

Inventoried carbon stocks of protected European blue carbon ecosystems: first outcomes from a systematic review



Claudia Armenio^a, Cristina Andolina^{b c}, Giovanna Cilluffo^{b c}, Geraldina Signa^{b c}, Antonio Mazzola^{b d}, Salvatrice Vizzini^{a b c d}

^aCentro di Sostenibilità e Transizione Ecologica (CSTE), Università degli Studi di Palermo, Piazza Marina 61, 90133 Palermo, Italia
^bDipartimento di Scienze della Terra e del Mare (DiSTeM), Università degli Studi di Palermo, via Archirafi 18, 90123 Palermo, Italia
^cNational Biodiversity Future Center (NBFC), Piazza Marina 61, 90133 Palermo, Italia
^dConsorzio Nazionale Interuniversitario per le Scienze del Mare (CoNISMA), Piazzale Flaminio 9, 00196 Roma, Italia

BACKGROUND

WHAT IS BLUE CARBON (BC)?

CO₂ sequestered and stored in coastal marine habitats, such as mangroves, salt marshes, and seagrass meadows known as Blue Carbon Ecosystems (BCE) ¹

ROLE OF MARINE PROTECTED AREAS (MPAs) IN BC SCIENCE

- laboratory for testing the effectiveness of protecting the potential of BCE
- policy tool for implementing key territorial socio-economic development strategies ²

OBJECTIVES

This systematic review aims to draw attention to:

- State of art on carbon stocks of European BCE under different protection regimes
- Carbon stock content in seagrass and saltmarsh ecosystems in protected and unprotected areas
- Effectiveness of the protection measures on the BCE services.

METHODOLOGY

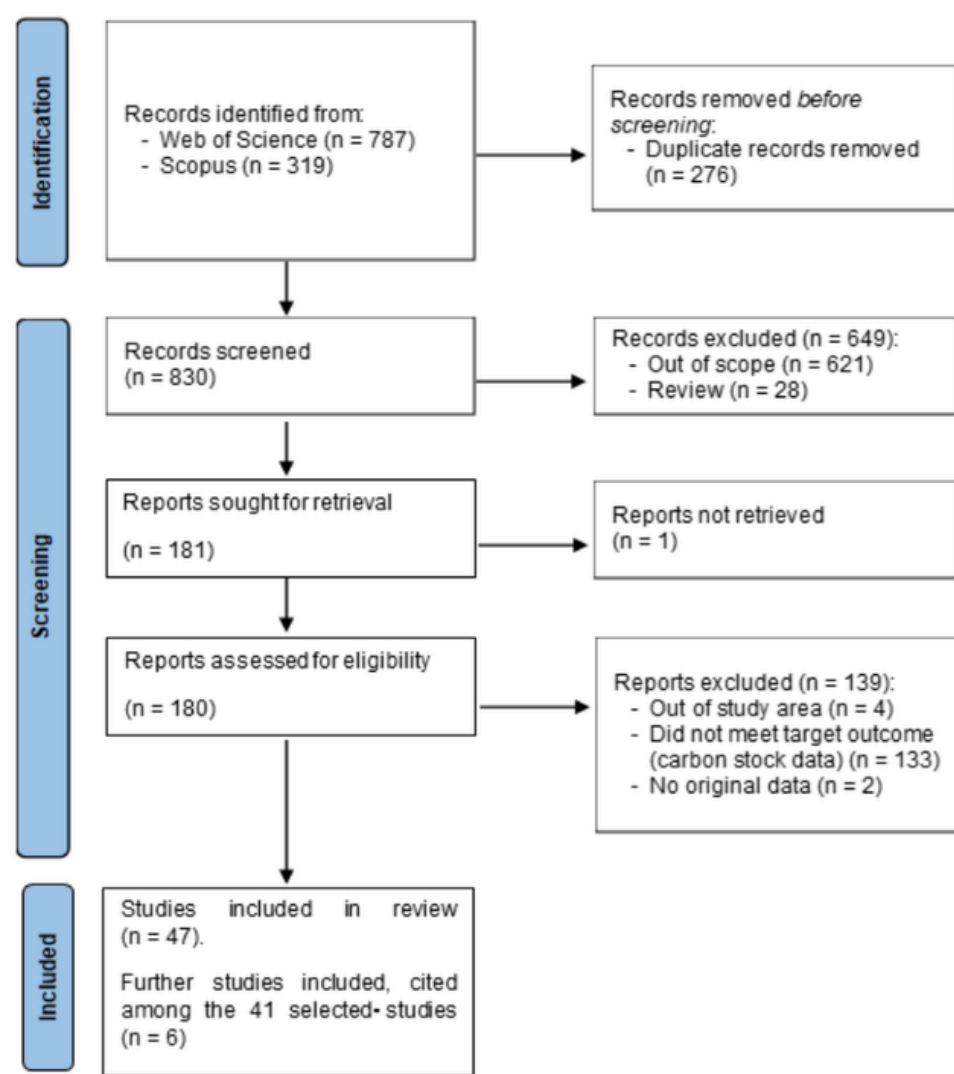
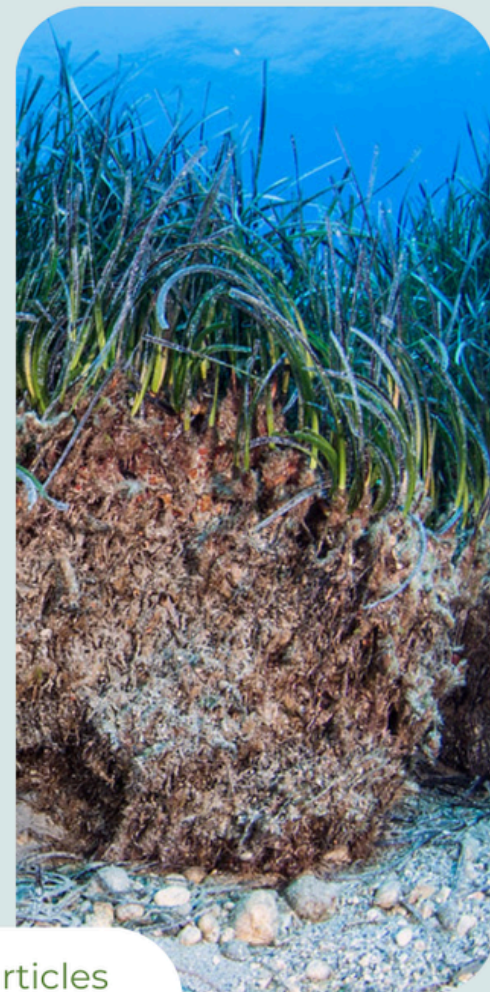


Fig.1 PRISMA Flow chart showing the strategy to be used



Only articles reporting carbon stock content per unit area were retained

RESULTS



Special Areas of Conservation

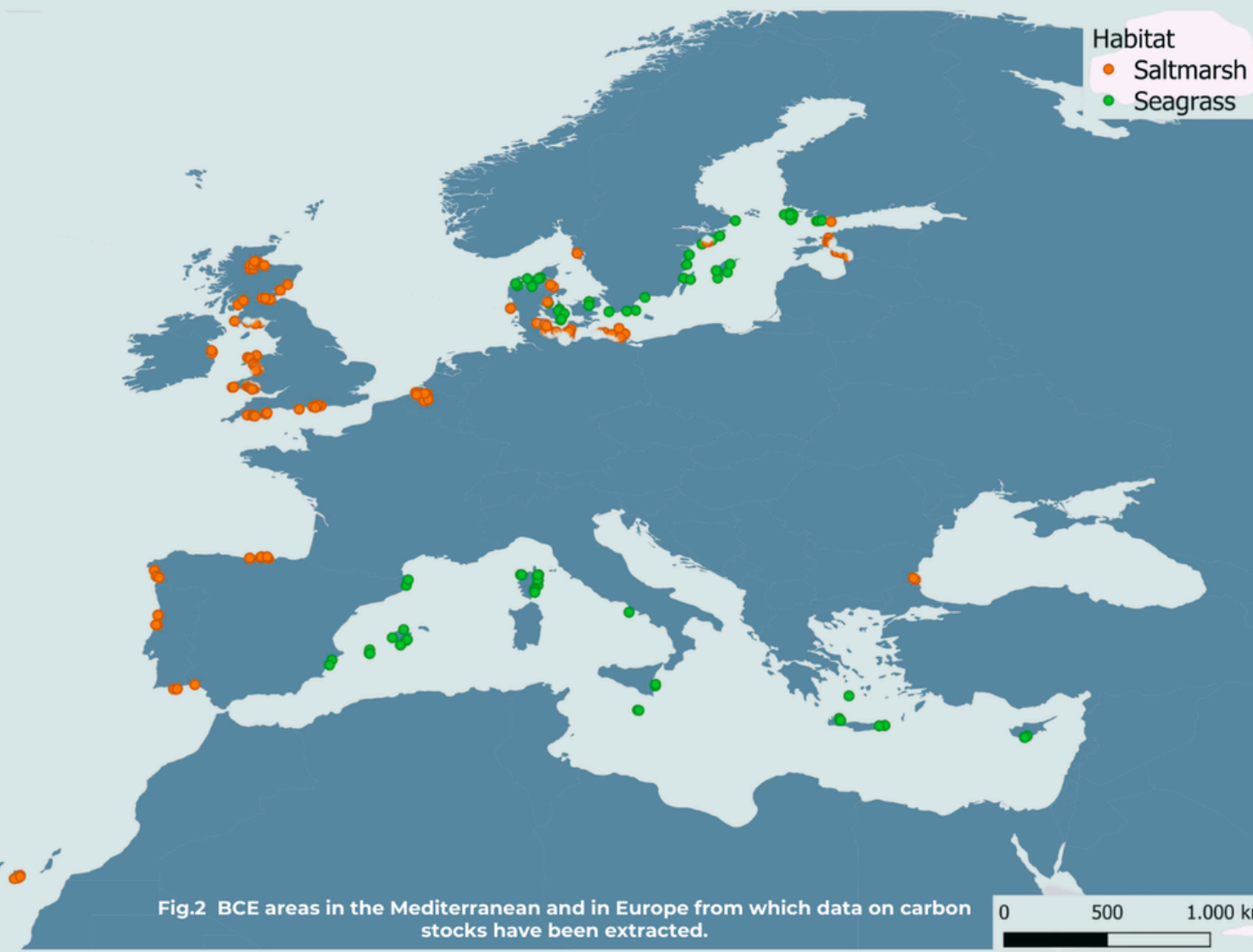


Fig.2 BCE areas in the Mediterranean and in Europe from which data on carbon stocks have been extracted.

CONCLUSION

Inventoried carbon stock is important to:

- ✓ obtain a baseline data on current state of BCE protection system at European level
- ✓ provide a more comprehensive BCE sequestration potential and its role in climate change mitigation

There is an urgent need to increase the spatial coverage of carbon stock investigations, particularly within Mediterranean MPAs

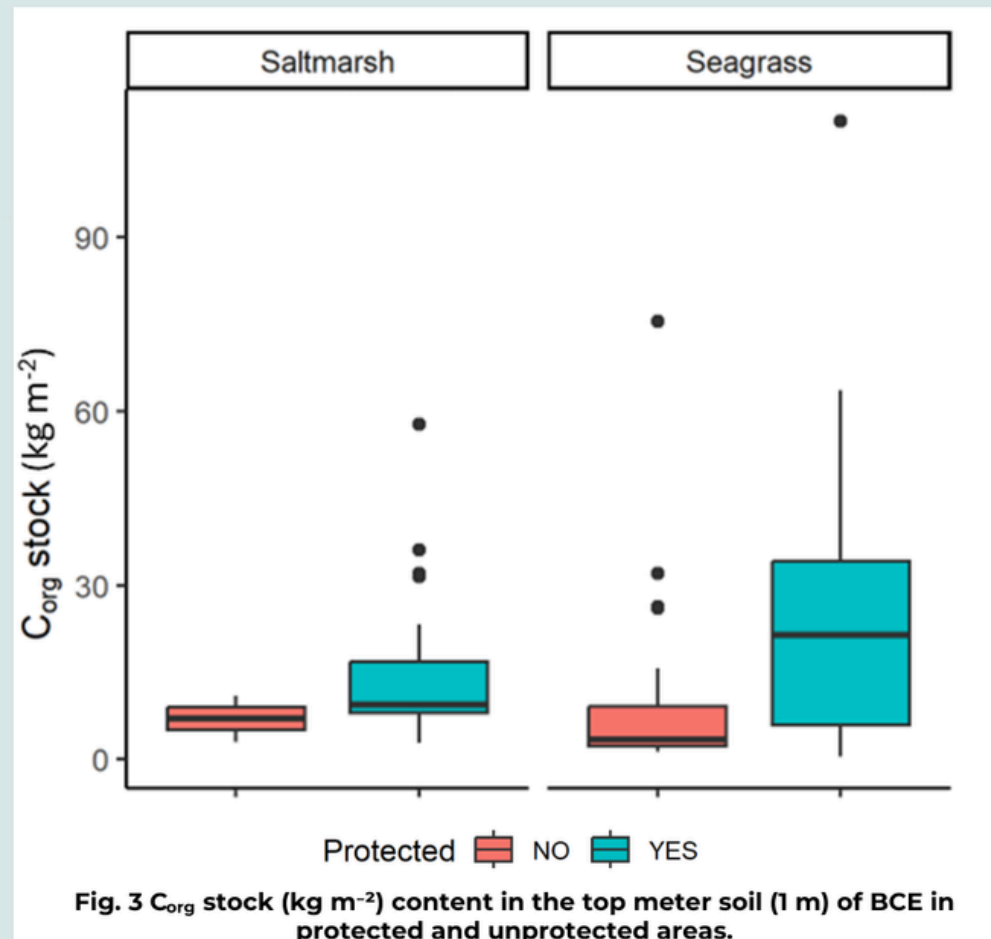


Fig. 3 C_{org} stock (kg m⁻²) content in the top meter soil (1 m) of BCE in protected and unprotected areas.

The C_{org} content (kg m⁻²) in the first meter of sediment was significantly higher in protected areas than in unprotected areas for seagrass habitats but not for saltmarsh

REFERENCES

¹Pendleton, L. et al. Estimating Global "Blue Carbon" Emissions from Conversion and Degradation of Vegetated Coastal Ecosystems. PLoS One 7(9), e43542 (2012)

²Howard, Jennifer, et al. "The potential to integrate blue carbon into MPA design and management." Aquatic Conservation: Marine and Freshwater Ecosystems 27 (2017): 100-115.

