
10.15-10.45	Break	
10.45-12.30	IODE specifics: GF3, GF3-Proc, GF3-PC, GF3-JGOFS (P.Geerders)	
12.45-14.00	Lunch (location: DIMAR Cafetaria)	
14.00-16.45	Practical work	
16.45-17.15	Break	
17.15-18.00	Practical work	
18.00-18.30	Travel DIMAR-Military Club	
24 October	**Location:**	**Planning Office**
08.30-09.00	Travel Military Club-DIMAR	
09.00-10.15	Data Quality Control (A.Rolla)	
10.15-10.45	Break	
10.45-12.30	Practical work	
12.45-14.00	Lunch (location: DIMAR Cafetaria)	
14.00-17.00	Technical Excursion	
17.00-17.30	Travel DIMAR-Military Club	

25 October: **Location:** **Planning Office**

08.30-09.00	Travel Military Club-DIMAR
09.00-10.15	National Oceanographic Data Centres: operation, activities, responsibilities, relations (P.Geerders)
10.15-10.45	Break
10.45-12.00	NODC's, regional activities (A.Rolla)
12.45-14.00	Lunch (location: DIMAR Cafetaria)
14.00-15.30	Case study (P.Geerders)
15.30-16.00	Break
16.00-17.00	Case study (P.Geerders)
17.00-17.30	Travel DIMAR-Military Club

26 October **Sightseeing trip.**

Trip through the colonial part of the city to admire the Capitol, the Cathedral, Bolivar Square and San Francisco Church. Visit to the Gold Museum and the Quinta de Bolivar. Visit to the Catedral de Sal.

27 October **Location:** **Planning Office**

08.30-09.00	Travel Military Club-DIMAR
09.00-10.15	Case study (P.Geerders)
10.15-10.45	Break
10.45-12.30	Case study (P.Geerders)
12.45-14.00	Lunch (location: DIMAR Cafetaria)
14.00-15.45	Practical work
15.45-16.15	Break
16.15-17.00	Practical work
17.00-17.30	Travel DIMAR-Military Club

28 October **Location:** **Planning Office**

08.30-09.00	Travel Military Club-DIMAR
09.00-09.30	Presentation on marine information systems (P.Geerders)
09.30-10.15	Relations with global bodies and their programmes such as WMO, UNEP, IMO, FAO (P.Geerders)
10.15-10.45	Break
10.45-12.30	Relations with global bodies and their programmes such as WMO, UNEP, IMO, FAO (cont. P.Geerders)
12.45-14.00	Lunch (location: DIMAR Cafetaria)
14.00-15.00	Remote Sensing data, general (P.Geerders)
15.00-15.45	Presentation of video on Remote Sensing
15.45-16.15	Break
16.15-17.00	Practical work with Remote Sensing data (P.Geerders)
17.00-17.30	Travel DIMAR-Military Club

29 October **Location:** **Planning Office**

08.30-09.00	Travel Military Club-DIMAR
09.00-10.15	Expert systems (P.Geerders)
10.15-10.45	Break
10.45-12.30	Examples and practical work (P.Geerders)
12.45-14.00	Lunch (location: DIMAR Cafetaria)
14.00-15.00	Electronic mail, presentation (P.Geerders)
15.00-15.45	Electronic mail, demonstration (P.Geerders)
15.45-16.15	Break
16.15-17.00	Practical work
17.00-17.30	Travel DIMAR-Military Club

30 October	**Location: Planning Office**
08.30-09.00	Travel Military Club-DIMAR
09.00-10.15	Practical work
10.15-10.45	Break
10.45-12.30	Practical work
12.45-14.00	Lunch (location: DIMAR Cafetaria)
14.00-15.45	Evaluation session
15.45-16.15	Break
16.15-17.00	Closing ceremony (coctail)
17.00-17.30	Travel DIMAR-Military Club

ANNEX II

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ANNEX III

QUESTIONNAIRE FOR COURSE EVALUATION BY TRAINEES

Note: The aim of this questionnaire is to collect general information related to the course and to improve future courses and related activities. Please mark the appropriate response and add your comments and suggestions.

1. How were the local arrangements?

   (1) Hotel

1	2	3	4	5

   (2) Training conditions including facilities and meeting rooms

1	2	3	4	5

   (3) Transport etc.

1	2	3	4	5

   Comments:

2. Were the objectives of the course clear?
   Were these achieved?

1	2	3	4	5

   Comments:

3. Were the presentations by the lecturers and the practical exercises adequate in view of the objectives?

1	2	3	4	5

   Comments:

4. What was in your opinion the level of the course:

advanced ☐ adequate ☐ too low ☐

Comments: (the activities undertaken satisfied your expectations)

5. Was the course useful for you?
Did you learn anything new?

1	2	3	4	5

Comments: (when affirmative, please indicate what ...)

6. Was the duration of the course adequate?

Too long ☐ Adequate ☐ Too short ☐

Comments:

7. Do you think it will be needed to alter the programme:

Yes ☐ No ☐

Comments: (when affirmative please indicate areas to be covered)

8. Did you participate in an earlier UNESCO or IOC course?

Yes ☐ No ☐

Comments: (when affirmative indicate which course(s))

9. In what way do you expect to be able to apply in your own situation the knowledge and experience gained during this course?

10. Do you have in your own situation the necessary equipment, trained personnel, publications, etc.? (When negative, what are the requirements of your institute/country?)

11. What is your opinion about the equipment used during the course?

(1) Hardware:

(2) Software:

12. Any other comment or suggestion related to the course including on the following subjects (use extra sheet if needed):

(1) Were all subjects of special interest to you?

(2) Did you have the opportunity to work in specific areas or obtain special assistance?

(3) What do you think IOC/UNESCO should do as a follow-up to this course in the region?

(4) Do you think other regions would benefit from a similar course?

(5) Other comments.

13. How do you qualify the course?

Bad	
Poor	
Average	
Good	
Very good	
Excellent	

REPUBLICA DE COLOMBIA

DIRECCION GENERAL MARITIMA

COMISION OCEANOGRAFICA INTERGUBERNAMENTAL

CERTIFICAN :

QUE EL SEÑOR (A)

PARTICIPO EN EL CURSO DE MICROCOMPUTADORES Y GESTION DE DATOS OCEANOGRAFICOS

REALIZADO EN SANTAFE DE BOGOTA, D.C., DEL 21 AL 30 DE OCTUBRE DE 1991

VALM MIGUEL G. RUAN TRUJILLO
Director General Marítimo

Dr. Fernando Robles
Secretario Subcomisión para el Caribe
y Regionales Adyacentes

ANNEX V

LIST OF COURSE MATERIALS AND INFORMATION DOCUMENTS

- UNESCO-MARINF/64 — Regional Workshop on Marine Science Micro-computer Database Development
- UNESCO-MARINF/70 — Some Marine Applications of Satellite and Airborne Remote Sensing, a Computer-based Learning Module
- UNESCO-MARINF/81 — Applications of Marine Image Data, Second Computer-based Learning Module
- The Data Book of ERS-1
- ERS-1 Brochure (ESA BR-36)
- IOC/TEMA-V/3 — Summary Report of the IOC Committee for Training, Education and Mutual Assistance in Marine Sciences, Fifth Session, Paris, 25 February - 1 March 1991
- IOC Manual, revised 1985
- List of IOC Member States
- FAO, Documento Técnico No. 295 — Aplicación de la tecnología de percepción remota a las pesquerías marinas: Manual introductorio
- MARIS Brochure — Geographic Information Manager
- IOC Manuals & Guides No. 17, Vol. 6 — Quick Reference Sheets for GF3 and GF3Proc, IOC
- IOC/IODE-XIII/3 — Summary Report of the IODE Thirteenth Session, New York, 17-24 January 1990
- Water Reports from Space — KNMI, The Netherlands
- SCIENCEnet Directory 1991 & related documents
- ICES Inventory of Oceanographic Investigations at North Atlantic Weather Stations, 1983
- Centro Argentino de Datos Oceanográficos, productos de datos oceanográficos, 1981
- IAPSO Publicación Científica 31 — SUN Report

- IOC/INF-830 — The Role of Electronic Mail for Mail Systems for Marine Science, P. Geerders, 1990
- IOC Manual, Part 1 — Marzo 1989
- CEADO Boletín Anual — 1984
- SC/MD/91 — Summary Report of the Fifteenth Session of the IOC Assembly, Paris, 4-19 July 1989
- Master file design (BT programme CEADO)
- MEDI Form, IOC
- IOC/INF-828 — Expert Consultation on OCEAN-PC, November 1990
- Procedimientos mínimos de control de calidad para los datos del IGOSS que hayan de transmitirse a través del SMT, CEADO
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ANNEX VI

LIST OF ACRONYMS

ASFA	Aquatic Sciences and Fisheries Abstracts
ASFIS	Aquatic Sciences and Fisheries Information System
BATHY	Code message on bathythermographic observations
BODC	British Oceanographic Data Centre
BT	Bathythermograph
CCO	Colombian Commission of Oceanography
CD-ROM	Optical read-only disk for archival of digital information
CEADO	Argentine National Oceanographic Data Centre
CECOLDO	Colombian National Oceanographic Data Centre
CSR	Cruise Summary Report
DIMAR	General Directorate of Maritime and Port Affairs (Colombia)
FAO	UN Food and Agriculture Organization
GF3	General Format version 3
GIS	Geographic Information System
ICES	International Council for the Exploration of the Seas
IMO	International Maritime Organisation
IOC	Intergovernmental Oceanographic Commission
IOCARIBE	IOC Sub-Commission for the Caribbean and Adjacent Regions
IODE	(IOC Committee on) International Oceanographic Data and Information Exchange
KNMI	Royal Netherlands Meteorological Institute
MARIS	Marine Information Service
MEDI	Marine Environmental Data Inventory
NOAA	National Oceanic and Atmospheric Administration
NODC	National Oceanographic Data Centre
NOP	National Oceanographic Programme
PC	Personal Computer
RNODC	Responsible National Oceanographic Data Centre
ROSCOP	Report on Observations and Samples Collected during Oceanographic Programmes
SOC	Southern Oceans
TESAC	Code message on temperature-salinity observations
TRACKOB	Report on along-track surface observations
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WMO	World Meteorological Organization