European Topic Centre
Spatial Information and Analysis

European Environment Agency

Forest-related activities and opportunities for the Carpathians

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Oilthigh na Gàidhealtachd agus nan Eilean

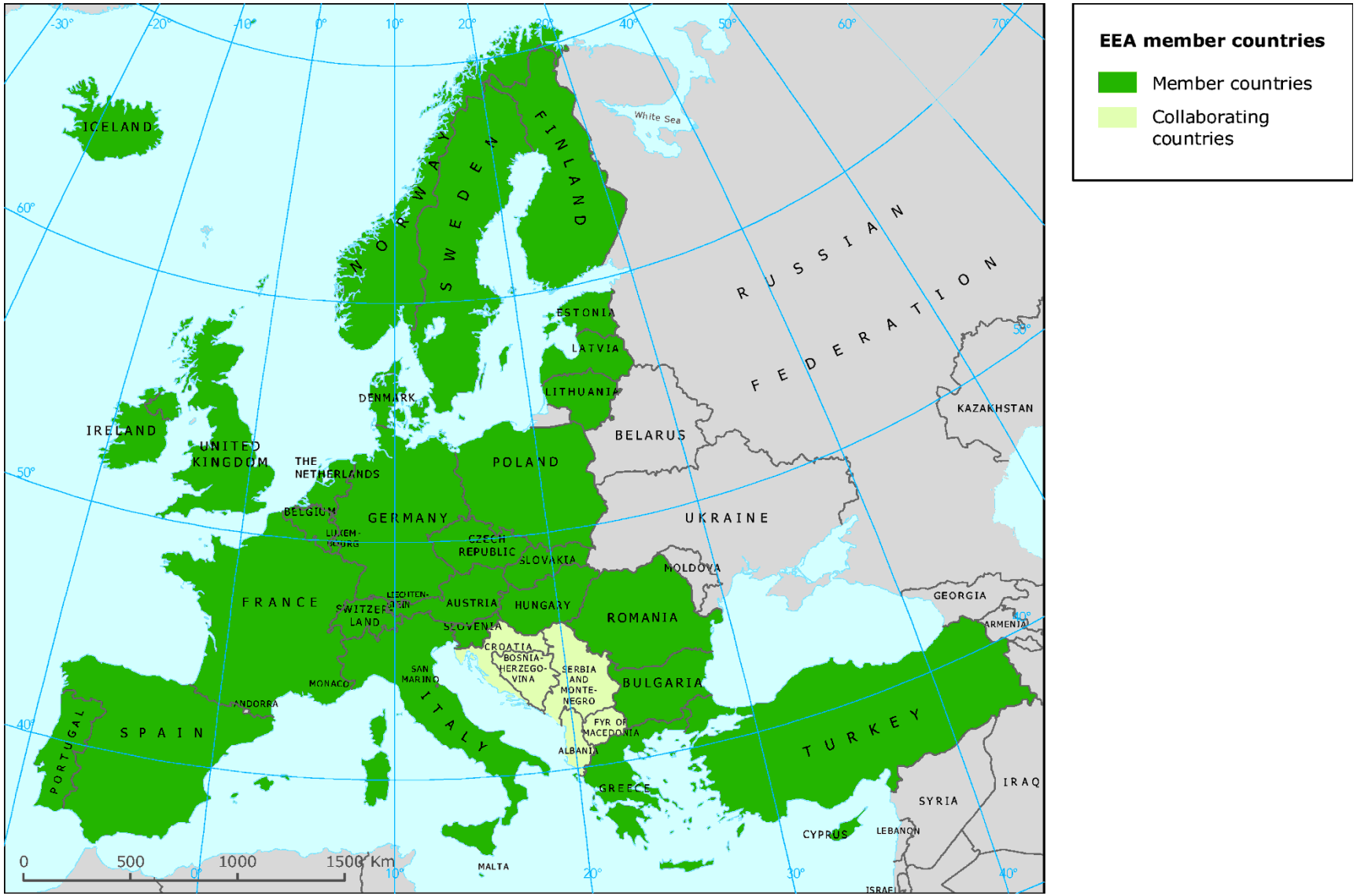
Carpathian Convention Working Group on Sustainable Forest Management
Rzeszow, Poland, 4-6 September 2013

European Environment Agency

- What is it?
  - Analyst and advisor (supporting European policies)
  - Independent provider of information (public)
  - Link science and (environmental) management
  - A network supporting the development of enviromental policies
- What is not?
  - A legislator
  - A research centre
  - A regulator

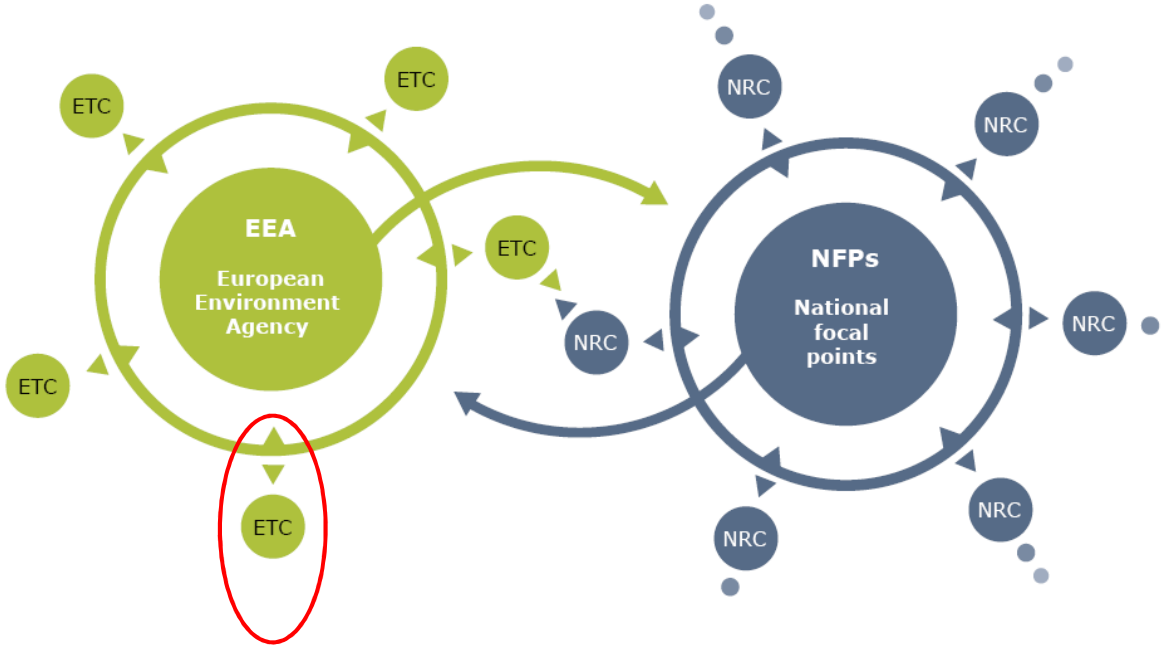
    (in the sense of controller)

EEA Member Countries



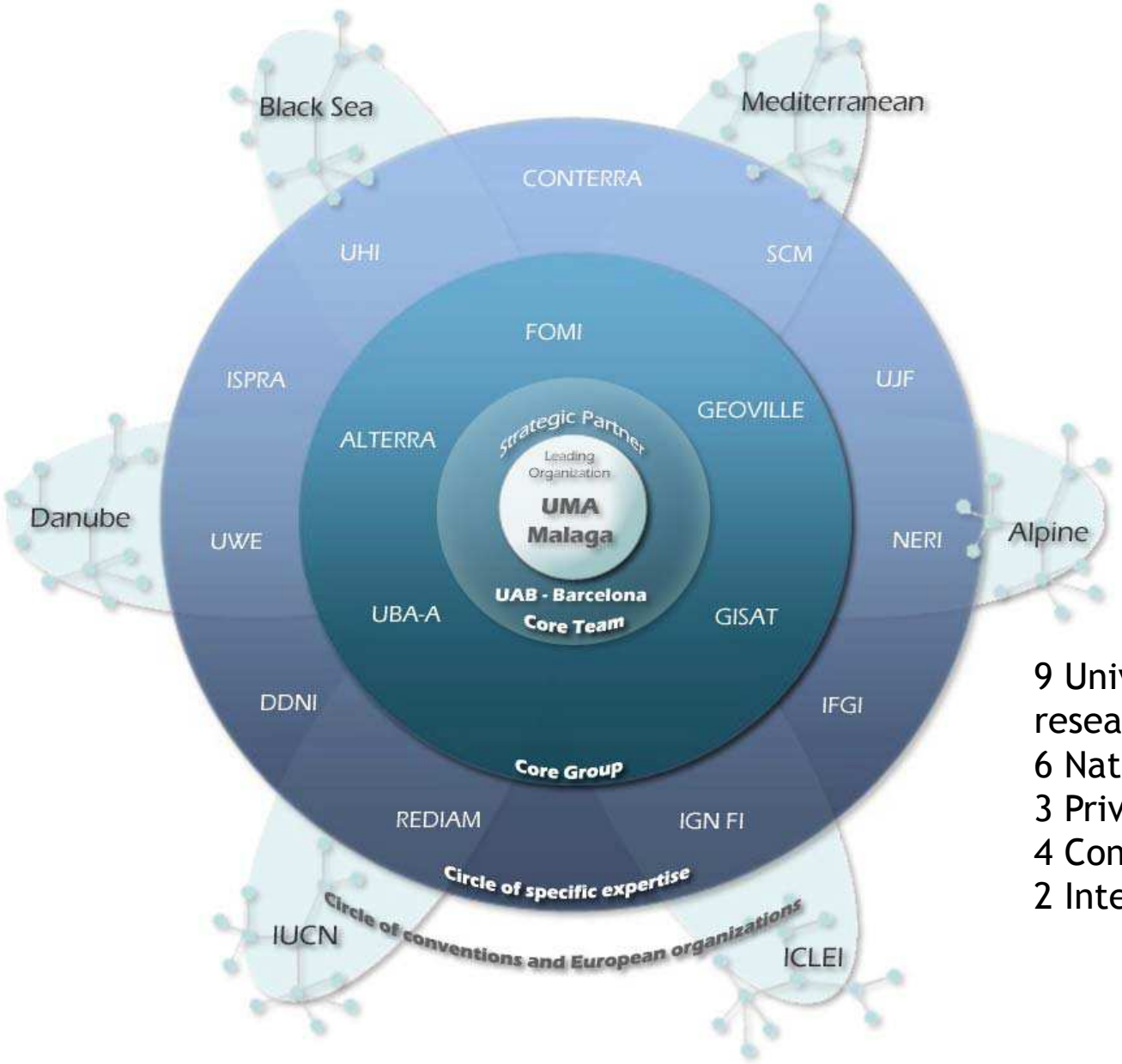
EEA and EIONET

- **EIONET**: "European Environment Information and Observation Network" (established in 1999)



European Topic Centre on Spatial Information and Analysis (ETC-SIA)

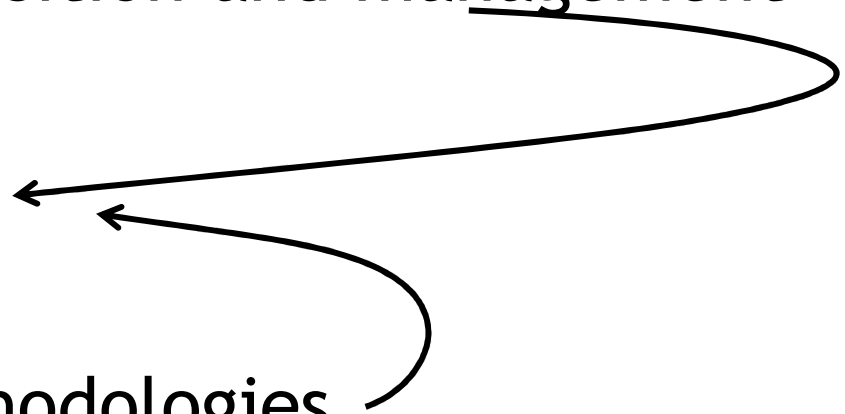
European Topic Centre



9 Universities and research centres
6 National agencies
3 Private companies
4 Conventions
2 International NGOs

ETC-SIA: Work process

- Geographical data acquisition and management
- Analysis and assessment
- Integrated analysis methodologies



ETC-SIA expertise & work

- Data collection/data processing
  - Sources: Directives, EEA dataflows
  - Scale: Europe
- Methodological development
  - Data integration (e.g. spatial information, socioeconomic)
  - Spatial analysis (e.g. fragmentation, green infrastructure)
- Thematic
  - Accounts
    - Land use
    - Carbon
  - Biodiversity (indicators)
  - Forest assessment
  - Mountain assessment
  - …

Slide 7

jfe1 A kind of summary or list of main areas/topics of expertise ETC
j_fons, 28/08/2013

Validated data/metadata

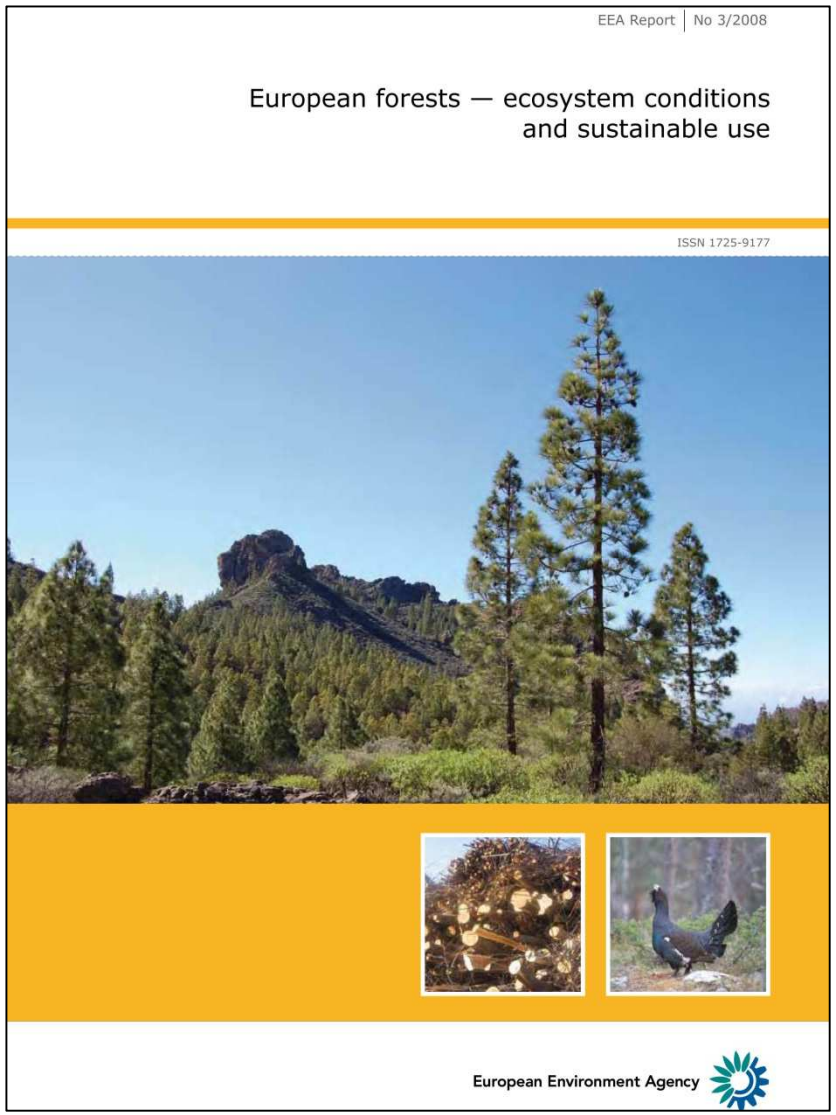
- Land cover
- Forests
  - growth
  - growing stock, increments, fellings
  - deadwood
- Protected areas
- Biodiversity
  - habitats
  - species diversity
  - phenology
- Climate
- Pollution
- etc.

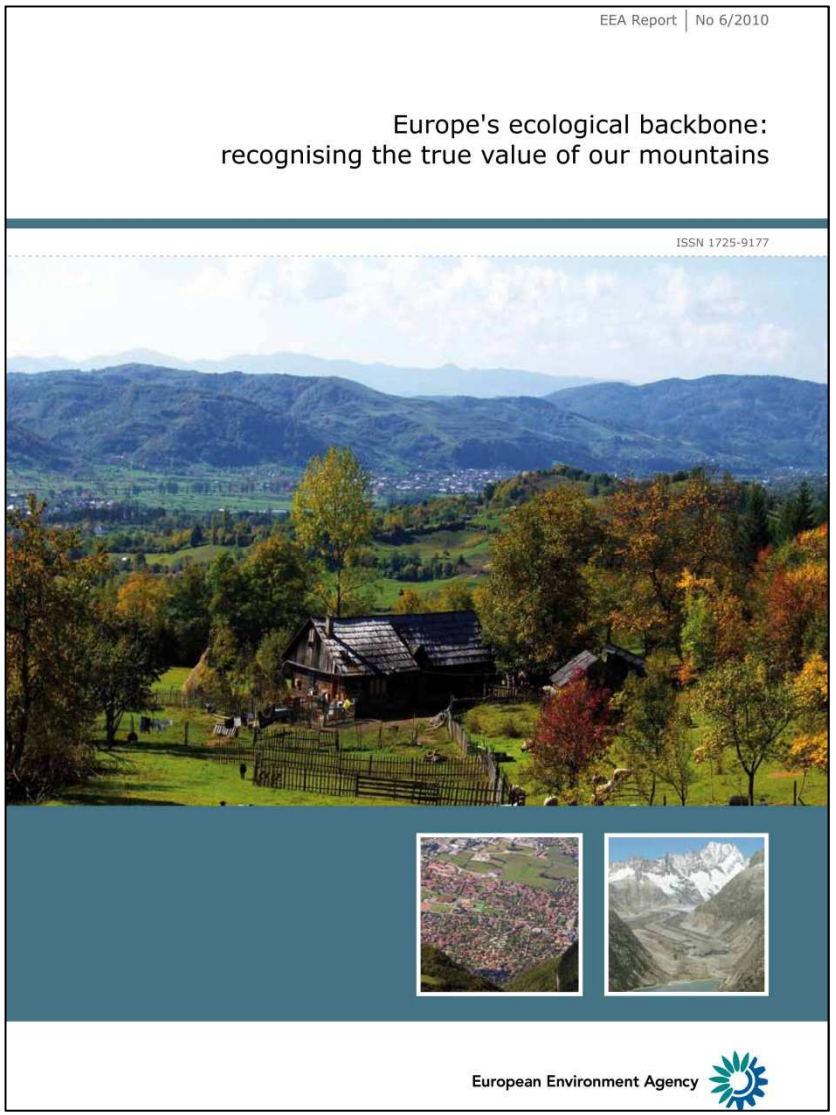
Slide 8

jfe2 A kind of summary or list of main areas/topics of expertise ETC

j_fons, 28/08/2013

Major European assessments





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Spatial Information and Analysis

Pan-European forest ecosystem assesment

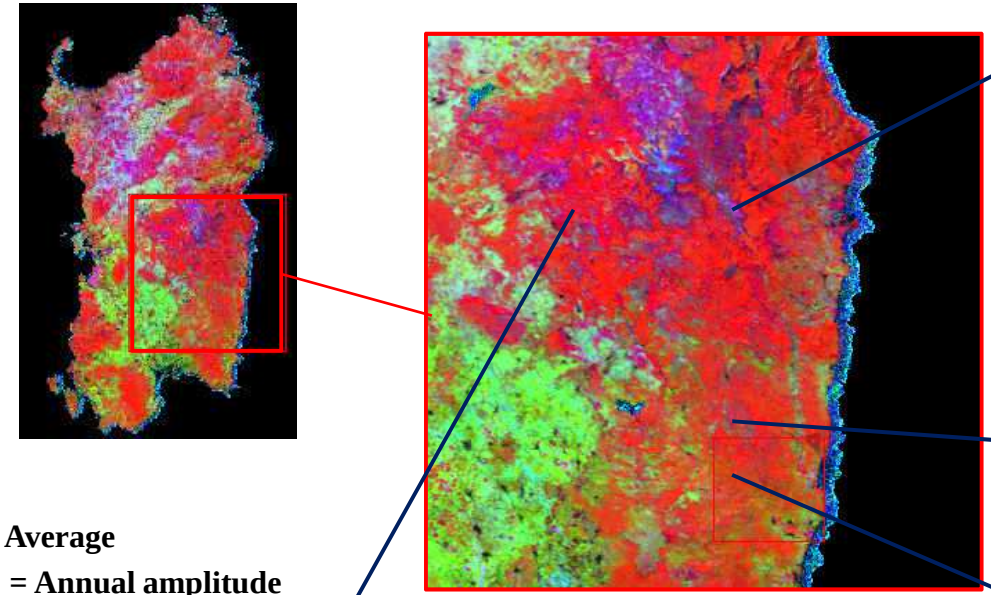
Ongoing work within Pan-European ecosystem assessment on:

- **Approaches and tools** to support experts developing ecosystem assessments with factual data / knowledge to measure / assess progress according to the **EU Biodiversity Strategy** to 2020
- Specific goals:
  - Specify **accurate & available information** to be used in building Pan-European assessment - improving understanding on the condition (state) of Pan-European ecosystems and the main drivers and pressures affecting them
  - Identify **indicators** and tools to test changes in ecosystems
  - Address **major gaps and uncertainties in existing Pan-European knowledge** and provide alternatives whenever possible
  - Raise awareness and guide research and Member States in:
    - identifying the **most reliable available knowledge** for assessing their ecosystems in a **regional context**
    - building individual / institutional capacity to undertake integrated regional ecosystem assessments and act on findings

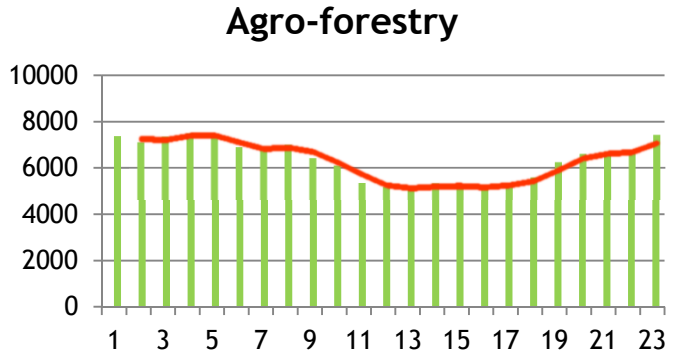
Further info: Dania Abdul-Malak, University of Málaga, daniaabdulmalak@uma.es, Tel: +34 952 028 869

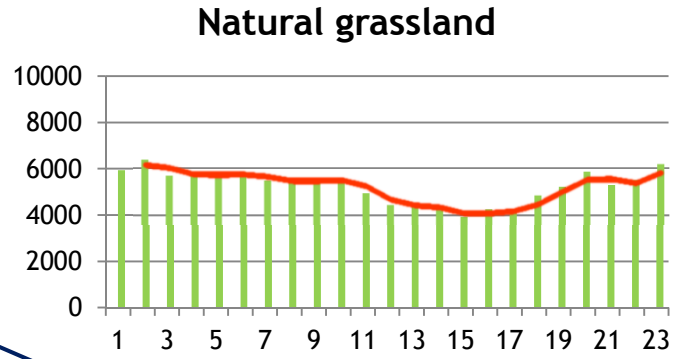
Land cover classification

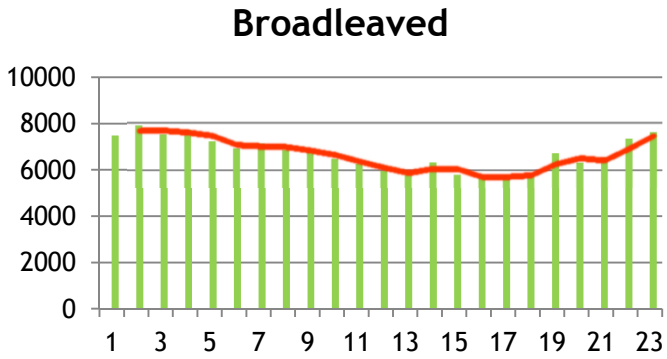
Differentiation of forest and semi natural areas

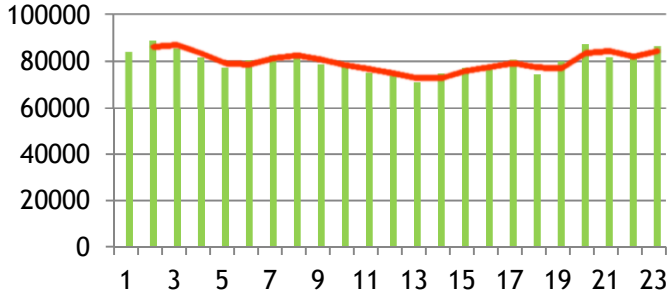


Red = Average
Green = Annual amplitude
Blue = six-months amplitude



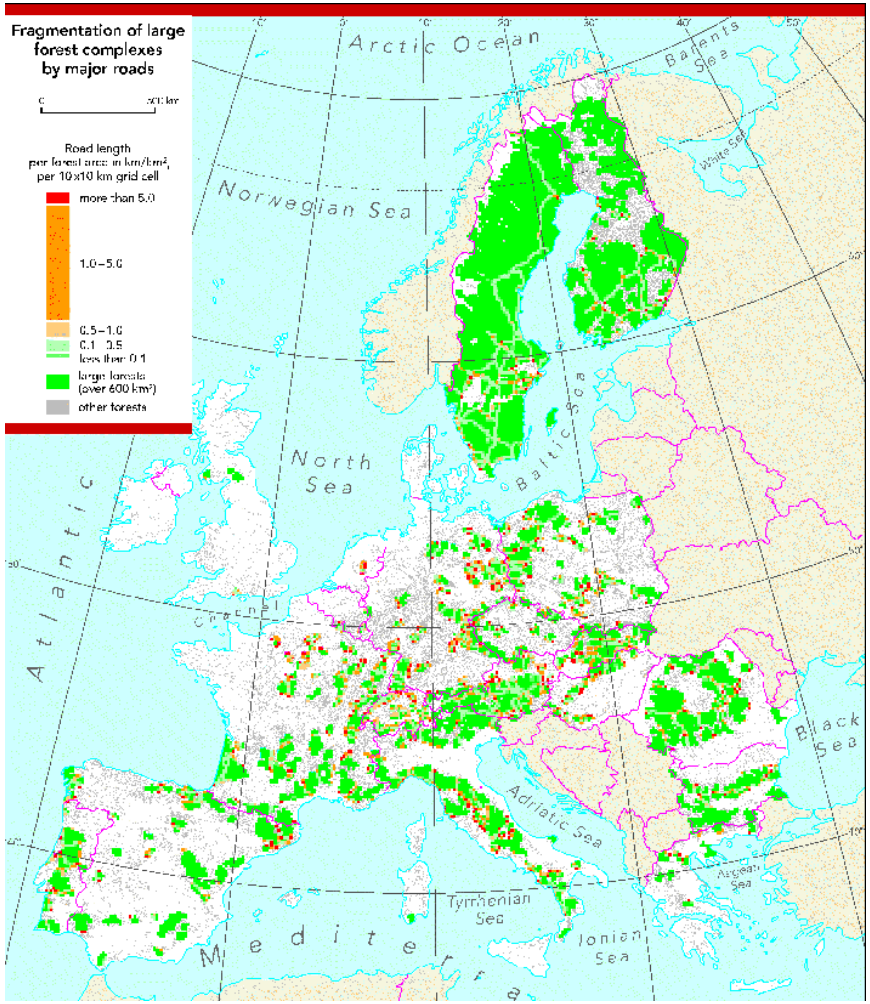


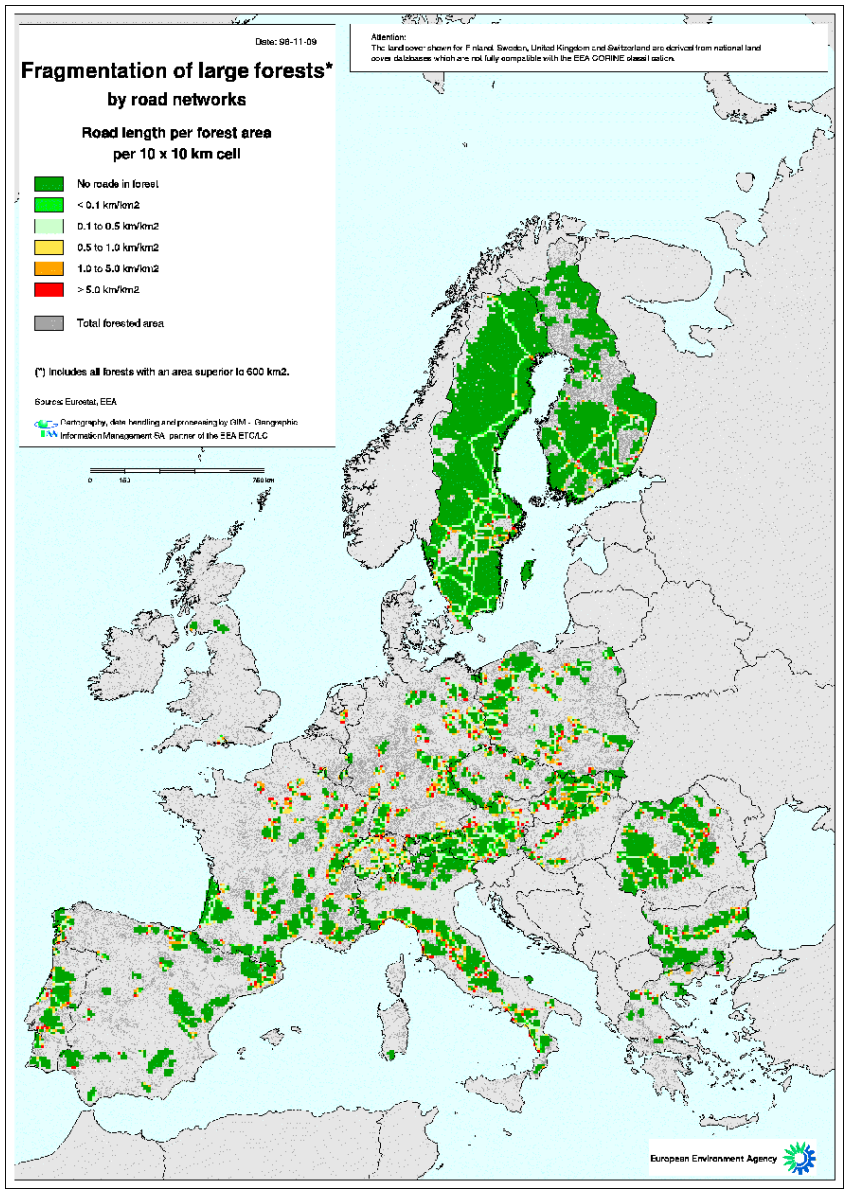




Forest fragmentation in Europe

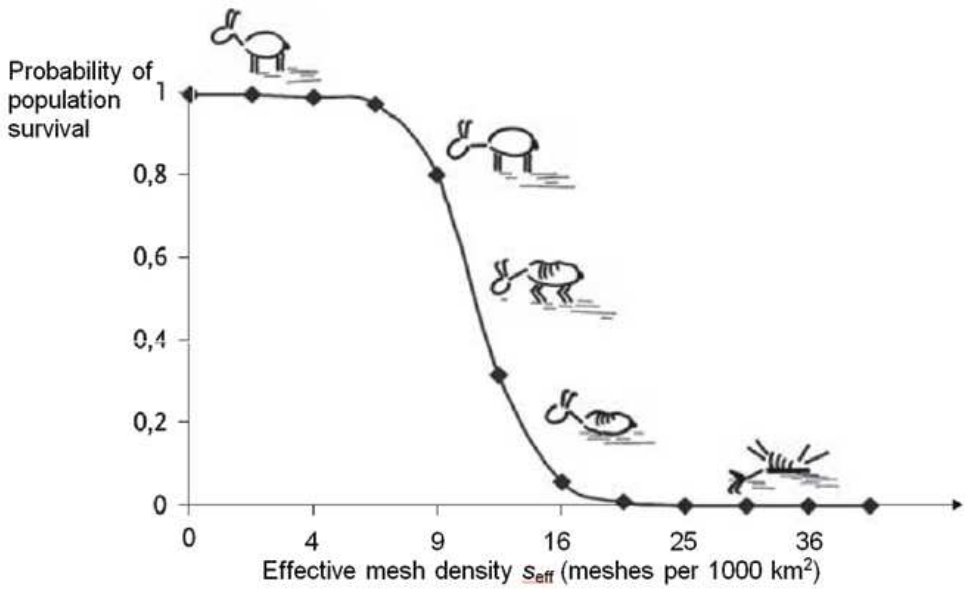
Simple approaches use infrastructure length per area





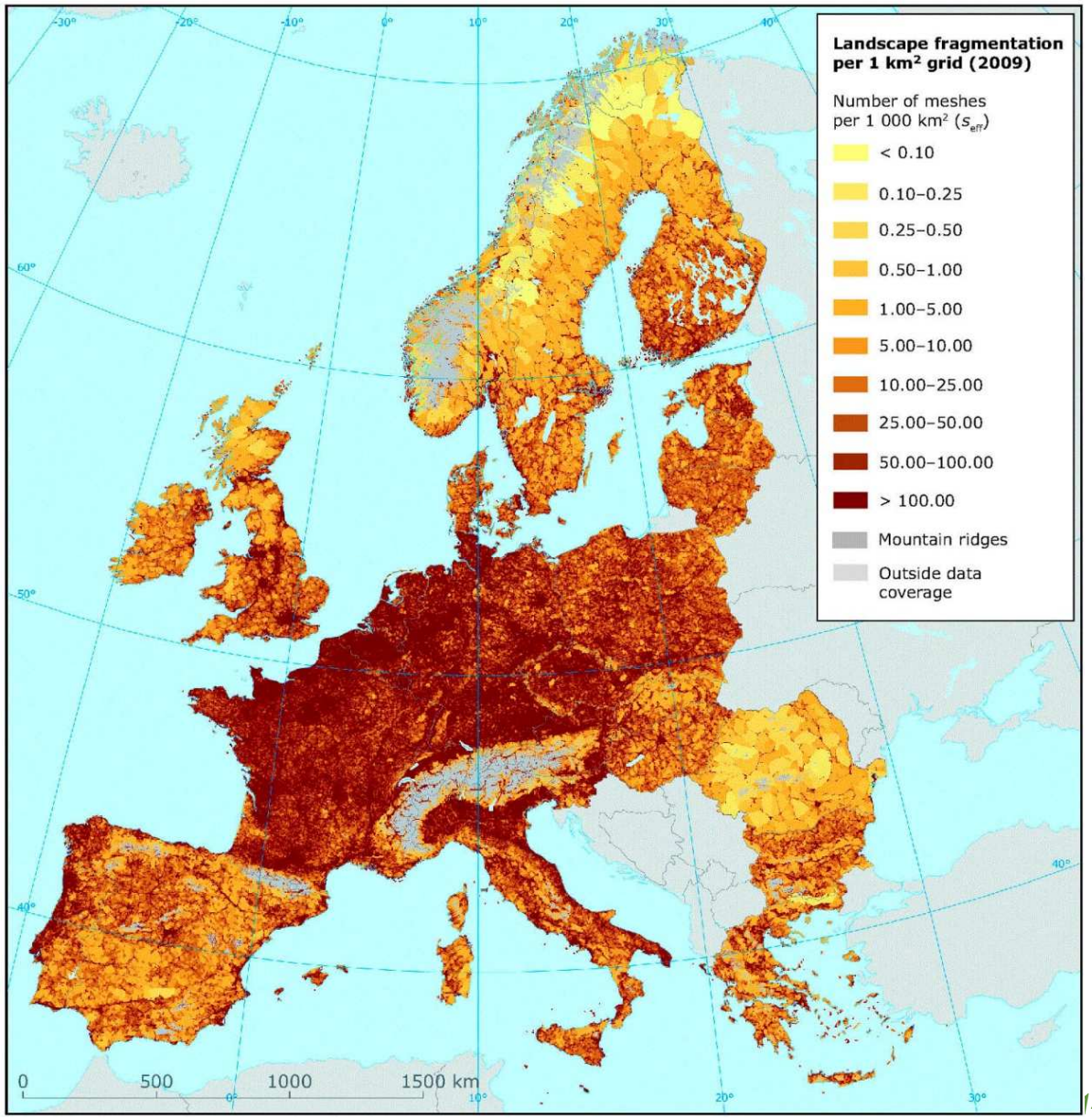
Complex approaches using well-known measures of mesh size

- MEFF: Effective mesh size measures **landscape connectivity**, i.e. the degree to which **movement** between different parts of the landscape is **possible**
  - expresses the probability that any two points chosen randomly in a region are connected; i.e., not separated by barriers. e.g. transport routes, built-up areas
  - The more barriers fragmenting the landscape, the lower the probability that the two points are connected, and the lower the effective mesh size
- SEFF: Effective mesh density measures **landscape fragmentation**, i.e. the degree to which movement between different parts of the landscape is **interrupted by barriers**
  - gives the effective number (density) of meshes per 1 000 km²
  - The more barriers fragmenting the landscape, the higher the effective mesh density



Forest fragmentation in Europe

- SEFF has been calculated for landscapes
- MEFF and SEFF have not yet been calculated specifically for forest areas



Forest stocks and flows in Carbon accounts

Ecosystem accounts

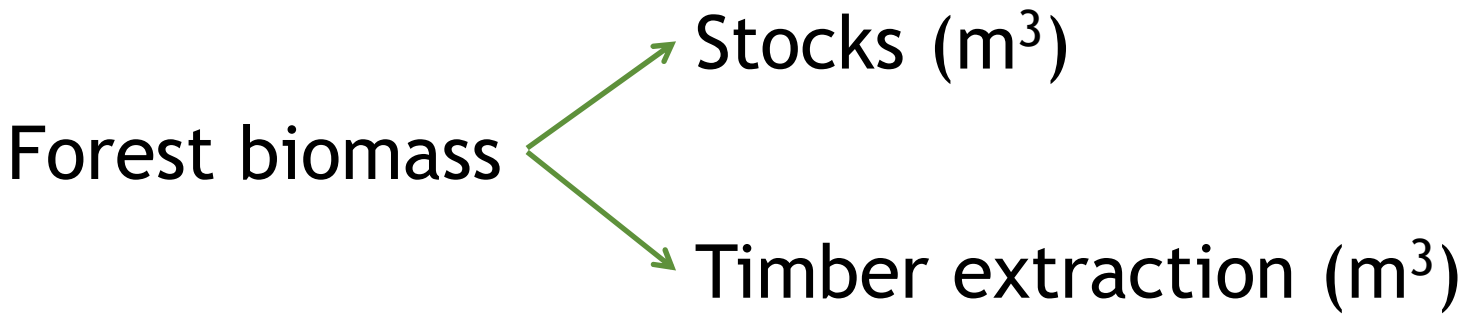
- describe the **biophysical reality** of the **European environment**
- by measuring the **ecosystem capital** in **physical units**

Data about **stocks and flows** of this capital

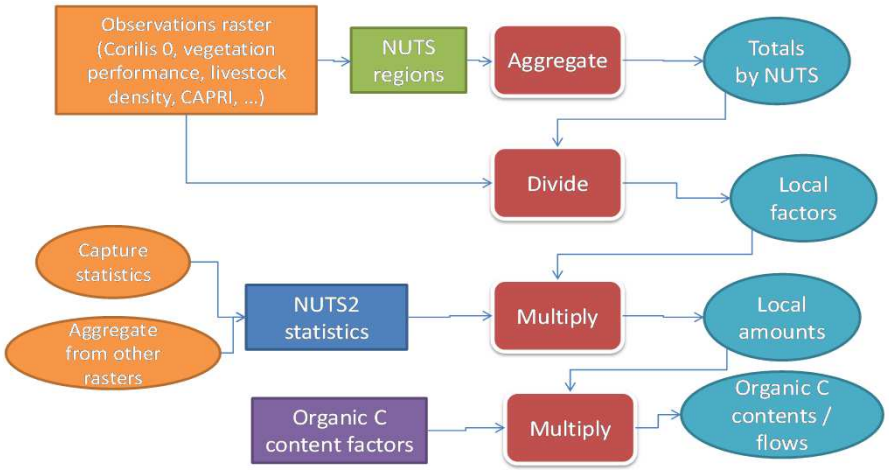
- used to estimate the **quantity of ecosystem resources** that are **accessible without degradation**

The purpose of the development of ecosystem accounts:

- to **assess, map and measure** the **state of ecosystems** in Europe
- to **track the changes of stocks and flows** over time



Forest stocks and flows in Carbon accounts



Input data:

- EFI EFISCEN & European Forest datasets, National Forest Inventories, FAO data
- Corilis (1 km raster)
- Statistics (NUTS 0-2 level) on felling
- Yearly average NDVI

Output data:

- 1km raster data (2000-2010):
  - ➢ Forest stocks
  - ➢ Forest stock Carbon content
  - ➢ Timber extraction
  - ➢ Timber extraction Carbon content

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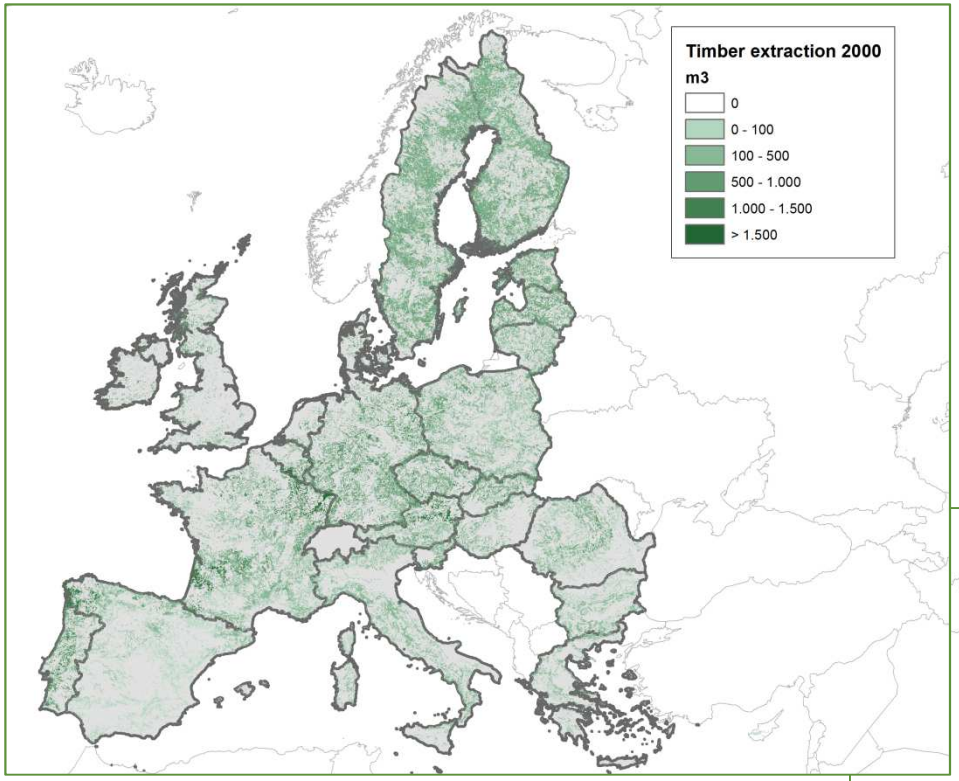
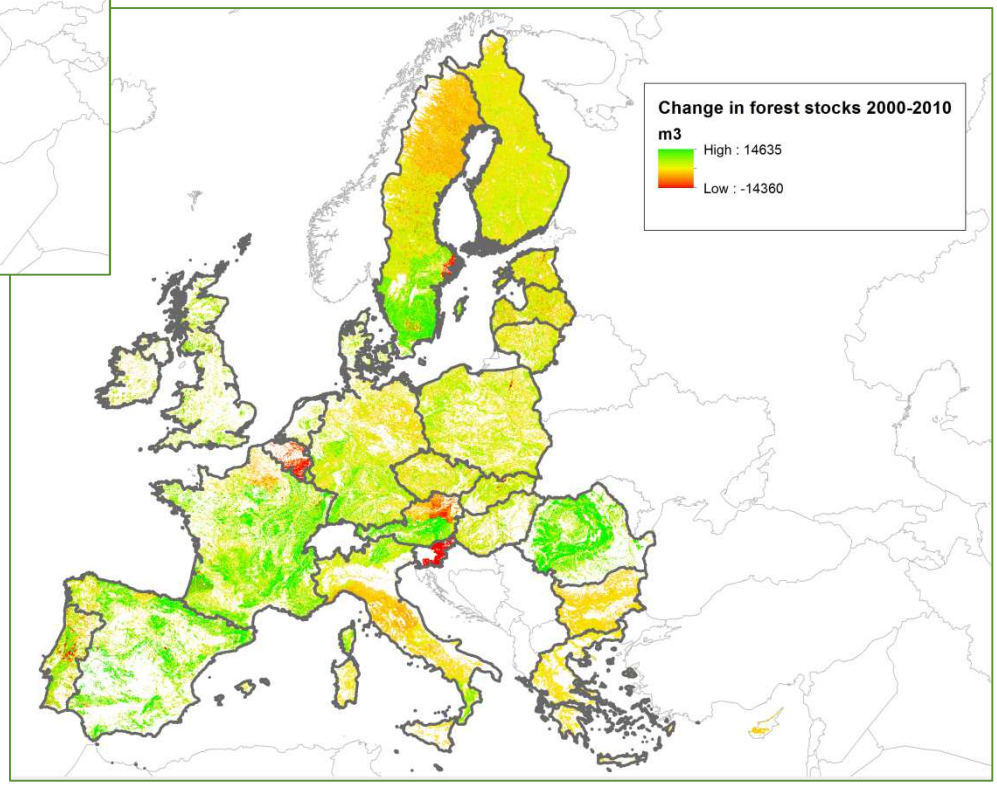
Forest Stocks and Flows in Carbon Accounts





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High Nature Value (HNV) Forest area

Application of a simplified methodology to identify the area of HNV forest in Europe

- implemented for the Boreal biogeographic region
- approach based on the naturalness indicator of forest species assemblages (improving the methodology of Chirici et al., 2012)
- calculation of beech forest and 5 other common European forest species: *Picea abies*, *Pinus sylvestris*, *Quercus petraea*, *Quercus robur*, *Quercus suber* (species assemblages)

Maps developed by the University of Málaga:

- naturalness of forest species assemblages in the Boreal biogeographical region

Further details: Dania Abdul Malak and Ana Marin (2013). *High Nature Value (HNV) Forest Area Indicator*. ETC-SIA report to the EEA.

* Chirici G., Eggers J, Bastrup-Birk A., den Herder M., Lindner M., Fabio Lombardi F., Marchetti M., 2012 European Forests Assessments: Further development of the High Natural Value (HNV) forest area indicator. Technical Annex to Specific Contract No. 3527/B2012/EEA. Implementing Framework Contract Ref. No. EEA/NSV/10/004

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High Nature Value (HNV) Forest

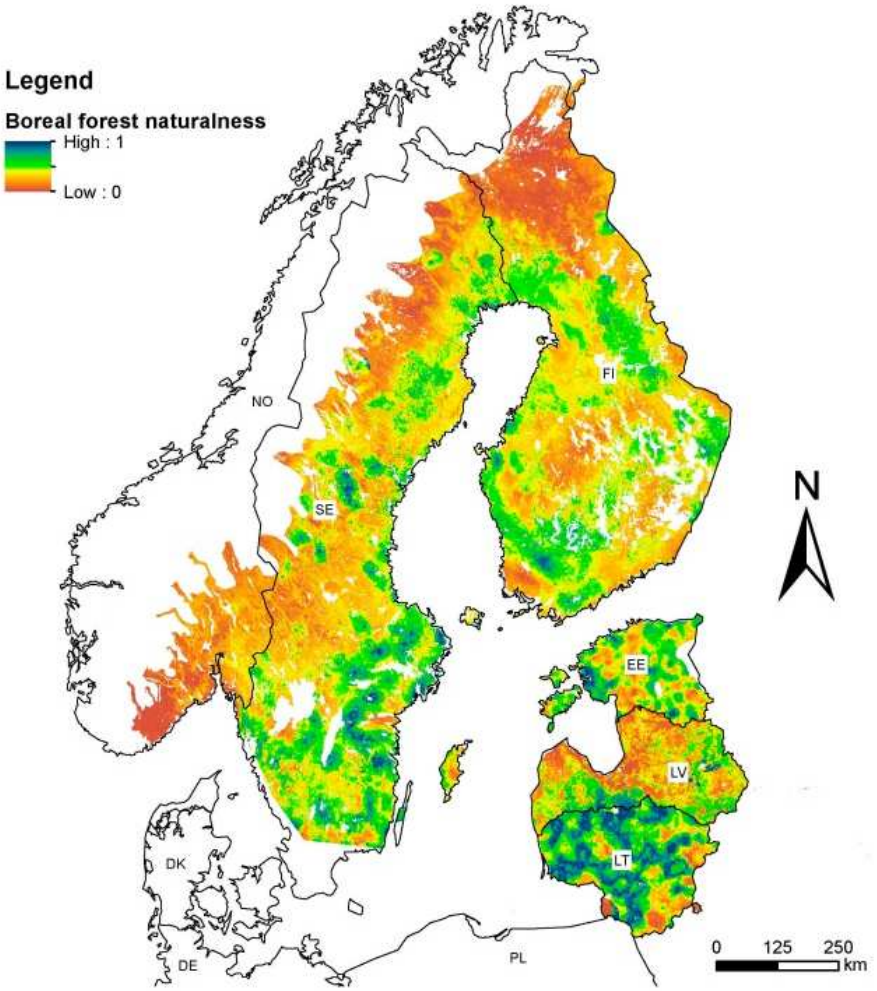
Input datasets:

- European Biogeographical Regions dataset 2011 (EEA)
- Tree species maps for European forests (EFI, Alterra)

Processing:

- Calculate dominant tree species assemblages in boreal forests
- Calculate naturalness of boreal forest tree species based on habitat suitability (FPi) & presence of main tree species assemblages (FRi)

$$(N_i = 1 - \sqrt{(FP_i - FR_i)^2})$$



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Future cooperation

Draft Partnership Agreement

- Data gathering and sharing + metadata
- Data combination and analysis
- Indicators @ regional-level
- Reports
- ?

Timing

- October: discuss topics & joint activities
- Mid-November: input to ETC-SIA 2014 Implementation Plan