



From biophysical modelling to ecosystem services accounts in the EU: the INCA approach

UN Big Data Conference, Bilbao 10 – 13 June 2024

Integrated modelling for ecosystem extent mapping and ecosystem services

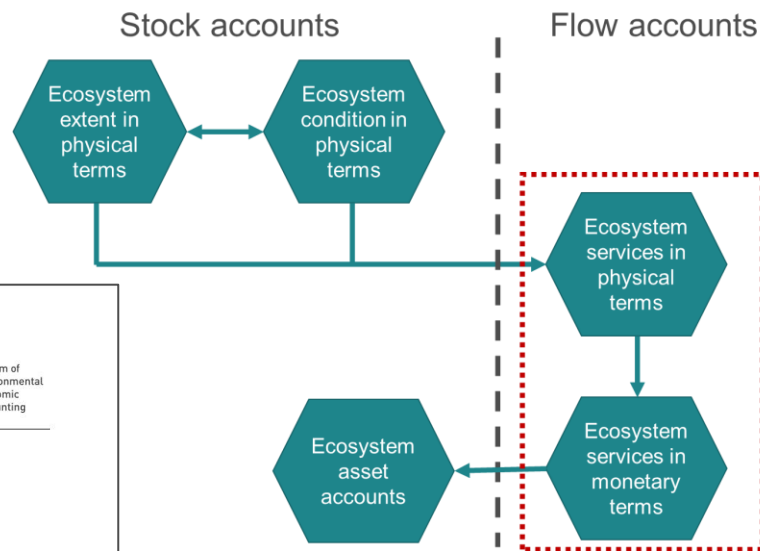
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Team Leader, Joint Research Centre
European Commission

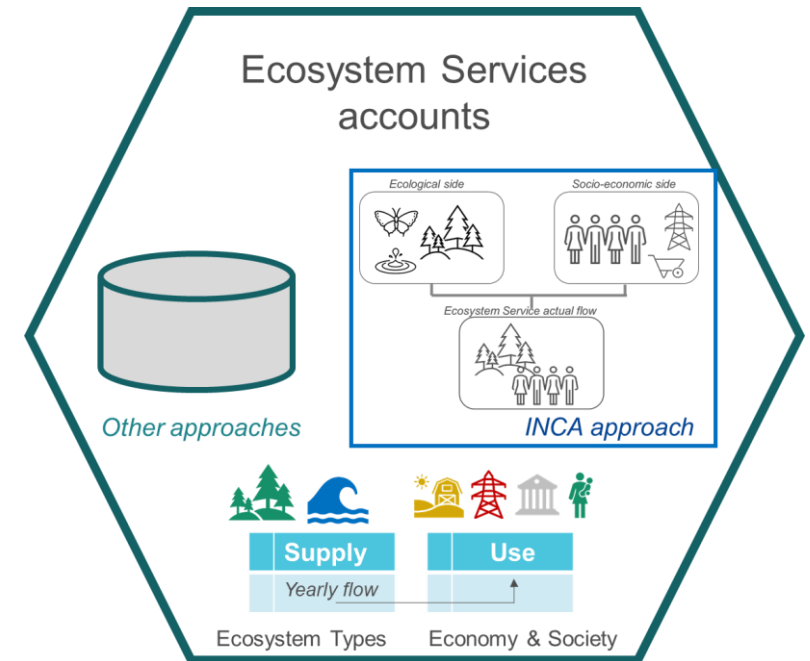
Joint
Research
Centre

Overview: INCA and SEEA EA

SEEA EA general framework



INCA operational procedure



Direct contribution to the development of the global standard of UN SEEA EA

DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
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

Disclaimer:
This paper has been prepared by the authors listed below as part of the SEEA EEA Revision. The views expressed in this paper do not necessarily represent the views of the United Nations. The paper has been published without any formal editing process.

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DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
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

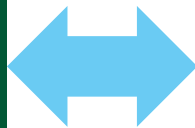
Version: 17 June 2019

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Miao, J., Driver, A., Cui, 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.

The Integrated system for Natural Capital Accounting (INCA)

2016



INCA Platform

Home About Publications News Data Catalogue Map Viewer Glossary INCA Tool Contact Us

How ecosystem services are assessed in INCA

Ecological supply: butterfly, trees, water drop

Socio-economic needs: people, power lines, shopping cart

Ecosystem Service use

Match: trees, people

Mis-match: warning sign, people

Ecosystem services map viewer

START

Accounting tables: -- Select --

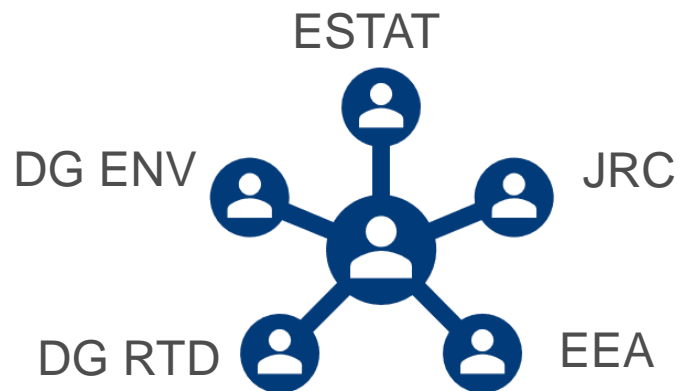
Complementary tables: -- Select --

EU supply and use tables: Download

INCA tool: Learn more

Ecosystem extent (EEA): -- Select --

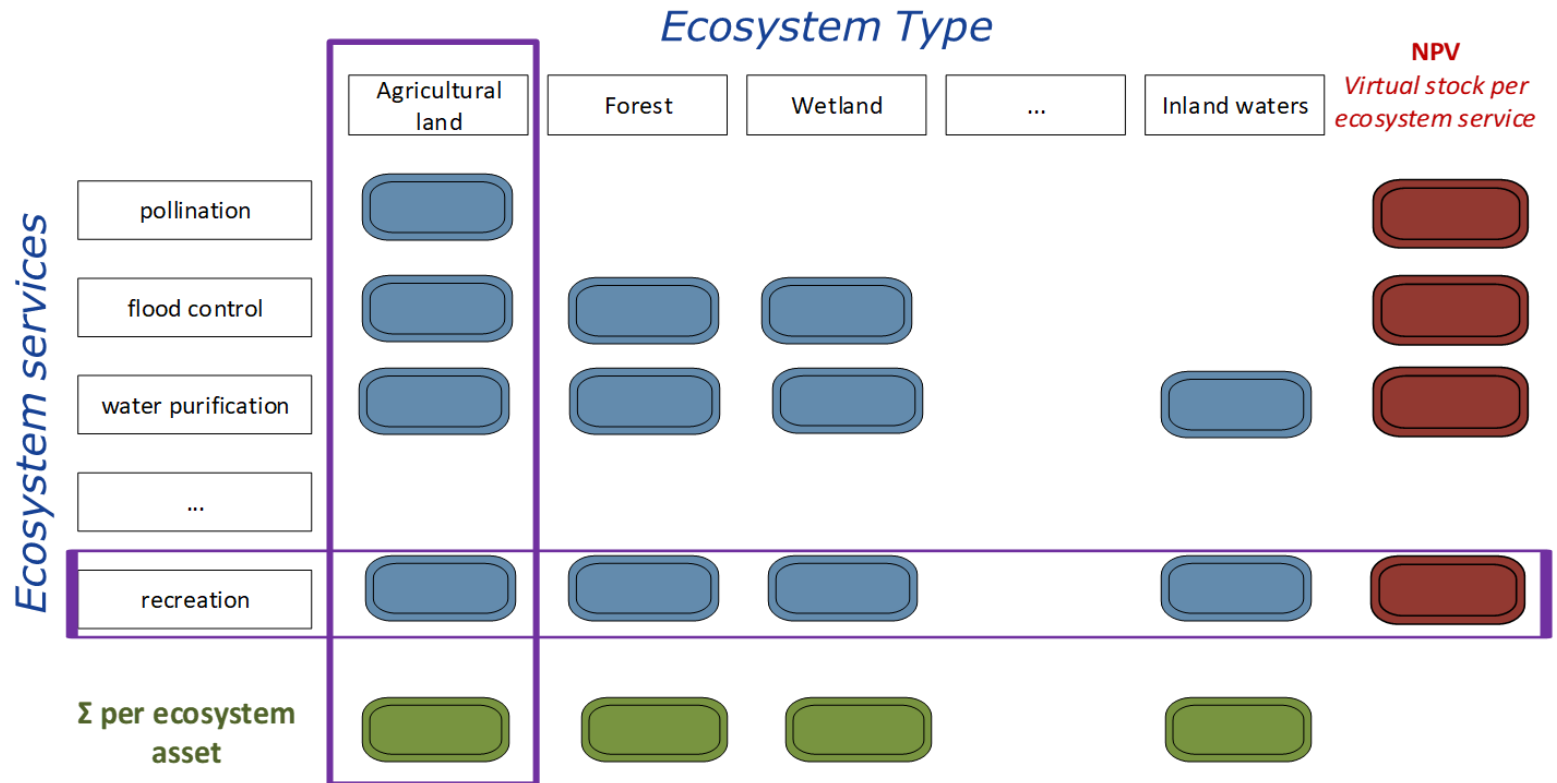
Ecosystem condition: -- Select --



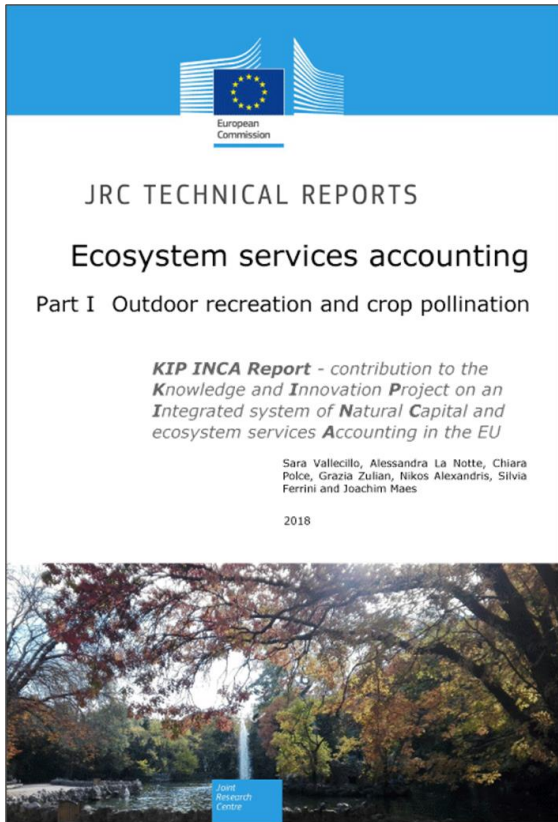
<https://ecosystem-accounts.jrc.ec.europa.eu/>

Structure of INCA: focus on ecosystem services

2017

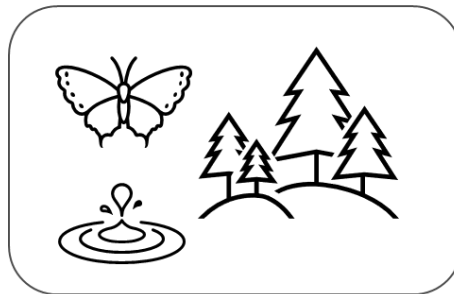


INCA part I: crop pollination and nature-based recreation

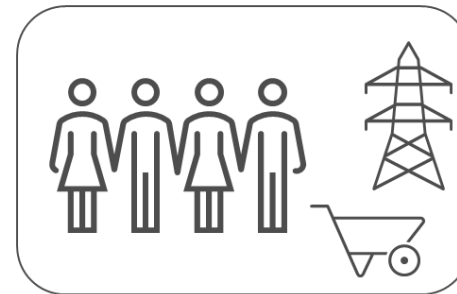


2018

Ecological side



Socio-economic side



Match between the ecological and economic sides

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

Supply table

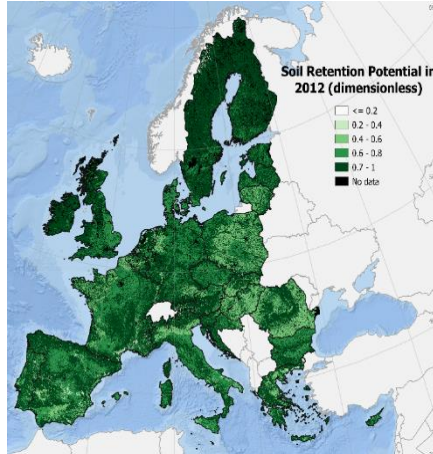
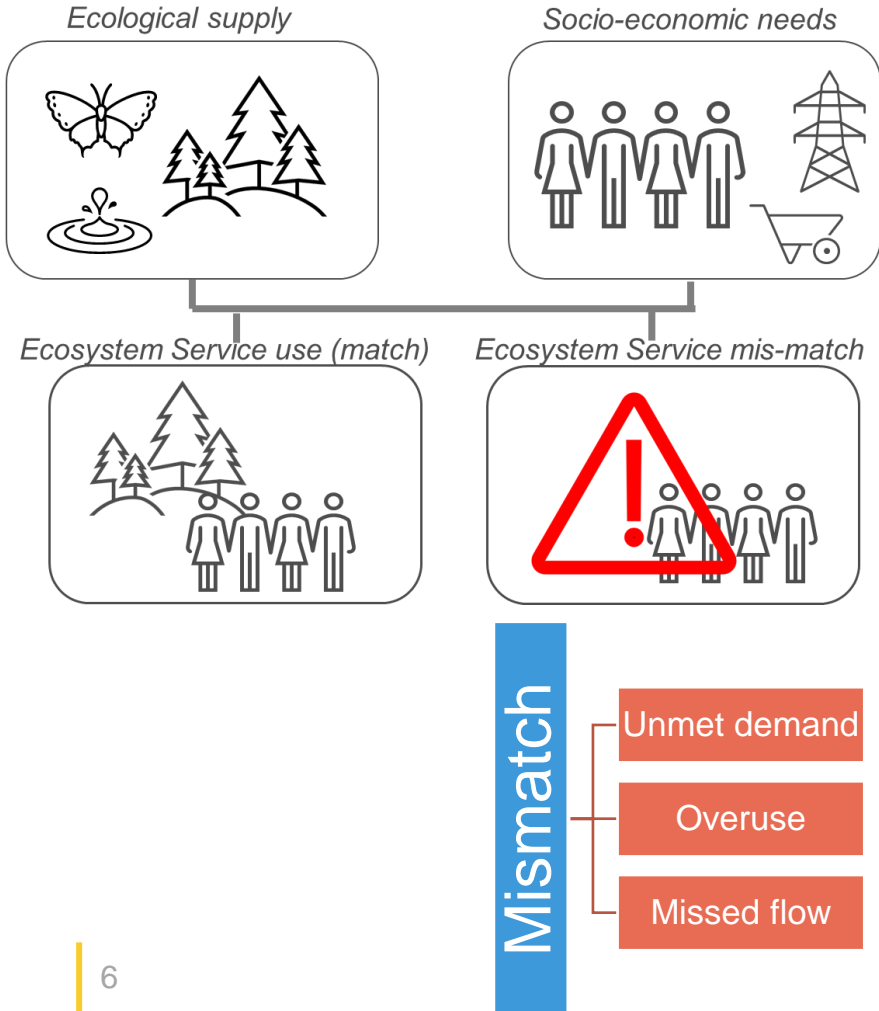


Use table	Primary	Secondary	...
ES 1			
ES 2			
ES ...			

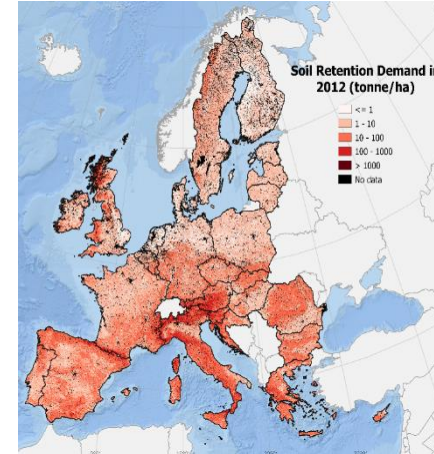
Use table

Identifying vulnerability

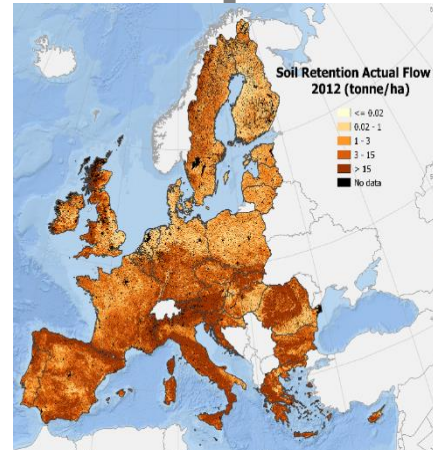
2018



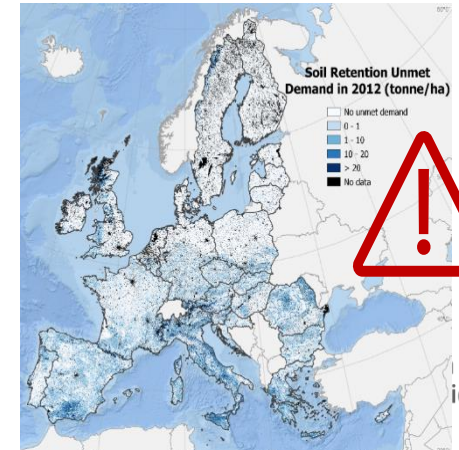
ES potential



ES demand



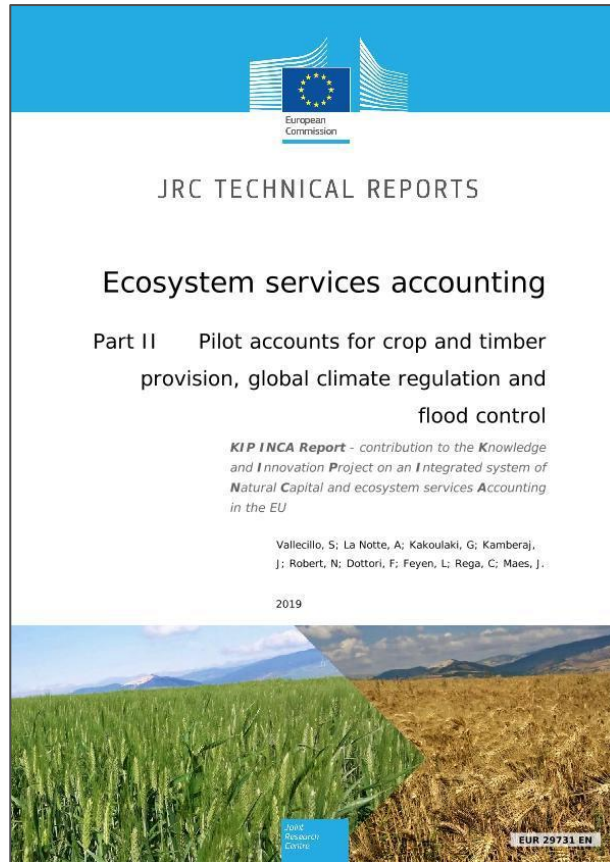
ES actual flow



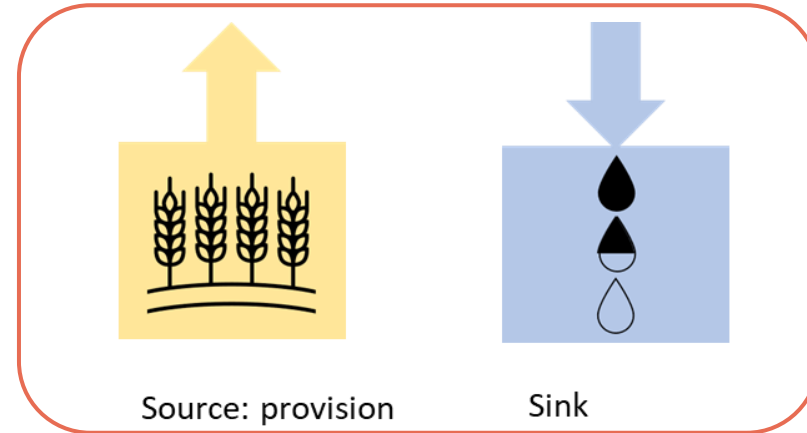
ES unmet demand

INCA part II: crop provision, timber provision, carbon sequestration and flood control

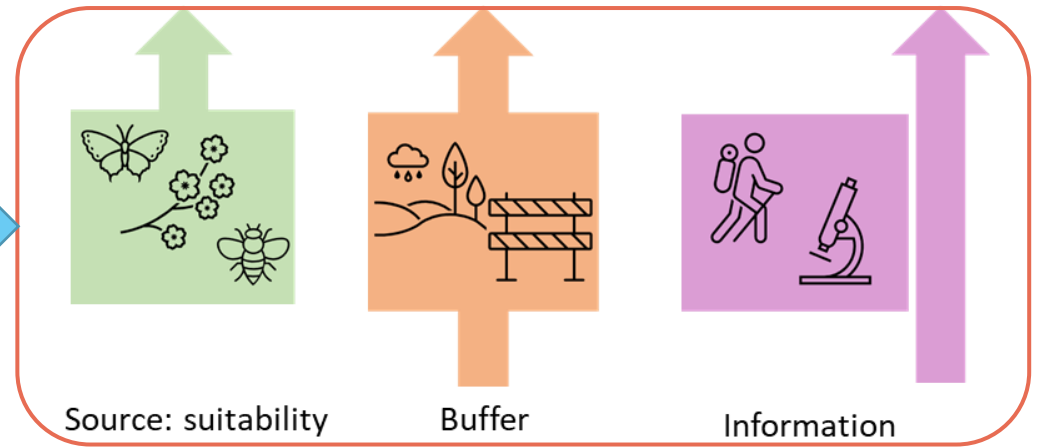
2019



Sustainability thresholds apply

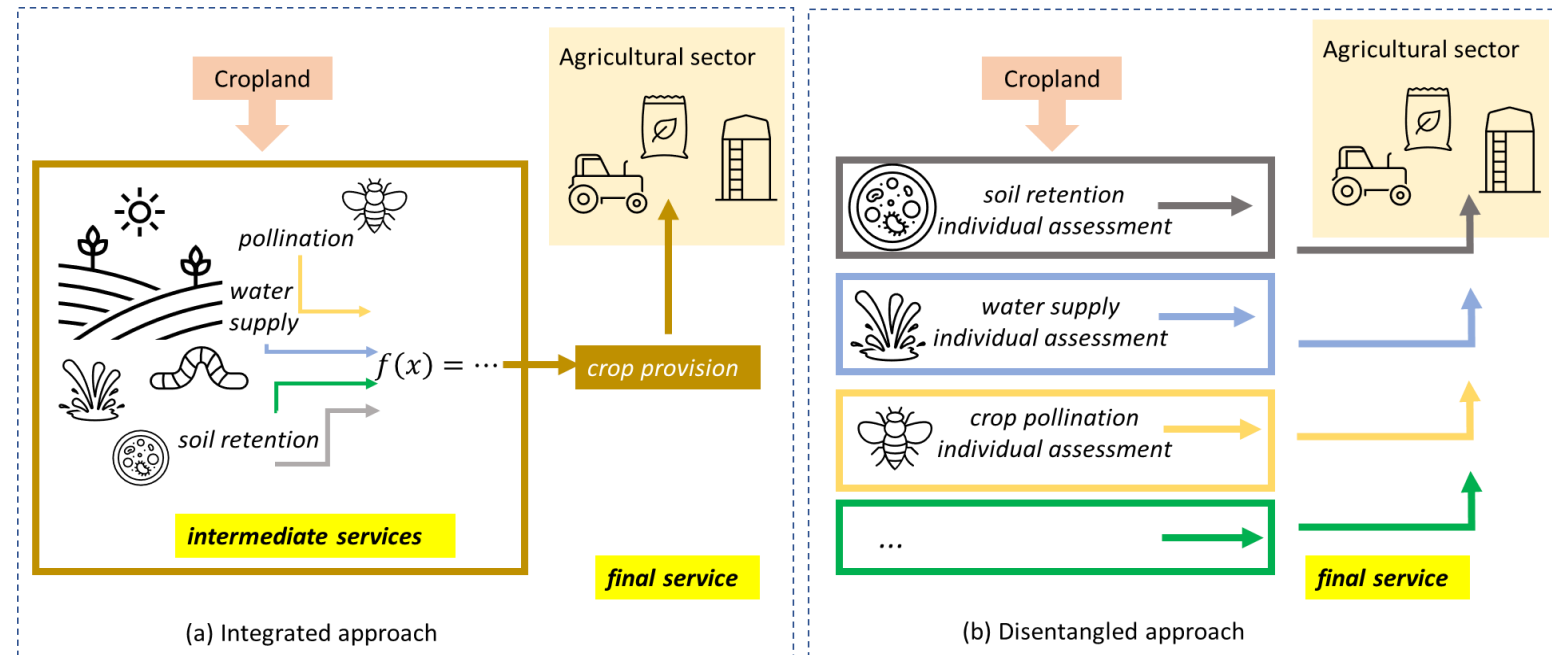
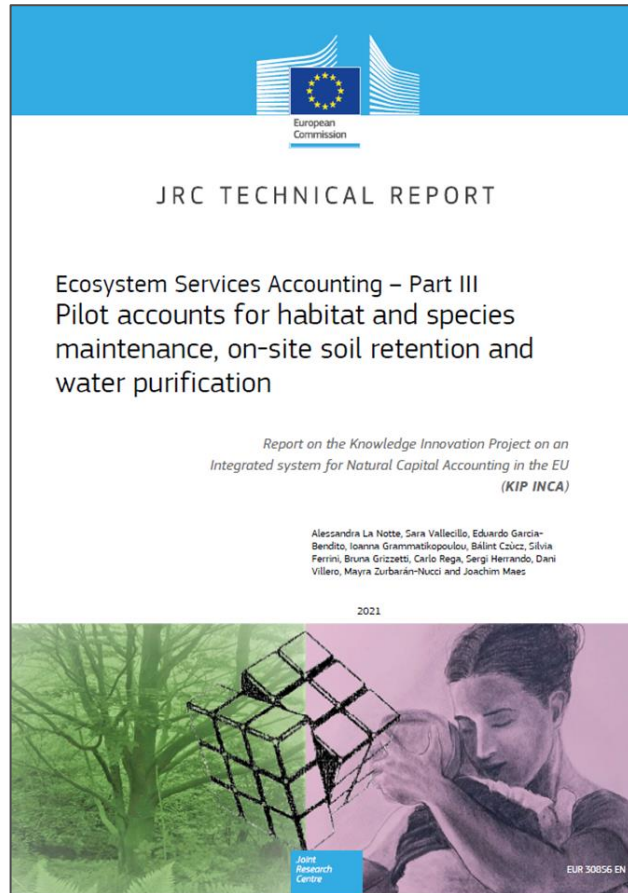


Presence/absence of ecosystems



INCA part III: habitat and species maintenance, soil retention and water purification

2021



INCA in the European Union



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



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

Proposal for a

REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

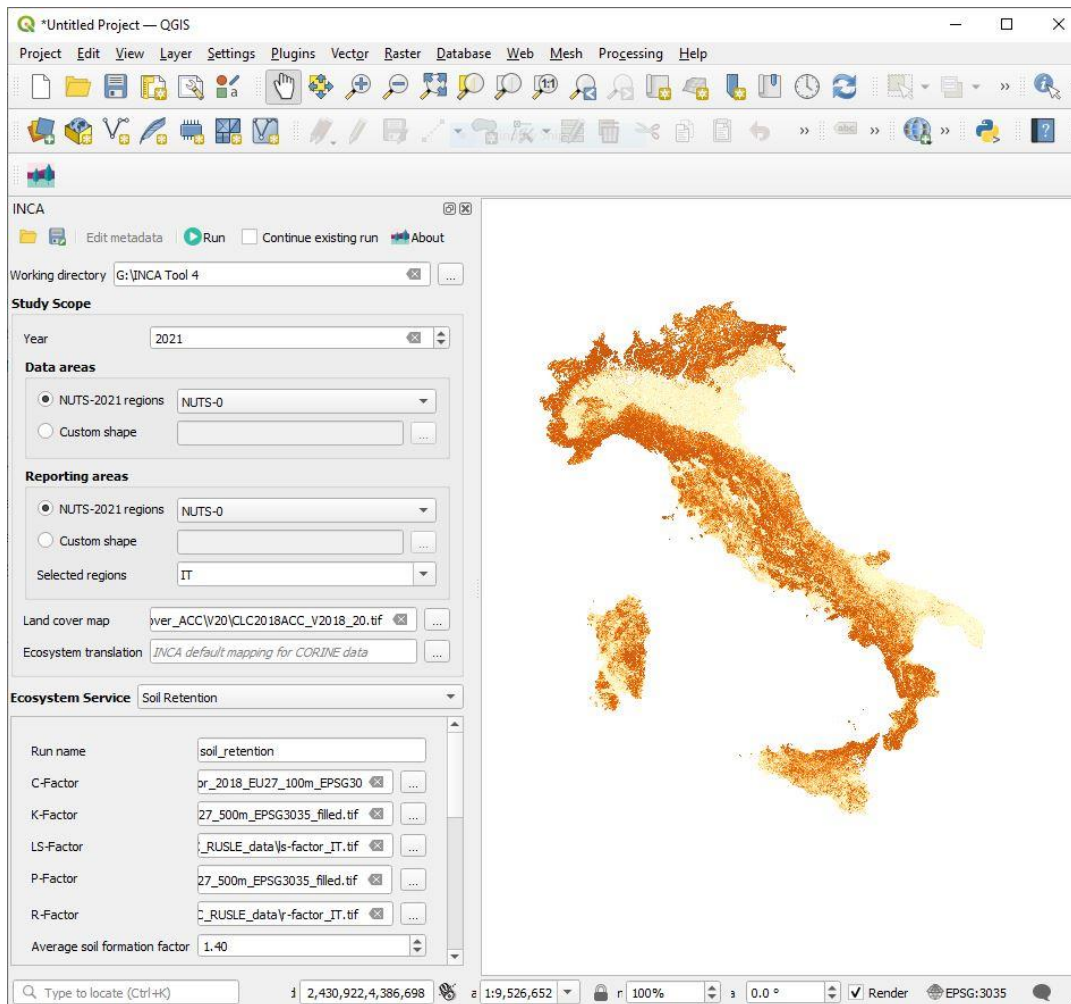
amending Regulation (EU) No 691/2011 as regards introducing new environmental economic accounts modules

2022



Current developments: INCA Tool (work in progress)

2023



Plugin for QGIS (open-source) by Eurostat

Possibility to generate accounts by MS or for EU

Provides SUTs as well as spatially explicit data outputs

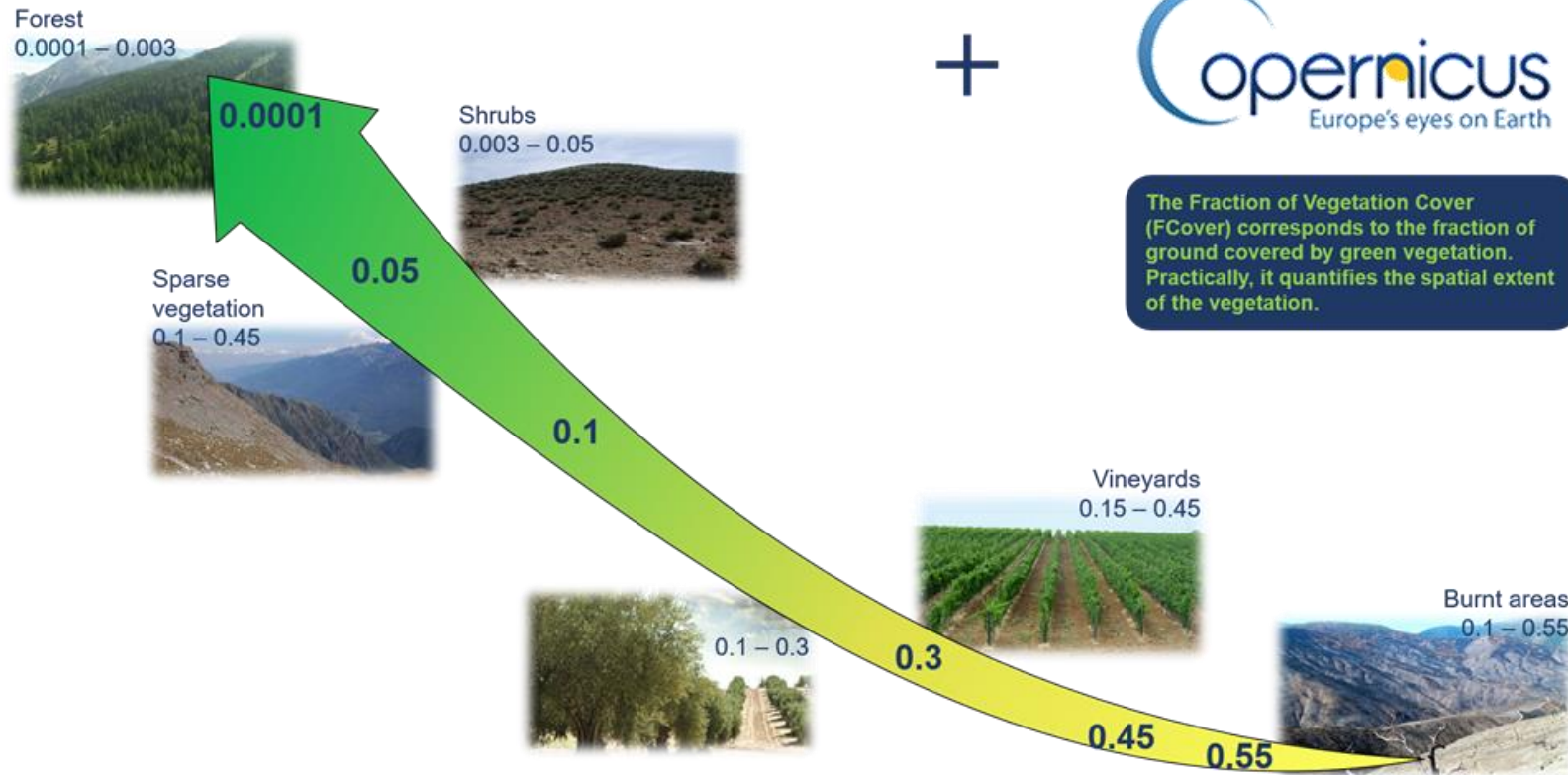
Currently testing version 2.0

Can generate 7 ES accounts

Follows the legal proposal

Soil retention model and data

The density of vegetative cover determines the C-factor within the ranges of each specific vegetative cover

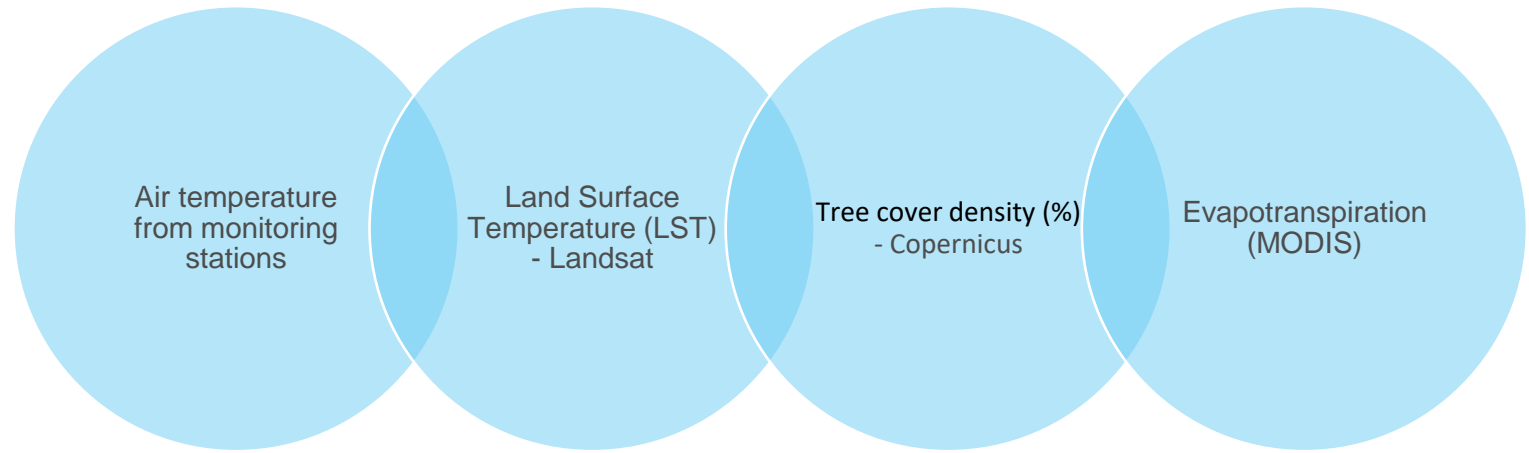


Values depend on the land cover type, as well as fraction of vegetation cover (FCover). Smaller values of C-factor, with higher vegetation cover, indicate a larger ecosystem potential for soil retention

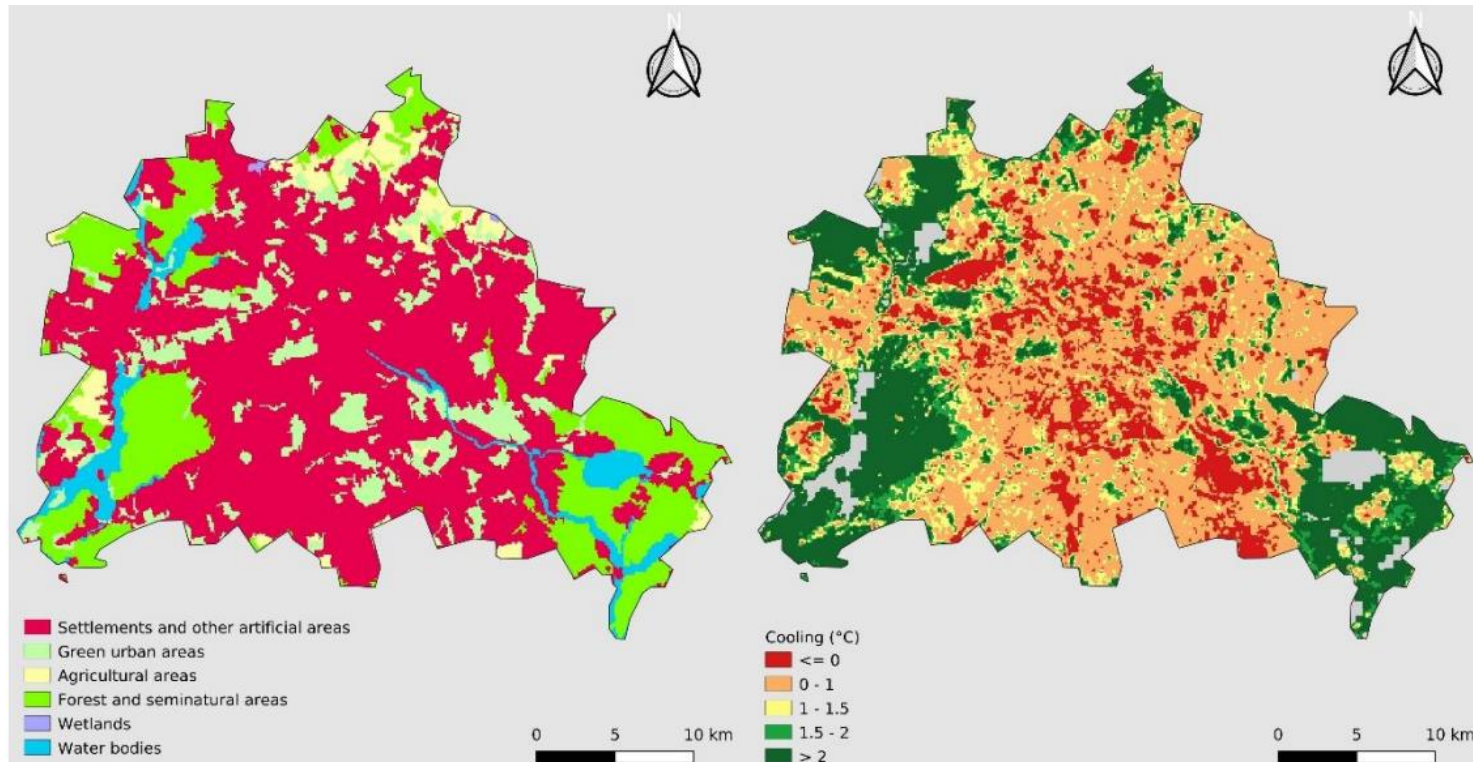
Examples of the C-factor values in non-arable land.

Urban ecosystem accounts: data

Local climate regulation: the ecosystem contribution to regulating ambient atmospheric conditions in urban areas through vegetation improving the living conditions of people and supporting economic production



Example of results Land cover types and average cooling in Berlin (LAU) for 2018



Forest and Green Urban Areas show higher cooling

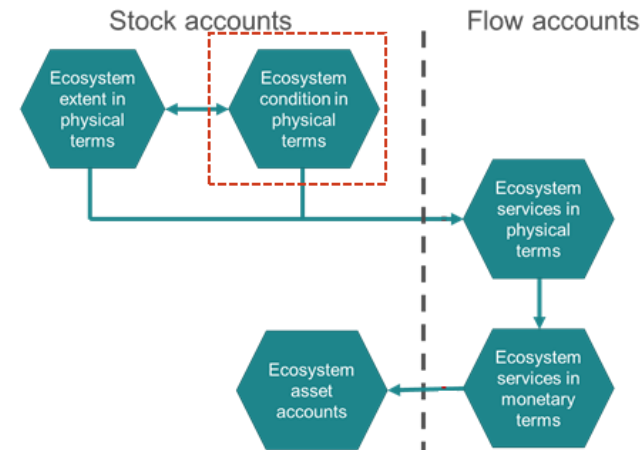
- The service is calculated in cities, towns and suburbs, in the summer months
- The model is based on Ordinary Least Squares (OLS) regression
- Higher levels of tree cover density and evapotranspiration increase the cooling effect

Ecosystem condition accounts

2022



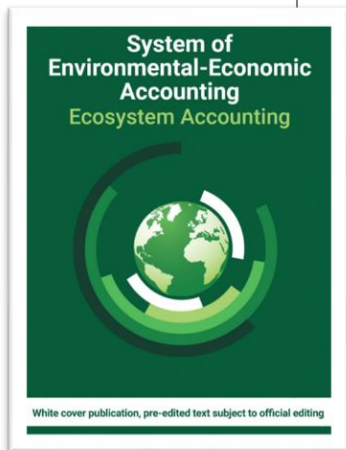
SEEA EA general framework



- The SEEA EA: reference framework that can be applied at **country level with spatially explicit data**

↳ Making use of more detailed data

The SEEA EA at the EU level



Challenges and opportunities ahead

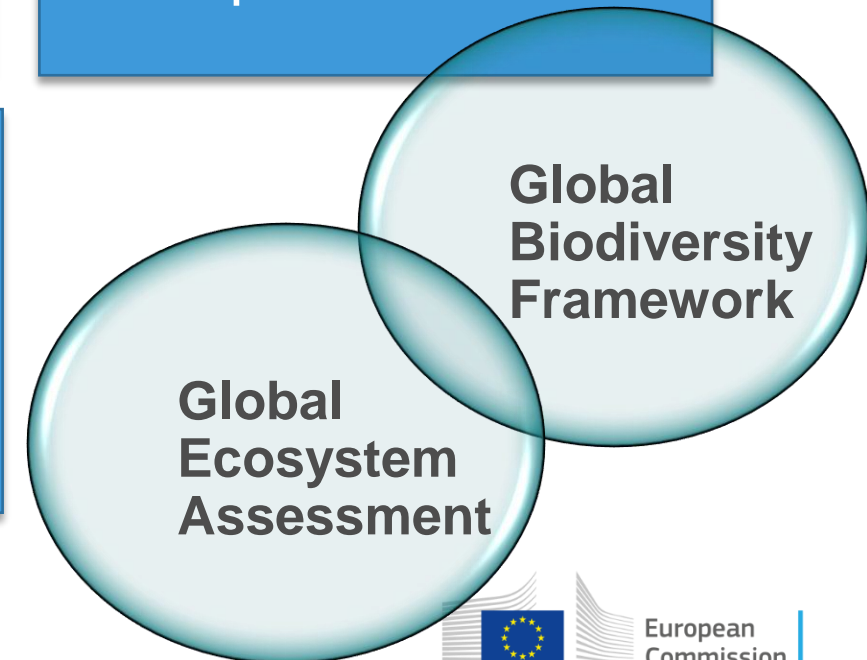
Data availability and consistency (spatial and temporal resolution)

EU: Implementation of the Regulation integrating mandatory ecosystem services accounts

Learning lessons from the INCA experience to support of global processes

Timely **validation** of models and accounts to provide timely support to policies

When moving to a supra-national level : need to ensure **comparability** of models and data



Thank you



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Slides 3, 10: SEEA EA cover, source: <https://seea.un.org/ecosystem-accounting>

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