First ODINAFRICA-III Training Course in Marine Data Management

Supported by the IOC and the Government of Flanders

Ostend, Belgium
April 11 – 29, 2005
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1. INTRODUCTION AND OBJECTIVES

The First ODINAFRICA III Training Workshop in Marine Data Management was held in Ostend, Belgium, April 11-29, 2005 and was attended by students from eleven African nations, representing the IOCINCWIO (Western Indian Ocean) and IOCEA (Central Eastern Atlantic) regions of the IOC. ODINAFRICA is a data and information project working towards establishing a lasting network of marine and aquatic institutes in Africa. Its headquarters is located at the central United National Environmental Program offices in Nairobi, Kenya. 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. The workshop was organized locally by Dr. Vladimir Vladymyrov of the IOC Project Office for IODE in Ostend.

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 resource, entitled OceanTeacher, is a 1.5 gigabyte Digital Library of primary documents -- accompanied by various thematic Course Manuals -- that has been under development by the IOC training staff since 1997 (see outline in Annex III). OceanTeacher is the principal training resource used during data management courses, currently available on the World Wide Web and soon to be published on DVD (digital versatile disk).

2. PARTICIPANTS

Participants included five countries which have already been involved in previous ODINAFRICA training workshops (Cameroon, Cote d’Ivoire, Guinea, Morocco and Seychelles) and six countries new to the program (Algeria, Angola, Congo, Egypt, Gabon and Namibia). The first group of
countries included those where previous students have moved on to other positions, or where remedial training had been recommended. Invited data managers from Australia, Belgium, France, the United States of America, and the IOC provided lectures. The list of participants and lecturers is provided as Annex II.

3. COURSE PROGRAMME

3.1 LECTURES AND PRACTICALS

3.1.1 Workshop Objectives

The ODINAFRICA III 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

This first workshop in the new cycle of ODINAFRICA training had been designed to cover materials formerly covered in two sequential years of work in previous cycles. It included all of the more complex topics — especially in the area of data and data-product synthesis. Particular emphasis is now placed on obtaining data directly from Internet website sources, rather than the previous heavy reliance on specially prepared CD-ROMs.

3.1.2 Workshop Technical Outline

The following is the outline of the relevant Course Manuals prepared and selected for use in this workshop. [ID = Interdisciplinary; DM = Data Management] All of the following topics were covered in lectures and practical exercises, using basic reference materials contained in the IODE OceanTeacher Digital Library (outlined in Annex III).
### ID 100: Introduction to OceanTeacher

<table>
<thead>
<tr>
<th>GOALS</th>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>To provide orientation to new students, on the structure and contents of OceanTeacher</td>
<td>Digital Library</td>
</tr>
<tr>
<td>To provide instructions on the use of the Course Manuals to access topical information in the Digital Library</td>
<td>Software</td>
</tr>
<tr>
<td></td>
<td>Data &amp; Information Exercise</td>
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<td></td>
<td>Course Manuals</td>
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</table>

### ID 101: Computer Basics

<table>
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<tr>
<th>GOAL</th>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>To introduce the data manager to computer systems, tools and practices necessary to operate a modern ocean data center</td>
<td>Skills Assessment</td>
</tr>
<tr>
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<td>Computer Hardware</td>
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<td>Operating Systems</td>
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<td>Software: Introduction</td>
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<td>Software: Editors</td>
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<td>Software: Browsers</td>
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<td>Software: Spreadsheets</td>
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<td>Software: Databases</td>
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<td>Software: Compression</td>
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<td>Computer Media</td>
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### ID 102: Internet Basics

<table>
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<tr>
<th>GOALS</th>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>To describe the functional components of the Internet/World Wide Web and the protocols and software that make it work</td>
<td>Internet Overview</td>
</tr>
<tr>
<td>To acquaint students methods to obtain ocean data and information on the Internet</td>
<td>General &amp; Introductory</td>
</tr>
<tr>
<td></td>
<td>World Wide Web</td>
</tr>
<tr>
<td></td>
<td>Internet Service Providers</td>
</tr>
<tr>
<td></td>
<td>Email</td>
</tr>
</tbody>
</table>
Outlook Express
FTP
Markup Languages
Websites
Information Seeking
Client-Server Concepts
Selected Information Product Websites
Selected Data Product & Analysis Websites
Downloading Data

ID 103: Information, Data and Metadata

GOAL  To introduce students to fundamental "bridging" concepts and current
activities between oceanographic information management and data
management

CONTENTS  Information Availability & Access
Data Availability & Access
Metadata
Information Centers
Data Centers
World Data Center System
IODE Data Center System
DNAs, NODCs and RNODCs
Other Ocean Data Centers
Information Catalogs
Data Catalogs
OPTION: MEDI Cataloging
Prerequisite: DM 101 or equivalent experience
Information & Communication Programs & Organizations

ID 104: Introduction to Oceanography

GOAL  To provide students with an overview of the ocean sciences today

CONTENTS  Background
Major Oceanographic Disciples
Research Oceanography
Survey Oceanography
Operational Oceanography
DM 102: Ocean Data Collection Management

| GOALS | To show students how to create a National Data Collection, using the World Ocean Database 2001, other published or unpublished data sources, and near real-time operational data
To demonstrate some basic data analysis functions in popular ocean software programs |
| CONTENTS | Area of Interest |
| | Creation of Data Collections |
| | Basic Data Analysis |
| | Collection Housekeeping |
| | Exporting ODV Products |
| | Adding Other Data |
| | Special Purpose Collections |
| | Methods for Operational Data |

DM 103 Ocean Data Products & Synthesis

| GOALS | To demonstrate a broad suite of basic analysis methods for ocean data (including remote sensing data) using popular software systems 
To demonstrate basic methods for combining data products in Geographic Information Systems (GIS) |
| CONTENTS | Gridding & Contouring with Surfer |
| | Surfer Vector Charts |
| | Managing HDF Files |
| | Bathymetry and Topography Products |
| | Managing Image Files |
| | Synthesis in GIS |

3.1.3 Invited Presentations

Several special invited presentations were interspersed throughout the regular schedule of lessons, provided by these resource persons (listed in Annex II).

- Ms. Linda Pikula: Introduction to Marine Information Management
• Mr. Loic Petit de Villeon: CORIOLIS Data Center Quality Control Procedures and ARGO Data
• Mr. Vladimir Vladymyrov: The IOC and the IODE
• Dr. Edward Vanden Berghe: Introduction to Biological Diversity Data Concepts
• Dr. Hassan El Ouizgani: Practical Aspects of NODC Website Publication
• Dr. Malika Bel Hassen-Abid: Overview of the IODE MEDI Software

3.1.4 Special Materials

The workshop attendees were provided with the following special training materials, provided by the indicated sources:


3.2 RESULTS AND RECOMMENDATIONS

The workshop schedule was successfully accomplished, including a number of special invited lectures on topics of interest. The students exhibited a wide range of individual skills, a situation that has been noted previously in all ODINAFRICA workshops. The most serious deficiencies include inexperience with the Windows operating system for personal computers, a matter of serious concern to the IODE OceanTeacher program, and relatively poor knowledge of marine science shown by some students from allied disciples. The time lost to assistance with operating system problems is considerable, when these problems are known. Unfortunately it is not possible always to identify these problems within the workshop setting, and situations that should have been addressed immediately (thereby also losing time) might have gone unnoticed. The OceanTeacher training curriculum practitioners (i.e. the IODE trainers) remain strongly concerned with the under-preparation shown by some participating students, a situation which we do not feel is still explainable by cultural or national economic milieu.

As with previous workshop cycles, students will be presented with sequential projects to complete over the next year, and these will be publicized by a special website. IODE and ODINAFRICA national coordinators will be kept informed of individual progress.
### ANNEX I

#### COURSE PROGRAM AND TIMETABLE

<table>
<thead>
<tr>
<th>Course</th>
<th>Lesson Title</th>
<th>Lecturer(s)</th>
<th>Duration (hrs)</th>
<th>Date</th>
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<td>Introduction to Ocean</td>
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<td>Brown</td>
<td>1/2</td>
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<td>1/2</td>
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<td>1/2</td>
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<td>1/2</td>
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<td>1/2</td>
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3. Temperature & Salinity Scales | Brown | 1/2 | 18
4. Standard Depths | Reed | 1/2 | 18
5. Collecting Data | Reed | 1 | 18
6. Data Format Types | Brown | 1 | 18
7. Oceanographic Data Formats | Brown | 1 | 18
7.A. Code Tables | Reed | 1/2 | 19
7.B. Geography: Location | Brown | 1 | 19
7.C. Geography: Charts | Reed | 1/2 | 19
7.D. Date & Time | Brown | 1 | 19
7.E. Quality Flags | Brown | 1/2 | 19

**DM 102: Data Collection Management**

1. Area of Interest | Brown/Reed | 6 | 20
2. Creation of Data Collections | Brown/Reed | 4 | 21
3. Basic Data Analyses | Brown/Reed | 4 | 21
4. Collection Housekeeping | Brown/Reed | 1 | 22
5. Exporting ODV Products | Brown/Reed | 6 | 22
6. Adding Other Data | Brown/Reed | 5 | 22
7. Special Purpose Collections | Brown/Reed | 1 | 25
10. Methods for Argo Data | Brown/Reed | 3 | 25

**DM 103: Data Products & Synthesis**

1. Gridding & Contouring with Surfer | Brown/Reed | 6 | 25
2. Surfer Vector Charts | Brown | 3 | 26
4. Bath/Topo Products | Brown | 2 | 26
5. Managing Images | Brown | 3 | 27
7. GIS Synthesis | Brown | 6 | 27
OPTIONS and make-up work | Brown | ? | 28

**Final Activities and Workshop Close**

N/A | Brown | 1 | 29
ANNEX II

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ANNEX III

IODE OceanTeacher Digital Library
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3. Quality Control Strategies
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   1. Planning Documents
   2. Data Management Policies & Guidelines
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   4. Taxonomic Complexities of Biological Data
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   6. Working with Meteorological Data
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   2. Modeling Ecosystem Processes
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2. Information Exercises

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ANNEX IV

Acronym list

- ODINAFRICA  Ocean Data and Information Network for Africa
- IOC  Intergovernmental Oceanographic Commission (of UNESCO)
- IOCINCWIO  IOC Committee for the Cooperative Investigation In the North and Central Western Indian Ocean
- IOCEA  IOC regional Committee for the Central Eastern Atlantic
- DNA  Designated National Agency
- NODC  National Oceanographic Data Center
- RNODC  Responsible National Oceanographic Data Centre
- MEDI  Marine Environmental Data Index
- DM  Data managers
- IODE  International Oceanographic Data and Information Exchange Program
- ODV  Ocean Data View
- HDF  Hierarchical Data Format
- GEBCO  General Bathymetric Chart of the Oceans