The IODE Resource Kit Pilot Project
(by Greg Reed, Australian Oceanographic Data Centre)

1. INTRODUCTION

The International Oceanographic Data and Information Exchange (IODE) Resource Kit is a CD-ROM based product that contains a range of marine data management and information management material, including software, quality control and analysis strategies, training manuals, and relevant IOC documents. It is a comprehensive self-training and resource tool for newly established Oceanographic Data Centres, designed to assist managers and staff members to acquire the skills to set up and run new IODE centres. The Kit provides a broad spectrum of background information on global data and information archiving activities, specifications for data storage in "standard formats," and the software tools to perform many quality control, subsetting, and analyses techniques. In addition, datasets and information relevant to specific geographical regions can provided as a plug-in "custom pack" to the Kit. While aimed at developing countries, the Kit will be of considerable value to developed countries and their marine science agencies.

2. BACKGROUND

The IODE Officers’ Meeting in February 1998 recommended the development of a Pilot Project proposal for an “IODE Resource Kit CD-ROM” for submission to IODE-XVI. The stated objectives of the IODE Resource Kit were:

- To constitute a computer-based tool as a follow-up and complement to IODE Data and Information management activities;
- To contain a number of modules which address marine data and information management requirements in the marine research process, going from program design to program report;
- To support the development of marine data and information management capabilities.

It was agreed that the project shall:

- Review and revise the ODINEA Course-in-a-box CD-ROM’s core document entitled “A Toolkit of Data and Information Management Modules for ICAM and Coastal Oceanography Programs”;
- Identify suitable data, metadata and information (including IOC documents) to include in the IODE course-in-a-box CD-ROM;
- Identify suitable data formats and format translation utilities to include in the IODE course-in-a-box CD-ROM;
- Produce a beta version of the IODE Resource Kit CD-ROM for submission to IODE-XVI.
The pilot project activities would concentrate on one region and it was proposed to use the IOCINCWIO region in view of the work already carried out on the ODINEA CD-ROM.

3. OVERVIEW OF THE RESOURCE KIT

The IODE Resource Kit provides an “NODC- In-A-Box” development tool for oceanographic data centres. The Resource Kit explains:

- Why data centres play a critical role in data management activities
- How to build a data centre
- What data manipulations and processes are expected
- What software tools and specifications are needed
- How and why metadata about datasets should be indexed and published
- How and why environmental datasets should be published on web servers
- What “customers” the centre should serve
- What “products” the centre should produce

The Kit is designed specifically for countries wanting to set up a data centre. The structure extends the limited approach used in OceanPC, which included only data quality control and some limited analysis functions. The design is based on material presented at IODE training workshops on ocean data management in the IOCINCWIO region held in Mombasa (ODINEA 1997) and Cape Town (ODINEA 1998, ODINEA 1999). The media is CD-ROM and the Kit is browser-driven, using either Netscape or Internet Explorer to navigate. The Resource Kit is written in HTML, with some documents provided in PDF, Word and Excel spreadsheet formats. Software applications are also installed and/or launched from the browser. The data plug-in module is extensively indexed by subject matter.

4. CONTENTS OF THE RESOURCE KIT

The Resource Kit is modular in design and contains four basic modules:

- Module 1. IODE Data Centre System
- Module 2. Data Management Systems
- Module 3: Data Analysis and Products
- Module 4. Regional Data and Information Custom Pack

Module 1 discusses the roles and responsibilities of an oceanographic Data Centre and describes the IODE global network system of Data Centres. It further describes data and information management within a science program and how the data manager can provide valuable data and information sources to managers and project scientists during a science program. Examples of the science and implementation plans are given including Climate Variability Program (CLIVAR), Global Ecosystems Dynamics Program (GLOBEC), Global Energy and Water Exchange Experiment (GEWEX), Joint Global Ocean Flux Study (JGOFS) and World Ocean Circulation Experiment (WOCE). A comprehensive reference library containing relevant IOC manuals and guides, online tutorials and standard reference material is also included.
Module 2 describes some of the skills essential for an ocean data manager including computer systems, database technology, metadata and information management, data observation and collection instructions, data quality control, the use of the Internet for data and information exchange, and an introduction to geographical information systems.

Module 3 describes in detail a number of data formats and the source of collateral data. It also includes a data classroom and software toolbox. The data classroom provides a training curriculum in the use of selected software to quality control and analyze ocean station data, using software tools such as the Ocean Data View and Java Ocean Atlas programs, and standard spreadsheet and relational database programs. The data classroom emphasizes the connections between available software and global databases, based on the use of common formats. The software toolbox provides a number of useful software tools that can be immediately installed and run. Manuals and test datasets are included. These software packages are freeware and shareware applications.

Module 4 is a regional data and information pack that includes environmental datasets, ASFA extracts, Glodir extracts and information and data products for a specific region. This module can be produced for any specified geographical area and is currently available for the western Indian Ocean (IOCINCWIO) region. The scope of the datasets includes ocean station data, satellite imagery, bathymetry and coastlines, weather climatologies, ocean climatologies, and coastal zone GIS coverage.

Modules 1, 2 and 3 of the Resource Kit are provided on a single CD-ROM. Module 4, the data and information custom pack, is provided on a separate CD. Full details of the contents of the Resource Kit are listed in Appendix A.

5. ISSUES FOR DISCUSSION

There are some issues to be resolved to ensure the Resource Kit becomes a useful tool for data and information managers:

Maintenance of the Resource Kit

The Resource Kit will require continual maintenance to ensure the latest software and documentation is included. A project team will be required to coordinate the inclusion of new material and the revision of existing material.

Information Management

The Resource Kit, as it is presented here, has been prepared by a team of experts primarily in the field of ocean data management. There is a lack of material on Information Management. Experts in the field of information management are invited to submit relevant material to the Resource Kit.

Availability of the Resource Kit

The Resource Kit is designed to be viewed with a web browser and the medium can be either CD-ROM or the Internet. The advantage of using the Internet as the medium for delivery is the ease of maintaining and updating the content. This can be done by a project team from various data centres in different parts of the world.
Internet also provides access to the latest material. The disadvantage of the Internet is that it may not be available to all users. A CD-ROM version can be produced at any time for distribution as has been done for the IODE capacity building workshops for the ODINEA project.

**Support for other Language Versions**

The Resource Kit has been prepared in English and many of the documents and software tools are only available in English. The Resource Kit should be available to the entire IODE community and this may require translation into other languages. This will be a major task and will require funding.

**Conclusion**

The IODE Resource Kit Pilot Project provides a valuable self-training and resource tool for ocean data managers and for newly established Oceanographic Data Centres. There is currently over 600mb of online tutorials, reference materials and software tools on the Resource Kit. In addition a further 650mb of regional data and information is available on the data CD-ROM.

The Resource Kit has been produced in English but it is envisaged that the Kit will be available in other languages. A French version of the Resource Kit may be required as a training resource for the ODINAFRICA-II project.

The Resource Kit Pilot Project has been jointly developed by Greg Reed from the Australian Oceanographic Data Centre, Murray Brown of Phoenix Training Consultants, and Peter Pissierssens from the IOC Secretariat.
Appendix A

Detailed Contents of the Resource Kit: Modules 1-3

Module 1. IODE Data Centre System

a. What is a Data Centre
   i. The IODE System
   ii. What is an Oceanographic Data Centre
   iii. Role of a data centre (summary of IOCMG5)

b. Description of Global marine Programs
   i. WOD
   ii. GTSPPP
   iii. GEBCO
   iv. GOOS
   v. GCOS
   vi. CLIVAR
   vii. WOCE
   viii. GODAE
   ix. LOICZ
   x. JGOFS
   xi. GLOBEC

c. Science Plans
   i. Clivar
   ii. Globec
   iii. GEWEX
   iv. JGOFS
   v. WOCE

d. Data Management Policy
   i. AODC
   ii. ICES
   iii. ICES treatment of CTD data
   iv. WOCE Data Policy & Practices
   v. WOCE Data Sharing Policy
   vi. Data Management Guidelines in Mast Projects
   vii. MAST Guidelines for Project Data Management
   viii. MAST Guidelines for Better Practice in Data Documentation

e. Reference Library
   i. IOC Manuals and Guide
   ii. Online tutorials
   iii. Standard Reference Materials

Module 2. Data Management Systems

a. Introduction to Computers
   i. Hardware Systems
   ii. Operating Systems
      Windows 98
      UNIX
      DOS
   iii. Application Software
      MS Excel
      MS Access
   iv. Computer Maintenance
Module 3. Data Analysis and Products

a. Data Formats
   i. Format types
   ii. Major formats
   iii. Other important marine formats
   v. Working formats
   vi. Repformatting methods

b. Collateral Data Sources
   i. Local, National, Regional
   ii. WWW Sources
   iii. Format issues
   iv. Working formats
   v. Catalogue of CD-ROMs

c. Software Toolbox
   i. Overview of Toolbox contents
   ii. Use issues
iii. Functional descriptions of major programs
iv. Catalogue of other Web-published software

d. Data Classroom
   i. Overview of "integrated software"
   ii. Format compatibilities
   iii. Using "Core Schematic"
   iv. Using the "Extension Schematic"
   v. Roadmaps

e. Data Products
   i. Packaging basic data deliverables
   ii. Typical compression methods for large deliverables
   iii. Station charts
   iv. Profiles & Sections
   v. Basic contour charts
   vi. Difference and derived-quantity contour charts
   vii. Regional atlas planning & scoping
   viii. Regional atlas data compilation
   ix. Regional atlas products selection & production
   x. Regional atlas documentation

f. Integrating Data into GIS
   i. Basemap considerations & choices
   ii. Use of images and worldfiles
   iii. Documentation considerations
   iv. Tutorial based on "South Atlantic Hard Bottom" CD

(end of document)