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Marine Biodiversity and Ecosystem Functioning

EU Network of Excellence

Sustainable development, global change and ecosystems

Deliverable D-7-CSP-3.2 Report on training course "biodiversity data management" March 2006, Belgium

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PU	Public	
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Intergovernmental Oceanographic Commission
UNESCO/IOC Project Office for IODE
Technical Report



Flanders Marine Institute

MarBEF/IOE/VLIZ
Training Course on Marine Biodiversity
Data Management

March 6-11, 2006
Ostend, Belgium

UNESCO

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1. SUMMARY

The IOC Project Office for IODE (Intergovernmental Oceanographic Commission of UNESCO Project Office for International Oceanographic Data and Information Exchange Committee), VLIZ (Flanders Marine Institute), MarBEF (Marine Biodiversity and Ecosystem Functioning European Union network of excellence) and VLIZ (Flemish Marine Institute) organized jointly the Marine Biodiversity Data Management Training Course from 6-11 March 2006.

This course focused on biodiversity data management and went into details on specific data needs for taxonomy and geography. The course was a combination of lectures and hands-on activities. The final sessions were devoted to development of a pilot application and reporting and analysis based on this application. A list of the topics that were covered by the course is attached.

Main lecturer was Dr Edward Vanden Berghe, with input from other members of the MarBEF data management team. Two recognized international experts were invited to give guest lectures.

These international experts were Dr Arthur Chapman (Australia) and Mr Tom Webb (UK). The working language of the course was English.

Being a joint IODE/MarBEF training course, the participants to the course were both from EU countries and from developing countries and Eastern Europe. The participants from non-EU countries were sponsored by the IOC Project office for IODE using funds kindly provided by the Government of Flanders. The participant list is included as Annex I.

2. VENUE

The workshop was held at the IOC Project Office for IODE in Ostend, Belgium (<http://www.iode.org/projectoffice/>), from June 6-11, 2006. Locally, the meeting was hosted by the Office Director, Dr Vladimir Vladymyrov, with assistance from the Flanders Marine Institute (VLIZ; <http://www.vliz.be/>) and financial support from the Government of Flanders.

3. PARTICIPANTS

IODE sponsored participants were selected via the regional coordinators of the IODE ODIN (Ocean Data and Information Network). MarBEF participants were selected through the MarBEF organizer (Dr Edward Vanden Berghe). The list of participants and lecturers is provided as Annex I.

4. WORKSHOP PROGRAMME

The following topics were covered during the training course:

- Introduction
- Importance of biodiversity and conservation
- Importance of biodiversity databases
- Demonstrator projects
- Data management
 - Documentation
 - Quality control
 - Back up
 - Exchange
 - Archive
- Biology:
 - Systematics
 - Classification and Nomenclature
 - Taxonomic hierarchy
 - Authority
 - Typification
 - Synonymy
- SQL/Access
 - Building database
 - Different possibilities to represent taxonomic hierarchy
 - Different possibilities to search open hierarchies
 - Demonstrator application
 - Identifying the problem
 - Locating the resources
 - Entering/Importing data from different sources
 - Reporting: Lists, Maps
- Quality control
- Analysis
- Measures of diversity
- Diversity coefficients (including taxonomic distinctness)
- Expected number of species
- Indicators of environmental health
- Measuring effects of natural & man-made disasters
- Monitoring system recovery
- Classification
- Ordination

5. TRAINING MATERIALS

A course CD-ROM was produced containing all resource materials and presentations used during the training course. The content of this CD-ROM is listed below.

- Data: Biodiversity data used in several parts of the programme
 - Cephbase, ethadiopsis, gobius, upeneus: Presence data downloaded from OBIS (<http://www.iobis.org>)
 - NSBS2.mdb: database resulting from the North Sea Benthos Survey (<http://www.vliz.be/vmcdedata/nsbs>), an activity of the Benthos Ecology of ICES

- (<http://www.ices.dk>). Used in the Data Management and statistical parts; demonstration of calculation of diversity coefficients, creating contour plots of diversity...
- Nsbs_dat.txt: same, in delimited text format; used in stats part
 - Macroben.txt: extract from the MarBEF (www.marbef.org) integrated database on soft-bottom macrobenthos. Used in the Data Management and statistical parts; demonstration of calculation of diversity coefficients, creating contour plots of diversity...
 - Database: data management part of the course
 - Data management.ppt: general intro to data management and relational databases
 - Access.ppt: intro to developing relational databases with Access
 - Primer3.mdb: example database developed in Access.ppt
 - Taxonomy.ppt: taxonomy (mainly nomenclature) as relevant for data managers
 - Hierarchy.ppt: various alternatives to implement taxonomic hierarchy in a relational database, plus some other issues
 - Hierarchy.mdb, hierarchy2.mdb: two different implementations of taxonomic hierarchy
 - Biodiv.mdb: example dataset, to link with GIS (ArcGIS, Diva-GIS)
 - Supporting documents
 - Winsept97e.pdf: article in Windows newsletter, about the development of MASDEA
 - Maps
 - EEZ, FAO, Longhurst, Seas: global covers of biodiversity-relevant regions, developed at VLIZ (Exclusive Economic Zones: <http://www.vliz.be/vmdcdata/marbound>; FAO fishing areas, Longhurst ecological regions; Regional Sea names of IHO)
 - Shape Files: various covers created during the workshop
 - Gebco: bathymetry of the North Sea extracted from GEBCO, to be used with the NSBS data
 - Photos
 - Presentations: general presentations not directly part of the curriculum
 - Biodiversity data management: for physical oceanographers; what is special/difficult about biological data?
 - OBIS
 - Some presentations by participants
 - QA: Quality control
 - 0-contents.doc: index of this directory
 - Documents: background documents, downloaded from http://www.gbif.org/prog/digit/data_quality
 - Data Quality

- Principles and methods
- Stats: Introduction to working with R Package (<http://www.r-project.org>); datasets used:
Macroben.txt (abundance data from a MarBEF project); NSBS
 - R Intro v2.pdf: step-by-step manual on how to start with R
 - R-2.2.1-win32.exe: install file for R; check for more recent releases on the web site
 - .rdata: R Workspace, restores all variables and functions created in sessions 2-4 of the R Intro document It contains the following objects:
 - ab.oc – a data frame of abundance and occupancy from working.dat
 - allspp.ranges – alpha- and convex hull range size estimates for all species in working.dat
 - alpha.hull – a function for calculating alpha hulls
 - chull.area – a function for calculating minimum convex hulls
 - macroben – the macrobenthos dataset
 - nsbs – the North Sea benthos dataset
 - ranges.sp – a function to apply alpha.hull and chull.area for a given species
 - ranges.x.sp – a function to apply ranges.sp to a list of species
 - samp – a random sample of 10000 to create a subset of macroben
 - sp.list – a list of species in working.dat
 - working.dat – the subsample of macroben determined by samp
 - Tinn-R 1.17.2.4setup.exe: install file for Tinn-R, a ascii editor to write R code. There are more recent versions of the programme available, but the newer versions seem to be more difficult to integrate with R.
 - Alpha hulls.r: R function to calculate Alpha Hulls (see background reading); can be edited in Tinn-R or any other ascii editor, like notepad
 - Packages: extensions of R, to allow calculating alpha hull. See R Intro for instructions on how to install and use.
 - blighty_2.0-0.zip
 - gpplib_1.3.zip
 - tripack_1.2-10.zip
 - Background papers
 - Brugman & Fox 2003.pdf: Bias in species range estimates from minimum convex polygons: implications for conservation and options for improved planning
 - Johnson & omland 2004.pdf: Model selection in ecology and evolution

ANNEX I PARTICIPANTS LIST

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