

# Is coastal and marine natural capital accounting a scam? Insights from Italy

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London Group on Environmental Accounting  
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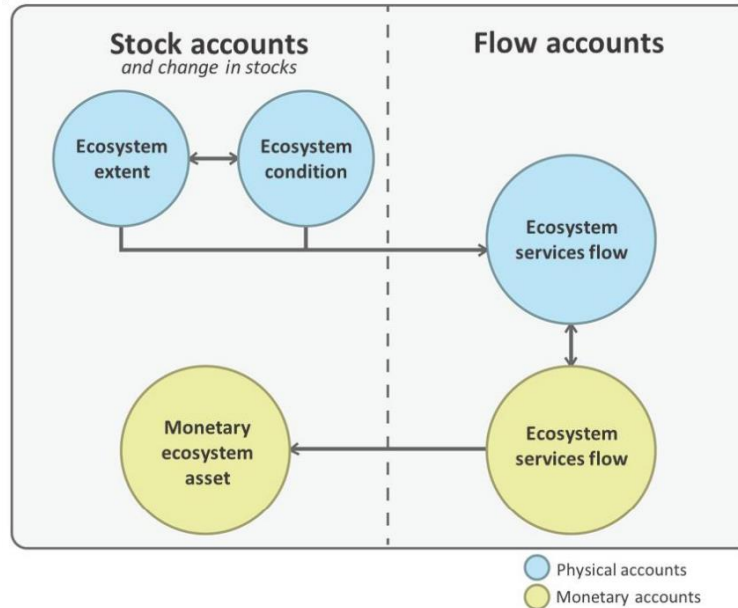


# Overview objective



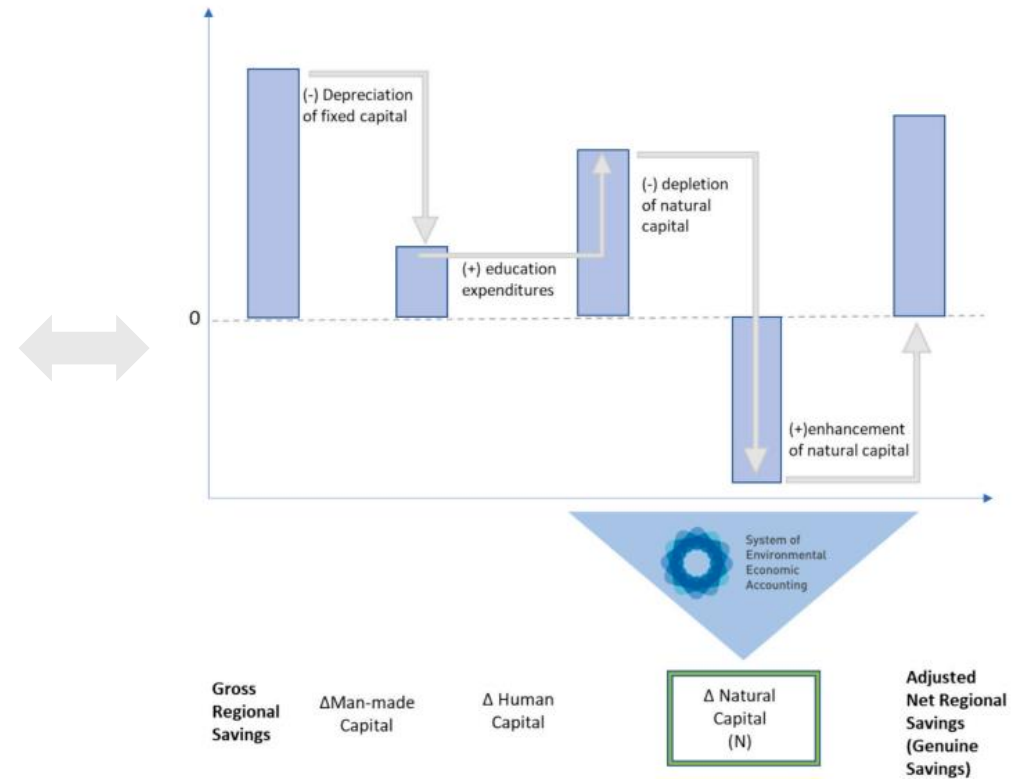
*Posidonia Oceanica*

## ECOSYSTEM ACCOUNTING



SEEA EA(2021)

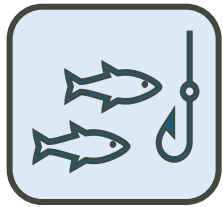
## GENUINE SAVINGS



Di Gennaro et al. (2025)

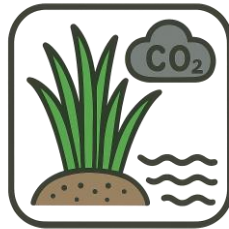
# Case study: *Posidonia Oceanica* in Italy

## Ecosystem Services



Fish provisioning

Carbon sequestration



Marine-based recreation

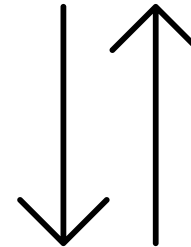


Marine-based tourism



## Scale: National vs regional

Top-down

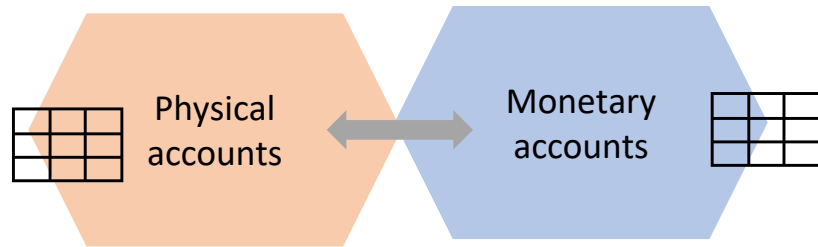


Bottom-up

# Results

It is indeed possible to build these accounts.

We managed to compile stock and flow accounts for *Posidonia oceanica* at both regional and national scales.



But ...

# Results

- **Data quality is uneven**

Posidonia Oceanica extent and condition in Sardinia region



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Research Article

## Ecosystem Accounting for Marine-Based Tourism provided by *Posidonia oceanica* in Italy

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### Abstract

This work presents the first ecosystem accounts for Marine-Based Tourism (MBT) in Italy. We develop a methodological approach to connect biophysical and economic information required to fill ecosystem accounting supply and use tables. Coherent with the System of Environmental Economic Accounting – Ecosystem Accounting (SEEA EA) framework, this approach starts by estimating the extent and the condition of marine ecosystems, showing the urgency in improving the availability, organisation and accessibility of biophysical data. This work provides valuable insights into understanding MBT from an ecosystem accounting perspective. We focus on the *Posidonia oceanica* and its role in the MBT sector in Italy, providing a physical quantification of such contribution and converting this flow into monetary terms. Our findings show that such habitat significantly contributes to the tourism sector, resulting in exchange values of MBT of €6 million in 2019 and €3.7 million in 2021.

Environ Monit Assess (2025) 197:541  
<https://doi.org/10.1007/s10661-025-13973-z>

RESEARCH



## A probabilistic sampling strategy for estimating plant density in *Posidonia oceanica* meadows

Alice Bartolini · Agnese Marcelli · Rosa Maria Di Biase · Lorenzo Fattorini · Silvia Ferrini

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**Abstract** Marine and coastal ecosystems, such as seagrasses, mangroves, and coral reefs, provide a range of essential provisioning, regulating and cultural ecosystem services. Recent United Nations guidelines on ecosystem accounting (SEEA EA) emphasise the need for biophysical data as the foundation for compiling ecosystem accounts and conducting economic evaluations for developing indicators and informing policies and interventions. However, data availability on marine ecosystems is limited with respect to terrestrial ones. Moreover, the collection of biophysical data on marine ecosystem extent and condition required for ecosystem accounting (EA) is often not aligned with existing habitat monitoring strategies. This study aims to address the scarcity of spatial data on marine ecosystems and facilitate the integration of current monitoring strategies

with the scope of EA. We propose the application of design-based inference for the estimation, mapping, and monitoring of key ecological attributes of marine ecosystems. We focus on the habitat of *Posidonia oceanica*, an endemic seagrass of the Mediterranean Sea, but the proposed strategy is adaptable to other ecosystems. The benefits of appropriate probabilistic sampling schemes for assessing *P. oceanica* are explored via simulation testing. The performance of different sample schemes in artificial populations reveals that reliable estimates of density (as well as their precision) can be obtained even with low sample sizes. The empirical viability of our methodology is exemplified using data collected on a meadow located in an Italian Marine Protected Area (Puglia region, Southern Italy).

**Keywords** *Posidonia oceanica* · Ecosystem accounting · Design-based inference · Simulation study

**Supplementary Information** The online version contains supplementary material available at <https://doi.org/10.1007/s10661-025-13973-z>.

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Bartolini et al. (2024)

Bartolini et al. (2025)

- **Scale matters**

Extent (ha)	Scanu et al. 2022	Regional (own elaboration)	Bartolini et al. (2024)
Sardinia	174,489.7	213,849.1	351,404.7

# Results

- Time series are fragile

Ecosystem services	Physical accounts	Monetary accounts
ES 1 fish provisioning	Over time (2013-2021)	Over time (2013-2021)
ES 2 carbon sequestration	fixed	Over time (carbon price)
ES 3 marine-based recreation	2 years (2014, 2020)	2 years (2014, 2020)
ES 4 marine based tourism	Over time (2014-2021)	2 years (2019, 2021)

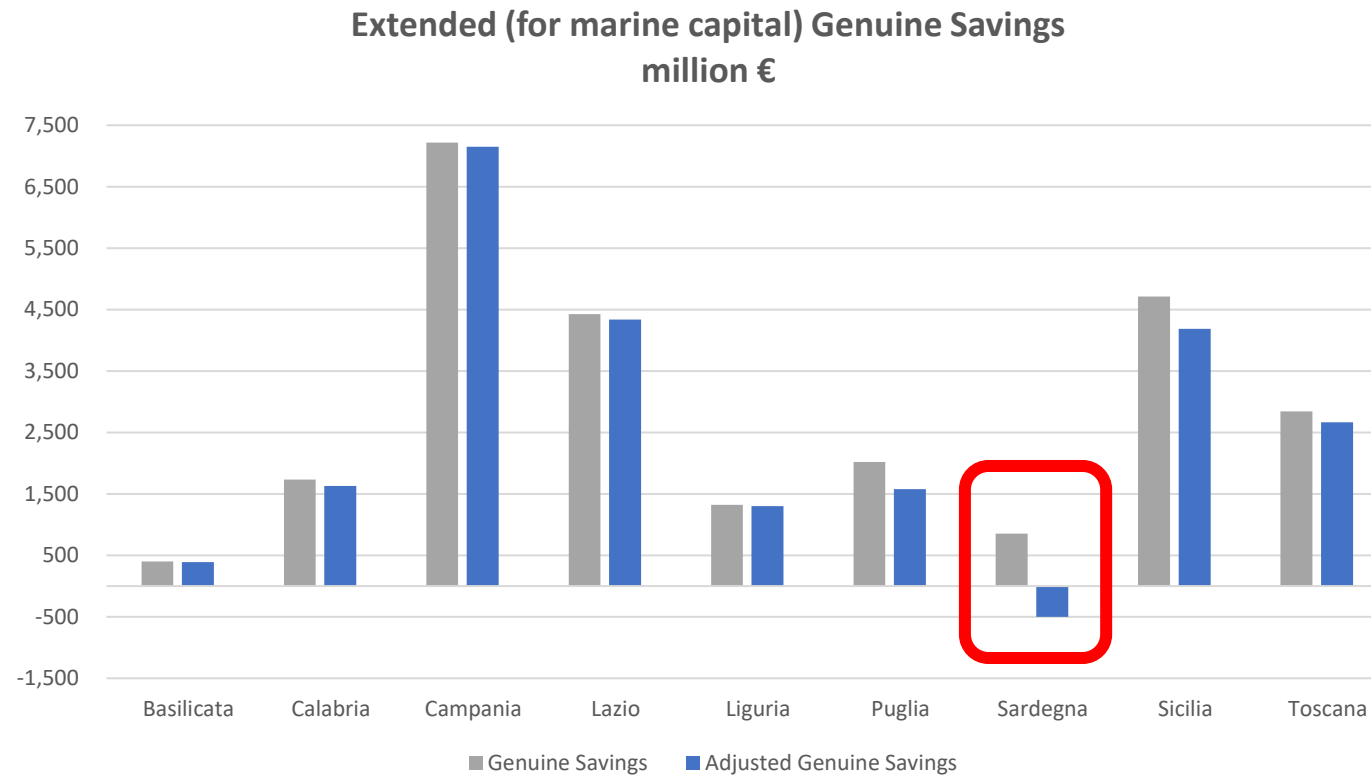
Ecosystem services (€/ha year)	2013	2014	2015	2016	2017	2018	2019	2020	2021
ES 1 fish provision	228	238	266	274	355	344	179	142	164
ES 2 carbon sequestration		5.50	6.25	5.70	5.54	14.28	15.10	15.84	24.90
ES 3 marine-based recreation		441						375	
ES 4 marine-based tourism		5.85	6.24	6.50	6.98	7.42	7.61	3.47	5.11

Tricky

Sticky

# Results

## Extended (for marine ecosystem) Genuine Savings



# Conclusion

*Is coastal and marine natural capital accounting a **scam**?*

**No**, it is essential for monitoring marine ecosystem health and their contribution to human well-being

(with an important warning)

Stock accounts

Extent and condition

Space and time inconsistency

Flow accounts

Habitat-flow ES dependency related to scale

Monetary values and methods

Stock accounts

Assumption on NPV and discount rate



# Conclusion

## Challenges

Spatial data gap

Temporal inconsistency

Lack of systematic compilation

Example:

Why does the data availability  
on marine ecosystems is  
limited?

Why does the current fishery  
economic data lack  
geographical references?

## Opportunities

Pragmatic initiatives

Communication

Cooperation and coordination



Make marine ecosystem accounts  
more **reliable**, more **transparent** and ultimately more **meaningful**  
for **policy decisions**

# Thanks for your attention!

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22<sup>nd</sup>-25<sup>th</sup> September 2025



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