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ODINAFRICA II Training Course in Marine Data Management for Mozambique

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Abstract

The ODINAFRICA-II Training Course in Marine Data Management was held in Maputo, Mozambique between 11 and 22 August 2003, and was organised by the Instituto Nacional de Hidrografia e Navegação (INAHINA). The workshop was attended by 10 students from marine institutions in Mozambique. Lectures were provided by invited resource persons from the USA and the IOC. 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.

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1. INTRODUCTION AND OBJECTIVES

The ODINAFRICA-II Training Workshop in Marine Data Management for Mozambique was held in Maputo, Mozambique from 11-22 August 2003 and hosted by the Instituto Nacional de Hidrografia e Navegacao (INAHINA). The workshop was attended by ten students from marine institutions in Mozambique. ODINAFRICA is a data and information project working towards establishing a lasting network of marine and aquatic data and information centres 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:

1. Provide assistance in the development and operation of National Oceanographic Data (and Information) Centres and establish their networking in Africa;
2. Provide training opportunities in marine data and information management applying standard formats and methodologies as defined by the IODE;
3. Assist in the development and maintenance of national, regional and Pan-Africa marine metadata, information and data holding databases;
4. Assist in the development and dissemination of marine and coastal data and information products responding to the needs of a wide variety of user groups using national and regional networks.

Under the leadership of the IOC, and with funding provided by the government of Flanders, the workshop was designed to address the final objective listed above. A complete record of the previous workshops, including detailed descriptions of the training materials, is given in IOC Training Course Reports 60 (Casablanca) and 64 (Tunis).

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 that forms part of the IODE Ocean Teacher product. The main collection, entitled the IODE Resource Kit, is a 650 megabyte CD-ROM that has been under development by the IODE training staff since 1997. The Ocean Data Management Training Manual, a smaller companion documents designed for instructors, accompanies the Resource Kit for Data Management.

2. PARTICIPANTS

Ten students from marine institutions in Mozambique attended the training workshop. Invited data managers from United States of America and the IOC provided lectures. The list of participants is 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 centre within the IODE System
- 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 topics for the workshop have been selected for coverage in the first year of an ongoing programme. These include:

- Introductory Materials
 - What is this particular course going to cover?
 - Who are the participants, and what do they do?
 - What are the instructional materials and how do they work?
 - The schedule and housekeeping information specific to an individual workshop.
- 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 centre?
- 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 Centre Operations
 - What does a data centre do, and what formalities guide this work?
 - How does a typical data centre operate?
 - How do you start a new data centre?
 - What are the scientific aspects of data centre operations?
 - What are the business aspects of data centre operations? 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?

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

3.3 WORKSHOP TECHNICAL OUTLINE

The following is the outline for Course 1 of the OceanTeacher Data Management Training Manual which is used for the first workshop in the ODINAFRICA II cycle of training. All of the following topics were covered in lectures and practicals, using basic reference materials contained in the IODE OceanTeacher.

Topic	Goal(s)	Content
The IOC-IODE System	<ul style="list-style-type: none"> • To provide an overview of international programs in marine data and information management • To provide an introduction to the types of data they maintain. 	<ul style="list-style-type: none"> • Overview <ul style="list-style-type: none"> ○ NODCs - National Oceanographic Data Centres ○ DNAs - Designated National Agencies ○ RNODCs - Responsible National Oceanographic Data Centres ○ Intergovernmental Oceanographic Commission's (IOC) Committee on IODE <ul style="list-style-type: none"> ○ Role of an NODC • WDCs - World Data Centres • Marine Data <ul style="list-style-type: none"> ○ What we measure and how we do it ○ Regional Survey: What data do you have?
Introduction to the use of PCs	<ul style="list-style-type: none"> • To introduce the data manager to computer systems, tools and practices necessary to operate a modern ocean data centre 	<ul style="list-style-type: none"> • Skills Assessment • Computer Hardware • Operating Systems • Software: Editors • Software: Browsers • Software: Spreadsheets • Software: Compression • Computer Networks • Computer Maintenance
Basic Data Concepts	<ul style="list-style-type: none"> • To familiarize students with the various types of data commonly found in marine science, and about some of the peculiarities of earth science data. 	<ul style="list-style-type: none"> • Data Formats • Special Topics <ul style="list-style-type: none"> ○ Parameters ○ Units ○ Code Tables ○ Geographic Coordinates ○ Map Projections ○ Global Sectors
Data, Metadata and Information	<ul style="list-style-type: none"> • To familiarize the students with the three major divisions in ocean resource materials: Data, Metadata, Information • To show how a small number of important formats are used most commonly to store and manipulate these resources 	<ul style="list-style-type: none"> • Global Sources of Data <ul style="list-style-type: none"> ○ Major Publishers ○ Major Publications ○ Major Formats ○ Data Media • Metadata <ul style="list-style-type: none"> ○ Overview and Importance ○ Cruise Summary Reports ○ Review of Standards and Systems ○ Introduction to Marine Environmental Data Inventory (MEDI) <ul style="list-style-type: none"> ○ MEDI Tutorial • Marine Information Management

Data Centre Operations	<ul style="list-style-type: none"> To acquaint the student with the administrative and programmatic requirements for establishing an NODC 	<ul style="list-style-type: none"> Data Management Policies & Procedures NODC Examples <ul style="list-style-type: none"> An Established NODC A New NODC - African Case Study Business Plans
Data Manipulation and Analysis	<ul style="list-style-type: none"> To demonstrate how to create a National Data Collection To describe a broad suite of data quality-control and analysis procedures for marine data 	<ul style="list-style-type: none"> Software: Analysis Tools The Formats Problem National Area of Interest (AOI) National Data Collection Adding Other Data Analysis & Quality Control Data Products Gridding & Contouring Using NetCDF Data
The Internet	<ul style="list-style-type: none"> To acquaint students with World Wide Web 	<ul style="list-style-type: none"> Technical Overview Markup Languages

4. RECOMMENDATIONS

The workshop included participants from four different institutions in Mozambique. This mix of professionals from different backgrounds (meteorology, fisheries and oceanography) provided a successful forum where the national data management issues were discussed and the participants were able to recognize the value of developing a strong national data centre.

It was agreed that some participants would benefit from supplementary training in basic keyboard skills, Windows commands and Excel spreadsheets. This would assist in providing the skills required to develop a national data collection.

All participants agreed that a follow-up to this course would be beneficial. This follow-up could take the form of an additional course in data management as provided in the Ocean Teacher Training Manual for Data Management (Course 2).

Students were reminded that the IODE Ocean Teacher was a dynamic product and the latest version should always be consulted at <http://OceanTeacher.org>.

ANNEX I

COURSE PROGRAM AND TIMETABLE

Day	Topic	Content	Description
1	Opening ceremony Preliminaries The IOC / IODE System Introduction to the use of PCs for Ocean Data Management	Welcome address Overview and Course Objectives Participant Introduction Introduction to OceanTeacher ODINAFRICA Project Overview of IODE World Data Centres Marine Data Skills Assessment Computer hardware Operating systems	IODE Resource Kit and Training Manual Overview of the ODINAFRICA Project The IODE System Description of NODCs, DNAs, RNODCs The IOC Committee on IODE The Role of an NODC Description of the World Data Centre System Introduction to Datasets Oceanography Primer National Survey All participants to complete questionnaire Overview of basic hardware components Overview of Windows
2	Data Concepts	Software – editors Software – browsers Software – spreadsheets Computer Networks Computer Maintenance Data Formats	ASCII editors tutorial and exercise Introduction to web browsers Creating ODV files in Excel Types of networks, Network components Backups, compressing files, viruses Major format types
3	Data, Metadata and Information	Global sources of data Metadata	Special Topics (parameters, units, code tables, etc) Overview of major publishers of data Media types for data distribution On-line data servers Major format types Overview and importance of metadata Review of metadata standards and systems
4	Data Centre Operations	Marine Information Management Data Management Policies and Procedures NODC Examples Business Plans	MEDI – introduction and software installation MEDI – data entry exercise Introduction to MIM Science Plans, Implementation Plans, DM Policies A long established NODC, a newly established NODC Examples of Business Plans
5	Data Manipulation and Analysis	Software: Analysis Tools Data Formats The Roadmap Tutorials	Software description and installation (including ODV) Format conversion, compatibility matrix Tutorial C. Area of Interest
6			Tutorial D. Ceate Data Collections Tutorial H. Add Other Data

7			Tutorial I. Analysis and Quality Control Tutorial J. Data Products
8			Tutorial K. Grid and Contour with Surfer Tutorial R. Using NetCDF Data
9	The Internet	Technical Overview Internet Service Providers Email Outlook Express Markup Languages	The Internet, WWW Dial-up connections, connect to the internet Email etiquette Set up an account Introduction to HTML
10	Course wrap-up	National Data Catalogues IODE Resource Kit Review of Intersessional Goals	Review of MEDI Review of Resource Kit Content

ANNEX II

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ANNEX III

GROUP PHOTOGRAPH

