

# INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

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## OceanTeacher/ODIMex (Dr. Murray Brown)

### *Introduction*

The objective of OceanTeacher is to provide training tools for Oceanographic Data and Information Exchange. These tools are used during IODE Training Courses but can also be used for self training and continuous professional development. Early prototypes were used in various ad-hoc training activities in the late 1990's, but the current system of resources was initially developed in 2000, during the ODINAFRICA II program. Since that time Information Management materials have been added to the initial Data Management resources, and very intensive training activities have been based entirely on OceanTeacher (both in ODINAFRICA and ODINCARSA). The system continues to grow, and evolve structurally, to meet current training needs. Areas of special growth have been operational oceanography and biological oceanography.

### *Past Activities*

#### **Overview**

OceanTeacher (OT) is now being expanded and technically re-tooled by a project called ODIMEX funded by Flanders, over a period of 4 years (2004-2007). There is on one hand the progress that OceanTeacher made as an IOC initiative (beginning with ODINEA, the predecessor of ODINAFRICA), resulting in a CD-ROM and static HTML web site (<http://www.oceanteacher.org>). On the other hand we have the new project product, which will be much more comprehensive and entirely different in structure. Innovations introduced in the new project will be:

1. OT entirely converted into e-learning environment

2. Peer-reviewed content model
3. Focus now also on training young scientists (not only data and information managers) on general concepts that should be more widely applied in research and operational work
4. Focus on continuous professional development (as opposed to starting data and information centers in developing regions)
5. Greatly expanded coverage of operational oceanographic concepts, processes and products
6. Addition of biology and diversity themes

### **ODIMEX-Sponsored Restructuring**

At workshops in Southampton, England (2003) and Capetown, South Africa (2004) the entire outline of OT was extensively studied and re-drawn, with a view toward combining elements common to both data and information areas, and to providing the optimal resource platform for the expansions and re-focusing described above. Additionally, this work was constrained by the intention to transfer the entire body of materials to an online distance learning system (to be selected). In the new system, the mass of primary resource materials will be a topically organized “Digital Library,” paired in binary fashion with “Courses” similar to the current data management Manuals. The Digital Library can be browsed in the normal fashion (as the Resource Kit can be today), but teaching will normally take place through the Course documents which “point” to specific primary resources in a structured way, according to the desired topics for training.

### **ODIMEX-Sponsored Revisions & Updating**

During the second half of 2004, a complete housekeeping of all the materials in OT was begun. Pursuant to the above list of desired innovations, large amounts of older material captured from websites was replaced by newer, small versions with lesser chance for outdated or broken hyperlinks; the operational oceanography theme was supported throughout the structure by the addition of new material; biology and diversity themes were similarly supported; the “bridge” between information and data (Division 2 – Information Technology and Scientific Communication) was initiated and supplied with valuable materials that had been badly needed for some time (e.g. communications infrastructure); an intensive survey of state-of-the-art online data products was added; and software related to operational oceanographic products has been added to the Toolkit. In the process, in line with the intention to foster a Digital Library containing substantive materials, many areas previous covered by elementary descriptions derived from secondary sources have been replaced by many PDF file copies of original sources. The new structure (which includes only data management materials at this time) consists of 5333 files, occupying 1006 MB. This 2.5X increase is an indication of the enormity of the revision and updating project. The final Digital Library will probably be approximately 1.5+ GB when information management materials are included.

## Digital Library Structure

The new content structure is as follows:

1. **Oceanography Today** - Contains resource materials describing the marine sciences as practiced today, with special emphasis on data and information management practices in research, routine surveys and operational programs.
2. **Information Technology & Scientific Communication** - Contains materials covering basic usage of computers for data and information management, and advanced topics on the use of metadata to find and utilize these resources.
3. **Information Management Principles** - Basic coverage of information management principles, without regard to specifically "marine" applications
4. **Oceanographic Information Management Processes** - Specific applications of information management principles to oceanography
5. **Data Management Principles** - Basic coverage of data management principles, without regard to specifically "marine" applications
6. **Oceanographic Data Management Processes** - Specific applications of data management principles to oceanography
7. **Examples** of different file formats
8. **Exercises** - Tutorials, practical instructions and illustrations of methods.

## OceanTeacher Courses

The following course manuals have been completed, and will be used for the first time in April, 2005 (Oostende Data Managers Training Workshop):

### Interdisciplinary Courses

1. **ID 101 Computer Basics** - Overview of the personal computer system (hardware & common software)
2. **ID 102 Internet Basics** - Using the World Wide Web/Internet for communications and obtaining and publishing marine data & information
3. **ID 103 Information, Data & Metadata** - Introduction to basic concepts; metadata; data centers; catalogs & indexes; related technology programs; programmatic aspects of marine data archiving & publication
4. **ID 104 Introduction to Oceanography** - Basic concepts; survey of major science disciplines; survey of major resources; research programs, survey programs and operational programs; agencies and authorities

### Data Management Courses

- **DM 101 Introduction to Ocean Data** - Oceanographic measurements (parameters, units, conventions); programmatic and technical aspects of data collection; data formats used for ocean data and their special characteristics

- **DM 102 Ocean Data Collection Management** - Building a national ocean data collection from the World Ocean Database 2001 and other local and published data sources; basic data analysis with popular software programs

Approximately ten other courses are currently listed for preparation.

## **Current Content**

OceanTeacher is currently the largest stand-alone, single-topic teaching system on the World Wide Web. It incorporates the following physical resources:

1. Total size (February, 2005): 1.45 GB
2. Over 6000 individual files of all types (HTML and PDF formats dominate in the documents; JPG format dominates in the graphics)
3. About 3600 illustrations
4. Considerable internal cross-linking (14,500 links) integrates the entire system; in addition, OceanTeacher is massively linked to external resources (13,800 links)
5. It incorporates many oceanographic textbooks previously difficult to find on the Web; these are being integrated into the fabric of OceanTeacher on a per-chapter basis to meet the Digital Library content standards set out above
6. It can be used online or (now) on DVD

## **Objectives & Benefits**

OceanTeacher provides a broad platform for all IOC training work in ocean data management and information management, both within formal workshop venues and in informal situations. The former situations are exemplified by the ODINAFRICA and ODINCARSA training programs, which are based 100% on the use of OceanTeacher. Because OT is designed to develop local teaching skills as well, it is already being used by National participants in their own training programs. An example of the latter case would be when questions are submitted to the IOC on subjects that are covered by OT. Responding officers can now simply point to the proper subject materials (either within the Digital Library or as covered by a specific Course), rather than have to spend the time gathering the information on an ad hoc basis. In many cases questions regarding data processing (one of the most frequently encountered inquiries) can be addressed by a reference to one of the Roadmap Tutorials which contain step-by-step illustrations of methods.

The “binary” model used by OT, consisting of the Digital Library paired with individual Courses that refer to objects within the Library, has been extremely successful. It is now possible to develop new courses with a minimum of effort, providing the basic materials are already present. New material necessary to create new courses can be added to the Library quite easily, due to the very comprehensive taxonomy of data and information topics adopted at the Capetown Workshop in 2004.

## ***Proposed Activities***

The following list of anticipated activities is based both on the ODIMEX list of activities for 2005 (a fairly broad set of goals) and the very practical set of objectives necessitated by the new ODINAFRICA-3 training program:

1. Addition of new materials supporting operational oceanography, biological oceanography, information management, circulation modeling, data collection methods and tools, data analysis methods and data quality control
2. Addition of Courses in marine information management (not yet identified)
3. Completion of approximately 10 additional proposed Course manuals (including 1 identified for Marine Biodiversity)
4. Addition of synthesis articles to summarize collected materials in many different topical areas
5. Continued updating of all software resources (as new versions are published) together with necessary updates to Exercise materials that relate to these programs
6. Addition of special materials and a Course dealing with the development of climatological data and ancillary geographic data in support of operational ocean modeling
7. Develop an external authors' pool to assist in further development of Library resources
8. Further testing and use of OT in ODINAFRICA, ODINCARSA and ODINCINDIO training activities

## ***Assessment Methods***

The use of Course manuals by student trainers (i.e. former students working to be "certified" as IOC trainers) at the 2003 ODINCARSA workshop was an unqualified success, based on the completion of a complete curriculum by the student trainers (using volunteer students) without intervention by the IOC observer/facilitators. Finally, we are aware from user statistics that approximately 8000 individual page views occur each year at the website for the older version of OceanTeacher. Whether these visits are part of self-training or simply occasioned by normal browse-and-search activities is not known.