

Strand B: Research

Mapping and assessment methods

Coordinators: Fernando Santos-Martín (UAM) & Marion Potschin-Young (Fabis)

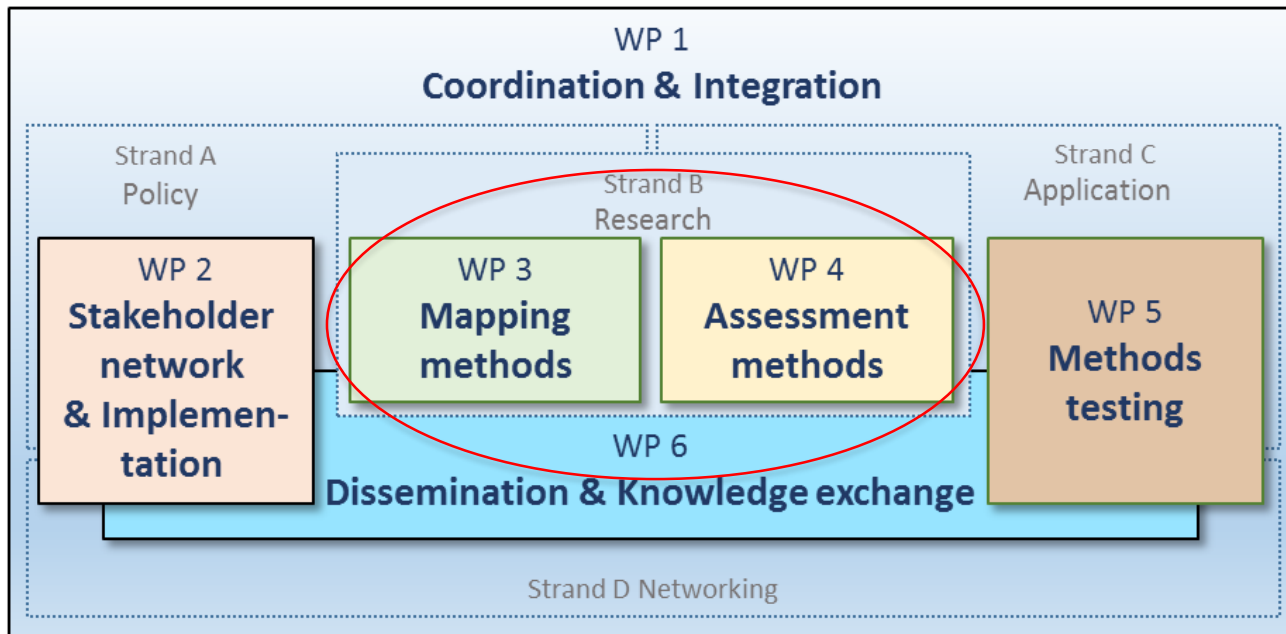
Tasks leaders: Luke Brander (VU) & Petteri Vihervaara (Syke), Bettina Weibel (ETH)

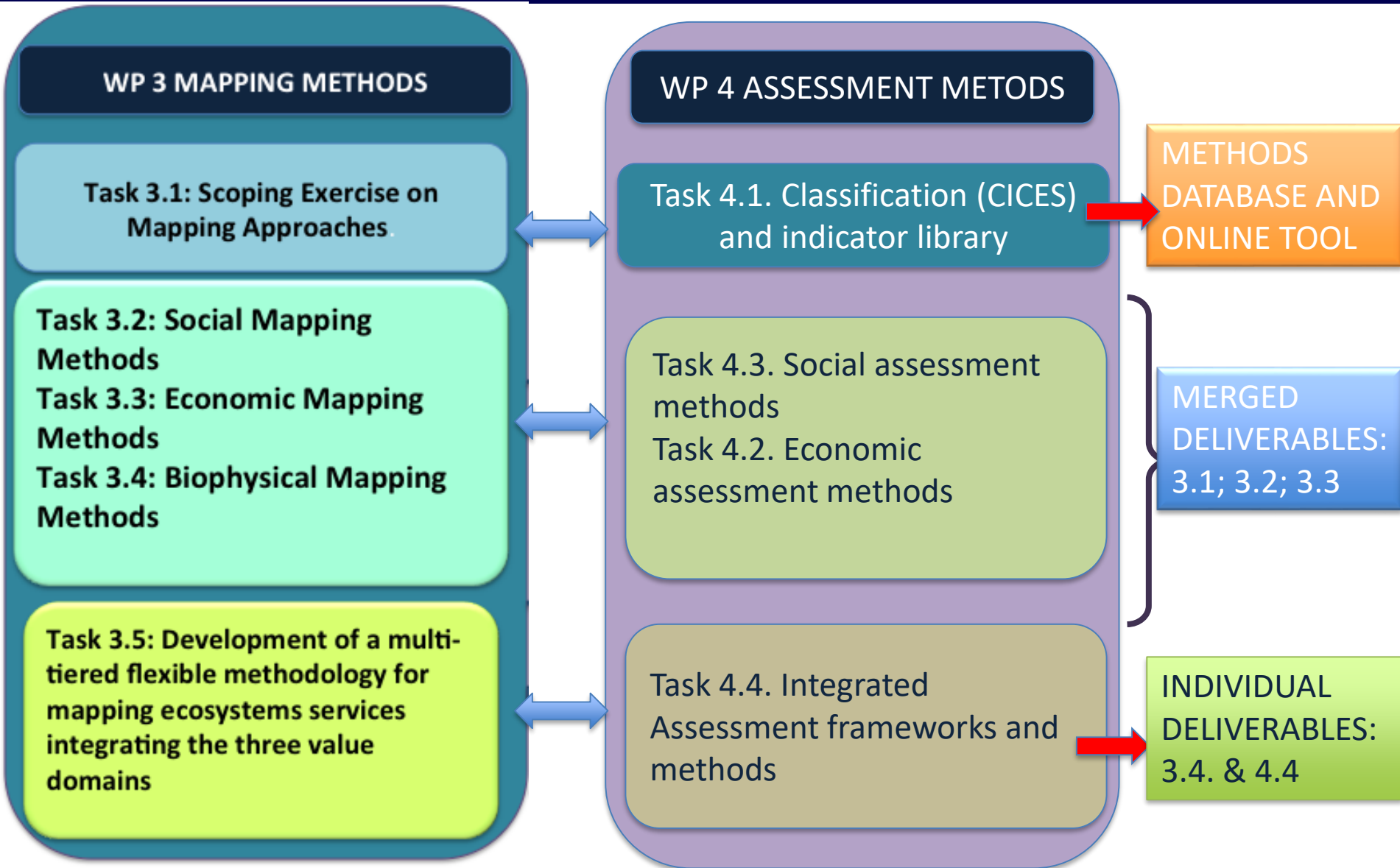


EU Horizon 2020 Coordination and support action



- ★ **Review the current state** of ES mapping and assessment methods in EU.
- ★ **Develop a multi-tiered flexible methodology to integrate** the three domains of ES (biophysical, economic and social) at different scales.
- ★ **Create an integrated assessment framework** in which different methods can be embedded.





Objectives:

Provide an overview of past and current mapping and assessment research activities in the EU

ESMERALDA database & visualization Tool

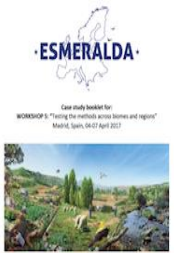
Example application	name of reporter	email of contact person	short information about case study
S3-1	Hannah	h.ostergard@swedishes	and ecosystem biodiversity will be
S3-2	Kristina Veideman	kristina.veideman@bef	Assessment of beach landscapes i recreational users
S3-3	Kristina Veideman	kristina.veideman@bef	Assessment of impact on coastal recreational services due to
S3-4	Miguel	mpecina@emu.ee	Mapping and assessment of ecosystem services in rivers, lakes and coasts
S3-5	Chiara Cortinovis	chiara.cortinovis@unitn	ng performance of different scenario
S3-6	Davide Geneletti	davide.geneletti@unitn	provided by different types of agricult
S3-7	Damian Lownik	damek@amu.edu.pl	Estimating the economic value of selected ecosystem services provide
S3-8	Petteri	petteri.vihervaara@ym	Key habitats capacity to deliver ES - t visitors' opinions
S3-9	Petteri	petteri.vihervaara@ym	Linking land use change (fast-growin tree plantations) to social perceptio
S3-10	Balint	cz.balint@okologia	A regional ES mapping and assessm project in the Nisraj & Tarnava Mica r
S3-11	Andy	andy.arnell@unep-wcmc.org	Working with local participants to understand the potential impacts of
S3-12	Andy	andy.arnell@unep-wcmc.org	Working with local participants to understand the potential impacts of
S3-13	Alon	alon.lotan@hamaarag.org.il	Israel National Ecosystem Assessm
S3-14	Mihai	adacri@gmail.com	ADAPTIVE MANAGEMENT PLAN FOR LOWER DANUBE RIVER, ROMANIA
S3-15	Mihai Adamescu	adacri@gmail.com	Mapping and assessment of ecosi services of different protected areas Romania
S3-16	Balint	cz.balint@okologia.mta	OpenNESS CS #12 (Kiskunság, HU): regional ES mapping and assessme
S3-17	Hermann	hermann.klug@sbg.ac.at	Long-Term Ecosystem Research (LTE site at the Alpine/pre-Alpine bord
S3-18	Hermann	hermann.klug@sbg.ac.at	Long-Term Ecosystem Research (LTE site at the Alpine/pre-Alpine bord
S3-19	Hermann	hermann.klug@sbg.ac.at	Long-Term Ecosystem Research (LTE site at the Alpine/pre-Alpine bord
S3-20	Mario	mario.baltan@mcast.edu	uses a variety of techniques to iden preferences and use of ecosystems ; identified preferences, actual uses ; perceptions; respondents link ES
S3-21	Mario	mario.baltan@mcast.edu	
S3-22	Inge Liekens	inlis.turkelboom@inbo	The project area "De Cirkel" is a

Welcome to the MAES Methods Explorer

On this website you can explore the ESMERALDA methods database. The Purpose of this database it to collect the majority of available methods to map and assess ecosystem services. Its aim is also to link those methods to specific ecosystem types as well as ecosystem services.

Methods & Case Studies

Learn more about the methods and explore our case study booklets.



explore methods & case studies

Search ESMERALDA database

Search the ESMERALDA database for case study literature and methods.



search database

Policy & business questions

Use policy or business question as a starting point to explore the database.



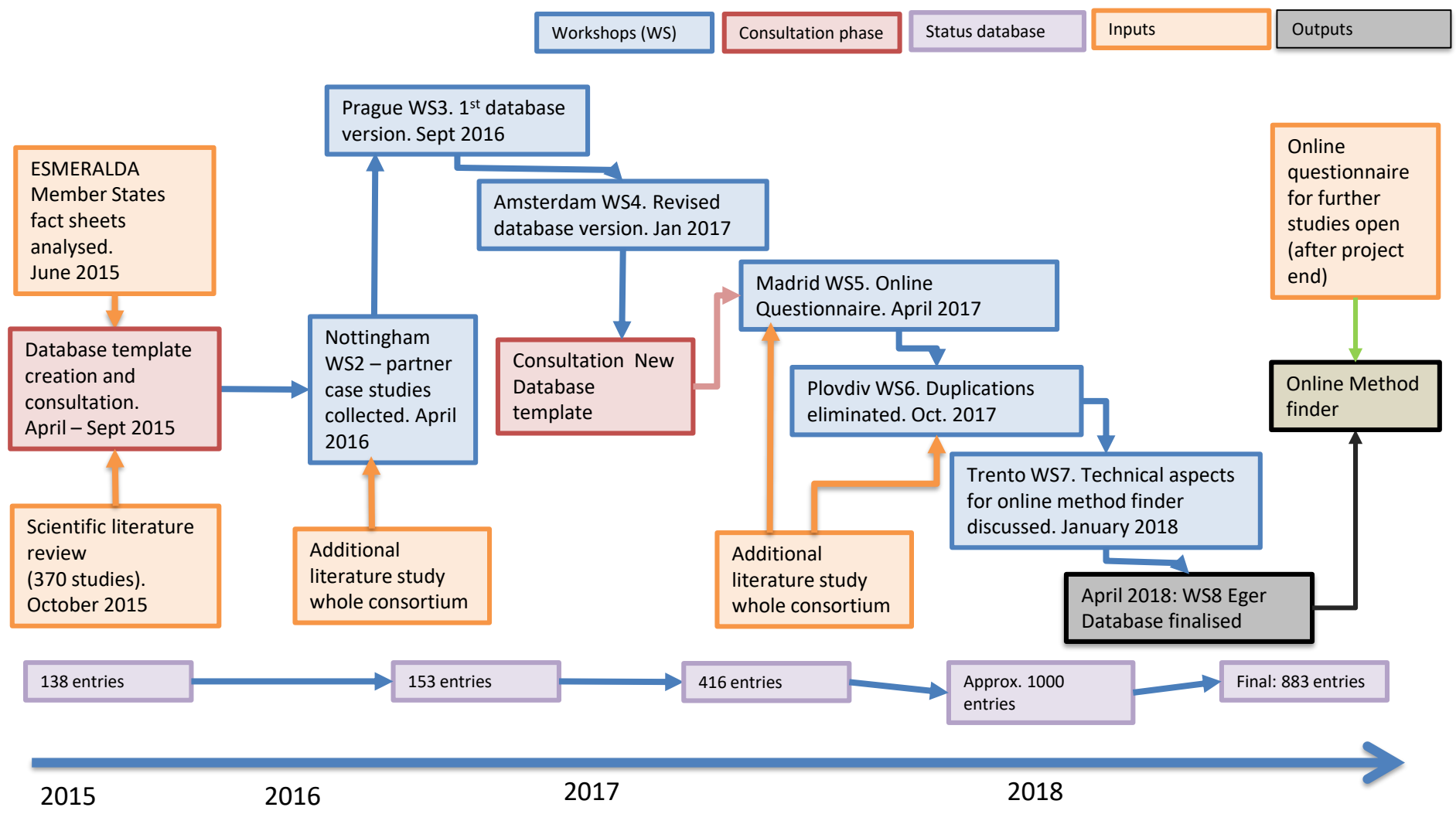
Tiers

Use "tiers" as starting point to explore our database.





T 3.1 & 4.1. SCOPING EXERCISE ON MAPPING AND ASSESSMENT METHODS



CICES

Towards a common classification of ecosystem services



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CICES Version 5.1 now

Ecosystem Services 29 (2018)



ELSEVIER

Contents lists available at ScienceDirect

Ecosystem Services

journal homepage: www.elsevier.com/locate/ecoser

Where concepts meet the real world: A system service indicators and their classification using

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^b European Topic Centre on Biological Diversity, Muséum national d'Histoire naturelle, 57 rue Cuvier

^c Environmental Sciences PhD School, Szent István University, Páter Károly u. 1, H-2100 Gödöllő, Hu

^d Fabis Consulting Ltd, Barton In Fabis, Nottingham NG11 0AE, UK

^e Department of Climatology and Landscape Ecology, University of Szeged, Egyetem u. 2., H-6722 Szeged, Hungary



One Ecosystem
Ecology and Sustainability Data Journal

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Policy Brief

One Ecosystem 3: e27108

<https://doi.org/10.3897/oneeco.3.e27108>

Revision of the Common International Classification for Ecosystem Services (CICES V5.1): A Policy Brief

▼ Roy Haines-Young, Marion B. Potschin-Young

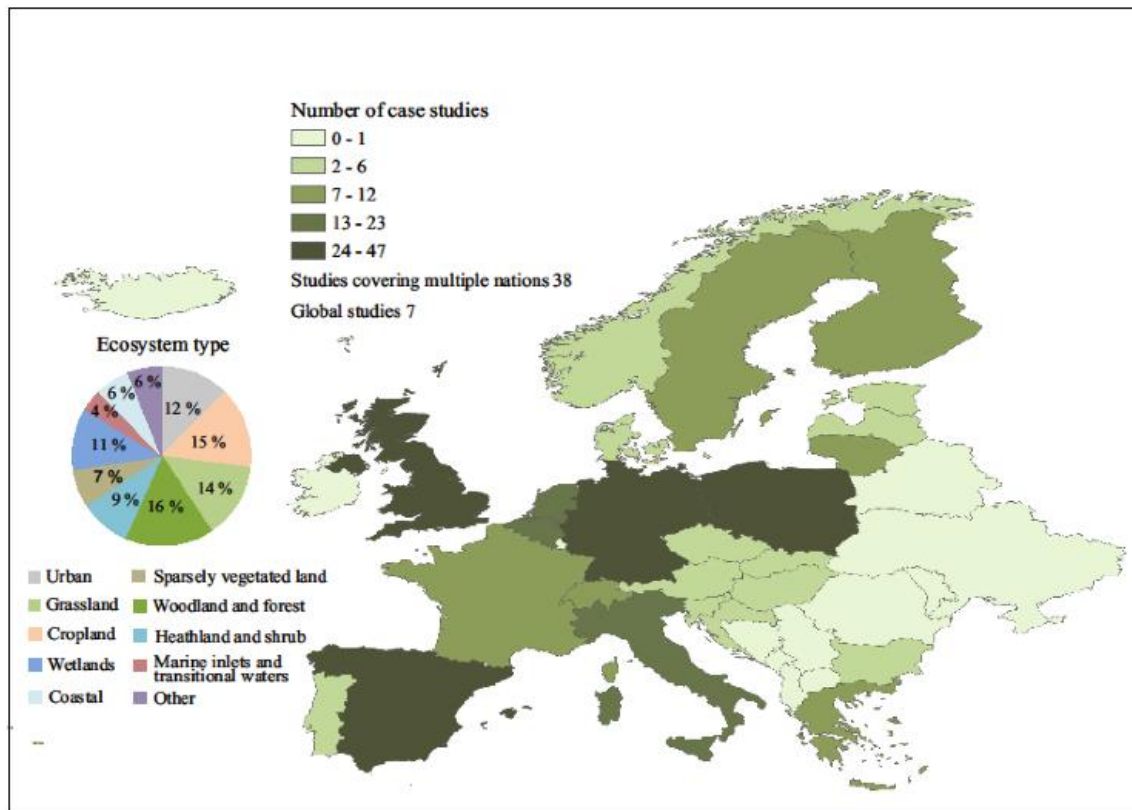
Abstract ▲

The Common International Classification of Ecosystem Services (CICES) is widely used for mapping, ecosystem assessment, and natural capital ecosystem accounting. On the basis of the experience gained in using it since the first version was published in 2013, it has been updated for version 5.1.

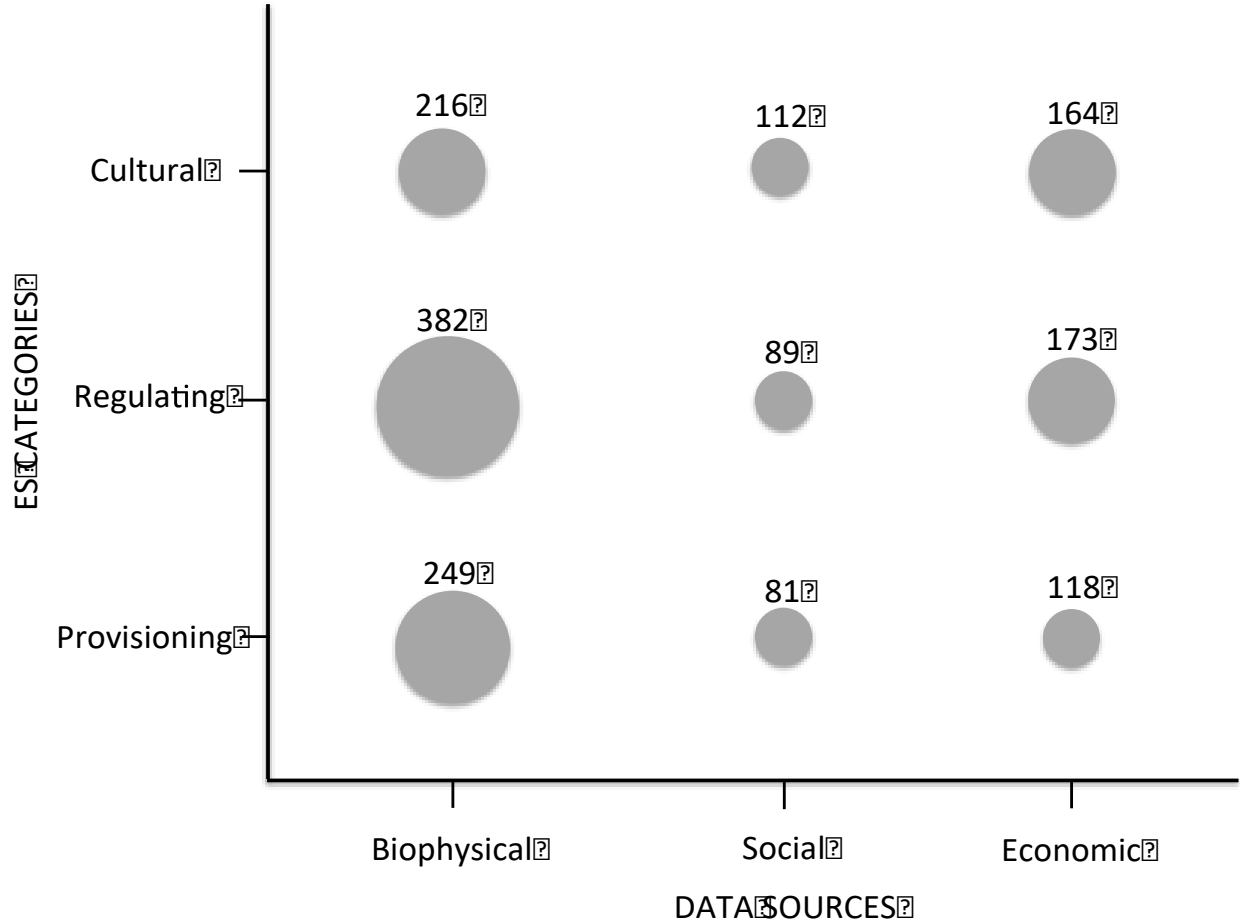
This policy brief summarises what has been done and how the classification can be used.

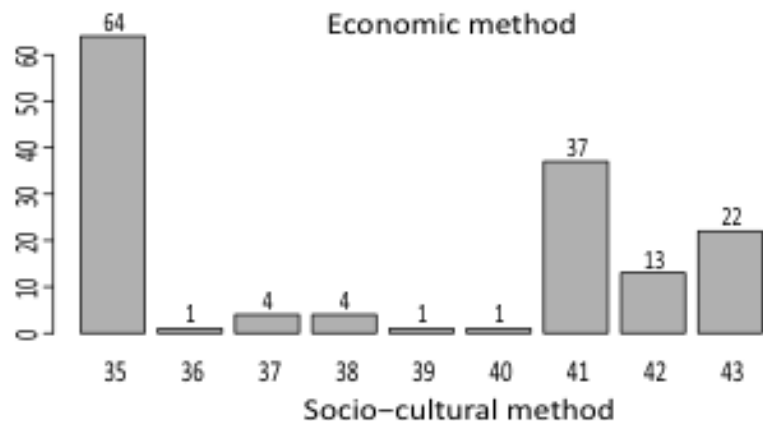
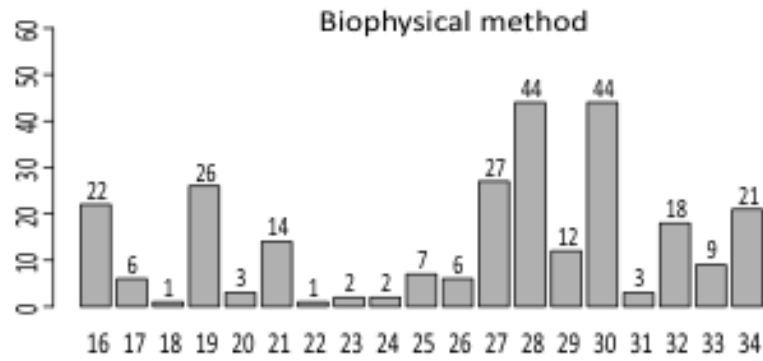
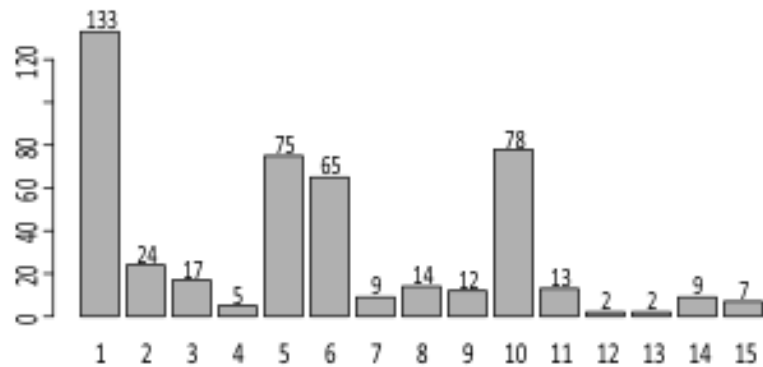
Creating an operational database for Ecosystems Services Mapping and Assessment Methods

Fernando Santos-Martín^a, Arto Viinikka^b, Laura Monomen^b, Luke Brander^c, Petteri Vihervaara^b, Inge Liekens^d, Marion Potschin-Young^e



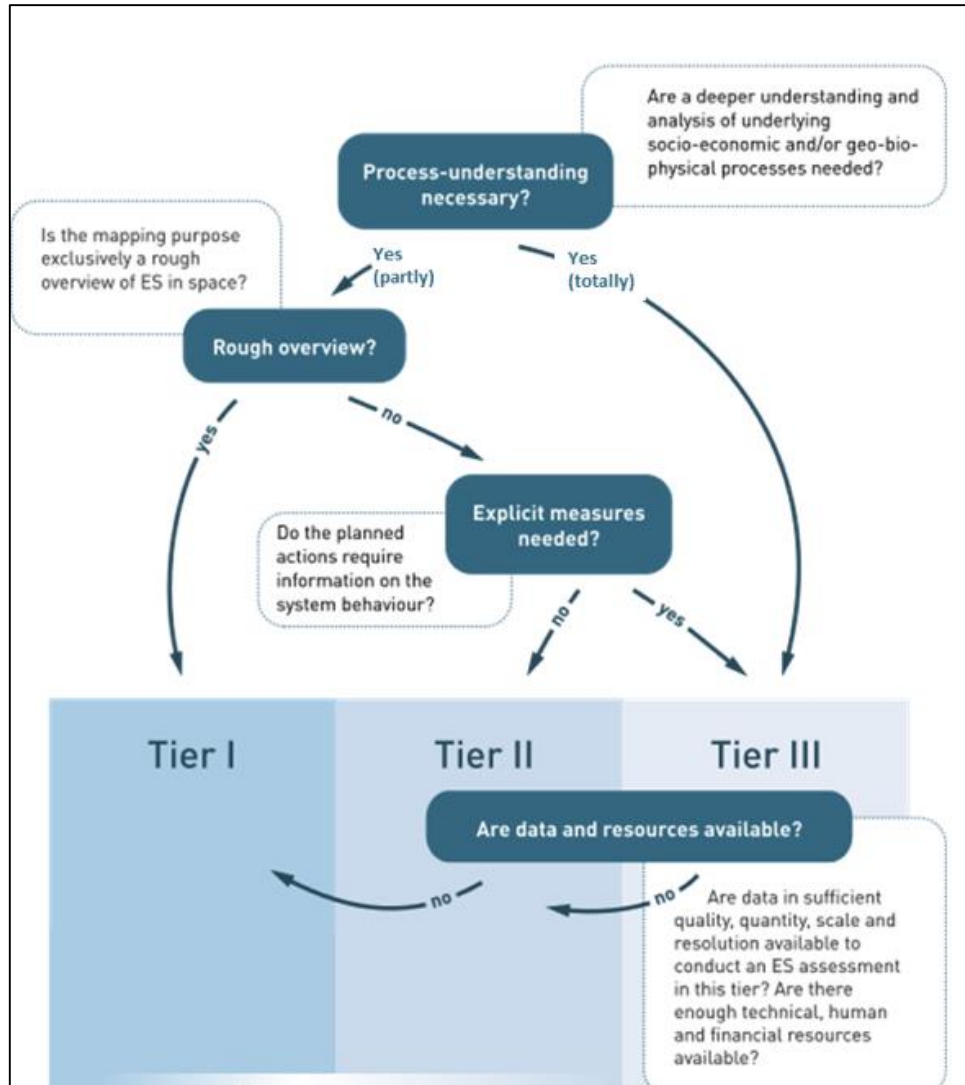
Spatial distribution of case study locations by country and type of ecosystem





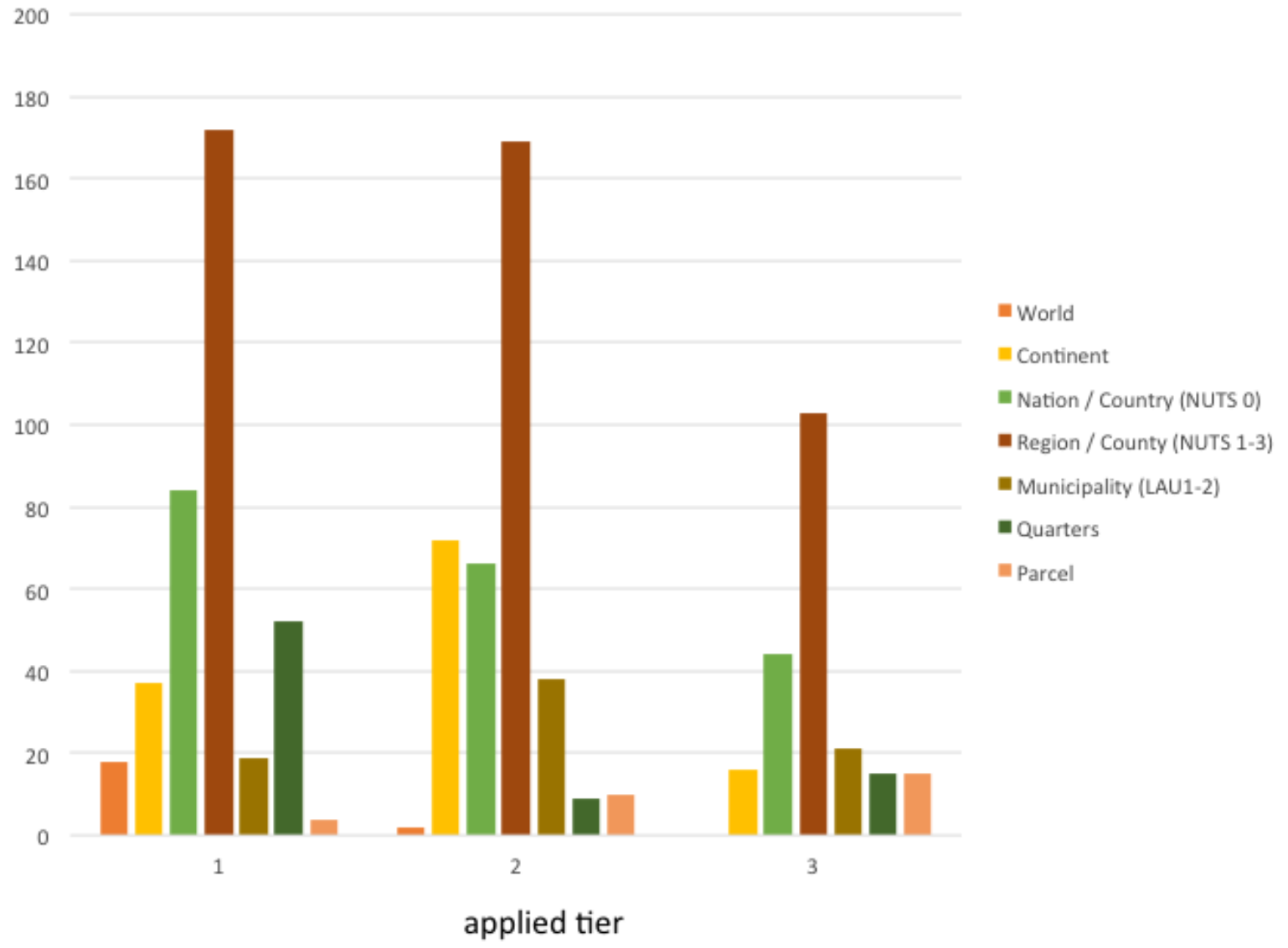
Methods

- 1: Spatial proxy methods
- 2: Phenomenological models
- 3: Macro - ecological models
- 4: Trait - based models
- 5: Process - based models
- 6: Statistical models
- 7: Eco logical Connectivity models
- 8: State and transition model
- 9: Conceptual model
- 10: In tegrated modelling framework
- 11: Field Observations
- 12: Surveys and questionnaires
- 13: Remote sensing and earth observations
- 14: Remote sensing and earth observation derivatives
- 15: Use of statistical and socio - economic data
- 16: Market price
- 17: Public pricing
- 18: Defensive expenditure
- 19: Replacement cost
- 20: Restoration cost
- 21: Damage cost avoided
- 22: Social Cost of Carbon
- 22: Social Cost of Carbon
- 23: Opportunity cost
- 24: Net factor income
- 25: Production function
- 26: Travel cost
- 27: Contingent valuation
- 28: Choice modelling
- 29: Group / participatory valuation
- 30: Value transfer (benefit transfer)
- 31: Cost Effectiveness Analysis (CEA)
- 32: Cost Benefit-Analysis (CBA)
- 33: Ecosystem Service Accounting
- 34: Corporate Ecosystem Service Review
- 35: Preference assessment
- 37: Photo - elicitation surveys
- 38: Geo- tagged photo-series analysis
- 39: Narrative assessment
- 40: Q-methodology
- 41: Participatory GIS
- 42: Participatory scenario planning
- 43: Deliberative assessment



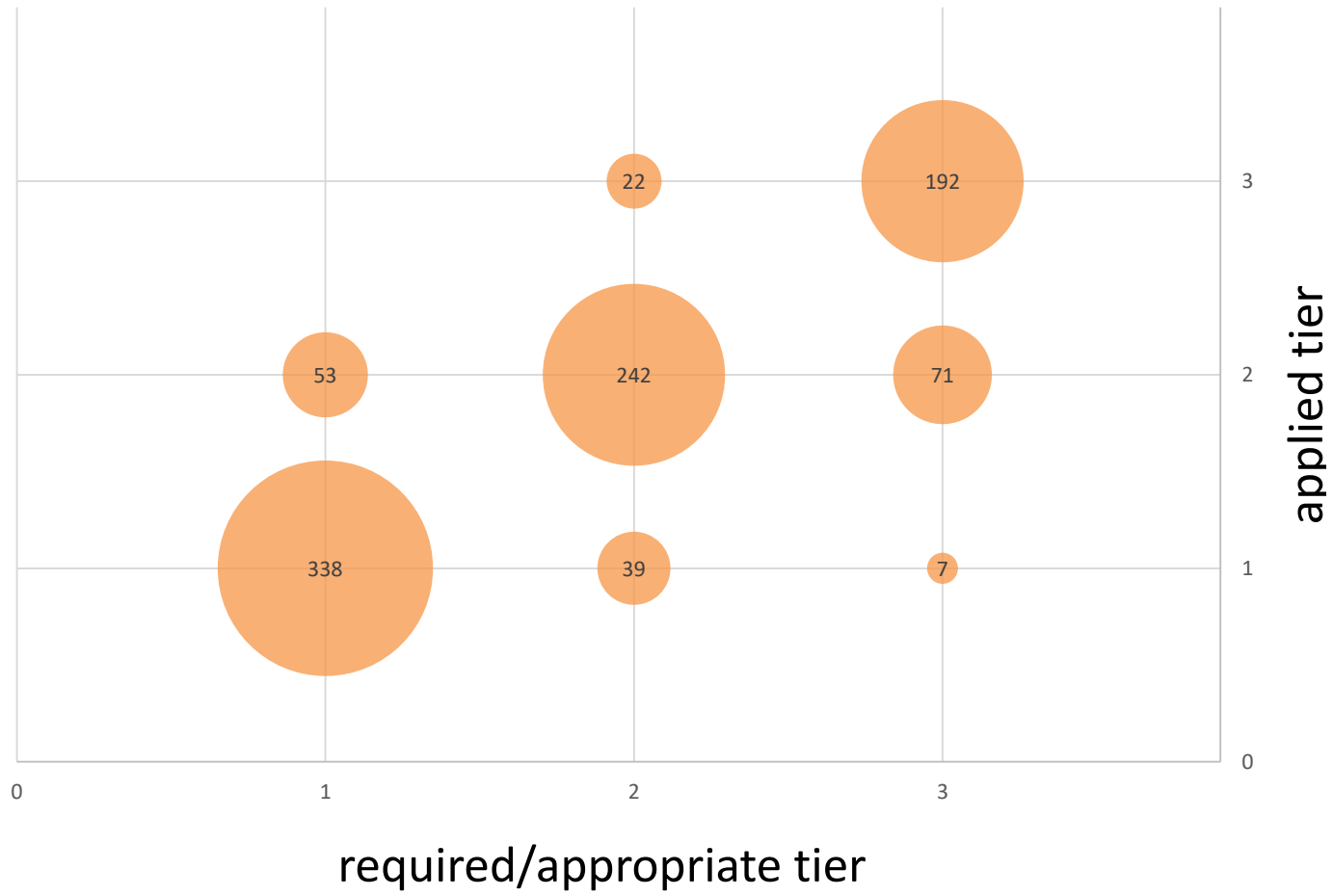
Source: Gret-Regamey et al. ES Mapping Book.

DATABASE – RESULTS



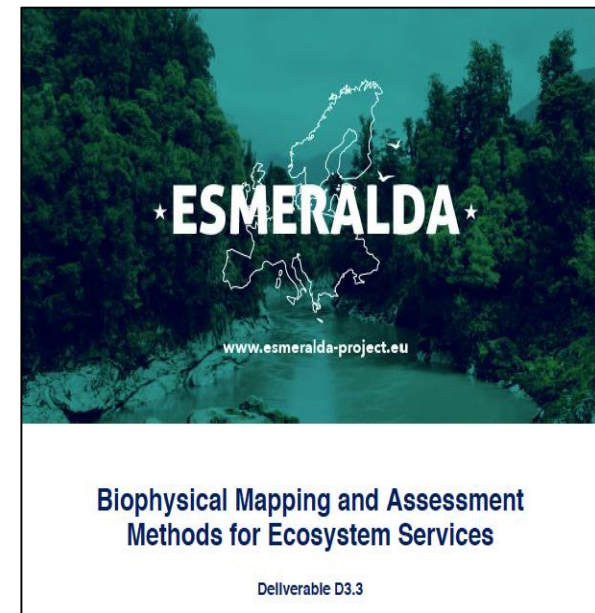
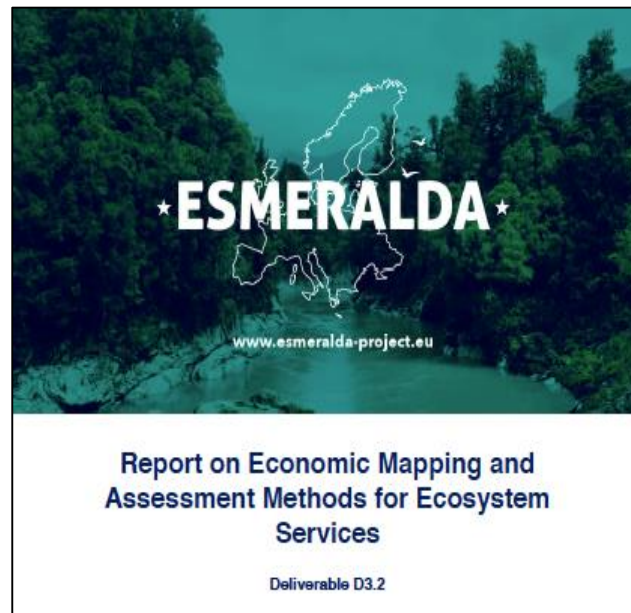
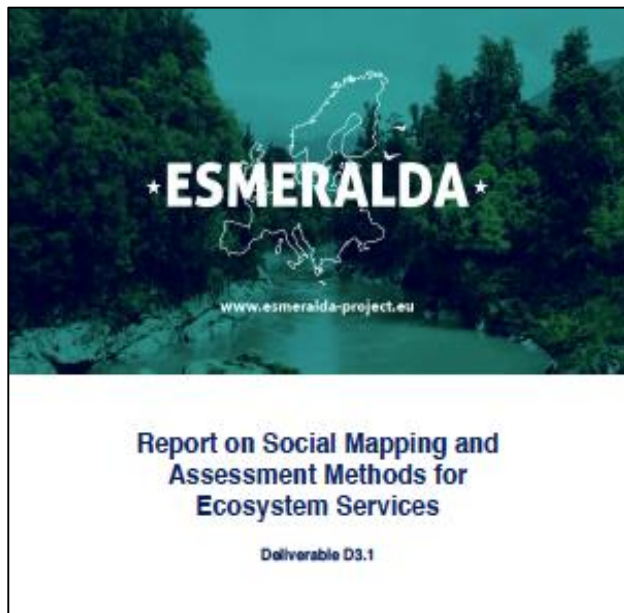


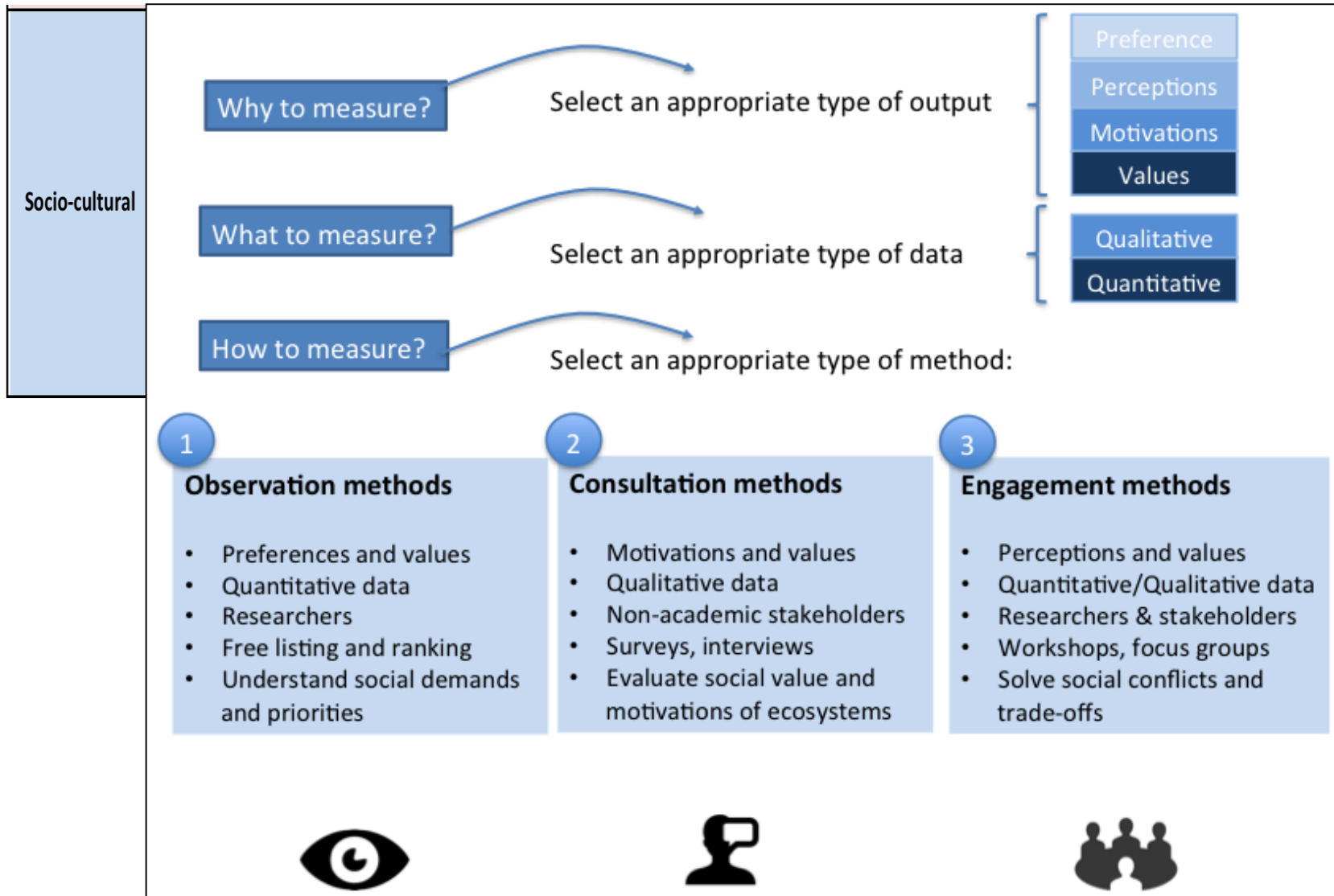
DATABASE – RESULTS



Objectives:

Submitting **3 Guidance Reports** describing the current situation and how to apply mapping and assessment methods for the tree domains (Biophysical/Economic/Sociocultural) in the EU.

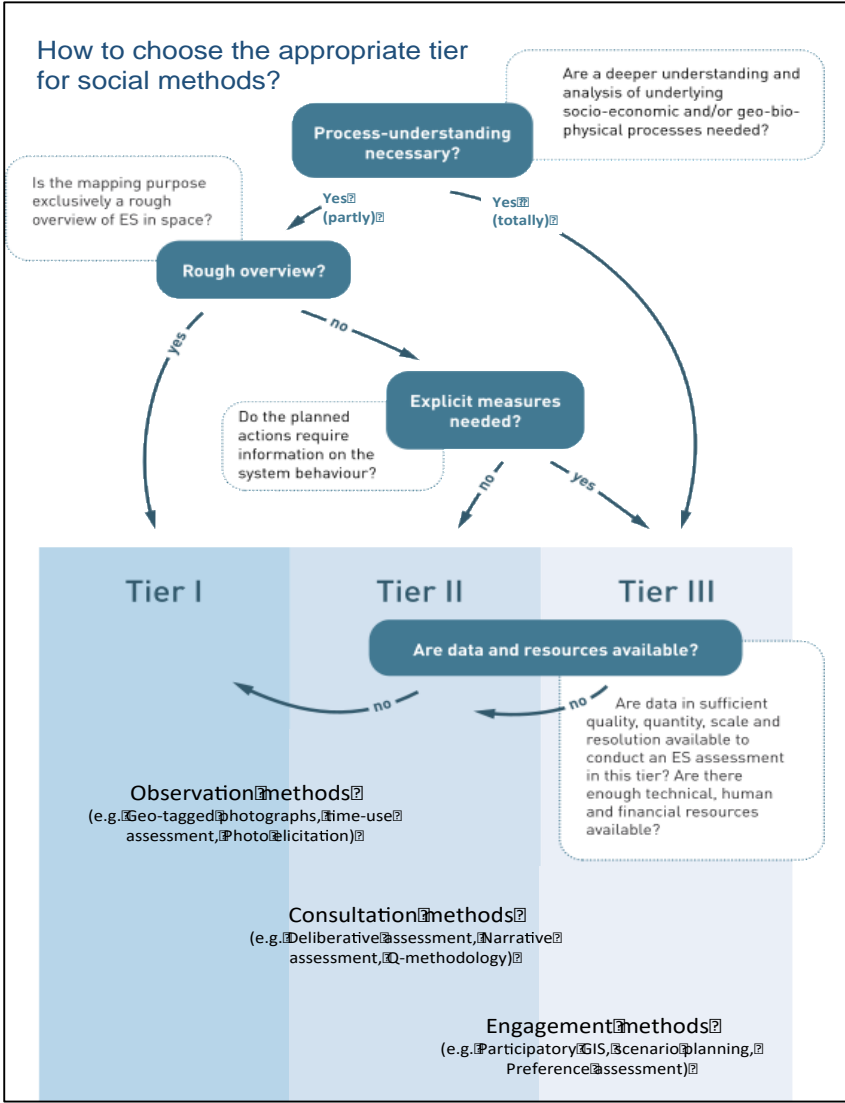




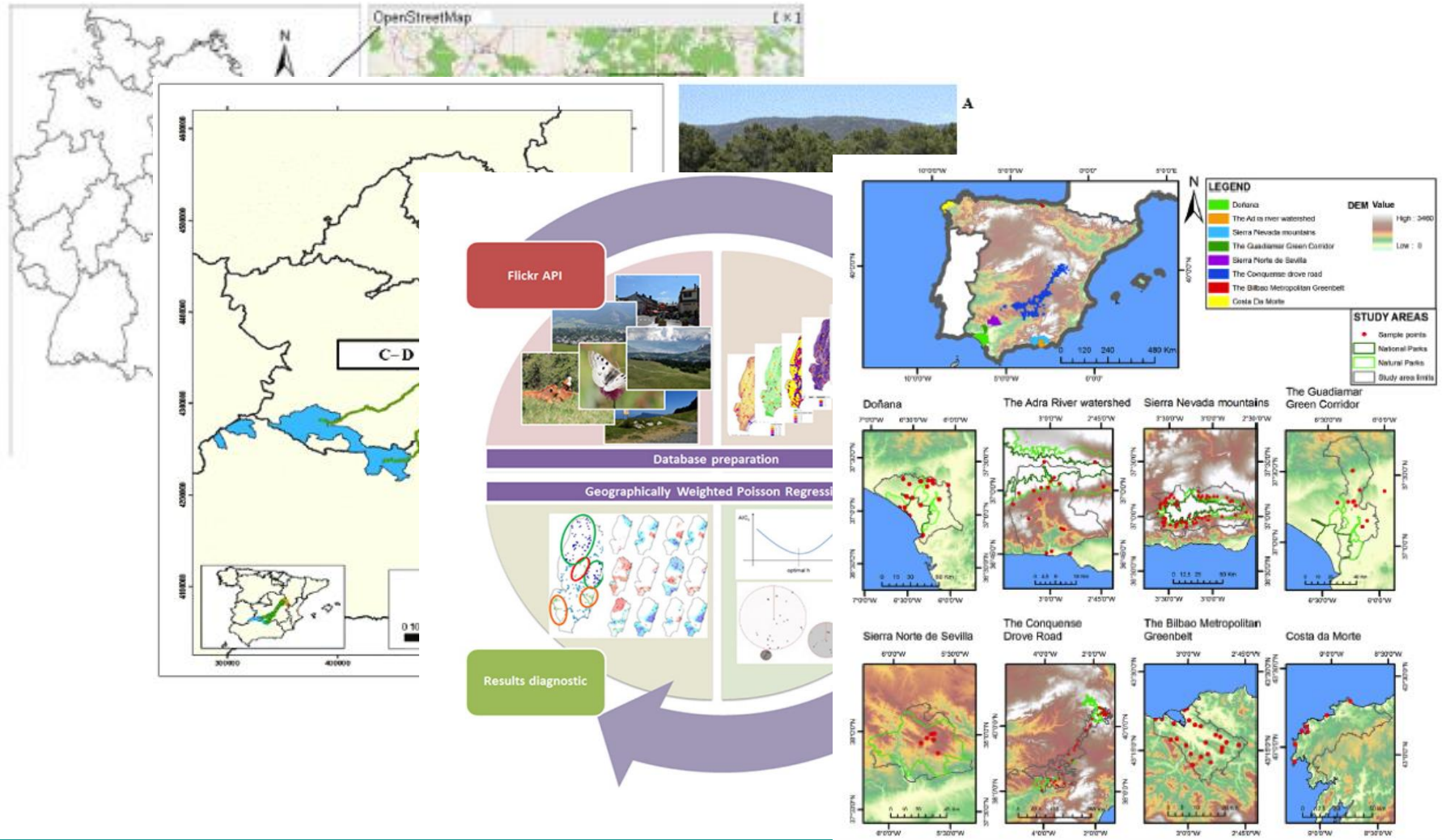
Key variability aspects to map and assess ES

SOCIO-CULTURAL METHODS	Approach		Preference		Procedure			Scale			Tier			Data			Values		Integration		Collaboration		Resources	
	Mapping	Assessment	Individual	Social	Observation	Consultation	Engagement	Local	Regional	National	Tier I	Tier II	Tier III	Amount	Qualitative	Quantitative	Diverse	Single	Biophysical	Economic	Researcher	Stakeholder	Time	Monetary
Observation methods																								
Time use assessment	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Photo-elicitation	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Geo-tagged photographs	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Consultation methods																								
Preference assessment	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Narratives assessment	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Q-methodology	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Engagement methods																								
Participatory GIS	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Scenarios planning	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Deliberative assessment	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Multicriteria analysis	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Tier approach for social methods

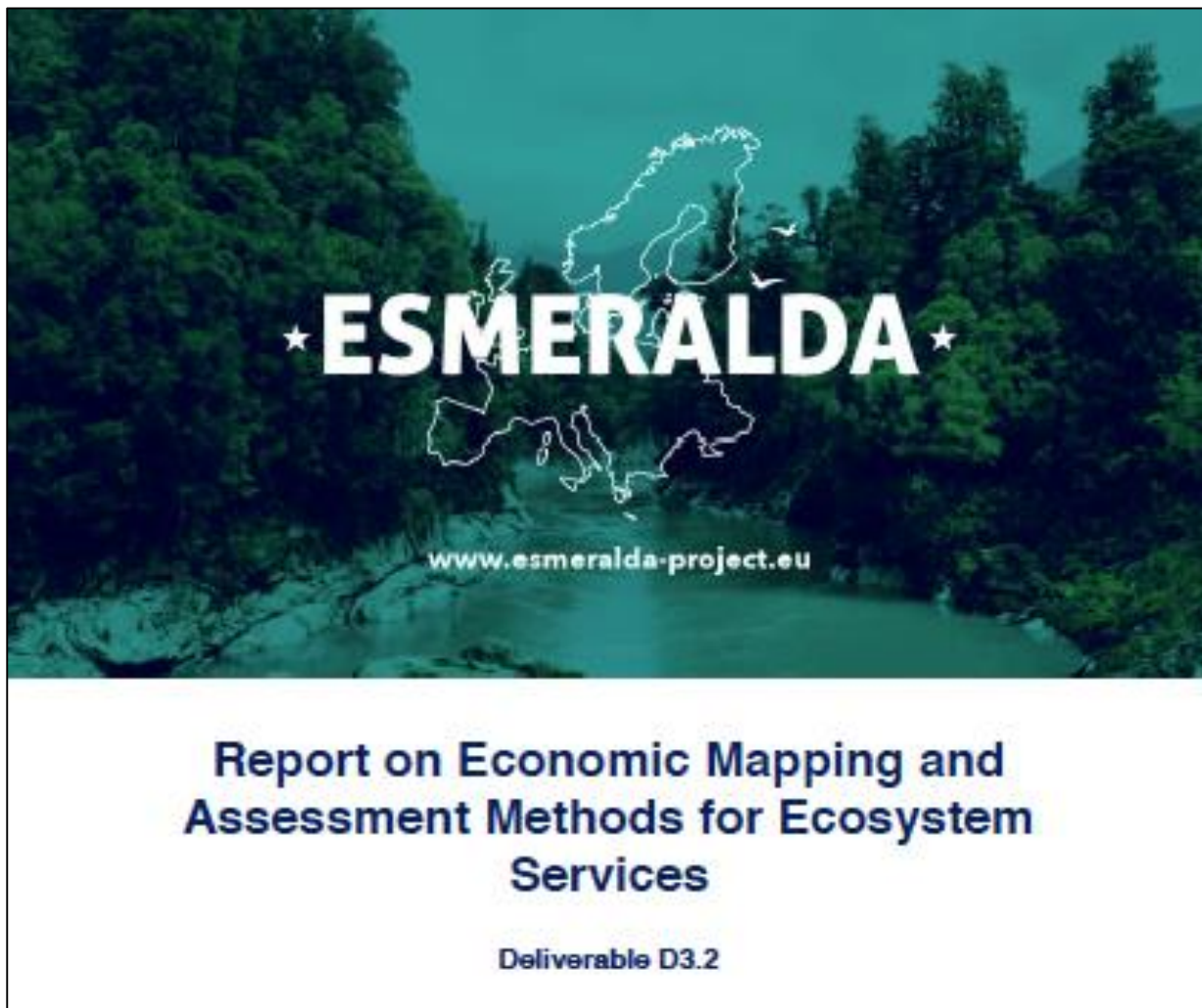


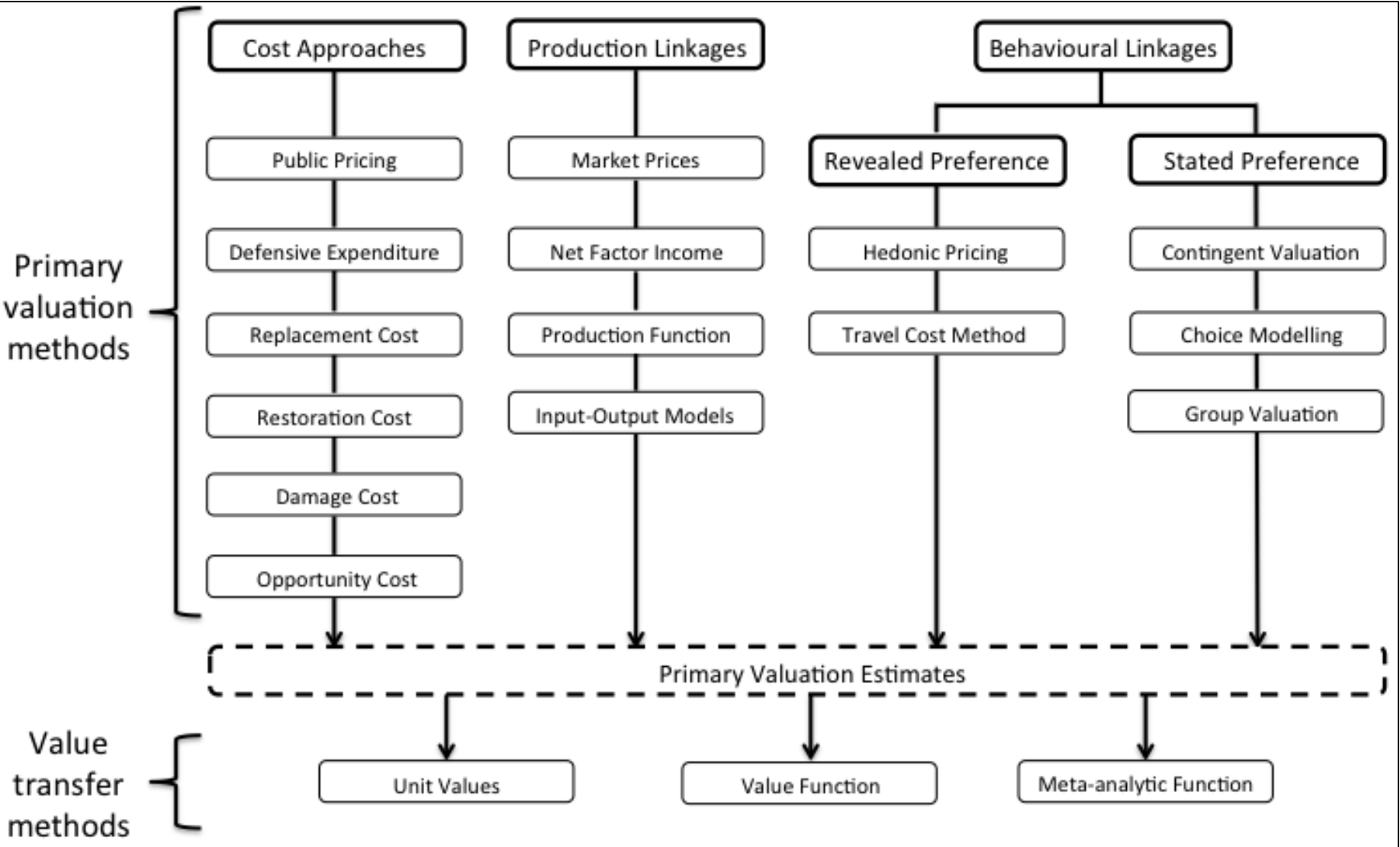
A comprehensive review of social methods and applications in EU



Operationalizing social methods in relation to policy questions

Social Methods		Policy support questions						Technical questions				Resources questions		Application questions			
		Agricultural policy	Biodiversity policy	Climate policy	Disaster risk	Economic policy	Impact assessment	Spatial planning	Spatial scale	Scenarios and	Priorities and	Cost and resources	Governance	Applications of ES	Payment for ES	Cost and Benefits	Communication
Observation	Time-use assessment	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Photo-elicitation survey	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Geo-tagged photographs	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Consultation	Preference assessment	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Narratives assessment	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Q-methodology	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Engagement	Participatory GIS	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Participatory scenarios	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Deliberative assessment	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	Multicriteria analysis	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

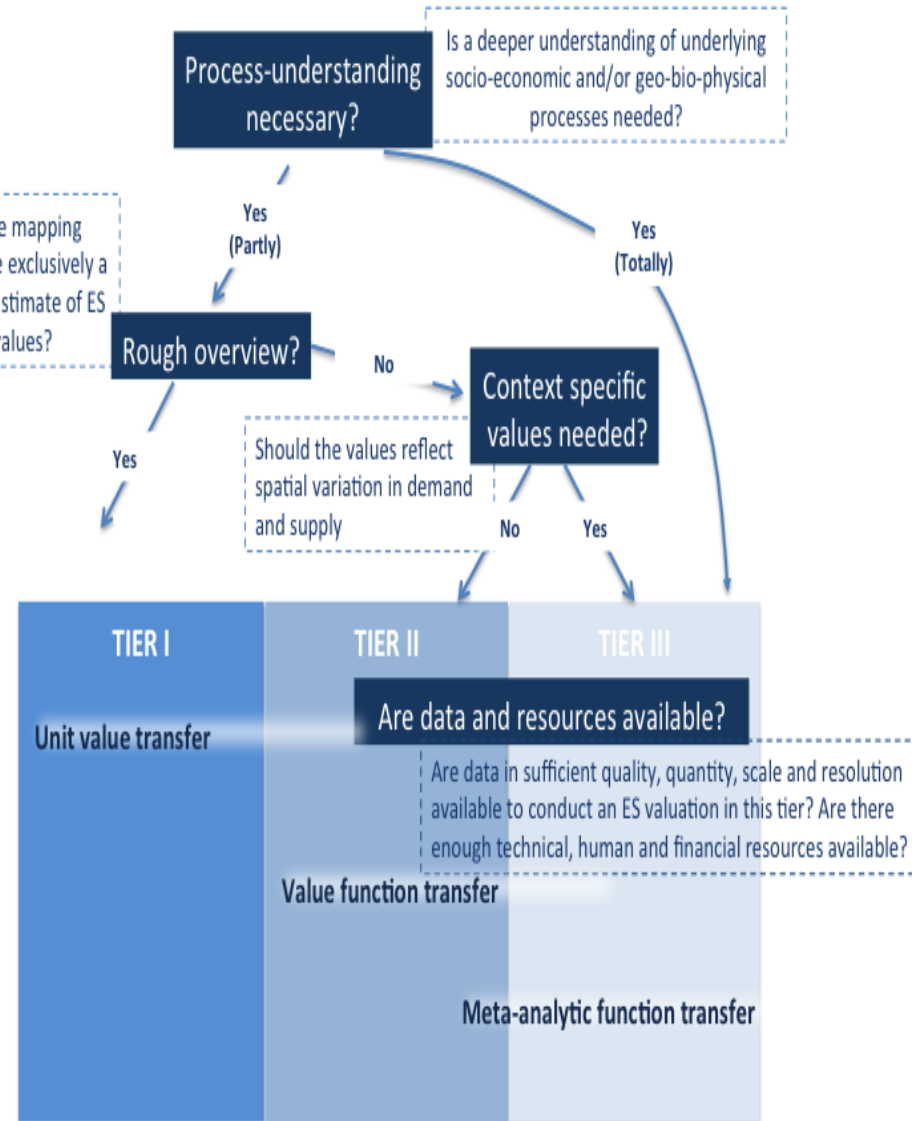
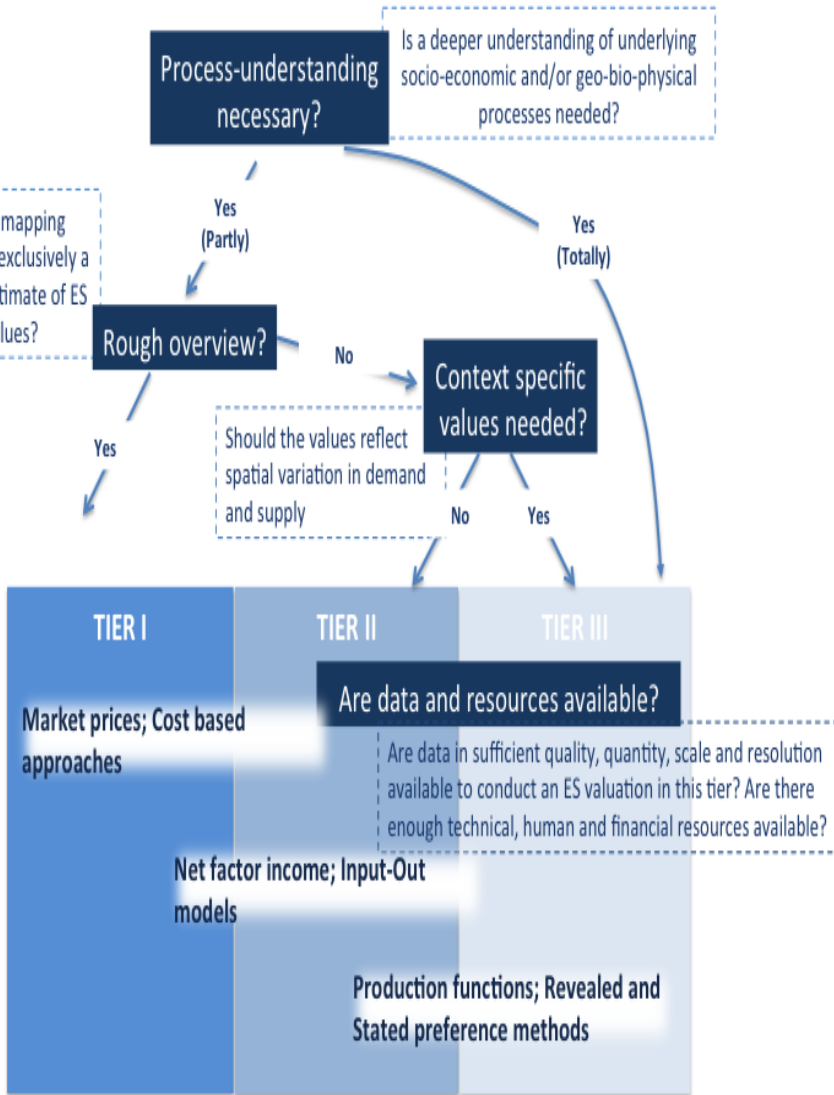




Key variability aspects to map and assess ES

Table 2: Primary valuation methods		Table 3: Value transfer methods, strengths, weaknesses and tier (adapted from Table 3, Brander 2013)				
Valuation method	Approach	Approach	Strengths	Weaknesses	Tier	
Market prices	Prices for ES that are directly observed in markets	Unit value transfer	Select appropriate values from existing primary valuation studies for similar ecosystems and socio-economic contexts. Adjust unit values to reflect differences between study and policy sites (usually for income and price levels)	Simple	Unlikely to be able to account for all factors that determine differences in values between study and policy sites. Value information for highly similar sites is rarely available	1
Public pricing	Public expenditure/monetary incentive (taxes/subsidies) for ES as an indicator of value	Value function transfer	Use a value function derived from a primary valuation study to estimate ES values at policy site(s)	Allows differences between study and policy sites to be controlled for (e.g. differences in population characteristics)	Requires detailed information on the characteristics of policy site(s)	2
Defensive expenditure	Expenditure on protection of ES	Meta-analytic function transfer	Use a value function estimated from the results of multiple primary studies to estimate ES values at policy site(s)	Allows differences between study and policy sites to be controlled for (e.g. differences in population characteristics, area of ecosystem, abundance of substitutes etc.). Practical for consistently valuing large numbers of policy sites.	Requires detailed information on the characteristics of policy site(s). Analytically complex	3
Replacement cost	Estimate the cost of replacing an ES with a man-made service					
Restoration cost	Estimate cost of restoring degraded ecosystems to ensure provision of ES					

Tier approach for economic methods



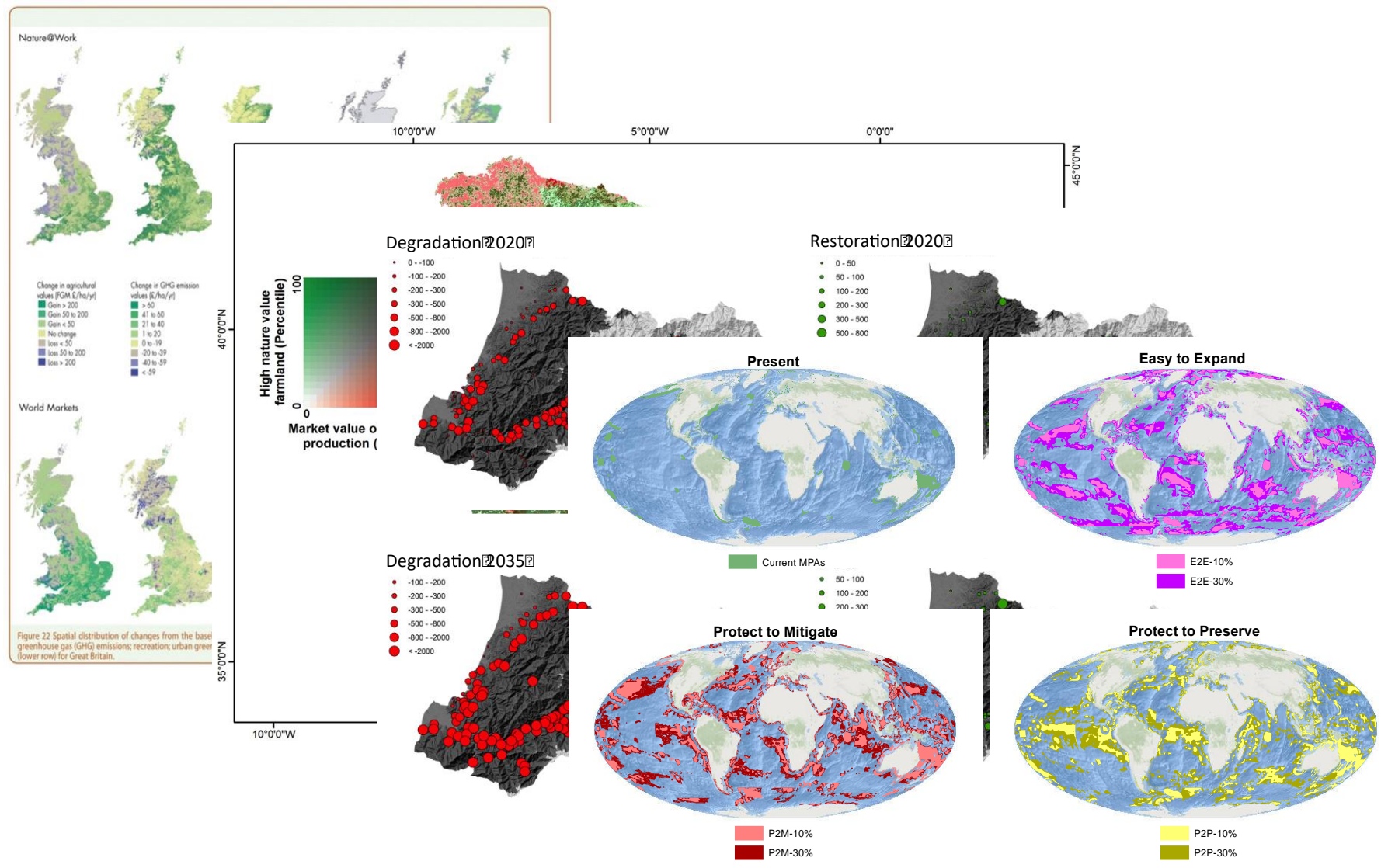


Figure 22 Spatial distribution of changes from the base greenhouse gas (GHG) emissions; recreation; urban green (lower row) for Great Britain.

Basemap Credits: Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors



Biophysical Mapping and Assessment Methods for Ecosystem Services

Deliverable D3.3

REVIEW OF EXISTING BIOPHYSICAL METHODS CLASSICATIONS

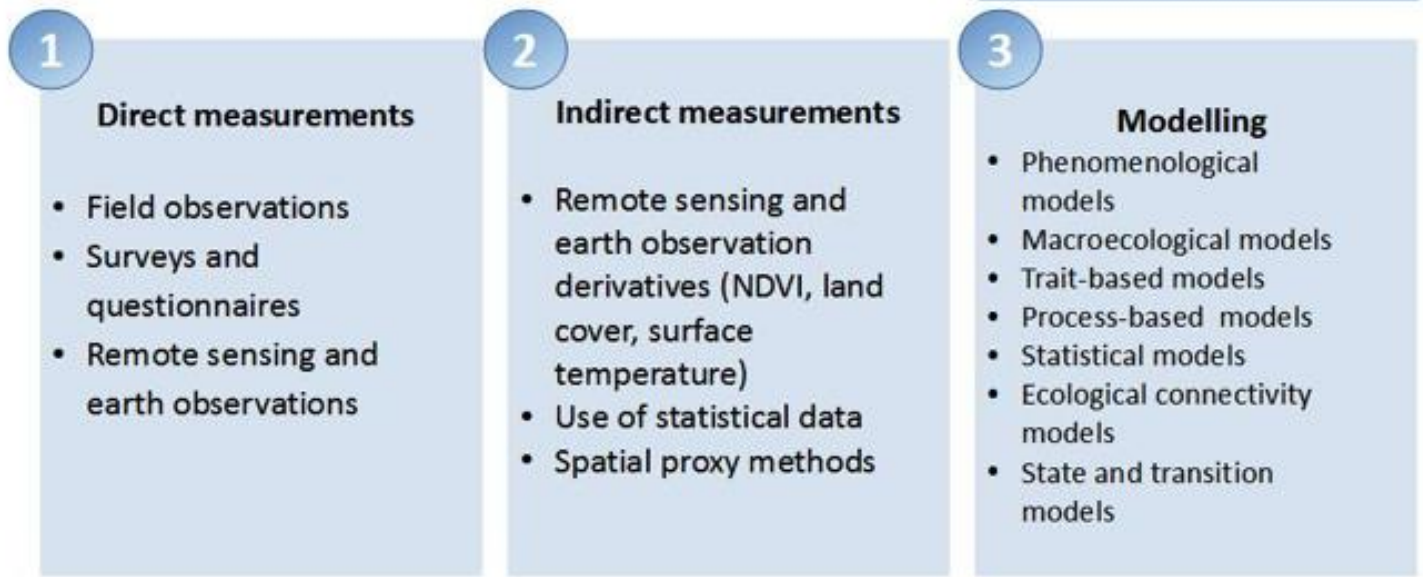
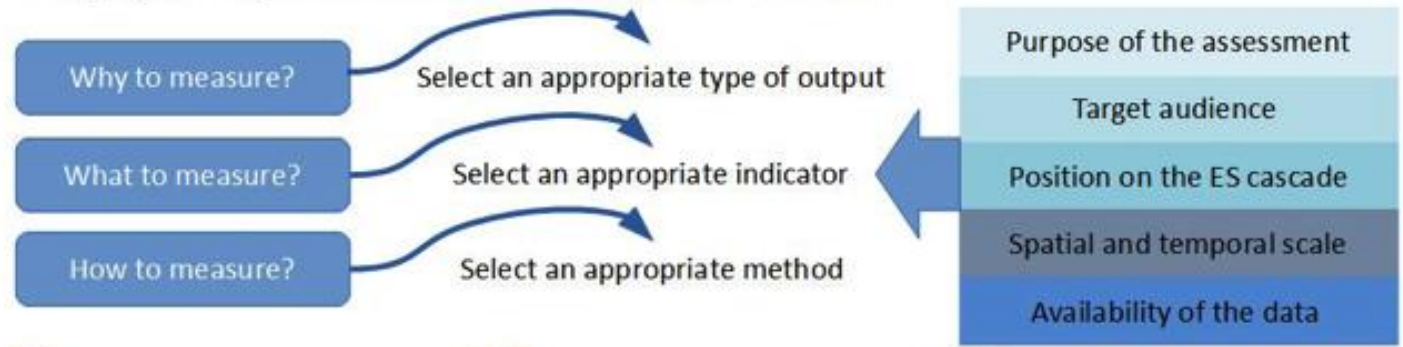
Methods explained in OpenNESS report

- Spreadsheet-type methods
- ESTIMAP
- Bayesian Belief Networks
- State and Transition Models
- QUICKScan
- InVEST
- Species distribution models
- ECOPLAN-QUICKScan
- MapNat smartphone application
- RUSLE (Revised Universal Soil Loss Equation) Erosion model
- Blue-green factor scoring
- Photoseries analysis
- Eco Chain Participatory Biodiversity Management

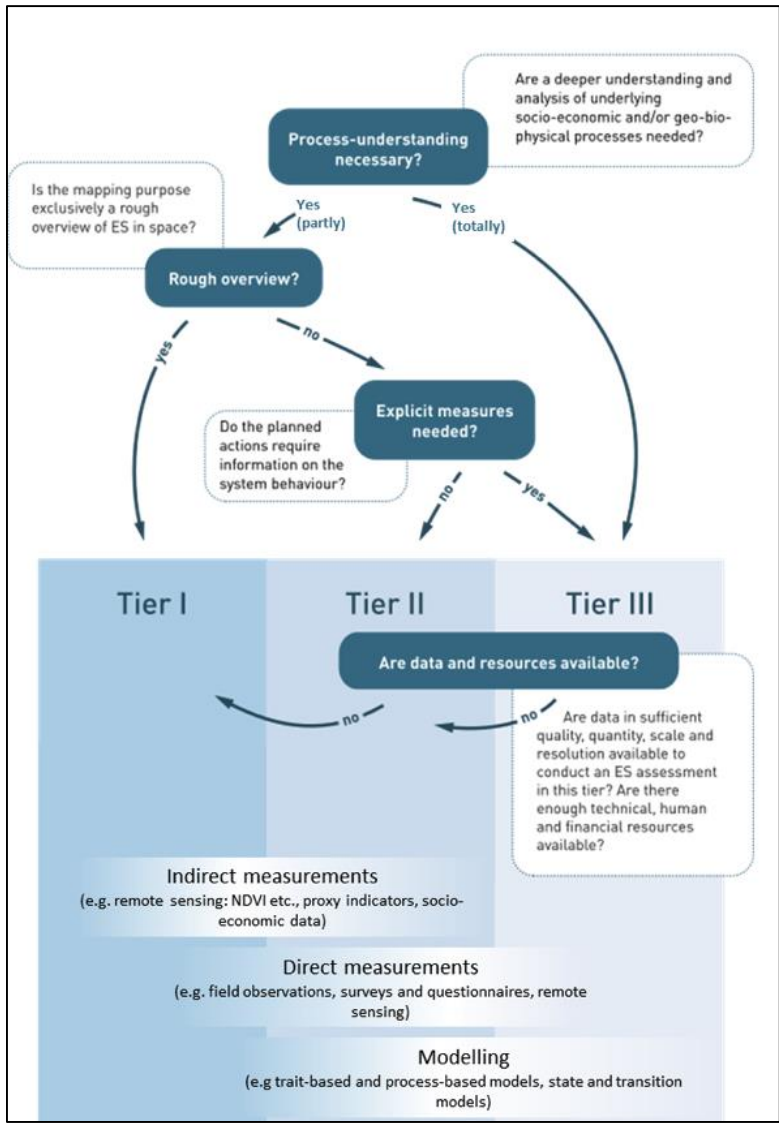
Methods explained in OPERAs report

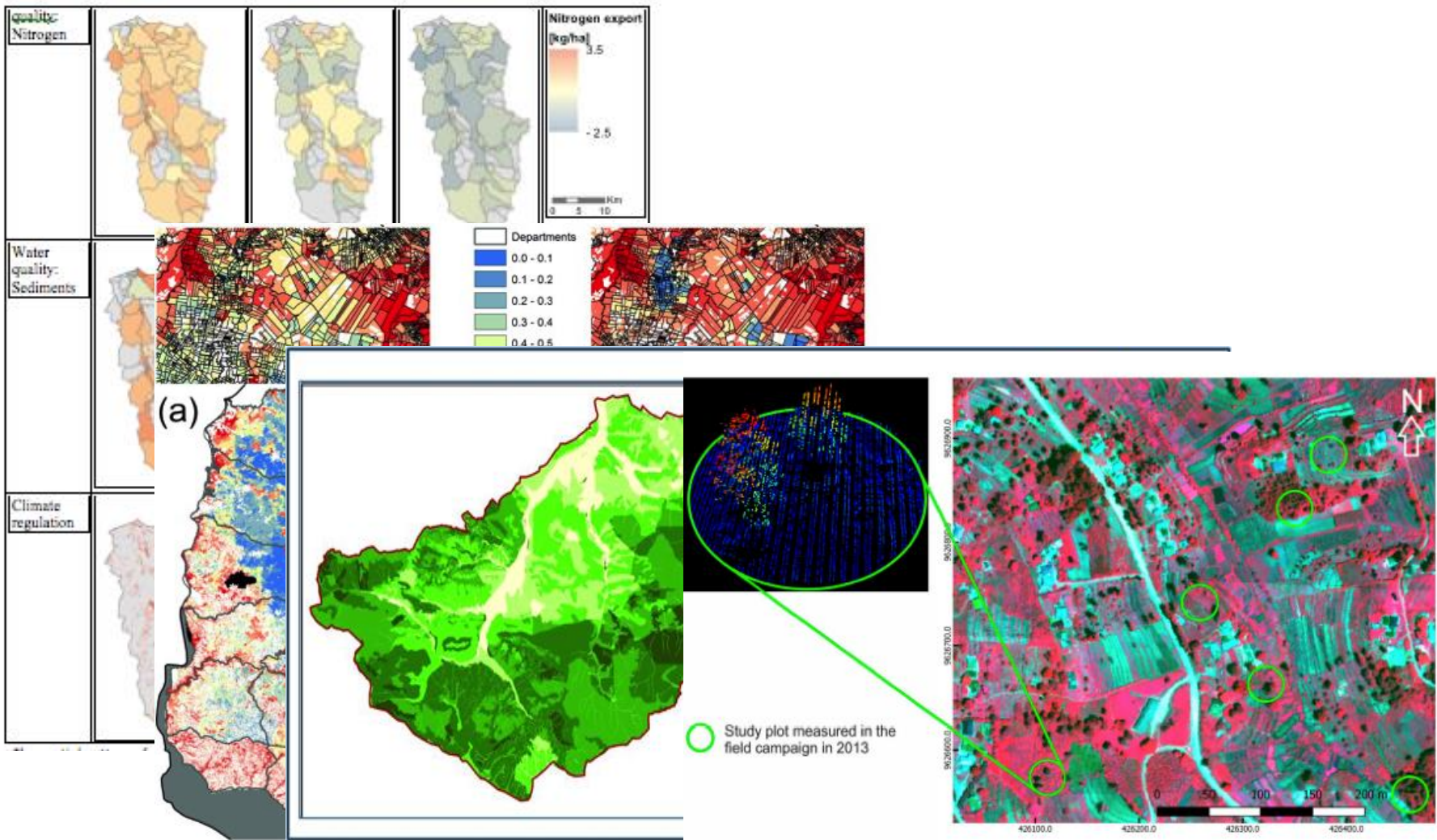
- 1) Spatial proxy models
- 2) Phenomenological models
- 3) Macro-ecological models
- 4) Trait-based models
- 5) Process-based models

Biophysical quantification of ecosystem services

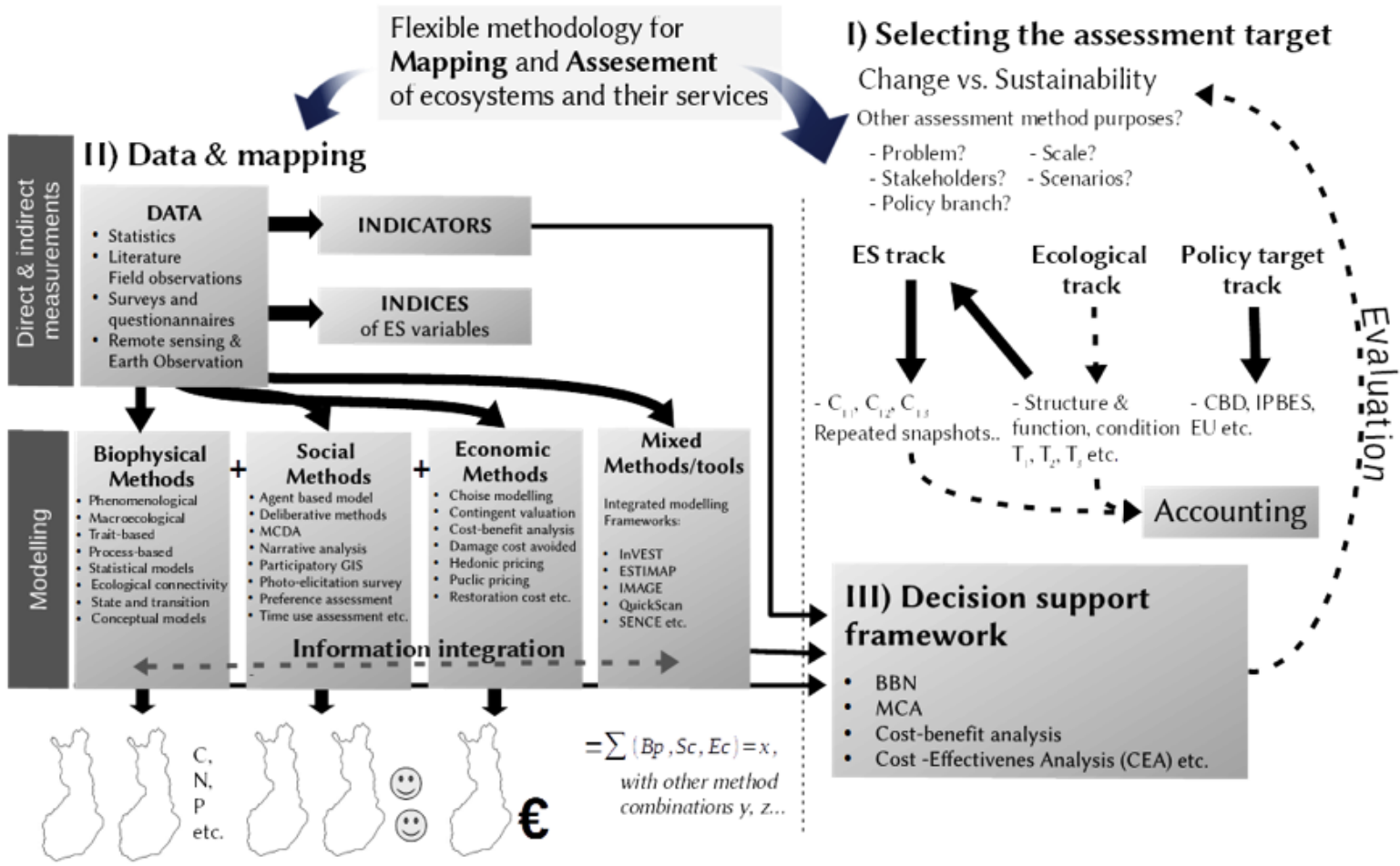


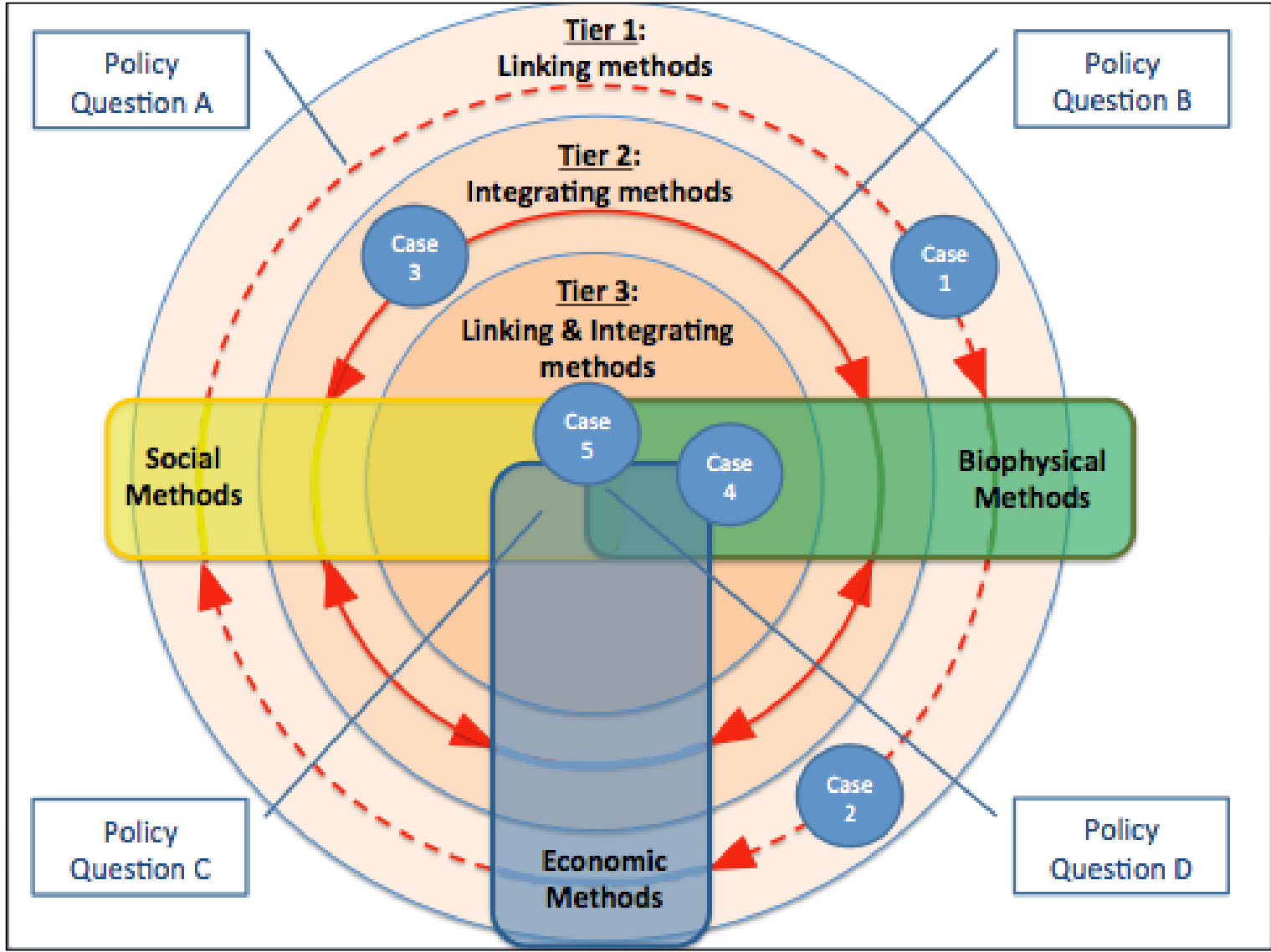
Tier approach for biophysical methods





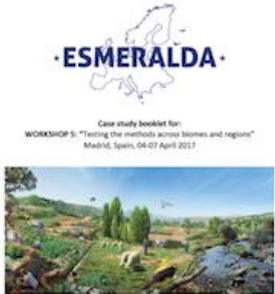
Workflow for Ecosystem Assessment





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explore methods & case studies

search database



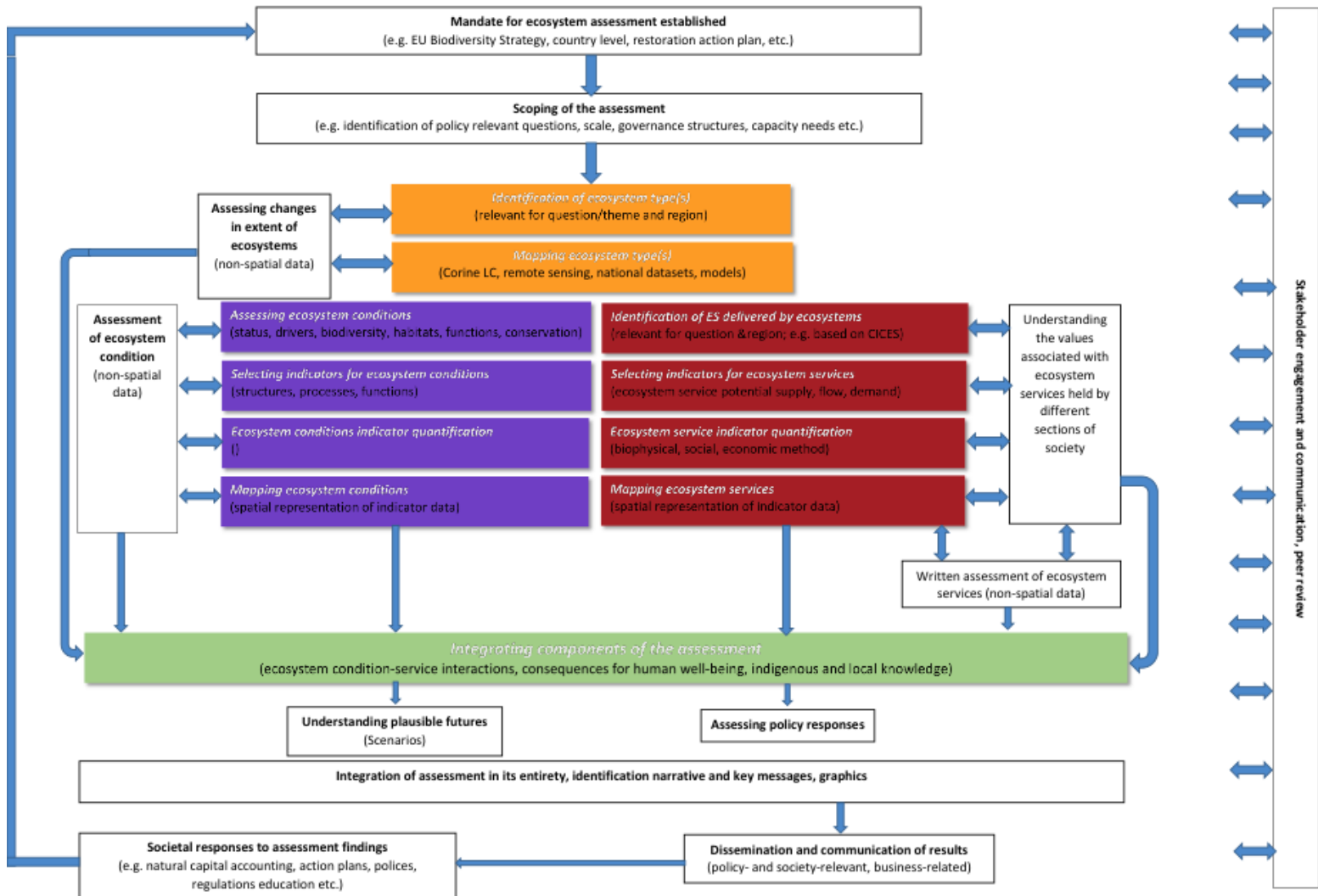
Policy & business questions

Use policy or business question as a starting point to explore the database.



Tiers

Use "tiers" as starting point to explore our database.



THANKS FOR ALL YOUR WORK !



Fernando Santos-Martín

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