



Accounting for flood control by ecosystems at EU level

KIP INCA project

Sara Vallecillo, Alessandra La Notte, Joachim Maes
MAIA webinar 21.06.2021

Outline

1. Introduction: ecosystem service accounts in INCA
2. Mapping of flood control: potential, demand, use, unmet demand
3. Monetary valuation
4. Accounting tables
5. Key findings

Introduction

KIP INCA Project 2015-2020



Accounts

Ecosystem extent

Ecosystem condition

Ecosystem services

Introduction: JRC approach

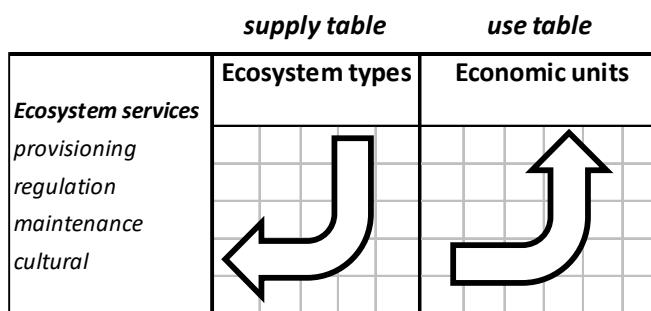
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
EU-27 (GDP)	161.143.51	200.030.47	237.073.37	246.584.36	252.561.76	246.40																		
EU-27 (GDP) real	150.447.72	200.402.07	235.051.32	246.644.30	251.051.92	252.10																		
EU-27 (GDP) real (EUR billions)	151.620.38	153.630.36	158.030.30	152.610.70	153.820.10	163.010																		
Bulgaria	3.215.31	3.223.38	3.865.42	3.848.78	3.845.77	3.850																		
Croatia	1.585.94	2.454.46	2.615.42	2.512.29	2.542.24	2.670																		
Denmark	2.381.48	2.355.77	2.333.01	2.225.45	2.265.53	2.260																		
Germany	3.584.87	3.141.96	2.799.59	3.473.94	3.884.18	4.078																		
Ireland	23.057.22	26.721.11	21.096.74	24.600.82	27.831.72	27.75																		
Latvia	308.11	249.94	255.57	251.29	258.30	428.6																		
Lithuania	1.832.03	1.887.24	1.739.0	1.886.19	1.796.16	1.796.13																		
Greece	1.577.17	1.577.39	1.577.39	1.577.39	1.577.39	1.577.39																		
Spain	16.247.39	17.250.39	17.250.39	17.250.39	17.250.39	17.250.39																		
Poland	28.355.25	29.725.03	29.402.29	28.351.08	27.011.08	26.472.08	27.201.08	26.472.08	27.201.08	26.472.08	26.472.08	26.472.08	26.472.08	26.472.08	26.472.08	26.472.08	26.472.08	26.472.08	26.472.08	26.472.08	26.472.08	26.472.08		
Croatia	1.585.94	2.454.46	2.615.42	2.512.29	2.542.24	2.670																		
Italy	27.693.82	29.116.98	26.386.79	26.209.22	26.000.87	26.209.37	27.831.72	26.000.87	26.209.37	27.831.72	26.000.87	26.209.37	27.831.72	26.000.87	26.209.37	27.831.72	26.000.87	26.209.37	27.831.72	26.000.87	26.209.37	27.831.72	26.000.87	
Croatia	327.39	334.43	312.83	328.91	342.39	347.81	319.81	262.82	289.32	249.37	249.37	249.37	249.37	249.37	249.37	249.37	249.37	249.37	249.37	249.37	249.37	249.37		
Ukraine	525.30	523.72	434.54	434.81	548.91	549.95	601.81	649.88	787.02	788.49	737.54	801.79	801.81	801.81	801.81	801.81	801.81	801.81	801.81	801.81	801.81	801.81	801.81	
Ukraine	1.146.58	1.226.48	1.064.79	1.082.00	1.025.88	1.035.88	1.017.88	1.172.29	1.801.78	1.651.87	1.551.52	1.545.88												

Official statistics

Translation monetary terms

Biophysical model

Spatially explicit

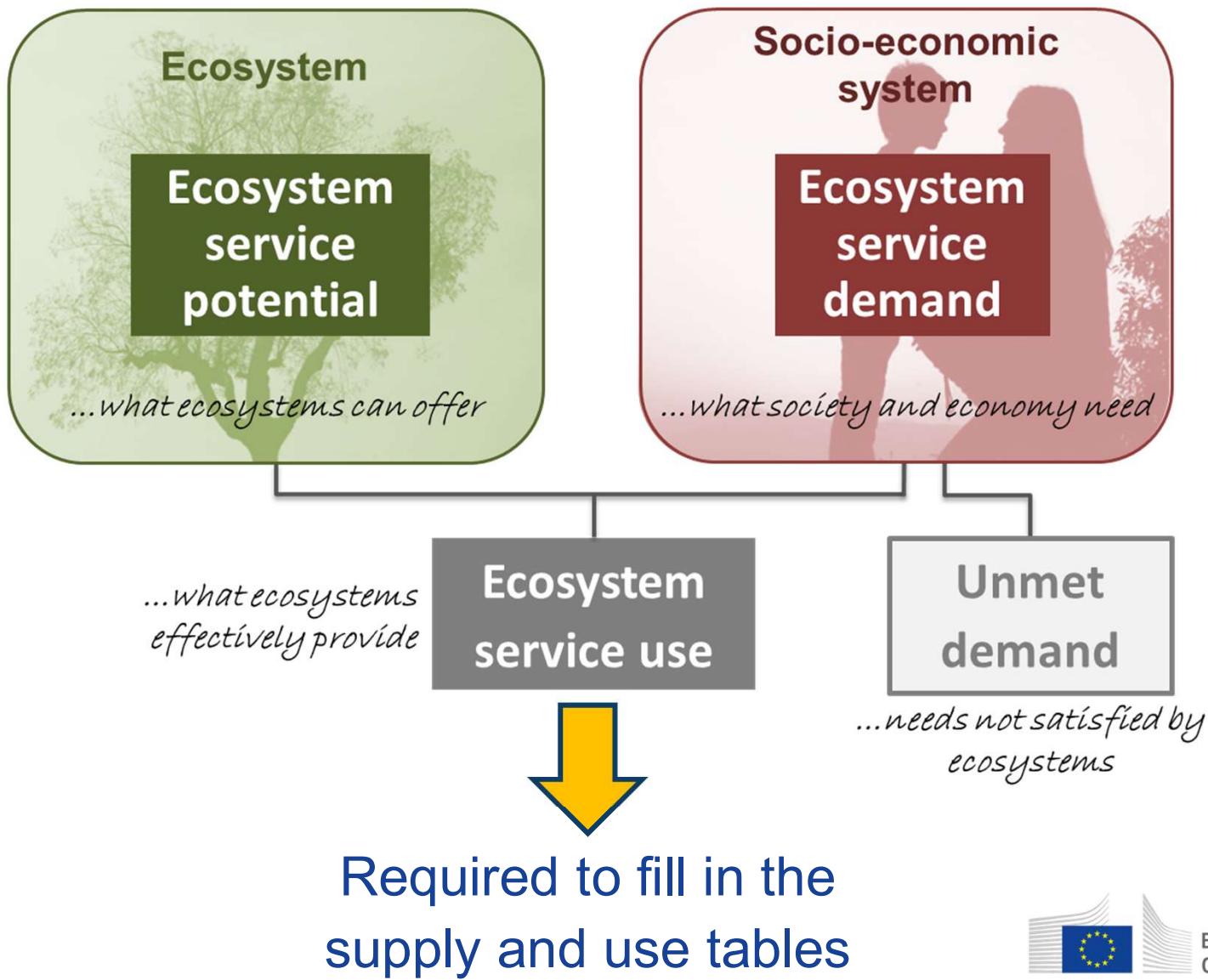


Accounting tables

Biophysical/monetary terms

4

Introduction: MAES framework



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2. Modelling flood control

Flood control

Runoff retention by ecosystems



Economic assets in floodplains



Flood control **POTENTIAL**

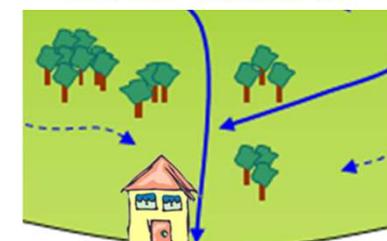
Service Providing Areas (SPA)

DEMAND for flood control

Service Demanding Areas (SDA)

SEEA EEA*
accounting
tables

Actual flow of
flood control



Extent of demand
protected by SPA upstream

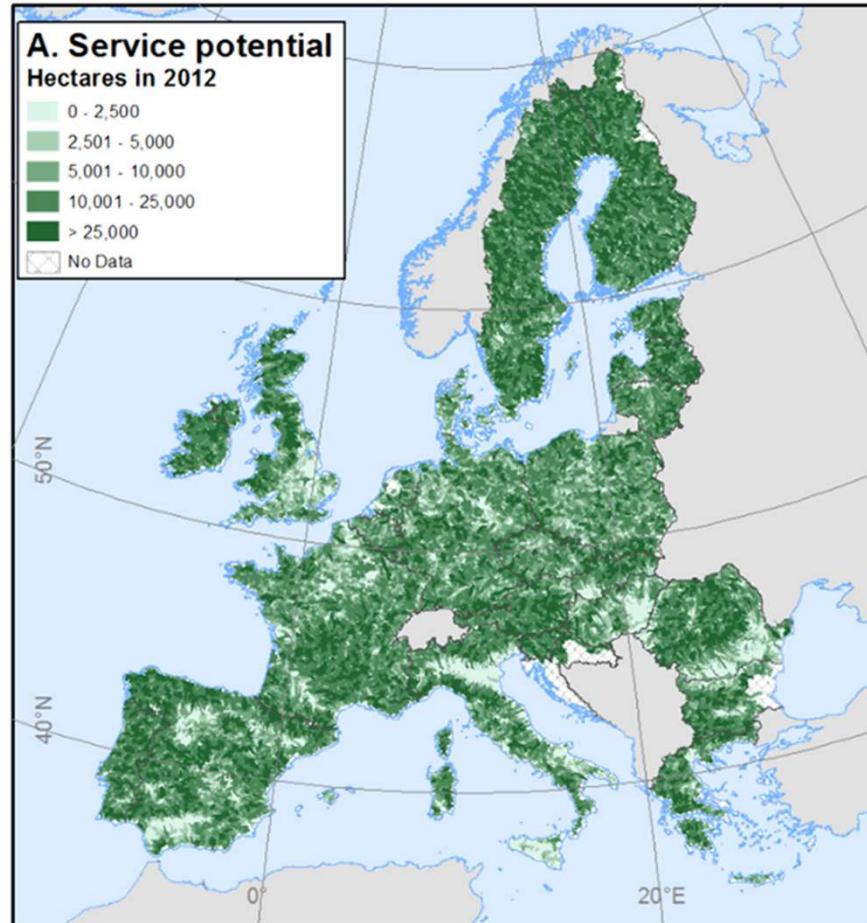
*Service Benefiting
Areas (SBA)*

*Amount of demand
protected by upstream
ecosystems*

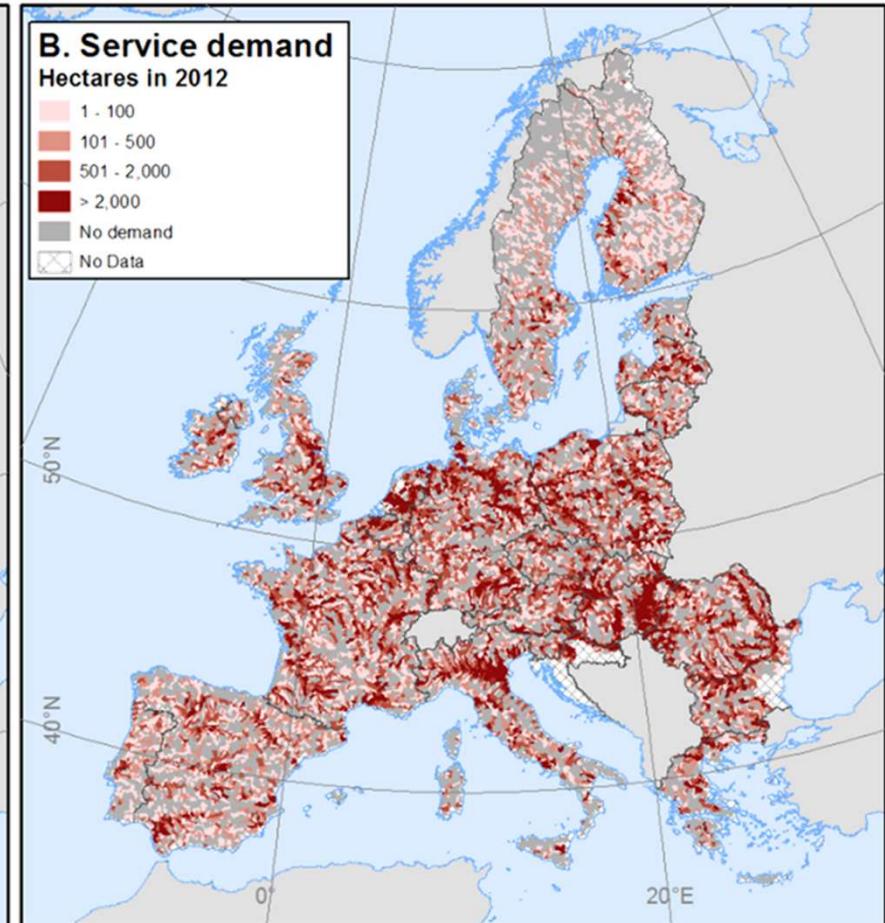
*United Nations System of Environmental-Economic Accounting- Experimental Ecosystem Accounts

2. Modelling flood control

Potential (SPA catchment)

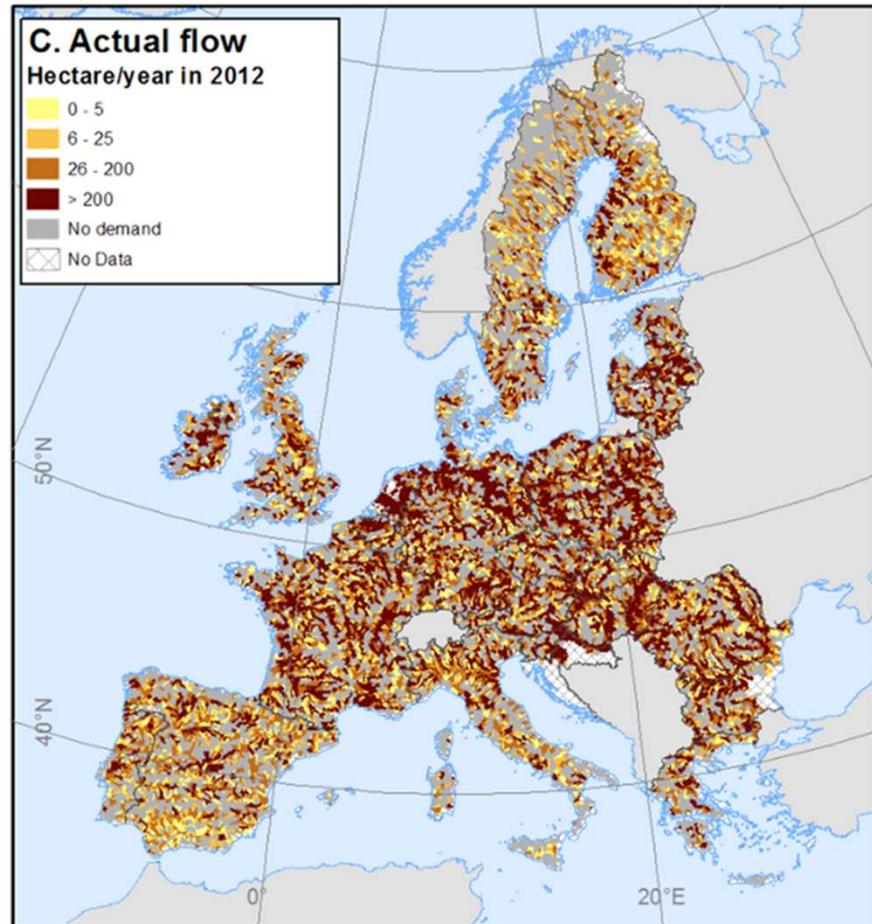


Demand (SDA catchment)

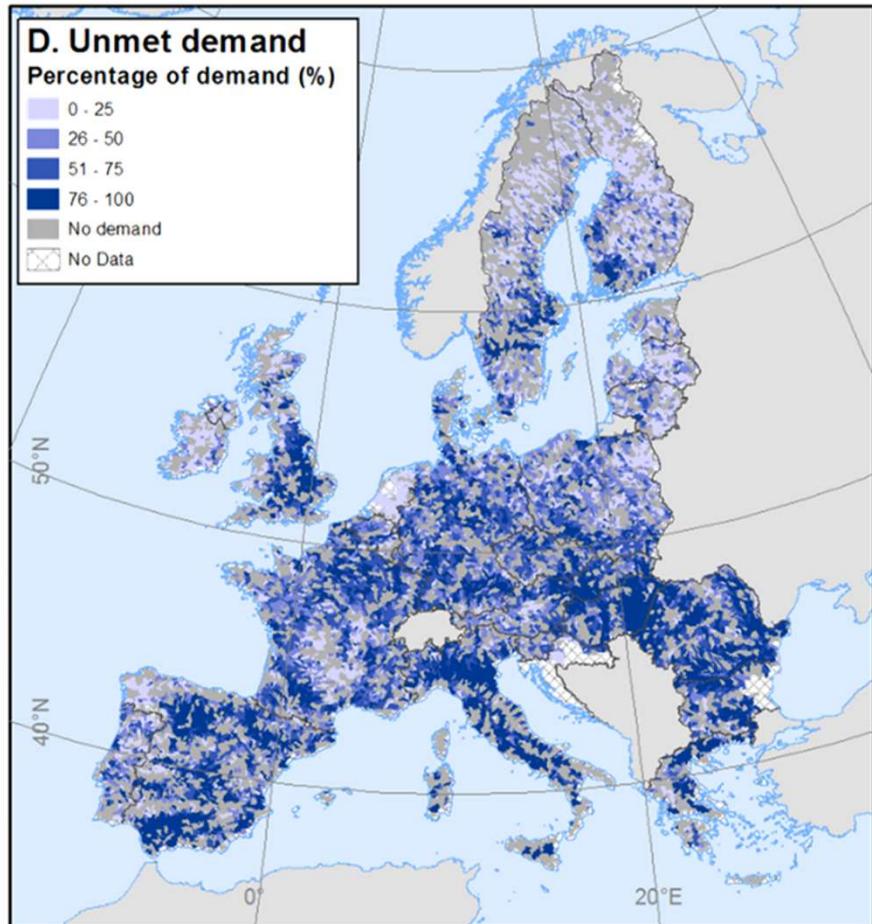


2. Modelling flood control

Use (SBA catchment)



Unmet demand (ecos. deficit)

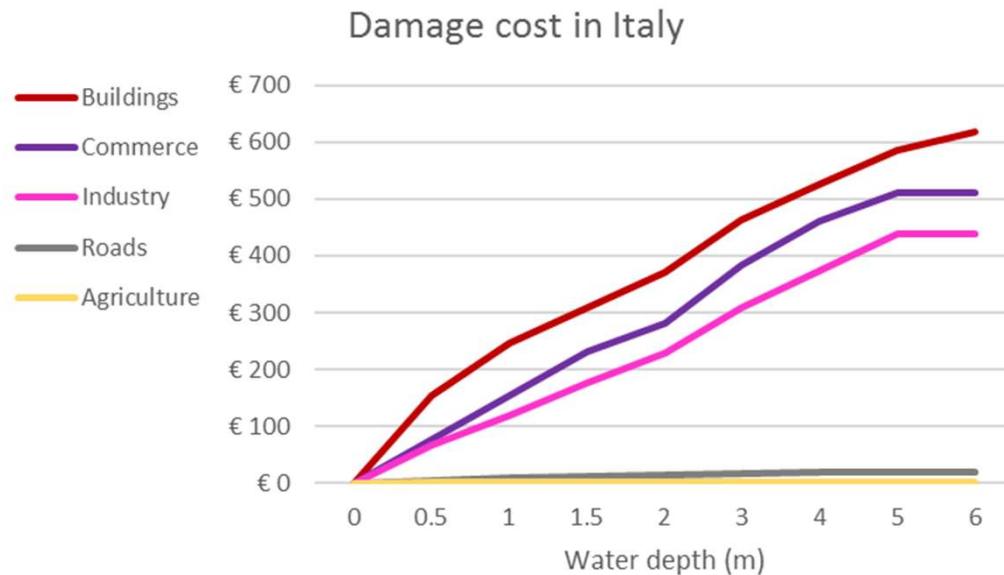


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3. **Monetary valuation**
4. Accounting tables
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3. Monetary valuation

'Avoided damage cost'



* Actual flow

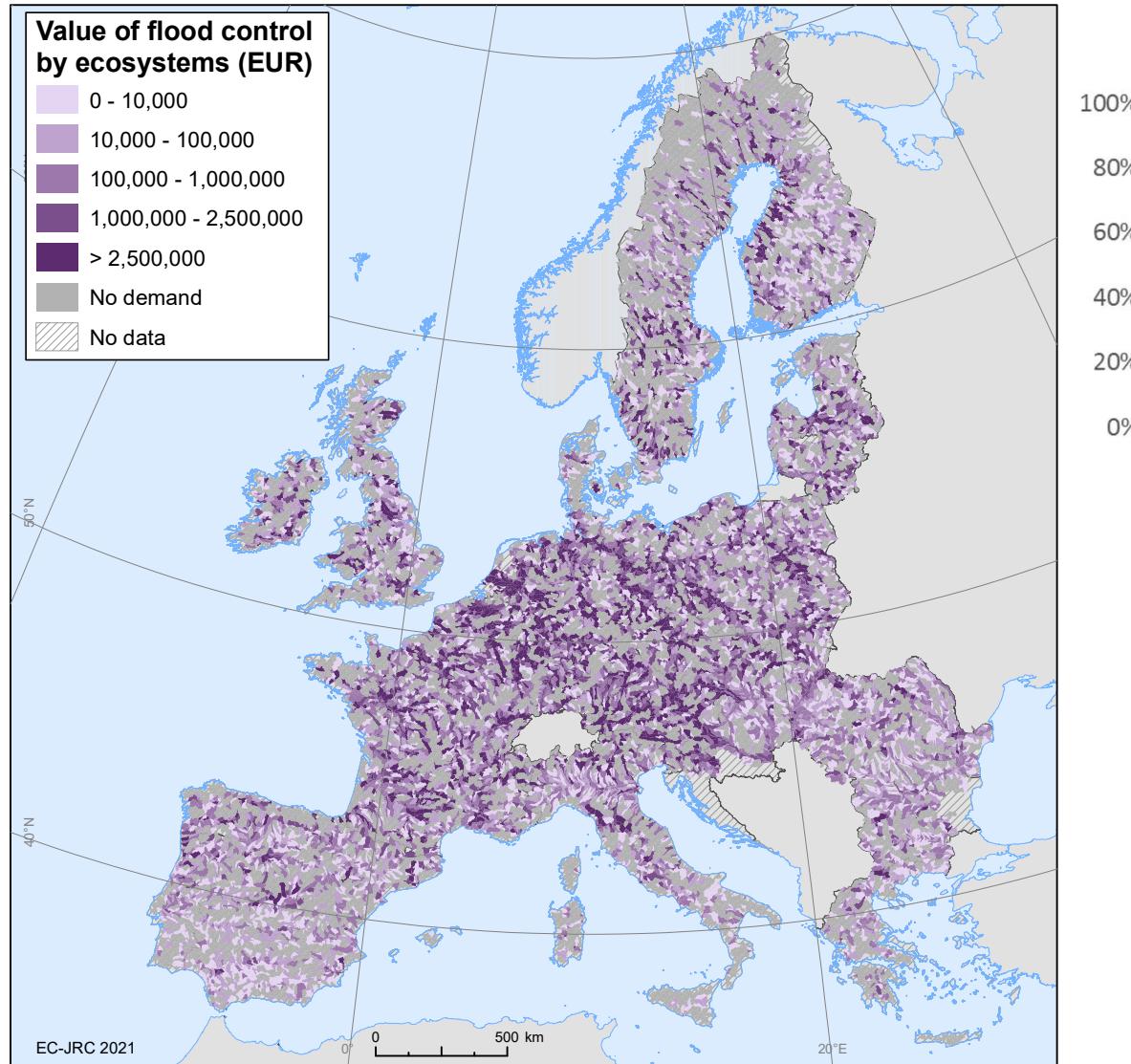


2 m depth
(EUR 371)

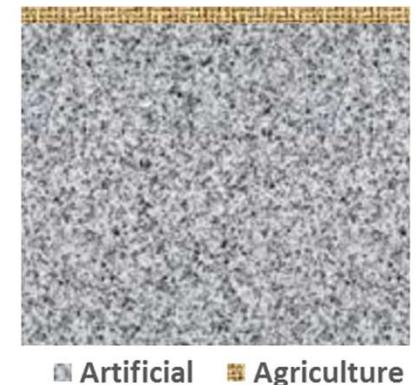
* Actual flow = 1 per pixel → EUR 371

* Actual flow = 0.2 per pixel → EUR 74.2

3. Monetary valuation



16,300 MILLION EUR



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4. Accounting tables

Supply table: contribution of ecosystems

	Ecosystem types									
	Urban	Cropland	Grassland	Woodland and forest	Wetland	Heathland and shrub	Sparsely vegetated land	River and lake	Coastal/intertidal area	Total
<i>hectare</i>										
2006	26,159	315,864	772,658	2,932,927	67,740	72,379	247	0	0	2,027,705
2012	26,239	313,591	767,010	2,922,936	67,508	72,032	243	0	0	4,169,559
<i>million Euro</i>										
2006	89	1,012	3,099	11,244	332	350	1	0	0	16,127
2012	89	1,015	3,129	11,388	333	357	1	0	0	16,312



70% provided
by forest

7 thousand
EUR/km²

4. Accounting tables

Use table: users of flood control by ecosystems

	Economic units				
	Primary sector	Secondary sector	Tertiary sector	Households	Total
<i>hectare</i>					
2006	3,691,255	43,193	302,887	150,638	4,187,973
2012	3,671,353	45,534	300,855	151,817	4,169,559
<i>million Euro</i>					
2006	804	2,303	1,393	11,627	16,127
2012	799	2,402	1,384	11,726	16,312

6.5 thousand
EUR/km² of
agricultural land

823 thousand
EUR/km² of artificial
areas

88% used by
agriculture

72% used by
households

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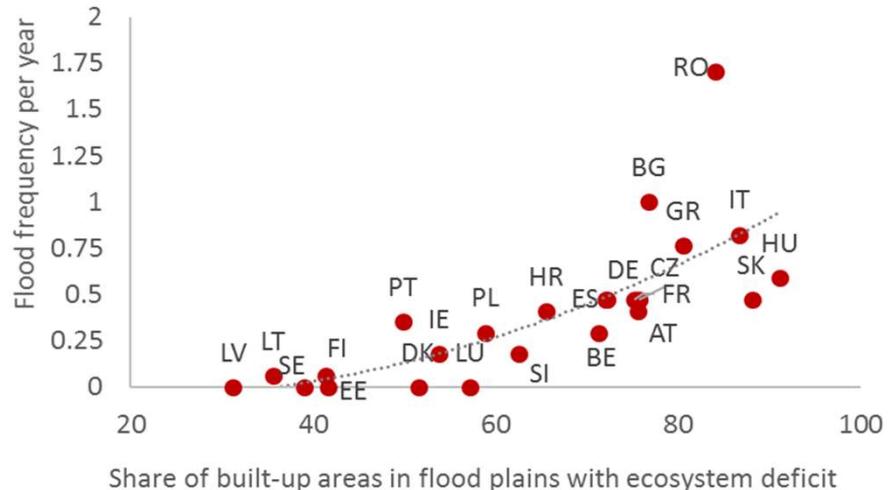
5. Key findings

SOME BAD NEWS...

- The value of flood control has increased by **1.14%** between 2006 and 2012
More users! Urban sprawl in flood plains !
- **67%** of the demand is not protected by ecosystems (unmet demand or ecosystem deficit)

SOME GOOD NEWS...

- Unmet demand useful to support flood risk management plans (reduce flood frequency!)



5. Key findings

Linkage to condition

To what extent soil sealing
reduce the extent of SPA?

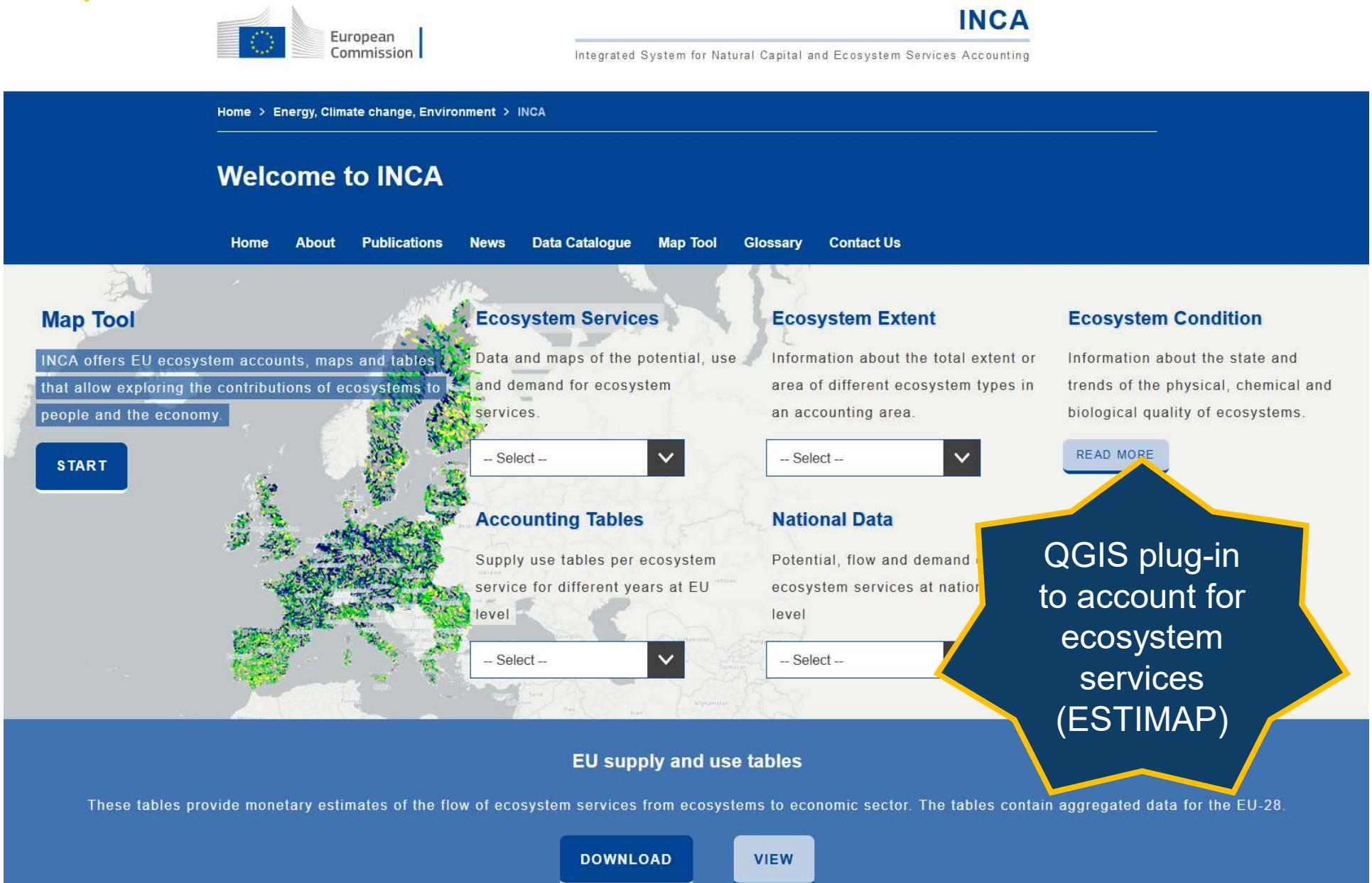


Decrease in the extent of service providing areas
due to the increase of imperviousness (in %)



* Data do not cover the whole country

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



The screenshot shows the INCA website homepage. At the top left is the European Commission logo. To its right, the INCA logo is displayed with the text "Integrated System for Natural Capital and Ecosystem Services Accounting". Below the header, a breadcrumb navigation path shows "Home > Energy, Climate change, Environment > INCA". A main title "Welcome to INCA" is centered above a navigation bar with links for Home, About, Publications, News, Data Catalogue, Map Tool, Glossary, and Contact Us.

The central feature is a map of Europe with green and blue shading representing ecosystem services. Overlaid on the map are several sections:

- Map Tool**: A button labeled "START".
- Ecosystem Services**: Text describing the potential, use, and demand for ecosystem services.
- Ecosystem Extent**: Text about the total extent or area of different ecosystem types.
- Ecosystem Condition**: Text about the state and trends of ecosystem quality.
- Accounting Tables**: Text about supply-use tables per ecosystem service.
- National Data**: Text about potential, flow, and demand for ecosystem services at national level.

At the bottom, there is a section titled "EU supply and use tables" with a note about monetary estimates for the EU-28. Two buttons are present: "DOWNLOAD" and "VIEW". A large, dark blue callout bubble with a yellow border is overlaid on the right side of the map, containing the text "QGIS plug-in to account for ecosystem services (ESTIMAP)".

Text at the bottom of the page: "These tables provide monetary estimates of the flow of ecosystem services from ecosystems to economic sector. The tables contain aggregated data for the EU-28."

Thank you

sara.vallecillo@ec.europa.eu

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