

Intergovernmental Oceanographic Commission
Training Course Report No. 63



Remedial Training Course in Marine Data Management for Cote d'Ivoire

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Abstract

First ODINAFRICA II Training Workshop in Marine Data Management was held in Casablanca, Morocco, April 2-13, 2001. Subsequent to the Casablanca workshop, the nation of Cote d'Ivoire has joined the ODINAFRICA program, and in order to bring the Ivorienne student up-to-date with the materials and training experience already provided in 2001, a special workshop has been held in Abidjan from March 21-29, 2002, hosted by the Centre des Recherches Oceanographiques (CRO). This report describes the content and accomplishments of that special workshop. The workshop programme was based on the IOC OceanTeacher capacity building tool - an extensive collation of documents on marine data, formats, software, program and data management procedures, manuals, protocols, and associated tutorials. A set of intersessional assignments was formulated that included a wide range of specific dataset measures and products that will be assigned regularly through the recently-established ODINAFRICA.net communication network.

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1. INTRODUCTION AND OBJECTIVES

The First ODINAFRICA II Training Workshop in Marine Data Management was held in Casablanca, Morocco, April 2-13, 2001, attended by students from ten western African nations and one eastern African nation. ODINAFRICA is a data and information project working towards establishing a lasting network of marine and aquatic institutes in Africa. Through its information services to the scientific community, the project aims at promoting the scientific capabilities of this continent. The objectives of the ODINAFRICA project are as follows:

- a) Provide marine scientists in Africa with the necessary bibliographic and scientific literature
- b) Make full use of the scientific literature available in Africa
- c) Promote and facilitate communication between marine scientists in Africa
- d) Promote and facilitate communication in Africa and other regions
- e) Promote the scientific activities of the marine and coastal scientists within and outside Africa
- f) Provide scientific information, and equipment, software and training to make full use of this information

Under the leadership of the IOC, and with funding generously provided by the government of Flanders, the workshop was designed to address the final objective listed above. A complete record of the Casablanca workshop, including a detailed description of the training materials, is given in IOC Training Workshop Report 60. Subsequent to the Casablanca workshop, the nation of Cote d'Ivoire has joined the ODINAFRICA program, and in order to bring the Ivorienne student up-to-date with the materials and training experience already provided in 2001, a special workshop has been held in Abidjan from March 21-29, 2002, hosted by the Centre des Recherches Oceanographiques (CRO). This report describes the content and accomplishments of that special workshop.

The marine data management training curriculum developed by the IOC's International Oceanographic Data and Information Exchange Program (IODE) is based on an extensive collation of international public documents on marine data, formats, software, program and data management procedures, manuals, protocols, and associated tutorials. The main collection, entitled the IODE Resource Kit, is a 600 megabyte CD-ROM that has been under development by the IOC training staff since 1997. It is currently accompanied by a smaller companion document (on the same CD-ROM) designed for teachers, called the IODE Resource Kit Training Manual. Both the Kit and the Manual were used for the Abidjan workshop.

2. PARTICIPANTS

Two students were designated by the host institution, the Center for Oceanographic Research, Abidjan. The list of participants and information about the lecturer are provided as [Annex II](#).

3. COURSE PROGRAMME

3.1 WORKSHOP OBJECTIVES

The ODINAFRICA II Marine Data Management training curriculum has been designed to provide participants with knowledge and skills in the following areas:

- Basic computer skills
- The importance of marine data in general, and particularly within participants' national and regional environments
- How to set up an oceanographic data center within the IODE System
- The infrastructure requirements, including hardware and software tools
- How to manipulate and analyze the principal types and formats of marine data

- How to produce ocean data products and to disseminate these products, both over the Internet and by traditional methods

3.2 WORKSHOP ABSTRACT

The following topics have been selected for coverage in the first year of the ongoing program. They are selected from the many possible topics by past experience in the predecessor ODINEA program, the former OceanPC program, and several informal workshops (Bulgaria, Albania, Thailand) co-sponsored by the IOC between 1996 and 1999.

- Basic computer skills
- The IOC/IODE System
 - What is it and what does it do?
 - What is included in "marine data & information?"
 - What is important about "marine data & information?"
- Introduction to the Use of the PC for Ocean Data & Information Management
 - What are the basic knowledge and skills needed by a marine data manager?
 - What are the computer tools we need to manage a marine data center?
- Basic Data Concepts
 - What are the formats we use for marine data?
 - How do we construct data files?
 - What are the special "tricks" a marine data manager must know?
- Data, Metadata & Information
 - Where do we get data?
 - What are the major data types we must work with?
 - What is metadata, and how do we use it?
 - What is the "best" metadata system for marine data?
 - How is "information management" related to "data management?"
- IODE Data Center Operations
 - What does a data center do, and what formalities guide this work?
 - How does a typical data center operate?
 - How do you start a new data center?
 - What are the scientific aspects of data center operations?
 - What are the business aspects of data center operations?
- Relational Database Management Systems
 - What is a relational database?
 - How and with what software do you manage relational databases?
 - How do you use relational database technology for marine data?
- Data Manipulation & Analysis
 - What are the software tools available for use with marine data?
 - What relationships exist between marine data formats and available software?
 - How can you integrate the various marine software programs with multiple data formats?
 - What are the "standard" analyses performed on marine data?
 - How is marine data quality controlled?
 - How are various marine and non-marine datasets (and their individual analytical products) synthesized?
- The Internet
 - What is it?
 - What system and software tools are necessary to make it work?
 - How are "web documents" created and managed?
 - How can I build my own website?
- Intersessional Goals

- What individual projects are expected of students during the 12-month period between formal training sessions?

The final program and timetable for the workshop are presented in Annex I.

3.3 WORKSHOP TECHNICAL OUTLINE

The technical outline of topics contained the Year 1 Manual was generally followed (see IOC Training Workshop Report 60 for the detailed list of topics), but due to time constraints and to prepare expeditiously for the upcoming Year 2 Workshop in Tunisia, the lesson outline was modified. This was done after extensive reading assignments had been covered by the ODINAFRICA student, prior to the workshop, and after an informal interview covering present skill levels with basic computer programs.

- **Intergovernmental Oceanographic Commission Resource Kit**
 - Kit structure and contents
 - International system of national and international databases (Kit Unit 1; covered in pre-workshop reading assignments)
 - Technology of database management on personal computers (Kit Unit 2; covered in pre-workshop reading assignments)
 - Management and analysis of marine data
 - Data formats
 - 22 major formats documented in the Kit
 - 300 other formats described in the Kit
 - Formats of primary importance: Excel spreadsheets, ODV spreadsheet, MEDI-Lite spreadsheet (for metadata), HDF (for gridded and satellite data)
 - Software
 - 45 programs provided free in the Kit
 - All are available locally to Center personal, from the Kit
 - Software of principal importance: Ocean Data View (ODV), Surfer; HDF Viewer
 - Available databases
 - Principal global archives described in the Kit
 - Principal global catalogs described Kit
 - Tutorials
 - 27 very detailed exercises for format conversions and standard data analyses
 - Step-by-step instructions for all processes
 - Data products
 - Set up a national data center
 - How to create data atlases
 - How to make standard data analyses with ODV
 - The Resource Kit as the basis for all IOC training
 - On the World-Wide Web at <http://www.oceanteacher.org>
 - On CD-ROM for local training
 - Copies available from Mme. Sery locally
 - **IOCEA Data CD (Central Eastern Atlantic)**
 - Special data product for western Africa; has been provided to all ODINAFRICA students
 - Approximately 1500 ocean data files (in standard formats)
 - Includes geographic mapping, biology and meteorology data
 - **Creation of the initial NODC for CI (CI-NODC)**
 - National boundaries, for Cote d'Ivoire marine data, were selected on the basis of land and Exclusive Economic Zone delineations:
 - E: 2°W

- W: 8.5° W
- N: 6° N
- S: 0°
- A canonical folder and file-name structure developed for the archiving, processing and analysis of marine data at the new Centre de Donnees Oceanographiques de Cote d'Ivoire (CNDO-CI)
- World Ocean Database data from the IOCEA data CD were extracted and loaded into the CNDO-CI archive
 - 6,646 stations
 - 453,182 samples
- Analysis products were produced, using the tutorials in the Kit
 - Station maps
 - Profiles
 - Sections
 - Scatter plots
 - Various configurations for ODV were established, selected from common graphical analyses deemed useful
- Preparations were made for the export of data, according to expected data requests from CRO scientists (client requests).
 - Simple spreadsheets
 - Compatible with Surfer
- **CI Data Archeology Project**
 - Set up process for capturing existing CRO report data into CNDO-CI spreadsheets
 - Successfully imported CNDO-CI station data into the new CNDO-CI data archive
 - Began quality-control of CNDO-CI data in the ODV software
- **CI National Marine Data Catalog**
 - Using the MEDI-Lite template, a CNDO-CI catalog was set up
 - Records have been entered
 - Includes filename links to datafiles in CNDO-CI
- **Activities with satellite data and other gridded data**
 - Explanation of and exercises with the HDF format (the principal satellite data format)
 - Workshop included instruction on conversion of HDF to ASCII format for use with Surfer
 - Conversion and extraction programs are available for all types of data

4. DEMONSTRATION

The workshop concluded with a demonstration of elements of the installed software and data products derived from the new CNDO-CI, hosted by Mr. Sankare Yacouba. In two sessions, needed to accommodate the large attendance, presentations were made entirely by the students, Mme. Sery and M. Bakayoko. The comments of the CRO Director, Mr. Jean-Baptiste Amon Kothias, contained in Annex III, were presented at this time.

5. RECOMMENDATIONS & ASSIGNMENTS

The Ivorienne student is prepared for participation in the Tunisian workshop. Although considerable time without the new computer equipment has passed -- presenting some practical difficulties with basic skills -- the very pragmatic activities accomplished during this special workshop (e.g. the CNDO-CI data archive, actual data entry, the CNDO-CI data catalog) are a great plus for Cote d'Ivoire.

The student has been requested to continue adding older datasets to the CRO archive, as well as metadata catalog items. She will also work with the ODV software during the interim period, which is strongly recommended.

ANNEX I

COURSE PROGRAM AND TIMETABLE

March 21	<p>Morning: Skills interview with student</p> <p>Afternoon: Review of Unit 1 and Unit 2 materials from the Resource Kit (IODE Data System; Computer Technology)</p>
March 22	<p>Morning: Continue Unit 2 materials presentations</p> <p>Afternoon: Data formats</p>
March 25	<p>Morning: Marine Software; install and demonstrate Ocean Data View</p> <p>Afternoon: Set up CNDO-CI data archive structure; extract relevant data from IOCEA Data CD; create ODV data collection for Cote d'Ivoire</p>
March 26	<p>Morning: Exercises with data subsetting; data export functions for client requests</p> <p>Afternoon: Creation of MEDI Lite national data catalog for Cote d'Ivoire; record entry</p>
March 27	<p>Morning: Digitizing old data records (from CRO archives) into ODV spreadsheets; importing data into the CNDO-CI archive; creating appropriate data catalog records for these new data files</p> <p>Afternoon: HDF data files; conversion of HDF to ASCII grids and subsequent processing to XYZ format for use with Surfer; gridding data in Surfer</p>
March 28	<p>Morning: Review of ODV functions; question-and-answer session covering all topics</p> <p>Afternoon: Preparation for demonstrations</p>
March 29	<p>Morning: Staff demonstrations</p>

ANNEX II

LIST OF PARTICIPANTS

I. TRAINEES

Mme. Sery Leocadie – ODINAFRICA Student
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M. Bakayoko Souleymane – CRO Observer
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II. RESOURCE PERSON

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ANNEX III

COMMENTS OF THE CENTER DIRECTOR

Allocution de Monsieur le Directeur du Centre de Recherches Océanologiques

- Monsieur Murray Brown,
- Chers collègues,
- Mesdames et messieurs,

En l'absence de Monsieur le Directeur du CRO (qui s'excuse car très pris par des problèmes administratifs de dernière minute), j'ai l'insigne honneur en son nom de vous présenter l'allocution de clôture.

Au moment où l'atelier de formation sur la gestion des données océanologiques va prendre fin, permettez-moi au nom de la Côte d'Ivoire, de vous adresser d'abord et avant tout, nos excuses pour n'avoir pu participer personnellement aux travaux compte tenu de nos obligations administratives.

Permettez moi aussi de vous adresser spécialement l'expression de notre profonde reconnaissance ainsi que nos vifs remerciements pour avoir accepté de venir en Côte d'Ivoire et de dispenser le cours sur la gestion des données océanologiques afin de nous permettre d'être au même niveau que les autres pays. Je vous en remercie.

Notre reconnaissance va à l'endroit de l'UNESCO-COI et de tous les pays membres du projet, qui malgré les moments difficiles que la Côte d'Ivoire a connu et qui a occasionné en partie une veille des activités du projet RECOSCIX-CEA, ont bien voulu nous retenir dans le nouveau projet ODINAFRICA. C'est un honneur qui est ainsi fait à la communauté ivoirienne et en particulier à la communauté scientifique du Centre de Recherches Océanologiques.

Je m'en voudrais de clore mes remerciements si je ne tournais mon regard vers le bailleurs de fonds, le Gouvernement de Flandres. Gouvernement qui à travers les actions de l'UNESCO-COI ne cessent de soutenir financièrement. C'est pourquoi j'adresse mes vifs remerciements au Gouvernement de Flandres.

Monsieur Murray Brown, la formation que vous avez donné a porté sur les outils du kit de la COI, les données IOCEA, l'initiation de la création du Centre National de gestion des données marines, l'archivage et le catalogage les données marines et enfin l'exploitation des données satellitaires. En d'autres termes, l'utilisation des nouveaux outils de l'information et de la communication dans la gestion des données océanologiques. Toute chose qui est d'une importance capitale pour le CRO.

Vu l'engouement que mes collègues accordent à la démonstration, je suis personnellement confiant dans l'avenir et souhaite vivement que les outils soient utilisés à bon escient et ne soient pas seulement limités au CRO. Aussi, j'invite tout le personnel du Centre à un séminaire de formation sur ces nouveaux outils dans un avenir très proche, car la présente formation ne représente que le premier module sur quatre.

Tout en espérant que vous avez eu un séjour agréable en Côte d'Ivoire, je vous souhaite bon retour en Louisiane et rendez-vous est pris pour la Tunisie pour le deuxième module.

Je vous remercie

Mr. Jean-Baptiste Amon Kothias, Director CRO
(by his representative, Mr. Nestor N'Goran Ya)