



Environmental quality and pressures assessment across Europe



Action 3 – Cause effect analysis and scientific evaluation

Status and next steps

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WHAT?

AIMS of Action 3 (Cause effect analysis and scientific evaluation) in EnvEurope

1. **analysis of historical and new ecosystem monitoring data** coming from a series of LTER sites- part of the EnvEurope project;
2. aims at evaluating the **status**, the **trends** and the **cause-effect relationships** at different spatial and temporal scales;
3. **Provide statistical information** for improving the network design (work with action A4 EnvEurope);
4. Use **long-term ecological data** to describe and analyze the **main temporal and spatial changes** in ecosystems and **define a set of key indicators**;

HOW?

Activities of the action A3

- 1) **METADATA ANALYSIS**
- 2) **ASSESSMENT OF METHOD CONSISTENCY**
- 3) **STATUS AND TRENDS**
 - a. BASED ON THE IDENTIFIED INDICATORS AND THEIR CORRESPONDING PARAMETERS;
 - b. PROPOSE NEW INDICATORS FOR INTEGRATION BETWEEN DIFFERENT ECOSYSTEM TYPES and INTEGRATION AT LANDSCAPE LEVEL);
- 4) **DRIVING FACTORS OF ENVIRONMENT CHANGE**
- 5) **SCALING UP**

HOW?

We have used a layered system for Action 3:

- A) work directly on a **selection of parameters** addressing **4 proposed thematic areas** ;
- B) Involvement of the EnvEurope community as well as the LTER community for the **proposal of common projects** (using the same conceptual background – themes and parameters)
- C) a **selection of indicators** also addressing the 4 thematic areas (or across thematic areas);
- D) work with **meta-analysis on a selection of complex topics** (across thematic areas) allowing in this way a better integration and also a better linkage with the policy makers (better communication).

Expected analysis/
results

Status assessment;
Trend analysis/
time series analysis
Cross-site linkages



METADATA ANALYSIS- Results

PROPOSED 4 thematic areas for both
GENERAL DATA GATHERING and PROJECTS

- a) **Climate and physical variability**
- b) **Biogeochemistry data,**
- c) **Structure and function of ecosystems, communities and populations,**
- d) **Human population and economy**

Results and started activities

1. General data gathering

2. Projects

3. Meta-analysis

Selection of parameters

Tool developed and available (A1 & A3)

List of projects (presentation tomorrow)

Data gathering started

Propose research activities based on the available datasets

All the sites must report on 1 & 2 in July 2010

Process started

Data collection must end in June 2012

To be started



The work up to now was focused on:

<p>General data gathering</p>	<p>Data collection using a general parameter list for each EnvEurope site-</p> <ul style="list-style-type: none"> - This is a <u>MUST</u> for all the sites in EnvEurope; -A MUST also for all the parameters in the list (but depending on the site structure).
<p>Projects</p>	<p>Involvement of the beneficiaries in the development of common projects –</p> <ul style="list-style-type: none"> -problem definition and -data collection;





1. General data gathering



Country
Austria
Bulgaria
Finland
Germany
Hungary
Italy
Lithuania
Poland
Romania
Spain
Sweden



More information in the A1 presentation

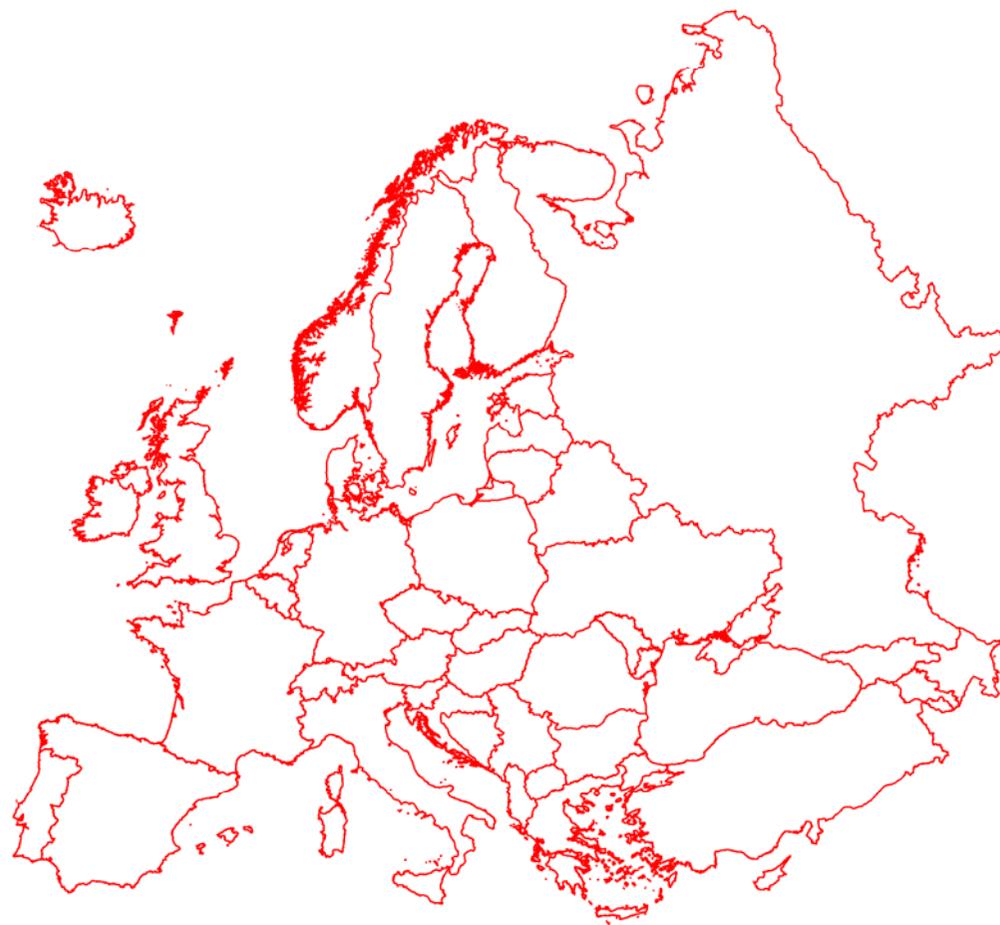
2. Projects

- 17 proposed projects
- 17 descriptions of projects
- 1 project dropped due to low interest
- datasets started to be gathered using the same tool as for general datasets gathering

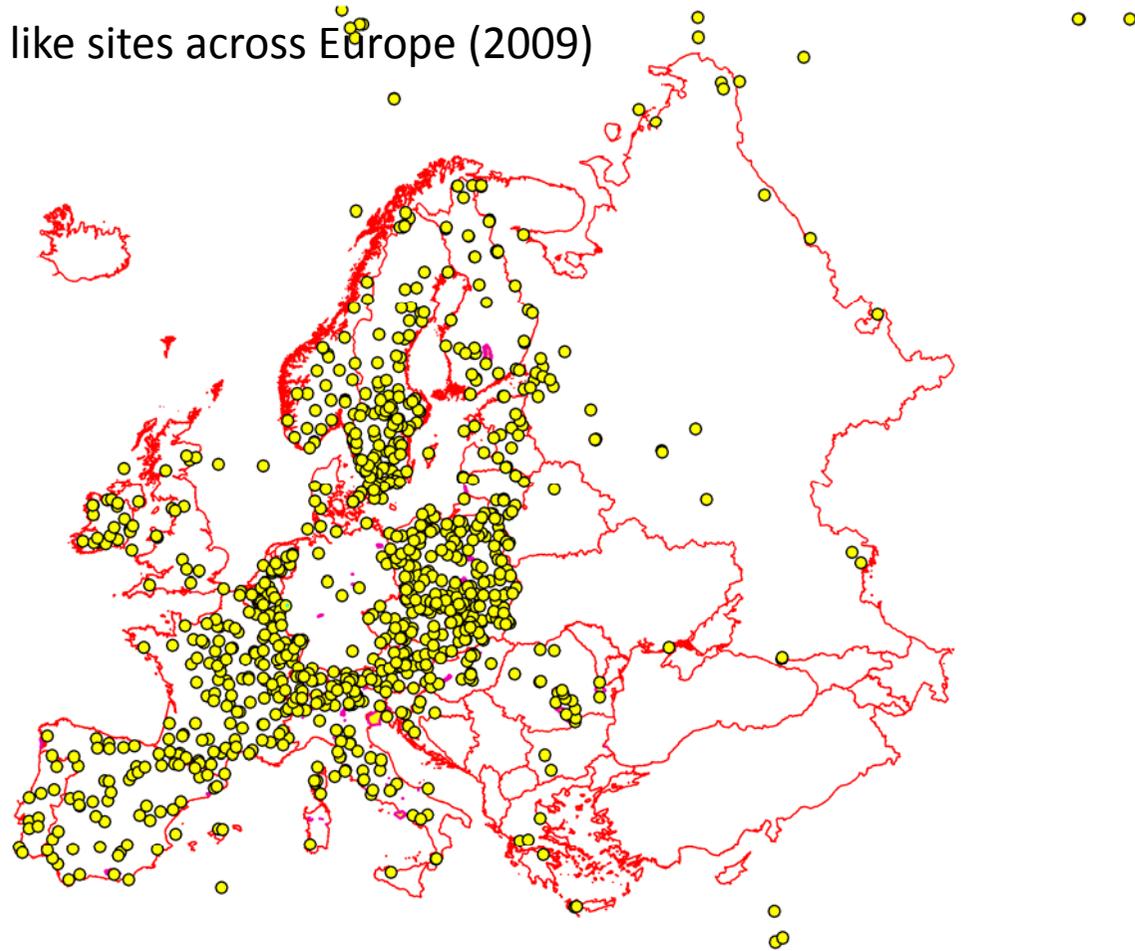
1. General data gathering

Parameters

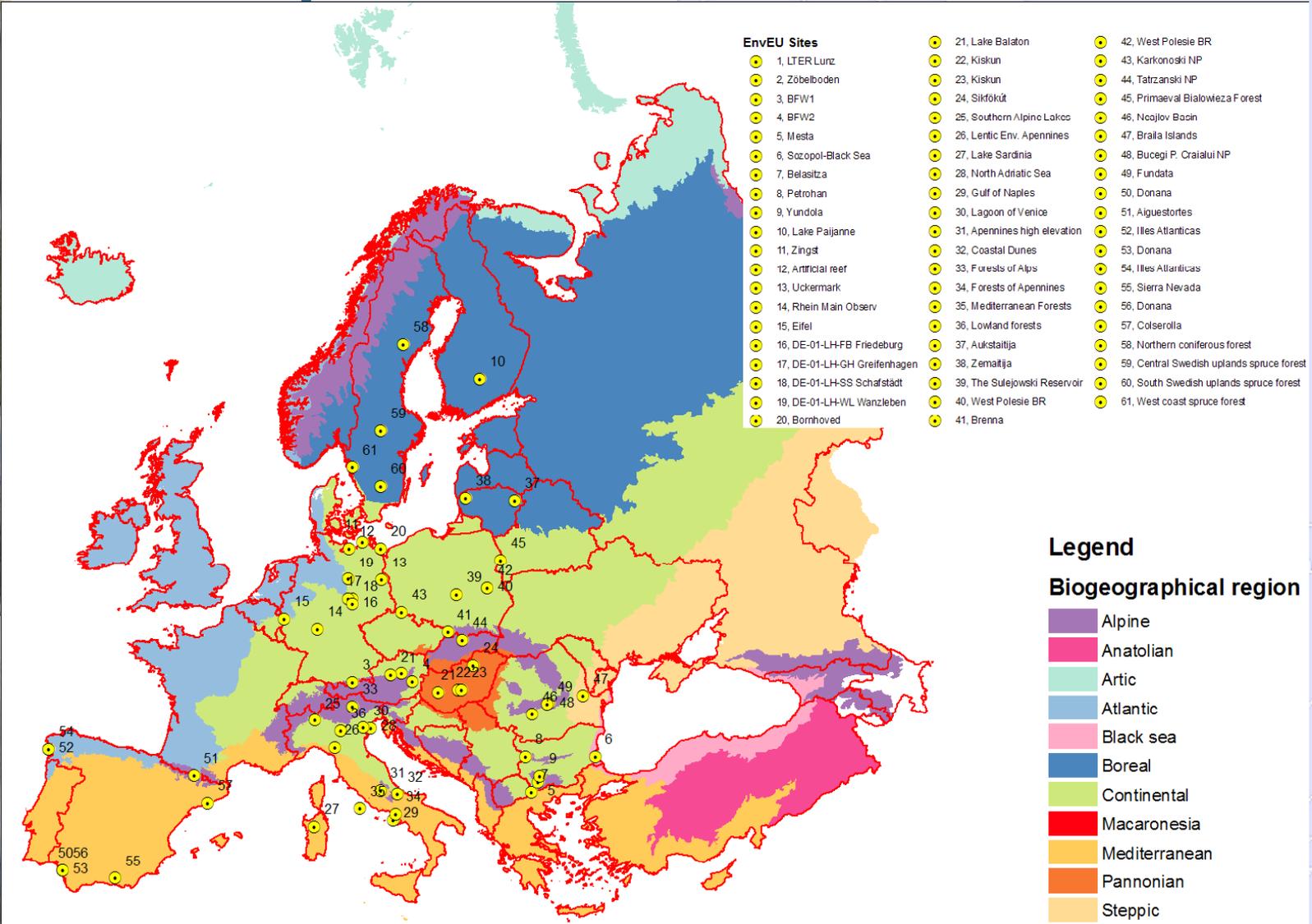
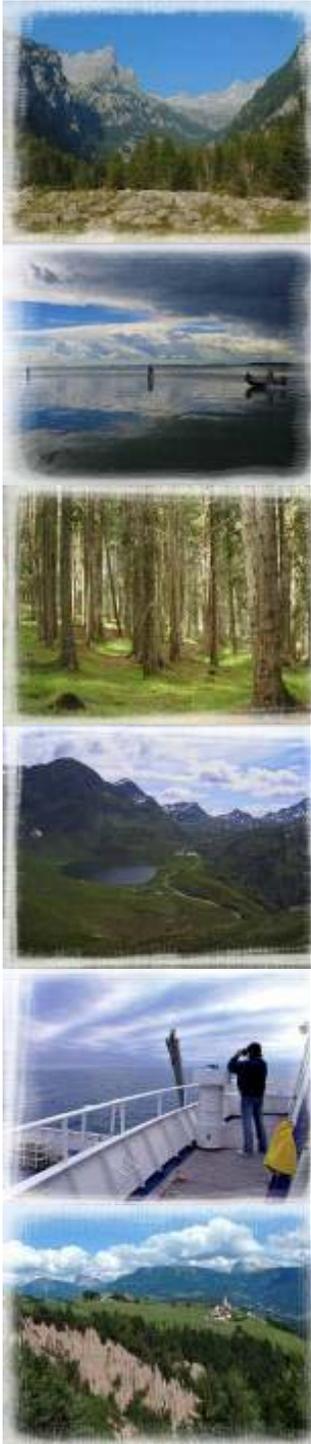




LTER<ER like sites across Europe (2009)

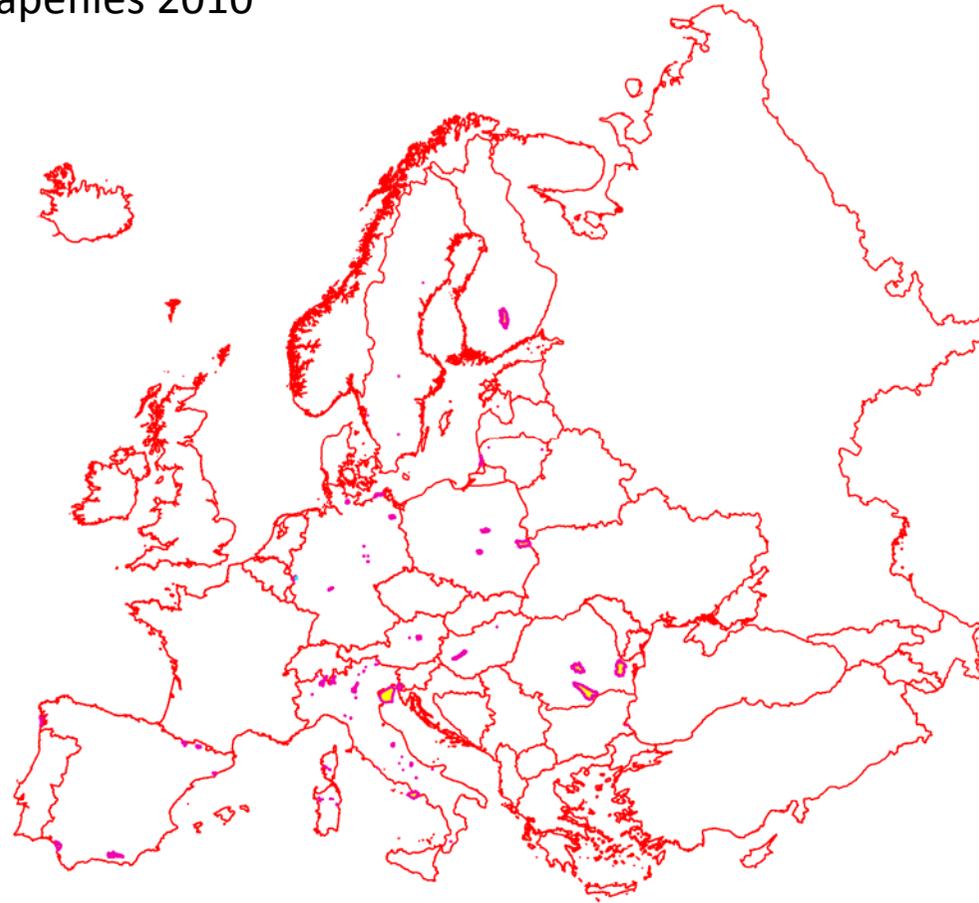


Map of the ENVEUROPE sites





EnvEurope shapefiles 2010



gathered by Ricardo Delgado
map by Constantin Cazacu

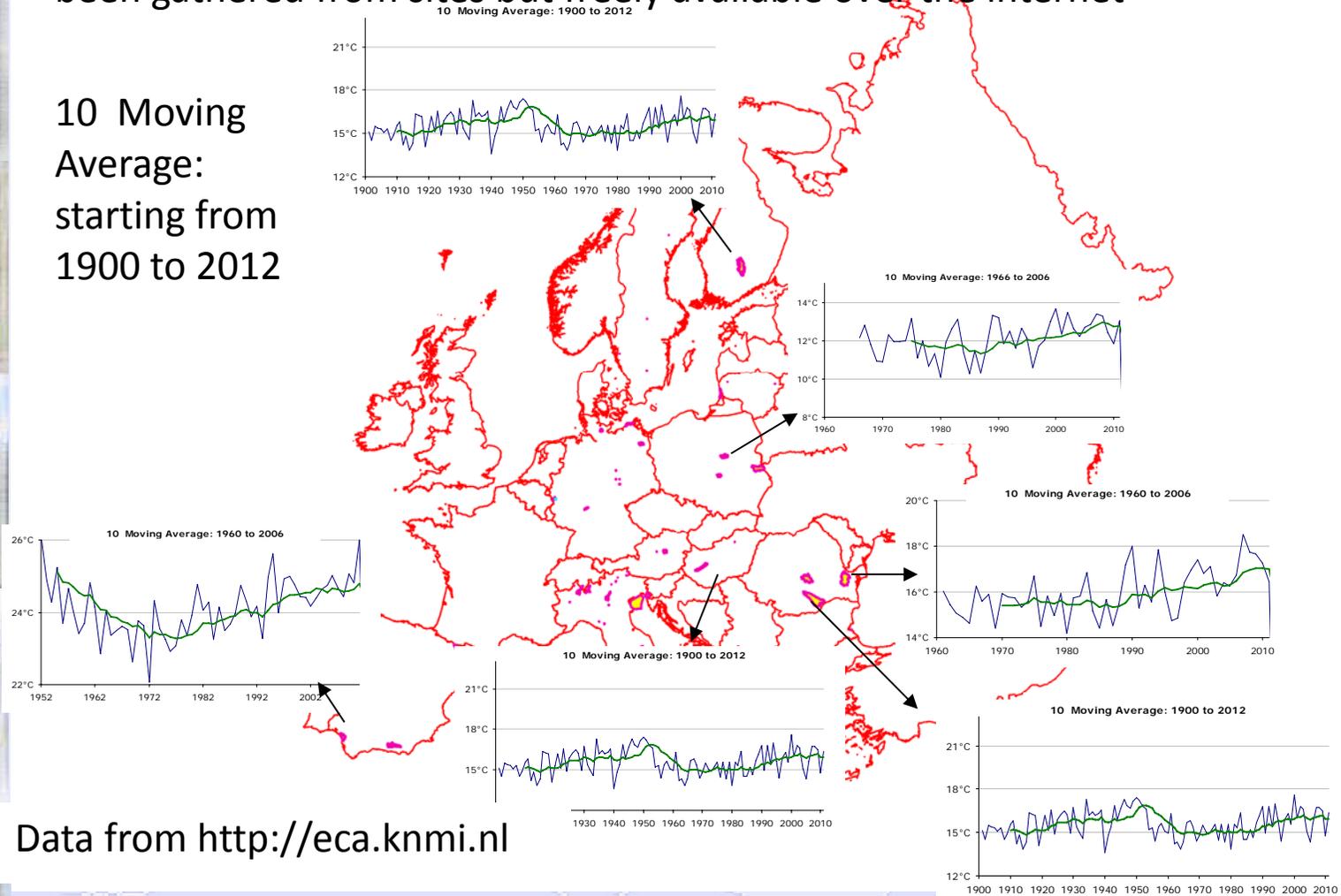


1. General data gathering



Example for temperature from different sites in EnvEurope: datasets not been gathered from sites but freely available over the internet

10 Moving Average: starting from 1900 to 2012



Data from <http://eca.knmi.nl>

Research directions

1. Trend analysis (comparison) of selected parameters across sites
 - identification of trends
 - influence of independent parameters on structure and function of ecosystems/communities/populations
2. Comparison of different systems: aquatic, terrestrial, habitat types etc.
3. Examination of interactions between biotic and abiotic factors defined as key for a site
4. Effects of nutrient increase on phytoplankton/marine & inland or on plants/terrestrial, or increase of temperature on species dynamics
5. Modeling approaches



Next activities and further involvement of the beneficiaries

1. Gathering of site general datasets should be finalized by the end of June 2012 for all sites;
2. Report from each site on the above process should be provided in July 2012 based on a format developed by A3;
3. Contribution on the possible uses of the general datasets should be submitted in order to finalize the report on cause –effect relationship report on A3.

What research questions should we consider for long term analysis? Please take into consideration the existence of the datasets.

2. Projects

- a) Meta-analysis (propose ideas, projects)
- b) cross- site parameters analysis
 - b.1 - new projects for long term data analysis based on proposed ideas ;
 - b.2 – integrated analysis for all sites using common selected parameters

Projects



Nr. project	Project name	Name	Country	Institute
1	Nitrogen deposition and vegetation change in LTER sites : testing critical load exceedance	Dirnböck Thomas	Austria	UBA
2	Eutrophication and climate change in EU-LTER sites	Adamescu Mihai	Romania	UNIBUC
3	Temporal patterns of phytoplankton diversity on a European scale	Karoly Palfy	Hungary	BLRI-HAS
4	Spatio-temporal assessments of ecosystem functions and services across different LTER Europe sites	Benjamin Burkhard	Germany	Institute for Natural Resource Conservation Department of Ecosystem Management
5	Effects of meteorological parameters and air pollution on trees growth in EnvEurope forest sites.	Tomasz Staneski	Poland	IETU
6	Investigating butterfly communities for biodiversity monitoring	Serena Corezzola	Italy	Italy
7	Imprints of priming effects on soil organic matter isotope signatures.	Rebecca Hood	Austria	University of Vienna
8	Tree-ring chronologies in relation to past human and natural disturbances	Stefan Neagu	Romania	ICAS
9	Response of forest ecosystem to synergetic effect of climate and air pollution changes	Algirdas Augustatis	Lithuania	ICP IM
10	Birds communities as indicators of ecological integrity in LTER sites	Livia Zapponi	Italy	Italy
11	Environmental factors as drivers of mast seeding in tree species across Europe	T. Maranon	Spain	CSIC
12	Phenological variations in response to climate change	Alessandro Oggioni	Italy	CNR-IREA
13	Coastal dunes Habitat fragmentation in time Exploring Italian EU-LTER sites	Coral Acosta	Italy	Uniroma 3
14	Long term development in the ecological status of Lake Paijanne	Kimmo Tolouen	Finland	University of Jyväskylä
15	HANPP as estimate of nutrient load from the catchement to fresh and coastal waters	Kinga Krauze	Poland	ERCE IIPAS
16	Net primary production at LTER Europe sites	Giorgio Matteucci	Italy	CNR
17	Recent changes in tree demographic rates in European forests: patterns and possible causes	Lorena Gómez Aparicio	Spain	CSIC

Projects- preliminary results

1. The special session tomorrow;
2. Each of the promoter will present the project
3. All the information are on web

Examples

Phenological variations in response to climate change (Pheno)

Aim:

1

- Identify critical phenological signals at LTER sites.
- Compare changes in these signals across sites.
- Collect “new” parameter for ground truth validation (GMES).

Promoters: Alessandro Oggioni, Alessandro Campanaro

Birds communities as indicators of ecological integrity in LTER sites

2

Aims:

- Create a cross-domain monitoring program for the assessment of ecosystem integrity through the analysis of avian assemblages.

Promoters: Livia Zapponi, Alessandro Campanaro



Environmental factors as drivers of mast seeding in tree species across Europe

Aims:

3

To describe temporal changes in tree seed production across Europe using long-term data from LTER sites.

Promoters: Theodoro Maranon

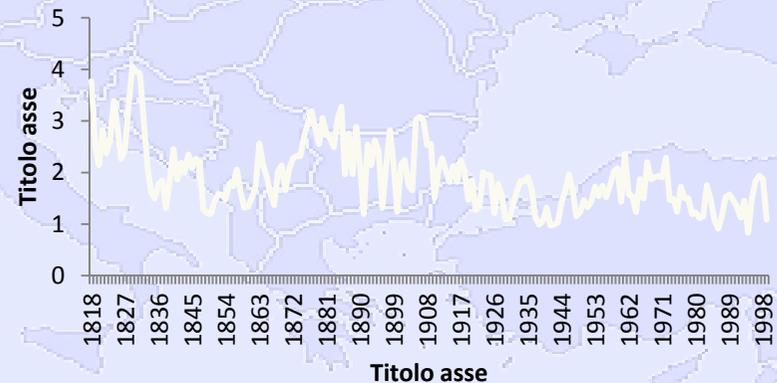
Tree-ring chronologies in relation to past human and natural disturbances

Aims:

4

Analyze of tree ring chronologies in relation to human and natural disturbances in order to identify trends of physiological growth.

Promoters: Stefan Neagu



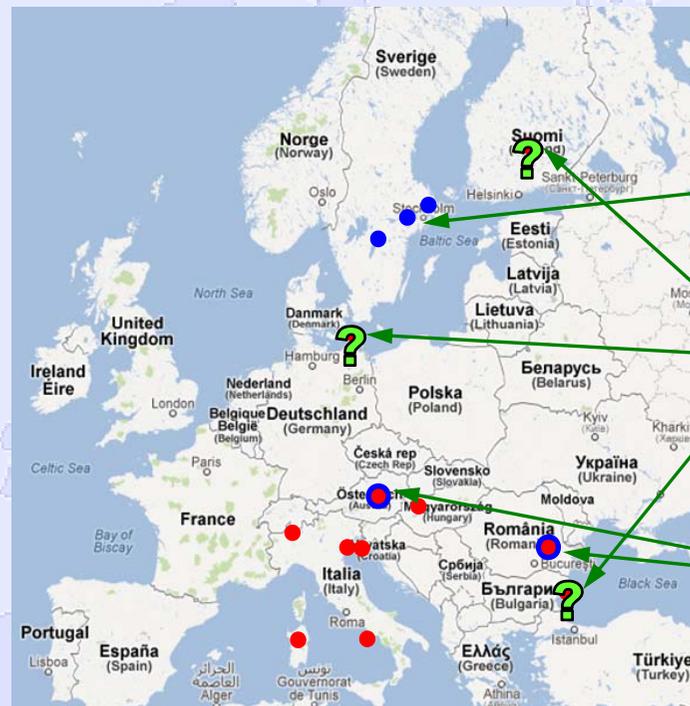
Temporal patterns of phytoplankton diversity on a European scale

Aims:

5

Revealing temporal patterns of diversity in the data series, determining its relationship with environmental variables and finding similarities/differences among the sites

Promoters: Karoly Palffy, L. Varas



Additional sites outside EnvEurope

Lack of response

Lack of sufficient data set





Effects of meteorological parameters and air pollution on trees growth in EnvEurope forest sites.



Aims:

6

The aim of the project is to show the level and differences in effects of meteorological parameters and air pollutants on trees growth in relation to climatic zones and altitude at the European scale.



Relationship between nitrogen deposition and long-term changes of forest biodiversity at LTER sites



Aims:

7

The aim of the project is to show the level and differences in effects of meteorological parameters and air pollutants on trees growth in relation to climatic zones and altitude at the European scale.





Special thanks to the project promoters:

Dirnböck Thomas
Karoly Palffy
Benjamin Burkhard
Tomasz Staneski
Serena Corezzola
Rebecca Hood
Stefan Neagu
Algirdas Augustatis
Livia Zapponi
T.Maranon
Alessandro Oggioni
Coral Acosta
Kimmo Tolouen
Kinga Krauze
Giorgio Matteucci
Lorena Gómez Aparicio

Milestones and deliverables

- **DELIVERABLE " CAUSE EFFECT ANALYSIS AND DATA EVALUATION"**
- **MILESTONE "RESULTS OF CAUSE-EFFECT DATA ANALYSIS"**
- DELIVERABLE "REPORTS ON ECOSYSTEM STATUS"
- RECOMMENDATION ON INDICATORS OF ENVIRONMENTAL QUALITY AND BIODIVERSITY STATUS AND TRENDS
- RECOMMENDATION ON SCALING UP LTER NETWORK

Repeating - Next activities and further involvement of the beneficiaries

1. Gathering of site general datasets should be finalized by the end of June 2012 for all sites;
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What research questions should we consider for long term analysis? Please take into consideration the existence of the datasets.
5. Meta-analysis
6. Indicators



A light blue map of Europe with white outlines of countries, serving as a background for the title text.

PROPOSAL FOR THE NEXT TECHNICAL MEETING IN SEPTEMBER 2012 IN ROMANIA





Thank you!

Kaunas

EnvEurope meeting

May 2012