MARBEFES PROJECT NEWSLETTER

Linking marine biodiversity to economic and cultural valuation.

December 2025 | Issue 3

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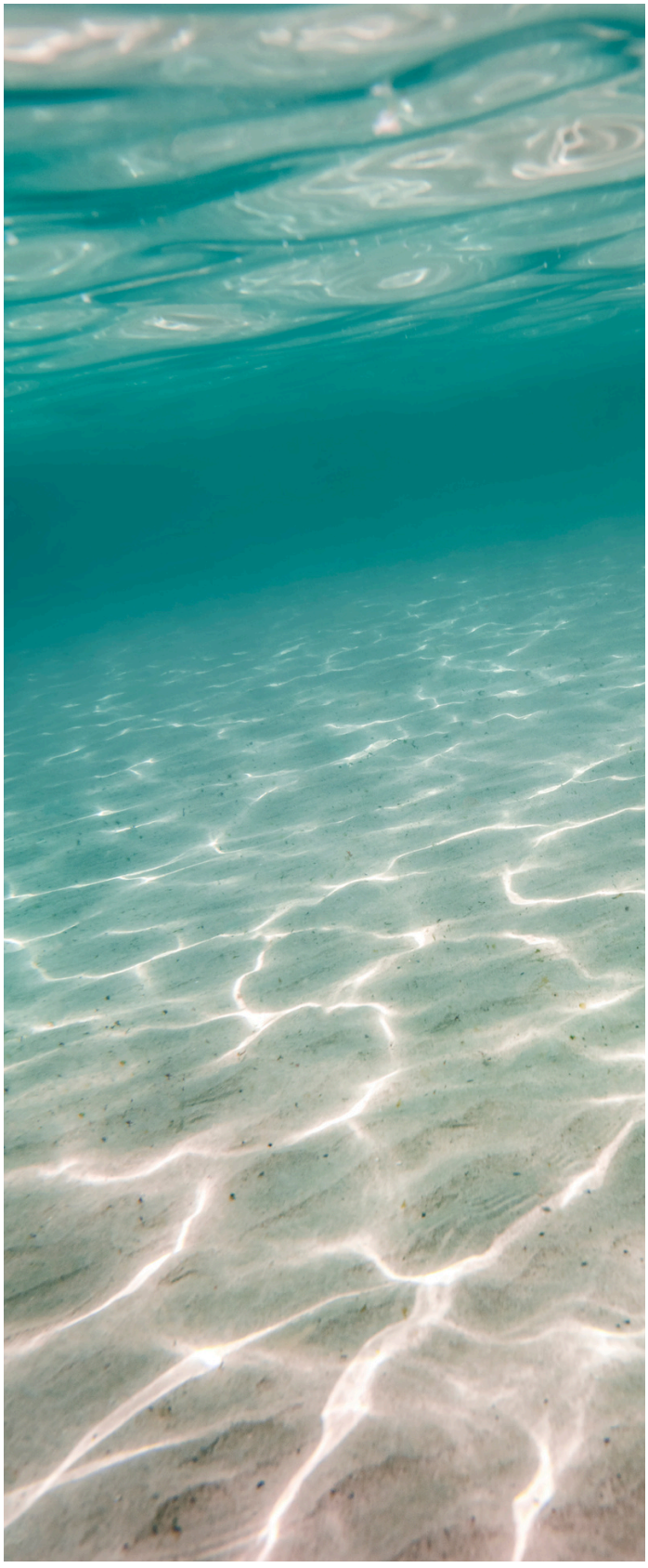

www.marbefes.eu

Introduction

In this issue you will find selected information about events and achievements in the MARBEFES project in 2025

MARBEFES

A collective and multidisciplinary effort to:

- Characterize marine biodiversity and link ecological structure to functioning across levels, from molecules to ecosystems.
- Define biodiversity-functioning-service links for key habitats and species in varied contexts.
- Assess ecological value in terms of fragility, connectivity, uniqueness, and vulnerability.
- Show how healthy biodiversity underpins ecosystem services and societal benefits.
- Apply natural capital accounting to value services and benefits.
- Advise on management to maximize ecological and economic value.
- Address global and European marine governance needs.
- Develop a toolbox for biodiversity valuation to guide policy and decision-making.


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What is this all about

The **MARBEFES** (**M**arine **B**iodiversity and **E**cosystem **F**unctioning leading to **E**cosystem **S**ervices) project aims to deepen our understanding of the links between marine biodiversity, ecosystem functioning, and the societal benefits they provide. With a focus on valuing natural and social capital, MARBEFES employs innovative tools to assess ecological and socio-economic aspects across 12 Broad Belt Transects, spanning diverse habitats from the Arctic to the Mediterranean.

By bridging gaps in knowledge and moving beyond compartmentalized approaches to biodiversity, the project emphasizes the interconnectedness of ecosystems along the river-to-ocean gradient. Involving 23 expert partners, MARBEFES co-develops tools with stakeholders to enhance policy and governance, ensuring sustainable management of marine resources for current and future generations.

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General Assembly

A 2.5-day General Assembly took place from 6 to 10 October in Seville, Spain. Meeting face-to-face greatly enriched the depth and quality of the discussions, reinforcing a shared commitment and paving the way for impactful final results.

Across a series of focused sessions, participants explored key components of the project. Discussions covered the MARBEFES Toolbox as the flagship product, the achievements and integration of biodiversity tools, and stakeholder usability and engagement. Sessions on ecological and economic valuation further examined outcomes from the BBTs and highlighted pathways for future application of tools and approaches by stakeholders.

Additional dialogues addressed upscaling and out-scaling strategies, stakeholder feedback, scenarios and gap analyses. The Steering Board shared reflections and strategic perspectives for the coming months. The meeting concluded with key messages, next steps, and administrative planning to ensure a strong and coordinated finish to the project.

Networking

BIOcean 5D General Assembly

A dedicated biodiversity session was held during the BIOcean 5D General Assembly, Barcelona, Spain, 11-13 February 2025. The session aimed at strengthening collaboration and alignment with representatives from seven EU partner projects working on marine biodiversity. We had a lot to discuss there.

Marine Biodiversity Cluster Event 2025

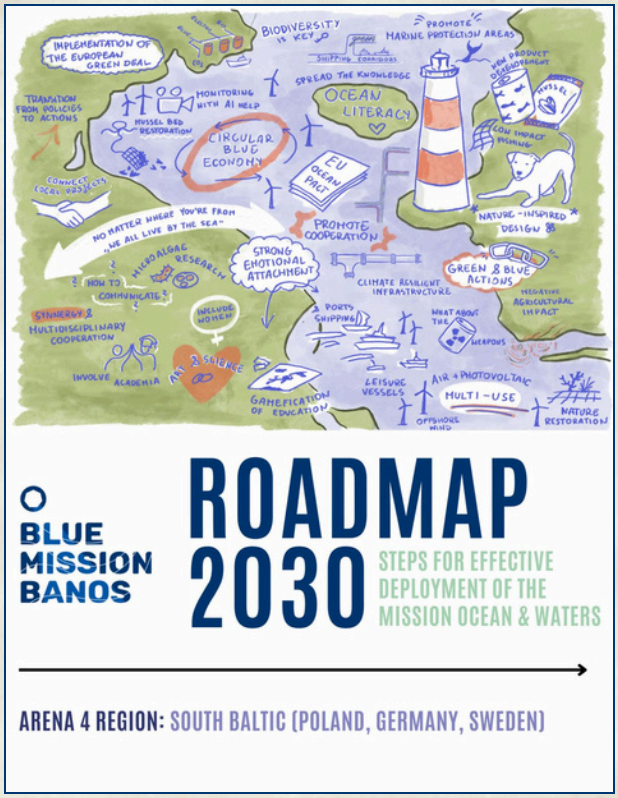
Representatives of the MARBEFES, among 30 EU projects, involved in marine biodiversity research have met on the Cluster event Restore & Protect Marine Biodiversity under the umbrella of BioAgora (https://bioagora.eu/).

Brussels, 13 March 2025

Capacity Building Session

Representatives of the MARBEFES, with cooperation of Marine SABRES, Marine Plan, Future Mares, OBAMA NEXT and GES4SEAS projects ran a seminar entitled "**Can we produce trustworthy artificial intelligence to support marine research and policy needs?**" Participants engaged in active discussion and networking across five sessions covering gender equity, peer-review practices, marine science culture, offshore wind and sustainability. Theme sessions further fostered dialogue on key marine science topics, including human dimensions, climate change, aquaculture and marine ecosystems.

Networking



4th Mission Arena

During the one-and-a-half-day event, in April 2025, participants discussed key blue economy issues in the Arena 4 region (Poland, eastern Germany, Denmark, south-eastern Sweden). Co-organised with the Blue Economy Baltic Forum and the Polish EU Council Presidency, the Arena focused on shipping, maritime security, and sustainable food production. Many MARBEFES project achievements were also presented and discussed.

The Arena was co-hosted by BlueMissionBANOS and the Sustainable Blue Economy Partnership.

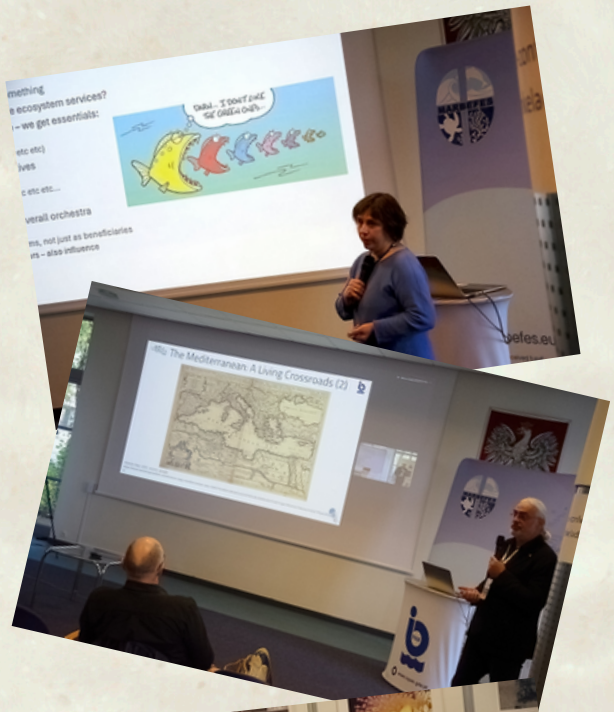
Networking

ICES 2025

the MARBEFES delegation, including both senior and early career researchers, participated in the ICES Annual Science Conference (ASC) in Klaipeda, Lithuania. Participants engaged in lively discussion and networking during five dedicated sessions, where big ideas met open conversations. These interactive forums addressed topics such as gender equity, peer-review practices, and the culture of marine science. Attendees also joined the playful "TAF-cademy Awards" and explored timely issues around offshore wind and sustainability. The theme sessions further encouraged exchange across key areas shaping marine science, including human dimensions, climate change, sustainable aquaculture, and marine ecosystems.

Networking

Humans and the European Marine Environment – Adaptation to Climate and Biodiversity Change



The MARBEFES project leader, Institute of Oceanology of the Polish Academy of Sciences (IO PAN) held an interdisciplinary conference organized as part of the implementation of the MARBEFES project.

The conference gathered representatives of the natural sciences, humanities, economics, and the arts.

The accompanying event was the exhibition titled: "Down Deep: Living Seas, Living Bodies" at the State Art Gallery in Sopot.

Overarching Stakeholders workshop.

Stakeholders and researchers discuss coastal management

photos: HuFoSS

The 2nd overarching workshop for stakeholders and researchers took place in Zandvoort, the Netherlands – 1-2 April 2025.

In the framework of the Horizon Europe projects MARBEFES and Marine SABRES, researchers and stakeholders from various regions came together to discuss and evaluate the results that emerged from the recently completed 2nd round of interviews and the various planning and policy instruments developed within both projects.

The workshop in Zandvoort not only generated valuable insights for both the MARBEFES and Marine SABRES projects, but also fostered a stronger connection between academic research and real-world practice. Through open dialogue, collaborative exercises, and knowledge sharing, stakeholders and researchers were able to exchange perspectives, identify common challenges, and explore opportunities for applying scientific findings in practical coastal and marine management. This interaction helped bridge gaps between theory and implementation, reinforcing the relevance of research outcomes for policy, community engagement, and ecosystem stewardship.

photos: HuFoSS

Surveying

Surveying Social and Cultural Benefits of Marine Environments

The survey explores how people use and value the sea, coast, and wetlands, focusing on recreation, relaxation, and cultural heritage. It examines how these benefits relate to ecosystem health and gathers views on how coastal areas should be managed. The research aims to better integrate social and cultural aspects of coasts into marine policy to support benefits for current and future generations.

We continue to survey residents and tourists visiting our operational BBTs. Some of them have been completed and resulted in results in word clouds.

We encourage you to participate and distribute!
Just click or scan links below

Gulf of Oristano

Gulf of Gdansk

Curonian Lagoon

The BioBlitz

Special event in Dublin

The third Bioblitz event was held on August 23, 2025, at Telegrafbukta in Dublin, with a focus on marine intertidal invertebrates as part of the MARBEFES project.

Photos: MARBEFES consortium members

From tiny isopods through various seaweeds to magnificent grey seals – this year's MARBEFES BioBlitz, hosted in Dún Laoghaire (County Dublin, Ireland) on August 23rd, was full of exciting finds. The event was held during National Heritage Week, aligning with this year's theme, "Exploring Our Foundations," which highlights biodiversity and healthy ecosystems as essential to society.

Within the MARBEFES project we organise such events in all of the four regions:
Sopot - June 2023,
Tromso - June 2024,
Dublin - 2025,
Sardinia - 2026.

What?

What is a Bioblitz?
A Bioblitz is a 24-hour species discovery challenge inspired by National Geographic. The goal is to identify as many species as possible within a specific area and timeframe.

Experts gathering

We thank our partner organisations (UCD SBES, INSS, IO PAN, NBDC, Dún Laoghaire-Rathdown County Council) for their support, and all volunteers who contributed to species identification, logistics, and safety.

The results

If you are interested what we have found during the previous events, check our database on the MARBEFES project webpage

Educational activities

Autumn School
The MARBEFES Tools: Protecting marine biodiversity for nature and humans.

Right after the General Assembly in Seville we ran a special event addressed to students, early career scientists, young researchers or early career practitioners.

Photo: CANVA stock

The program offered an interdisciplinary overview of contemporary approaches to marine biodiversity assessment and management. Participants explored methods for evaluating ecological structure and functioning, including both individual and system-level aspects of biodiversity. Attention was given to system-level ecological valuation, large-scale biodiversity and habitat metrics, and the identification of risks and hazards affecting marine ecosystems. The school also addressed the integration of biodiversity management tools such as decision support systems (DSS), along with a focus on social-ecological systems analysis. Finally, it explored the socio-cultural and socio-economic dimensions of biodiversity, emphasizing the importance of holistic valuation frameworks in marine conservation and policy.

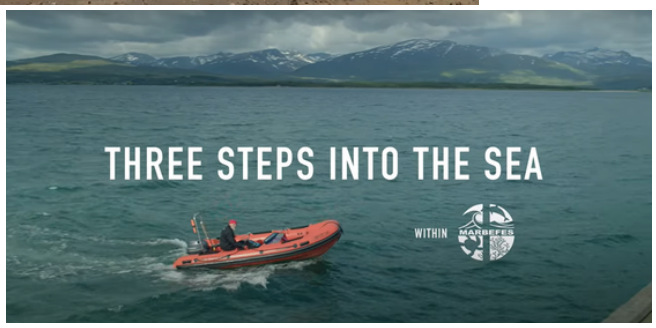
Ocean Literacy activities

Three steps to sea

The first three short films from the "3 Steps into the Sea" series are now available on social media. Each of the four planned episodes focuses on a different BBT and serves as a compelling inspiration to reflect on the state and changes in the biodiversity of Europe's coastal ecosystems, from the Arctic to the Mediterranean.

In the latest—third—episode of our journey through the BBTs, we take you to Dublin on the coast of the Irish Sea. Here, the ocean meets a vibrant cultural landscape, and the tides create a living laboratory of biodiversity.

Access through the MARBEFES Project website



We were present at the Science Picnic in Sopot on 20 September. On the grounds of IO PAN, 30 tents were set up, where 24 institutions presented their scientific and socio-ecological activities for the benefit of the marine environment. We were visited by 1,000 residents and tourists. Adults engaged in conversations, while children had a great time.

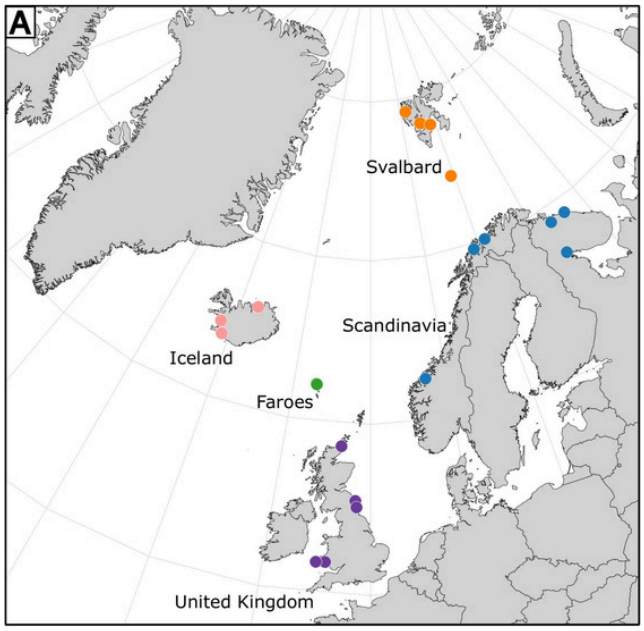
Publications

Arctic Past and Present Through the MARBEFES Lens

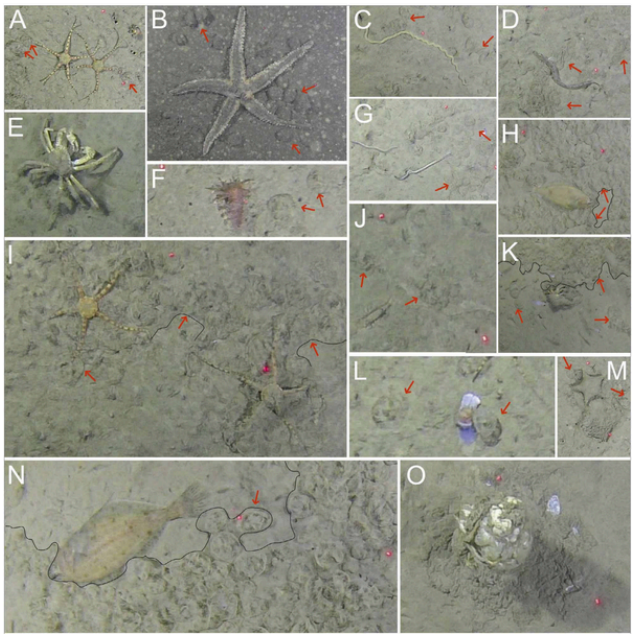
Genome sequence analysis provides evidence that a boreal crustacean colonised Svalbard well before the ongoing Atlantification of the Arctic

The arrival of the boreal barnacle Semibalanus balanoides in Svalbard was examined using low-coverage whole-genome data. Its colonisation was tested as either a recent result of human-driven Atlantification or an older natural event. The expansion was found to have occurred during the Holocene Thermal Optimum, well before the Anthropocene, although ongoing connectivity may still be introducing European genetic material into the Svalbard population.

DOI: 10.1038/s41437-025-00793-7



Map from original paper; Sampling locations



Images from original paper; red arrows points abandoned *Oikopleura vanhoeffeni* houses on seafloor of Isfjorden and Hornsund .

Observation of discarded appendicularian houses in the benthic and pelagic zones of Spitsbergen fjords using drop-camera imagery

Abandoned Oikopleura vanhoeffeni houses were observed accumulating on the seabed of several Spitsbergen fjords, based on 253 video stations recorded between 2015 and 2021. High mineral suspensions suggested effects on house production and sinking. This short-lived event is viewed as an episodic yet ecologically important example of benthic–pelagic coupling, revealed through modern video surveys.

DOI: 10.3354/meps

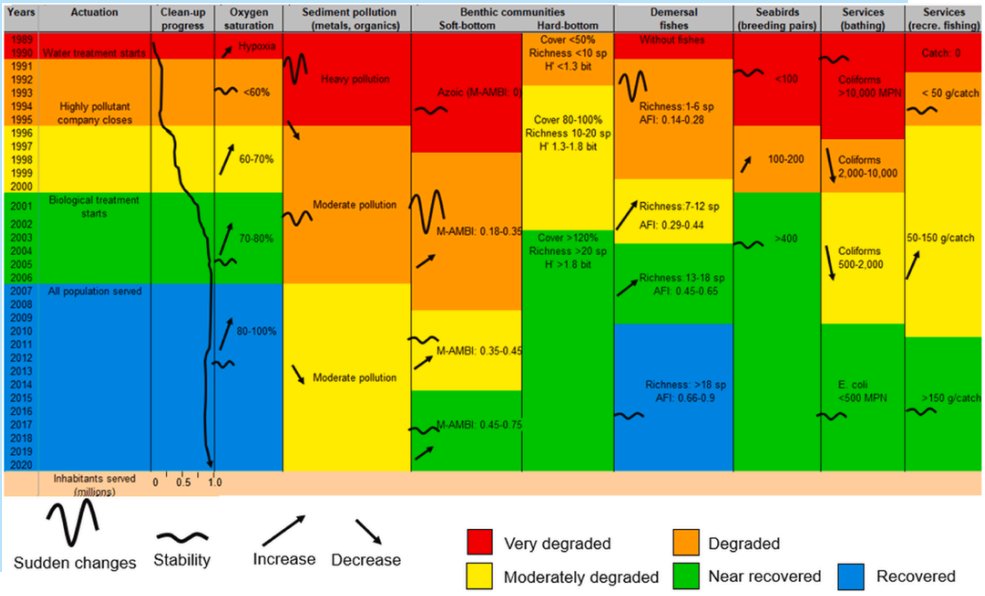
Publications

Knowledge to Action Translation

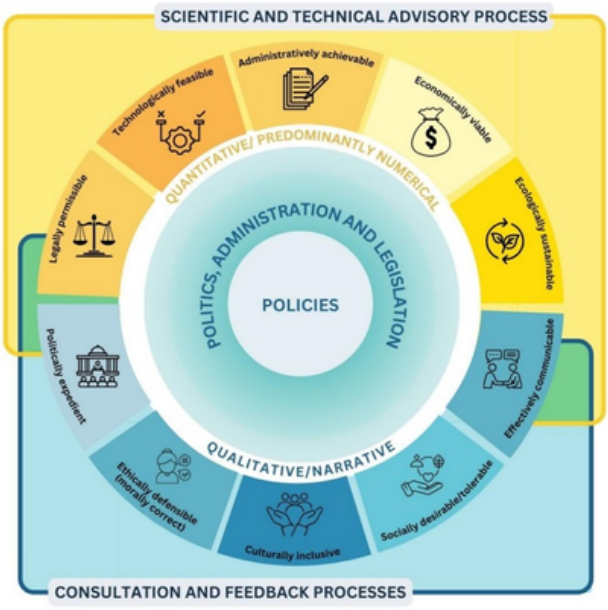
Managing marine resources sustainably – But how do we know when marine management has been successful?

Management success is viewed here as dependent on clear goals, effective stakeholder engagement and coordinated actions, especially in complex marine areas. It is emphasized that science cannot confirm a "successfully managed" environment due to shifting baselines and uncertainties, so success must be judged against SMART policy objectives and defined outputs. A well-structured planning cycle is therefore seen as essential, with actions implemented, outputs delivered and outcomes achieved through coordinated programmes.

DOI: 10.1016/j.ocecoaman.2025.107623



Graph from original paper; Nervión estuary recovery analysis



Infographic from original paper; The ten-tenets and their meaning

Making sense of marine management – The ten-tenets revisited

The ten-tenets for sustainable marine management are revisited, showing how they still support a continuum from the Ecosystem-Based Approach to Ecosystem-Based Management and Ecosystem-Based Technical Measures. Their overlap is noted, with ecological and communication tenets seen as overarching, while others may be weighted differently by context. The ten-tenets are considered robust tools for risk management and marine spatial planning, as all must be met to achieve sustainable, successful management.

DOI: 10.1016/j.marpolbul.2025.118580

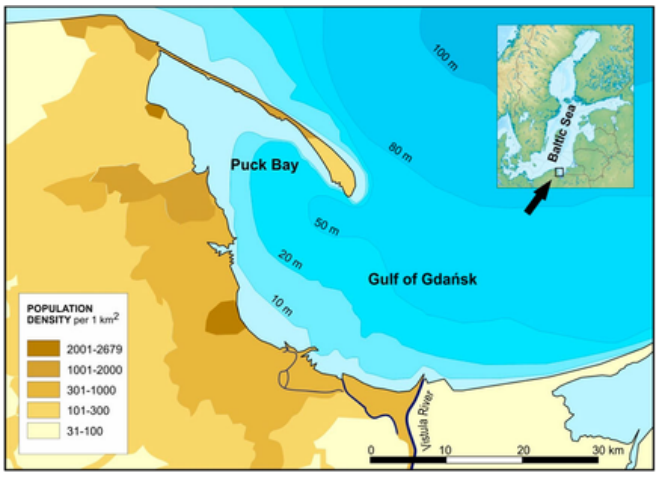
Publications

Human understanding and valuation of nature

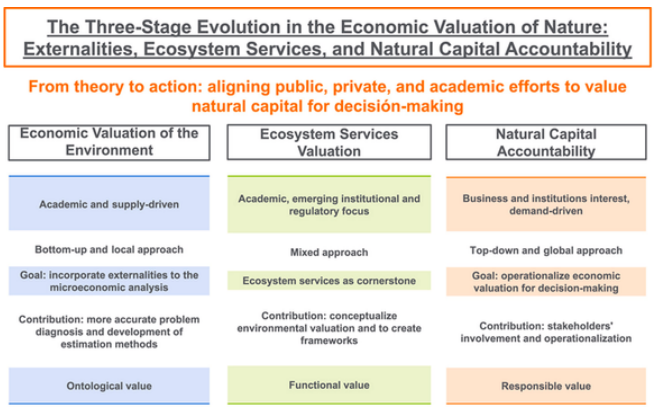
Environmental change between 1980 and 2020 followed by societal change in the Gulf of Gdańsk, Southern Baltic, a review

The Gulf of Gdańsk, long monitored and hosting Poland's widest range of marine habitats, has shown mixed trends over recent decades. Ecosystem health has generally improved through protection and natural recovery, with cleaner waters and rebounding coastal habitats. Yet global warming brings rising temperatures, weaker oxygenation and species shifts, masking some gains. Fishery decline, expanding tourism, and renewed industrial growth now shape a dynamic coexistence of natural, social and economic interests.

DOI: 10.3389/feart.2025.1557993



Map from original paper; Gulf of Gdansk with density of population on the coast and main bathymetric features.



The three-stage evolution in the economic valuation of nature: Externalities, ecosystem services, and natural capital accountability

The economic valuation of nature has evolved through three paradigms: valuing the environment, valuing ecosystem services, and assessing natural capital. Approaches have shifted from academic to operational as institutions and businesses are increasingly held accountable for their impacts and dependencies. Natural capital valuation now supports the ecological transition, guided by SEEA EA in the public sector and emerging private-sector initiatives. Though standards remain incomplete, growing collaboration suggests that broader consensus is on the way.

DOI: 10.1016/j.jclepro.2025.145899

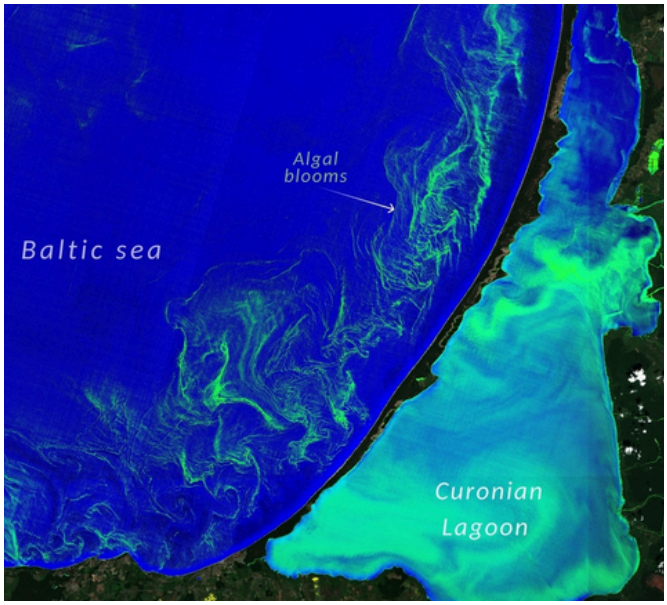
Publications

Computing the Future of Coastal Ecosystems

EUTROPY: A Python-based software optimized with Just-In-Time compilation for simulating eutrophication dynamics in aquatic systems

EUTROPY, an open-source Python tool, was developed to simulate primary production and study eutrophication. Python was chosen for usability, with performance boosted through Numba JIT compilation, reaching up to 40× speedups and surpassing a Fortran model. A Shiny interface enables interactive analysis, allowing simulation and visualization in one environment and making the tool practical for research and future environmental applications.

DOI: 10.1016/j.softx.2025.102430



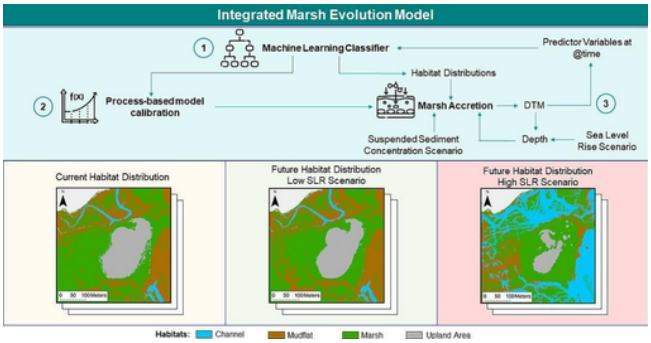
Copernicus; Sentinel-2

Canva stock

Eco-geomorphic modelling response of tidal marshes to sea level rise and changes in suspended sediment supply

Tidal marsh evolution under rising sea levels and changing sediment supply was assessed by integrating a machine-learning classifier with a process-based eco-geomorphic model. Potential future distributions of three Spanish marshes were simulated, showing substantial habitat losses under current sediment conditions. The combined approach was demonstrated to improve local-scale projections and can be adapted for other coastal systems.

DOI: 10.1016/j.scitotenv.2024.178164



Graphical abstract of original paper

Publications

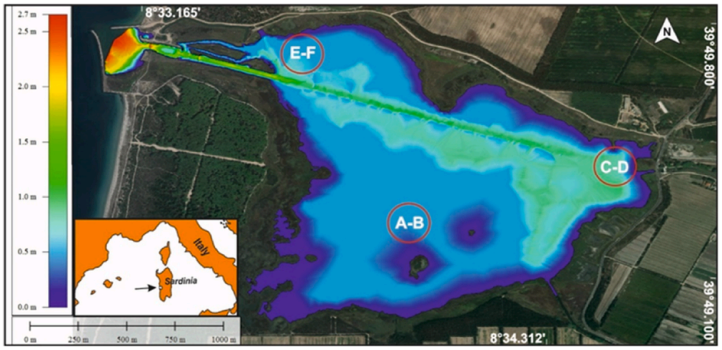
Benthic Responses to Habitat Conditions in Coastal Waters

Unveiling the diversity of benthic habitats of the Romanian Black Sea coast: New records and an updated checklist

An ecological survey of the Romanian Black Sea coast documented the rare bivalve Barnea candida for the first time in six decades, with mature and juvenile specimens indicating local recruitment. Thirteen benthic habitats were assessed, revealing 76 taxa and notable records such as Zostera marina. Marl beds were highlighted as key microhabitats. The findings provide a baseline to support monitoring, habitat protection, and biodiversity management.

DOI: 10.1016/j.gecco.2025.e03885

Benthic seascape; image from original paper



The S'Ena Arrubia Lagoon map with sampling locations; image from the original paper

Benthic trophic status and spatiotemporal variability of macrobenthic assemblages in S'Ena Arrubia Lagoon (Sardinia, Italy)

Benthic dynamics in a Mediterranean coastal lagoon were analyzed by relating macrobenthic assemblages to the quantity and nutritional quality of sedimentary organic matter. Seasonal and spatial differences were detected, with photosynthetically derived OM and freshness emerging as key drivers of abundance and richness. The results enhance our understanding of benthic ecosystem functioning and health of naturally eutrophic soft-bottom coastal lagoons.

DOI: 10.1016/j.ecss.2025.109452

We present here only few selected publications that appeared in 2025. The full list of publications can be found on the project website.

Editorial Notes

Issue #3
December 2025

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