



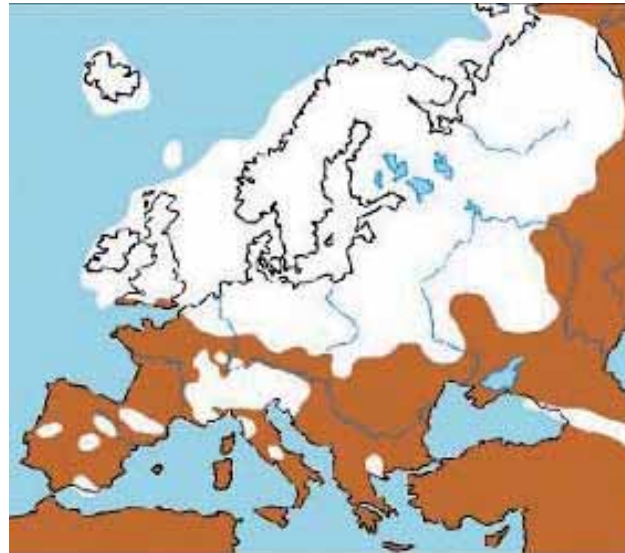
LTER-España, una iniciativa común en espacios naturales. Origen, presente y perspectivas de futuro

Una red de sitios y plataformas para el seguimiento y la investigación ecológica y sobre biodiversidad a largo plazo.

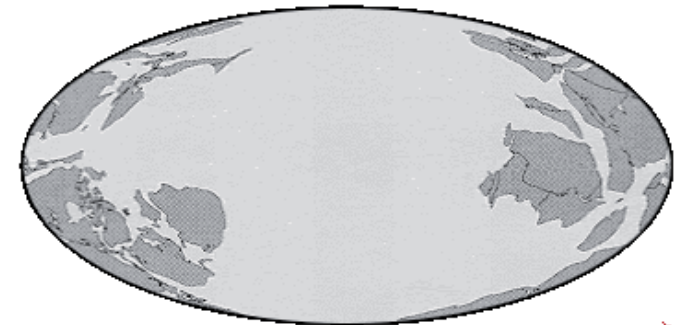
Motores de cambio ecológico a escala global



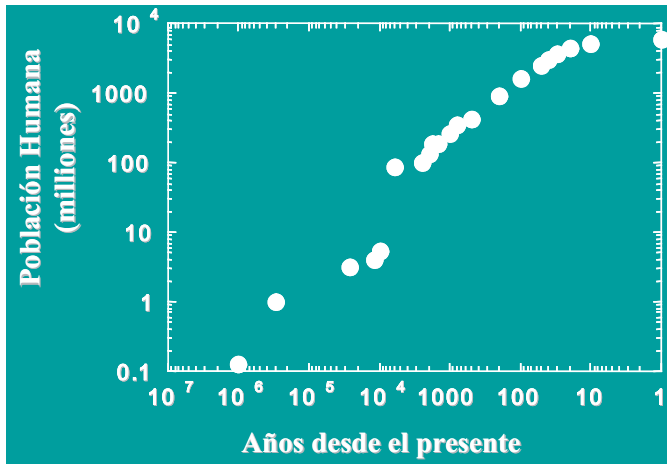
"Change is one of the few things in life of which we can be certain"



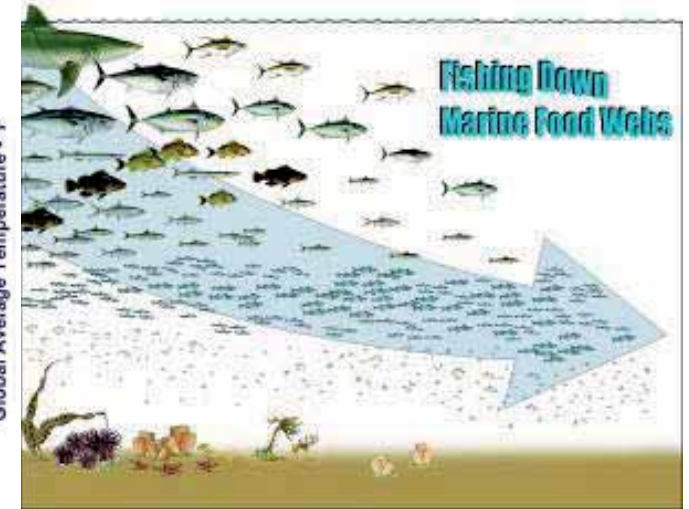
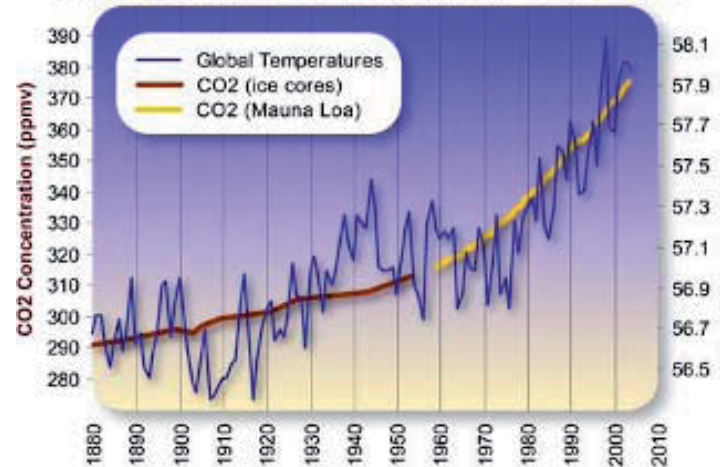
Areas covered with glacial ice during the Pleistocene



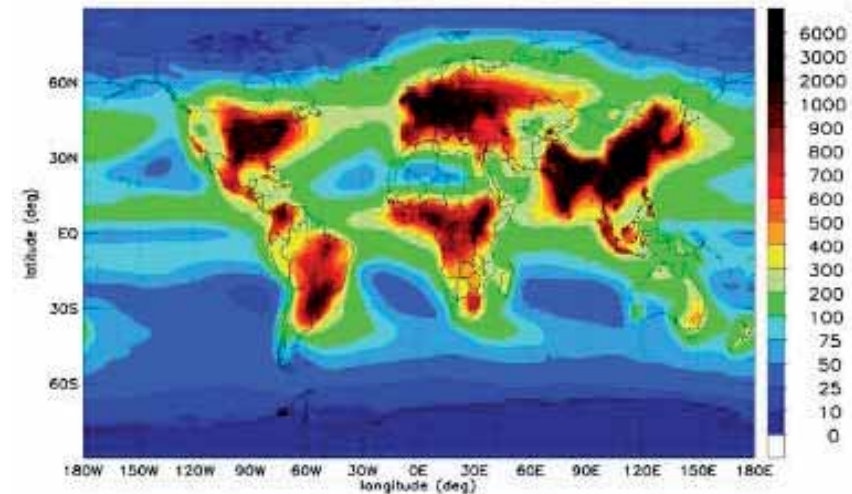
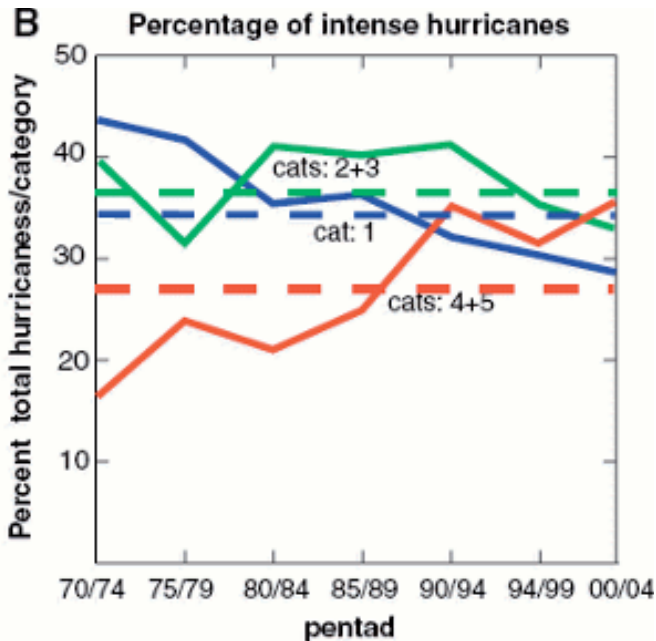
Motores actuales de cambio ecológico



Global Average Temperature and Carbon Dioxide Concentrations, 1880 - 2004



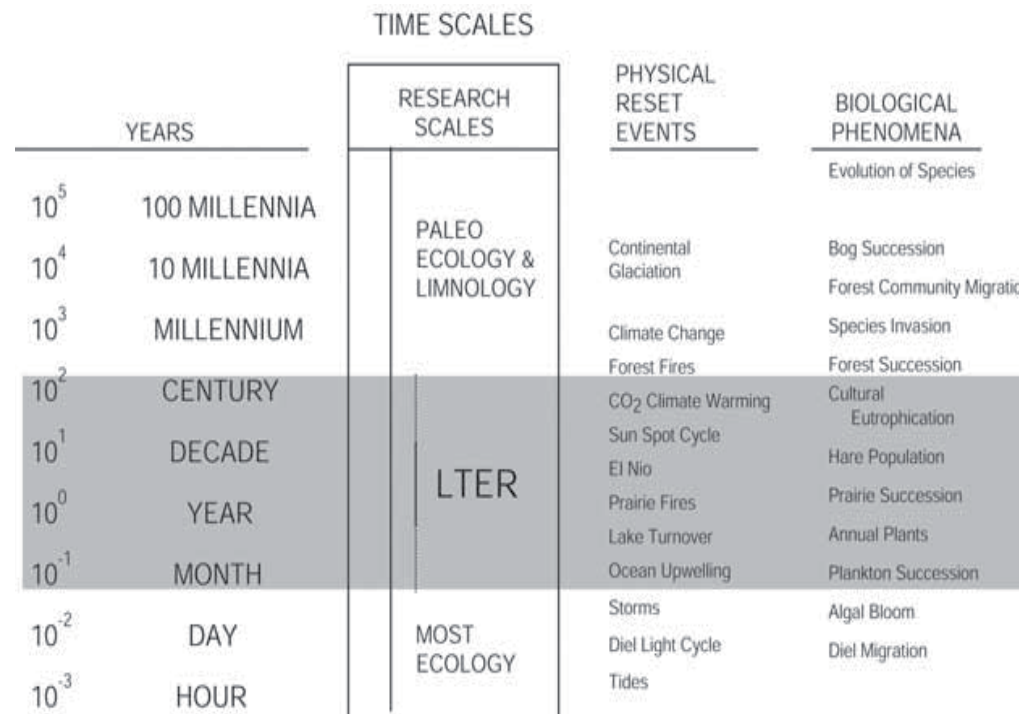
"Change is one of the few things in life of which we can be certain"



Implicaciones ecológicas

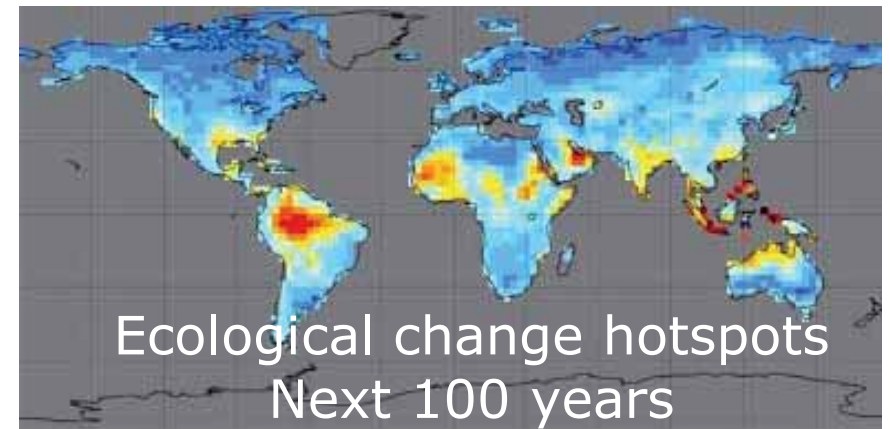
- Estado de *no-equilibrio* de los *ecosistemas*
- *No-linealidad* de los procesos ecológicos
- Procesos *sutiles*, de *baja frecuencia y complejos*
- Importancia de *las perturbaciones* en la configuración de las comunidades ecológicas

Necesidad de Investigación Ecológica a Largo Plazo (LTER)



Investigación del cambio ecológico a largo plazo

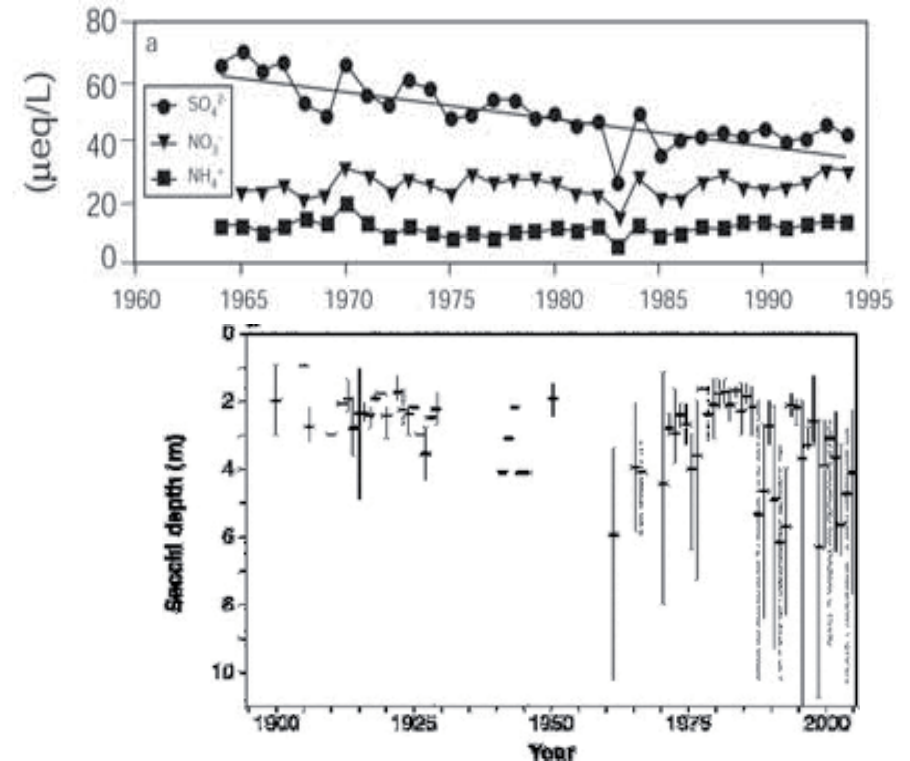
- *Aumentar el conocimiento* ecológico a múltiples escalas temporales y espaciales
- *Síntesis ecológica* por medio del contraste de hipótesis a largo plazo (diseño experimental)
- *Diseminación de la información*, accesible a la comunidad científica
- *Transferencia del legado* de observaciones y experimentos a largo plazo
- *Formación específica* de científicos en investigación a largo plazo, colaborativa sobre paradigmas ecológicos
- *Transferencia de conocimiento*, a la sociedad, gestores, políticos...
- *Capacidad predictiva* sobre cambios futuros



Historia LTER

US-LTER

- Founded in 1980
- 24 sites (2 urban)
- \$18 Millions annual budget
- 1100 scientists
- Generate \$44 Mi. in LTER-related research



<http://www.lternet.edu/>



Historia LTER



ILTER (International LTER)

- Founded in 1993
- 40 countries
- 5 continents

<http://www.ilternet.edu/>

ILTER'S MISSION:

ILTER consists of networks of scientists engaged in long-term, site-based ecological and socioeconomic research. Our mission is to improve understanding of global ecological systems and inform solutions to known and unknown environmental problems.

GOAL 1:

Foster collaboration and coordination among ecological researchers and research networks at local, regional and global scales

GOAL 2:

Improve comparability of long-term ecological data from sites around the world, and facilitate exchange and preservation of this data.

GOAL 3:

Deliver scientific information to scientists, policymakers, and the public to meet the needs of decision-makers at multiple levels.

GOAL 4:

Facilitate education of the next generation of long-term scientists.



Historia LTER

Global Networking of Ecosystem research sites



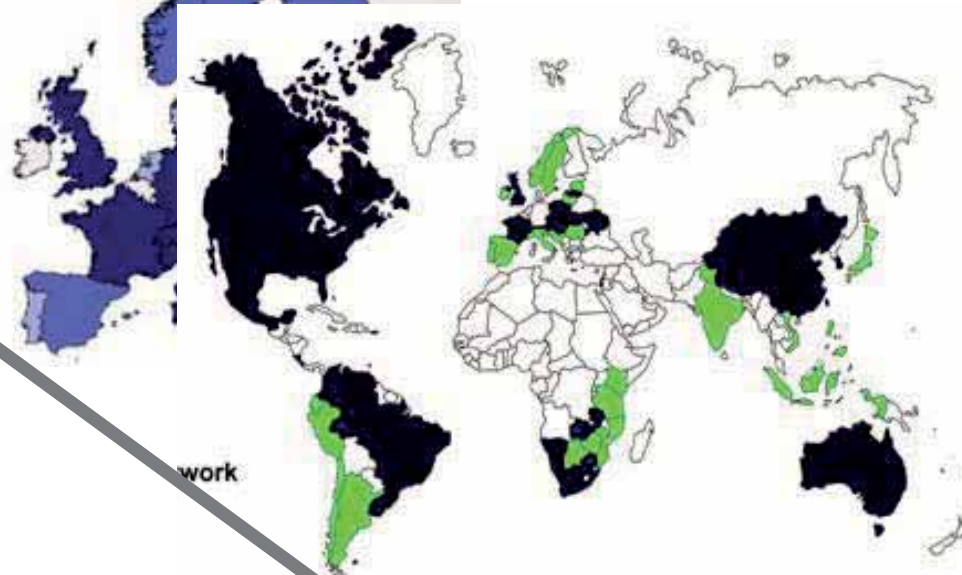
LTER Sites



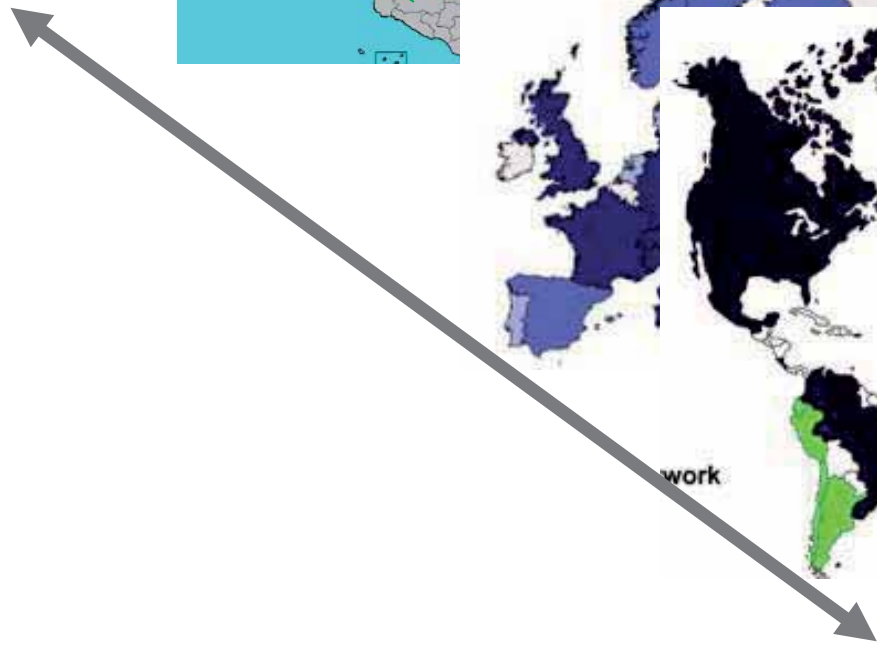
National
Networks



Regional
Networks



local



global

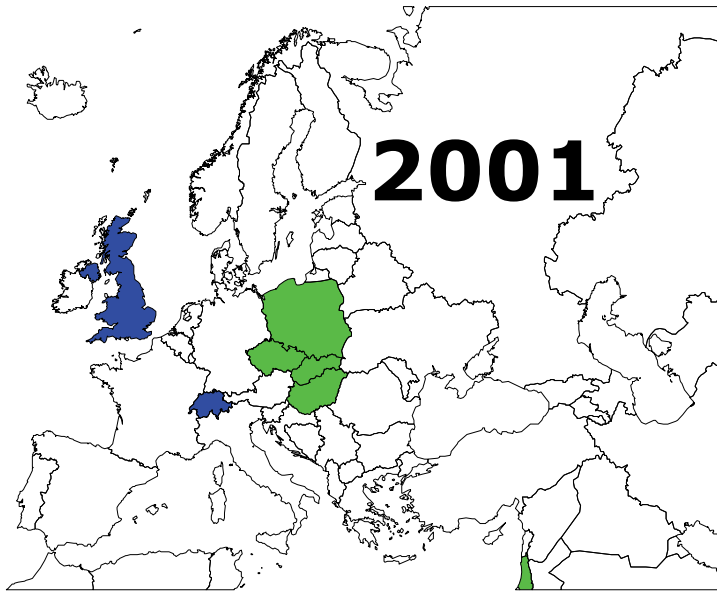
**Global
ILTER**
www.ilternet.edu

ILTER – Unique Capability on a Global Scale

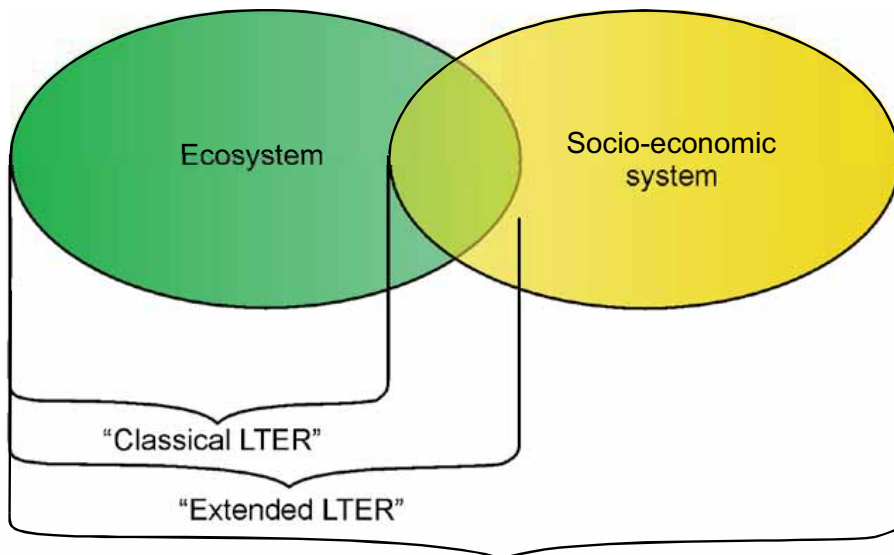
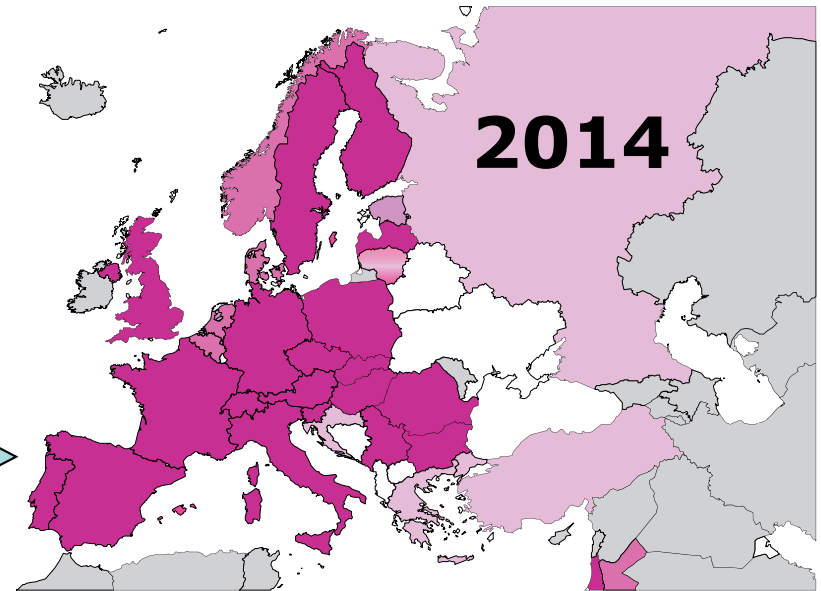
	Site-based	Network of sites	Network of people/groups	Long-term research	Long-term monitoring	Scientific collaboration	Measurement and data standardization	Data sharing	Data integration	Long-term data preservation/access	Global trend detection	Country or regional trend detection	Teach/train next generation	Inform scientists, policymakers, public
ILTER	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ICSU			✓			✓	✓	✓	✓				✓	✓
IGBP		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
GOSIC						✓	✓	✓		✓				✓
GBIF						✓	✓	✓	✓	✓				✓
GEOS		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
START		✓	✓			✓		✓	✓			✓	✓	✓
CEISIN						✓		✓	✓	✓			✓	✓
MA			✓			✓		✓	✓	✓	✓	✓		✓

The ILTER regional network for Europe

<http://www.lter-europe.net/>



6th EU FP



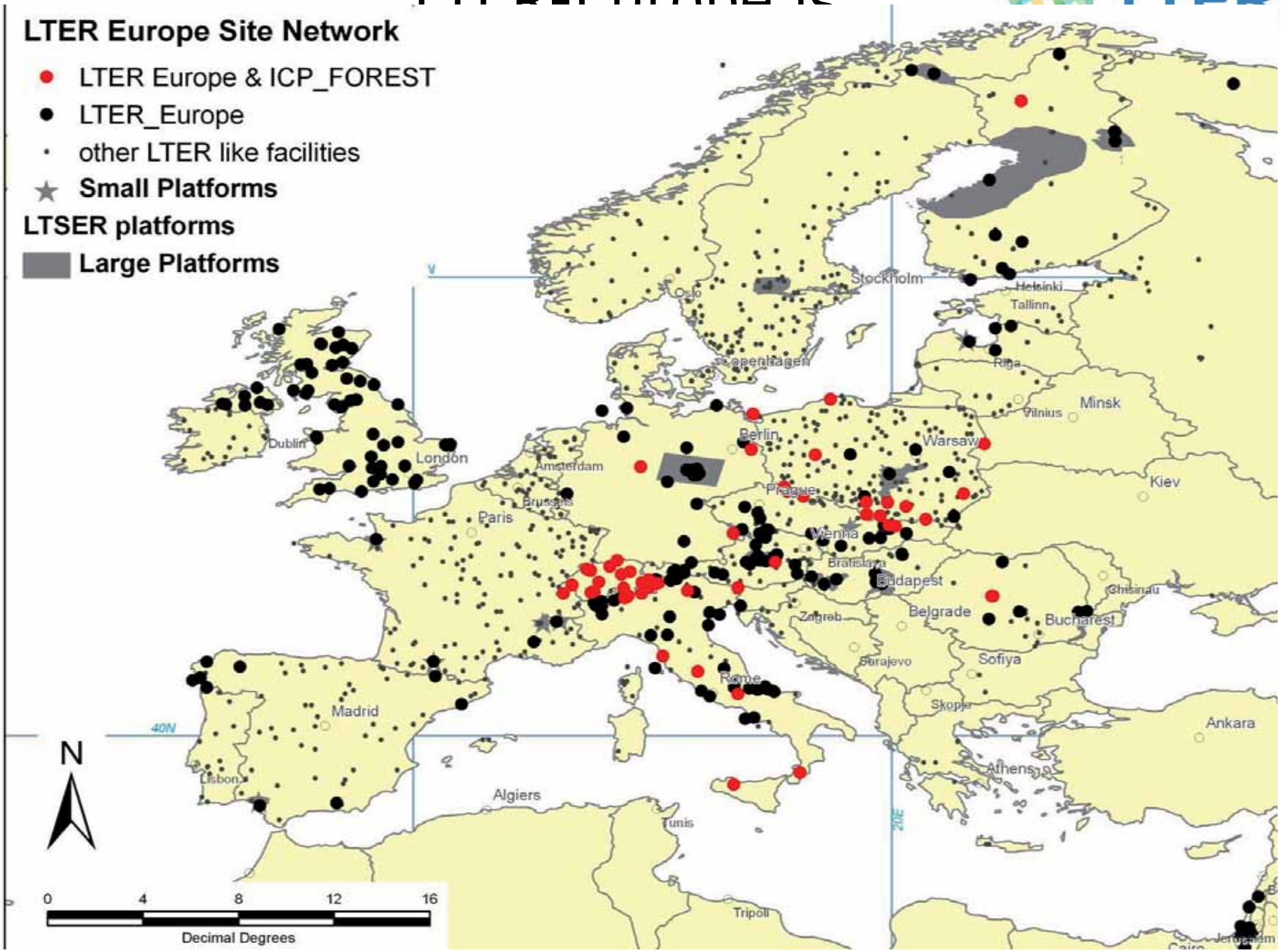
400 sitios
35 plataformas LTSER

ITER_Europe is

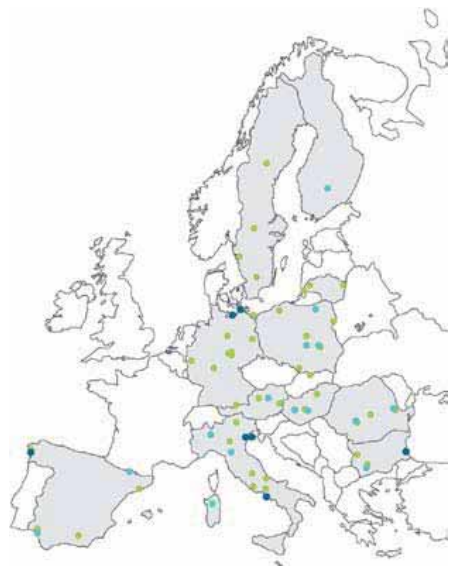


LTER Europe Site Network

- LTER Europe & ICP_FOREST
 - LTER_Europe
 - other LTER like facilities
 - ★ Small Platforms
- LTSER platforms
- Large Platforms



LTER-Europe projects: EnvEurope



- ENVironmental quality and pressure assessment across EUROPE: the LTER network as an integrated and shared system for ecosystem monitoring
- 11 countries, 67 sites
- LIFE+ program

DEMANDS FROM LTER EUROPE

How to harmonize the LTER parameters?

How to make parameters and methods available?

How to manage LTER datasets?

How to share and make accessible LTER datasets?

Is LTER-Europe prepared to catch ecosystem change?

Which link of LTER-Europe with Remote Sensing (Copernicus)?

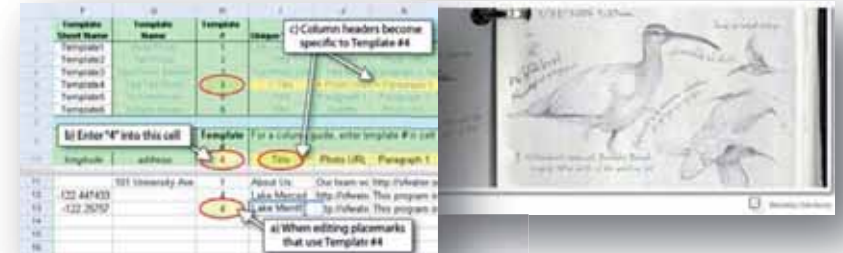
LTER-Europe projects: EnvEurope

The framework: Ecological Integrity

	Elements of Ecological Integrity	Indicators of Ecological integrity	Examples for parameters (measurables)
Structures	Biotic Diversity	Flora Diversity	<i>Species list and abundance of vascular plants</i>
		Fauna Diversity	<i>Species list and abundance of breeding birds</i>
		Within Habitat Structure	<i>Vegetation structure within habitats</i>
Structures	Abiotic Heterogeneity	Soil	<i>Bulk density</i>
		Atmosphere	<i>Air temperature</i>
		Habitat	<i>Land cover</i>
Processes	Energy Budget	Input	<i>Photosynthetic active radiation</i>
		Storage	<i>Above-ground Net Primary Production</i>
		Output	<i>Respiration (production of CO₂ by living organisms)</i>
		Efficiency measures	<i>Respiration per biomass</i>
Processes	Matter Budget	Input	<i>Wet and dry deposition of atmospheric nitrogen</i>
		Storage	<i>Nitrogen fixation</i>
		Output	<i>Nitrate leaching</i>
		Efficiency measures	<i>Litter decomposition</i>
Processes	Water Budget	Input	<i>Precipitation</i>
		Storage	<i>Soil moisture</i>
		Output	<i>Surface runoff</i>
		Efficiency measures	<i>Ratio transpiration / evaporation</i>

LTER-Europe projects: EnvEurope

Information management



1. MetaData



2. Thesaurus



3. Datasets



DEIMS

MD harmonization
<http://data.lter-europe.net/deims>



EnvThes

terms harmonization
<http://vocabs.lter-europe.net/EnvThes.html>

ID	DATE	NAME	SCORE	MISSION	LITERED	MAX_LEVEL	MIN_LEVEL	SIZE	YEAR	WORKS_DAT	WORKS_YEAR	WHITE	BECKE	SPIC	TRIO
1	2012-01-01	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Data **Reporting**
 Data harmonization

LTER-Europe projects: EnvEurope

Information management



EnvEurope Drupal Ecological Information Management System

[HOME](#)
[METADATA EDITOR](#)
[DISCOVERY](#)
[GEOVIEW](#)
[ADMINISTRATION](#)
[LOG OUT](#)

[VIEW](#)
[EDIT](#)
[TRACK](#)
[SET TEMPLATE](#)

Welcome to the EnvEurope Drupal Ecological Information Management System version 2.0

[Printer-friendly version](#)
[PDF version](#)

What this portal is?

The EnvEurope Drupal Ecological Information Management System provides a web client interface for Long Term Ecosystem Research (LTER - Europe) network stakeholders to describe, discover, view and download data sets provided by the individual research sites based on national research networks.

How it has been developed?

The development of this tool has not been done from the scratch. This instance is based on the First release of Drupal metadata editor provided by colleagues from the US LTER network and related ongoing development of Drupal Ecological Information Management System.

What does it provide?

- **DISCOVERY** - provides searching and displaying facilities for the created metadata. Discovery provides more interfaces to define various types of queries to be sent to the metadata database as well as displaying of the results. Simple and Advanced metadata search for the data sets as well browsing for the persons and sites information is provided
- **GEOVIEW** - provides data portrayal on a map and view attributes of individual features (research sites, data sets). It runs as a different Geoportal application within IFrame
- **METADATA EDITOR** - provides entry forms for authorised users to create metadata description for data sets in accordance with EnvEurope (LTER-Europe) Metadata Specification for Dataset Level based on EML (Ecological Metadata Language) specification. LTER Europe site description based on Infobase system so far is planned to be implemented here as well soon.

Who does it support?

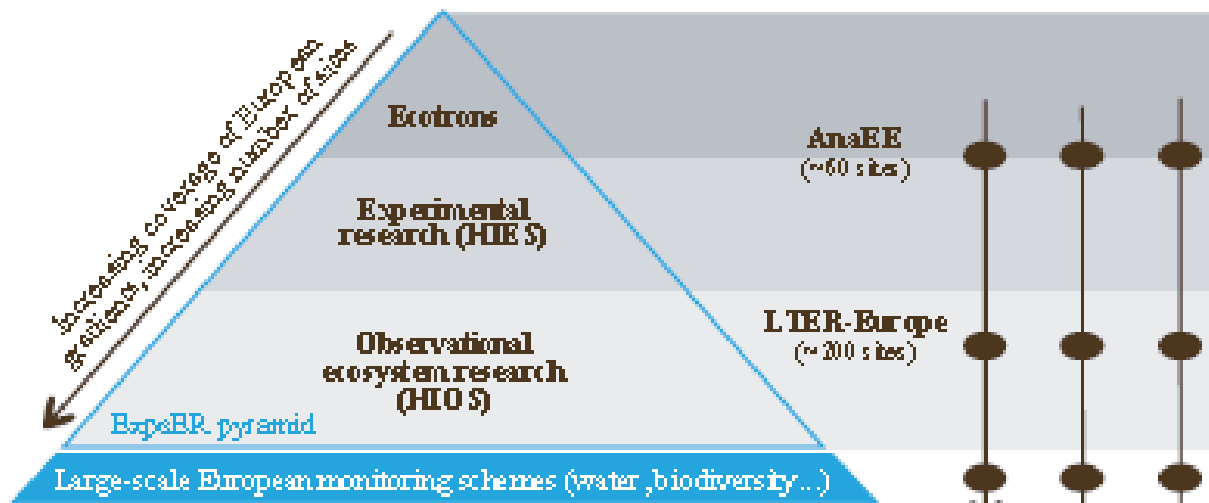
Work related to development of this tool is funded by the LIFE financial instrument of the European Community and contributes to the particular deliverables of the EnvEurope project.

<http://data.lter-europe.net/deims/>



LTER-Europe projects: EXPEER

- 19 countries
- FPVII funded (Infrastructures)
- Transnational access



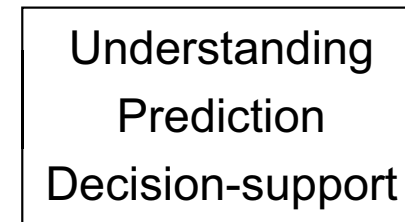
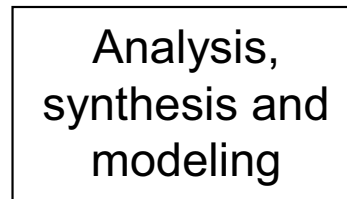
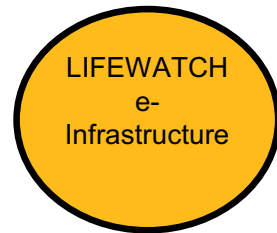
NETWORKING TOWARD: Consistent designs and lobbying
 Coordinated contributions to scientific targets
 Joint use of tools (IT, modeling, analytical platforms)



Bridge to ESFRI ANAEE



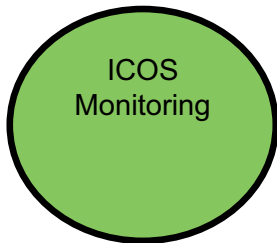
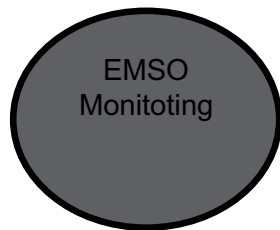
ILTER-Europe at the ESFRI context



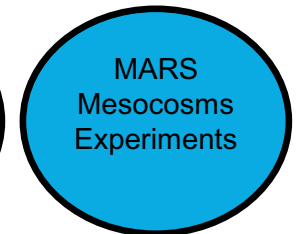
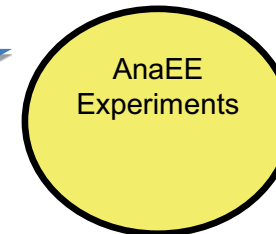
Data input and
data requests



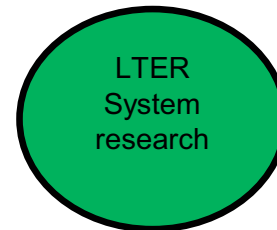
Parameter input
and requests



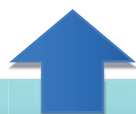
Monitoring Infrastructure for
time and spatial data series



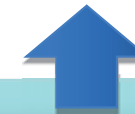
Experimentation supporting
Infrastructure



Natural and socio-ecological systems
research (trends)

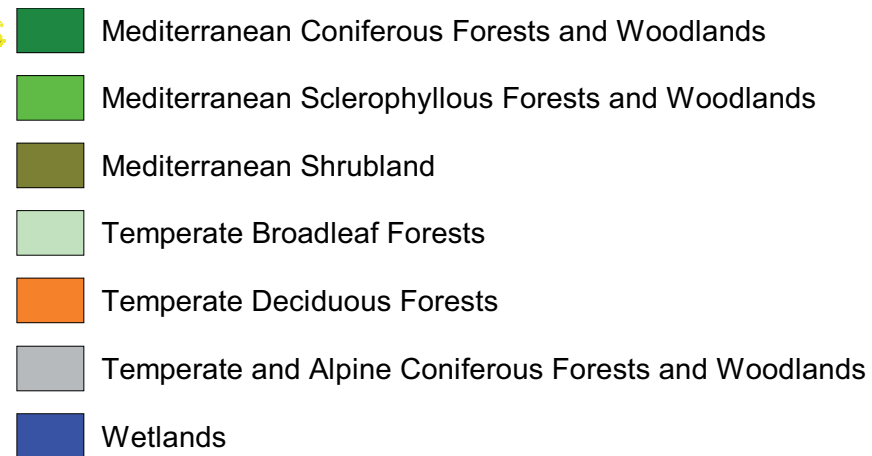


Generic supporting e-Infrastructures (EUDAT and others)



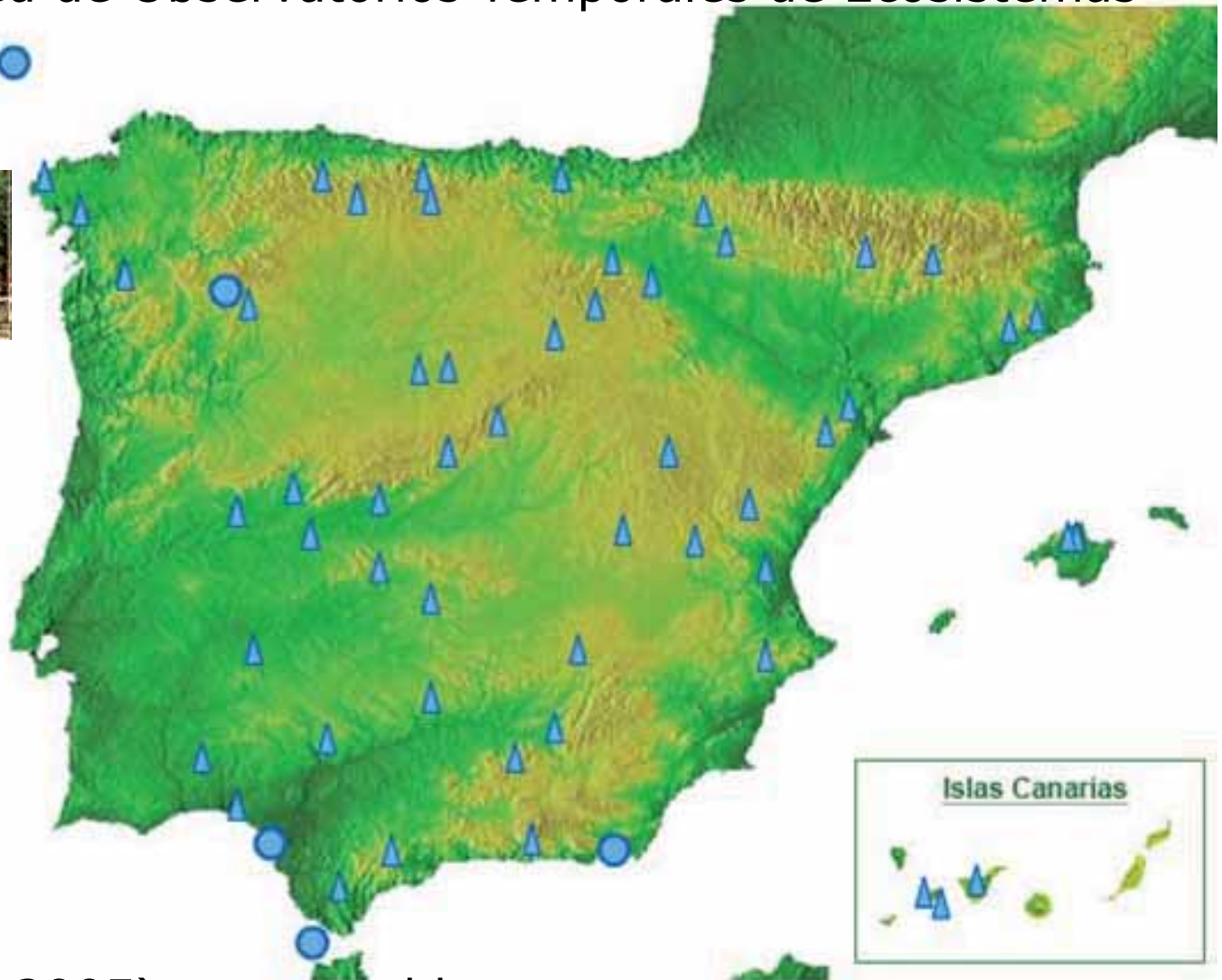
¿Y en España? ...

...solo faltaba el vehículo



El chasis: REDOTE

2003. Red de Observatorios Temporales de Ecosistemas

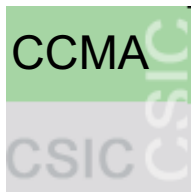


Pilot network (June 2005) composed by:

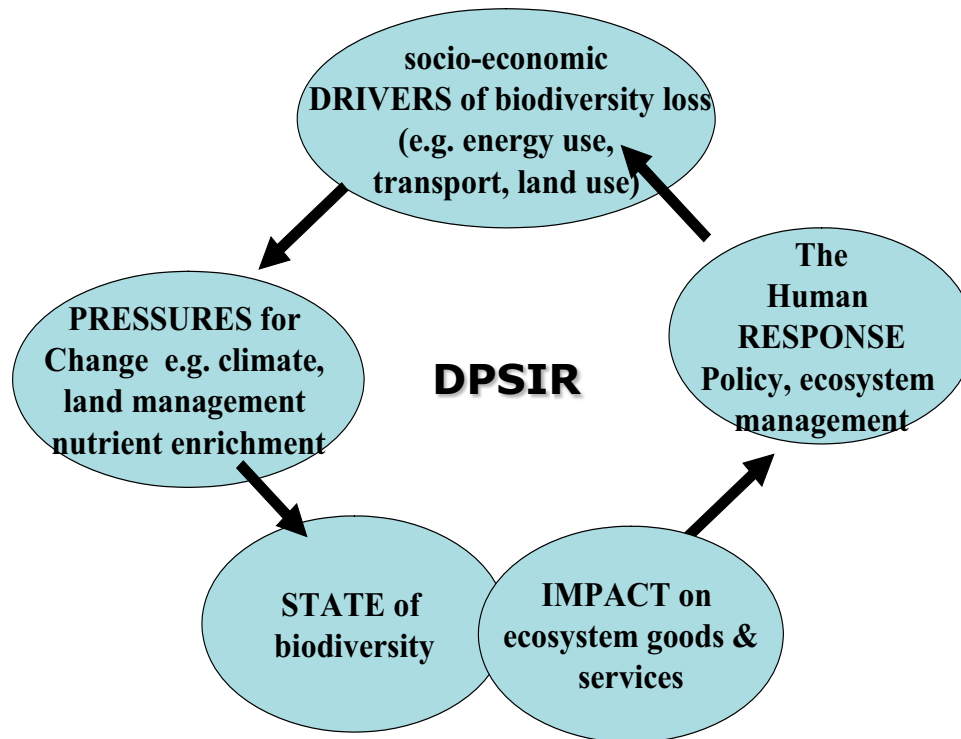
- ▲ Level II Network Forest Damage (54 sites)
- Monitoring sites (6 sites)

Las Bujías: ALTER-Net

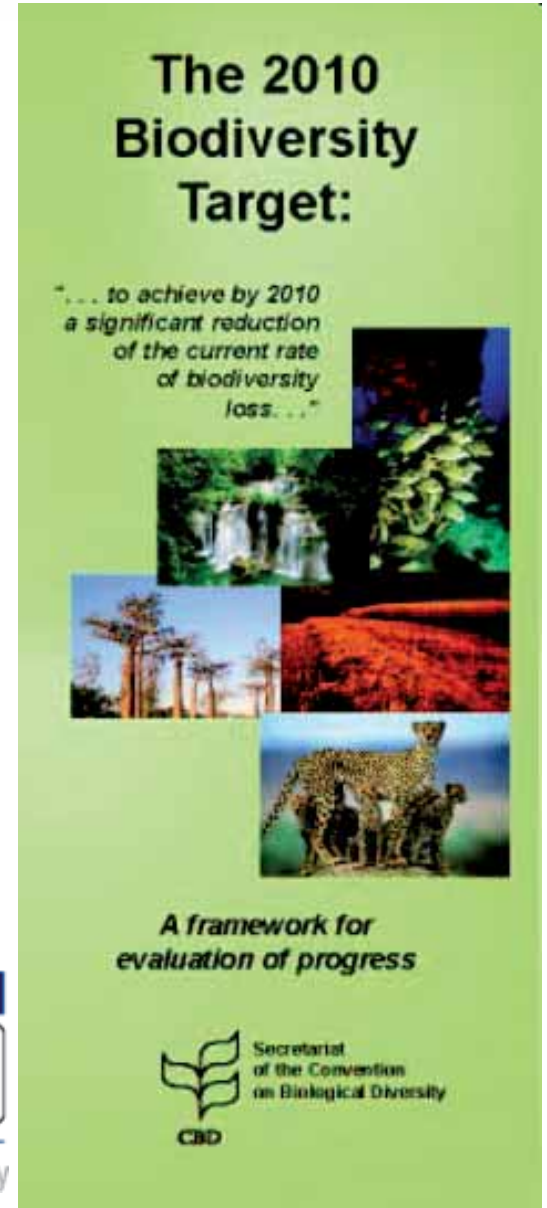
2005-2009. Red de Excelencia Europea



Drivers:Pressure:State:Impact:Response (DPSIR)



EEA, 1999



El motor: Doñana LTSER



European LTSER platforms



- National Park (537 km²)
- Natural Park (523 km²)
- Protection area (70 km²)
- LTSER platform (2736 km²)

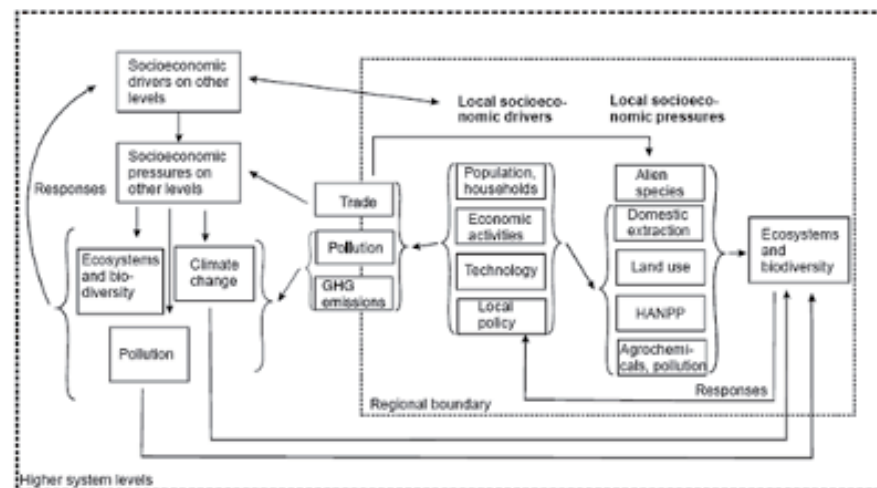
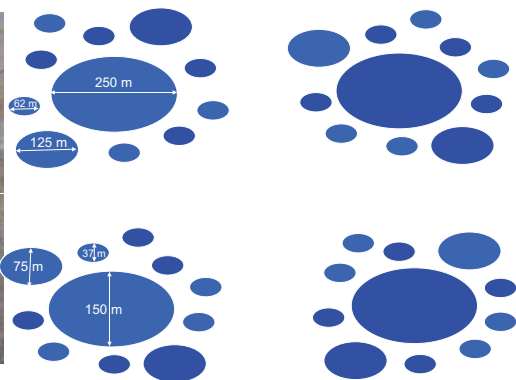


EU CAP transposition



effects on LTSER biodiversity

Adaptive management experiment



Implementation of a conceptual socio-ecological model (Haberl et al. 2009)

Las válvulas: Seguimiento ecológico Doñana y Sierra Nevada

Traditional manual



Automatic & near real-time

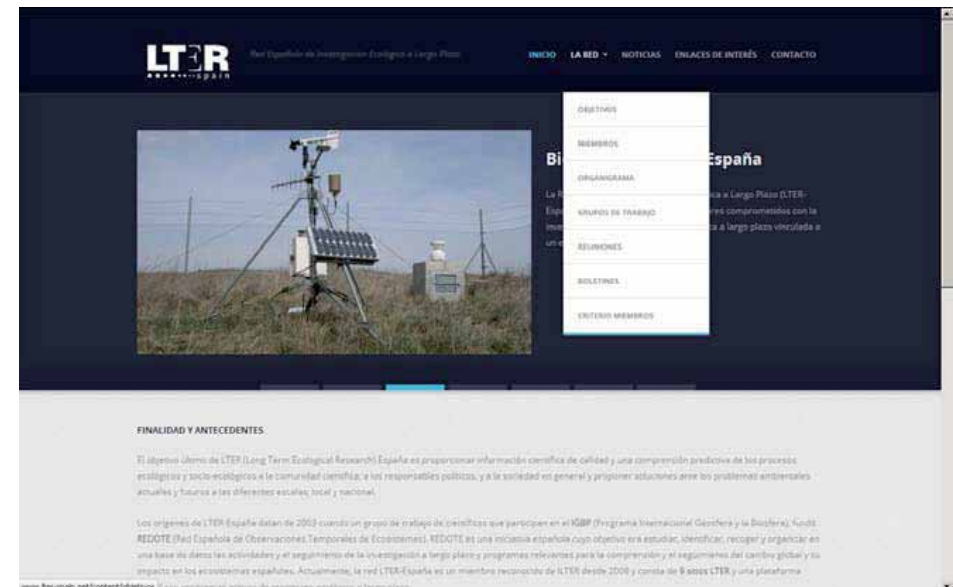


El rendimiento: Acceso público a datos

<http://icts.ebd.csic.es>



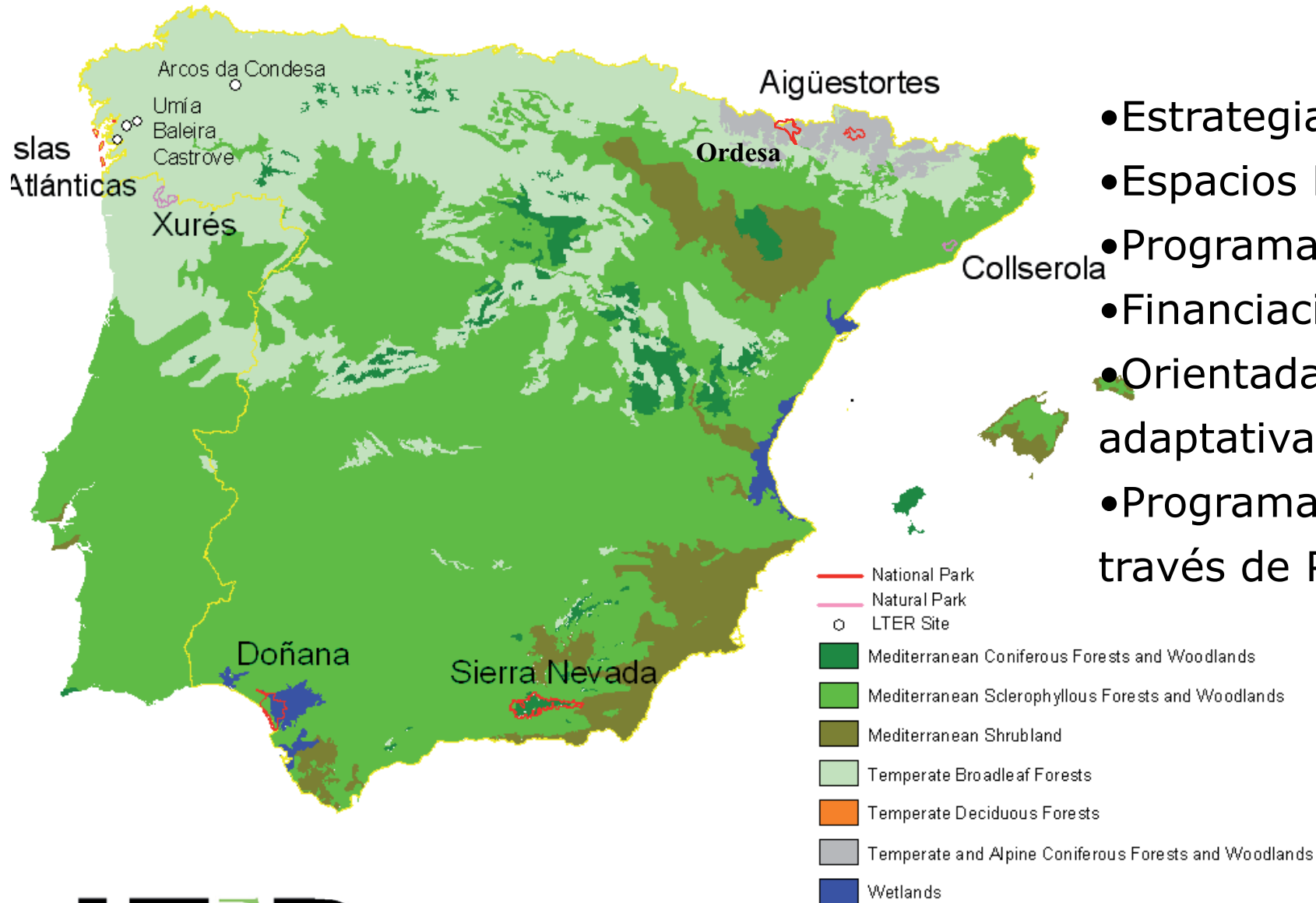
<http://linaria.obsnev.es/>



<http://mercurio.ebd.csic.es/seguimiento>

<http://www.lter-spain.net>

El diseño: Propuesta pragmática de sitios LTER



- Estrategia 'Bottom-Up'
- Espacios Protegidos
- Programa de Seguimiento
- Financiación continuada
- Orientada a gestión adaptativa
- Programa científico a través de PPNN y CSIC

Representatividad de la red



Sierra Nevada



Aigüestortes



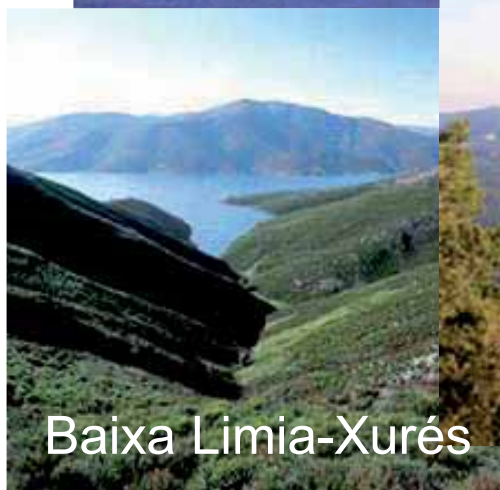
Ordesa y Monte Perdido



Doñana



Illas Atlánticas



Baixa Limia-Xurés



Serra de Collserola

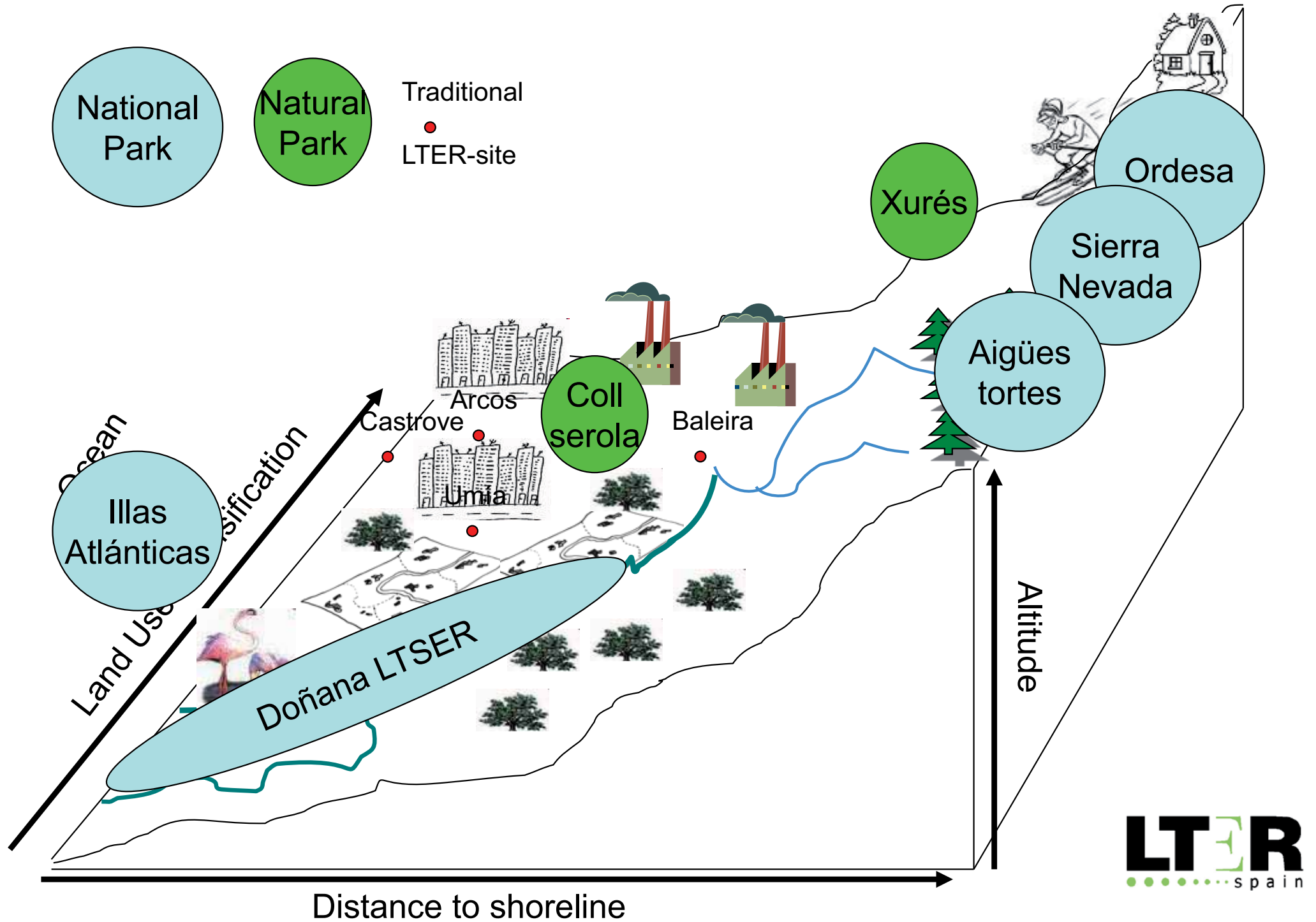


Baleira



Río Umía

Gradiente ambiental cubierto



Altas y "bajas" en la red

Nuevos miembros



P.N. de las Tablas de Daimiel



Plataforma LTSER
Sureste Árido



P.N. del Montseny

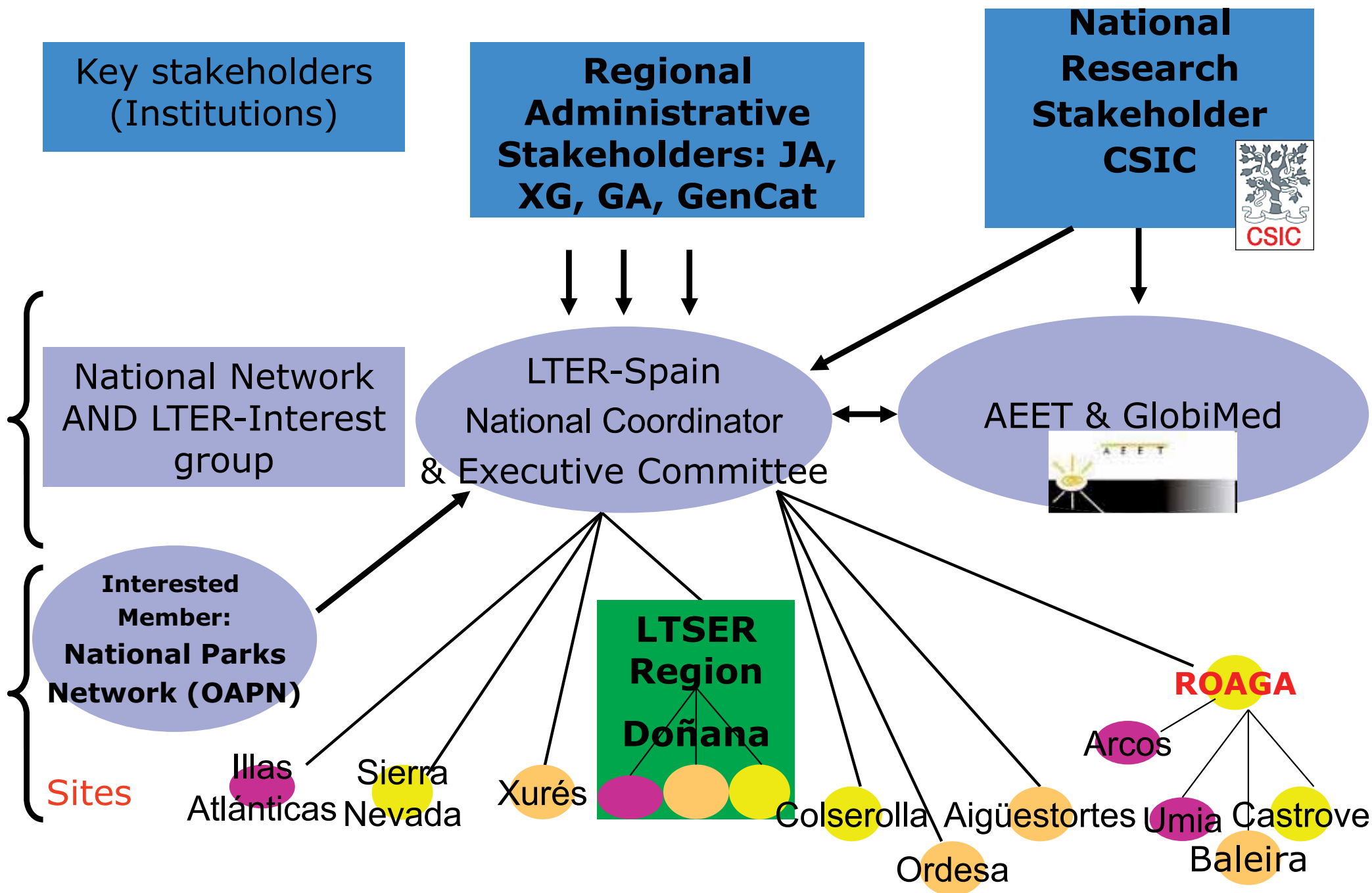
En Estado de inactivos:

- ROAGA
- Xurés

En disposición:

- P. N. Cabrera
- P. N. Delta del Ebro
- P. N. de Guadarrama
- P. N. de Picos de Europa

Estructura de la red



LTER-España: Estructura ejecutiva

Comité Ejecutivo Nacional conformado por:

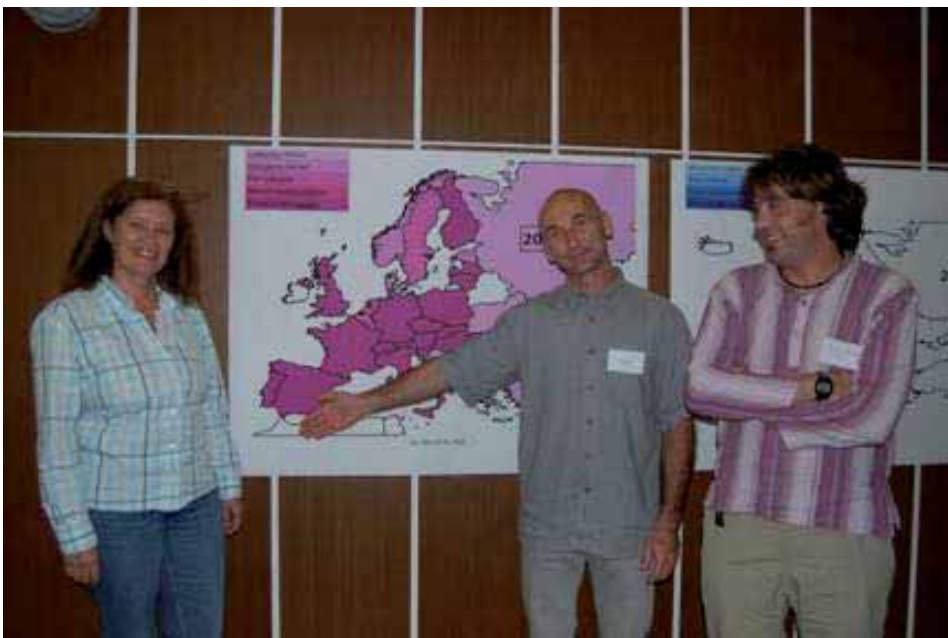
- Coordinador nacional de la red
- Secretaría técnica
- Asesor/es académico/s
- Representantes científicos y de gestión de sitio/plataforma (mínimo 2 personas, i.e. representante y suplente)
- Comité Científico Asesor (conformado por los grupos de investigación de cada sitio)
- Cargos renovables cada 2 años
- Creación de estatutos (a medio plazo)
- Constituirse como asociación o fundación (a medio plazo)

Líneas prioritarias de investigación

LTER-Spain Executive and Scientific Committee have agreed to promote long-term research at LTER-Spain sites into the next core areas:

1. Role of biodiversity on ecosystem functioning (resilience) and structure.
2. Disturbance patterns and frequencies.
3. Effects of Global Change on ecosystem functioning and structure (ecosystem thresholds).
4. Definition of adaptive management criteria and decision-making for conservation and their effects on ecosystems.
5. Long-term socio-ecological modeling.

ILTER-España aceptada en ILTER (Eslovaquia 2008)



Acceso nuevos candidatos

<http://www.lter-spain.net/content/criterio-para-miembros>

2.1 Formal criteria

- Basic commitment of hosting institution(s) for at least 5 years (signed paper) including
 - Financing
 - Staff
 - Infrastructure (field work, lab work etc.)
- Principal agreement on data exchange
- Availability of information in English
- Maximum response time to questions/requests of 10 days (email)
- Site/Platform Scientific & Management Representatives

2.2 Data criteria

- Language: English
- Up-to-date/current documentation in the LTER-Spain database
- Storage (ad hoc solution -> Excel, Access; future perspective -> shared database, at least for metadata)
- Availability (bylaws for sharing)
- Time series (depend on topics; at least two data sets with a sufficient time interval)
- Frequency of measurements (thresholds for discontinuity?)

Evaluados por comité nacional y comité científico asesor



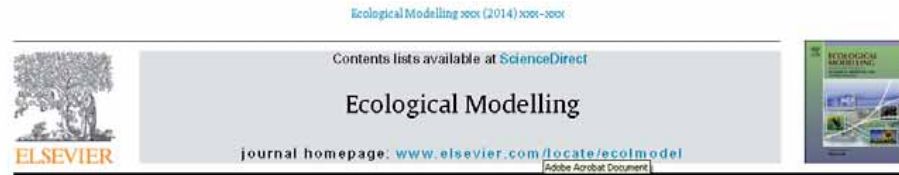
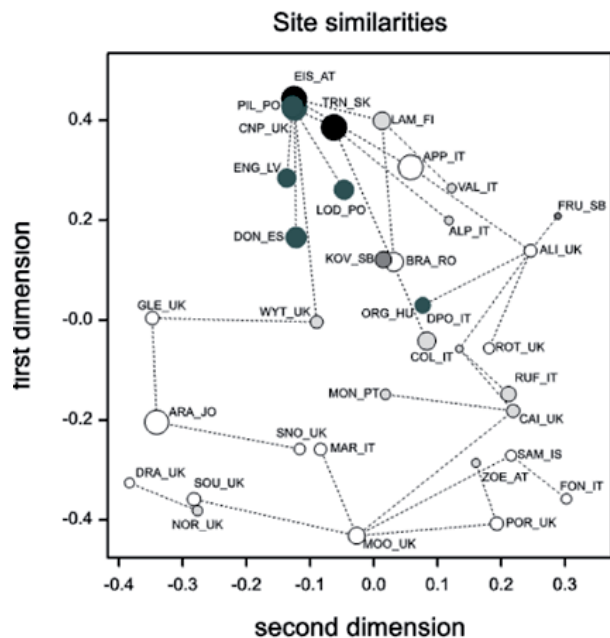
BENEFICIOS DE LA INTEGRACIÓN EN REDES: ILTER Y LTER-EUROPA



Beneficios Científicos

ECOSYSTEM SERVICES: A RAPID ASSESSMENT METHOD TESTED AT 35 SITES OF THE LTER-EUROPE NETWORK

JAN DICK^{1*}, AMANI AL-ASSAF², CHRIS ANDREWS¹, RICARDO DÍAZ-DELGADO³, ELLI GRONER⁴, EUBOŠ HALADA⁵, ZITA IZAKOVIČOVÁ⁶, MIKLÓS KERTÉSZ⁷, FARES KHOURY⁷, DUŠANKA KRASIĆ⁸, KINGA KRAUZE⁹, GIORGIO MATTEUCCI¹⁰, VIESTURS MELECIS¹¹, MICHAEL MIRTL¹², DANIEL E. ORENSTEIN¹³, ELENA PREDÀ¹⁴, MARGARIDA SANTOS-REIS¹⁵, ROGNVALD I. SMITH¹, ANGHELUTA VADINEANU¹⁴, SANJA VESELIĆ⁸, PETTERI VIHERVAARA¹⁶



Assessment of ecosystem integrity and service gradients across Europe using the LTER Europe network

Stefan Stoll^{a,b,*}, Mark Frenzel^c, Benjamin Burkhard^{d,e}, Mihai Adamescu^f, Algirdas Augustaitis^g, Cornelia Baeßler^g, Francisco J. Bonet^h, Maria Laura Carranzaⁱ, Constantin Cazacu^j, Georgia L. Cosor^l, Ricardo Díaz-Delgado^j, Ulf Grandin^k, Peter Haase^{a,b}, Heikki Hämäläinen^l, Rob Loke^m, Jörg Müller^{n,o}, Angela Stanisciⁱ, Tomasz Staszewski^p, Felix Müller^d



Original assessment matrix from Burkhard et al. (2009, 2012)

CLC class	Ecological integrity	Provisioning services	Regulating services	Cultural services	Supporting services
CLC urban fabric	1	1	1	1	1
CLC urban areas	2	2	2	2	2
CLC agriculture	3	3	3	3	3
CLC forests	4	4	4	4	4
CLC wetlands	5	5	5	5	5
CLC water bodies	6	6	6	6	6
CLC bare ground	7	7	7	7	7
CLC cropland	8	8	8	8	8
CLC grassland	9	9	9	9	9
CLC pastures	10	10	10	10	10
CLC high forest	11	11	11	11	11
CLC broadleaved forest	12	12	12	12	12
CLC coniferous forest	13	13	13	13	13

One matrix for entire Europe

2 creation of local subsets of the assessment matrix for each participating site

CLC class	Ecological integrity	Provisioning services	Regulating services	Cultural services	Supporting services
CLC urban fabric	1	1	1	1	1
CLC urban areas	2	2	2	2	2
CLC agriculture	3	3	3	3	3
CLC forests	4	4	4	4	4
CLC wetlands	5	5	5	5	5
CLC water bodies	6	6	6	6	6
CLC bare ground	7	7	7	7	7
CLC cropland	8	8	8	8	8
CLC grassland	9	9	9	9	9
CLC pastures	10	10	10	10	10
CLC high forest	11	11	11	11	11
CLC broadleaved forest	12	12	12	12	12
CLC coniferous forest	13	13	13	13	13

+



visualisations of all EI and ES for each local sites using CLC data

Beneficios en la Gestión de datos



Iniciativa LTER-Europa: DEIMS Política de datos

The screenshot displays the EnvEurope GeoPortal interface. On the left, a 'Layers' panel lists various LTER sites across Europe. The main map shows a satellite view of Europe with data points overlaid. A 'Parameters' table lists various parameters and their monitoring periods. A 'Chart' displays a time-series plot of Chlorophyll and Phosphorus levels from 1985 to 2013. A 'Data' table shows specific measurements for PTOT and CP at various times.

Type	Start	End
Chlorophyll	1965-05-19 11:00:06	2012-10-16 11:00:06
Chlorophyll depth	1965-05-19 11:00:06	2012-10-16 11:00:06
Water Temperature	1951-11-13 10:00:00	2012-10-16 11:07:12
Secchi Disk	1965-03-25 10:00:00	2012-10-16 11:00:00
Phosphorus	1965-03-25 10:00:06	2012-10-16 11:07:12
Phosphorus depth	1965-03-25 10:00:06	2012-10-16 11:07:12
Silica	1953-11-13 10:00:00	2012-10-16 11:07:12
Silica depth	1953-11-13 10:00:00	2012-10-16 11:07:12
Ammonia	1965-03-25 10:00:06	2012-10-16 11:07:12
Ammonia depth	1965-03-25 10:00:06	2012-10-16 11:07:12
Nitrate	1965-03-25 10:00:06	2011-12-15 10:04:00
Nitrate depth	1965-03-25 10:00:06	2011-12-15 10:04:00

Parameter	Time	Value
PTOT	1985-12-12T10:00:24.000...	30.95
CP	1986-03-06T10:00:24.000...	25.3
PTOT	1986-03-06T10:00:24.000...	30
CP	1986-03-29T10:00:24.000...	34.6
PTOT	1986-03-29T10:00:24.000...	31.98
CP	1986-04-03T11:00:24.000...	37.7

[View full metadata](#)

[View as EML XML](#)

[View as ISO XML](#)

[W3C SKOS](#)



Catálogos, repositorios, servicios, visores, tesauros...

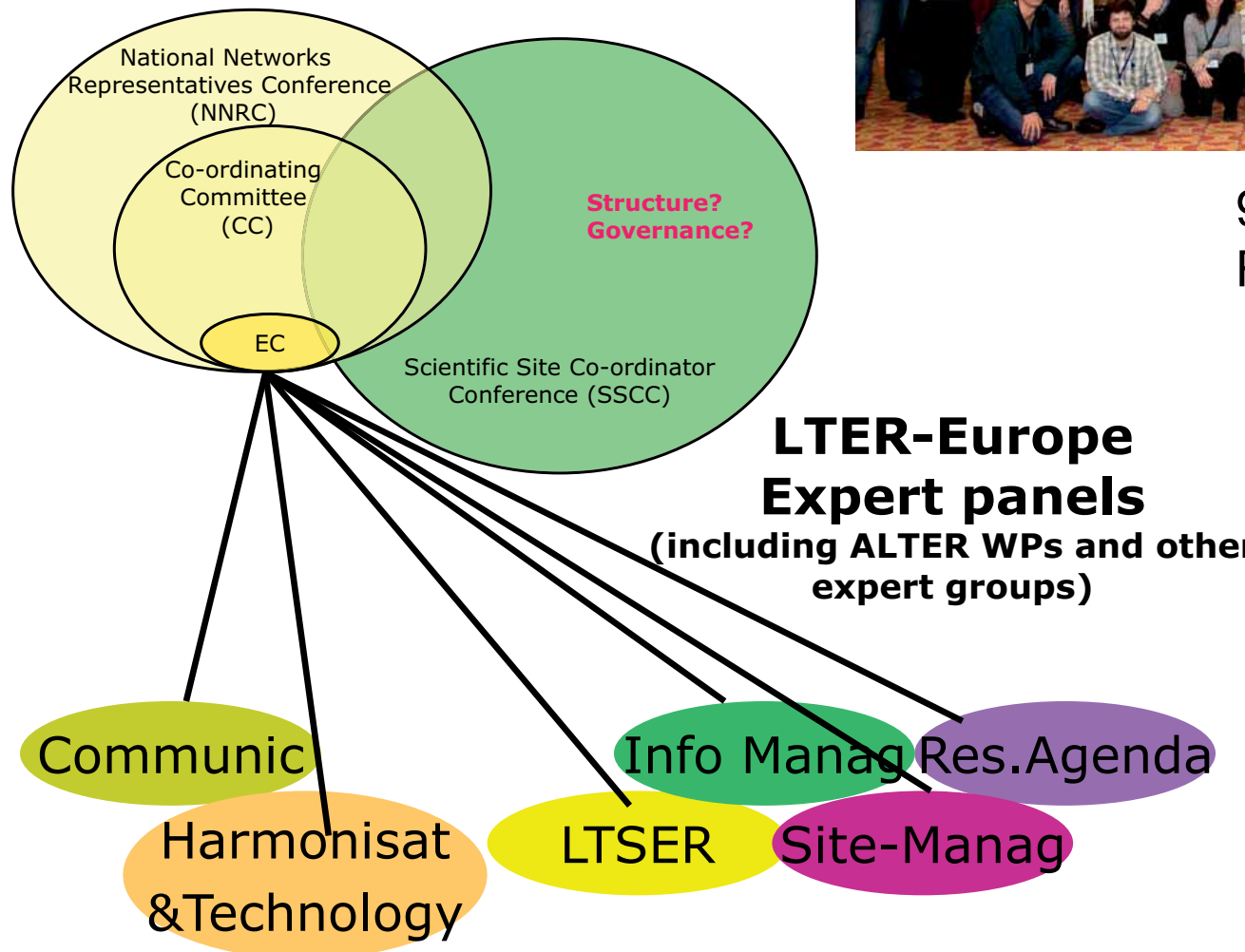


Beneficios en formación y métodos: Expert Pannels

Paneles de expertos: Dar soporte a la comunidad y continuidad a la actividad de la red.
 Mantener "networking"
 Promover proyectos

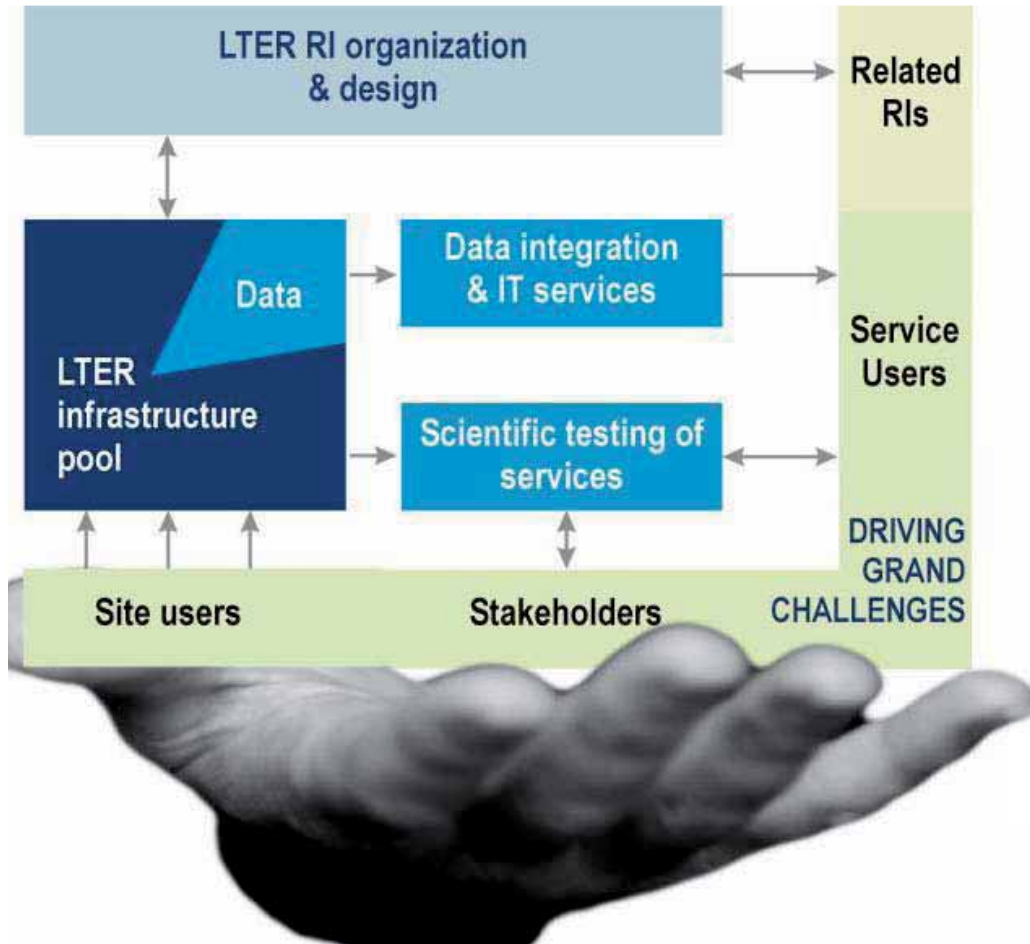


9th LTER-Europe Conference
 Roma, 2013



Beneficios para financiación de actividades

Participación en proyectos europeos: eLTER (INFRAIA-H2020); COST Actions



BIOECOST-Europe
Cost proposal

**Biodiversity, Ecosystems,
Society: reinforcing
harmonized Trend studies in
Europe**

Beneficios para los gestores: sumario

- Sistemas de apoyo a la toma de decisiones
- Supervisión y asesoría en programas de seguimiento
- Supervisión y asesoría en sistemas automáticos de medición y experimentación
- Beneficios derivados del trabajo en red (repercusión, atracción, etc.)
- Herramientas de gestión de la información
- Talleres de difusión y formación
- Aproximación socio-ecológica
- Políticas de acceso a datos
- Participación en proyectos inter-disciplinarios
-
- Cenas divertidas
- Viajes
- Estancias...



LT^{ER}
.....spain

Gracias