

# Project overview



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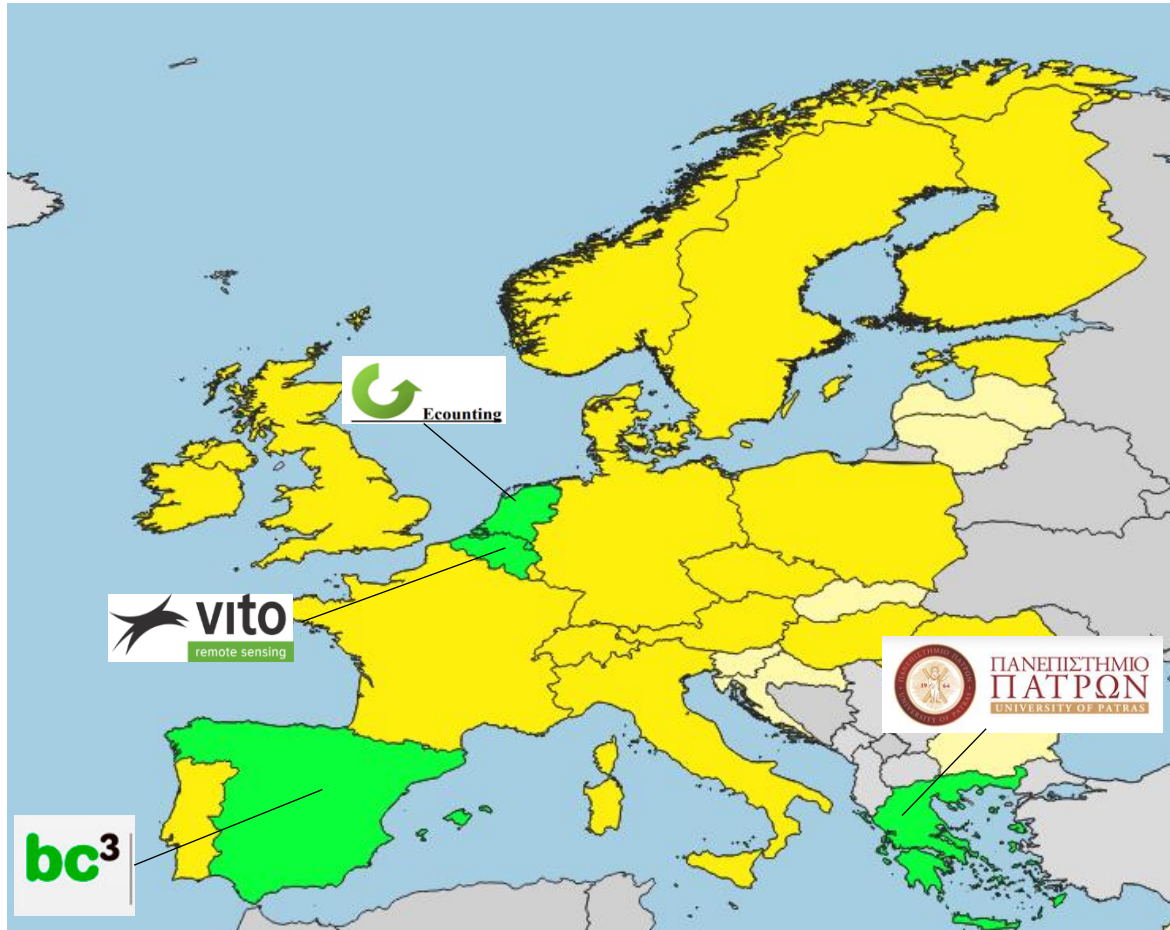
# *Project objectives*

Study the relevance of EO for ecosystem accounts in **terrestrial and freshwater ecosystems**, and develop, validate and showcase some advanced EO solutions to produce ecosystem accounts, in physical terms, on ecosystem extent, condition and services.

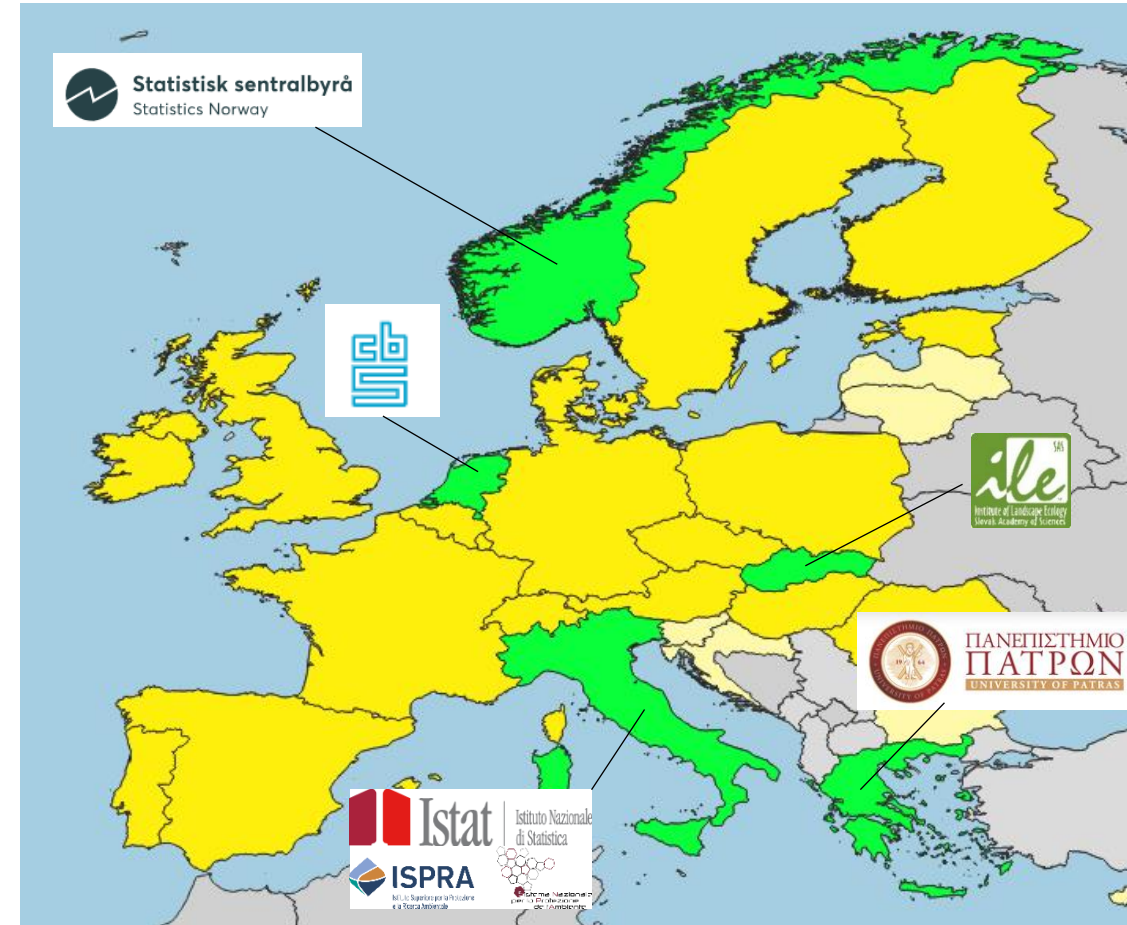
1. Conduct a **comprehensive review of the opportunities and challenges to integrate Earth Observation in SEEA compliant national accounting** on ecosystem extent, condition and services in terrestrial and freshwater ecosystems,.
2. **Develop, validate and showcase, with some Early Adopters, a number of “EO for Ecosystem Accounting” demonstrators** that show the value of Earth Observation in national ecosystem accounting of ESA/EU Member States.
3. **Integrate EO data processing and analytics workflows** on existing cloud computing platforms, following the FAIR principles, to enable their use by countries (NSOs and National Environmental Agencies).
4. **Develop a R&D agenda** that identifies the critical areas where further research is needed to bring EO-integrated solutions to the required level of accuracy and reliability for their adoptions in national ecosystem accounting.

# Project Team

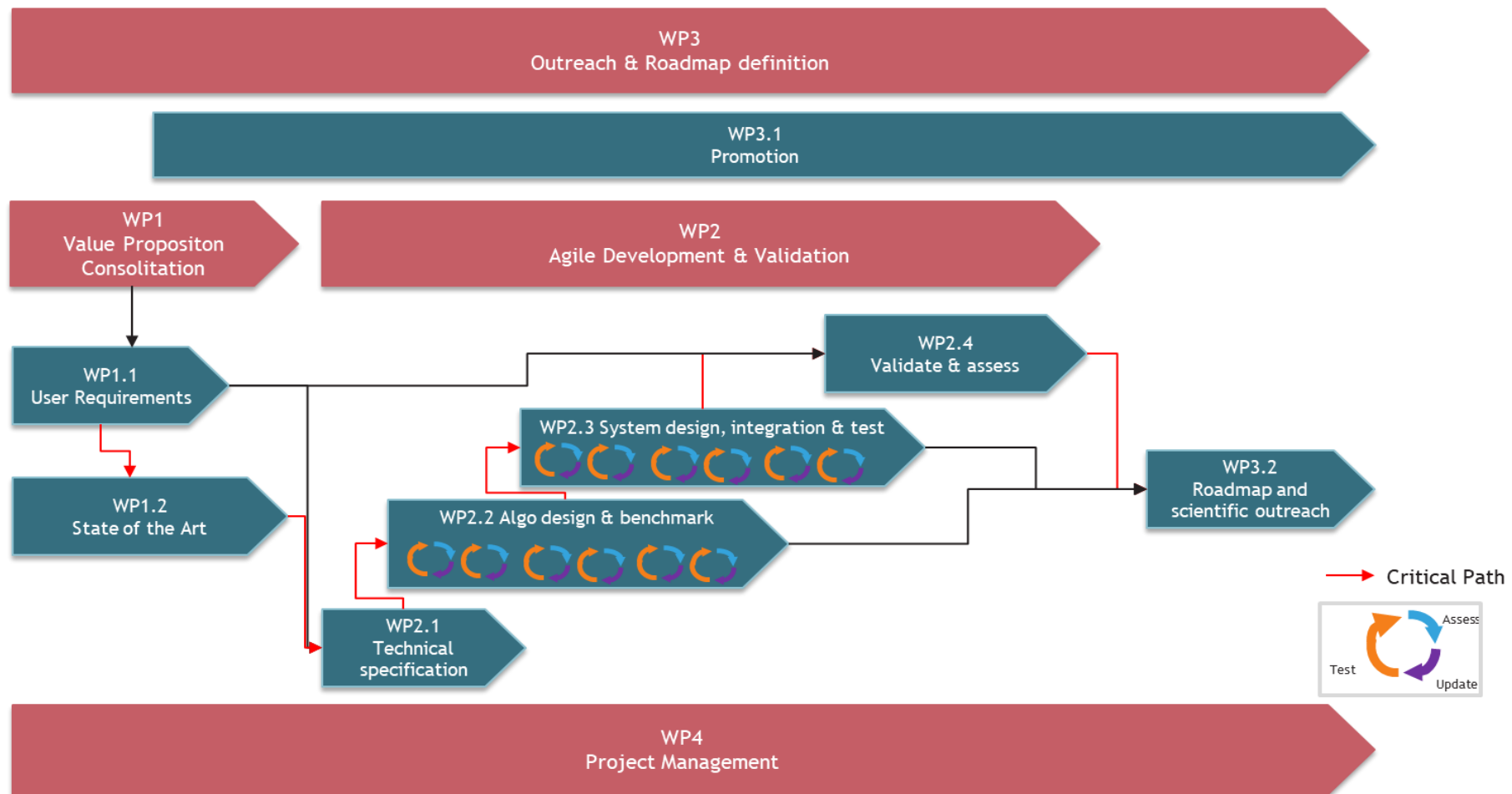
## 4 Partners



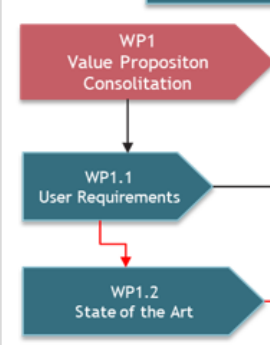
## 5 Early Adopters



# Agile development



# Main Achievements WP1



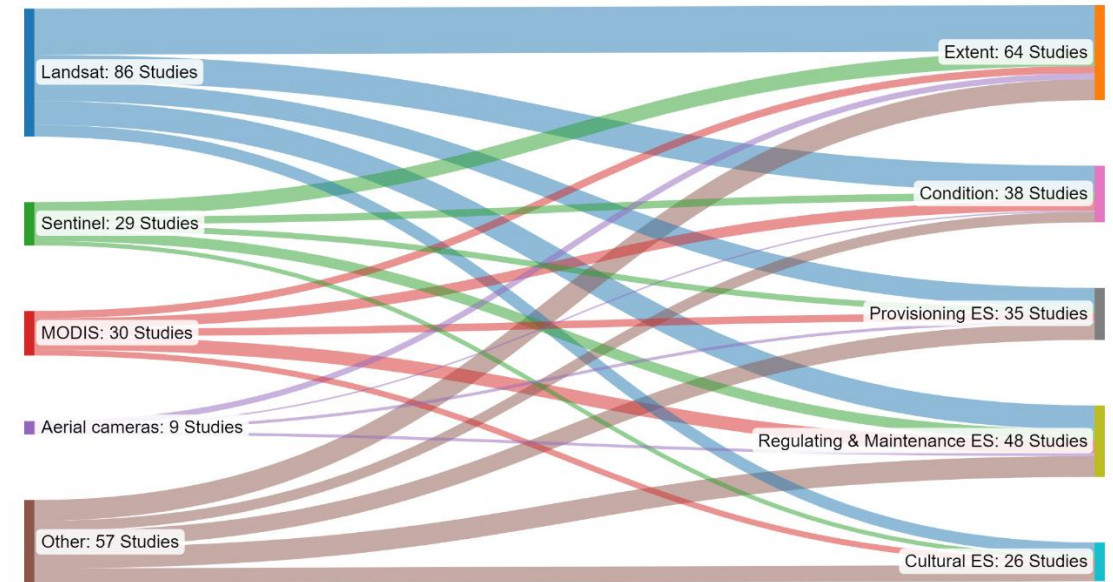
## State-of-Art review

Table 2. Policy Traceability Matrix.

Policy	Ecosystem accounting								
	Ecosystem extent			Ecosystem condition			Ecosystem services		
	Relevance of use of EO data	Possible contribution to monitoring obligation	Possible contribution to reporting obligation	Relevance of use of EO data	Possible contribution to monitoring obligation	Possible contribution to reporting obligation	Relevance of use of EO data	Possible contribution to monitoring obligation	Possible contribution to reporting obligation
EU legislation on environmental ecosystem accounting (SEEA EA)	5	x	x	5	x	x	5	x	x
Habitats Directive	4	x	x	4	x	x	2		
Birds Directive	3	x	x	3	x	x	2		
Water Framework Directive	4	x	x	3	x	x	2		
Monitoring EU progress towards sustainable development goals	2			2			3		x
8 <sup>th</sup> EAP / biodiversity (post-2020 global biodiversity framework)	4		x	4		x	4		x
Pledge process - 30% protected land, 10 % strictly protected	3	x (expected)	x (expected)	2	x (expected)	x (expected)	3		
Pledge process - 30% habitats or species improved conservation status	4	x (expected)	x (expected)	3	x (expected)	x (expected)	2		
8 <sup>th</sup> EAP / circular economy	1			3			4		
8 <sup>th</sup> EAP / climate and energy	3	x	x	3			4	x	x
8 <sup>th</sup> EAP / Zero pollution	3			3			3	x	x
Nature Restoration Law	4	x (expected)	x (expected)	5	x (expected)	x (expected)	4		
Mapping and Assessment ecosystems process	5	x	x	5	x	x	5	x	x
Common Agricultural Policy (CAP), high nature value (HNV) farmlands and forests	4	x	x	4	x	x	4	x	x
Forest strategy	4	x	x	4	x	x	3		
EU Pollinators Initiative	3	x	x	4	x	x	4	x	x

**Objective 1.** Conduct a comprehensive review of the opportunities and challenges to integrate Earth Observation in SEEA compliant national accounting.

## Scientific Paper

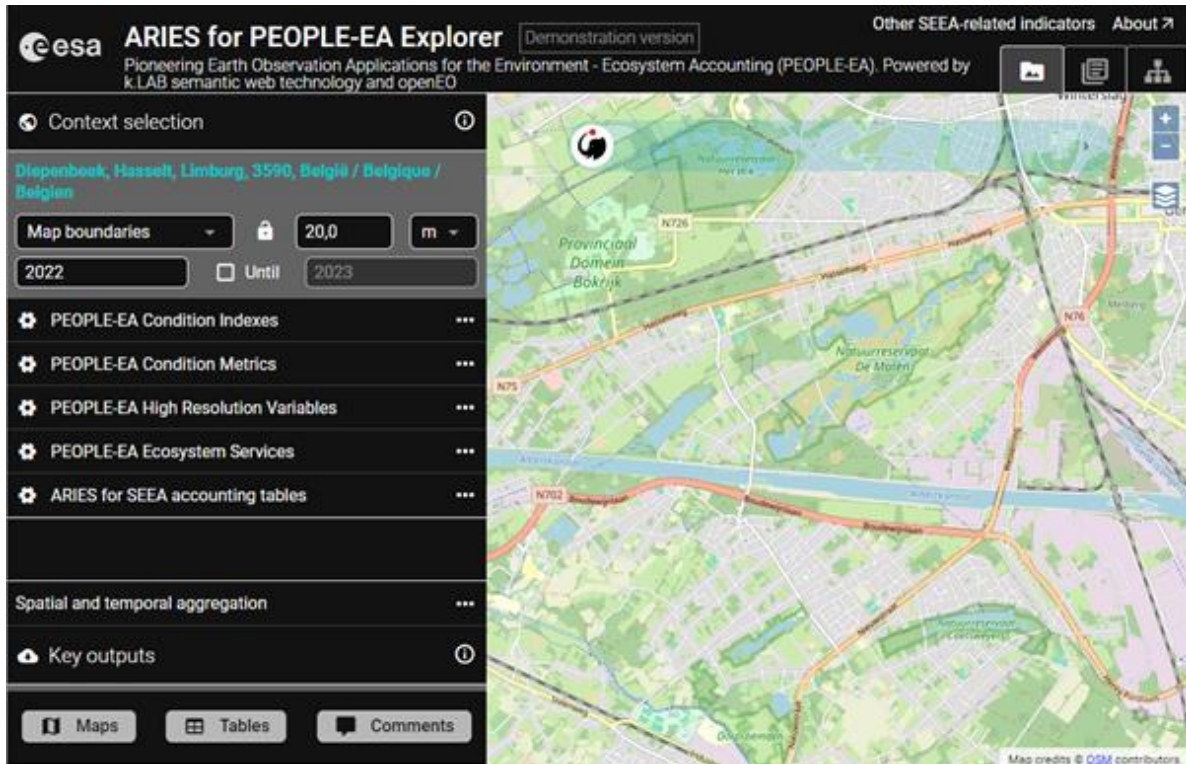
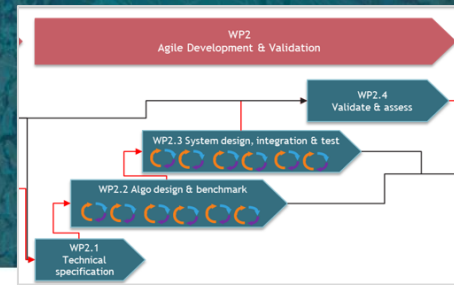


<https://esa-people-ea.org/en/results/deliverables>

1. Policy Analysis
2. International networks and projects
3. Review of EO data integration in ecosystem accounting

Kokkoris, I.P., Smets, B., Hein, L., Mallinis, G., Buchhorn, M., Balbi, S., Cernecky, J., Paganini, M., Dimopoulos, P. (2024). Applying earth observation for ecosystem accounting. *Ecosystem Services*, under review.

# Main Achievements WP2



<https://esa-people-ea.org/en/results/aries4people-application>

The super-system: ARIES (k.lab), OpenEO, INCA models

**Objective 2.** Develop, validate and showcase, with some Early Adopters, some “EO for Ecosystem Accounting” demonstrators.

**Objective 3.** Integrate EO data processing and analytics workflows on existing cloud computing platforms, following the FAIR principles.

Account	Tool/workflow	Countries	Status
Extent	Offline	SK, GR	Under validation <i>Will be continued in WEED</i>
Forest Condition	Aries4People	Europe, (global)	Preliminary validated
Coastal Condition	Offline	IT, NL	Under test
Wood Provision	Offline	SK, NO	Under validation
Global Climate Regulation	Offline	n.a.	On-hold
Tourism recreation	INCA	GR, NO	Under test
(Soil Erosion)	Aries4People	Europe, (global)	INCA model integrated

<https://esa-people-ea.org/en/results/demonstrator-accounts>

# Main Achievements WP3



## Evolution Roadmap

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In collaboration with Early Adopters



**Objective 4.** *Develop a R&D agenda that identifies the critical areas where further research is needed to bring EO-integrated solutions to the required level of accuracy and reliability for their adoptions in national ecosystem accounting.*

1. Scientific Paper : *Ecosystem Services*, under review.

### Applying earth observation for ecosystem accounting.

Kokkoris, I.P., Smets, B., Hein, L., Mallinis, G., Buchhorn, M., Balbi, S., Cernecky, J., Paganini, M., Dimopoulos, P. (2024). *Ecosystem Services*, under review.

2. White Paper : 30th meeting of London Group 30Sep-03Oct, accepted – in writing **Navigating connected data and models through semantics for SEEA: an Earth observation perspective**

Stefano Balbi<sup>1,2</sup>, Ferdinando Villa<sup>1,2</sup>, Kenneth Bagstad<sup>3</sup>, Alessio Bulckaen<sup>1</sup>, Marcel Buchhorn<sup>4</sup>, Bruno Smets<sup>4</sup>, Marc Paganini<sup>5</sup>

3. Contribution to scientific paper : *Ecosystem Services*, under review.

### Interoperability for ecosystem service assessments: Why, how, who, and for whom?

Kenneth J. Bagstad<sup>1\*</sup>, Stefano Balbi<sup>2,3</sup>, Greta Adamo<sup>2</sup>, Ioannis N. Athanasiadis<sup>4</sup>, Flavio Affinito<sup>5</sup>, Simon Willcock<sup>6,7</sup>, Ainhua Magrach<sup>2,3</sup>, Kiichiro Hayashi<sup>8</sup>, Zuzana V. Harmáčková<sup>9</sup>, Aidin Niamir<sup>10</sup>, Bruno Smets<sup>11</sup>, Marcel Buchhorn<sup>11</sup>, Evangelina G. Drakou<sup>12</sup>, Alessandra Alfieri<sup>13</sup>, Bram Edens<sup>14</sup>, Luis Gonzalez Morales<sup>15</sup>, Agnez Vári<sup>5,16</sup>, María-José Sanz<sup>2,3</sup>, Ferdinando Villa<sup>2,3</sup>