

Intergovernmental Oceanographic Commission
Training Course Report No. 64



Second ODINAFRICA-II Training Course in Marine Data Management

Supported by the IOC and the Government of Flanders

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Abstract

The Second ODINAFRICA Training Course in Marine Data Management was held in Tunis, Tunisia between 29 April and 10 May 2002, and was organised by the Institut National des Sciences et Technologies de la Mer (INSTM). It was held simultaneously with the ODINAFRICA II Marine Information Management Training Course, and the last session of both workshops was a joint activity to foster coordination between the groups. The workshop was attended by students from 18 countries of the IOCINCWIO and IOCEA Regions. Lectures were provided by invited resource persons from the United States of America 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. 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 Second ODINAFRICA II Training Workshop in Marine Data Management was held in Tunis, Tunisia, April 29-May 10, 2002, attended by students from sixteen 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 Kenya Marine and Fisheries Research Institute (KMFRI) in Mombasa, 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 organised locally in Tunis by Dr. Malika Belhassen of the Institut National des Sciences et Technologies de la Mer (INSTM). It was held simultaneously with the ODINAFRICA II Marine Information Management Training Course, and the last session of both workshops was a joint activity to foster coordination between the groups.

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 (see outline in [Annex VII](#)). It is currently accompanied by a smaller companion document (on the same CD-ROM) designed for teachers, called the IODE Resource Kit Training Manual. The Manual, provided as annual incremental volumes, has just been augmented by the publication of the Year Two unit. The dual-volume CD-ROM is the principal training resource used during data management courses, and it is currently also available on the World Wide Web at the main IOC website.

2. PARTICIPANTS

Participants attended the course from most of the nations participating in the IOCINCWIO and IOCEA components of the ODINAFRICA II Program, constituting the first joint session of both student groups. IOCINCWIO students have completed a curriculum of studies during the period 1997-2000, while the IOCEA students have begun in 2001. [Cote d'Ivoire, which joined the IOCEA group only in 2002, has benefited from a special Remedial Workshop in April 2002, to cover material already presented in the 2001 workshop.] Lectures were provided by invited data managers from Australia and the United States of America, and the IOC. The list of participants and lecturers is provided as [Annex II](#).

3. COURSE PROGRAMME

3.1 OPENING CEREMONY

Professor Amor El-Abed, Director of the INSTM officially opened the workshop. The text of his welcoming remarks is contained in [Annex III](#).

3.2 NATIONAL SUMMARIES OF CURRENT STATUS

Workshop participants were requested to provide brief, information descriptions of the current status of ocean data management in their countries and/or their progress in establishing National Oceanographic Data Centers. These responses are provided in [Annex IV](#).

3.3 LECTURES AND PRACTICALS

3.3.1 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

The second year workshop is designed partially to re-enforce materials already presented in the first year, and to introduce more complex topics – especially in the area of data and data-product synthesis. Particular emphasis has been placed on the use of the data files provided to the students in two companion CDs: IOCINCWIO Marine Data Collection and IOCEA Marine Data Collection.

3.3.2 Workshop Technical Outline

The following is the outline of the Teachers' Manual prepared for this second 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 Resource Kit (outlined in [Annex VII](#)).

- Ocean Data View (ODV) Spreadsheets
 - Basic ODV Spreadsheet Format
 - Entering Data on an ODV Spreadsheet
 - Merging Data from Different Sources
- National Hydrography Dataset
 - World Ocean Database and eWOCE Global Datasets
 - Assembling Data Blocks and Types
 - Creating the ODV Collection
 - Exporting the Data Subset
- National Hydrography CD
 - Contents
 - Organization
 - HTML Interface
 - CD Production
 - Distribution and Support
- Data Management in ODV
 - Description of ODV
 - Schematic Diagram for Ocean Station Data and Software
 - Data Quality Control with ODV
 - Data Subsetting with ODV
- Hierarchical Data Format (HDF) Methods
 - What is HDF?

- Making HDF Files
- Extracting Grids from HDF Files
- SURFER Data Products
 - Basic Concepts
 - Blanking
 - Product Export
 - Tutorials (with SURFER)
- Using Images in Geographical Information Systems (GIS)
 - Information about Map Projections
 - GeoTIFF Documentation
 - Integration Schematic for Spatial Analysis Data Domain
 - Converter Programs (for formats)
 - GeoTIFF Examiner Software
 - Using Satellite Images in a GIS Synthesis
- Image and Data Synthesis in GIS
 - How to Make a Data Atlas
 - Synthesis of Data in a GIS Program
- National Data Catalogs
 - Present Collection of National Data Catalogs (IOCEA only)
 - DIF (metadata format description)
 - Global Change Master Directory
 - MEDI (metadata format description and software)
- ODINAFRICA Group Proposals
 - Guide for Writing a Funding Proposal
- Document and Spreadsheet Style Issues
 - Using Stylesheets in MS Word

4. STUDENT PROGRESS EVALUATION

It has not been made entirely clear through other means how thoroughly the data management skills taught in ODINAFRICA have been absorbed by the students, nor did evidence available to the IOC instructors indicate whether national data collections have/had been created during the intersessional periods. To evaluate the current level of proficiency of all students, a list of basic data manipulation skills was drawn up (see below), and an examination was designed (in English and French; see [Annex V](#)) to measure these skills directly. This examination was administered on the penultimate day of the workshop, with very satisfying results.

Basic Skill Levels the Students Should Demonstrate after Year 2

1. Create a new ODV collection, and fill it with data from WOD98 and eWOCE
 - a. Use WOD98 variables for structure
 - b. Import WOD98 data as WOD98 data
 - c. Import eWOCE data as ODV spreadsheet
2. Manipulate and examine the data in the collection
 - a. Create a TS scatter plot
 - b. Create Sections
3. Put other data into ODV spreadsheets, and add them to the ODV collection
 - a. For example the Princess Muriel example data set
4. Creating and exporting (subsetting) special data products for clients
 - a. ODV spreadsheets (TXT)
 - b. Do not confuse source (national collection) with product

5. Zip/EXE files
 - a. Where to unzip?
6. Extracting gridded data from HDF archives
 - a. HDF--->ASCII Grid (HAIF)
 - b. HAIF--->XYZ
7. Conversions needed before re-gridding the data in Surfer
 - a. Longitude problem
 - b. Converting color values to data values
8. Grid and contour data in SURFER
 - a. GRID>DATA
 - b. MAP>CONTOUR MAP

The examination results, tabulated below, indicate that the greater experience of the IOCINCWIO students has resulted in a substantially higher average score (30 points of a total 100 points). However, the top six examination papers (all receiving perfect examination scores) include an equal number of IOCEA and IOCINCWIO students. One of the perfect scores was obtained by a new IOCEA student who had not attended the 2001 workshop, and who spoke very little English. The very good 94 score was obtained by the IOCEA Remedial Workshop student who had covered the Year 1 material less than one month previously. From a very subjective standpoint, the instructors consider the scores in the 70s to be “low-acceptable” although certainly not yet at desirable skill levels.

Student (identified by IOC Region only)	Score
IOCINCWIO	110
IOCINCWIO	110
IOCEA	110
IOCINCWIO	110
IOCEA	110
IOCEA	110
IOCINCWIO	109
IOCEA	95
IOCEA	94
IOCINCWIO	90
IOCEA	77
IOCEA	72
IOCINCWIO	72
IOCEA	72
IOCEA	60
IOCEA	46
IOCEA	0
IOCEA	0
Average (all)	80.4
Average IOCINCWIO	100.2
Average IOCEA	70.5

The instructors are convinced, based on classroom experience over a two-year period with the IOCEA students that the known language difficulties contribute only moderately to the three or four extremely low scores shown above. A major other factor is the very low proficiency level in basic computer skills initially shown by these same students, which has only slightly ameliorated since their receipt of ODINAFRICA computers. One of the 0 scores was obtained by an entirely new student who does not speak English. The original course requirements that students must (a) be proficient in English,

and (b) be of intermediate proficiency with modern computers, were not fully met in a few cases, and this continues to be a grave problem for the individuals involved.

5. RECOMMENDATIONS & ASSIGNMENTS

It is now quite clear that further progress in the ODINAFRICA group must be directed by the administration of specific goals and objectives that can be quantified, both in terms of quantity of databases and data products and in terms of professional quality. In the 5 years since the beginning of the predecessor ODINEA program, all students have been assumed to be working independently toward the establishment of discrete national data collections (derived from materials presented during the classes and from databases obtained locally), and to be developing national data product capabilities. Although specific individual skill levels appear to be progressing, the IOC training staff does not find convincing evidence that sufficient progress has been made with regard to these aims. Toward insuring that substantial national progress can be made in these areas, the training program will now enlarge to include a wide range of specific dataset measures and products that will be assigned regularly through the recently-established ODINAFRICA.net communication network. Among these measures will be regular reporting of ocean station and sample totals (from the individual data centers), sample data products and analysis products, images of synthesized data products, and narrative reports. These matters are summarised in Annex VII.

ANNEX I

COURSE PROGRAM AND TIMETABLE

DAY	RESOURCE*	SUBJECT	COMMENTS	INSTRUCTOR
Monday	Official Workshop Opening Activity			
Monday	Individual progress reports (10 minutes each)			
Tuesday	Yr. 1 Manual, The Internet, Internet Service Providers	Internet Service Provider Setup (Year 1 Manual)	Setting up ISP with Control Panel function; going on-line	Reed/Brown
Tuesday	Yr. 1 Manual, The Internet, Outlook Express	Outlook Express General Setup (Year 1 Manual)	Identities; name registration; signatures; reply techniques;	Brown
Tuesday	Yr. 1 Manual, The Internet, Outlook Express	Outlook Express Account Setup (Year 1 Manual)	How to set up individual email accounts	Brown
Tuesday	Yr. 1 Manual, The Internet, EMail	Outlook Express Contacts and Mail Groups (Year 1 Manual)	Adding/editing contacts; making groups; using group addresses; relation to OA mailing list addresses	Brown
Tuesday	Yr. 1 Manual, Use of PCs, Software: Compression	Zippping and Unzipping Files (Year 1 Manual)	Use of Winzip; making EXE files	Brown
Wednesday	Yr. 1 Manual, Use of PCs, Computer Maintenance, Computer Viruses, Antivirus Software	Using & Updating Norton Antivirus (Year 1 Manual)	How to update the virus definition files over the Internet	Reed
Wednesday	Yr. 1 Manual, Data Concepts, Special Topics, Parameters and Units	Fundamentals of Marine Data (Year 1 Manual)	Longitude; latitude; dates; time; parameters; units of measurement	Brown
Wednesday	Yr. 2 Manual	Ocean Data View Spreadsheets	ODV spreadsheet design; data entry from old hard copy; QC by sorting & simple statistics;	Brown
Wednesday & Thursday	Yr. 2 Manual	National Hydrography Dataset	Compile data from WOD98 (WOD02?) for country; import to ODV; create national subset; add spreadsheet data	Brown
Friday	Yr. 2 Manual	National Hydrography Dataset CD	How to make a CD; if html editor is available, includes editing a simple interface template	Reed; Brown will make interface template

Monday	Yr. 2 Manual	Data Management in ODV	How to use ODV to flag data quality and to make data subsets	Brown
Tuesday	Yr. 2 Manual	Hierarchical Data Format (HDF) Methods	How to make HDF files, to extract ASCII grids, and to create subsets for gridding	Brown
Tuesday and Wednesday	Yr. 2 Manual	SURFER Data Products	Gridding, contouring and analysis export to other programs (GIS)	Brown
Wednesday	Yr. 2 Manual	Using Images in GIS	Tagging image files with geographic coordinates for use in GIS	Brown
Wednesday	Yr. 2 Manual	Image and Data Synthesis in GIS	Synthesis of all data types, including tagged images	Brown
Wednesday and Thursday	Yr. 2 Manual	National Data Catalogs	Review of MEDI-Lite	Reed/Brown
Thursday	Yr. 2 Manual	ODINAFRICA Group Projects	Mini-seminar within the workshop on how to write and submit group proposals for international funding	Odido
Thursday	Yr. 2 Manual	Document and Spreadsheet Formatting	How to create a family of documents within each NODC and within the group of NODCs that have a good “look and feel”; basics of document style sheets	Reed
Thursday		Review of topics; preparation for examination; skills examination		Brown
Friday		Joint Session with Information Management Class		

* All “Yr. 1 Manual” locations refer to new sections to be added to the existing Year 1 Manual, and also to the Resource Kit, as needed.

ANNEX II

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ANNEX III

WELCOMING ADDRESS GIVEN BY DR. ABED

Au nom du Ministre de la Recherche et de la Technologie, je souhaite la bienvenue aux participants du second ODINAFRICA Atelier sur l'Echange de Données et Informations Marines. Dans ce cadre, je tiens à souligner que la Tunisie s'engage dans le renforcement de la coopération entre les pays africains, particulièrement pour la promotion de nouvelles technologies. L'INSTM exprime également sa ferme volonté à promouvoir les méthodologies d'échange de données et d'informations marines. Finalement, je tiens à exprimer ma grande satisfaction que ces cours puissent se dérouler en Tunisie, qu'ils soient assurés par des professeurs chevronnés et espère que cet atelier se concrétise par des coopérations fructueuses dans le cadre du projet ODINAFRICA.

ANNEX IV

NATIONAL REPORTS FOR THE IOCEA REGION

1. BENIN

- Institution: National Oceanographic Data Center
- Significant Accomplishments
 - Updated of the existing data at the CNDO (Oceanographical of the different campaigns, Meteorological, Hydrographic and Biological);
 - Filing beginning of data of oceanographical and biological research existing;
 - Training course of the other personnel of the CNDO and 2 students on the oceanographical data management (Concepts acquired at the time of the Workshop of Morocco);
 - Meeting of the Steering committee of Project ODINAFRICA in order to give a description of the filing of the Oceanographical data and to define the strategies of success of the project at the national level;
 - Participation of the CNDO in the activities of and the follow-up Information system of the Environment on Internet (SISEI) within the framework Programs of Benin Agency for Environment (ABE) (pooling on the national level of the environmental data)
 - Monitoring of the Cetacean of Benin continental shelf;
 - Development of atlas of the various marine fish species of commercial interest of the benin continental shelf (started);
 - Development of bibliographical review of Information available on oceanography and the coastal zone in benin (started);
 - Development of the National Repertory of the researchers in marine science in Benin (started)
- Problems
 - Difficulties in returning in possession of the funds placed at the disposal by ODINAFRICA to undertake the activities of the CNDO;
 - Format of the data of the various national institutions;
 - Predisposition of our partner to work together;
 - Setting in networks of the computers of the CNDO;
 - Lack software to collect certain data of the other structures.
- Future Plans
 - To hold the national workshop in order to continue the discussions with our national partners on the need for pooling of the data;
 - Continuation of the activities of Network SISEI/UNEP/ABE;
 - Continuation of the data-gathering of the public records and sub-regional;
 - Staff training of the CNDO and other active institutions of the project during English and initiation with the SIG for the control of the aspects of management of the oceanographical data;
 - Establishment of the repertory of the researchers, Atlas of marine fish and bibliographical Review of the maritime field and the coastal zone;
 - To inform, sensitize the actors of the sector and general public (marine data producers, pupils, students and teachers) by talks, leaflet, folder and films video on the activities of the CNDO.

2. CAMEROON

- a. Activities of the Data Centre after the Casablanca-Morocco meeting:

Holding of a working session with the Researchers of the IRAD Fisheries and Oceanography Research Station Limbe to introduce the activities of the workshop and perspectives.

Notably, the IODE Resources Kit Manual and its use was introduced and later when there were some modifications.

Daily use and in depth study was made of the Resource Kit manual.

A report introducing the Resource Kit Manual by the NODC to affiliated organisations and Institutions was made and dispatched.

Compilation of available (09) CD diskettes within the NODC.

Development of general information in collaboration with national institutions/organisations on their data holdings in terms of type of data collected, and possibilities of having access to them.

A questionnaire (metadata) was later on established for distribution to these institutions/organisations.

Establishing a letter-head for the NODC.

Request to national collaborating institutions to designate their contact persons.

A list of journals (34) and books(35) was compiled and forwarded to IOC-UNESCO for subscription.

Establishment of the IOCEA MEDI Lite Version 2.0 file with some data holdings in Cameroon.

b. Problems and perspectives. The following problems and perspectives are eminent:

Lack of trained technical staff.

The need to convince and motivate some national collaborating institutions (e.g. the meteorological services) to make their data available to the NODC.

The lack of motivation to the NODC staff to take care of overtime and transport to and back from the NODC.

There was optimum need for collaboration between national Institutions.

Structuring of data base and meta data was lacking due to no control of existing data for data quality.

The need for a technician to assist the data manager in his daily work.

The absence of a laptop computer to assist the Data Manager during field-work was a handicap to a smooth functioning of his work.

3. COTE D'IVOIRE

Institution: Oceanological Research Center

Accomplishments:

Special "Catch-Up" Data Management Workshop in April

Initiation of the National Catalog of Marine Data in MEDI-Lite format

Temporary acquisition of a computer

4. GHANA

Institution: Marine Fisheries Research Division

Significant Accomplishments

There were no significant accomplishments in the reviewing period.

Significant Publications

There were no significant publications in the reviewing period.

Problems

Non availability of funds for work.

Plans

1. Setting up of Office.
2. Organization of First National Workshop.
3. Development of National Metadatabase.
4. Workshop on Information Products & Public Awareness.

5. GUINEE

6. MAURITANIA

Activité du CNDO de Mauritanie programmé en 2002 :

- 5 enquêtes (4 à Nouakchott et 1 à Nouadhibou);
- 1 catalogue relatif aux activités du laboratoire environnement et milieux (campagnes, matériels, nature des données, ...etc.);
- 1 description de la base des données du CNDO;
- 2 atlas sur l'hydrologie (T°C et salinité)
- 1 brochure de présentation des données du CNDO et le système d'analyse;
- création d'un site web;
- 13 campagnes océanographiques (dont 5 sont réalisées);
- 13 rapports de campagne (5 sont disponibles);
- achat d'une caméra numérique;
- un atelier sur les activités du CI;
- + les activités et actions programmées au sein de l'institut.

7. NIGERIA

8. SENEGAL

Institution: National Oceanographic Data Center (CNDO-SN)

Data Manager: Anis DIALLO

The following activities have been carried out during the past year:

1. The organization of our National workshop, implementing the NODC and the IC officially (12-13 October 2001). Main results are:
 - a. The NODC (CNDO-SN) will be held in CRODT and the IC in DOPM
 - b. 25 Institutes were identified as National partners in the project.
2. Settlement of the NODC team (7 persons):
 - * 02 (physical oceanography, chemistry and hydrology)
 - * 03 (fish biology and aquaculture)
 - * 01 (librarian)
 - * 01 (computer science)
3. Settlement of a Scientific Committee of the project (21/12/2001) as recommended during the National workshop.
4. Identification of available data and data bases in all national institute partners.
5. Extraction of data related to Senegal from available data sets for ease of use
 - * Quality control of data from cruise reports and coastal stations
 - * MEDI update

Plans:

- Extract, Create and archive data and data bases
- Create a catalogue of professional and institutes dealing with oceanography.
- Develop and information brochure for public awareness
- Provide data and data products using resources available in the data center:
 - Maps (TSM, Chlorophyll, etc...)
 - Web site
 - Documents
 - Start Planning and Scoping progress for making Atlas

9. TOGO

Institution: Centre de Gestion Intégrée du Littoral et de l'Environnement, Université de Lomé.

Quelques caractéristiques de la zone côtière

- 50 km de côte
- Côte sableuse avec lagunes
- 23 km de largeur du plateau continental
- 2 villes: Lomé (capitale) et Aneho
- Population: 1.100 000 hbts (estimation 2000), toutes activités, 90% des activités industrielles du pays

- Données disponibles (physiques, socioéconomiques)
- Surface: continentale 6 400 km² Océanique 18 500 km²
- Limites (estimations):

Continentales

Points	Latitude	Longitude
C1	6,86	0,53
C2	7,05	1,61
C3	6,15	1,35
C4	6,3	1,81

Océaniques

Points	Latitude	Longitude
O1	6,15	1,35
O2	6,25	1,7
O3	3,11	2,58
O4	3,31	3,00

Principales activités réalisées

- Restitution de la formation en gestion de données océanographiques
- Planification du catalogue de données et des points focaux
- Constitution d'une base de données des levés topographiques du littoral archivés sur papier sous forme de profils
- Planification de l'atlas
- Planification de la collection: "Publications réunies"
- Planification de la formation des points focaux en matière de gestion de données

Publications: Aucune publication

Problèmes:

- Problèmes administratifs
- Difficultés pour installer MEDI
- Problèmes financiers

Activités prévues

- Réunion générale du staff du CNDO avec les différents points focaux
- Finir le catalogue concernant les données et les points focaux
- Formation des points focaux en matière de gestion de données
- Atlas sur le littoral
- Collection "Publications réunies"

10. TUNISIA

Institution: Institut National des Sciences et Technologies de la Mer

Significant Accomplishments: During the year 2001-2002 many contacts were made with different institutions. Particularly, a good contact was established with institutions holding regional or national databases, such as the operational Atlas for the fight against Coastal Accidental Pollutions or the Atlas of Littoral Sources of Pollution, developed by the National Agency of Littoral Protection. As for the NODC development, the national committee, in charge to follow the activities of the CNDO, held three reunions during the year to discuss the prerogatives of the center and the modalities of data exchange between different institutions.

Significant Publications: Establishment of GIS databases in tree main Tunisian golf : the Golf of Gabés (south), the Golf of Tunis (north) and the Golf of Hammamet (east) . These databases consist of a collection of coastal marine data, including physical and chemical data (current, temperature, salinity, nitrate, nitrite...), biological parameters (stock assessment of benthic and pelagic recourses, fish larvae distribution ...), bionomical, geomorphologic and sedimentary data and anthropogenic activities. These data constitute different georeferenced maps, structured as a GIS project and managed with Arcview. To diffuse these products, these databases were copied on CDROMS and distributed to the potential users (Tunisian Ministry of Environment, Environmental Agencies, etc.).

Problems:

Organizational: There is always a decay between the real achievement of the financing and the time planned for each activities. Sometime it is difficult to meet the ODINAFRICA objectives and those of the original institute programmes, which are

very specific and not necessary in the same working scale (time and space) as the ODINAFRICA programmes.

Software: The use of different software than those recommended by ODINAFRICA, limit the consultations between the partners of the project, especially when these are some problems encountered with these soft wares.

Plans:

- 1- Improve the GIS collection of coastal marine data, including other item and prospecting other sites (Tunisian lakes).
- 2- Develop a link between these cartographic databases and the web site of the institute.
- 3- Conceptualise Access database for all our results of stock assessment programmes annual cruises since 1980), realise the interface with GIS for mapping biological parameters.

NATIONAL REPORTS FOR THE IOCINCWIO REGION

1. COMORES

2. KENYA

3. MADAGASCAR

4. MAURITIUS

Institution: Mauritius Meteorological Services

Significant Accomplishments: The National Oceanographic Data and Information Centre (NODC) is proceeding to form a distributive system based on contributions by local agencies, involved in ocean data collection and analysis. The various components of the NODC have different data and information management strategies encompassing physical, chemical and biological observations made in situ and from other remote sensing devices. Practical implementation of the nodc has begun by locating the existing oceanographic parameters for the region to form a metadata dataset in conformity to the guidance, standards, and strategies of the IODE. Two questionnaires have been developed at the NODC, the first one describes the data collection methods and instruments and the second one lists the marine scientists.

Significant Publications :

- (1) "Extreme weather impacts upon the coastal zone"; (Newsletter of MMS).
- (2) Mean sst of the south west indian ocean basin (1971-2000)
- (3) Report on annual review planning meeting held in November, 2001
- (4) Report on Marine Information Management course held in 2001
- (5) Brochure on Mauritius national oceanographic data centre and its services
- (6) Report on workshops held in September 2001
- (7) Progress report on nodc
- (8) Workplan 2001-2004

Problems:

- (1) No permanent staff : trained staff replaced by untrained ones.
- (2) Hardware not easily accessible: old and obsolete.
- (3) MEDI software – not user friendly
- (4) Data managers of the NODC participating institutions are not easily accessible; time constraints due to involvement in other duties.
- (5) Technicians involved in data entries require basic courses in oceanography.
- (6) Archived data exist in varying formats. Many have been developed locally and could be improved by adoption of latest knowledge and techniques. Extra staff, time and funds, and capacity building needed to rationalize the dataset

Plans:

- (1) Complete and update all metadata entries.
- (2) Quality control of data before archiving.
- (3) Ocean data exchange policy to be formulated.

- (4) Advise the institutions of the data collections programme to use standard format
- (5) Capacity building for local expertise to be enhanced.
- (6) Construct a web-site to allow free flow of data & information
- (7) Organise workshop/seminar at regular intervals and publicize it through media to promote awareness campaign.

5. MOZAMBIQUE

Establishment of CENADO: CENADO is not yet a formalized institution, although it is functioning from 1998. There were proposed several models of CEANADO (Associative model, Institutional model – an standalone institution, integrated in another institution). This concerning arises because the financial support. Now CENADO is being financed trough the ODINAFRICA Program and the INAHINA's co participation. What will happen after the end of ODINAFRICA Program? The solution, is to choose a model that can support CENADO even after the ODINAFRICA program ends. The proposal is to full integrate CENADO as part of INAHINA (as Department or Section).

Management of Data and Information: Routines for collecting, update, publication and distribution of METADATA are already established and are running well. We have provided training to users. At least two students from the Department of Physics of UEM (University of Eduardo Mondlane). We have started a program for inventorying the cruises – Example, PELAGIA Cruise, that took place in 2001. The cruise started from La Reunion Island; covered Madagascar and the Mozambique Channel. The objectives of the cruise are:

- Obtain hydrographic observations of the south equatorial current to the east and north of Madagascar
- Recovery and redeploys an array of current meters moorings in the Mozambique Channel at - 17° latitude
- Do a detailed hydrographic survey, including CTD-yoyo stations for obtaining observations on the propagation of internal waves

One scientist from INAHINA participated in this cruise. In the year 2002, the recovering of moored current meters, was done by <<Bazaruto>>, a ship that belongs to INAHINA. A copy of all observations was provided to CENADO / INAHINA. CENADO is building a database to accommodate these data.

Products: CENADO has made 2 studies, which resulted in two products: The Zambezi River Channel Morphology and the Seasonal Variation of Tides, Currents, Temperature and Salinity in the Mozambique Channel

6. SEYCHELLES

7. SOUTH AFRICA

8. TANZANIA

Institution: Institute of Marine Sciences, University of Dar Es Salaam

Significant Accomplishments: Since the beginning of the ODINAFRICA project, one of the major activities of the data centre is to sensitize various stakeholders and scientists on the need of having coordinated oceanographic data management in the country. Inline with this, for the last year, the data centre has accomplished four important things. These include: (i) has increased awareness for the need of having coordinated oceanographic data management as can be seen by the increased acceptance of the data centre by the various stakeholders and scientists, (ii) developed good working relationships with the various stakeholders in particular those involved in integrated coastal management, (iii) finished preparations for upgrading the status of IMS to full National Oceanographic Data Centre (NODC) which involved the visit to senior government officials and stakeholders, and (iv) completed the conversion of the meta-database from ACCESS into FileMaker format ready to be hooked on the internet. In general the visibility of the data centre and its activities has increased.

Significant Publications: For the last year, the data centre produced several publications as follows: (1) The web pages for the Institute of Marine Sciences (IMS) and the data centre were

hooked onto the internet. These pages contain a lot of information about IMS and the data center. (2) A folder and brochure for the data centre were produced and have been widely distributed nationally and internationally. (3) Apart of the usual yearly reports to IOC/UNESCO, the data centre presented and submitted two papers to the Tanzania Coastal Management Partnership (TCMP). The papers are titled (i) Oceanographic data and information management network for Africa (ODINAFRICA) project, and (ii) Advances in Oceanographic Data and Information Management at the Institute of Marine Sciences - The Designated National Agency for Tanzania. These papers have been published in the TCMP working document report series. (4) Copies of the meta-database have been distributed to various stakeholders for use and/or data entry.

Problems:

In implementing its activities, in the last year the data centre faced several problems as follows:

Organizational: This was a long standing problem since the nomination of IMS as the Designated National Agency (DNA). IMS had not restructured to accommodate the new role of the DNA, therefore ODINAFRICA project activities were only considered to be similar to any other project activities without any special national responsibility. However, this problem was rectified in September, 2001 following the establishment of the Information and Communication Technology (ICT) unit that was charged to carry out the daily activities and responsibilities of the DNA, and was given offices.

Hardware: The data centre has only one PC for data management and another one which is the mail and http server. The mail server is old and has limited capacity in terms of clock speed, and hard disk space, and therefore needs replacement in order to increased efficiency and reliability. One extra PC is also need for data management. This will be used as a database server and will allow hooking of the meta-database onto the internet.

Software: Currently, there is a shortage of image and data processing software at the data centre. To solve this problem, the data centre has been setting aside some funds for the purchase of one or two software every year. The usual approach is to request stakeholders and scientists to advise us on what software are needed.

Limitation of funds: The availability of funds is also one of the major problems of the data centre. This has the effect of limiting the scope of the data centre's activities. To resolve this problem, whenever there is an opportunity for funding, the data centre tries to participate, for example by writing project proposals.

Plans: The data centre has several plans for the year 2002 that are focused at improving its capability in data archiving, data collection and provision of services. The planned activities will be implemented using the usual funds from IOC, and if possible additional funds. The data centre has submitted two project proposals, one to Western Indian Ocean Marine Science Association (WIOMSA), and another one to IOC for extra funding. The project proposal submitted to WIOMSA is to be implemented by the data centre and the Science and Technical Working Group (STWG) of the TCMP. The main focus of the two projects is data archeology and improvement of data and information archiving at the data centre. Also, important to the projects is the improvement of services at the data centre. This will include redesigning of the web page.

The data centre plans to produce several data summaries, brochures and a data CD. Preparations of data summaries will be commissioned to various experts in their fields of study who will be required to process the data and prepared a summary and data set to be submitted to the data centre.

Finally, the data centre plans to upgrade its status to full National Oceanographic Data Centre before the end of 2002.

ANNEX V

ODINAFRICA POST-YEAR 2 PROFICIENCY EXAMINATION

FRENCH VERSION

INSTRUCTIONS

1. Vous pouvez utiliser tous les documents de formation y compris le Ressource Kit et le Manuel
2. Utiliser les données de la région IOCEA et non pas celles de IOCINCWIO
3. Sur votre PC, créer des dossiers de façon suivante:
 - C:\Examen
 - \Question 1
 - \Question 2
 - \Question 4
 - \Question 5
 - \Question 6
 - \Question 7
3. Mettre vos produits dans votre PC, dans un dossier spécial que vous avez créé. Nous vérifierons ces dossiers après l'examen.

QUESTIONS

1. Créer une nouvelle collection dans Océan Data view (ODV) en utilisant les données des quadrants de WMO (numéros de dossiers 5100 et 3100 à partir de 'World Ocean Database 1998' (WOD98).
 - Créer une nouvelle collection dans le dossier QUESTION 1 et donner lui un nom
 - Utiliser les variables de WOD98
 - Utiliser seulement les données de NAnsen Bottle data (BDOxxx and NBOxxx)
 - Créer une table d'inventaire de la collection
2. En utilisant ODV et la nouvelle collection, faire les différents produits de graphiques:
 - Scatter Mode: faire un grand graphique de Température/Salinité (T-S diagram).
 - Enregistrer le graphique comme un fichier Gif dans le dossier QUESTION 2.
 - Section Mode: Faire une ligne de section dans la collection, à partir de Ouest à Est. Le graphique de cette section doit avoir les variables suivantes temperature; salinity, oxygen et phosphate.
 - Enregistrer le graphique comme un fichier Gif dans le dossier QUESTION 2.
4. A partir de la nouvelle collection, exporter un produit en feuille de calcul pour un clients de façon suivante:
 - Les limites géographiques sont :
 - Limite supérieure: -13
 - Limite inférieure: -17.5
 - Limite à gauche: -2
 - Limite à droite: 1.5
 - Inclure uniquement la période de temps June, July et August
 - Inclure uniquement les données qui ont les variables: salinity et depth
 - Inclure uniquement les données à partir de "10 Meter Profondeur Standard" (utiliser la table des profondeurs du CNDO pour déterminer les limites inférieures et supérieures de la profondeur standard.
 - Il n'y a pas d'autres limites sur le produit.
 - Exporter ce produit comme une feuille de calcul dans le dossier QUESTION 4
5. Convertir le fichier en feuille de calcul txt ainsi créé dans la question 4 en fichier zip (*.zip). Convertir ce fichier zip en fichier EXeFile localisé dans C:\TEMP où il est exécutable. Mettre les deux fichiers ZIP et ExeFile dans le dossier QUESTION 5.

6. Dans IOCEA DATA CD>CHEMISTRY & HYDROGRAPHY>WORLD OCEAN ATLAS 1998 ANALYSED NITRATE, trouver le fichier HDF pour la profondeur 5000 m.

Copier ce fichier dans le dossier QUESTION 6.

Extraire les données quadrillées en ASCII du fichier HDF et enregistrer le fichier HAIF dans le dossier QUESTION 6.

Convertir les données quadrillées en ASCII en format XYZ, et l'enregistrer dans le dossier QUESTION 6

7. Le (s) produit (s) de données créés à la question 4 ont des longitudes en ODV qui sont à convertir en format Océanographique normal.

Ouvrir ce fichier en feuille de calcul TXT avec EXCEL, et convertir toutes les Longitudes en format Océanographique normal s'ils sont supérieurs à 180. Supprimer toutes les lignes de données qui ne contiennent pas des variables salinity. Enregistrer le fichier ainsi corriger dans EXCEL dans le dossier QUESTION 7.

8. Utiliser SURFER pour quadriller les données salinity du fichier EXCEL créée dans la question 7. Enregistrer le fichier de SURFER (*.grd) dans le dossier question 8.

ENGLISH VERSION

INSTRUCTIONS:

1. You may use all ODINAFRICA training materials for this examination, including the Resource Kit and the Manuals.

2. Use the IOCEA Data CD for data, not the IOCINCWIO CD.

3. On your own computer, make the following structure of folders:

```
C:\EXAMINATION
  \QUESTION 1
  \QUESTION 2
  \QUESTION 4
  \QUESTION 5
  \QUESTION 6
  \QUESTION 7
  \QUESTION 8
```

3. Put your products on your own computer, in the special folders you have made. We will check these folders after the examination.

QUESTIONS

1. Create a new collection in Ocean Data View (ODV) using the data in WMO Squares (folder numbers) 5100 and 3100 from the World Ocean Database 1998 (WOD98).

Create the new collection in the Question 1 folder.

Use any name.

Use the WOD98 variables.

Only use the Nansen Bottle data (BDOxxxx and NBDxxxx).

Create an Inventory Table for the collection.

2. Using ODV and the new collection, make the following graphic products:

SCATTER MODE: Make a large T-S Plot. Save the graphic image as a GIF file in the QUESTION 2 folder.

SECTION MODE: Make a straight line section through the collection, from West to East. The graphs for this section should show these variables: temperature, salinity, oxygen, and phosphate. Save the graphic image as a GIF file in the QUESTION 2 folder.

QUESTION 3. No question this time.

QUESTION 4. From the new collection, export one product spreadsheet for a client, as follows:

Limit the geographic limits to:

TOP: -13

BOTTOM: -17.5

LEFT: -2

RIGHT: 1.5

Include only the time period June, July and August

Include only data that must have these variables: salinity and depth

Include only data that is from the "10 Meter Standard Depth" (use the NODC depths table to determine what the upper and lower limits of this "standard depth" are)

There are no other limitations on the product

Export the desired product as a spreadsheet to the QUESTION 4 folder.

QUESTION 5. Convert the TXT spreadsheet file created in No. 4 to a zipfile (*.zip). Convert the ZIP file to a self-unzipping EXE file that unzips to C:\TEMP when it is run. Place both the ZIP file and the EXE file in the QUESTION 5 folder.

QUESTION 6. In IOCEA DATA CD>CHEMISTRY & HYDROGRAPHY>WORLD OCEAN ATLAS 1998 ANALYZED NITRATE find the HDF file for 5000 m depth.

Copy the HDF file to the QUESTION 6 folder.

Extract the gridded ASCII data from the HDF file, and save the HAIF file in the QUESTION 6 folder.

Convert the ASCII gridded data to XYZ format, and save the XYZ file in the QUESTION 6 folder.

QUESTION 7. The data product created in No. 4 contains ODV longitudes that must be converted to normal oceanographic format. Open the spreadsheet TXT file in EXCEL, and convert all longitudes to normal oceanographic format IF THEY ARE LARGER THAN 180. Also, delete any data lines that do not contain the variable salinity. Save the final, corrected EXCEL spreadsheet to the QUESTION 7 folder, using EXCEL XLS format.

QUESTION 8. Use SURFER to grid the salinity data in the XLS file created in No. 7. Save the SURFER grid file (*.grd) to the QUESTION 8 folder.

ANNEX VI

INTERSESSIONAL ASSIGNMENTS FOR WORKSHOP PARTICIPANTS

Task	Comments
Collect relevant information to up-date the national coastal and ocean meta-database concerning databases available in your country; use the MEDI-Lite format as an interim measure	The original MEDI Lite catalogs will be used as the basis for an achievement measurement system; details will be announced in June 2002
Collect relevant data to up-date and enlarge the national coastal and ocean data archive	For ocean station data, the Ocean Data View inventory table will be used as the fundamental metric; other datasets will be counted as their MEDI Lite record entries.
Update the directory of marine and freshwater professionals (GLODIR) as it pertains to your institutions and your country. In order to know who already appears in the directory, search at http://ioc2.unesco.org/glodir/index.htm You can add any missing persons directly or send us their details.	Total counts, as of July 1, 2002, will be used as the initial metric to monitor national progress.
Provide data services/products to users in your country; maintain a log indicating who has been provided with services, what type of services and when.	Log forms will be submitted for group examination (schedule to be determined); service record spreadsheets will be submitted prior to Workshop 3.
Publicize the availability of products/services through the internet, brochures, and information leaflets	Products will be submitted for scanning and electronic archiving (schedule to be determined)
Organize a national workshop (and a national coordination meeting for some of the countries) for participants drawn from ocean related organizations in your country in order to promote the use of oceanographic and coastal data sets by identifying distinct sets of data products for use in coastal zone management. This requirement limited to certain countries; ask the IOC for further information.	During the session we also agreed that proposals for products would be sent to the Regional Coordinators by end of May 2002 to enable them to start drafting the fee contracts for these. However in view of the delays in disbursement of funds which will likely lead to delays in national workshops it may not be possible to meet this deadline.

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ANNEX VII

**IODE Resource Kit
Table of Contents**

IODE Data Centre System	What is a Data Centre?	The IODE System What is an Oceanographic Data Centre? The Role of a National Oceanographic Data Centre
	Global Programs	Intergovernmental Programs Scientific Programs
	Science Plans	Examples of Science and Implementation Plans
	Data Policy	Example data management policies
	Reference Library	IOC Manuals & Guides Online Tutorials Standard Reference Material
Data Management Systems	Computer Systems	Hardware Operating System Applications Software Networks Computer Maintenance Computer Viruses
	Database Technology	Database Management Systems MS Access 2000 Tutorial. Cruise Report Database Tutorial. Other Database Management Systems. Oracle 8 Informix Universal Server PostgreSQL
	Metadata	Overview of Metadata What are Metadata? Why use Metadata? The Role of a Data Directory The MEDI System Background to MEDI The MEDI Catalogue Development of the MEDI Software Install the MEDI Software Cruise Summary Report Global Change Master Directory Distributed Oceanographic Data System Metadata Standards
	Data Collection	Instrumentation WOCE Operations Manual Oceanographic Instrumentation Protocols for JGOFS core measurements Data Collection Forms Hardcopy Logsheets Spreadsheets Instruction Manual for Data Collection

	Quality Control	Overview of Quality Control Objectives of quality control Quality control procedures Quality Control of Data from Global Programs MEDS Quality Control Procedures TOGA/COARE Quality Control Procedures for Surface Meteorology Data BODC-WOCE Sea Level Data Assembly Centre Quality Assessment TOGA Sea Level Centre Quality Assessment Policy Quality Control of data received by Ocean Climate Laboratory Quality Control References GTSP Real-time Quality Control Manual (Manuals & Guides 22) Manual of Quality Control Procedures for Validation of Oceanographic Data (Manuals & Guides 26) Quality Control Cookbook for XBT Data
	The Internet	Introduction to the Internet History of the Internet Electronic Mail (email) File Transfer Protocol (FTP) Telnet Discussion Groups Mailing Lists World Wide Web (WWW) Web Browsers Netscape Interface Internet Explorer Interface Browser Errors The URL Search Engines Search Syntax Netiquette Glossary of Internet Terms Beginners Guide to HTML (from NCSA) HTML Tags - Quick Reference eXtensible Markup Language (XML)
	GIS	Overview of Geographic Information Systems Benefits of a Marine GIS GIS Glossary The Emergence of Marine GIS GIS Tutorial) GIS Resources on the Internet
Data Analysis & Products	Introduction	Formats Data Software Classroom Data Products

Formats	Format ABC's Format Types Integrated Data Formats Formats Catalog
Data	Introduction to Atmospheric & Oceanographic Datasets Oceanography Primer Oceanographic Parameters Oceanographic Units Oceanographic Instruments Oceanographic Glossaries Datasets Major Publishers Major Publications Data Directories/Indexes WWW Data Sources Catalog Data CD-ROM Catalogue Quality Control Program Planning Manuals, Methods & Protocols Standards and Reference Materials Intercalibration Managed Data Flow Statistics & Graphics Analysis Bad Data? Final Data
Software	The Toolbox IOC/IODE Catalog of Marine Software
Classroom	Resource Integration Format Conversion Tutorials
Data Products	Metrics Center Documents Maps Principal Formats Dataset Products Analysis Products Data Atlases Web Options