Work Package 8

Title

Deliverable 8.12

FixO3 Training Workshop:
Acquisition, validation, quality control and access to (biodiversity) data -
Training course for less experienced users of data products

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EXECUTIVE SUMMARY

In the frame of the FixO3 project a training workshop for two full days, 14th and 15th of June, in Vlissingen, the Netherlands, was organised to introduce less experienced users in methods and techniques for processing biodiversity data, integrating physico-chemical and biodiversity data, and delivering data products that may be required to meet policy needs such as GES descriptors.

A group of six (6) experts in the field of data management and marine observation of biodiversity trained nineteen (19) international participants, from all over the world by means of a series of lectures on theory, practical examples, and hands-on sessions. The participants had been selected out of seventy (70) applicants from twenty-nine (29) countries.

The theoretical and practical classes included introductions to scientific concepts and theoretical models, examples on the practical use of as well biodiversity as environmental data in a range of previous and current European research projects and global programmes, overviews of data repositories and current statistical packages, hands-on sessions on data treatment and analyses, using the (previously explained) repositories and packages, and finally an overview of the use of biodiversity data in policy and legislation.

The participants valued the training course unanimously as very good and excellent (with an average of 4.73 out of 5 points). This holds especially for the lectures and venue which were judged excellent.

The conclusion of the participants was that they were now better able to collate, order and analyse the complex oceanographic data as can be delivered by the FixO3 project.
1. INTRODUCTION

1.1. Background and objectives

In the frame of the FixO3 project a series of workshop and training courses was organized for less experienced users of data, monitoring procedures and data products (April 2015, September 2015 and June 2016, respectively). A training workshop on biodiversity data was organised by NIOZ for two full days, 14th and 15th of June, in the city of Vlissingen in the south of the Netherlands (see programme in appendix 1).

The aim of the training workshop was to introduce less experienced users, who want to improve their abilities, in methods and techniques for processing biodiversity data, integrating physico-chemical and biodiversity data, and delivering data products that may be required to meet policy needs such as GES descriptors.

As the FixO3 project will stimulate the flow of a range of oceanographic data (as well physical, chemical as biological parameters), the workshop helped improve the skills of data-users in collating, ordering and analysing those complex data.

1.2. Organisation of this report

The report presents an overview of the (results of the) application process, the content of the theoretical and practical training, and the evaluation of the training workshop.

2. METHODOLOGY

The workshop consisted of a series of lectures on theory, practical examples, and hands-on sessions, all given by experts in the field of data management and marine observation of biodiversity.

3. RESULTS AND DISCUSSION

Applicants and participants

During the call for participation 70 applications were received. The applicants came from 29 countries all over the world (Figure 1)
All applications were evaluated according to a range of criteria. The criteria encompassed the relation of the study or research, and of the interest and motivation of the applicants into biodiversity and oceanographic data issues. Applicants at the start of their career were prioritised. A total of 10 points could be obtained. Finally 22 candidates, i.e. those scoring 8 points or higher (see Figure 2), were selected and invited. Of these 19 candidates were able to attend (see list of participants in appendix 2).

All participants received a refund for their travel and subsistence costs during the workshop, as provided by the FixO3 project.

**The training course content**

Practical hands-on sessions were accompanied by lectures on the theoretical aspects and examples on the practical use of as well biodiversity as environmental data. This included scientific concepts, theoretical models, examples from previous and current research projects and programmes,
overviews of data repositories, current statistical packages, and finally also the use of biodiversity data in policy and legislation.

**Evaluation**

The participants valued the training course unanimously as very good and excellent (see Figure 3). This holds especially for the lectures and venue which were judged excellent.

Although the practical sessions were valued as very good, some considerations were given regarding the duration of the practical sessions. Several participants indicated that more exercises (especially with the R and Primer programmes) would have been preferred, with more information during a longer period, which would mean that the training should have to be extended to 3 or 4 days.

![Figure 3. Evaluation scores of the FixO3 training workshop at Vlissingen (indicated are average and standard error; maximum score was 5; scores were received from by 62% of the participants)](image)

Irrespective of the tight schedule (see programme in appendix 1) the participants felt there was sufficient flexibility to accommodate the interests of each, and ample time to ask questions at any time. The casual atmosphere was helpful in this respect.

In general the participants judged that the training workshop was well organised and very useful. They indicated that they will use the knowledge for their (PhD) work, understand more about how to manage their biodiversity and environmental data, how to put different kinds of variables to test the hypotheses in their project, and now how to solve practical problems with mathematical and statistical programs.

Also the accommodation at hotel Arion in Vlissingen and social aspects were valued high. This included a nice walk along the beach of Vlissingen (picture 1) and the debriefings in the evening (pictures 2, 3).
Picture 1. The beach of Vlissingen under a raincloud (© V. Macovei 2016)

Picture 2. Exchanging experiences on the workshop during a social gathering in Vlissingen (© M. Frost 2016)

Picture 3. Final evening at Panta Rhei in Vlissingen (© S. Soria 2016)
4. CONCLUSIONS AND OUTLOOK

Altogether, the organisers, lecturers as well as the participants to the FixO3 training workshop in Vlissingen look after an eminent, pleasant and instructive event.

The participants indicated to be now more able to process complex data sets of multidisciplinary nature. This will aid the application of datasets as generated by the FixO3 project.

Several participants requested for a follow-up workshop in the frame of FixO3 with regard to more advanced training in data acquisition and processing.

5. ACRONYMS

Ecoauthor    Scientific writing and Ecological Expertise, Heinkenszand, the Netherlands
FixO3        Fixed point Open Ocean Observatories Network
HCMR         Hellenic Centre for Marine Research, Gourmes, Crete, Greece
IODE         International Oceanographic Data and Information Exchange, Ostend, Belgium
MBA          Marine Biological Association, Plymouth, UK
NIOZ          Royal Netherlands Institute for Sea Research, Yerseke, the Netherlands
OBIS         Oceanographic Biodiversity Information System, Ostend, Belgium

6. ANNEXES

Annex 1: Announcement and Programme FixO3 training workshop
Annex 2: Participants
Annex 1: Announcement and Programme FixO3 training workshop

Title workshop: Acquisition, validation, quality control and access to (biodiversity) data - Training course for less experienced users of data products

Date
14-15 June 2016

Venue/Location
Amadore Hotel Restaurant Arion
Boulevard Bankert 266
4382 AC Vlissingen, the Netherlands
Website: http://www.amadore.nl/hotel-zeeland/vlissingen/arion

Organiser and secretariat
Herman Hummel and Joke van Houte
Netherlands Institute for Sea Research
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Lecturers
- Herman Hummel (NIOZ)
- Sander Wijnhoven (NIOZ, EcoAuthor)
- Sarah Faulwetter, Nicolas Bailly (HCMR)
- Matt Frost (MBA)
- Pieter Provoost (OBIS, UNESCO)

Participants:
Professional researchers and students, that have less experience, and want to improve their abilities, in processing biodiversity data.
Accommodation
In the hotel rooms have been booked (and paid) for all participants from Monday 13 June evening till Thursday 16 June morning (3 nights, incl. breakfast). Also lunch, dinner and a couple of drinks for 14 June and 15 June (for all participants) have been booked (and paid).

Transport
There is a direct train from Amsterdam airport (Schiphol) to Vlissingen (it takes 2.5 hours; leaving from Schiphol twice an hour on xx:16 and xx:46).
Schiphol airport has a railway station in the vicinity of the arrivals halls (1 to 4; see map).
You cannot buy tickets in the train. There are serviced counters to buy a ticket in the hall (see arrow in map).
It is also possible to buy your tickets now already at home through internet. The website to buy tickets is:
(or: https://www.ns.nl/producten/en/losse-kaartjes-toeslagen)

ARRIVALS & SCHIPHOL PLAZA

From station Vlissingen to hotel there is a bus connection (bus-line 56 in front of Vlissingen station, direction “Middelburg station”, leaving twice an hour on xx:00 and xx:30; get out after about 7 minutes at stop “Badhuisstraat”).

From bus-stop “Badhuisstraat” to hotel is 4 minutes walking (to the seafront; see map).
Awards and refund

The FixO3 project offers to the participants of the workshop a (partial) refund of the costs of the workshop.

The refund will include the (cheapest) economy return ticket from your work/home to the venue (for the refund original invoices, tickets and bills have to be sent to the secretariat (copies are not eligible); mind that costs of taxi will not be refunded).
Programme

Day 1: Tuesday 14 June
09:00 - 09:45: Introduction, terms, and concepts on Biodiversity
- Introduction to the workshop (Hummel)
  - Aims of workshop, introducing each other shortly, practical issues
- A few concepts of Biodiversity (Hummel)
  - Overview of definitions for biodiversity at different organisational levels
  - Relation between biodiversity at different organisational level
- How is biodiversity defined in policy (Frost)
  - An introduction on the use of biodiversity in policy and politics

09:45 - 10:30: Networking in marine biodiversity research and in data management
- History of networking in marine (biodiversity) research (Hummel)
  - From 1900 to Horizon2020
- A short history on marine data networking (Bailly)
  - Overview of history and present-day (European and global) marine data infrastructures

10:30 - 11:00: Coffee break

11:00 - 12:30: Biodiversity data management
- Data acquisition (Faulwetter)
  - The importance of sample planning, protocols, data recording. Examples of problems in data management that can arise from bad planning
- Metadata (Faulwetter & Bailly)
  - What is metadata? How do we record it? Why is it so important? Some examples
- IPR (Faulwetter)
  - Property rights and licenses
- QA/QC: the role of quality control, validation and harmonization (Faulwetter & Provoost)
  - What is quality control? Why do we do it? Examples, e.g. a proliferation of synonymous and misspelled taxon names, how would this affect statistical analyses. Which tools exist (e.g. WoRMS, Marine Regions, Lifewatch Belgium) to help standardization...
- Data repositories (Provoost & Bailly)
  - Which major repositories exist, what do they do (e.g. OBIS, GBIF, Fishbase, Dassh)

12:30 - 13:30: Lunch

13:30 - 14:30: Biodiversity data management (continued)
- Tools for data processing (Provoost & Faulwetter)
  - Introduction to mathematical and statistical packages, e.g. PRIMER and R; incl. strength, weaknesses and capabilities of each package

14:30 - 18:30: Practical exercises on biodiversity data treatment
(including: 15:30 - 16:00: Tea break)
- Exercises in data capture, validation, ordering (Faulwetter & Provoost)
  - Data formats and data structure (xls vs databases, local formats vs DarwinCore for data exchange, data atomization)
  - Taxonomy and nomenclature (incl. synonyms, how to find names that are not in WoRMS, ...)
  - Quality control procedures (e.g. following OBIS node manual), incl. geography (georeferencing locations), taxonomy, general integrity checks (e.g. finding problems in
data, standardization and quality control transformations into different formats as csv, xls, problems in UTF-8, ...)

19:00 - Dinner

**Day 2: Wednesday 15 June**

08:30-09:30: Biodiversity data unraveled
  - Spatial and temporal trends in marine biodiversity in Europe (Hummel & Frost)
    - Geographic gradients observed in Europe
    - Trends between physico-chemical data and biodiversity data
    - Which environmental factors explain geographic gradients most?

09:30-12:00: **Practical exercises** on biodiversity data treatment (continued)
  (including: 10:30-11:00: Coffee break)
  - Statistical treatment of biodiversity data (Faulwetter, Wijnhoven & Provoost)
    - The use of Primer and R for basic analyses as MDS, Anosim, Clustering, ...

12:00-12:30: Linking biodiversity and physicochemical data
  - The use of statistical packages in linking biodiversity to environmental (physicochemical) variables (Provoost, Wijnhoven & Faulwetter)

12:30-13:30: Lunch

13:30-16:30: **Practical exercises** on linking biodiversity and physicochemical data
  (including: 15:30-16:00: Tea break)
  - Using statistical packages to link biodiversity to environmental (physicochemical) variables (Provoost, Wijnhoven & Faulwetter)

16:30-17:15: Data sharing and publishing,
  - Data citations, data papers, why and when should we share data (Bailly & Faulwetter)

17:15-18:00: Biodiversity data in conservation, policy and legislation
  - The use of biodiversity in national and European directives, and in conservation and Protected Areas (Frost & Hummel)
    - The implementation of the Marine Strategy Framework Directive (MSFD) and the concept of Good Environmental Status (GES)

18:00-18:30: Wrap-up, workshop evaluation

19:00-....: Dinner
Annex 2. Participants

<table>
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Participants and lecturers to the FixO3 training workshop at Vlissingen, the Netherlands, 14-15 June 2016. (photograph by J. van Houte)


Front row (from left to right): John Paul Balmonte, Rohan PrabhuLal Thakker, Thaysa Portela de Carvalho, Simone Nunes Brandao, Folasade Adeboyejo, Sara Castillo, Jose Antonio Sanabria Fernandez, Natali Lazzari, Maria Cecilia Dalton, Sabrina Andrea Soria