

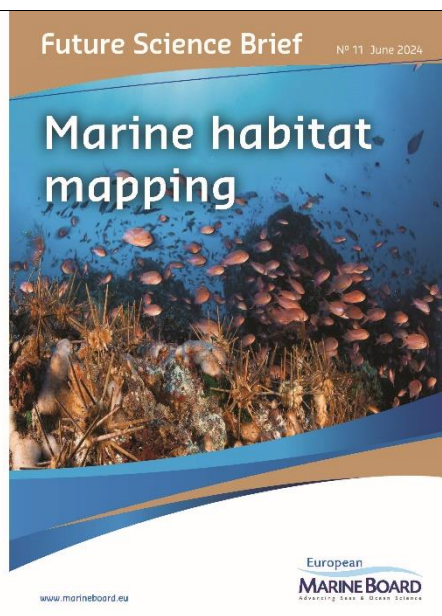
Marine habitat mapping

Background

Accurate and extensive marine habitat maps are fundamental to support a wide variety of marine policies and ambitions including the EU's Marine Strategy Framework Directive and policies to deliver the ambitious plans of the European Green Deal. However, large areas remain unmapped and current maps predominantly focus on physical aspects of marine habitats and lack sufficient biological resolution, such as species and communities. Higher resolution maps are needed to better represent the linkages between the seabed and water column in three-dimensions and to enable an ecosystem approach that considers the marine environment in the "fourth dimension" of time. In addition, there is a need for better standards for mapping and strengthened coordination of mapping efforts.

This Future Science Brief highlights science and policy needs and recommendations to advance marine habitat mapping in order to fulfil European and international ambitions for biodiversity, conservation, restoration and climate. It covers the following overarching topics:

1. Collecting data for marine habitat mapping: current and future trends in collecting remotely-sensed data and direct, *in situ* observations, and integrating artificial intelligence.
2. Combining data to produce marine habitat maps: physical and biological habitat maps, distribution models, fit-for-purpose habitat classification schemes, and assessing and communicating accuracy and confidence.
3. What and where to map: what has been mapped, key gaps, the need for spatial prioritisation, who uses marine habitat maps and for what purpose, and bespoke fit-for-purpose maps.
4. Communication and dissemination: increasing the value of each map via data dissemination, and using marine habitat maps to improve public understanding of the Ocean.



Recommendations

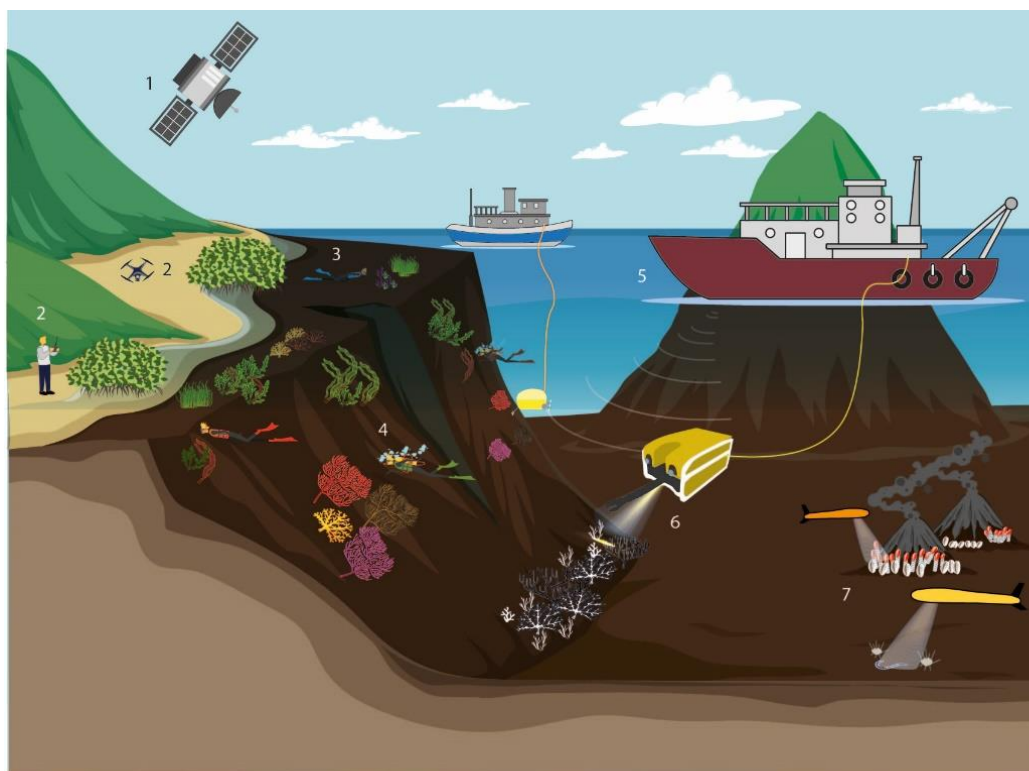
To address policy needs and increase the capacity for the production and dissemination of accurate marine habitat maps, we recommend scientists/map producers and research funders to:

- Support multidisciplinary national and EU research projects to advance novel methods to increase the resolution of biological information within marine habitat mapping;
- Support national and EU research programmes that focus on repeat mapping to understand temporal change, particularly of ecologically significant spatial units, i.e. hot spots of ecosystem functioning where high rates of change are expected;
- Promote the standardisation of mapping methods and outputs in research and mapping programmes;
- Promote and incentivise research and mapping programmes to publish marine habitat mapping data according to the Findable, Accessible, Interoperable and Reusable principles and to submit data centralised data services;

- Support public-private research collaboration for the development of cost-effective mapping tools; and
- Support dedicated mapping projects focusing on citizen science and reformatting mapping products that promote Ocean literacy.

In addition, we recommend policymakers to:

- Strengthen national, regional, European and international coordination mechanisms for interdisciplinary mapping efforts to ensure effective use of mapping resources and identification of gaps;
- Establish an international effort to identify priority areas in need of mapping, with a focus on areas of the largely unmapped deep-sea and coastal areas, which are under the greatest pressure from human activities;
- Require map producers (e.g. ICES Working Group on Marine Habitat Mapping, EMODnet, large mapping projects) or map users (e.g. the European Environment Agency, Joint Nature Conservation Committee) to produce best practice and reporting templates for the standardised assessment and reporting of map accuracy and confidence; and
- Advance habitat classification schemes, which lie at the heart of all marine habitat maps, to include quantitative characterisation of habitats to support the assessment of their condition. Habitat maps will be enriched further if these classification schemes link to other sources of information such as sensitivity to pressures and ecosystem service provision.



Credit: G. Castellan (CNR-ISMAR)

Find out more about the EMB Future Science Brief No. 11 “Marine habitat mapping” at:

<https://marineboard.eu/publications/marine-habitat-mapping>

June 2024