EU ecosystem accounting
The 'INCA KIP':
Knowledge Innovation Project for an Integrated system for Natural Capital and ecosystem services Accounting

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Policy context for natural capital accounting in the EU

- EU Biodiversity Strategy to 2020:
  - **Action 5: map and assess the state of ecosystems and their services, assess their economic value and promote the integration of these values into accounting and reporting systems**
- EU 7th Environmental Action Programme (7th EAP):
  - **Objective 1: 'protect, conserve and enhance the European Union's natural capital'**
  - **Objective 5: build environmental knowledge base**

What do we need for ecosystem accounting in the EU?

- We need biophysical accounts
  - **for direct use**
  - **as a basis for valuation studies, upscaling**
- We need an EU data layer of accounts
  - **reference frame for countries**
  - **data foundation for responding to EU policies**
- We need stepwise approach towards a common methodology

What is the challenge?

Many different & separate & expensive data collection exercises which are **not tailored to** mapping and **assessing ecosystems** and which are undertaken by **different institutions**

LUCAS (ground observation)

Biodiversity monitoring

COPERNICUS (satellite images)

Corine Land Cover

Forest statistics

Water Framework Directive reporting

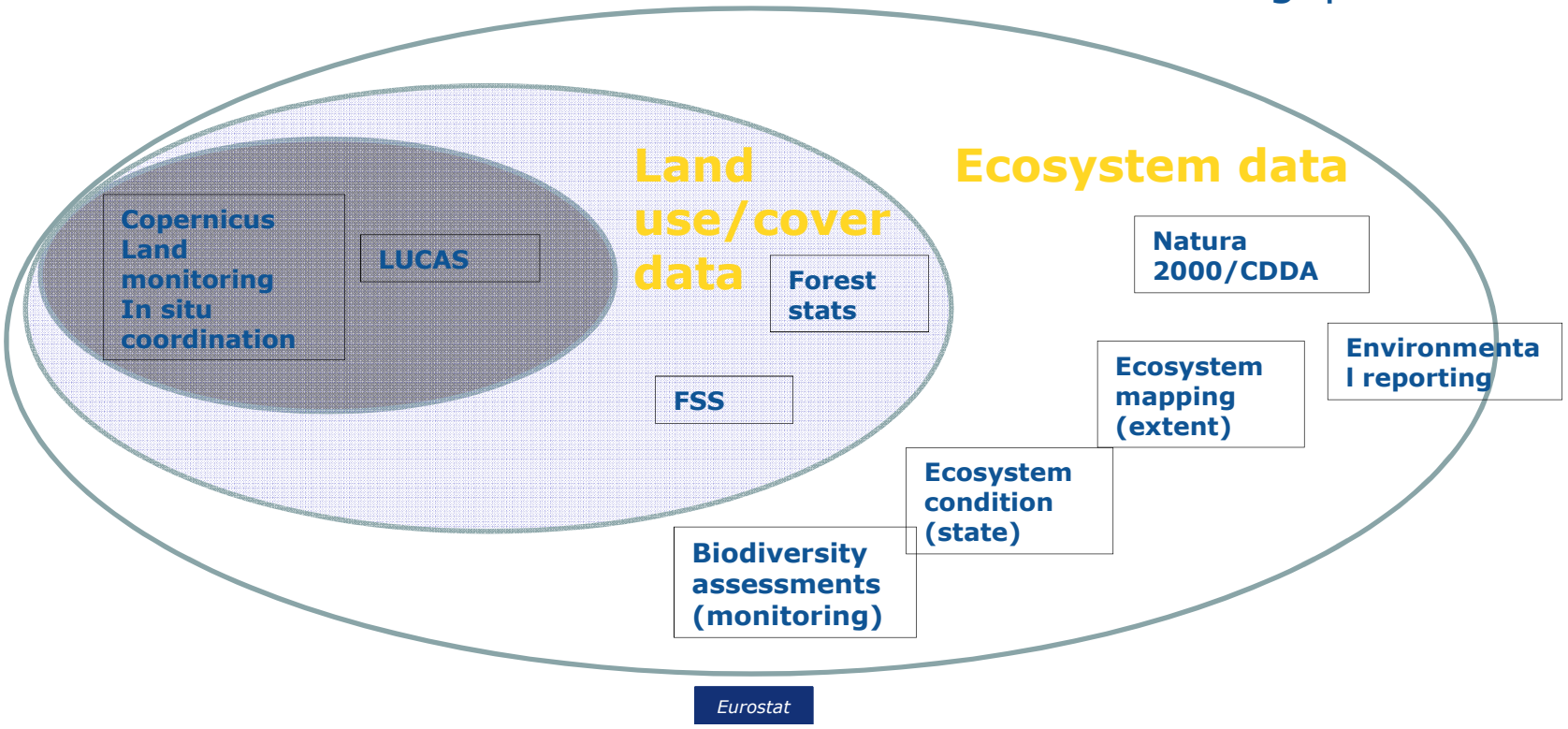
Farm Structure Survey (agricultural census)

Natura 2000 reporting

…

What is the potential solution ?

- A system of nested and datasets within a common framework;
- Integration of existing initiatives – assessment of ecosystems, modelling ecosystem services…;
- Use of models to transfer data into accounts and fill data gaps



Project KIP INCA

- Knowledge Innovation Project on Integrated System for Natural Capital and Ecosystem Services Accounting in the EU
- Project developed by a partnership of European Commission services (DG ENV, DG CLIMA, DG JRC, DG ESTAT, DG RTD and EEA)
- Objective to **strengthen the knowledge base for the implementation of the 7th EAP**
- Knowledge Innovation Projects (KIPs) have the ambition to **address gaps in environmental knowledge**, using **an innovate approach**

KIP INCA partners

Eurostat (leader in phase 1):

- Experience with geospatial-statistical data integration
- Operates LUCAS
- Lead service for geospatial information in the EU
- Statistics on land use/ land cover, forest, agriculture
- Environmental-Economic Accounts (SEEA)

EEA:

- Principal information provider on the state of the environment in Europe
- Long-term experience in ecosystem accounting, involved in MAES
- Operates data centres on water and biodiversity
- Responsible for CORINE land cover and Copernicus data
- The main data processing partner

DG Environment:

- Provides policy context and is the principal user of KIP INCA outputs
- Responsible for MAES
- Follows Natural Capital Accounting initiatives (private and global)
- "owns" administrative reporting obligations

DG RTD:

- Runs research programs on ecosystem services and biodiversity, e.g. ESMERALDA
- Coordination between INCA and research activities

EC Joint Research Centre:

- Operates data centres on forest and soil and information systems on agriculture, ecosystems and water
- Vast modelling experience on ecosystem services

Where does KIP INCA fit in?

- KIP INCA **provides a shared data platform** to record the extent, condition and trends in ecosystems and their services.
- KIP INCA uses a fit-for-purpose approach **based on existing, EU-wide data** collections (LUCAS, Copernicus, MAES, administrative data, etc.)
- KIP INCA **integrates all available data** and makes sure new data fit into the system (-> permanent improvement).
- KIP INCA accounts **follow UN accounting standards** (SEEA and SNA)
- KIP INCA tests SEEA–EEA (but is not limited to SEEA–EEA = innovation)
- EU Member States can link their national systems to KIP INCA.

KIP INCA structure and timeline

Two phases:

- **Phase 1: Feasibility and design phase (mid 2015 – mid 2016)**
- **Mid 2016: go/no go decision by Directors General**
- **Phase 2: Implementation phase (2016 – 2020)**

Expected outcomes of KIP INCA, Phase 1

- A **blueprint for the future INCA** including the sets of tables and accounts, the input data layers, some mock-up accounts for illustration and a description of the limitations
- A **dialogue with stakeholders** (EU member states, researchers, policy makers, other users) e.g. at the MAES delivery workshop in December 2015
- A **reliable estimate of necessary resources**
- An **implementation plan until 2020**
- A **plan for improving the data sources**

KIP INCA timeline – 'to do list' for Phase 1

Data:

- Review existing and planned EU-wide data collections
- Test the integration of these data sources
- Propose changes to existing data collections and models
- Define minimum data quality standards

Resources:

- Secure necessary resources from all stakeholders

System design:

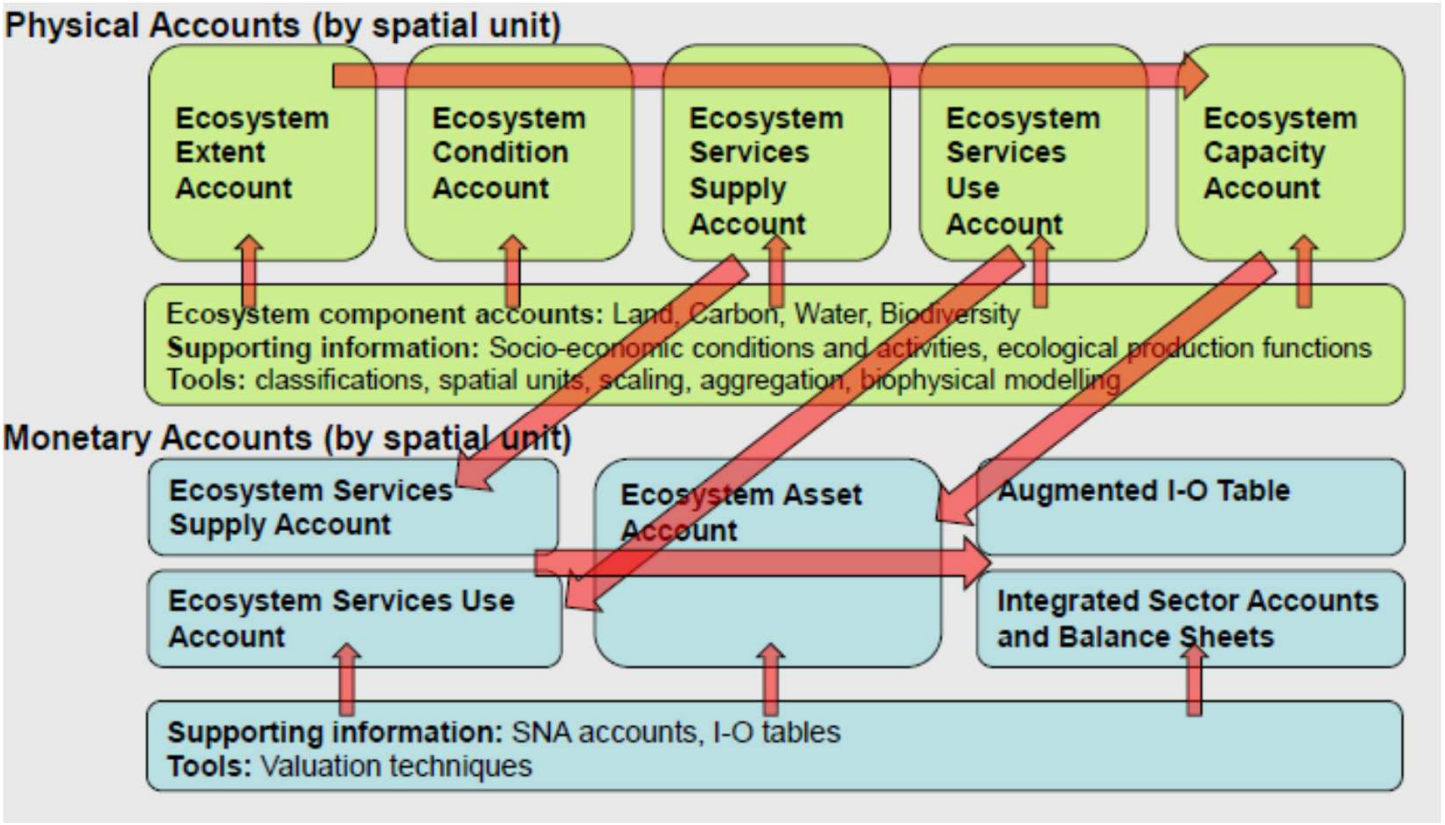
- Test modelling approaches
- Understanding the uncertainties including error propagation, reducing complexity
- Design a prototype system of (physical) ecosystem accounts in line with UN standards

Further proposal:

- Design a plan for an integrated accounting system, to be presented to the EKC for approval (for Phase 2)

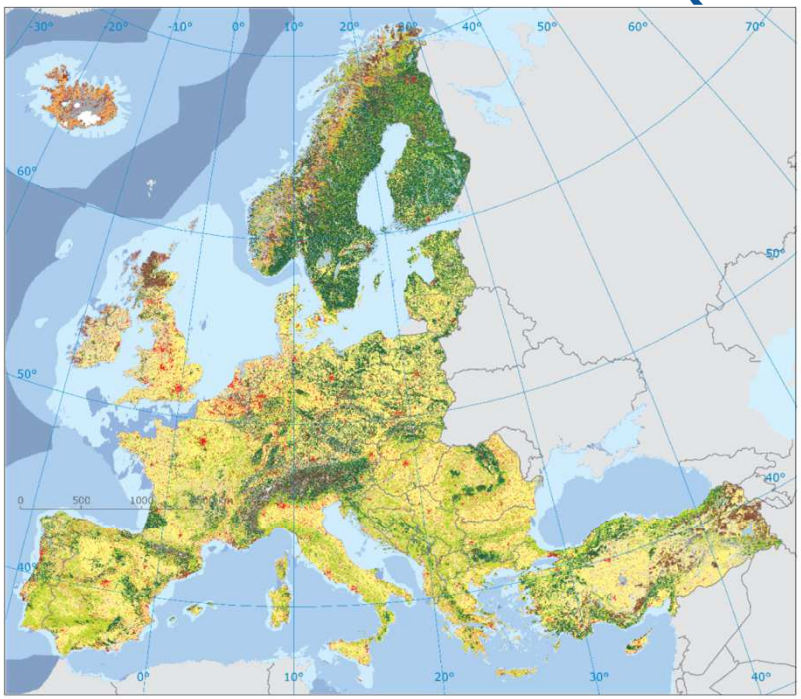
Components of KIP INCA now being developed

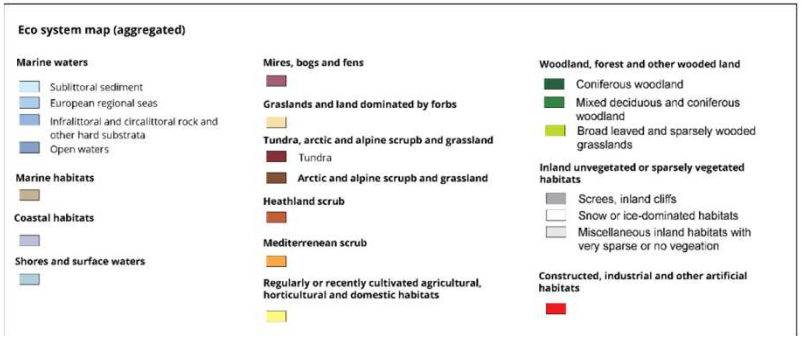
(figure shown is from SEEA EEA Technical Guidance draft – outdated presentation but shows key components)



(Source: SEEA – EEA)

Existing potential input layers: MAES activities
(ecosystem extent)





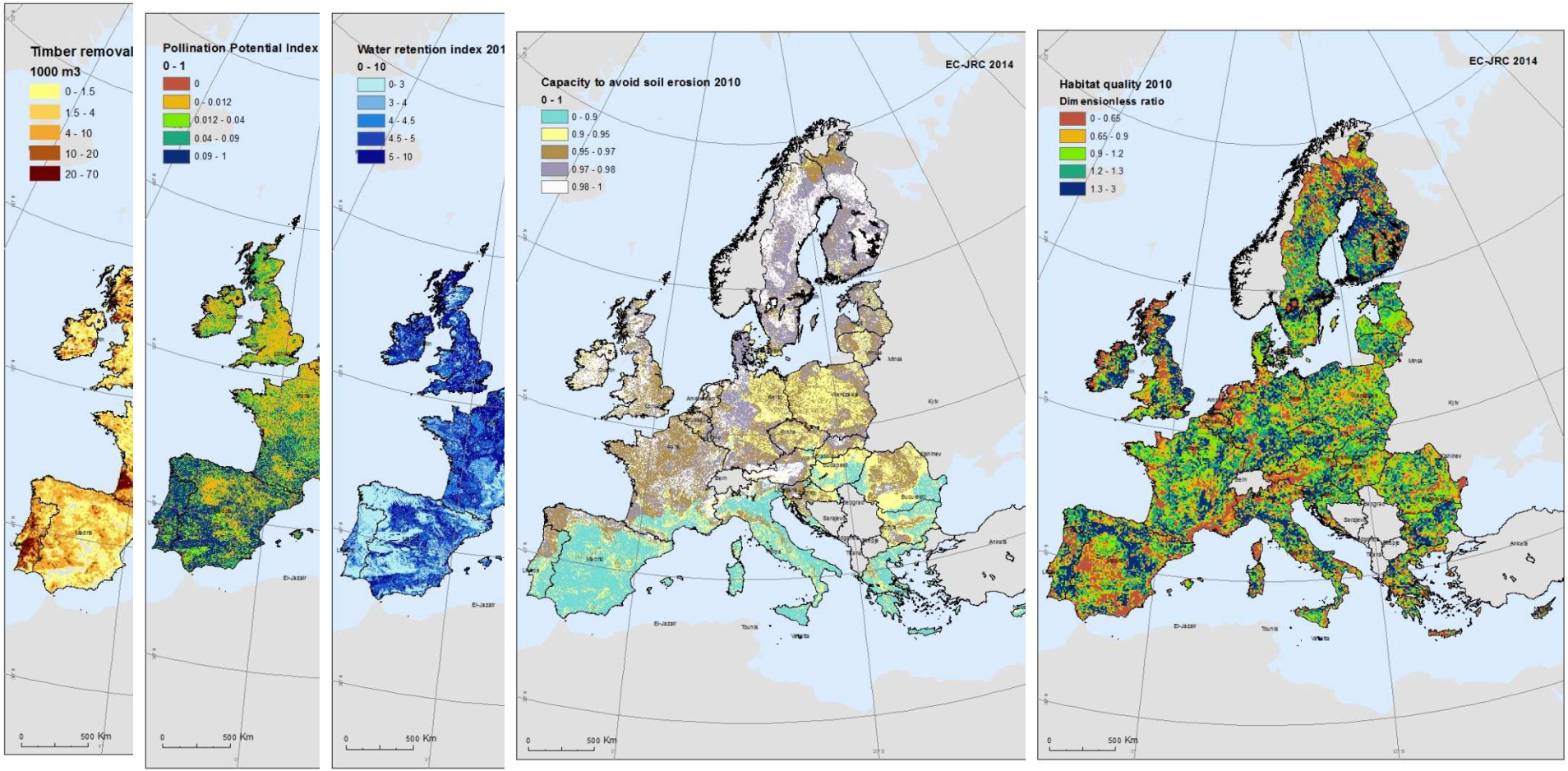
Ecosystem type	EUNIS Level 1	EUNIS Level 2	Total ecosystem coverage	
			Area (km²)	% area EUNIS level 2 per level 1
Urban	J Constructed, industrial and other **artificial** habitats	J1 Buildings of cities, towns and villages	**102151**	46.08
		J2 Low density buildings	**94150**	42.47
		J3 Extractive 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

Eurostat

(Source: EEA)

European Commission

Existing potential input layers - MAES activities
(ecosystem services)



Eurostat

(Source: JRC)

European Commission

From maps to accounting tables...
(...from accounting tables to better policies)

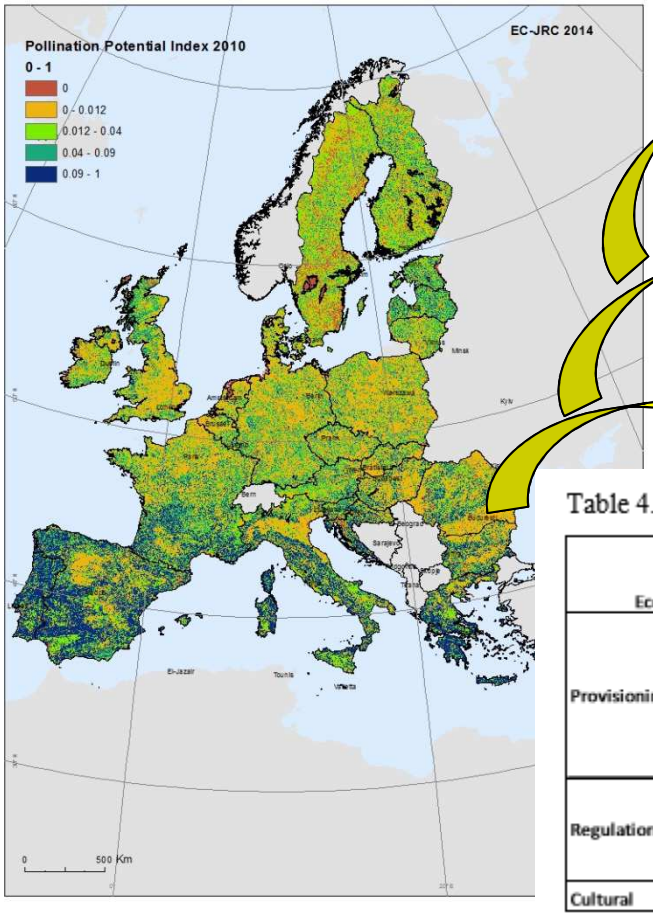


Table 4.2 Ecosystem extent account

Cover	Urban and associated		Rainfed herbaceous cropland		Forest tree cover		Inland water bodies		Open wetlands	Total
Use	Infrastructure	Residential	Permananet crops	Maintenance	Forestry	Protected	Infrastructure	Aquaculture	Maintenance	
Ownership	Government	Private	Private	Private	Private	Government	Government	Private	Government	
Units	hectares									

Ecosystem condition account (similar to SEEA EEA Table 4.3: see also SEEA EEA Table ... with changes in condition account)

Ecosystem type	Ecosystem extent	Ecosystem condition					
	Area	Vegetation	Biodiversity	Soil	Water	Carbon	Index
	hectares						
...n and ...ated							

Table 4.4 Ecosystem services supply account (LCEU by CICES)

Ecosystem service		Units	Land cover type								
			Urban	Pasture	Cropland	Forest	Heath	Peat	Water	Other nature	Provincial total
Provisioning	Hunting	kg meat	-	9,100	14,732	8,100	678	70		1,513	**34,193**
	Drinking water extraction	10^3 m^3 water	4,071	7,026	11,227	3,117	214	-	478	862	**26,995**
	Crop production	10^6 kg produce	-	-	1,868	-	-	-	-	-	**1,868**
	Fodder production	10^6 kg dry matter		533	251						**784**
Regulation	Air quality regulation	10^3 kg PM_{10}	272	404	717	700	45	7	40	69	**2,254**
	Carbon sequestration	10^6 kg carbon	875	8,019	273	50,664	393	149	-	1,056	**61,429**
Cultural	Recreational cycling	10^3 trips	2,690	1,863	2,611	1,565	30	3	139	220	**9,121**

Eurostat

Summary on KIP INCA

- **Data integration** allows making use of existing data
- Expertise and data available with **key partners**, incl. accounting, monitoring, analysis and modelling
- **Gradual adjustment** of existing data collections (such as LUCAS 2018) towards better contributing to ecosystem accounting
- **EU level** data sets are integrated **by EU-level bodies** – no extra work for EU member states but an opportunity to "plug in"
- KIP INCA is the EU response to clear **EU policy targets of the 7th EAP** and current international developments