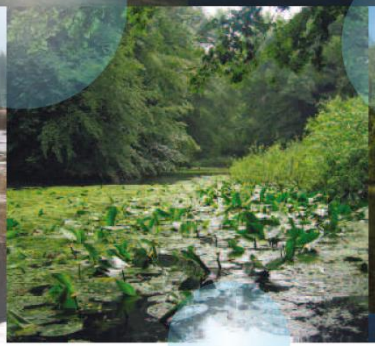
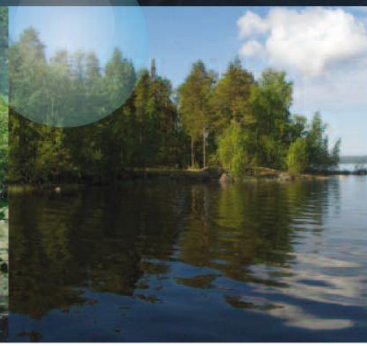

ENV europe
EnvEurope
Bulletin issue n.2

Contents

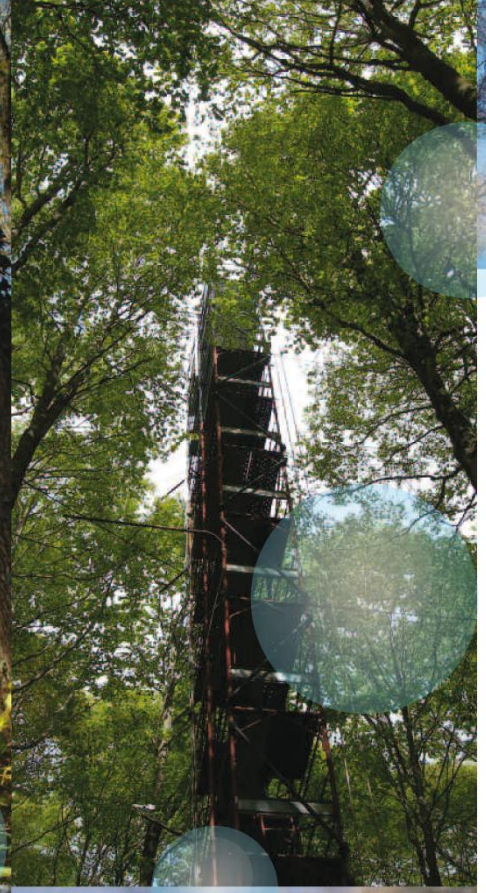




Introduction

EnvEurope, after 30 months implementation, is on the way to achieve the expected results:

- The setting up of an integrated and permanent system of terrestrial, freshwater and marine sites to detect and evaluate, on the long-term, the ecosystem status and quality in Europe along environmental gradients, is in an advanced phase.
- Harmonized methods for assessing key ecological indicators of ecosystem quality, to be long-term monitored, has been developed and manuals with revised and harmonized parameters have been produced.
- Data and information on status and trend of ecosystems at EU scale are at the present time under collection and elaboration.



Data Management

ACTION 1 "Data collection and Management" is led by the EAA (Umweltbundesamt GmbH, Austria), but a Data Management Core Team, consisting of members from EAA, CNR and University of Bucharest, has been formed in order to support the long-term monitoring sites with the necessary data infrastructure in the frame of the project and of the LTER-Europe network.

Within EnvEurope the metadata are provided for the sites as well as for datasets used in the project context. In order to comply with existing standards and recommendations, a screening of existing standards as well as the use within the consortium was done.

An online tool (for metadata entry and data management), called EnvEurope Ecological Information Management System, has been created. This Management System is an extension of the Drupal Ecological Information Management System (DEIMS) developed by the US LTER, it supports the EnvEurope partners in the lifecycle of ecological meta information by editing, search and display not only data but also sites and persons. In the DEIMS, Action 1 develop also an OGC webservice (Web Feature and Map Services) based geoviewer to visualize and share boundaries of LTER sites as polygons. On this basis the community profiles both for sites and datasets are now available at https://secure.umweltbundesamt.at/eMORIS/ as part of the LTER-Europe site description. Metadata on datasets can be found at http://deims.enveurope.eu.

At the moment, in order to meet the requirements of the project and the technical standard of the participating institutions a simplified architecture, using file based data exchange and a centralised database, was decided. This simplified architecture was implemented using EnvEurope DEIMS as MetaData editor, a common data reporting format, and a central database for the check and import of the data files.

To develop an integrated data management, it has been evaluated that, in the domain of long-term ecological research and related projects, Sensor Web Enablement (SWE) and Linked Data (LD) were the most promising techniques to interlink existing data as web services. First tests with D2RQ (http://d2rq.org/) and 52°North (http://52north.org/swe) were performed with the newly created central database.

Finally, a controlled vocabulary for EnvEurope (EnvThes) is under development as the basis for semantic annotation used in the Metadata collection, as well as for further semantic harmonisation of datasets. Current standard vocabularies were screened for their relevance for the domain of long term monitoring. The vocabulary of the US LTER network was selected as backbone and extended by selected concepts from standard vocabularies resulting in a first version of EnvThes. In addition references to GEMET, AgroVoc, EARTh and NatureSDI+ have been established.

Further analysis of Observation and Measurements (O&M) conceptual module, related with international standard (OGC and GEOSS) and INSPIRE Environmental Facilities spatial data theme models for a service oriented data exchange is needed in order to further develop options for service based data exchange of observation data in the ecological domain.

Currently 149 datasets are uploaded to a central data repository resulting in about 58.200 observations from 31 stations covering 77 parameters.

Parameters and Methods

ACTION 2 "Parameters and methods elaboration" is led by UFZ (Helmholtz Centre for Environmental Research, Germany). An expert panel for the different eco-domains inside the EnvEurope community was created and enlarged including also knowledge within LTER-Europe, by addressing national networks.

The main activities were based on: i) elaborating the framework for indicator selection (Ecological Integrity concept), ii) collecting expert knowledge within the EnvEurope and LTER-Europe community, iii) developing data base structures for information related to the manuals to be produced, iv) preparation of the database for recommended indicators, parameters and methods for LTER and v) provision of the first version of the "Manual of harmonised methods for environmental indicators across different ecosystems".

The selection of parameters and methods for new indicators according to feasibility and importance as well as the adjustment and harmonizing of methods for new and already measured parameters at LTER sites is now available, dynamically created from an Excel data base. The concrete result of this activity is a living document about indicators and data quality descriptors available at www.lter-europe.net/ep/ep-std.

The compilation of indicators/parameters in a hierarchical scheme was the result of a process that considered: i) the development of the conceptual background and a set of guiding questions making decisions how to come from processes and functions to parameters traceable, ii) a proposal about focal qualities of monitored systems; iii) a review and selection of abiotic/biotic indicators by compilation of indicators suitable for LTER Europe site; iv) the identification of existing and new indicators for trans-domain and eco-domain specific indication (marine, freshwater, terrestrial); v) a synthesis of identified indicators and parameters already measured at LTER sites.

The actual "Manual of harmonised methods for environmental indicators across different ecosystems" covers a lot of non-ranked parameters. In order to boil down the number of parameters, we started an additional activity creating an online survey (www.enveurope.eu/news/SurvParam) aiming at a ranking of parameters according to different criteria to end up with a ranked list of top parameters.

It is the first time that such a collection of indicators and parameters related to the concept of Ecological Integrity is compiled for the LTER community. Although many methods are known to several sites, for many others they are new in the way they have not been known and considered yet. The harmonization issue is covered by property descriptors of measurable like frequency, scale etc. of measurements, as these characteristics are most important for comparison of data sets.

Cause-effect approach

ACTION 3"Cause-effect analysis and scientific evaluation" is led by University of Bucharest that set up but a number of expert groups according to the different eco-domains. A first set of activities started with and extensive search through literature in order to realise a synthesis paper about the knowledge status on meta-analysis applied in ecology and with exploration of the possible use of meta-analysis in cause-effect analysis and scientific evaluation for the LTER sites. The activity concentrates upon data exploratory tools for ecological research (e.g. Bayesian techniques) and metadata analysis, and on meta-analysis.

A selection of key parameters (around 70) for cross-site and network level analysis have been proposed in the following thematic areas: i) climate and physical variability; ii) human population and economy; iii) biogeochemistry; iv)structure and function of population and ecosystems.

Datasets collected for the key parameters, at least including the last 10-15 years of measurements, will be used in order to perform the analysis of the status assessment, trend /time series, cross-site linkages. In total a number or 149 data files were provided by the project partners. Almost half of the EnvEurope sites (31 sites of the 67 listed within EnvEurope) provided datasets until now. The level of data (observations, monthly or yearly means) varies according to the parameter requested and the use within the project. In total 58.200 records.

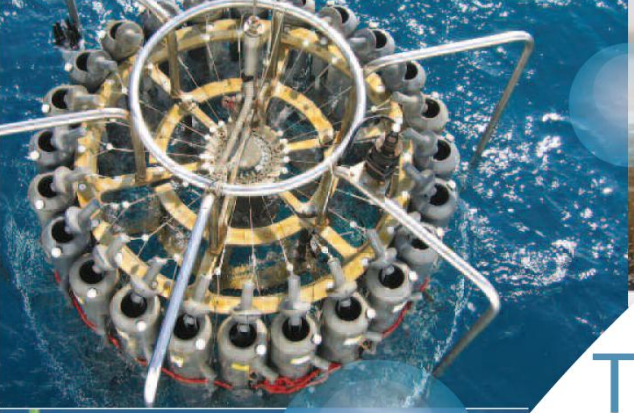
Data collected using different methods (sampling, analysis) have to be tested in order to identify the effect of the method changing on the overall trend. The basic idea, behind this data set creation, is the development of a common database that will be continuously updated in conjunction with the network metadatabase, and the possibility of an integrated analysis for all sites using common selected parameters. To involve partners in the analysis of historical (consider gathering long-term datasets from different sites) and new ecosystem monitoring data coming from a series of LTER sites, a list of 18 research topics ("projects") focused on long term dataset analysis has been proposed by the EnvEurope partnership itself. The descriptions of the "projects" are available on the web page of EnvEurope (www.enveurope.eu/Project/Detailed_actions/action-3-internal-projects). The main aims for setting up the "projects" were: i) evaluate the status, the trends and the cause-effect relationships at different spatial and temporal scales, in different ecosystems; ii) provide statistical information for improving the network design; iii) use long-term ecological data to describe and analyze the main temporal and spatial changes in ecosystems and to define a set of key indicators.

Network Design

ACTION 4 "Network design" is led by National Forest Service (ITALY) in strict cooperation with the University of Rome "La Sapienza" - Department of Biology and Biotecnology "Charles Darwin" and the National Centre for the Study and Conservation of Forest Biodiversity "Bosco della Fontana" (Verona). Besides, all the activities were designed and carried out together with the LTER-Europe Chair and Secretariat.

This Action considers and elaborates all the relevant EnvEurope outcomes, from all the other Actions, in order to produce know-how on the organization (or re-structuring, if necessary) of the LTER-Europe network, to improve the information flow and increase the visibility of LTER-Europe as a reference network for policy makers and environmental managers at the European level. The activities were concentrated mainly in finalizing the acquisition of metadata at site level, organize the further update step of the metadata analyses and set up contacts with GMES (Global Monitoring for Environment and Security). Indeed, since September 2010, Action 4 has mainly dealt with the acquisition of metadata at the site level, for EnvEurope as well as for the whole LTER Europe network, in collaboration with the LTER-Europe Chair and Secretariat. In order to foster and sustain this activity the new Expert Panel called "Network design" was set up in LTER-Europe.

A first analysis of the current LTER network in terms of representativeness of sites, diversity among sites, gaps, connections and overlapping of LTER with other existing networks (e.g. ICPs; Natura 2000, etc.) was realized in order to propose an updated scheme for the LTER network. Results coming from this analysis were discussed inside the EnvEurope and the LTER-Europe community, in order to plan the definition of an integrated and revised scheme of monitoring network. The restructuring of the LTER network will consider the interactions with the potential use of data in relevant European initiatives and processes. From this point of view the analysis of the existing links between LTER network and GMES has been evaluated, by checking with all the EnvEurope beneficiaries the matching among the LTER parameter and the requirements of the in situ GMES component. Next steps will determine the usability of the LTER sites for ground truth validation of environmental data from the space and/or as provider of data inside the GMES perspective.



Testing in the field

ACTION 5 "Testing in the field", led by CNR, involved in the field activities all the EnvEurope sites, managed both by the Project Beneficiaries and by third parties (the project external assistance).

Action 5 represents the experimental phase of the project, based on the sampling in the field of the new and pre-existing parameters and indicators at different level/scales of investigation. The overall objective is to assess the state and trend of European ecosystems for a set of commonly established parameters collected in different ecosystem types.

Parameters, methods and indicators have been decided in interactions with Action 2. The field experimental activity aims at sampling, at all the EnvEurope sites, a set of parameters and important accompanying ancillary/supporting variables. The set has two levels of detail: (i) Level 1, including at least one parameter/indicator for each of the ecological integrity element which represent the minimum common base for the campaign and (ii) Level 2, with the aim of deepen the analysis in as many sites as possible. For complex, large sites where different ecodomains are present, an assessment of landscape scale basic indicators will be accompanied with measurements in at least one of the habitats included in the site. A total of 37 sites participated to the 2011 pilot phase of the testing in the field with nearly 110 parameters surveyed, many of them common among sites. 61 EnvEurope sites participated to the 2012 campaign. Ecodomains are represented as follows: i) terrestrial: 39; ii) lacustrine: 14; iii) marine: 7 and iv) river: 1. The number of measured parameters, divided in level 1, level 2 is as follow: i) terrestrial: 422, 279; ii) lacustrine: 148, 46; iii) marine: 59, 41 and iv) river: 11, 2. In both years (2011 and 2012) some of the parameters entail data collection along the year or in different seasons, so the number of collected data greatly exceed the number of parameters. Samples analyses, preparation and delivery of data collected at the EnvEurope sites participating to the 2011 and 2012 testing in the field is currently on-going and it will be finalized in the first half of 2013.

In cooperation with Action 6 "Dissemination", an "EnvEurope" exemplary event, related to the testing in the field, is currently on-going at the different sites, involving external visitors, scientists, journalist and with media coverage (photo, video). The finalisation of this activity, with on-line dissemination of material, is planned for the first half of 2013.

Communication

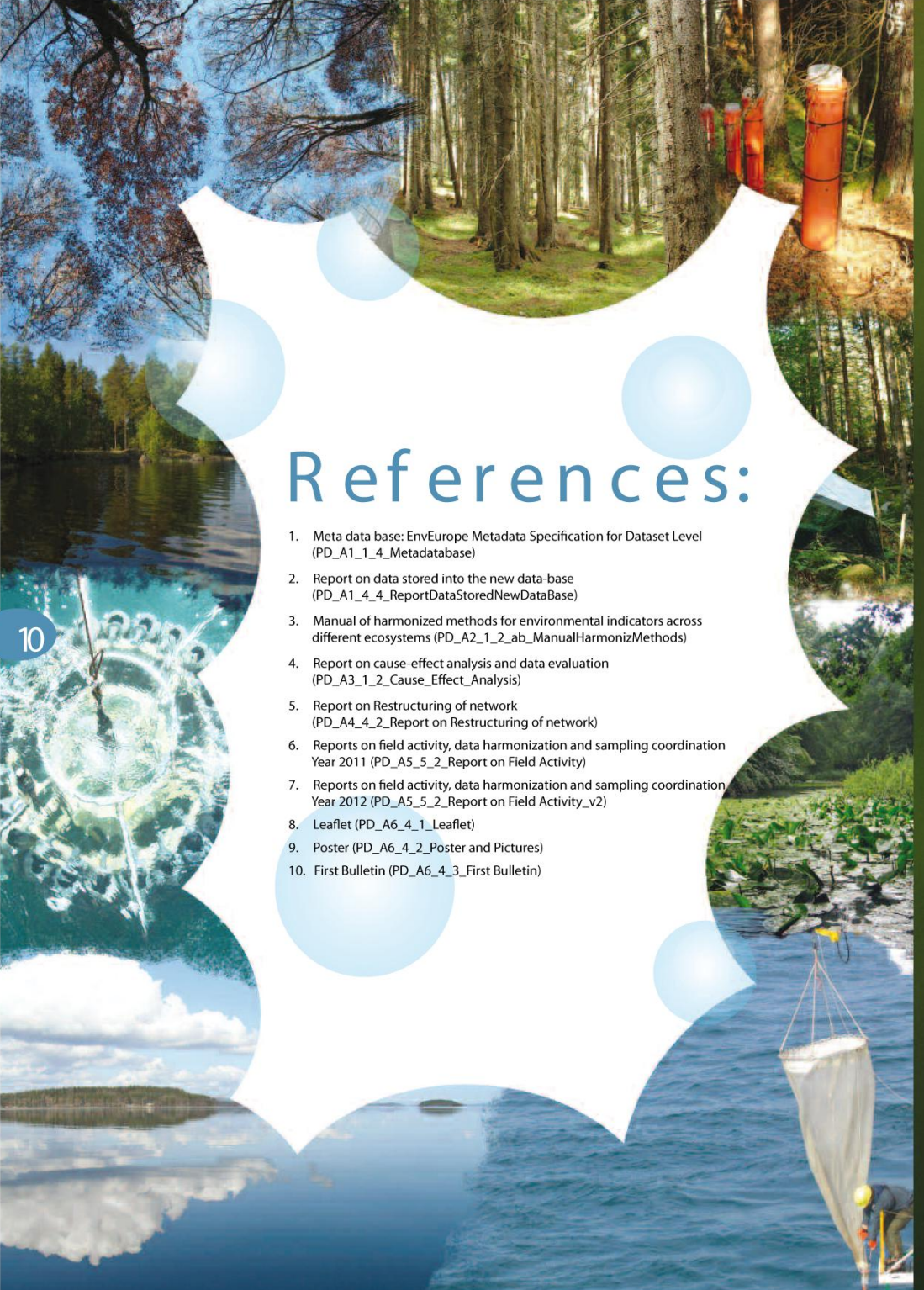
ACTION 6 is led by CNR that appointed an Advisory Committee in order to create interactions, share opinions and comments about the progress of the project with external experts. The Committee has been asked to contribute by estimating the general quality of the activities realized and identifying possible gaps, needed improvements, next possible necessary adjustments.

The scope of the strategic action performed by Action 6 is to contribute at the definition of the schemes and procedures to reorganise the LTER-Europe network, in cooperation with Action 4, as well as to build a strategy of involvement of specialised and very specialised audience in the project initiatives.

The most relevant networks have been selected and contacted, by coordinating at European level partnership activities in several different initiatives. The total number of 23 meetings have been organised under this framework. An average attendance of 20-40 participants each has been recorded, excluding the EEF and IUFRO International Conferences where a participation of more than 100 persons was attained.

The website supplies information and visibility of EnvEurope at a glance. Major revisions have been operated at the website structure and look in the last year: new public pages have been created and populated by contents, documents, pictures, internal and external links and the pre-existent pages has been substantially revised both in the structure and contents. Despite the member area, largely used as document repository, another tool has been implemented: a specific ftp private area, hosted at the CNR-ISMAR server, to permit specifically to the Action Responsibles to share documents, videos and information.

A marked increase in the dissemination activities organization was recorded in the last year. Not only EnvEurope partners but also third parties, involved in the project as external assistance, organised public events to promote EnvEurope goals at a broad community (not just specialised audience). A total of 17 different public events is recorded. The number of participants at these events was quite high; an average participation of more than 75 each could be recorded; at the "R2B", "Hessentag" fairs, in Italy and Germany, and at the "The Long Night of Sciences" (Germany), 500-1000 people approximately attended each event. Moreover, 19 events to disseminate EnvEurope finalities were participated.



References:

1. Meta data base: EnvEurope Metadata Specification for Dataset Level (PD_A1_1_4_Metadatabase)
2. Report on data stored into the new data-base (PD_A1_4_4_ReportDataStoredNewDataBase)
3. Manual of harmonized methods for environmental indicators across different ecosystems (PD_A2_1_2_ab_ManualHarmonizMethods)
4. Report on cause-effect analysis and data evaluation (PD_A3_1_2_Cause_Effect_Analysis)
5. Report on Restructuring of network (PD_A4_4_2_Report on Restructuring of network)
6. Reports on field activity, data harmonization and sampling coordination Year 2011 (PD_A5_5_2_Report on Field Activity)
7. Reports on field activity, data harmonization and sampling coordination Year 2012 (PD_A5_5_2_Report on Field Activity_v2)
8. Leaflet (PD_A6_4_1_Leaflet)
9. Poster (PD_A6_4_2_Poster and Pictures)
10. First Bulletin (PD_A6_4_3_First Bulletin)

Authors:

Daniela Sani [1], Paola Focaccia [2], Alessandra Pugnetti [2], Mariangela Ravaioli [2]

with the contributions of

Cristian Mihai Adamescu [3], Marco Bascietto [4], Alessandro Campanaro [5], Paolo Colangelo [5], Mark Frenzel [6], Giorgio Matteucci [4], Alessandro Oggioni [7], Johannes Peterseil [8]

1 ASTER, Italy

2 National Research Council - Institute of Marine Sciences, Italy

3 University of Bucharest, Romania

4 National Research Council - Institute of Agro-Environmental and Forest Biology, Italy

5 National Forest Service-National Centre Forest Biodiversity "Bosco Fontana" of Verona and University of Rome "La Sapienza"- Dept. Biology and Biotechnology, Italy

6 Helmholtz Centre for Environmental Research – UFZ, Germany

7 National Research Council - Institute of Institute for Electromagnetic Sensing of the Environment, Italy

8 Environment Agency Austria, Austria