Implementation of Action 5 of the EU Biodiversity Strategy: Status and progress of MAES (Mapping and Assessment of Ecosystems and their Services)

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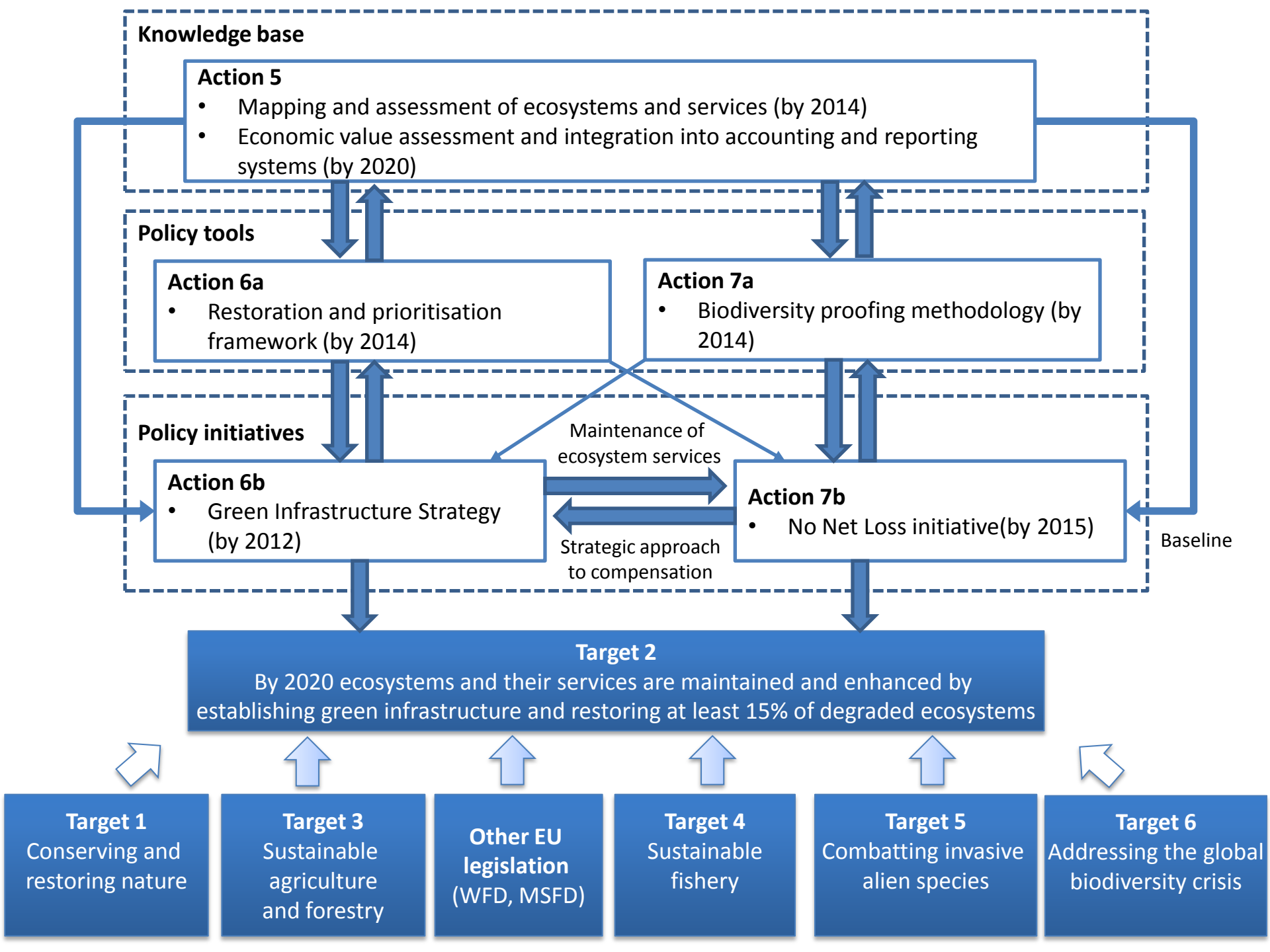
Action 5 of the Biodiversity Strategy

Improve the knowledge of ecosystems and their services in the EU

"Member States, with the assistance of the Commission, to map and assess the state of ecosystems and their services in their national territory by 2014, assess the economic value of such services, and promote the integration of these values into accounting and reporting systems at EU and national level by 2020"

*The working group on Mapping and Assessment of Ecosystems and their Services (**MAES**) oversees the implementation of Action 5*


Knowledge base
Action 5
• Mapping and assessment of ecosystems and services (by 2014)
• Economic value assessment and integration into accounting and reporting systems (by 2020)
Policy tools
Action 6a
• Restoration and prioritisation framework (by 2014)
Action 7a
• Biodiversity proofing methodology (by 2014)
Policy initiatives
Maintenance of ecosystem services
Action 6b
• Green Infrastructure Strategy (by 2012)
Action 7b
• No Net Loss initiative(by 2015)
Strategic approach to compensation
Baseline
Target 2
By 2020 ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15% of degraded ecosystems
Target 1
Conserving and restoring nature
Target 3
Sustainable agriculture and forestry
Other EU legislation
(WFD, MSFD)
Target 4
Sustainable fishery
Target 5
Combatting invasive alien species
Target 6
Addressing the global biodiversity crisis

Milestones of MAES (2012-2015)

2012 ● Member States workshop

2013 ● MAES reports

2014 ● MAES high level event

2015 ● 10th working group meeting

● MAES delivery workshop (15-16/12, Belspo)

MAES working group

- Conceptual model linking biodiversity to human well-being
- Typologies for ecosystems and ecosystem services (CICES 4.3)
- Common Assessment Framework
- Thematic and cross-cutting pilots

EU institutions

- **EEA**: Ecosystem map, Ecosystem condition mapping and assessment, BISE
- **JRC**: Mapping ecosystem services
- **ENV**:Guidance and training
- **RTD**: Horizon 2020

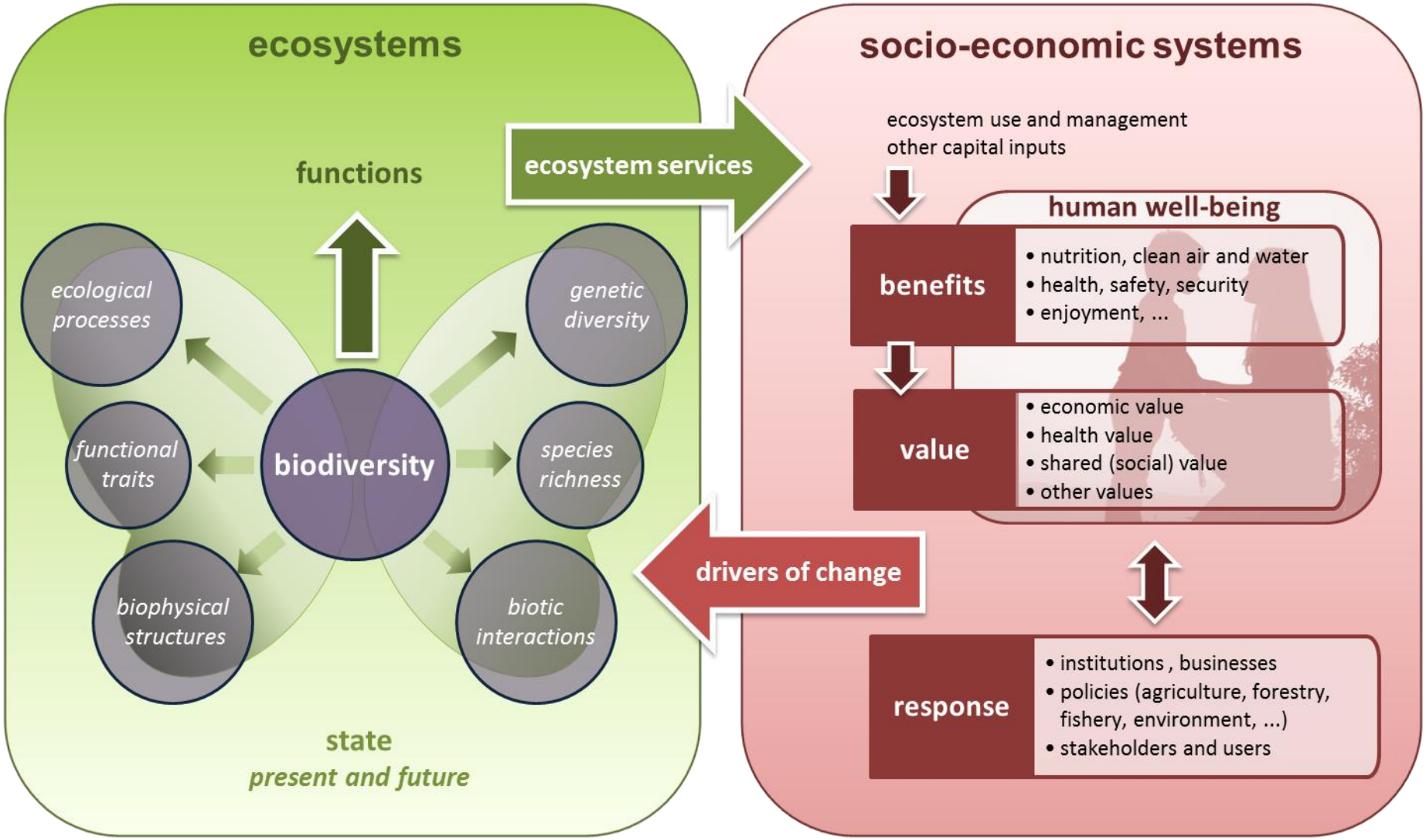
Member States (MS)

- MAES started in almost all MS.
- Some MS have completed a national scale mapping
- Many MS have regional case studies

Research community

- **ESMERALDA**: A dedicated coordination and support action
- FP7 projects OpenNESS, OPERAs, MARS
- Ecosystem Services Partnership, ALTER-net

MAES working group activities



Common Assessment Framework:

Building blocks for an integrated ecosystem assessment

(1)
Map ecosystems

Urban	**Land use land cover data, e.g.**
Cropland	Corine Land Cover
Grassland	Copernicus high resolution data
Woodland and forest	Elevation data
Heathland and shrub	Seabed maps
Sparsely vegetated land	National datasets
Wetlands	
Rivers and lakes	Models for spatially delineating wetlands or natural, unmanaged systems
Marine inlets and transitional waters	
Coastal	
Shelf	
Open ocean	

(2)
Assess the condition of ecosystems

Indicators	***Data***
Conservation status of habitats and species	Art.17 assessment
Ecological status of water bodies	WFD assessment
Environmental status of seas	MSFD assessment
Ecosystem status and biodiversity	data including air pollutant concentration, habitat connectivity, land use change, soil degradation, …

(3)
Assess te ecosystem services delivered by ecosystems

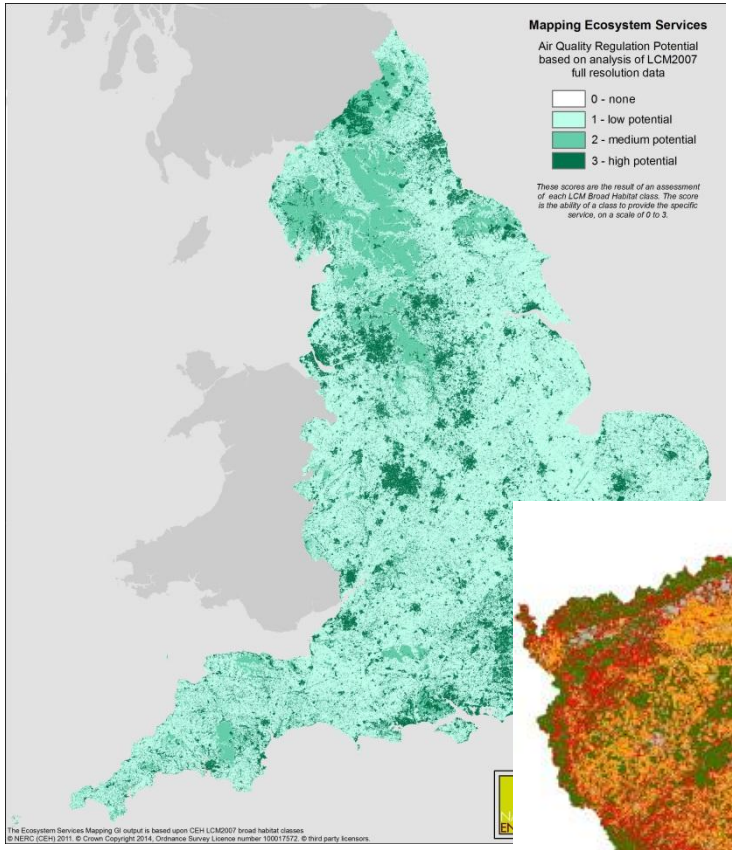
Indicators	***Data and models***
Supply indicators: Indicators of stock and flow of ecosystem functions and ecosystem services	Different sources of environmental data and models
Demand indicators: Indicators for the human demand for ecosystem services	Different socio-economic statistics

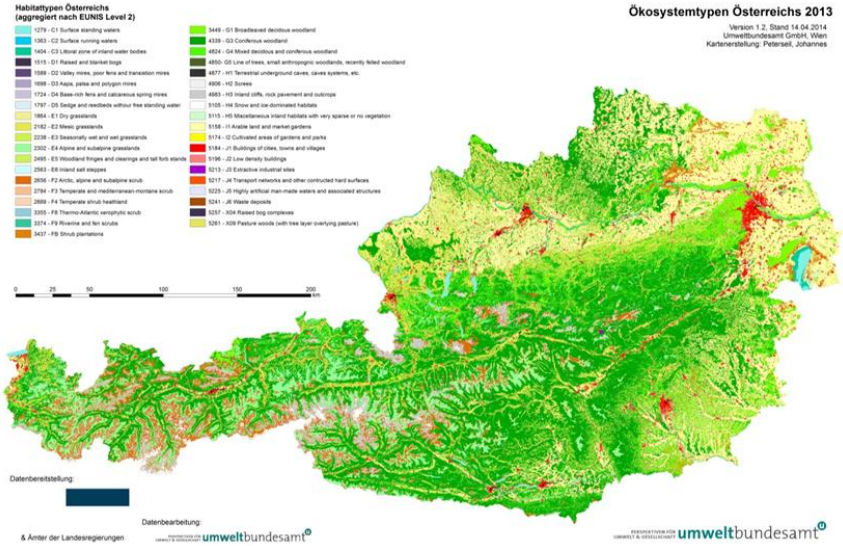
(4)
Integrated ecosystem assessment:
How does condition relate to services provision?
How do the various ecosystem types interact to provide services?

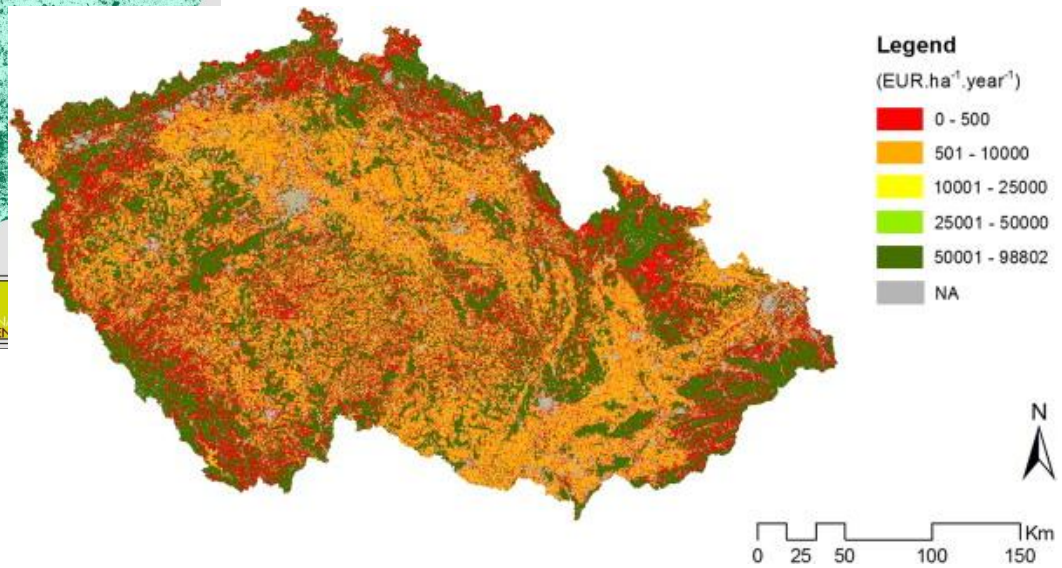
Pilot studies

- *Results of the pilots on agriculture, forest, fresh water and marine are available in the 2nd MAES report*
- *Special report on Natural Capital Accounting*
- *Currently running pilots on soil and urban ecosystems*
- *https://ec.europa.eu/eusurvey/runner/MAES_UrbanPilot_survey_2015*

Mapping in the Member States

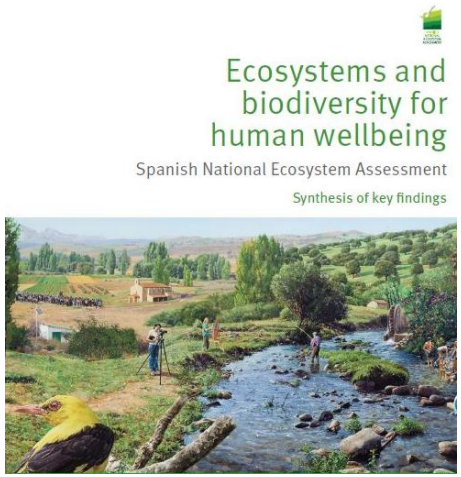


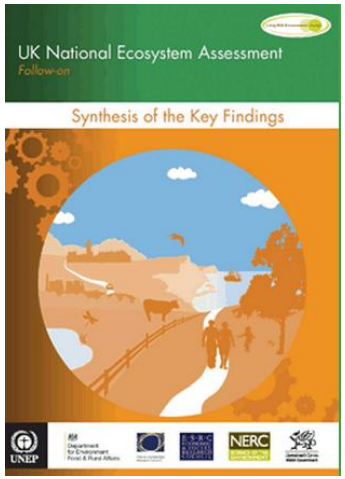


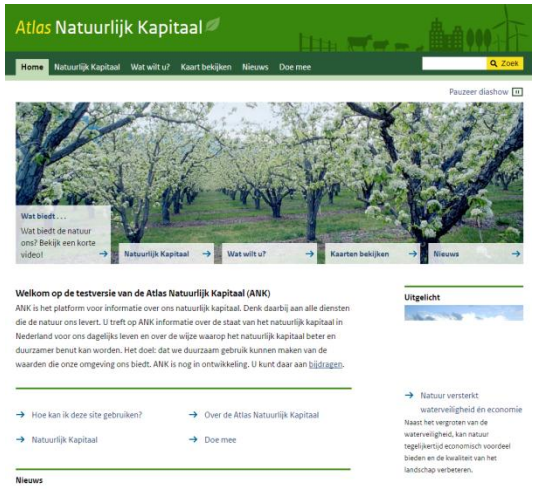


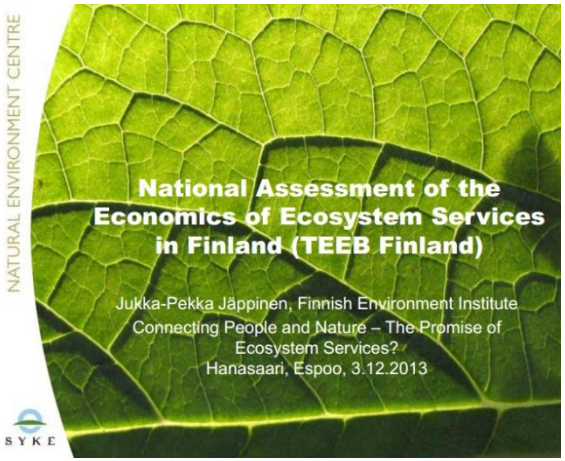
Assessments in the Member States

European Commission



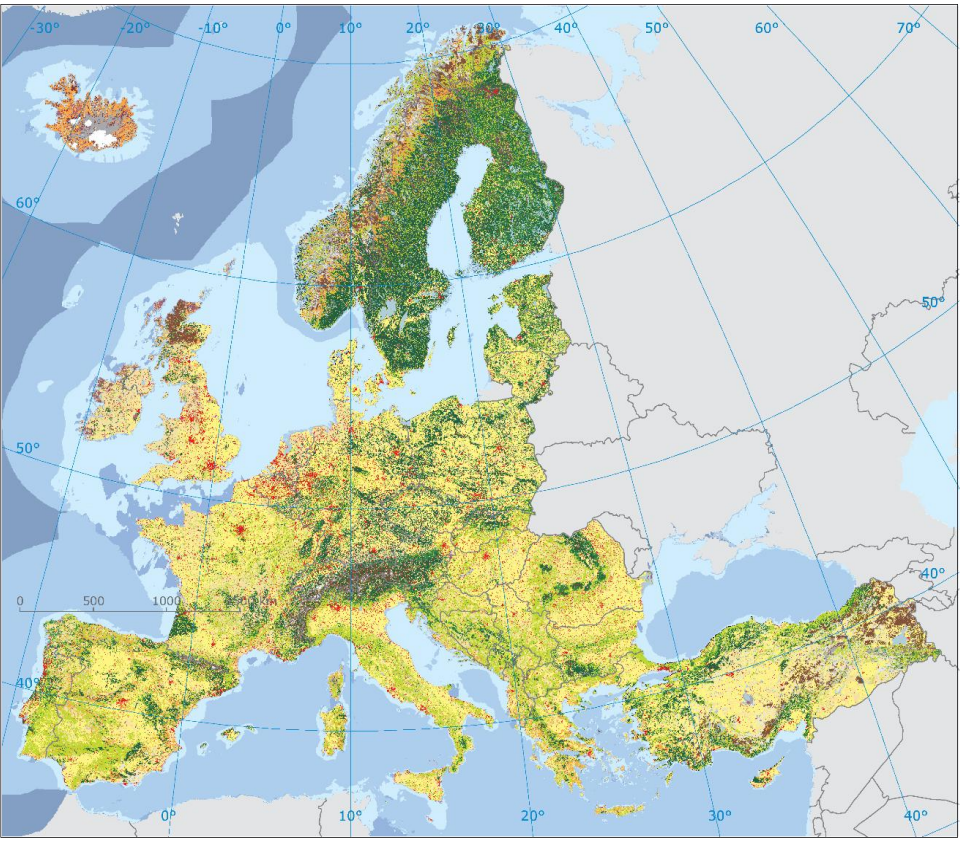


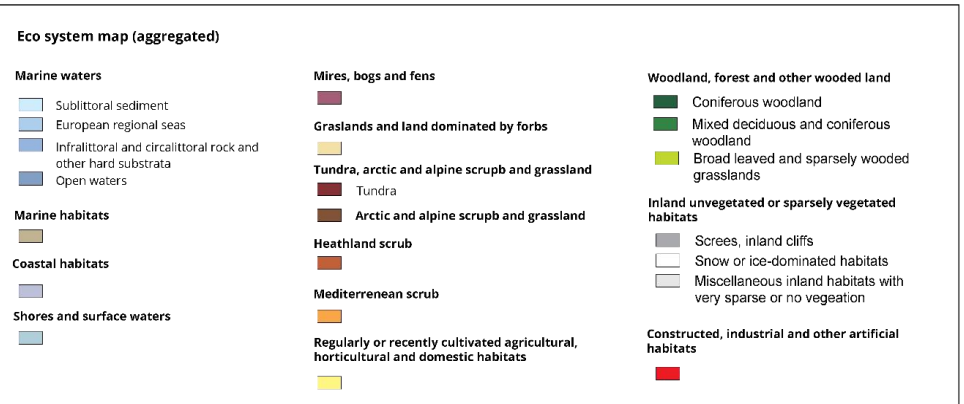




MAES activities at EU level

Ecosystem Map

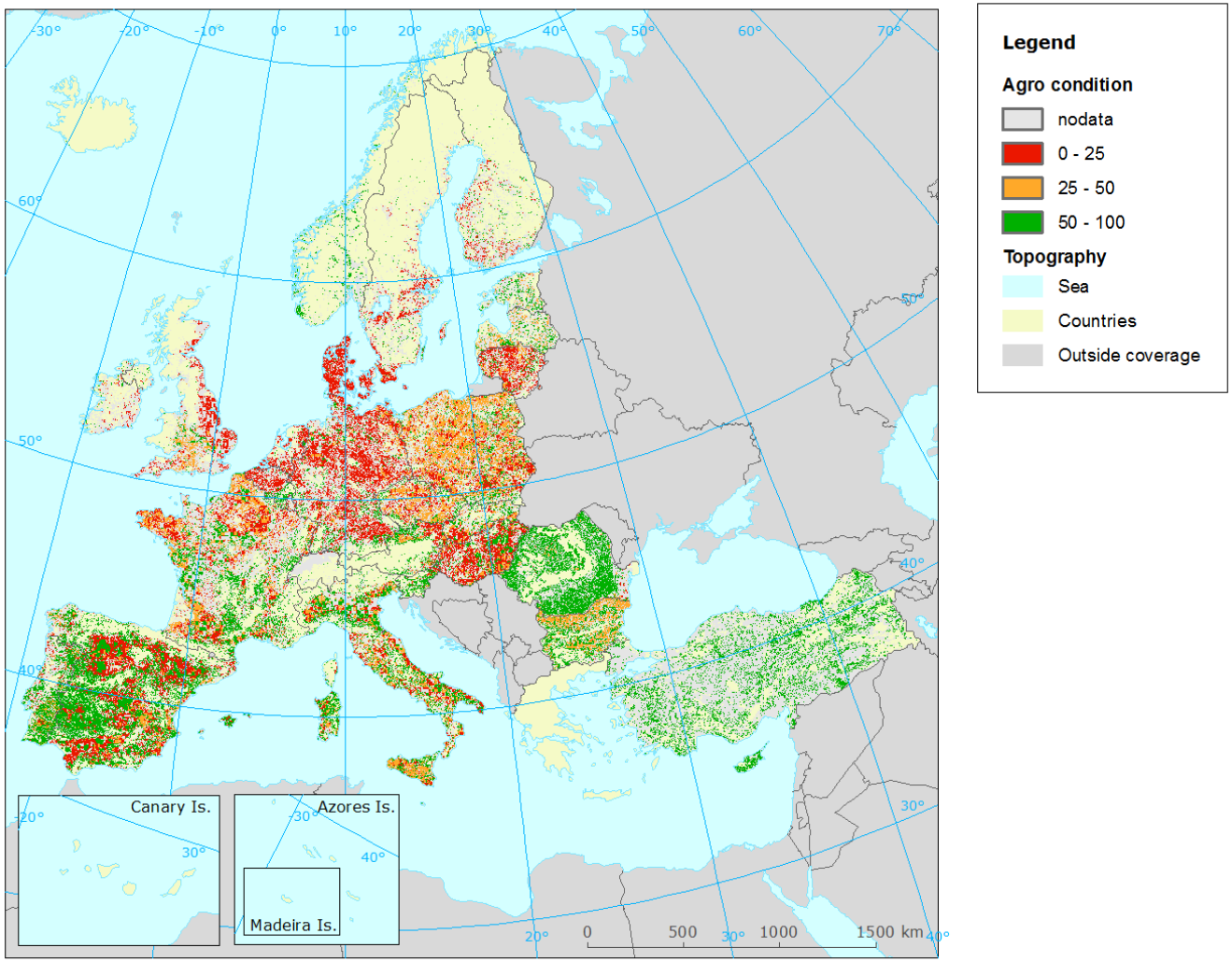




Ecosystem type	EUNIS Level 1	EUNIS Level 2	Total ecosystem coverage	
			Area (km^2)	% area EUNIS level 2 per level 1
Urban	J Constructed, industrial and other **artificial** habitats	J1 Buildings of cities, towns and villages	**102151**	46.08
		J2 Low density buildings	**94150**	42.47
		J3 Extractive industrial sites	**6453**	2.91
		J4 Transport networks and other constructed hard-surface areas	**16100**	7.26
		J5 Highly artificial man-made waters and associated structures	**1828**	0.82
		J6 Waste deposits	**998**	0.45
Cropland	I Regularly or recently cultivated **agricultural**, horticultural and domestic habitats	I1 Arable land and market gardens	**1243168**	99.18
		I2 Cultivated areas of gardens and parks	**10292**	0.82
Grassland	E **Grasslands** and land dominated by forbs, mosses or lichens	E1 Dry grasslands	**9330**	1.35
		E2 Mesic grasslands	**571931**	82.48
		E3 Seasonally wet and wet grasslands	**55771**	8.04
		E4 alpine and subalpine grasslands	**21128**	3.05
		E5 Woodland fringes, clearings and tall forbs stands	**0**	0.00
		E6 Inland salt steppes	**3043**	0.44
		E7 sparsely wooded grasslands	**32195**	4.64
Woodland and forest	G Woodland, **forest** and other wooded land	G1 Broadleaved deciduous woodland	**487970**	28.29
		G2 Broadleaved evergreen woodland	**49248**	2.86
		G3 Coniferous woodland	**695907**	40.35
		G4 Mixed woodland	**291687**	16.91
		G5 Lines of trees, small woodlands, recently felled woodlands, early stage woodland, coppice	**199784**	11.58
Heathland and shrub	F **Heathland**, scrub and tundra	F1 Tundra	**0**	0.00
		F2 Arctic, alpine and subalpine scrub	**34524**	14.88
		F3 Temperate and mediteraneo-montane scrub	**52824**	22.76
		F4 Temperate shrub heathland	**691**	0.30

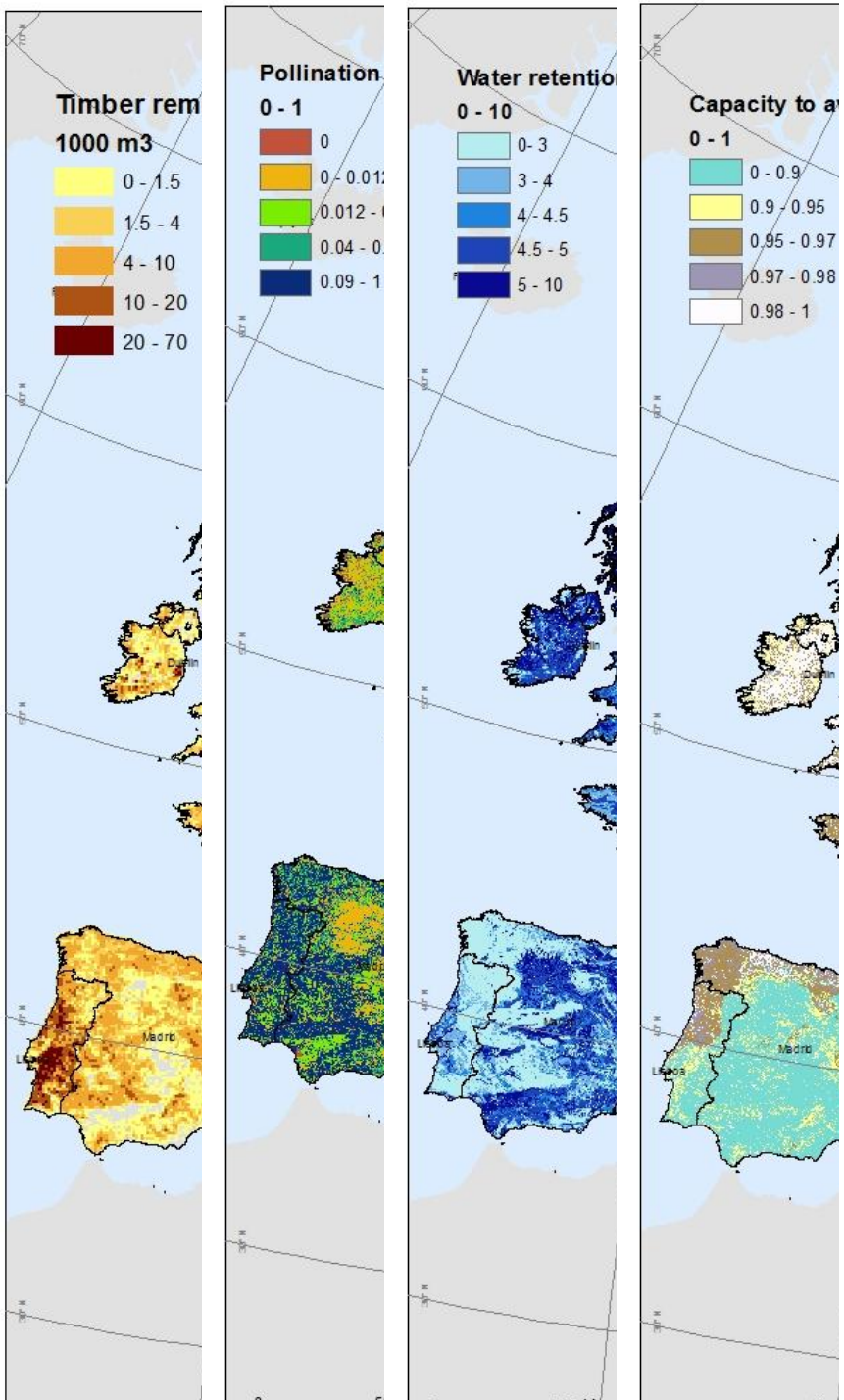
Mapping the Ecosystem Conditions

Example for assessment of agro ecosystem condition (cropland and grassland)

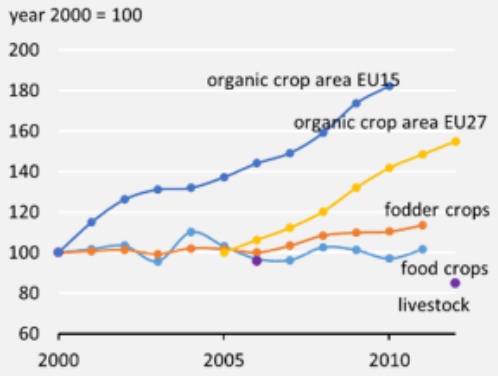


ETC/SIA 2014

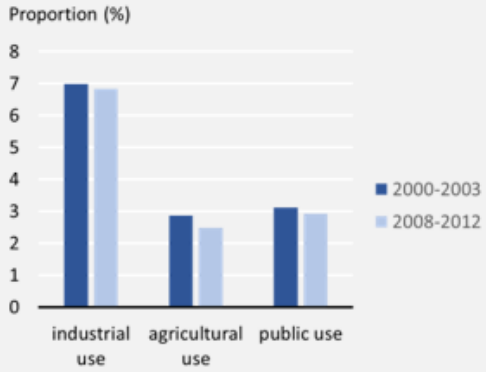
European Environment Agency


Timber rem
1000 m3
0 - 1.5
1.5 - 4
4 - 10
10 - 20
20 - 70
Pollination
0 - 1
0
0.09 - 1
Water retentio
0 - 10
0- 3
3 - 4
4 - 4.5
4.5 - 5
5 - 10
Capacity to a
0 - 1
0 - 0.9
0.9 - 0.95
0.95 - 0.97
0.97 - 0.98
0.98 - 1
Habitat quality 2010
Dimensionless ratio
0 - 0.65
0.65 - 0.9
0.9 - 1.2
1.2 - 1.3
1.3 - 3
EC-JRC 2014
Madrid
Lisboa
Minsk
Kyiv
Chisinev
Belgrade
Sarajevo
Ankara
El-Jazair
Tounis
Valletta

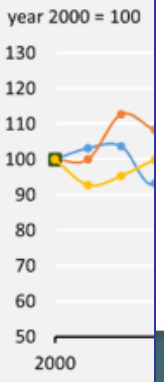
Food and fodder

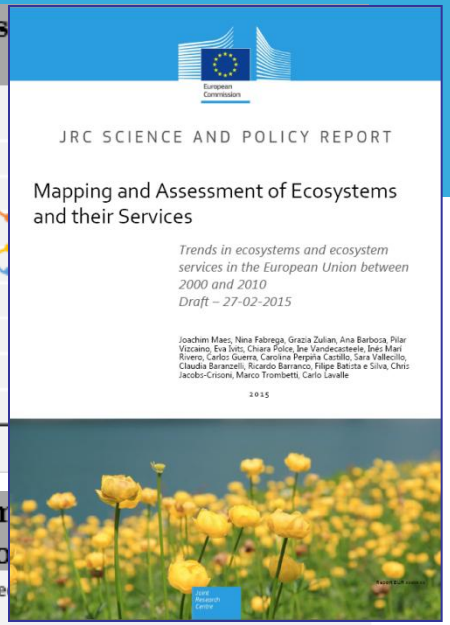


Water

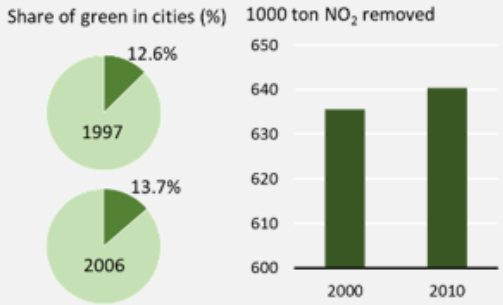


Materials energy

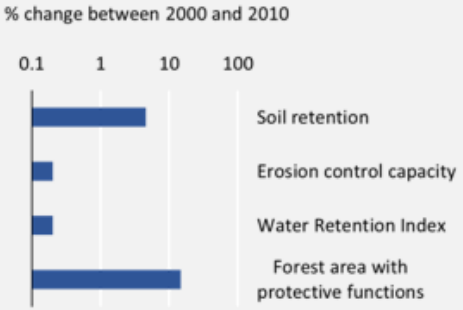




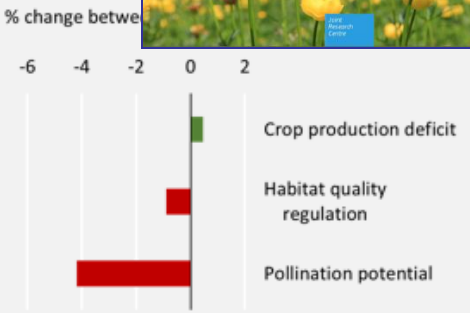
Air quality regulation (in cities)



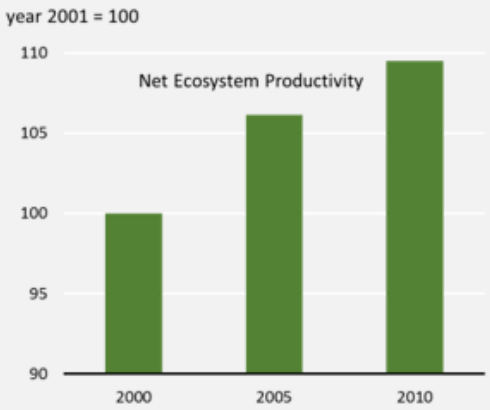
Erosion control and water regulation



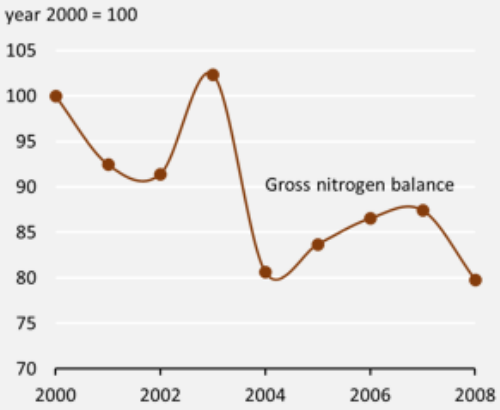
Habitat m pollinatio



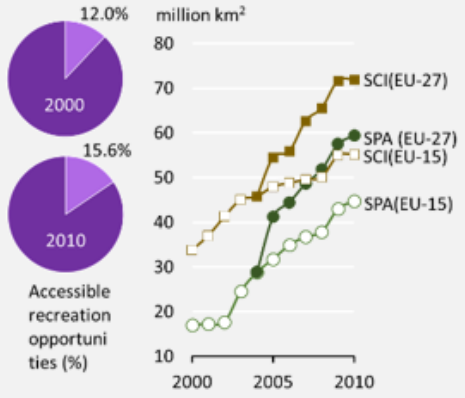
Climate regulation



Soil formation and composition



Recreation



MESEU: Mapping ecosystems and their services in the EU and its Member States

Three year contract study funded by DG ENV to support MAES using case studies in the Member States (2013-2015)

- **Survey based country profiles: Status of MAES implementation in the Member states (planning, stakeholders, capacity, data, outputs)**
- **Case studies on nation-wide mapping (gaps, methods, coverage)**
- **All documents and reports available on CIRCA BC**

TRAIN: Training member states on ecosystem services mapping through hands on workshops

Service contract funded by DG ENV to invite Member States to trainings on mapping ecosystem services

Based on a joint JRC-EEA-MESEU workshop in 2014

- **MAES country teams (state official, researcher and GIS expert) invited to map ecosystem services based on country specific data sets.**
- **NL, FR, CZ, IT**

TRAIN workshops according to this format

- **1st workshop: 20, 21 and 22 January: AT, HU, LV, RO**
- **2nd workshop: 17, 18 and 19 February: HR, CY, GR, LT, MT**
- **3rd workshop: 24, 25 and 26 March: EE, IE, LU, SK, SI**

Enhancing ecosystem services mapping for policy and decision making

EU Horizon 2020 Coordination and support action

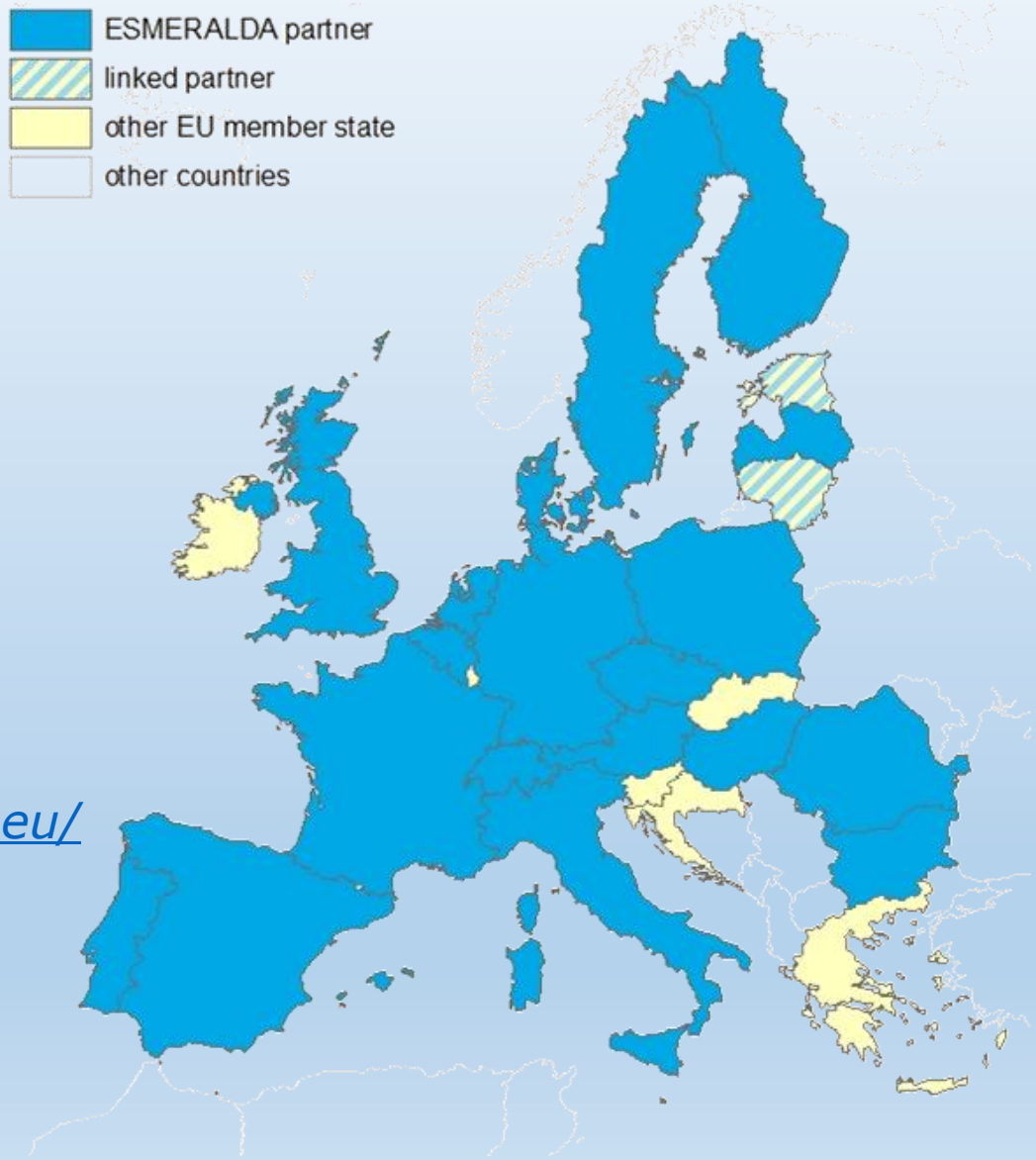
Benjamin Burkhard (Project coordinator)

Kiel University, Germany
Institute for Natural Resource Conservation
Department of Ecosystem Management

ESMERALDA consortium:

- 25 project partners
- 20 European countries
- 2 linked Baltic countries
- Linked western Balkan countries
- 44 % university partners
- 28 % state or other superior organisations
- 16 % from other academia
- 12 % SMEs

http://www.esmeralda-project.eu/



Stakeholder workshop

- Gap analysis and identification of solutions:
  - Gaps in data, EU2020 target implementation and ES mapping and assessment activities will be discussed with stakeholders from EU Member states.
  - Solutions and recommendations to overcome such gaps will be formulated.

- **Riga, 12-14 October**

http://www.esmeralda-project.eu/

Gateway to deliver MAES related products

- "Guidance document for MAES deliveries in BISE_v1.pdf" (10 pages)
- Two types of products / deliveries:
    1. Case studies for upload as doc/pdf
    2. Web services for view in digital atlas
- One metadata template per product / delivery (in zip - files)

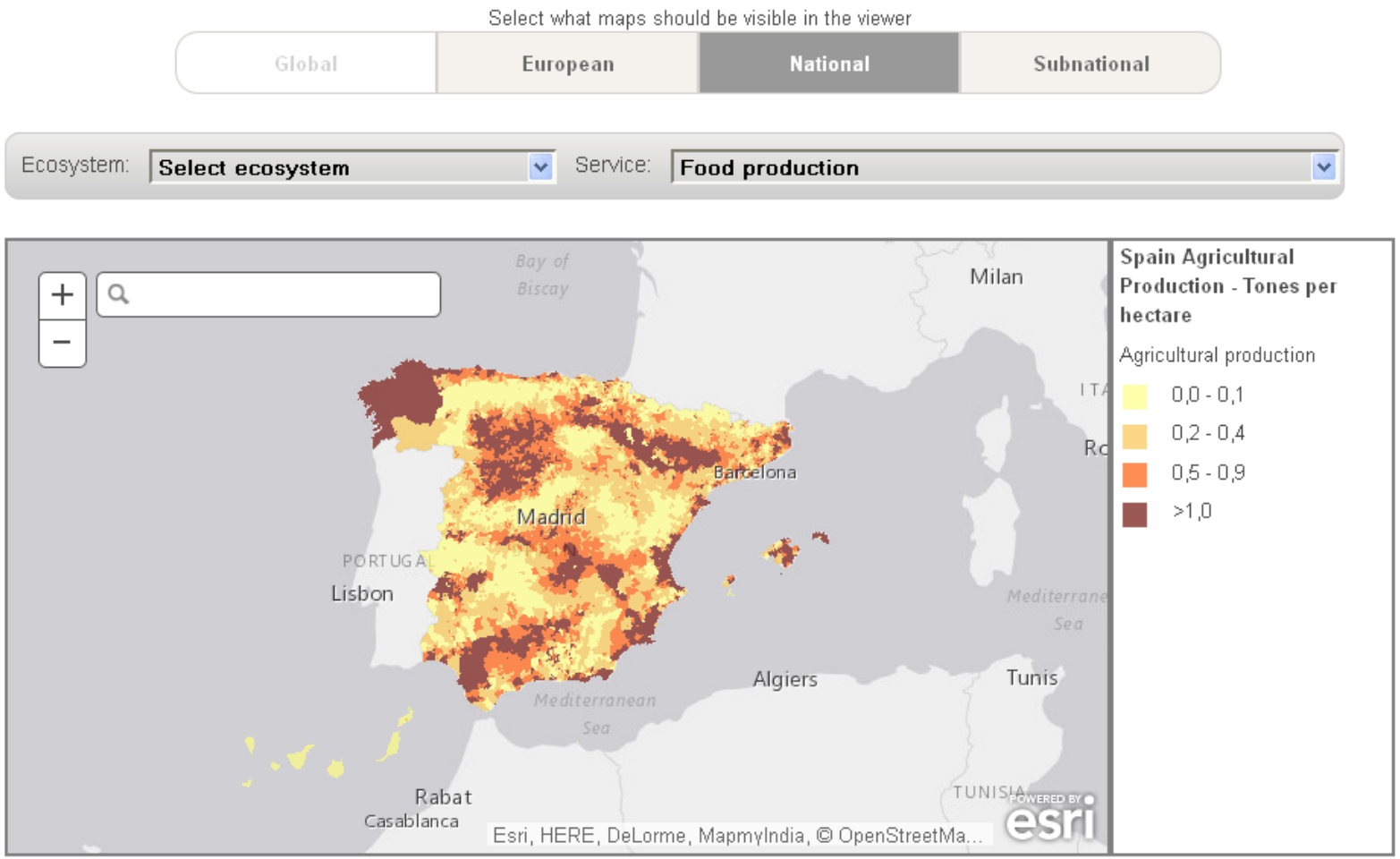
Case Studies

Catalogue: http://biodiversity.europa.eu/maes/maes-catalogue-of-case-studies

European Environment Agency

Web Services

MAES digital atlas: http://biodiversity.europa.eu/maes/maes-digital-atlas



This case study has been elaborated in the frame of the MESEU (Mapping of Ecosystems and their Services in the EU and its Member States) service contract for the European Commission

Conclusions and way forward

- *Action 5 and MAES have been instrumental in generating, boosting, scaling up and harmonising mapping and assessment activities at national and regional scale*
- *Solid MAES community establishing across MS*
- *A more complete picture of status of MAES in the different MS available (September 2015)*
- *MAES recognised as most advanced regional assessment scheme under IPBES and as core EU input to the IPBES regional assessment*
- *Increasing focus on values of biodiversity for human well being and natural capital accounting (Knowledge Innovation Project on NCA)*