Intergovernmental Oceanographic Commission
Training Course Report No. 60

First ODINAFRICA-II Training Course in Marine Data Management

Supported by the IOC and the Government of Flanders

Casablanca, Morocco
April 2-13, 2001

UNESCO

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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. 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 organized locally in Casablanca by Dr. Maria Snoussi of the Université Mohammed V, Faculté des Sciences, Département Sciences de la Terre, Rabat, Morocco.

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. 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 Benin, Cameroon, Ghana, Guinee, Morocco, Mauritania, Nigeria, Senegal, Togo and Tunisia. The Comores, which previously could not participate in the Eastern African-oriented ODINAFRICA I training workshop, provided an additional student. A previous student from Madagascar, completed the predecessor ODINEA training program, is now an associate instructor in the ongoing program. Lectures were provided by invited data managers from Australia, Madagascar, the United States of America, and IOC. The list of participants and lecturers is provided as Annex II.

3. COURSE PROGRAMME

3.1 OPENING CEREMONY

M. Mohamed Mohatane, Secrétaire Permanent Conférence Ministérielle sur la Coopération Halieutique entre les Etats Africains Riverains de l'Océan Atlantique officially opened the workshop. The text of his welcoming remarks is contained in Annex III.

On behalf of the Secretary IOC, Mr. Peter Pissierssens thanked M. Mohattane, and the government of Morocco for co-organizing and hosting this training course. He expressed the wish that this training course would contribute to the further development of the IODE system and its implementation in the Western Africa region. He reiterated the importance attached by the IOC to the IODE programme and highlighted the important role of the National Oceanographic Data Centres in the IODE system. Mr. Pissierssens concluded his remarks with a summarization of course goals, and an introduction of instructors Reed and Brown.

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.

To assist workshop instructors in the day-to-day conduct of the course, an informal survey of initial skill levels was taken. This survey, whose results are summarized in Annex V, provided a rough idea of the students' individual levels of accomplishment at the beginning of the course, as well as some idea of their at-home resources. Use of a similar questionnaire in the past, however, has shown the IOC instructors that only the most generalized conclusions can be drawn, due to the extremely wide range of students' backgrounds. For instance, a student from a nation with very limited computer resources might describe his/her own accomplishment level in such common software as MS Word or Excel as "advanced" even if access to the computer is occasional, and expertise is quite rudimentary, given the fact that most of his/her associates have even less access and even lower skill levels.

The instructors' review of the survey results indicates that personal perception is somewhat more optimistic than the skills demonstrated during workshop tutorials, so great emphasis on basic skills will be integrated into continuing education – to be carried out through a full-time educational extension activity included in ODINAFRICA II – and during future workshops.

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 thee products, both over the Internet and by traditional methods

3.3.2 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.

3.3.3 Workshop Technical Outline

The following is the outline of the Teachers' Manual prepared for this 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 Resource Kit (outlined in Annex VIII).

- The IOC-IODE System
    - Overview
        - NODCs - National Oceanographic Data Centers
        - DNAs – Designated National Agencies
        - RNODCs - Responsible National Oceanographic Data Centers
        - Intergovernmental Oceanographic Commission's (IOC) Committee on IODE
        - Role of an NODC
    - WDCs - World Data Centers
    - Marine Data
        - Introduction to Datasets
        - Oceanography Primer

- The Use of Personal Computers for Marine Data Management
  - Skills Assessment
  - Computer Hardware
  - Operating Systems
  - Software: Editors
  - Software: Browsers
  - Software: Spreadsheets
    - Tutorials
  - Computer Networks
  - Computer Maintenance
- Data Concepts
  - Data Formats
  - Special Topics
    - Code Tables
    - Geographic Coordinates
    - Map Projections
    - Global Sectors
- Data, Metadata and Information
  - Global Sources of Data
    - Major Publishers
    - Major Publications
    - Major Formats
    - Data Media
  - Metadata
    - Overview and Importance
    - Cruise Summary Reports
    - Review of Standards and Systems
    - Marine Environmental Data Index (MEDI) – Introduction
    - MEDI – Tutorial
  - Marine Information Management
- Data Center Operations
  - Data Management Policies and Procedures
  - NODC Examples
    - An Established NODC – The Australian NODC
    - A new NODC – The Madagascar NODC
- Relational Database Management Systems (RDMS)
  - RDMS Theory
  - Marine Data Tutorial
- Data Analysis and Products
  - Software: Analysis Tools
  - Format Conversion
  - Capturing Digital Data
  - Data Processing
  - Data Quality Control
  - Data Gridding and Contouring Introduction
  - Data Analysis: The Roadmap Tutorials
  - Data Products
  - Geographic Information Systems
- The Internet
  - Technical Overview
  - Markup Languages
  - Web Page Design

4. COURSE EVALUATION

At the conclusion of the course, an evaluation of the students' opinions regarding course content and format was conducted. A copy of the **Participant Assessment** is listed in Annex VI.

5. RECOMMENDATIONS & ASSIGNMENTS

It is recommended that the workshop participants re-assemble approximately one year from the date of the present workshop, for the second session in this 3-part curriculum. In the interim, a set of "Intersessional Assignments" has been assigned to all national representatives (Annex VII). To support the accomplishment of these assignments, and to foster increased dialog among participants, the IOC has established a Help Desk function (listed in the Annex), to be staffed by the Training Coordinator.

ANNEX I

COURSE PROGRAM AND TIMETABLE

Day	Session	Topic	Content	Description
1	1	Opening ceremony and preliminaries	Welcome address Overview and Objectives	
	2		Introductions Introduction to the IODE Resource Kit and Workshop Manual Participant Introduction	
	3	The IOC / IODE System	Overview of IODE	Description of RNODCs Description of NODCs, DNAs The IOC Committee on IODE The Role of an NODC
	4		World Data Centres	Description of the World Data Centre System
			Marine Data	Introduction to Datasets Oceanography Primer
2	1	Introduction to the use of PCs for Ocean Data Management	Training course CD	Introduction to the ODM training CD
			Computer hardware	Basic hardware components
			Operating systems	Overview of O/S Windows tutorial and exercise
	2		Software – editors	ASCII editors tutorial and exercise
			Software – browsers	Introduction to web browsers
	3		Software - spreadsheets	Excel spreadsheet tutorial and exercise Creating ODV files in Excel
3	1		Computer Networks	Types of networks, Network components
	2		Computer Maintenance	Backups, compressing files, viruses
	3	Data Concepts	Data Formats	Major format types
	4			Special Topics
4	1	Data, Metadata and Information	Global sources of data	Overview of major publishers of data
	2			Media types for data distribution
				On-line data servers
	3			Major format types
	4			Introduction to ODINAFRICA data CD
5	1		Metadata	Overview and importance of metadata
				Review of metadata standards and systems
	2			MEDI – introduction and software installation
	3			MEDI – data entry exercise
	4		Marine Information Management	Overview an relationship to Data Management

6	1	Data Centre Operations	Science Plans	How to incorporate data management in Science Plans
			Data Management Policies	Overview of data management policies
	2		NODC Examples	Overview and discussion of established NODC
				Establishing an NODC: African case study
			ODINAFRICA Project	Overview of the ODINAFRICA Project
	3	Database Management Systems	Introduction to database management systems	Overview of database management systems
	4			MS Access tutorial
7	1			Exercise: Design a database to store oceanographic data
	2			Exercise: Design a database to store oceanographic data
	3	Data Manipulation and Analysis	Software: Analysis Tools	Software installation (Ocean Data View)
	4		Format Conversion	Format conversion, compatibility matrix
8	1		Capturing Digital Data	Data entry with a spreadsheet
	2		Data Quality Control	Introductory material
	3		Data Analysis: The Roadmap Tutorials	Tutorial 1
	4			Tutorial 2
9	1			Tutorial 3
	2			Tutorial 4
	3			Tutorial 5
	4		Data Products and GIS	Discussion and view sample graphics
10	1	The Internet	Introduction to the Internet	Overview of history and evolution, Internet services
			WWW	WWW – browsers, URL, search engines
	2		Markup languages	Overview of HTML
				HTML exercise
	3	Course wrap-up	Review of Intersessional Goals	

ANNEX II

LIST OF PARTICIPANTS

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ANNEX III

WELCOMING ADDRESS GIVEN BY M. MOHATTANE

Mesdames et Messieurs,

Pour commencer, je voudrais remercier le Directeur de l'INRH et les organisateurs de cet atelier pour voir bien voulu inviter le Secrétariat Permanent de la Conférence Ministérielle sur la Coopération Halieutique entre les Etats Africains Riverains de l'Océan Atlantique pour assister à l'ouverture des travaux de cet atelier sur la gestion des données océanographique pour la région de l'IOCEA et pour prendre la parole devant ce panel d'océanographes prestigieux sur le plan académique et scientifique.

Au nom de la Conférence Ministérielle, je vous souhaite donc la bienvenue au Maroc, comme je formule mes voeux de succès aux travaux de cet atelier.

Nous avons également appris que le Gouvernement des Flandres et la COI ont bien voulu contribuer au financement de votre projet (ODINAFRICA II), nous tenons à leur exprimer nos sentiments de reconnaissance et de remerciements.

Par ailleurs et à cette occasion, permettez-moi de vous présenter assez rapidement la vocation de notre Conférence Ministérielle, ses objectifs et ses réalisations.

Notre Conférence Ministérielle a vu le jour à Rabat en 1989, à l'initiative du Maroc. 22 ministres chargés des pêches des Etats riverains de la côte Atlantique du Maroc à la Namibie ont assisté à cette réunion constitutive.

Les Etats membres de cette Conférence ont fait l'honneur au Maroc d'abriter le siège de la Conférence Ministérielle et d'en assurer le Secrétariat Permanent.

Notre Conférence a pour objectifs :- de promouvoir une coopération active et structurée en matière d'aménagement et de développement des pêches dans la région ; - de dynamiser l'ensemble des secteurs économiques nationaux sur la base des effets directs et induits qui peuvent résulter de l'exploitation des ressources halieutiques ; - de développer, coordonner et harmoniser leurs efforts et leurs capacités en vue de préserver, exploiter, mettre en valeur et commercialiser les ressources halieutiques ; - de renforcer la solidarité à l'égard des Etats africains sans littoral et les Etats géographiquement désavantagés.

Un certain nombre d'actions ont été menées ou en cours de réalisation, des idées de projet sont également en gestation. Je me limiterai à rappeler quelques unes de ces actions : - la mise en oeuvre d'un Système d'Information Géographique (SIG) appelé aux pêcheries de l'Afrique de l'Ouest ; des démarches sont en cours pour étendre ce SIG à l'ensemble du littoral atlantique de l'Afrique ; - l'estimation des stocks de petits pélagiques au large des côtes Nord-ouest africaines; - la Base de Données Régionale Maritime ; - La coopération tripartite Maroc-Japon et Etats africains membres de la Conférence Ministérielle ; - L'établissement d'un inventaire des Institutions de formation et de recherché Etablissements ; - Un projet est en cours pour la mise en réseau des centres scientifiques et de recherches des Etats membres de la Conférence.

Comme vous pouvez le constater, les études océanographiques restent pour le moment l'enfant pauvres de notre organisation régionale. Ceci s'explique par un certain nombre de facteurs : - les sciences océanographiques sont fortement capitalistes et portent sur des horizons de recherche et d'investigation à très lointain; - elles supposent également l'existence communauté scientifique importante et scientifiquement très pointue, chose qui fait défaut dans des pays comme les notres. Cependant on ne peut élaborer de stratégies de développement sérieuses dans le domaine maritime et halieutique sans disposer de données océanographiques importantes et fiables, parce que dans ce domaine nous sommes face à des dynamiques systémiques complexes qui ne connaissent pas de frontières. A titre d'exemple, les changements climatiques que connaît notre planète ont certainement des effets multiples sur les ecosystèmes marins, en particulier sur les rythmes de reproduction biologique des espèces. Nos pays sont

très peu informés sur ce type de phénomènes, faute de moyens et parce que la quasi totalité des connaissances et l'information circulent dans ce domaines dans le sens horizontal NORD-NORD.

Je ne reviendrais pas sur le diagnostic de l'état de la recherché scientifique et technique dans notre région, qui reste marquée par le manque de moyens matériels et humains, l'exode des cerveaux...Mais j'ai cette conviction de croire que qu'une coopération, dans le cadre de réseaux opérationnels, dynamiques et efficaces de centres de recherches océanographiques à l'échelle de notre continent est susceptible de contribuer, dans une certaine mesure au développement des sciences océanographiques dans notre région, ainsi qu'une meilleure gestion de nos zones marines et côtières, grâce notamment à l'échange continu et efficient des données et de l'information et au transfert du savoir-faire.

En conclusion, je voudrais terminer sur deux points d'information : - un programme de recherche, piloté par l'INRH, est sur le point d'être lancé, au moyen du navire « Dr. Fridtjof Nansen » pour l'évaluation des biomasses dans le Nord Ouest africain ; je pense que c'est une opportunité à saisir pour une collaboration conjointe ; - au niveau de la Conférence ministérielle, nous sommes en train de préparer la réunion du Bureau de notre organisation (Rabat, 8-11 mai 2001) ; nous sommes prêts directement, ou par un de vos représentants, à lui transmettre les conclusions de votre atelier, ses recommandations et les idées de projets que vous auriez identifiées et sur lesquelles on pourra s'engager et travailler ensemble pour les mettre en oeuvre.

Je vous remercie pour votre attention.

ANNEX IV

NATIONAL REPORTS

1. BENIN

Le Centre National Océanographique du Bénin (CNO) est un Comité mis en place par le CBRST et créé par l'Arrêté n°475/MEMS/DGM/CBRST du 07 avril 1988.

Le Centre National Océanographique du Bénin est un répondant de la Commission Océanographique Intergouvernementale de l'UNESCO (COI/UNESCO) sous la tutelle du Centre Béninois de la Recherche Scientifique et Technique qui est une Direction Technique du Ministère de l'Éducation Nationale et de la Recherche Scientifique.

Le rôle du Centre est de promouvoir la recherche en science de la mer et les services connexes, afin d'accroître les connaissances relatives à la nature des eaux maritimes béninoises et leurs ressources.

Le CNO regroupe des chercheurs, ingénieurs, cadres et techniciens des Ministères, Institutions de recherche et services concernés par l'Océanographie et toute autre personne dont le concours est jugé utile pour la réalisation de ses objectifs.

Il s'agit des chercheurs de la Direction des Pêches, du CBRST de l'Université Nationale du Bénin (UNB) et de l'Institut National de la Recheche Agronomique du Bénin (INRAB) qui constitue un noyau de base possédant une expertise, en émergence dans la compilation et le traitement des données océanographiques.

Le Centre National a entre autres commission, de fournir aux décideurs les avis de gestion nécessaires pour gérer et réglementer la pêche, de favoriser la conception de programmes de recherche communs et de transfert de technologies avec d'autres pays notamment avec ceux du Golfe de Guinée.

Le CNO a exécuté plusieurs projets dont celui de l'évaluation des stocks de poissons démersaux en collaboration avec la Direction des Pêches. Ce projet financé par l'Agence Canadienne de Développement International (ACDI) a contribuer à consolider les bases de manipulation des données. Ce projet a permis de constituer une banque de données depuis 1989.

Le CNO a toujours participé à des croisières en mer organisées dans la sous-région pour la collecte des données océanographiques, environnementales et de pêche. (Campagne NIZERRY, Campagne LME, Campagne COPACE Fritjorf)

Les données sont stockées en Dbase IV et en Access.

Le projet ODINAFRICA-II est arrivé à point pour la mise en commun des données océanographiques collectées ça et là sur toute l'étendu du littoral béninois.

Ce projet vient renforcer l'aptitude à acquérir, à gérer, à archiver et à diffuser les données, ainsi que la capacité de créer l'information à l'appui de la décision et de la gestion des zones océaniques béninois.

ODINAFRICA-II permettra de:

- renforcer la collecte et la diffusion de l'information scientifique en tant que base d'une gestion efficace de la zone côtière.
- faciliter une utilisation plus poussée des systèmes modernes de communication électronique, tels que les connexions à internet et les mécanismes de transfert de données.
- aider à élaborer et à diffuser des produits de données et d'information marine répondant aux besoins d'une grande variété d'utilisateurs aux niveaux national et régional ainsi qu'aux priorités nationales et régionales.

- offrir des possibilités de formation à la gestion des données et de l'information utilisant les formats et méthodes normalisés et définis par l'IODE;
- aider à créer et à maintenir des bases de données nationales, régionales et panafricaines détenant des métadonnées et données marines;

2. GHANA

Ghana has a coastline of about 550 kilometres and a narrow continental shelf (15 – 75 metres deep) with a total surface waters. This represents 15 % of the country's territorial waters. The Marine Fisheries Research Division (MFRD) of the Directorate of Fisheries/Ministry of Food & Agriculture was established in 1962. It started with the three main divisions characteristic of any fisheries research organisation namely: Fisheries Oceanography, Fisheries Biology and Statistics, and Fishing Technology and Methods. MFRD conducts research activity on the marine environment that affects the coastal fisheries of Ghana. This involves studies on:

- Systematic of Phytoplankton and Primary Production
- Systematic and variability in Zooplankton Abundance
- Systematic and variability of Ichthyoplankton
- Hydrography in relation to fish abundance – Water Temperature, Salinity, Oxygen, Turbidity and Currents

This information is obtained by:

- Collecting and studying of the daily beach temperatures and salinities at eight selected stations
- Carrying out of weekly oceanographic transects of Tema for collecting information on sea water temperature, turbidity, ocean currents, wind speed and direction as well as samples for dissolved oxygen, salinity and plankton studies at four predetermined stations

No formal [marine data management] activities have begun at the centre. There will be a meeting soon to discuss the programme for commencement of work. Ghana's fishing industry, oil and gas exploration, sand and gravel industry, and the salt mining industry will all benefit from the data that will be available through ODINAFRICA.

3. GUINEE

Le CNDO de Guinée est localisé au sein du Centre de Recherche Scientifique de Conakry – Rogbanè (CERESCOR) dans la Division Gestion Information.

Le CNDO est établi depuis 1990 ; il collecte et gère les données produites par quatre départements du CERESCOR Océaographie Physique , Hydrobiologie , Géologie Marine, Interaction Océan Atmosphère. En outre, il collecte les données produites par les groupes thématiques et les programmes conjoints auxquels participent les chercheurs du CERESCOR.

Le CNDO dispose de bases de données conçues à l'aide de MS ACCESS .

Le CERESCOR est l'une des institutions partenaires du Projet ODINAFRICA-II ; de ce point de vue le CNDO a été réorganisé pour intégrer le centre d'information qui était le point focal du projet RECOSCIX.

4. MAURITANIE

Le Centre National de Recherches Océanographiques et des Pêches (CNROP) est chargé, entre autre, des études relatives aux évaluations des stocks, l'écobiologie des populations et l'environnement particulièrement les aspects hydroclimatiques. Plusieurs programmes de recherches ont abouti à produire des résulats scientifiques. Plussieurs rapports de groupes de travail, de publications scientiqques et d'atlas ont été réalisés.

Le CNROP dispose également d'une base de données sur les statistiques de pêche, sur les campgnes d'évaluations des stocks (chalutage), sur les données biologiques (enquéteurs, …etc.) et sur les

données hydroclimatiques. La base de données hydroclimatique est gérée sur le Fox-Pro et contient toutes les campagnes océanographiques qui se sont déroulées dans la ZEEM depuis 1955, des stations côtières à partir de 1952 et des données météorologiques des deux stations de Nouadhibou et Nouakchott (données ASECNA) à partir de 1960. Le produit sera ensuite représenté sous forme de cartes ou graphiques en utilisant le Surfer. Il y a la possiblité d'utiliser le Fortan pour ce qui est modélisation et également le Matlab pour des sujets particuliers.

5. NIGERIA

The Nigerian institute for oceanography and marine research (NIOMR),Lagos has the mandate to conduct research into the nature Nigerian marine environment including, marine weather forecasting, topography of the seabed and deposits on or under the sea bed . The mandate covers research into coastal water pollution monitoring, impacts, mitigation and prevention. NIOMR also conducts research into the geo-physical phenomenon of the Nigerian continental margin and contiguous land mass. work currently going on comprises monitoring of physio- chemical characteristics of inshore and offshore waters along the entire 853 KM of the Nigerian coastline, sea level monitoring, hydrodynamic processes, coastal ecological monitoring, sediment and nutrient exchange processes coastal erosion and bathymetry.

6. SENEGAL

- The Centre de Recherches Océanographiques de Dakar-Thiaroye (CRODT) represent the NODC and is one of the two N.I.D.. It is also the Management Information Centre in Sénégal.

- As an Oceanographic Centre, we work on the main programs with 12 activities:
  - Resources and environment
  - Interactions in production systems (fishing strategies)
  - Development of fisheries information systems
  - We have many data bases on fish biology, Fish statistics and marine water quality (physical and chemical parameters)

- The centre has as technical support:
  - A new BOAD (1800 TJB)
  - An informatic centre
  - Teledetection and satellite image processing unit (NOAA, Météosat).

- The national workshop planned on March 30 - 31 was delayed to April.
- The project ODINAFRICA II, will contribute to more consolidate the Data Bases with a better management. It offers the opportunity of communication with others scientist (African mainly) and a better utilisation of oceanographic data in Senegal

7. TOGO

L'institution à laquelle j'appartiens est le Centre de Gestion Intégrée du Littoral et de l'Environnement (CGILE) qui est un centre de recherche de l'Université de Lomé coordonnant les activités de recherche et de développement sur le littoral au Togo. A ce titre, le centre a eu à mener un certain nombre d'actions dont la coordination de travaux d'installation d'ouvrages de protection contre l'érosion côtière, l'étude du milieu lagunaire du Togo, une étude sur la vulnérabilité du littoral, l'élaboration d'un document dénommé " *Profil environnemental du littoral du Togo* " sponsorisé par l'ONUDI à travers le projet Large Marine Ecosystem of Gulf of Guinea, etc.

Le Togo a déjà organisé depuis le 28 mars 2001 son atelier national de mise en oeuvre du Centre National de Données Océanographiques (CNDO). Ce centre se trouve au Centre de Gestion Intégrée du Littoral et de l'Environnement. Le rapport de l'atelier sera publié ultérieurement. Nos attentes par rapport à ODINAFRICA II concernent le plus que nous pourrons avoir en matériels, en formation, en gestion de donnée dans un SGBD approprié. Mais le meilleur apport sera d'introduire une nouvelle philosophie en

matière de collecte, d'acheminement, de partage, de gestion de données pour une meilleure gestion intégrée des milieux marins et côtiers.

8. TUNISIE

L'institution à laquelle j'appartiens est Institut National des Sciences et Technologies de la mer (INSTM). Actuellement, on ne dispose pas de centre de données océanographiques, bien qu'on soit en possession de plusieurs bases de données marines, telles que des bases de données relatives à l'évaluation des stocks halieutiques. La Tunisie a tenu deux journées d'information (8 et 9 mars 2001) pour la désignation d'un centre de données océanographiques. A cet effet, plusieurs instituions scientifiques ont été invitées pour enrichir la discussion sur les objectives et les attentes du projet ODINAFRICA. Finalement, l'INSTM a été désigné comme le CDO en Tunisie. Egalement, un comité national a été créé pour suivre les activités du CDO et assurer son alimentation en données océanographiques.

ANNEX V

IOC/IODE Marine Data & Information Management Training Course
Individual Skills Questionnaire

Please circle the best response. You can provide more than one response if needed. Put your personal comments in the last column, if you feel an explanation or exception is needed.							
My current computer is	None	386 PC	486 PC	Pentium	Pentium II	Pentium III	Other:
RESPONSES	**1**	**2**		**4**	**5**	**1**	
My agency's computer "system" is	No network connections between computers	A few computers are connected as "peer to peer" units	Nearly all computers are connected "peer to peer"	There is a dedicated PC server in a local area network (LAN)	There is a dedicated (UNIX) work station in the LAN	A dedicated work station in the LAN, and Internet connection	A dedicated work station in the LAN is also an FTP and HTTP server on the Internet
RESPONSES	**5**			**2**	**1**	**2**	
My current operating system is	DOS	Windows 3.X	Windows 95	Windows 98	Windows 2000	Windows ME	UNIX
RESPONSES			**2**	**6**	**6**		
My skill level with MS Access	No experience ; what is it?	Familiar with it, but very little experience	Basic skills in tables and data entry	Moderately skilled in tables, queries, reports	Advanced skills, including macros and programming	Highly skilled in all aspects	Expert instructor
RESPONSES	**5**	**1**	**3**	**2**	**1**		
My skill level with MS Excel	No experience ; what is it?	Familiar with it, but very little experience	Basic skills in sheet design and data entry	Moderately skilled in formulas, cell formatting, import/export	Advanced skills in selection and analysis functions, and graphics	Highly skilled in all aspects	Expert instructor
RESPONSES	**1**	**1**	**4**	**1**	**5**	**2**	
My skill level with programming languages (responses included Turbo-Pascal, VisualBasic, FORTRAN)	Cannot program in any computer language (YET!)	Familiar with it, but very little experience	Can write simple programs to re-format ASCII files	Moderately skilled in writing programs to manipulate and analyze data, including working with arrays	Advanced skills in binary and ASCII data manipulation graphics, and subroutines or calls to external executables	Highly skilled in all aspects	Expert instructor
RESPONSES	**4**	**4**					
My familiarity with marine data	No familiarity at all (YET!)	Have seen some data CDs and some other marine data files, but have little other knowledge	In between? Please describe:	Have/have access to many marine data sets on CD or other media, and am familiar with global types and sources	In between? Please describe:	I manage a large, organized collection of marine data in various media; actively gather new data for my archive	Expert instructor in marine databases
RESPONSES		**8**	**2**	**2**			
My ability to work with marine data	No ability at all (YET!)	Have observed marine data management & analysis; no personal experience	Modest skills in analyzing data in some standard programs if the data are already in the right format(s)	Have worked with some of the main datasets, such as World Marine Database 98, and gridded satellite data; little re-formatting experience	Have extensive experience in re-formatting and analyzing many types of marine data	Highly skilled in analysis and synthesis of marine data and other data types	Expert instructor in manipulation & analysis of marine data

RESPONSES		**5**	**4**	**1**	**1**		
My experience with metadata	No experience at all, and unfamiliar with the term "metadata"	Have seen some metadata catalogs of science data, but have never created one	In between? Please describe:	Have created a metadata catalog of earth science data	In between? Please describe:	Highly skilled with metadata catalogs, and familiar with some common formats	Expert instructor in metadata cataloging of earth science data
RESPONSES	**5**	**6**	**1**				
Please outline your formal education (degrees and fields of study) at the college & university level:	Highest levels reported: Four Ph.D's, 4 Masters of Science, 2 Bachelors of Science						
What is the scope of your ocean data center?	So new that we don't know what to do yet	We have just begun, but we have a plan for our operations	In between? Please describe:	We have some ocean data sets and a catalog design, and we have a process for getting new data and for distributing data; we analyze some data	In between? Please describe:	We are a highly experienced organization with many cataloged data sets and many customers; we have an extensive quality-control and analysis program in place	We are acknowledged leaders in this area
RESPONSES	**2**	**5**		**6**			
What is the staffing of your ocean data center, in terms of labor available every year? (Results given here are the average of all complete responses)	Director 3/4	Computer systems person 1/2	Secretary 2/3	Clerk/Typist 1/6	Scientist/ Analyst 1 1/6	Other (Programmer, accountant given as examples) 1/2	

ANNEX VI

FIRST ODINAFRICA-II OCEANOGRAPHIC DATA MANAGEMENT TRAINING COURSE FOR THE IOCEA REGION

Casablanca, Morocco, 2-13 April 2001

PARTICIPANT ASSESSMENT

NAME:
COUNTRY:

1. What were your expectations for this course? **1. Quelles sont vos attentes de cette formation?**

2. What parts of this course did you find most interesting? **2. Quelles parties de cette formation vous semblent-elles la plus interessante?**

3. What parts of this course did you find least interesting? **3. Quelles parties vous semblent-elles moins interessantes?**

4. What parts of the course would you like covered in more detail? **4. Quelles parties du cours aimeriez-vous avoir plus de details?**

5. **What parts of the course would you like covered in less detail?** **5. Quelles parties du cours aimeriez-vous avoir moins de details?**

6. Were your computer skills adequate to complete the class exercises? **6. Votre competence informatique vous a-t-elle permis de suivre les exercices ?** YES/NO OUI/NON

7. If NO, in what area do you require additional training? **7. Si NON, dans quel domaine aimeriez-vous avoir une formation supplementaire?**

8. Any other comments **8. Commentaires**

ANNEX VII

INTERSESSIONAL ASSIGNMENTS FOR WORKSHOP PARTICIPANTS

Task	Deadline
1. Develop a national catalogue of ocean related data holdings and data providers and • Submit the catalogue to the Training Program Coordinator (Dr. Murray Brown) When approved: • Submit the catalogue to the ODINAFRICA Information Services Centre for inclusion in the ODINAFRICA web site • Distribute the catalogue to all national data providers	August 2001
2. Obtain details on the national data holdings and enter into a MEDI-based metadatabase of national data holdings • Submit batches of the catalogue to the Training Programme Coordinator (Dr. Murray Brown) in 3-monthly intervals When approved: • Submit metadatabase to the ODINAFRICA Information Services Centre for inclusion in the ODINAFRICA web site	As from December 2001
3. Advertise your NODC services at national level • Report to the Training Programme Coordinator (Dr. Murray Brown) in 3-monthly intervals on your national promotional activities • Send copies of the reports to the ODINAFRICA Information Services Centre for inclusion in the ODINAFRICA web site	As from May 2001
4. Set up your NODC oceanographic database • Identify suitable datasets available in your institution • Use the CruiseReport database application or TSV-O • Enter the data into the database • Check data formats and values (basic QC) by entering in ODV and synthesis with WOD98 data • Submit first batch of the database to the Training Programme Coordinator (Dr. Murray Brown)	As from February 2002
The Training Programme Coordinator (Dr. Murray Brown) will send you data in 'the format of the month' and you will be given tasks to perform on these data such as import, conversion, plot, etc.	As from June 2001

Contact Information:

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ANNEX VIII

IODE Resource Kit
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	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
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	Maps
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	Dataset Products
	Analysis Products
	Data Atlases
	Web Options