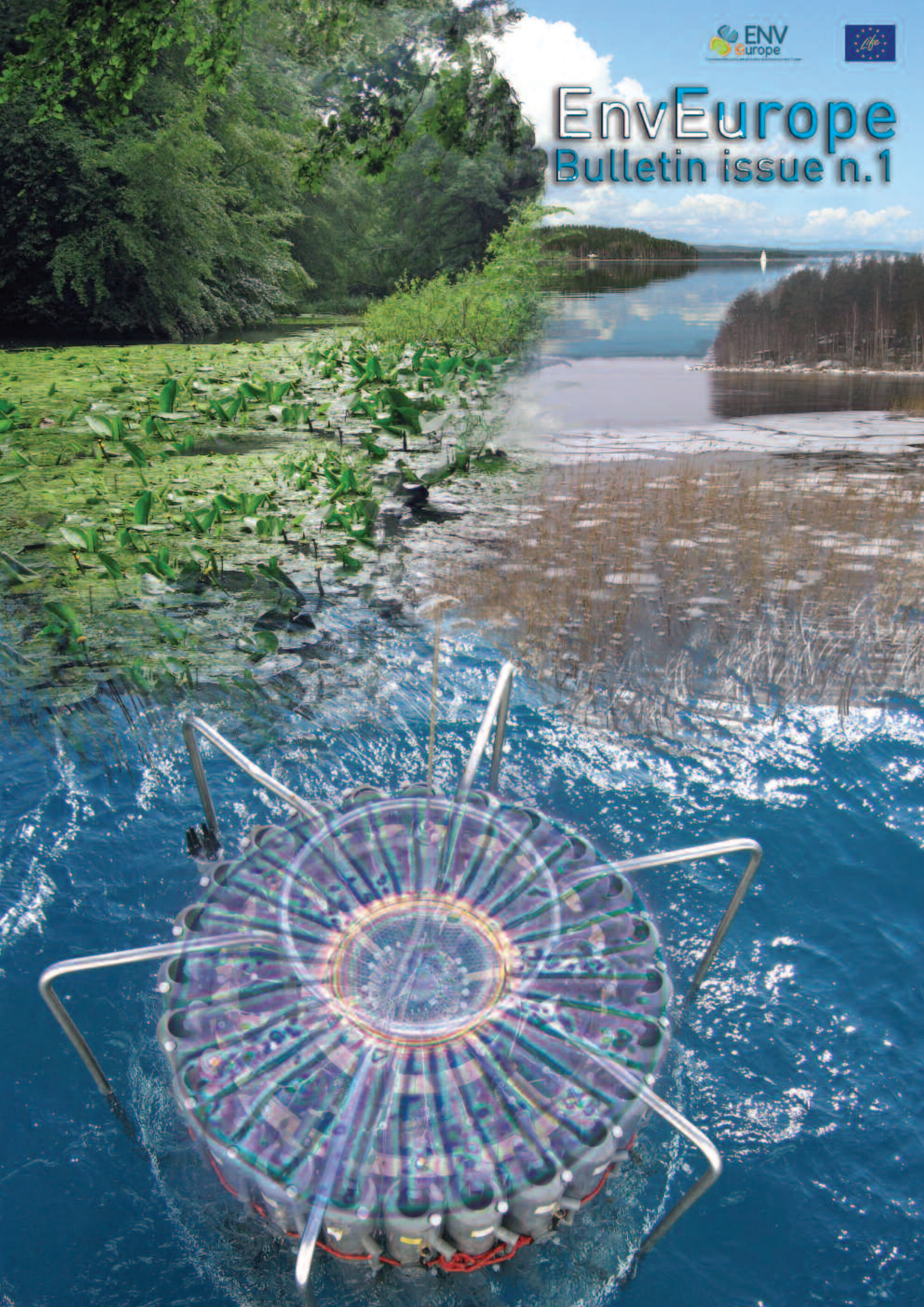
ENV europe
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Bulletin issue n.1

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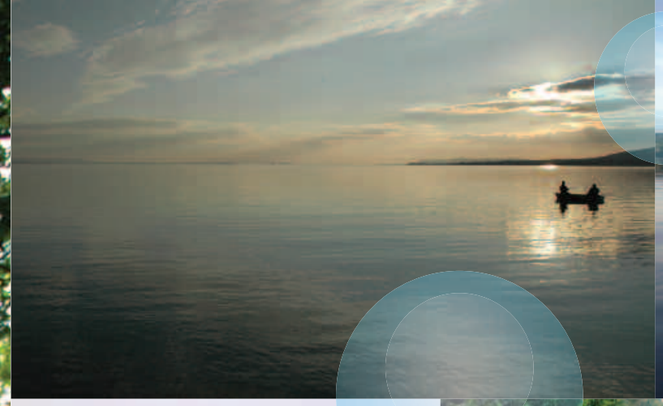
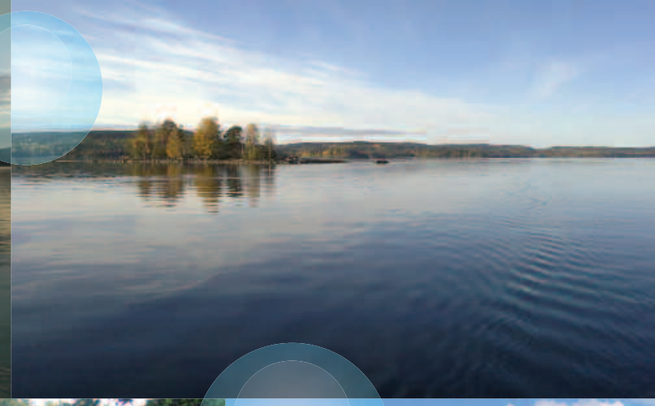




The Project

The potential of long-term ecological studies to recognize and interpret environmental changes is best realized when data on ecosystems are gathered at a broad geographical scale with an harmonized methodological approach. Ecological monitoring and consistent reporting systems need to be improved across Europe – a challenge tackled by the process Shared Environmental Information System for Europe (SEIS) and the GMES initiative (Global Monitoring for Environment and Security).

Within this context, the project "EnvEurope" proposes a design for environmental high quality research and monitoring sites and the exemplary establishment of common parameter sets to be collected across the largest site-based network of Long-Term Ecosystem Research in Europe (LTER Europe, www.lter-europe.net). The current LTER Europe network design (400 ca. sites across 22 European countries), consisting of several national networks with own governance structures, is not yet fully harmonized at the European level. Under this perspective and focusing on three ecosystems types (terrestrial, freshwater and marine ones), EnvEurope selects 20% ca. of the total LTER Europe sites as key-examples of ecological, geographical and ecosystem variability across Europe.

Data Management

Action 1 has been working on giving solution at questions like: How to manage the long-term ecological distributed data? How to manage distributed data sources and heterogeneous data access?

LTER Europe consists of networks of institutions, research sites and people. Sharing knowledge and data to promote research and monitoring in Europe and globally is one of the main LTER goals. However, there is heterogeneity and diversity in the data management systems, as the long-term data are stored in different kind of databases, spreadsheets, text files or even field notes. In this framework, Action 1 has proposed solutions for common problems of distributed and heterogeneous long-term ecological data in Europe.

The solutions are based on metadata collection with standardized methods and common metadata languages both of describing the research sites and data generated there.

The objective is to have information about the network and then about the data themselves. Furthermore, the more suited Information Management practices have to be shared without forgetting the collaboration outside Europe.

"We have been working on metadata and architecture issues", says Johannes Peterseil, the head of the working group, of EAA (Environment Agency Austria, Austria). He tells that the Dataset level metadata will be based on EML and ISO standards and Tomas Kliment (National Research Council-CNR, Italy) was one of the main responsible in doing the work (EnvEurope Metadata Editor on http://enveurope.geocatalogue.ise.cnr.it/deims/). DRUPAL based metadata editor is being developed in US LTER and it is seriously considered to be used instead of Morpho, because of the easy to use interface for metadata input. "Tomas Kliment and Alessandro Oggioni (CNR, Italy) are working on that", Johannes says. Also the site level metadata will be presented in the future using DRUPAL implementation built on InfoBase, the current metadatabase of LTER-Europe.

EnvEurope data management aims to support the network of long-term ecosystem monitoring sites with the necessary data infrastructure and will serve as a conceptual test case for Shared Environmental Information Systems (SEIS). EnvEurope will also support and contribute to ILTER site level metadata portal, which will focus both on site level (e.g. description) and dataset level metadata. With the information included in metadata and data sources, we can produce (analyze and summarise) and we can generate new knowledge about long-term changes in our environment, useful also for policy makers. In fact, Johannes affirms "With all these best practices and tools we can manage the distributed long-term ecological data and provide knowledge for policy makers."








Parameters and Methods

Action 2 is essential for one of the main objectives of the project: the elaboration and harmonization of assessment methodologies for the selected environmental quality parameters at EU level. This is most important for comparability of data gained at hundreds of long-term ecosystem research and monitoring (LTER) sites across Europe. To tackle this issue, Action 2 focuses on the elaboration of a conceptual framework for ecosystem monitoring, the collection of indicators and parameters targeting at structures and processes within ecosystems and the final selection of a core set of ecological parameters to be studied. It aims at producing manuals providing a comprehensive collation of parameters and methods for terrestrial, freshwater and marine sites covering (a) new parameters and (b) often applied parameters, along with the properties important for comparison of data (e.g. scale, frequency, level of detail of measurement). As "New" parameters are regarded as those not usually measured at LTER sites or which are developed for trans-domain comparison.

The general progress relates to (a) elaboration of the conceptual framework for monitoring of ecological integrity, which aims at the ability to sustainable self-organisation of ecosystems as a base for indicator selection; (b) development of user-orientated data base structures for information about indicators which is directly linked to the manuals to be produced; (c) collecting expert knowledge within the EnvEurope and LTER-Europe community.

The main activities were based on (a) specialist group work at technical meetings, (b) development and filling of questionnaires about data gathered at long-term ecosystem research and monitoring sites, (c) development and filling of a database related to the ecological integrity indicators and (d) presentation of EnvEurope outcomes at scientific conferences.

The outputs can be synthesized as follow:

- enlarging the expert base (including knowledge within LTER Europe and by addressing national networks);
- a comprehensive proposal for tuned indicators about focal qualities related to structures and processes (e.g. energy, water, matter fluxes) of systems to be monitored;
- a review and selection of abiotic and biotic indicators, by identifying existing and new indicators for trans-domain and within eco-domain (marine, freshwater, terrestrial) comparison. This is followed by an evaluation of the relevance in terms of feasibility, importance and cost-effectiveness.
- a review and selection of methods internationally established and applied for new and already measured parameters at LTER sites (comparability of data gaining procedures, agreements on revised methods).

Cause-effect approach

Action 3 is dedicated to cause-effect analysis and scientific evaluation focusing both on long-term time series of variables and on data directly collected within EnvEurope, describing ecosystem current status and trends. EnvEurope is taking advantage of the European LTER/LTSER network, comprising more than 400 sites across Europe. A key feature of this network is the emphasis on long-term collection and management of data and information as well as the integration between the ecological and social data over spatial and temporal scales.

A major contribution of Action 3 to EnvEurope project is first to push LTER/LTSER site responsible to share scientific data in a common database, which will then allow further evaluation and development of the concept of environmental quality and its trends across Europe, by means of scientific analysis.

The demonstration dimension of Action 3, coordinated by University of Bucharest, consists actually in defining parameters and gathering common datasets across LTER/LTSER sites and by deriving project proposals aimed at long-term metadata and data analysis, involving as many as possible LTER/LTSER sites. In this way, people can have the opportunity to investigate hypothesis using available and widely diverse data. Furthermore, additional data sets collected under Action 5 can be used as a further series to complete the long-term trend.

The action is perfectly aware about the main concerns of the society towards possible environmental changes and risks. The cause-effect approach of the Action will contribute mainly to the definition of the potential and effective use of long-term datasets in identifying and addressing important scientific questions, while, in the future, it will allow integration of the specific information and knowledge into policies, strategies and development programs.

Action 4 is focused on analysis, further development and improvement of an integrated and permanent system of sites, with the aim not only to gather data on biodiversity, ecological processes and ecosystem services at different scales of observation, but also to reinforce data analysis, information synthesis and knowledge transfer to policy makers and the public.

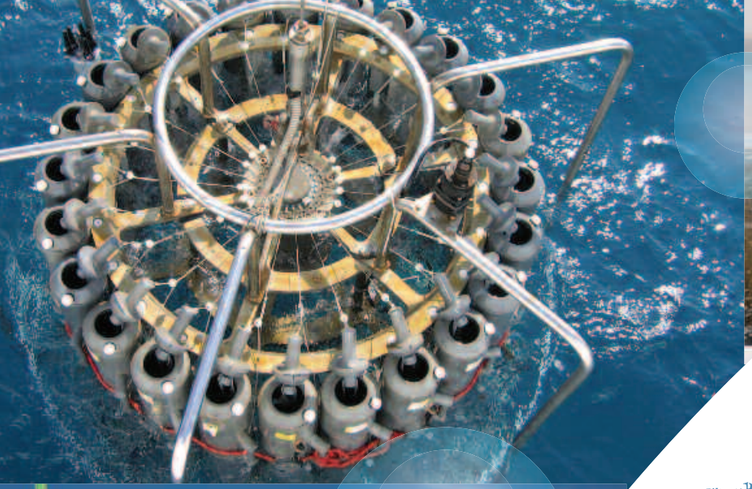
In order to improve the information flow and to support research and monitoring of high quality, Action 4, under the responsibility of CFS (National Forest Service, Italy), aims also at adoption of harmonized methodologies and protocols across the network and implementation of relevant indices to detect and assess variations in environmental quality with respect to socio-economic and environmental similarities and gradients in Europe, building on the work performed by Action 2 and put into practice in the "testing in the field" campaign of Action 5.

Action 4, starting from the LTER-Europe sites declared to EnvEurope, facilitates the participation of non-EnvEurope sites, institutions and countries in the development of excellence in environmental research and monitoring, and sharing know-how to serve the whole European network and to support Global Monitoring for Environment and Security (GMES) and SEIS initiatives. Action 4 is aiming also at linking up EnvEurope network, protocols and methods with Long-term Ecological Monitoring (LTEM) networks (e.g. ICP Water, ICP Forest, ICP Integrated Monitoring) and standards applied by them in compliance with EU regulations.

Network Design

In June 2011, Action 4 in collaboration with Action 1 of EnvEurope, the Expert Panel on Information Management of LTER and the LTER-Europe Secretariat, has updated the list of the LTER Europe sites and contacts, and addressed them with the an updated version of the fact sheet on sites infrastructure, operation and data availability. The survey was focusing on the status of the network and heterogeneity among sites, including: bio-geographical characteristics, instrumentation, linkage to national and international initiatives, applied methodologies, extension of data series, data format and quality. It also identifies the main research topics addressed at the site and their potential to provide reference data from areas of nature conservation.

The preliminary results of the survey were already presented in September at the 8th LTER-Europe Annual Meeting in Avila (Spain) and in November during the Plenary EnvEurope Meeting in Bucharest (Romania). During the LTER-Europe Meeting the progress of EnvEurope Action was discussed with the LTER National Representatives. In that occasion, the LTER Coordinating Committee decided to establish an Expert Panel on Network Design aimed at developing a formal link between EnvEurope and the LTER-Europe Network, at increasing efficiency of actions and giving a green light to implementations of Action 4 deliverables. The new Expert Panel will operate as a joint activity of EnvEurope and LTER, based on members and expertise of both communities. Michael Mirtl (Environment Agency, Austria) was appointed as the lead of this new Expert Panel.



Testing in the field

Action 5 aims at testing the LTER network as a harmonized set of sites by implementing measurement of the parameters recommended by Action 2. This will be realised by the "testing in the field" campaigns where, employing a multi-level and multi-functional approach, a broad spectrum of parameters will be measured aiming also at up-scaling. A preliminary test has been implemented in 2011 on a sub-set of EnvEurope sites but the central year for the campaign is 2012, when all the sites will be participating.

Both pre-existing and new parameters and measurement methods will be used and the action will test the methods and manuals elaborated by Action 2, to which Action 5, coordinated by CNR (IBAF institute, Italy), has contributed. Based on the pre-existing monitoring, assessment of trends will also be possible, in connections with Actions 1 and 3.

According to the variability of the European ecosystems and LTER sites, a set of the recommended parameters are crosscutting among the sites (e.g. meteorology, substrate chemistry, primary productivity, biodiversity), while another part of them is habitat specific. An originality of the project is that the crosscutting set of parameters will be a common base for comparison and evaluation.

By developing a database of commonly established parameters, the Action will support the assessment of the states and trends of the European ecosystems in LTER sites, pointing to the evaluation of environmental quality across Europe. The database will provide ground-truth data to the GMES, and will suit the SEIS initiative in order to contribute to data sharing and publicity.

The LTER sites concerned vary not only in habitats but also in size, complexity, infrastructure, and institutional background. The implementation of the harmonized monitoring will take this heterogeneity into consideration. The actual measurements on the sites, which are not managed by EnvEurope beneficiaries, will be carried on by subcontractors.

Altogether, 9000 data set expected from Action 5!

Communication

Action 6 is focused on strategic actions towards targeted stakeholders (i.e. EU initiatives SEIS and GMES) and dissemination activities towards specialized (networks and scientific experts) and not specialized audience (citizens and policy makers). It's consisting of four sub-actions: Advisory Committee; Strategic Actions; Website and Dissemination.

CNR (ISMAR Institute, Venice and Bologna) is coordinating the Action, while all project partners are differently involved.

The EnvEurope Advisory Committee is composed by the following members: Martin Forsius - Finnish Environment Institute (Helsinky, Finland); Gyula Lakatos - University of Debrecen (Debrecen, Hungary); Stefano Nativi – Italian National Research Council (CNR-IAA)/University of Firenze (Firenze, Italy); Angel Pérez-Ruzafa - University of Murcia (Murcia, Spain); Nadia Pinardi - National Institute of Geophysics and Volcanology (Bologna, Italy).

The scope of Strategic Actions is the involvement of specialised audience in contributing to the definition of the schemes and procedures to reorganise the LTER-Europe network at European level, as well as in collaborating for a common strategy to share data and metadata at European level. In particular, it focuses to join or interact with SEIS and GMES initiatives.

The most relevant European networks have been selected and contacts planned according to the different stakeholder, in order to better focus the expected indicators. Currently Action 6 counts a good number of meetings performed at national level in the different countries (13 events) with an average attendance of 20-40 participants and a very successfully international scientific assembly organized within the 12th EEF Congress 2011 (more than 100 participants; 1000 EnvEurope leaflets included in the EEF official folder were distributed to all Congress attendants!). Congress video is visible at http://youtu.be/UGvm4AU41LY.

Project participants organized 4 public events to promote the project to the citizens' community; the attendance was relevant with an average participation of more than 75 persons each. Information kiosks were set up in coincidence with two of the events (at Researchers Night 2011 in Bologna and Science Festival in Genova).

Lastly, EnvEurope has been presented as a LIFE + project during more than 15 events around Europe.

The web site operates since the project start supplying information and visibility at a glance. In particular, the member area has been largely used by partners to upload-download working documents or share opinions and create discussion on project activities through chat and forum tools.

Different dissemination materials have been produced and are available at the web site: 1 notice board, 2 Leaflets, 3 Posters, 2 roll-ups, 11 articles (scientific/technical and general publications) and several presentations.

References:

1. Report on data stored into the new data-base (PD_A1_4_4_ReportDataStoredNewDataBase)
2. Report on Restructuring of network (PD_A4_4_2_Report on Restructuring of network)
3. Manual with new harmonized methods and Revised manual of pre-existing manuals (PD_A2_1_2_RevisedNewHarmonizMethods_Rev-1)
4. Reports on field activity, data harmonization and sampling coordination (PD_A5_5_2_Report on Field Activity)
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6. Poster (PD_A6_6_2_Poster and Pictures)
7. Leaflet (PD_A6_6_1_Leaflet)

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