Ecosystem services accounts: from the operational platform (INCA) to their economic bridging (LISBETH)

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Joint OECD/UNECE Seminar on the Implementation of SEEA, 18-20 March 2024

Outline

The Integrated system of Natural Capital Accounting (INCA)

- Policy updates
- Background of INCA and current developments
- From ecosystem service accounts to economy

Policy updates

Regulation (EU) No 691/2011

- **Introducing new environmental economic accounts modules**

Modules Overview

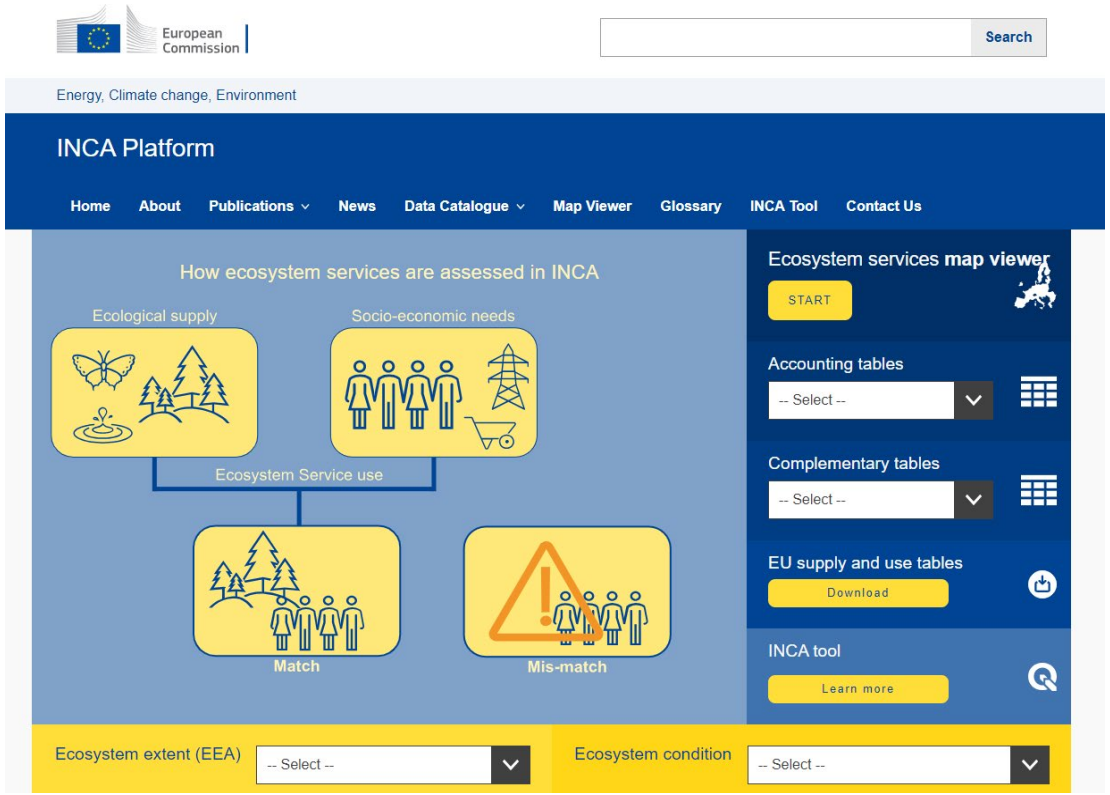
- **Ecosystem extent accounts**
- **Ecosystem condition accounts**
- **Ecosystem services accounts (7 ecosystem services)**

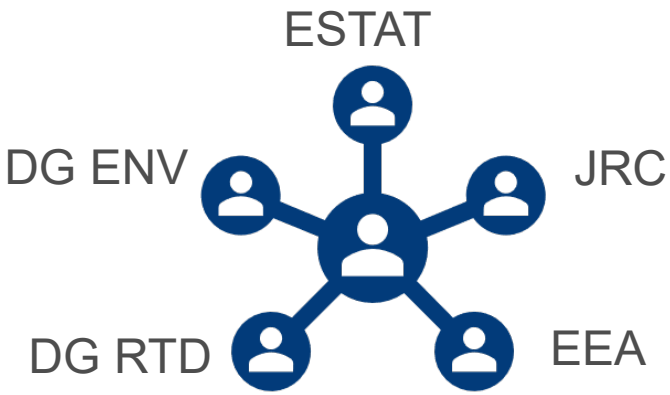
Looking Ahead

- By 2027: Member States Report Yearly on Ecosystem Service Accounts

The INCA project in the context of SEEA

https://ecosystem-accounts.jrc.ec.europa.eu/
(in updating process)





European Commission

The timeline of INCA

2017
The structure of INCA

- Methodological framework of INCA approach

2018
Pilot applications: INCA part I

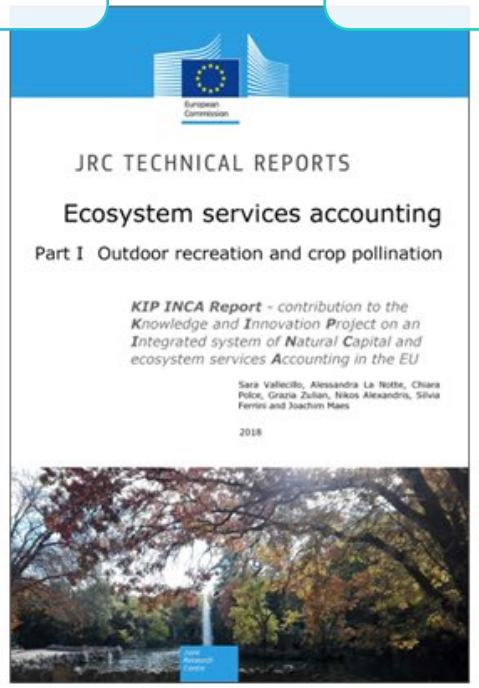
- Ecosystem service accounts put in practice: Pollination and nature-based recreation

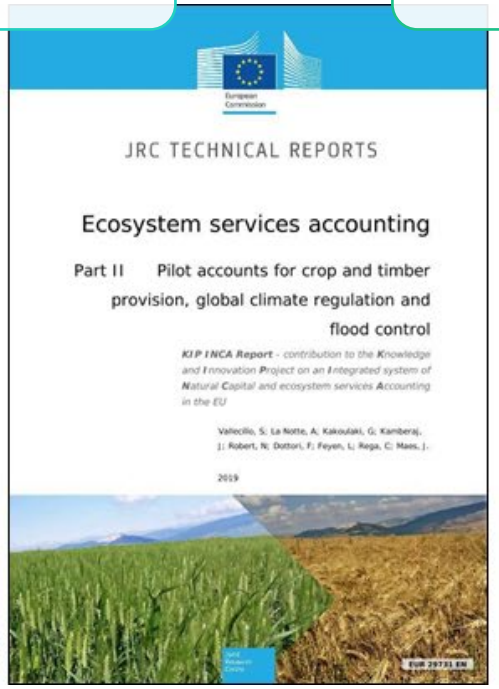
2019
Pilot applications: INCA part II

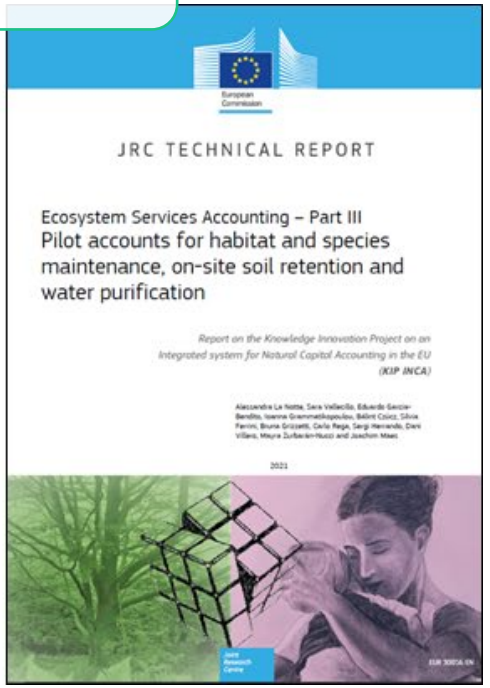
- Ecosystem service accounts put in practice: Crop and Timber provision, carbon seq. and flood control

2021
Pilot applications: INCA part III

- Ecosystem service accounts put in practice: HSM, soil retention and water purification







Support to EU policy making

EUROPEAN COMMISSION

Brussels, 18.7.2019
SWD(2019) 305 final

PART 1/3

COMMISSION STAFF WORKING DOCUMENT

EU guidance on integrating ecosystems and their services into decision-making

EUROPEAN COMMISSION

Brussels, 11.7.2022
COM(2022) 329 final
2022/0210(COD)

Proposal for a

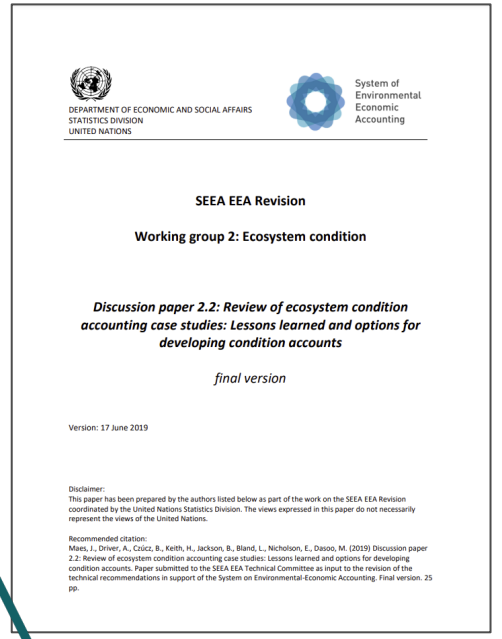
REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

amending Regulation (EU) No 691/2011 as regards introducing new environmental economic accounts modules

European Commission

Support to SEEA EA global framework

Contribution to the development of the global standard of UN SEEA EA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STATISTICS DIVISION
UNITED NATIONS

System of Environmental Economic Accounting

SEEA EEA Revision

Working group 2: Ecosystem condition

Discussion paper 2.2: Review of ecosystem condition accounting case studies: Lessons learned and options for developing condition accounts

final version

Version: 17 June 2019

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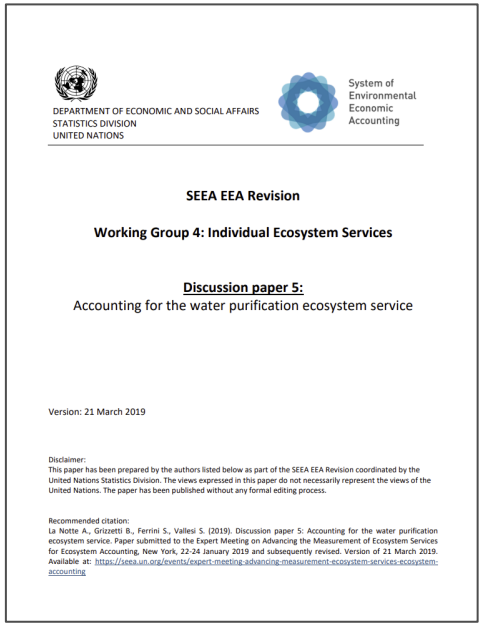
Recommended citation:
Maes, J., Driver, A., Czúcz, B., Keith, H., Jackson, B., Bland, L., Nicholson, E., Dasoo, M. (2019) Discussion paper 2.2: Review of ecosystem condition accounting case studies: Lessons learned and options for developing condition accounts. Paper submitted to the SEEA EEA Technical Committee as input to the revision of the technical recommendations in support of the System on Environmental-Economic Accounting. Final version. 25 pp.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STATISTICS DIVISION
UNITED NATIONS

System of Environmental Economic Accounting

SEEA EEA Revision

Working Group 4: Individual Ecosystem Services

Discussion paper 5:
Accounting for the water purification ecosystem service

Version: 21 March 2019

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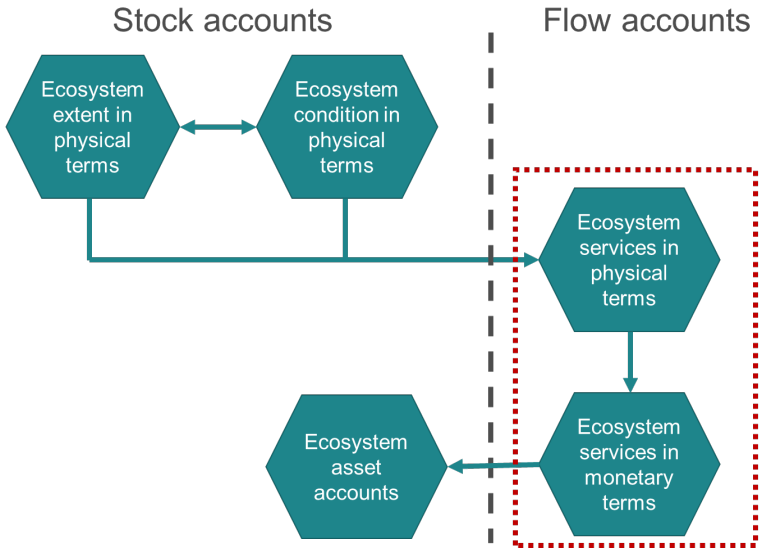
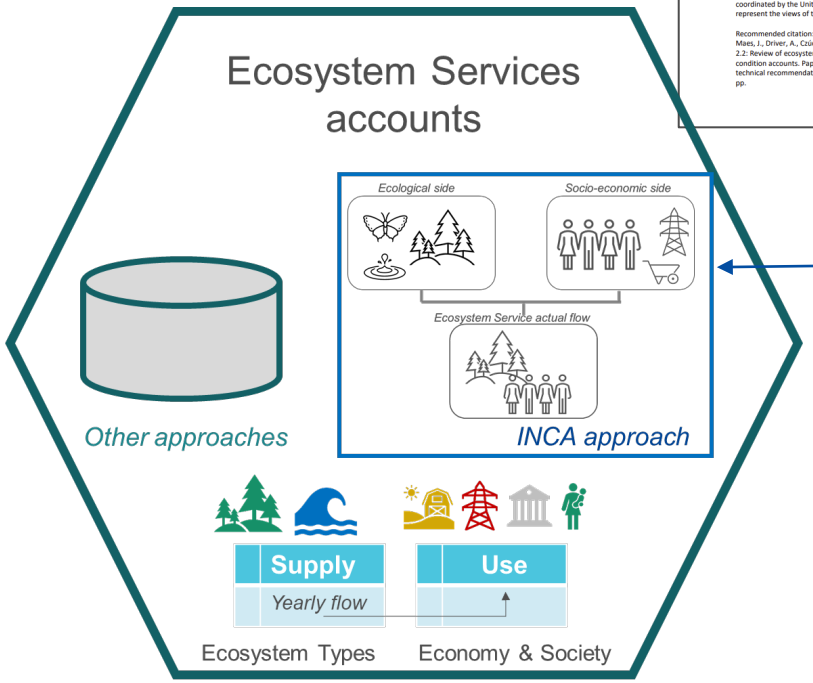
Recommended citation:
La Notte A., Grizzetti B., Ferrini S., Vallesi S. (2019). Discussion paper 5: Accounting for the water purification ecosystem service. Paper submitted to the Expert Meeting on Advancing the Measurement of Ecosystem Services for Ecosystem Accounting, New York, 22-24 January 2019 and subsequently revised. Version of 21 March 2019. Available at: https://seea.un.org/events/expert-meeting-advancing-measurement-ecosystem-services-ecosystem-accounting

SEEA EA general framework

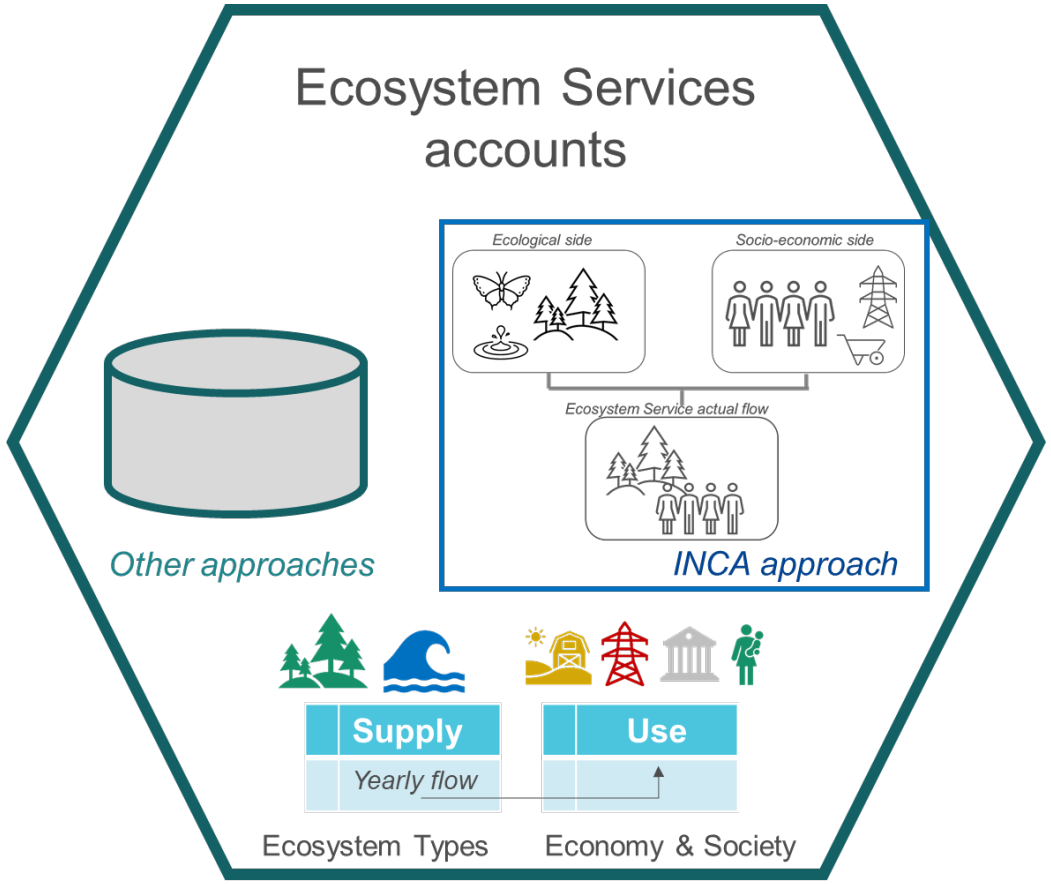




INCA operational procedure

European Commission

The INCA operational procedure and data production



- 4 Modules
  - Potential supply
  - Demand
  - Actual Flow or use
  - Mismatch
- Modules in physical and monetary terms
- 4 Accounting periods (+1 to be added)
- 9 ecosystem services (+2 to be added)
- Maps and tabular data

European Commission

Current developments

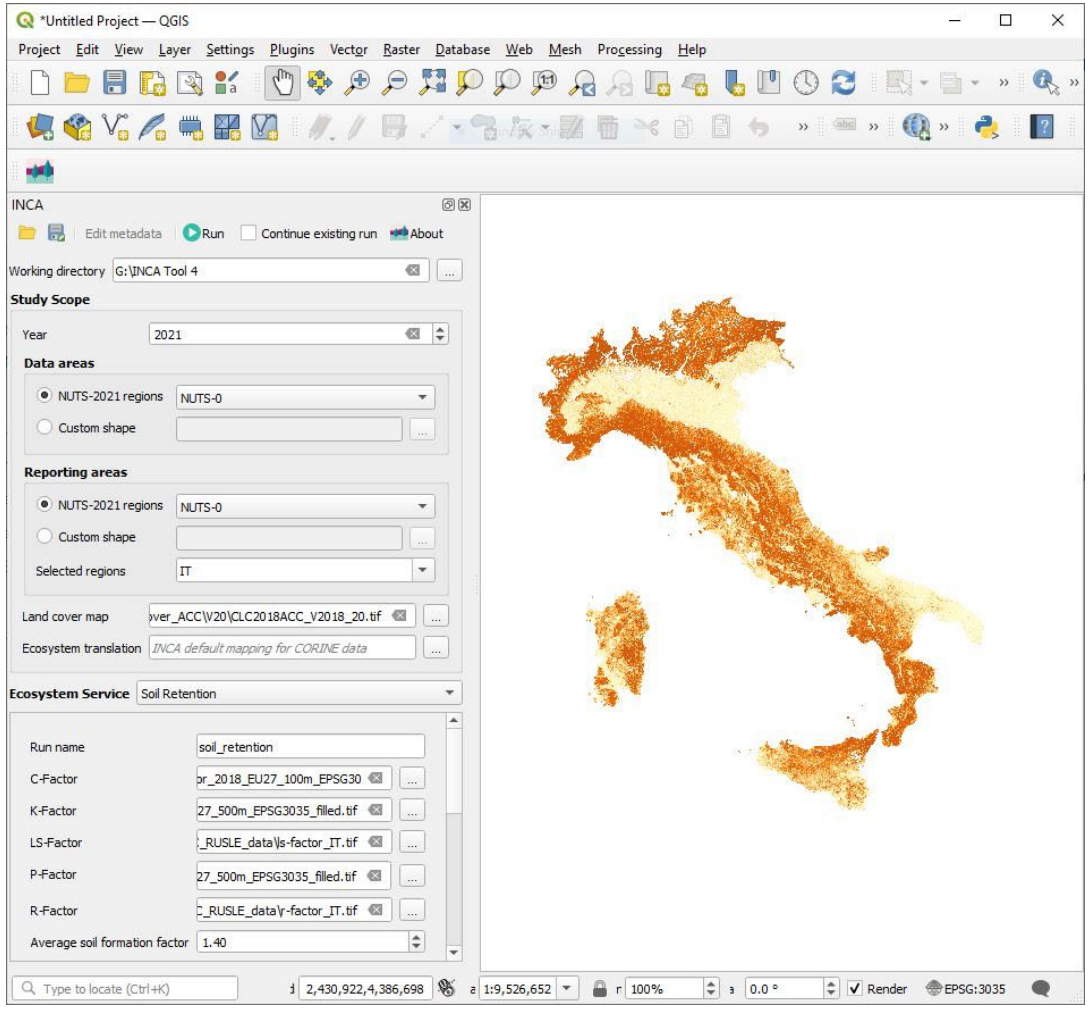
Incorporating new ES accounts

Local climate regulation
Air filtration

Marine Ecosystem Services:
Coastal protection
Fish provision
Nature-based recreation

European Commission

Current developments: INCA Tool (work in progress)



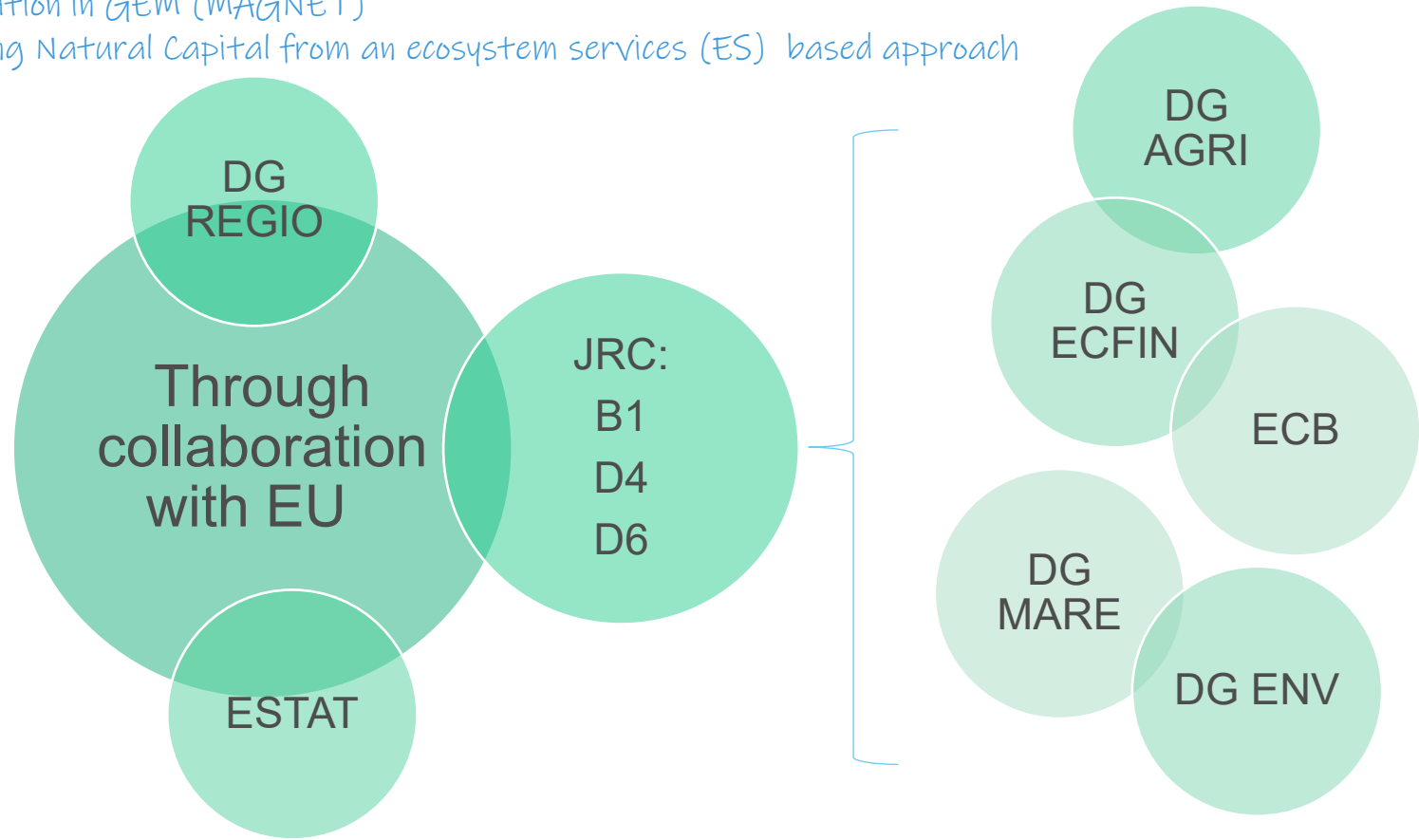
- Plugin for QGIS (open-source)
- Possibility to generate accounts by MS or for EU
- Provides SUTs as well as spatially explicit data outputs
- Currently in version 2.0
- Follows the legal proposal

https://ecosystem-accounts.jrc.ec.europa.eu/inca-tool

European Commission

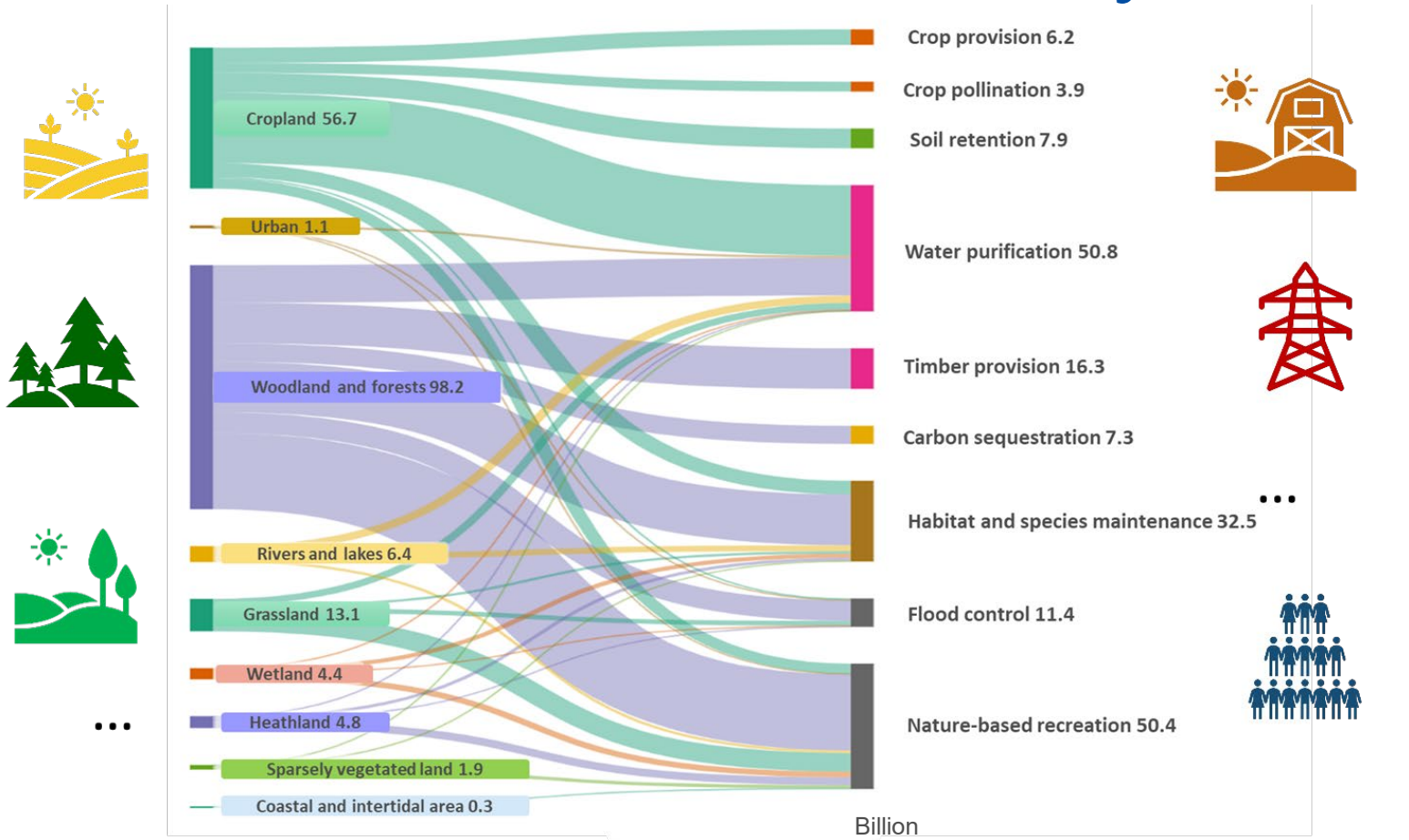
Current developments: Addressing policy questions

- Contribution of natural capital in regional growth and cohesion
- Assessing nature-related risks
- INCA integration in GEM (MAGNET)
- Conceptualizing Natural Capital from an ecosystem services (ES) based approach



European Commission

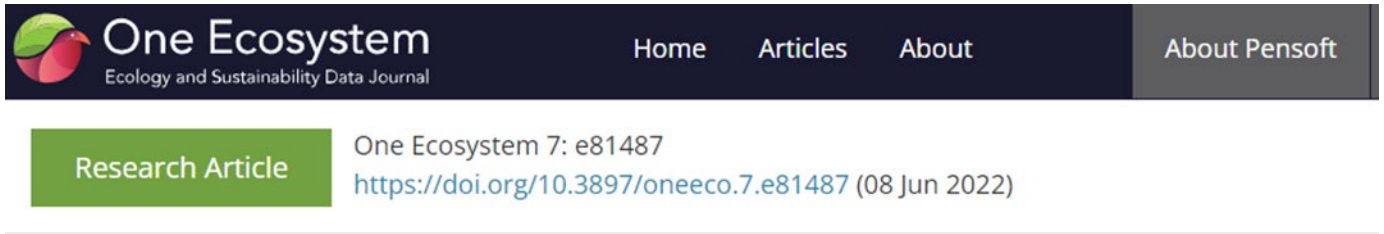
How do we connect ecosystem condition to socio-economic analysis?



Through Ecosystem Services

European Commission

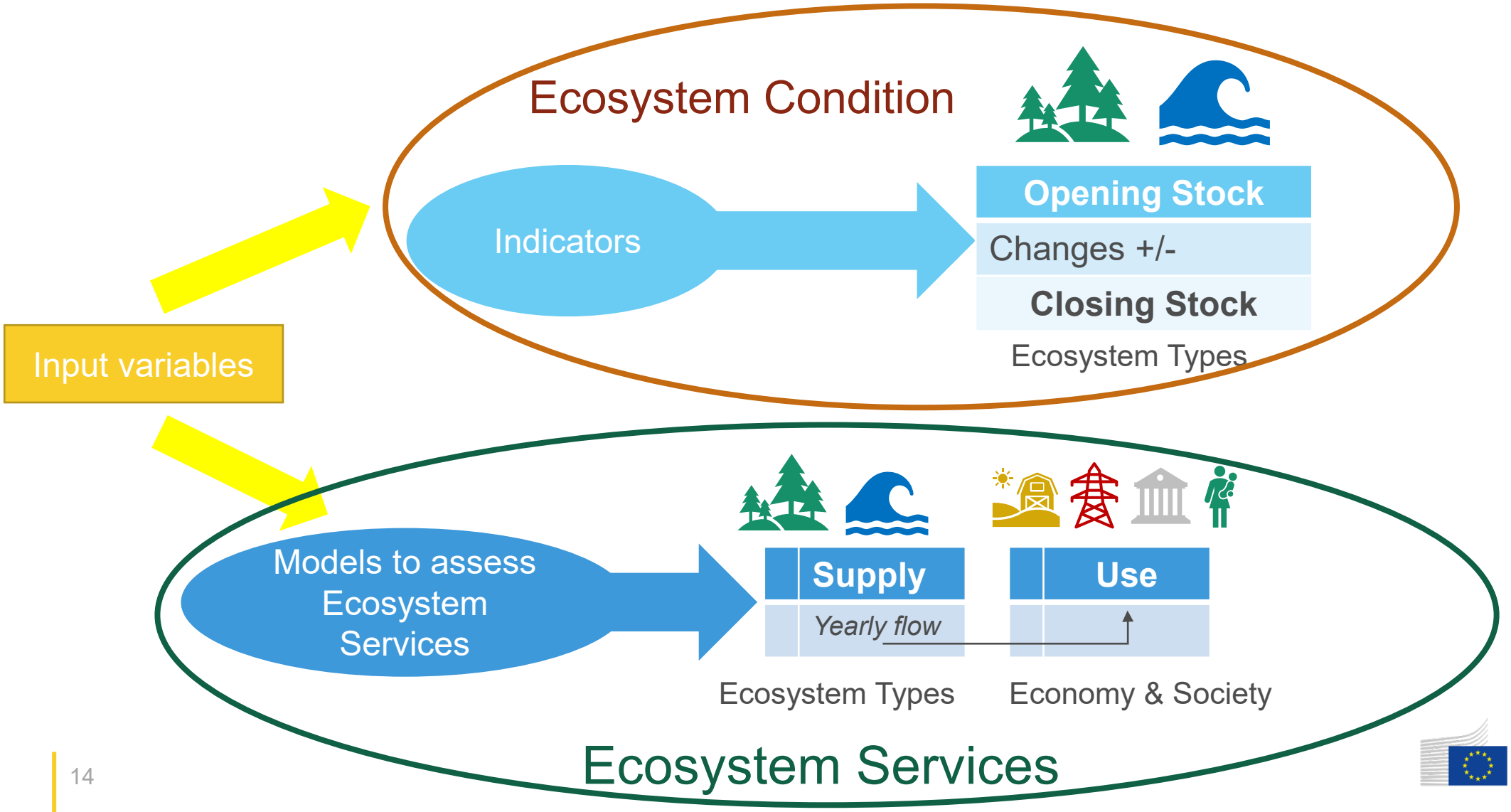
HOW ?



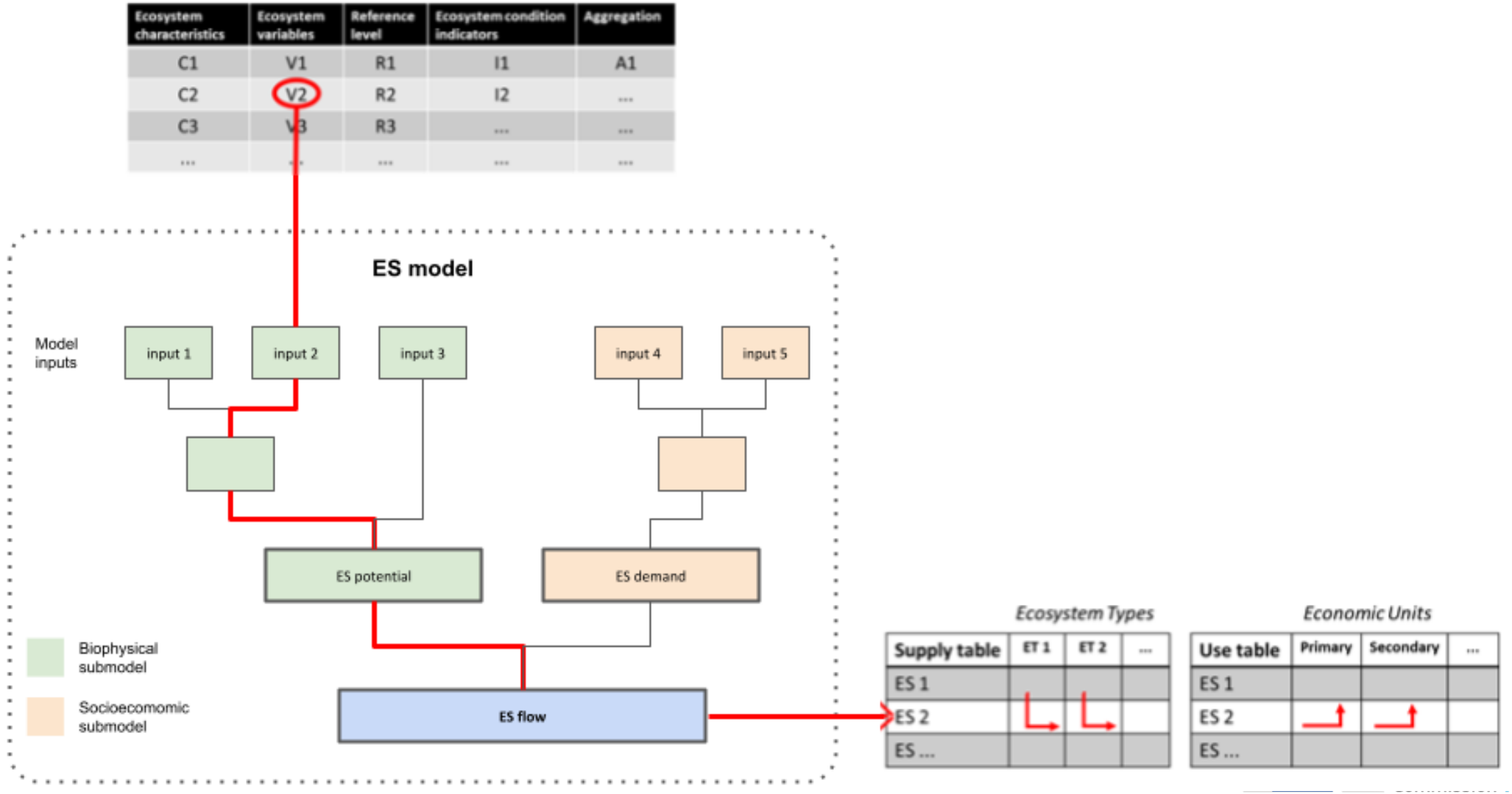
Ecosystem condition underpins the generation of ecosystem services: an accounting perspective

European Commission

There is a direct connection between ecosystem condition and ecosystem services



When sharing common input variables, a change in condition directly affects the flow of ecosystem services



Example #1: crop pollination

biophysical modelling

Ecosystem characteristics	Ecosystem variables	Reference level	Ecosystem condition indicators	Aggregation
...	...	...	...	...
Biotic/ compositional state	Species richness	...	...	...
...	...	...	...	...
...	...	...	...	...

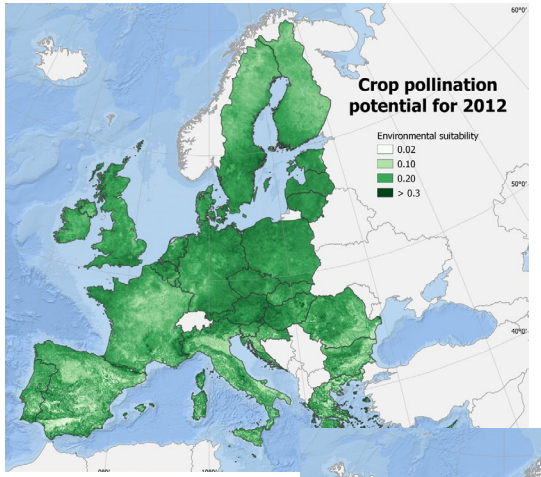
Expert-based model

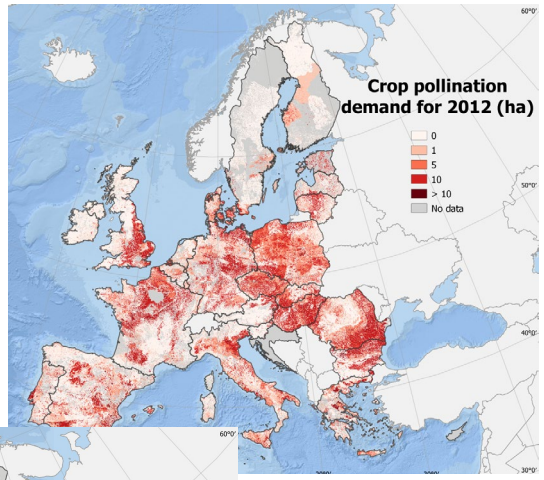
- Land Cover & roads
  (Food resources and nesting sites)
- Irradiance & Temperature
  (Insect activity)
- Distance to semi-natural areas

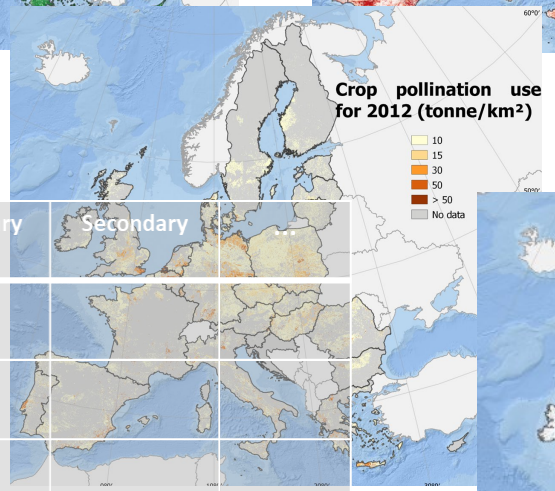
Species distribution model

- Species occurrences
- Land Cover (%)
- Climate
- Topography
- Distance to semi-natural areas

Calculation of environmental suitability

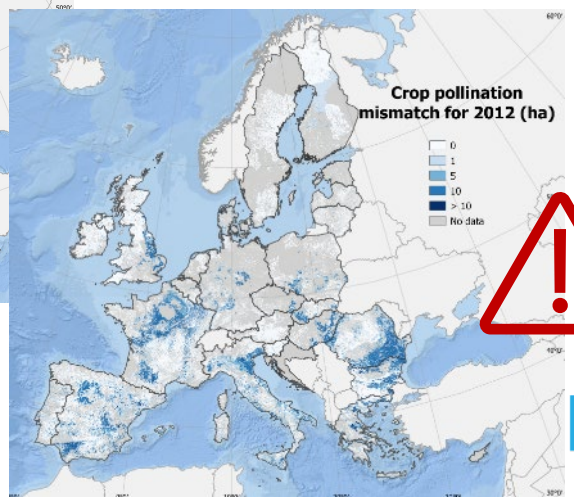






Supply table	ET 1	ET 2	...
ES 1			
ES 2			
ES ...			

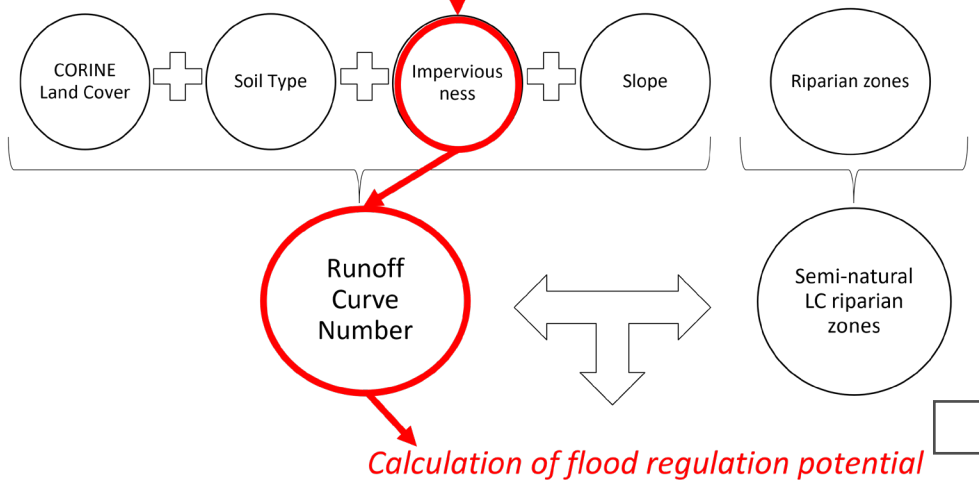
Use table	Primary	Secondary	...
ES 1			
ES 2			
ES ...			

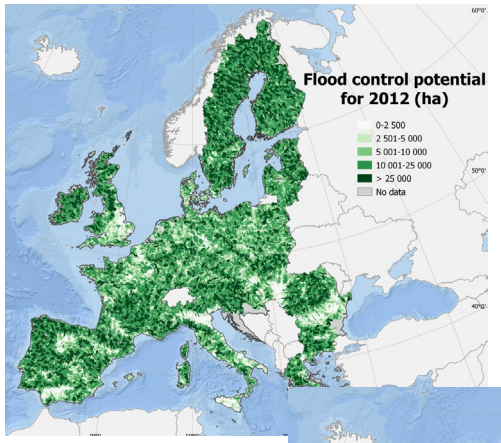


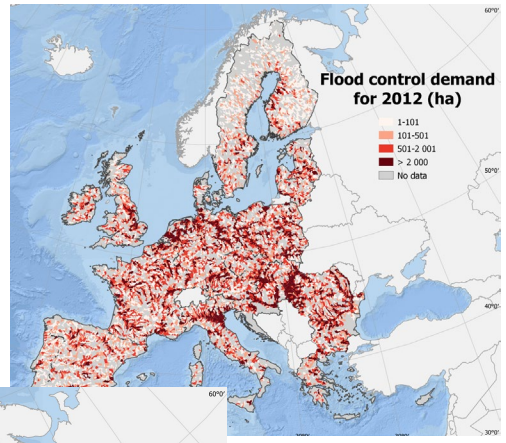
Example #2: flood control

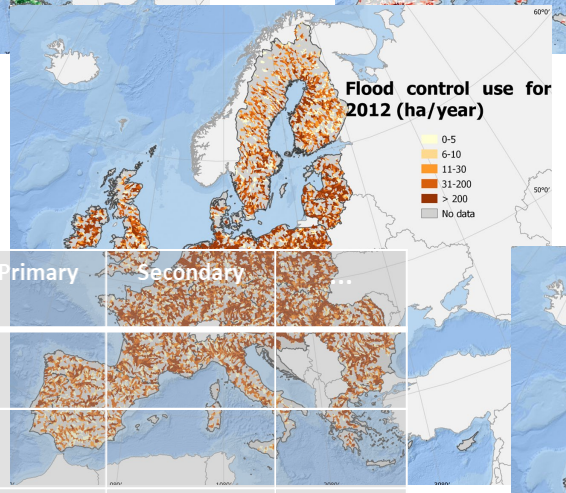
Ecosystem characteristics	Ecosystem variables	Reference level	Ecosystem condition indicators	Aggregation
...	...	...	...	...
Abiotic/ physical state	Impervious surface	...	...	...
...	...	...	...	...
...	...	...	...	...

biophysical modelling









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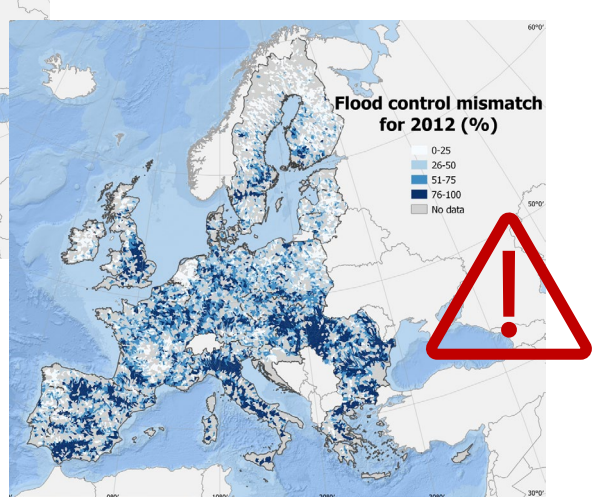
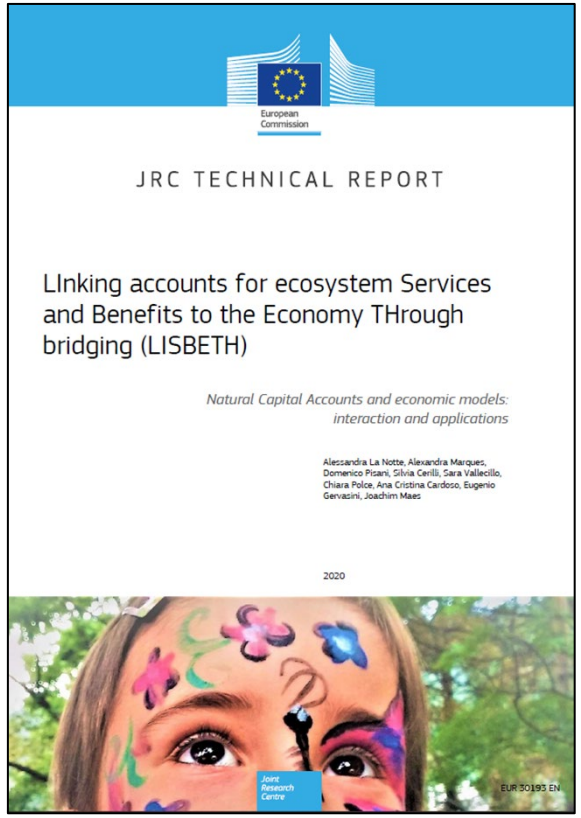
ES 1			
ES 2			
ES ...			

Use table	Primary	Secondary	...
ES 1			
ES 2			
ES ...			



TO DO WHAT ?

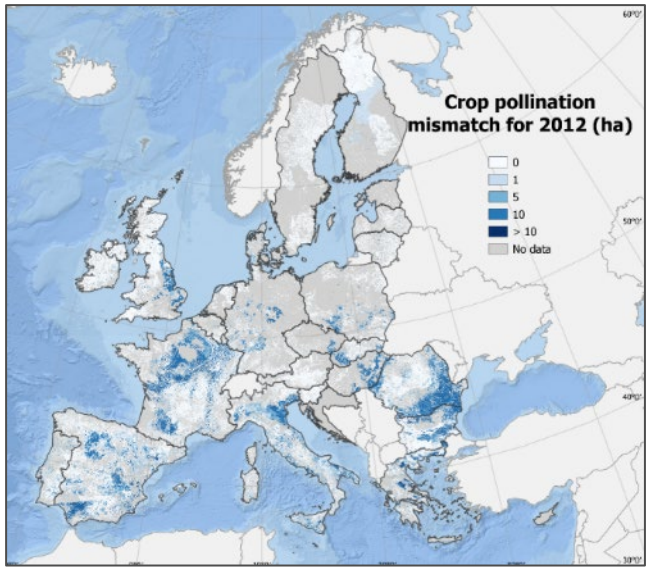


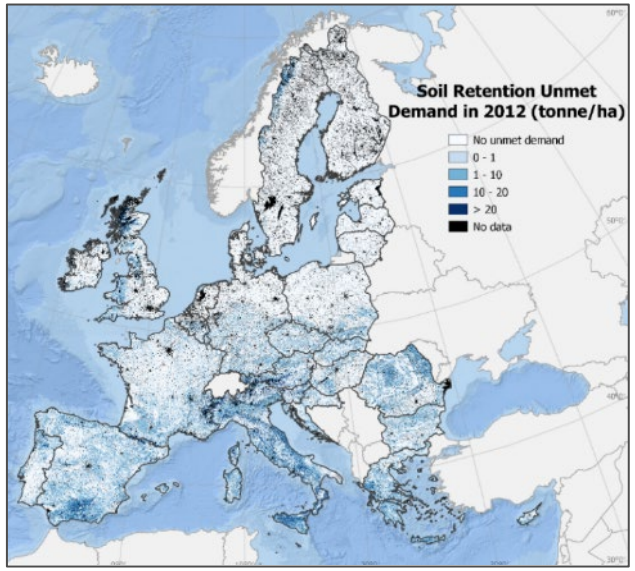
European Commission

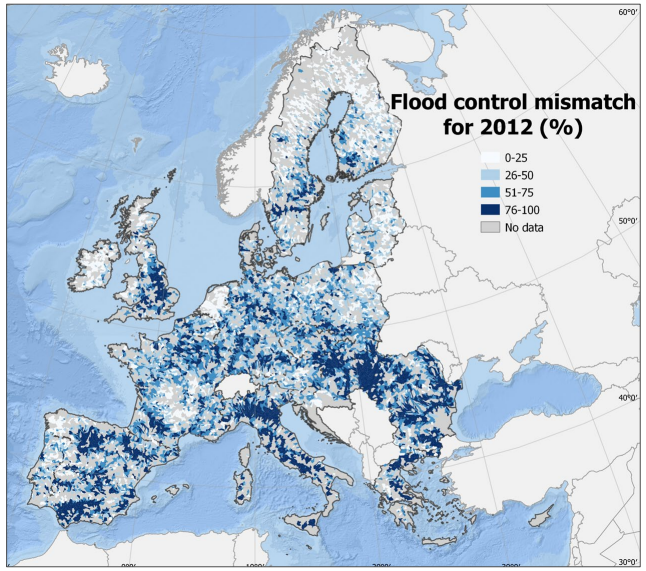
To where to restore , why to to restore ….

1. to move toward resilient agricultural practices

Examples:
crop pollination and soil retention





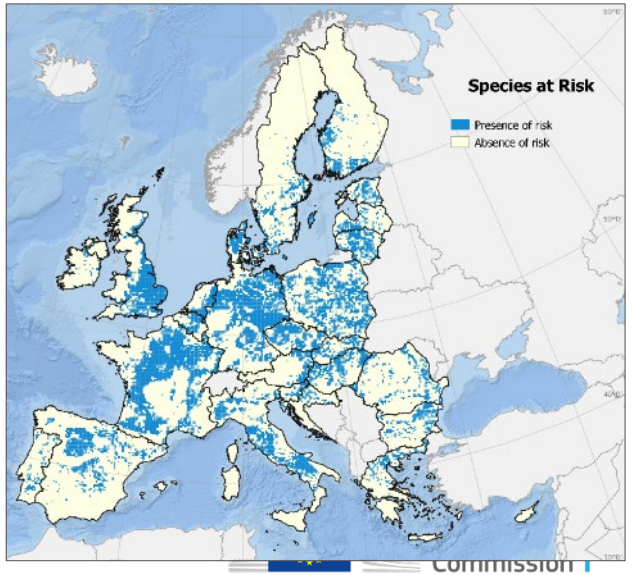


2. to adapt to CC extreme events

Example:
flood control

3. to stop biodiversity loss

Example:
habitat and species maintenance



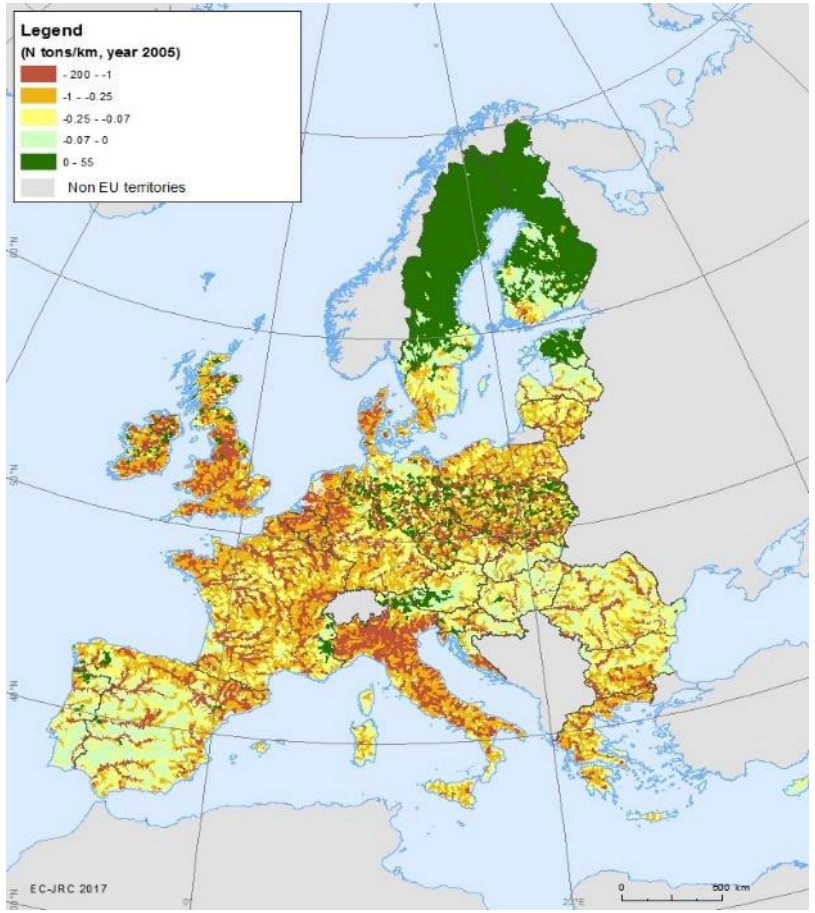
To measure where to restore, why to to restore,

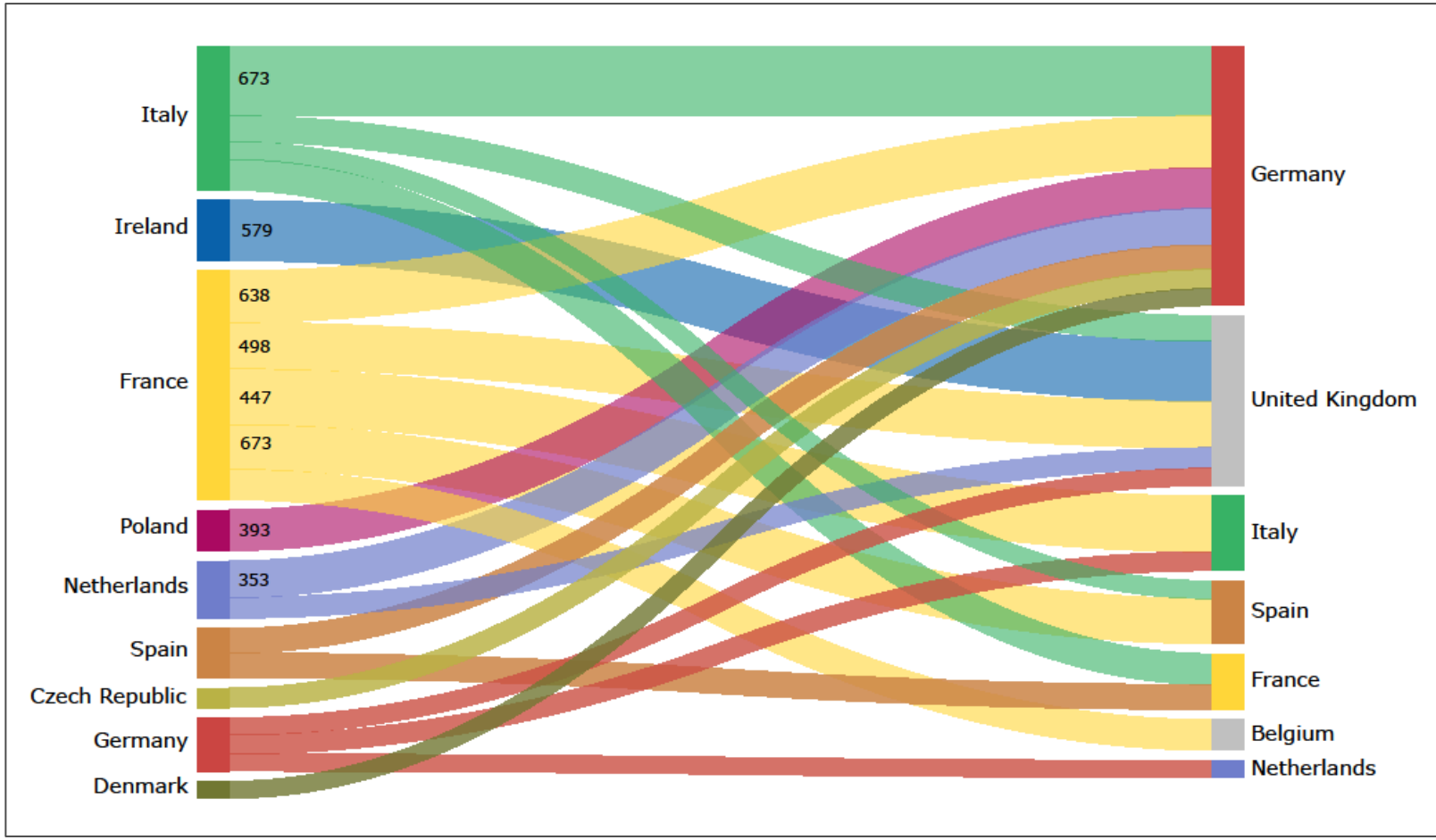
…and how much do we lose if we don't

mlln euro	Ecosystem Service provided	Ecosystem Service not provided
Pollination and soil retention	16,029	3,630
Flood control	16,312	27,932
Habitat and species maintenance	35,660	55,915
Carbon sequestration	9,189	4,585

(Euro/year)

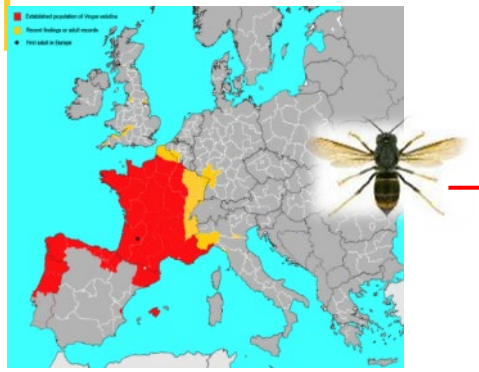
To measure the consumption drivers of ecosystem pressure

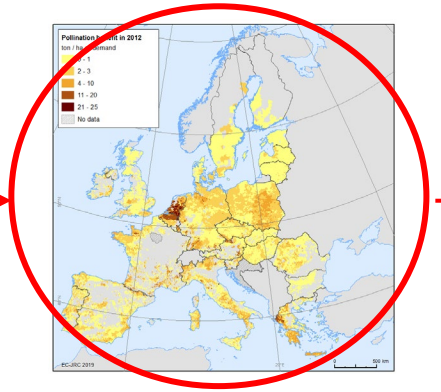


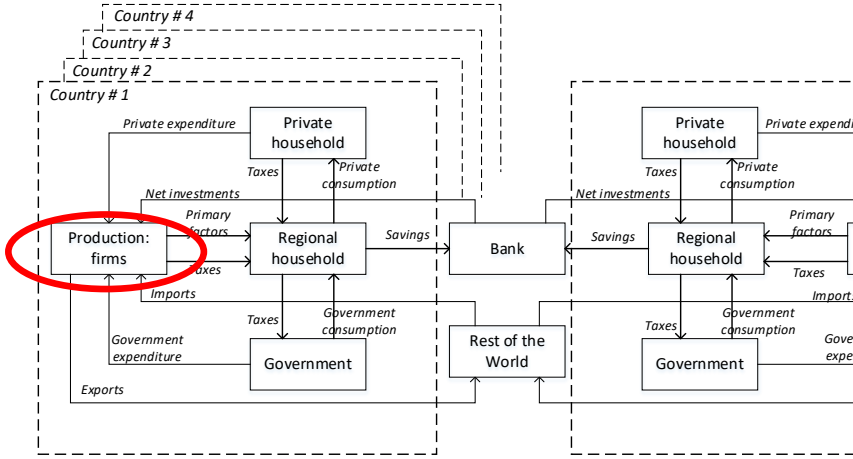


European Commission

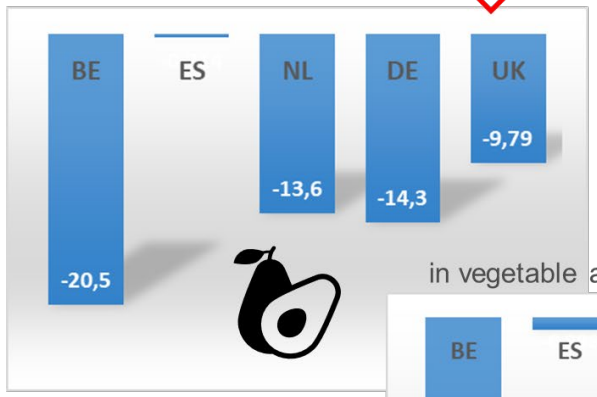
To measure the economic impacts of changes in ecosystems



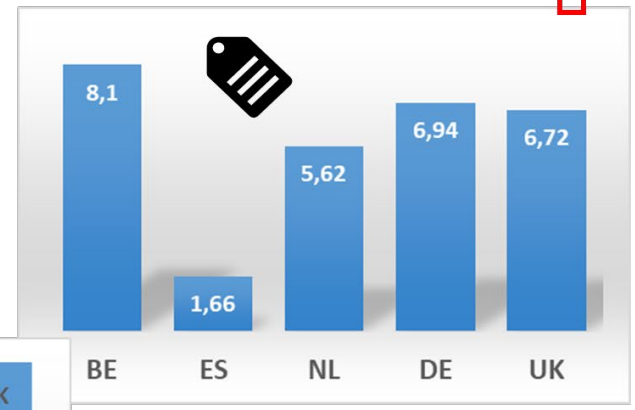




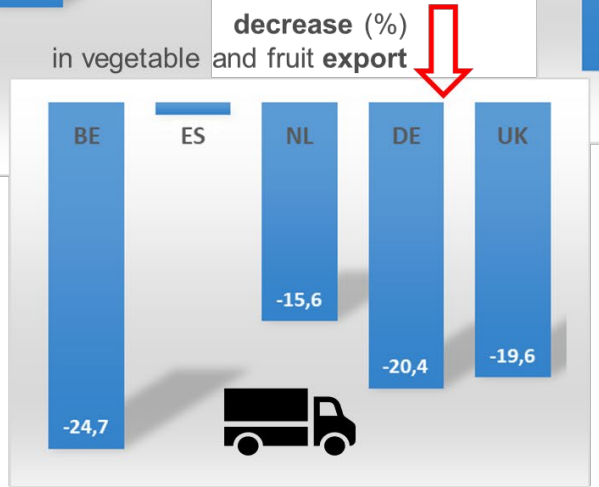
decrease (%)
in vegetable and fruit **production**



increase (%)
in vegetable and fruit **import price**

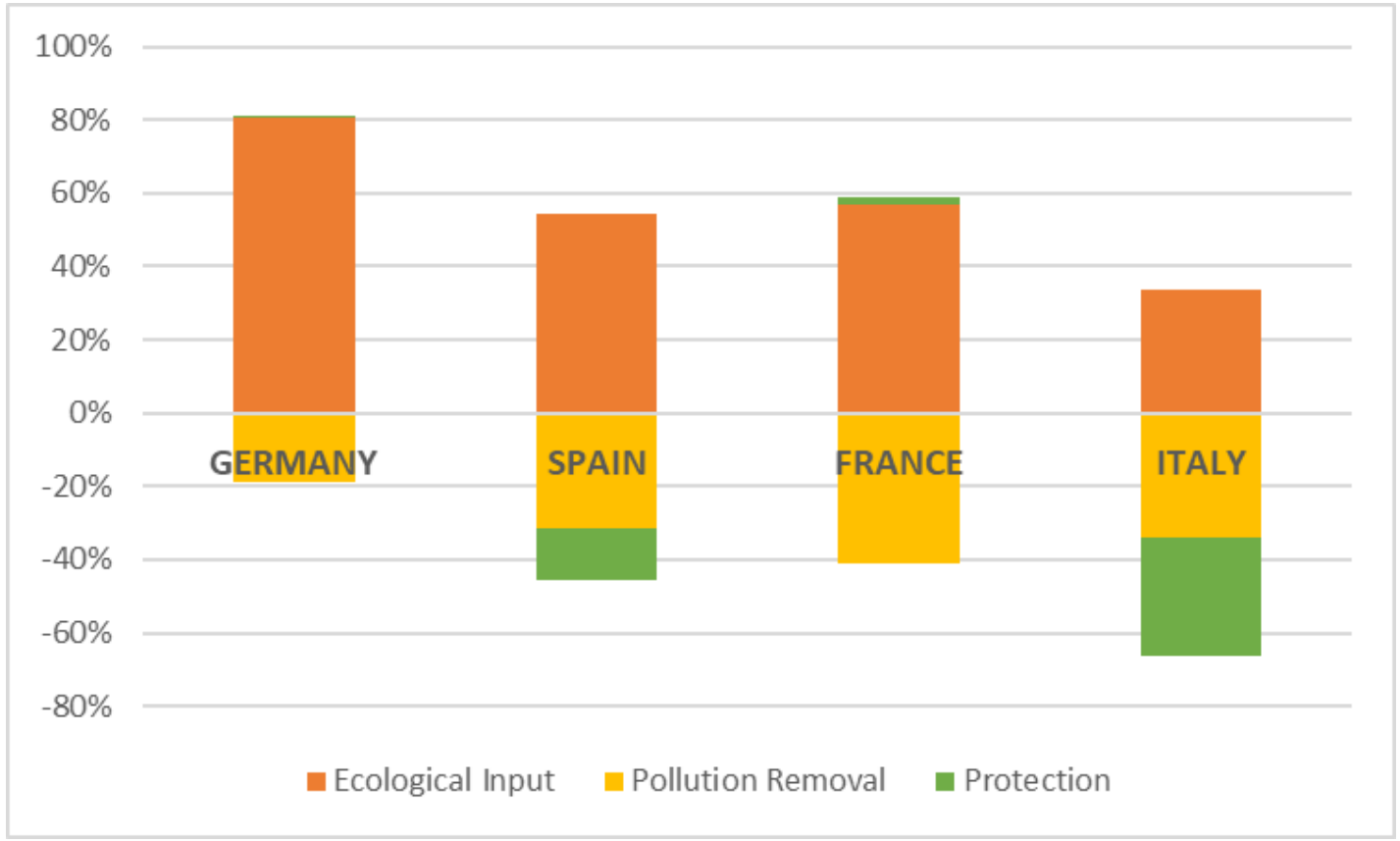


decrease (%)
in vegetable and fruit **export**



European Commission

To measure economic exposures wrt ecosystem services vulnerabilities



Countries	ES Vulnerability components		
	Ecological inputs	*Pollution removal*	*Protection*
AT-Austria	1.536	-0.255	0.034
BE-Belgium	1.631	-0.578	0.170
BG-Bulgaria	-0.929	-0.229	-0.056
CZ-Czechia	2.830	-0.459	-0.036
DE-Germany	2.486	-0.576	0.025
DK-Denmark	2.137	-0.459	-0.030
EE-Estonia	2.928	0.523	0.277
EL-Greece	-0.522	-0.208	-0.167
ES-Spain	0.432	-0.250	-0.113
FI-Finland	2.894	2.363	0.148
FR-France	0.537	-0.388	0.022
HR-Croatia	2.320	-0.189	0.118
HU-Hungary	1.062	-0.446	-0.214
IE-Ireland	3.101	-0.274	0.342
IT-Italy	0.230	-0.232	-0.225
LT-Lithuania	3.211	-0.525	0.228
LU-Luxembourg	2.468	-0.397	0.179
LV-Latvia	3.306	0.096	0.280
NL-Netherlands	3.197	-3.464	0.100
PL-Poland	2.772	-0.653	0.128
PT-Portugal	1.194	-0.241	0.123
RO-Romania	-0.502	-0.379	-0.197
SE-Sweden	3.000	2.809	0.013
SI-Slovenia	2.539	-0.195	0.130
SK-Slovakia	1.434	-0.212	-0.217

How ecosystem accounts can support CC adaptation?

- Identify the ES that more strongly relate to CC adaptation:
  - Directly (short term effects): flood control, coastal protection, fire control, local climate regulation, etc.
  - Indirectly (long term effects): nature-based recreation and tourism, crop and timber provision, etc.
- Assess ES actual flow and ES vulnerability (mis-match) to locate those areas where economic activities and households are more exposed to risk
- Create scenarios to “shock” production variables in general equilibrium models and assess economic impacts

Thank you
and keep in touch

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