

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of UNESCO)

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Information Exchange (IODE-XIX)**
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OceanTeacher/ODIMex

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1. OCEANTEACHER OBJECTIVES

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. The early prototypes of OceanTeacher were used in various ad-hoc training activities in the late 1990's, but the first version of the current system of resources was initially developed in 2000, during the ODINAFRICA II program. The initial Data Management resources have been extended since that time with training materials on Information Management and specialized training courses such as Geographic Information Systems (GIS). Very intensive training activities in the framework of regional networks (ODINAFRICA, ODINCARSA, ODINECET, ODINCINDIO) have been based entirely on OceanTeacher. The system continues to grow and to evolve structurally, to meet current training needs. Areas of special growth have been operational oceanography, geographical information systems and biological oceanography.

2. OCEANTEACHER BENEFITS AND USAGE

2.1. Training courses

OceanTeacher provides a broad platform for all IODE training activities in ocean data management and information management, both within formal workshop venues and in informal situations. OceanTeacher has been used in the period 2005-2006 in the following training courses, all organized at the IOC Project Office for IODE (Ostend, Belgium).

- **ODINAFRICA Basic Oceanographic Data Management Workshop**, April 11-29, 2005
- **ODINAFRICA Marine Information Management training course**, August 15 – September 03, 2005
- **ODINCINDIO Ocean Data Management training course**, October 10-22, 2005
- **ODINCARSA Basic Oceanographic Data Management Training Workshop**, November 07-19, 2005
- **ODINCARSA Marine Information Management Training Workshop**, November 09-19, 2005
- **ODINCARSA Oceanographic Data Management Training Workshop (advanced)**, November 21-26, 2005
- **Training course on development of electronic repositories on marine related publications from Africa (ODINPubAfrica)**, December 05-09, 2005
- **ODINCINDIO Marine Information Management Training**, February 13-24, 2006
- **Marine Information Management training for the ECET (European Countries in Economic Transition) countries**, March 13-24, 2006.
- **Ocean Data Management training course for the Indian Ocean Countries**, May 8-19, 2006
- **Joint IODE/IOI (International Ocean Institute) Training Course on the GIS and Remote Sensing Data**. September 18-23, 2006
- **ODINAFRICA Advanced Data Management workshop, Dates: September 25-29, 2006.**

OceanTeacher was also used during 'training-of-trainer' events:

- **ODINCARSA Ocean Data Management Training**. Dates: November 21-26 2006. 8 trainees.
- **ODINAFRICA Advanced Data Management workshop**, Dates: September 25-9, 2006.

In total 15 trainees participated in 'training-of-trainer' events.

Besides these courses and workshops OceanTeacher has also been used a number of training courses outside the Project Office in Ostend.

- **HELCOM/BSRP/ICES and IOC/IODE Training Workshop**: Baltic Sea Data Collection, Management and Synthesis. Vilnius, Lithuania. Dates: October 24-28, 2005.
- **SC/IOC – ADRICOSM-Ext Data Management Workshop**. Trieste, Italy. Dates: March 29-31 2006.

Because OT is designed to develop local teaching skills as well, it is already being used by National participants in their own training programs in their home institutions. 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.

3. NEW VERSION OF OCEANTEACHER

The previous static html version of OceanTeacher, which has grown steadily over the years (2000-2006), has now been transformed into an Integrated Expert and Training System for Oceanographic Data and Information Management (ODIMEX) using the existing OceanTeacher system and content as a basis. This work was carried out in the ODIMEX project which was funded by Flanders over a period of 4 years (2004-2007).

The Kewl.NextGen eLearning software was used to implement this new system. The new version is a single integrated e-learning and expert system providing all the expert and training resources for marine data management and marine information management needed by professional ocean data and information managers and scientists involved in data management. It also provides the knowledge required by ocean researchers and students to interact effectively with their national oceanographic data centers.

The new system takes the 'binary' structure concept of the 'old' OceanTeacher framework as a starting point. The system serves both as an e-learning platform (the 'training manuals' of OceanTeacher) and as an encyclopedia style learning resource (the OceanTeacher Resource Kit). It allows developing 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. The system enables users to browse the content freely or follow a specified course, as in the existing OceanTeacher Resource Kit.

The new OceanTeacher has the following characteristics:

- A Dynamic Content Management System (DCMS), enabling the editing of content online;
- A hierarchical tree structure, enabling directory style browsing.
- The ability to manage various types of content, including text, documents and links, with the possibility to add metadata for each type;
- The system is indexable by search engines (e.g. Google) and provides functionality for its resources to be harvestable. It allows distributed searching, complying with protocols such as OAI-PMH and z39.50.

- The system is partially or fully exportable to a CD-ROM or DVD for distribution in countries without good internet access.

During the first half of 2006, the scheduled migration of OceanTeacher resources into the KEWL architecture was delayed when the massive size of the current resource base proved too large for the existing import mechanisms. Since June, 2006, an expert team has developed new migration/import systems that have finally succeeded (by late December 2006) in unprecedented ingestion of such a large corpus of files. The new version of OceanTeacher, based on the KNG software will be launched in March 2007. The URL is <http://www.oceanteacher.org>.

The system will be used during capacity building activities organized in the framework of regional IODE networks: ODINAFRICA, ODINCARSA, ODINECET and ODINCINDIO. There is also a need for such a resource in developing countries and countries in transition since there is a lack of specific curricula for data and information management at universities.

4. CONTENT OF OCEANTEACHER

4.1. 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 (January, 2007): 1.8 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

Digital library

The content of the digital library 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.

Courses

The following course manuals have been completed and are available in the new version of OceanTeacher.

Interdisciplinary Courses

- [ID 100 Introduction to OceanTeacher](#) - Overview of contents and structure, with links some sections of major interest.
- [ID 101 Computer Basics](#) - Overview of the personal computer system (hardware & common software).
- [ID 102 Internet Basics](#) - Using the World Wide Web/Internet for communications and obtaining and publishing marine data & information
- [ID 103 Information, Data & Metadata](#) - Introduction to basic concepts; metadata; data centers; catalogs & indexes; related technology programs; programmatic aspects of marine data archiving & publication
- [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

Information Management Courses

Information Management training exercises consist of highly individualized workshop and classroom activities tailored closely to the specific learning requirements of the instant student group. In general, however, the exercises and lessons follow the main and secondary headings in the '[Information Management Principles](#)' and '[Oceanographic Information Management Processes](#)' chapters of the digital library of OceanTeacher.

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.
- [DM 103 Ocean Data Products & Synthesis](#) - Ocean data products: Synthesis of ocean and related data products in GIS; active server applications
- [DM 104 Ocean Data Intensive Workshop](#) - Compressed curriculum for DM 102 and DM 103 only; for working data professionals with IODE background or equivalent
- [DM 200 OceanTeacher Advanced Training Workshop](#) - To orient graduates of the Basic Level training to significant new materials in OceanTeacher, and to provide practice in teaching methods
- [DM 202 Marine Biodiversity Data Management*](#)
- [DM 203P Geographic Information Systems for Coast & Ocean Management](#)
Based on ArcGIS software
- [DM 204 Remote Sensing Data Management for National Data Collections](#)
- [DM 205 Ocean Modeling Data Support](#)
- [DM 209 Oceanographic Data Quality Control](#)

A number of other training courses are currently under development:

- DM 201 Operational Oceanographic Data Management
- DM 203N Geographic Information Systems for Coast & Ocean Management
Based on non-proprietary software (Saga and MapWindow)
- DM 206 National Oceanographic Data Center Website Development
- DM 207 Marine & Coastal GIS Atlases
- Based on non-proprietary software (Saga and MapWindow)
- DM 208 Sea Level Data Management and Analysis

4.2. New materials and courses (2005-2006)

New Content Items in OceanTeacher added in 2006

1. Entirely New
 - a. Exercises: 29 Data Management Roadmaps
 - b. Courses: 4 (DM 104*, DM 200, DM 203, DM 209)
 - c. Examples [entire division revised and updated]: 206 sample data format files and categorical index; integrated from files formerly located elsewhere and/or from new files required by new Roadmaps
 - d. Software Toolbox: 6 programs, descriptions and install packages (IDV, Saga, MapWindow, Bzip2, FileZilla, GRADS**)

- e. Format Converters: 5 (plus ancillary information and examples in Roadmaps)
- f. Special Data Collections: 3 (Sediment Thickness, Landcover, World Ocean Atlas in ODV format)

In total 253 entirely new content items have been added in 2006.

2. Significantly Re-Written
 - a. Exercises: 26 Data Management Roadmaps
 - b. Courses: 3 (DM 102, DM 103, DM 205)
 - c. Digital Library: approximately 100 (mainly in Geopolitics of Oceanography, Technical Aspects of Quality Control, Coasts & Landmarks, Formats Conversion, and Integrated Data Formats)

In total approximately 129 entirely new content items have been added in 2006.

* Survey course, based on other courses

** Restored after long absence

4.3. Video lectures

A number of video lectures were recorded during training events at the IODE Project Office for IODE in 2006. Video lectures have the advantage that the trainees can repeat the training at home or present the learned skills more easily in their home institution. The lectures were edited and made available in streaming video format in the multimedia section of OceanTeacher (<http://iodeweb1.vliz.be/multimedia/mmhome.htm>). There are 2 different lectures available: Recorded lectures (video film) and Powerpoint presentations with video/audio guidance. At the moment video lectures are available from following training courses:

- **Joint IODE/IOI (International Ocean Institute) Training Course on the GIS and Remote Sensing Data.** September 18-23, 2006.
- **Combined Modeling and Data Management Training Workshop (Jamboree-II).** October. October 8-14, 2006.

5. PROPOSED ACTIVITIES IN 2007-2009

1. WMO agrees to cooperate with IOC to include topics on Marine Meteorology in OceanTeacher. OceanTeacher will be advertised as “OceanTeacher: a training resource for Oceanography and Marine Meteorology”.
2. Creation of new multimedia training materials including video lectures on introductory courses (for self-study).
3. 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.
4. Addition of Courses in marine information management
5. Completion of approximately 10 additional proposed Course manuals (including 1 identified for Marine Biodiversity)
6. Addition of synthesis articles to summarize collected materials in many different topical areas
7. Continued updating of all software resources (as new versions are published) together with necessary updates to Exercise materials that relate to these programs
8. Addition of special materials and a Course dealing with the development of climatological data and ancillary geographic data in support of operational ocean modeling
9. Develop an external authors’ pool to assist in further development of Library resources.
10. Development of University Curriculum.

We note that OceanTeacher is currently a project supported under the Flanders-UNESCO Science Trust Fund (FUST) (<http://www.iode.org/fust>) - project 613GLO2002: Integrated Expert and Training System for Oceanographic Data and Information Management ODIMeX - through which US\$ 382,800 was received covering the period 2004-2007. The Project has been managed through the IODE Steering Group for OceanTeacher. The Project will end on 31 December 2007.

<p>The Committee will be requested to advise on the further development of OceanTeacher beyond 2007 (ie beyond the current FUST supported project).</p>

ANNEX I SISTER WORKSHEET

Element type: **ACTION**

Code: 32132300

Heading: Further develop and strengthen the International Oceanographic Data Exchange (IODE) system

Expected Result N° 3		Development, dissemination and use by target audiences of an oceanographic data and information management training system (OceanTeacher)	
	Performance Indicator(s)	Means of Verification (data source) (Optional)	Programmed Benchmark (where available baseline data so permit)
1	OceanTeacher continuously updated and available on-line (and on CD-ROM)	http://www.oceanteacher.org	baseline: established target: 200 content items have been added by mid 06; 253 content items have been added by end 06
2	training of trainers	15 trainees trained during 3 events (2005-2006).	baseline: none target: 20 trainers trained by end 2007
3	OceanTeacher use qualified by web statistics and feedback logs	statistics and logs	[baseline: none; target: not less than 1000 visits/month to the site by the end of 2006. Not measurable due to transition of OT to the new version.

[end]