



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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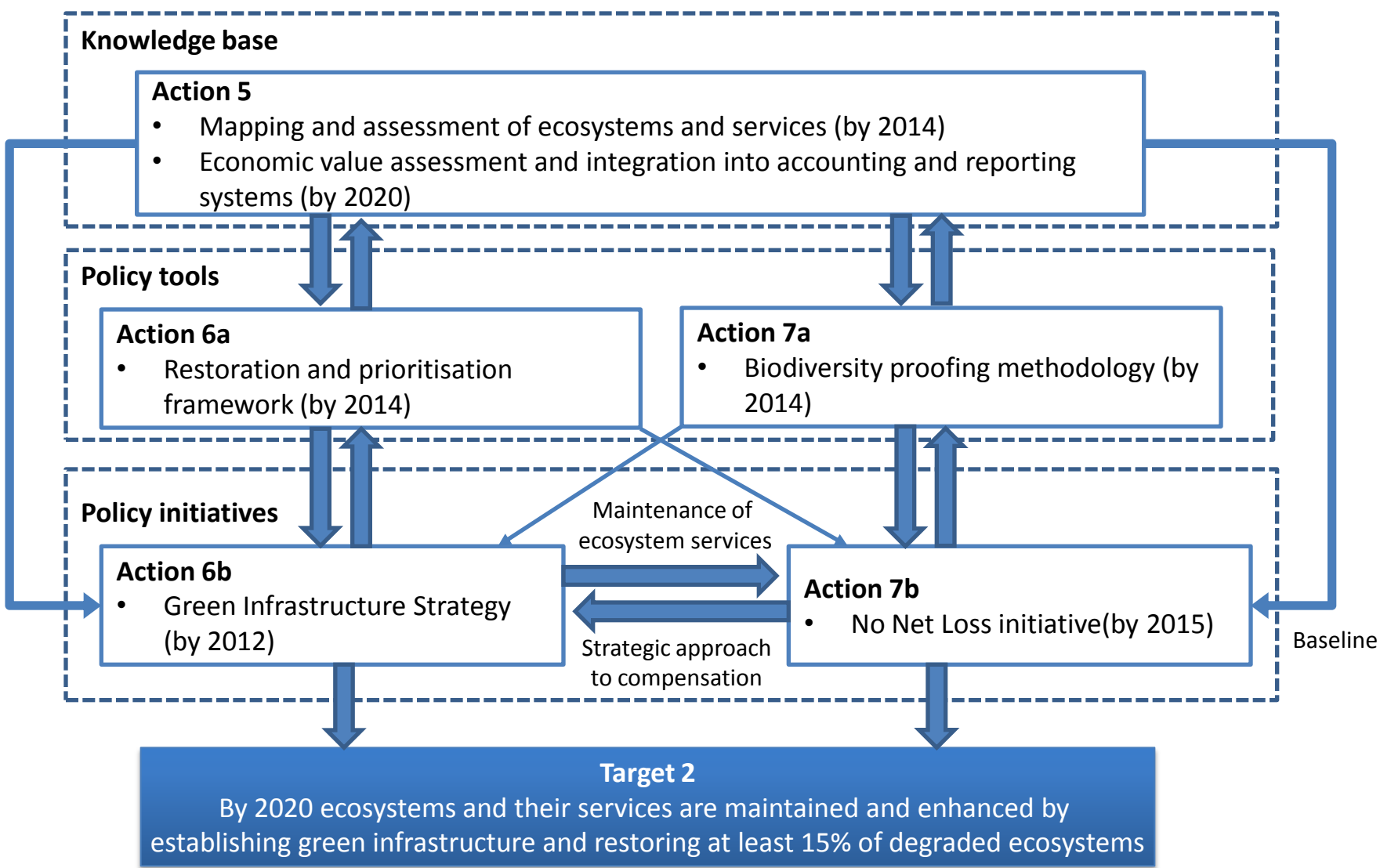
European Commission DG Environment, Brussels

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*



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

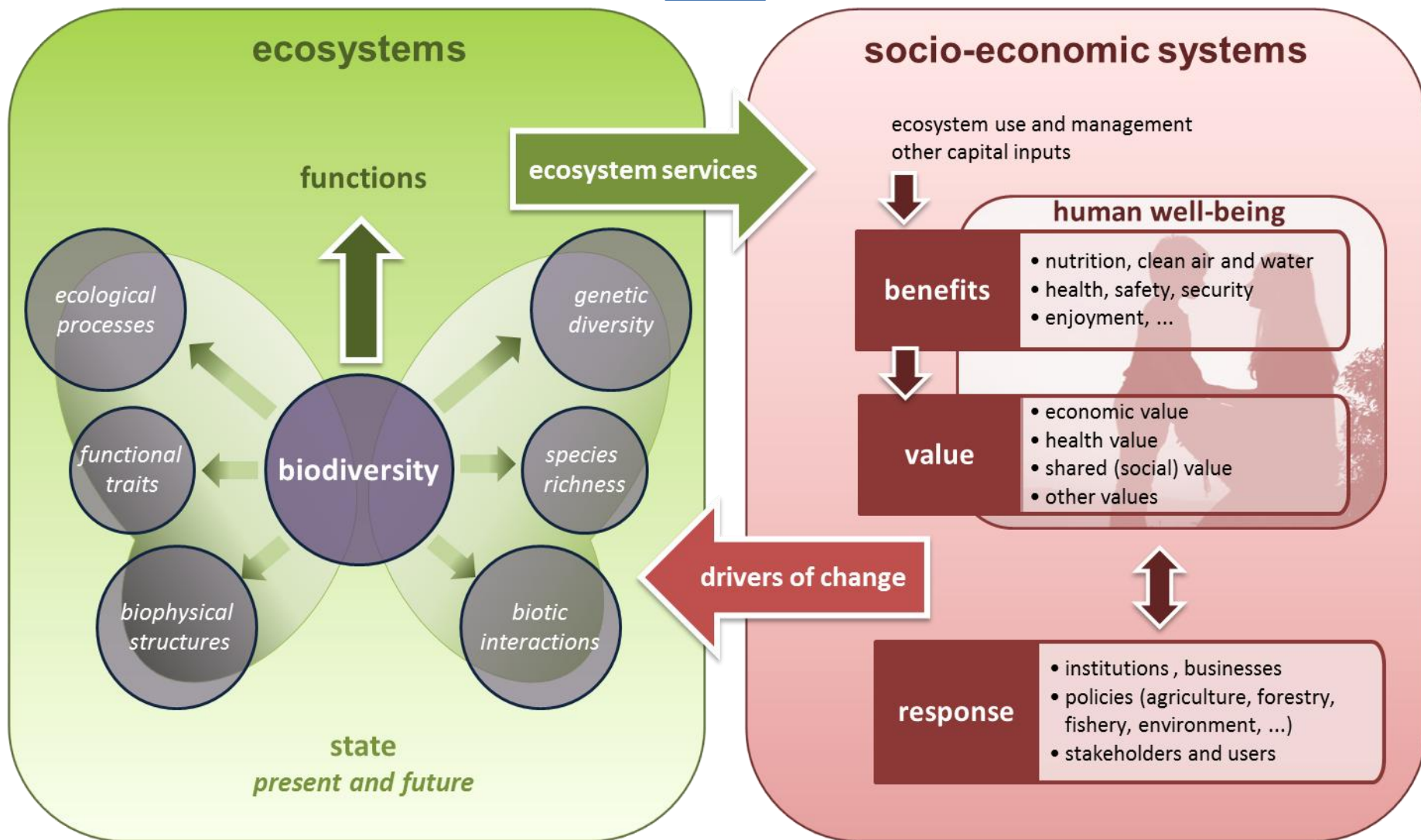
Member States (MS)

- 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





Common Assessment Framework:

Building blocks for an integrated ecosystem assessment

(1) <i>Map ecosystems</i>	
Urban	Land use land cover data, e.g. Corine Land Cover Copernicus high resolution data Elevation data Seabed maps National datasets
Cropland	
Grassland	
Woodland and forest	
Heathland and shrub	
Sparsely vegetated land	
Wetlands	
Rivers and lakes	
Marine inlets and transitional waters	
Coastal	
Shelf	
Open ocean	

(2) <i>Assess the condition of ecosystems</i>	
<i>Indicators</i>	<i>Data</i>
<i>Conservation status of habitats and species</i>	Art.17 assessment
<i>Ecological status of water bodies</i>	WFD assessment
<i>Environmental status of seas</i>	MSFD assessment
<i>Ecosystem status and biodiversity</i>	data including air pollutant concentration, habitat connectivity, land use change, soil degradation, ...

(3) <i>Assess te ecosystem services delivered by ecosystems</i>	
<i>Indicators</i>	<i>Data and models</i>
<i>Supply indicators:</i> Indicators of stock and flow of ecosystem functions and ecosystem services	Different sources of environmental data and models
<i>Demand indicators:</i> Indicators for the human demand for ecosystem services	Different socio-economic statistics



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

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

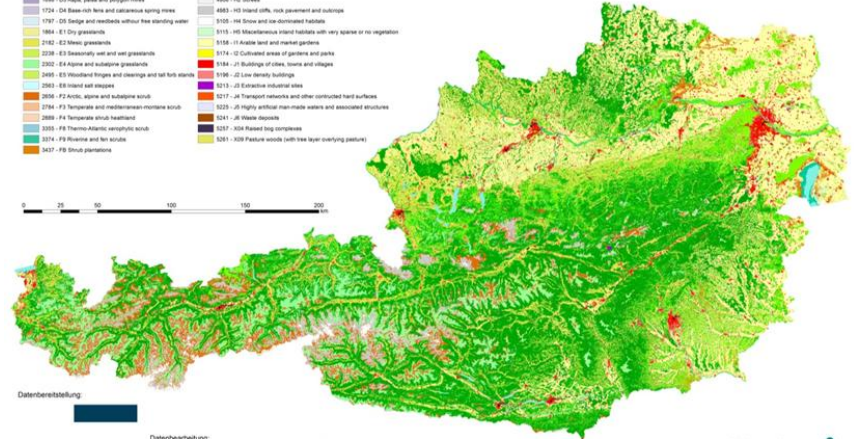


European Commission

- Habitattypen Österreichs**
(aggregiert nach EUNIS Level 2)
- | | |
|--|---|
| 1079 - C1 Surface standing waters | 5448 - O1 Broadleaved deciduous woodland |
| 1081 - C2 Surface running waters | 4339 - O2 Coniferous woodland |
| 1046 - C3 Deep zone of riparian wetlands | 4824 - O4 Broad deciduous and coniferous woodland |
| 1015 - C1 Mixed and blanket bogs | 4805 - O5 Low of heath, small anthropogenic woodlands, recently felled woodland |
| 1098 - O2 Valley mires, poor fen and transition mires | 4877 - M1 Terrestrial underground caves, cave systems, etc. |
| 1049 - O3 Acid, open and spongy mires | 4006 - H2 Birkens |
| 1724 - O4 Base-rich ferns and calcareous spring mires | 4683 - H3 Broad cliffs, rock pavement and outcrops |
| 1797 - O5 Sedge and meadow without free standing water | 3108 - H4 Snow and ice-dominated habitats |
| 1044 - E1 Dry grasslands | 3118 - H6 Montane tundra habitats with very sparse to no vegetation |
| 2162 - E2 Wet grasslands | 5158 - H1 Arable land and market gardens |
| 2238 - E3 Seasonally wet and wet grasslands | 3174 - O2 Cultivated areas of gardens and parks |
| 2202 - E4 Alpine and subalpine grasslands | 1184 - J1 Buildings of stone, brick and stoneware |
| 2405 - E5 Woodland fringes and clearings and tall herb meadows | 1196 - J2 Low density buildings |
| 2963 - E6 Inland salt steppes | 5213 - J3 Extractive industrial sites |
| 2964 - F2 Arctic, alpine and subalpine scrub | 5217 - J4 Transport routes and other constructed hard surfaces |
| 3764 - F3 Temperate and Mediterranean maritime scrub | 5225 - J5 Highly artificial man-made waters and associated structures |
| 2888 - F4 Temperate shrub heathland | 5241 - J6 Waste deposits |
| 2895 - F6 Humid-Atlantic sclerophyllous scrub | 5257 - J0A Felled logging operations |
| 3074 - F9 Rhododendron and fir scrub | 5261 - J0B Felled woods with low tree stocking patterns |
| 3437 - F8 Shrub pastures | |

Ökosystemtypen Österreichs 2013

Version 1.2, Stand 14.04.2014
Umweltbundesamt GmbH, Wien
Kartenerstellung: Peterseil, Johannes

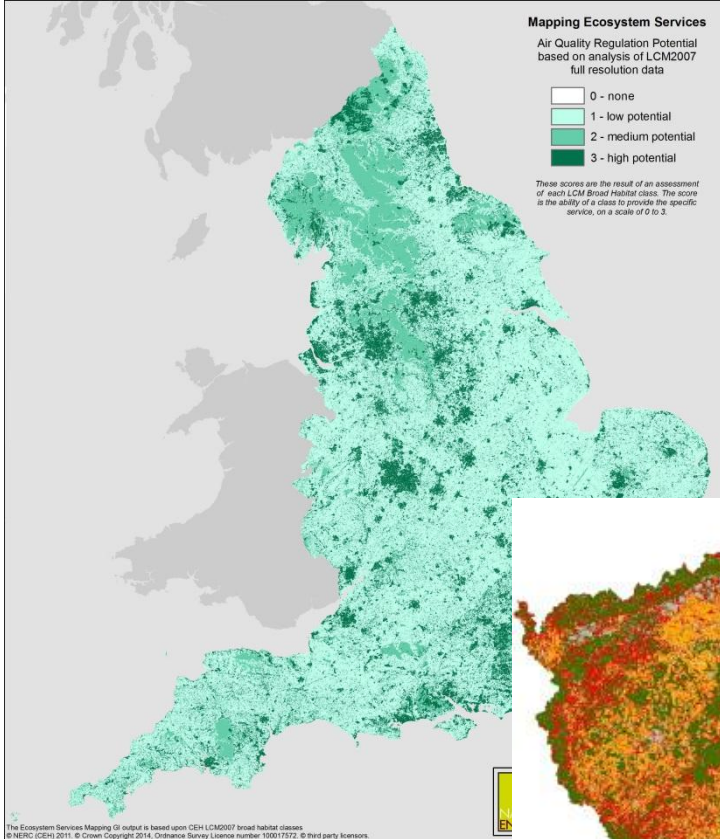


Mapping Ecosystem Services

Air Quality Regulation Potential based on analysis of LCM2007 full resolution data

- 0 - none
- 1 - low potential
- 2 - medium potential
- 3 - high potential

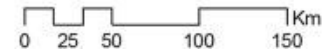
These scores are the result of an assessment of each LCM Broad Habitat class. The score is the ability of a class to provide the specific service, on a scale of 0 to 3.



Legend

(EUR.ha⁻¹.year⁻¹)

- 0 - 500
- 501 - 10000
- 10001 - 25000
- 25001 - 50000
- 50001 - 98802
- NA



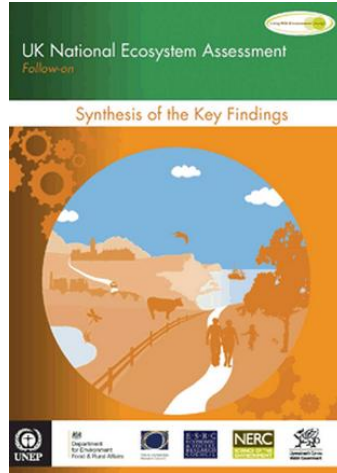
Assessments in the Member States



European Commission

Ecosystems and biodiversity for human wellbeing

Spanish National Ecosystem Assessment
Synthesis of key findings



Welkom op de testversie van de Atlas Natuurlijk Kapitaal (ANK)
ANK is het platform voor informatie over ons natuurlijk kapitaal. Denk daarbij aan alle diensten die de natuur ons levert. U treft op ANK informatie over de staat van het natuurlijk kapitaal in Nederland voor ons dagelijks leven en over de wijze waarop het natuurlijk kapitaal beter en duurzamer benut kan worden. Het doel: dat we duurzaam gebruik kunnen maken van de waarden die onze omgeving ons biedt. ANK is nog in ontwikkeling. U kunt daar aan bijdragen.

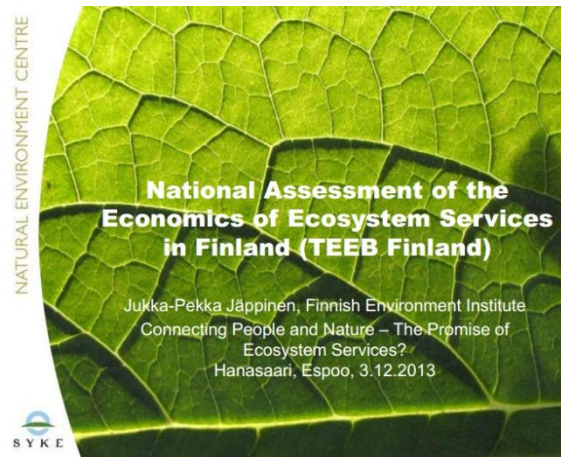
Uitgeleukt

- Natuur versterkt waterveiligheid én economie naast het vergroten van de waterveiligheid, kan natuur tegelijkertijd economisch voordeel bieden en de kwaliteit van het landschap verbeteren.

→ Hoe kan ik deze site gebruiken? → Over de Atlas Natuurlijk Kapitaal

→ Natuurlijk Kapitaal → Doe mee

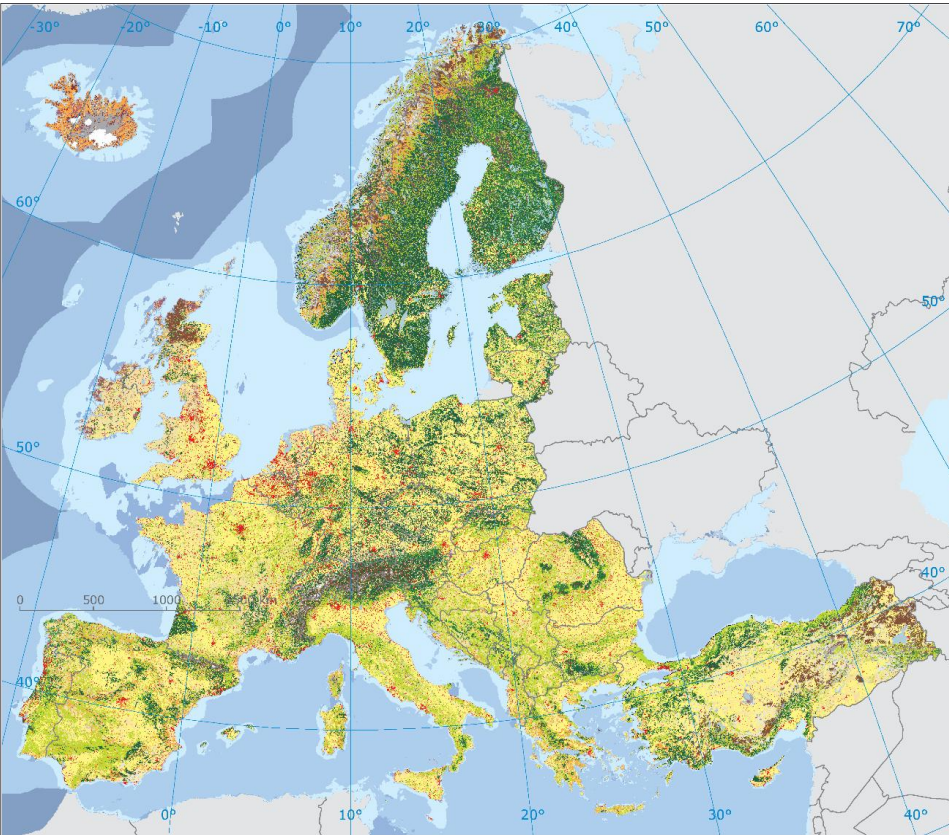
Nieuws



Natuurrapport 2014
Toestand en trend van ecosystemen en ecosystemendiensten in Vlaanderen

INSTITUUT
NATUUR- EN BOSONDERZOEK

www.inbo.be



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 mediterraneo-montane scrub	52824	22.76
		F4 Temperate shrub heathland	691	0.30

Eco system map (aggregated)

Marine waters

- Sublittoral sediment
- European regional seas
- Infralittoral and circalittoral rock and other hard substrata
- Open waters

Marine habitats

Coastal habitats

Shores and surface waters

Mires, bogs and fens

Grasslands and land dominated by forbs

Tundra, arctic and alpine scrub and grassland

- Tundra
- Arctic and alpine scrub and grassland

Heathland scrub

Mediterranean scrub

- Regularly or recently cultivated agricultural, horticultural and domestic habitats
- Regularly or recently cultivated agricultural, horticultural and domestic habitats

Woodland, forest and other wooded land

- Coniferous woodland
- Mixed deciduous and coniferous woodland
- Broad leaved and sparsely wooded grasslands

Inland unvegetated or sparsely vegetated habitats

- Screes, inland cliffs
- Snow or ice-dominated habitats
- Miscellaneous inland habitats with very sparse or no vegetation

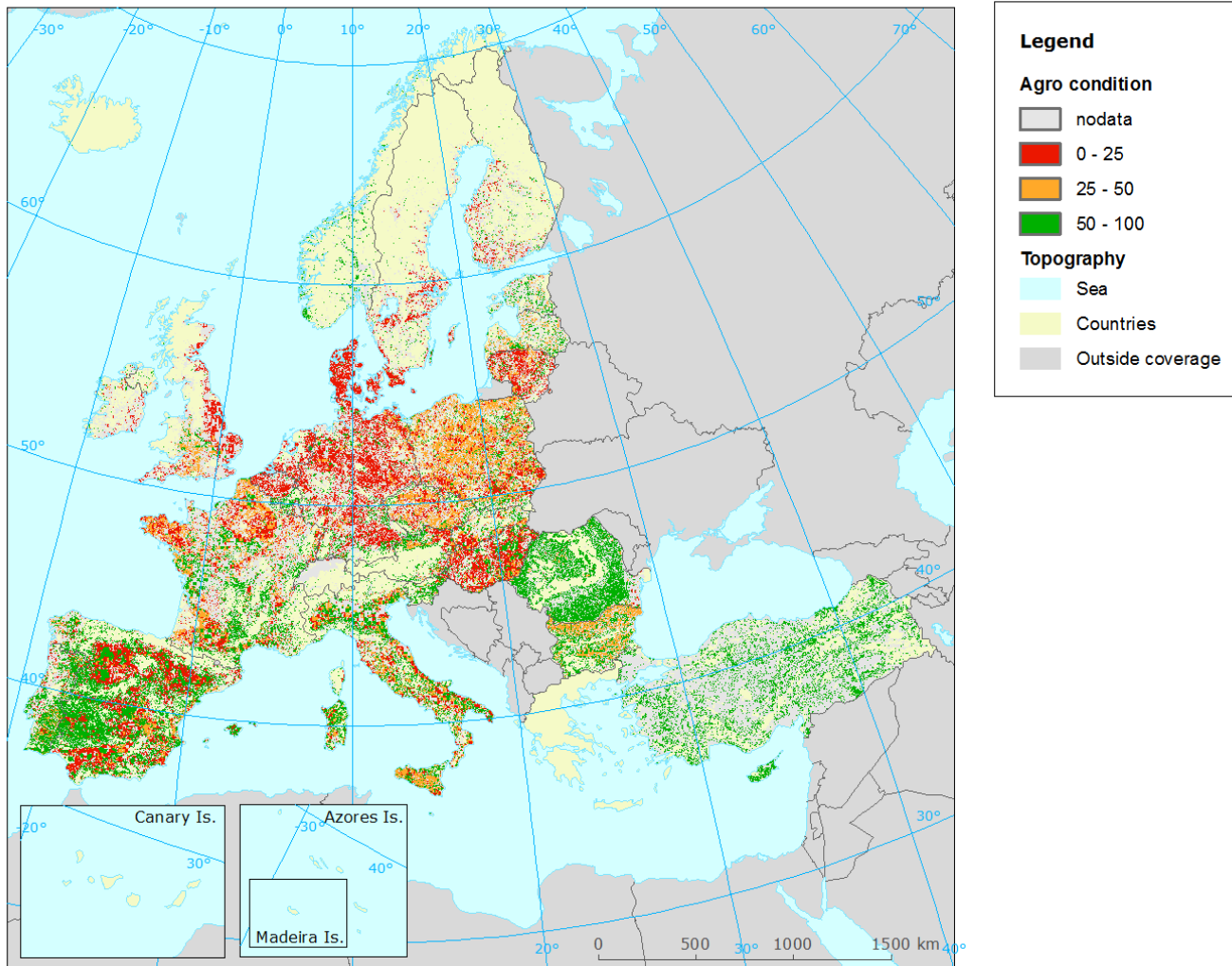
Constructed, industrial and other artificial habitats

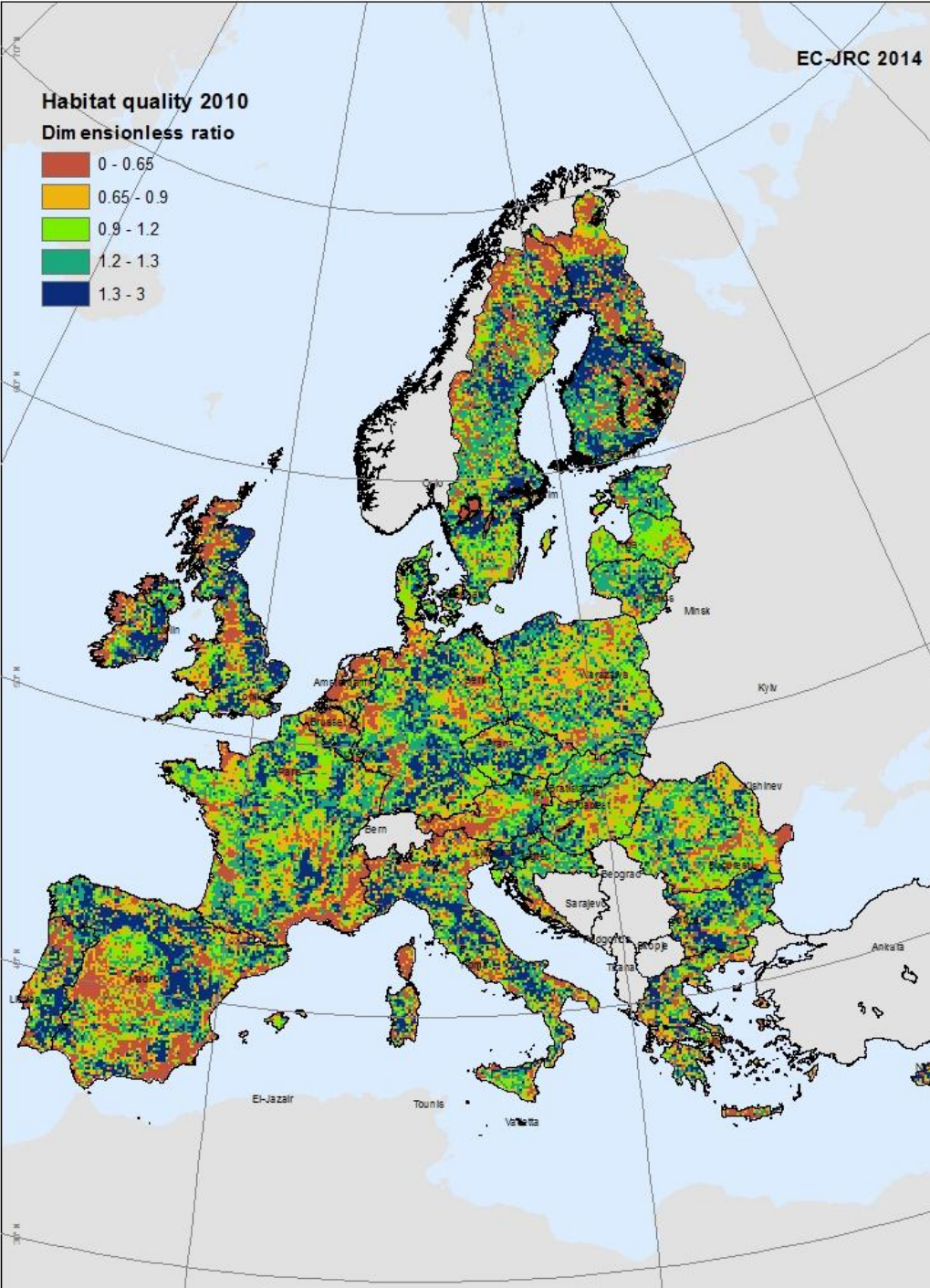
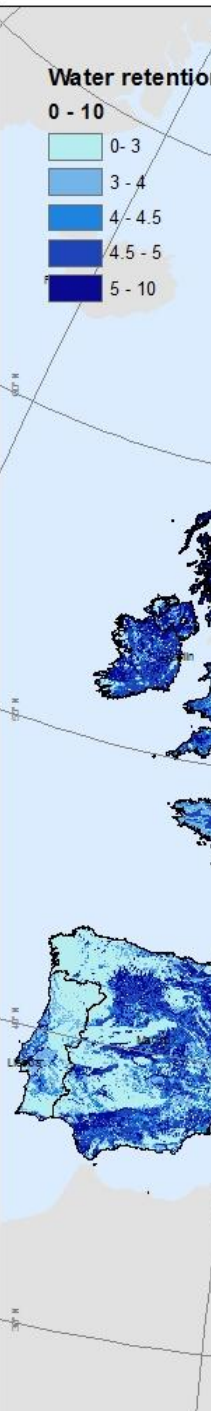
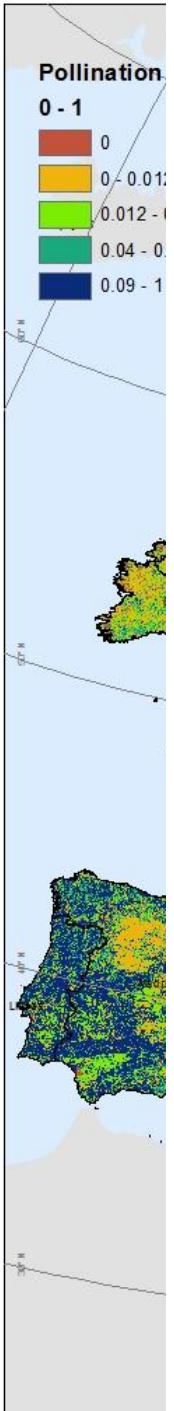
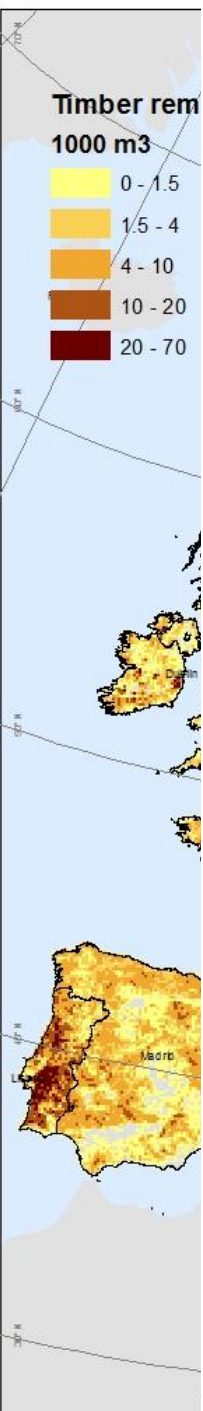
- Constructed, industrial and other artificial habitats



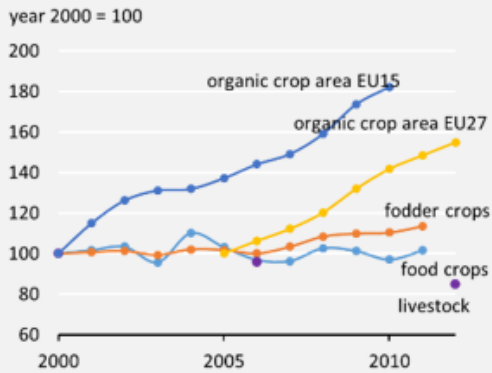
Mapping the Ecosystem Conditions

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

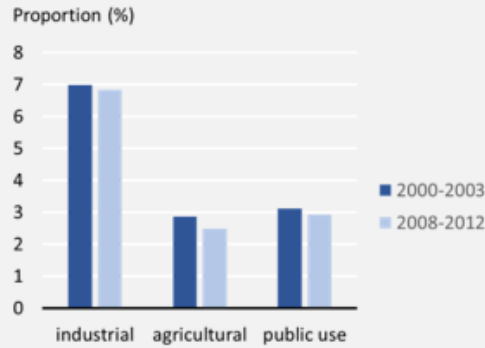




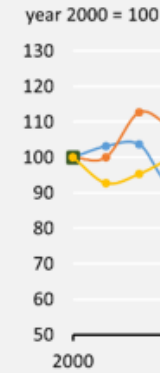
Food and fodder



Water



Materials energy



JRC SCIENCE AND POLICY REPORT

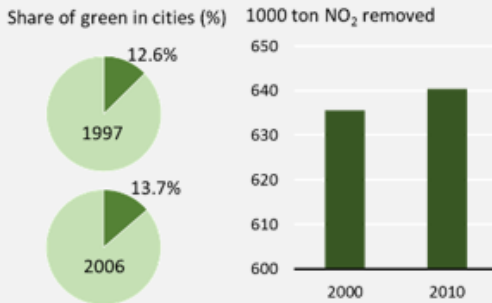
Mapping and Assessment of Ecosystems and their Services

Trends in ecosystems and ecosystem services in the European Union between 2000 and 2010
Draft – 27-02-2015

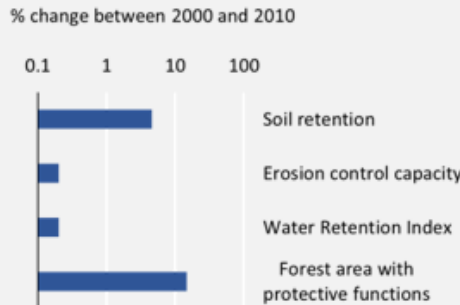
Joachim Maas, Nina Fabrega, Grazia Zulian, Ana Barbosa, Pilar Ytcerano, Eva Jutti, Chiara Polce, Ine Vandecasteele, Ines Mari Rivera, Carlos Guerra, Carolina Perpiñá Cardillo, Sara Malheiro, Claudia Baranzelli, Ricardo Barranco, Filipe Batista e Silva, Chris Jacobo-Crisostom, Marco Trombetti, Carlo Lavalle

2015

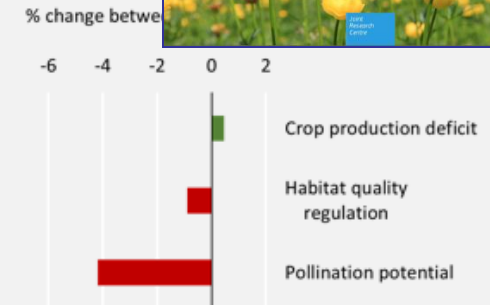
Air quality regulation (in cities)



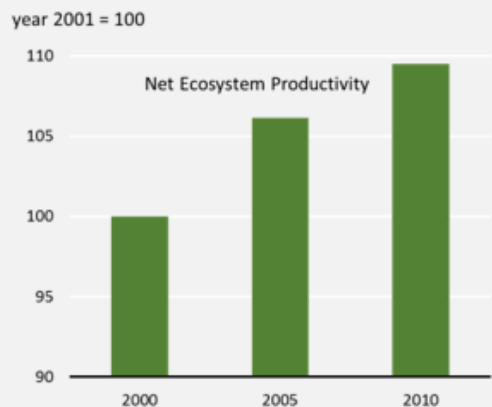
Erosion control and water regulation



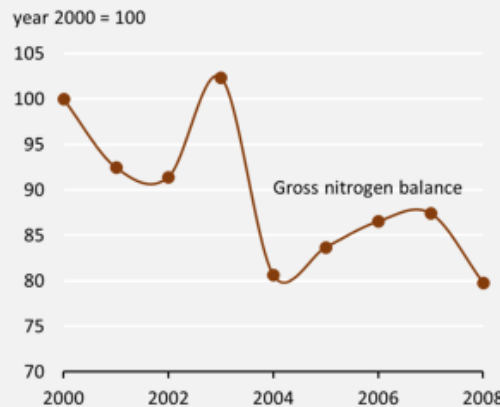
Habitat management and pollination



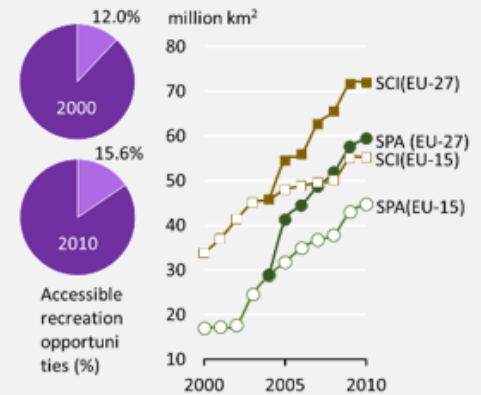
Climate regulation



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)

ESP
Ecosystem Services Partnership

zalf

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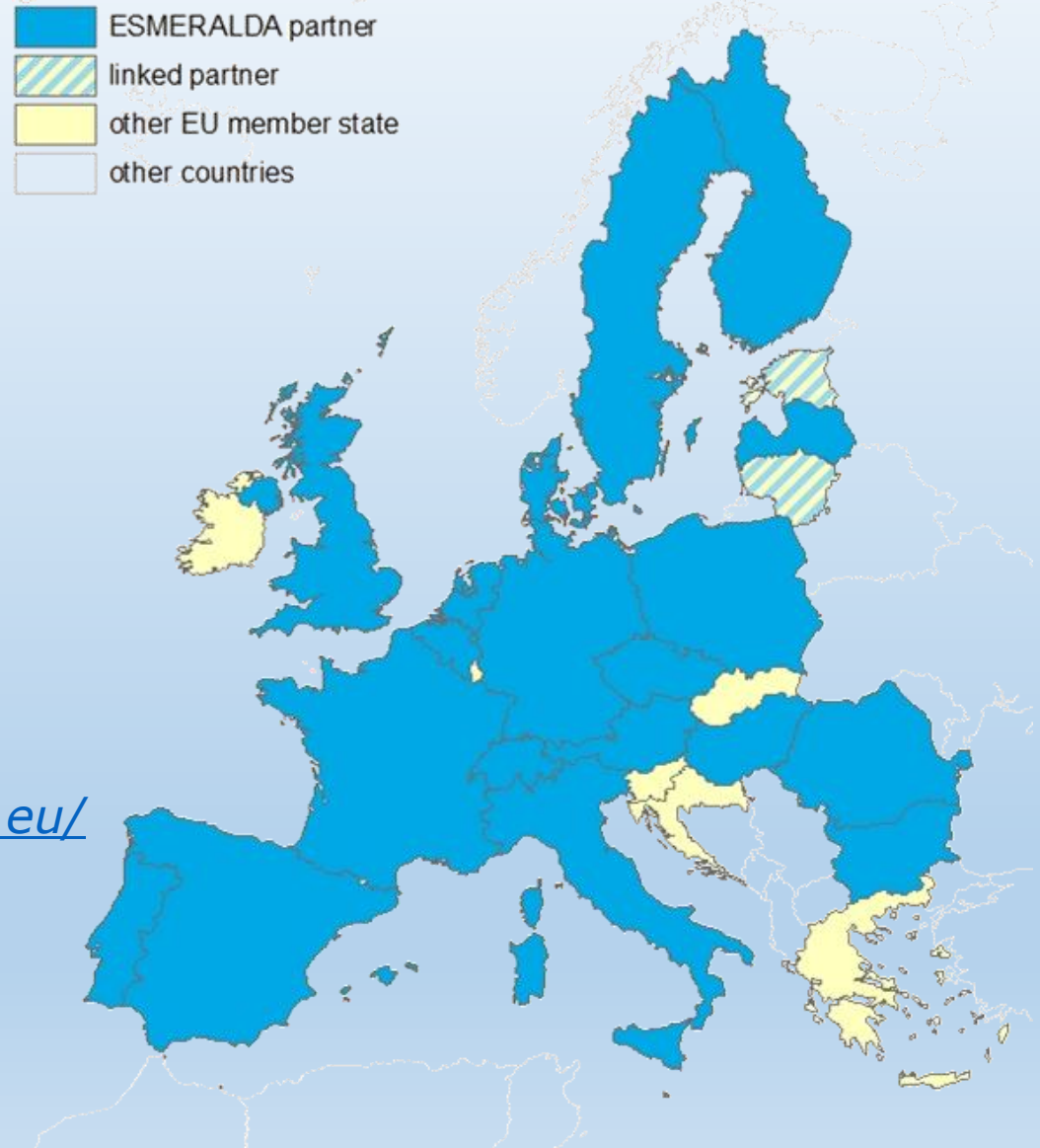
Kiel University, Germany
Institute for Natural Resource Conservation
Department of Ecosystem Management



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)

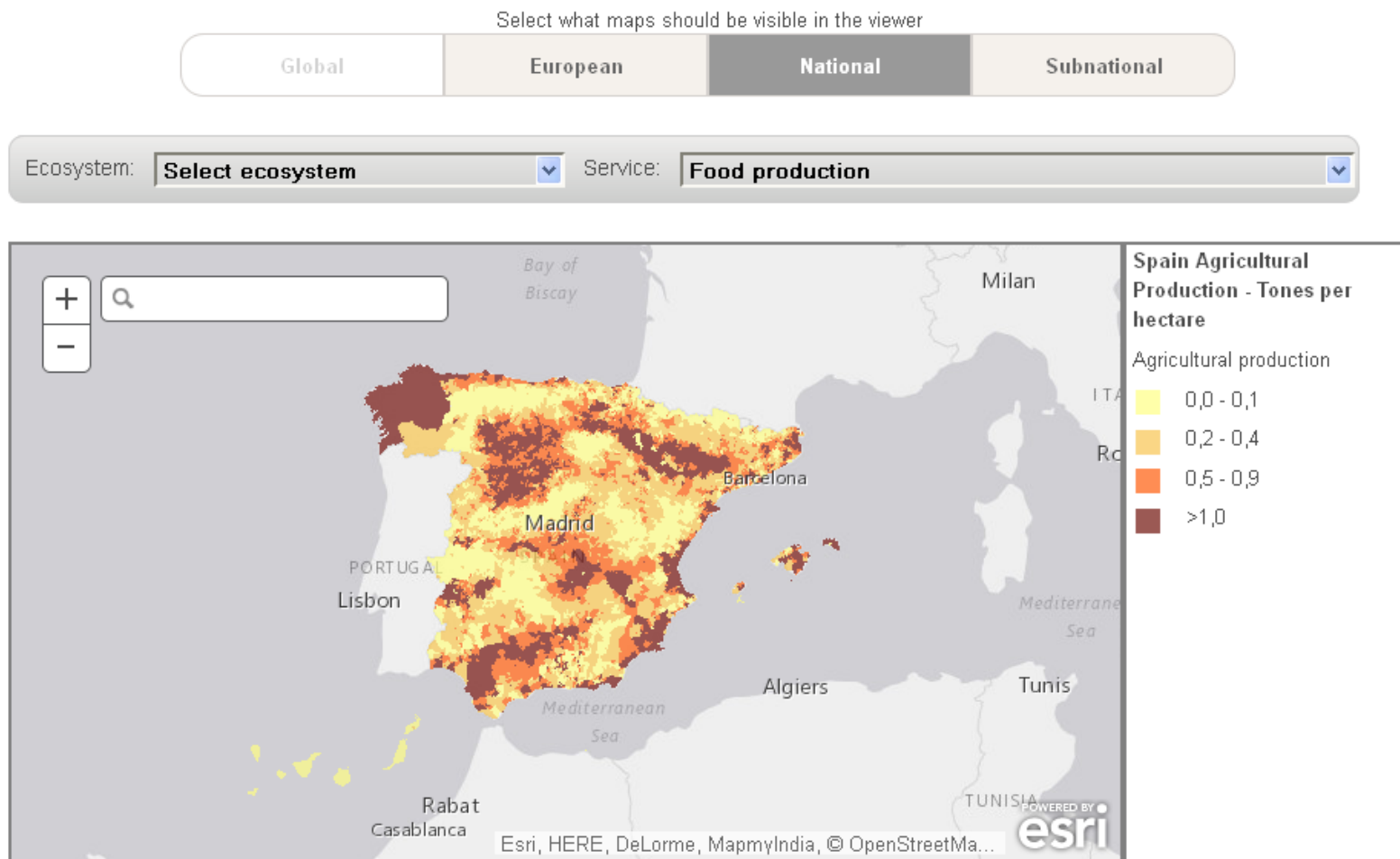
Case Studies

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



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)*