Rethinking the deep: collaborative and equitable approaches for deep-ocean science-policy engagement

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To most, the deep ocean is a remote, featureless, and inaccessible space. Yet it provides vital ecosystem services, from climate regulation to food security – and it's also a source of inspiration. Jules Verne's *Twenty Thousand Leagues Under the Sea* took generations on a journey aboard the Nautilus, a submarine ahead of his time; filmmakers have drawn on deep-ocean organisms to imagine iconic screen creatures; and scientists have explored the deep for over 150 years. Still, our ecological understanding of this vast biome remains limited due to logistical challenges, fragmented research, and strong spatial biases – most data come from the North Atlantic, Pacific, and Economic Exclusive Zone of economically developed nations. These gaps hinder our ability to address deep-ocean issues on a global scale and to support key policy efforts like the Agreement on Marine Biodiversity of Areas Beyond National Jurisdiction and the Kunming-Montreal Global Biodiversity Framework.

The UN Decade of Ocean Science for Sustainable Development (2021–2030) offers a unique opportunity to globally advance deep-ocean science. At the onset of the Decade, the Deep-Ocean Stewardship Initiative, being mindful of international policy process knowledge requirements, proposed a shift from business-as-usual to a coordinated, global, community-led programme with the ability to advance our understanding of deep-sea marine life at unprecedented scale. The Challenger 150[1], formally endorsed by the Decade in 2021, aims to expand biological observations, share research capacity, build ecological knowledge, and embed deep-sea science in policy and management. Now at its midpoint, Challenger 150 hosts ten Decade projects[2], has promoted the creation of an active African Network of Deep-water Researchers[3], reviewed the current knowledge on deep-ocean biodiversity in the North[4], South and Central Atlantic[5] and in the Arctic Ocean[6] and endorsed over 30 research cruises to map deep-ocean life in all ocean basins.

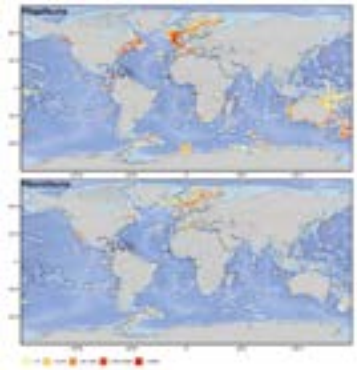

FIGURE 1
Open-access records in the Ocean Biodiversity Information Service (OBIS) for mega- and macrofauna below 200m depth.

FIGURE 2
Human capacity development. The first Deep-OceanTraining Expedition, onboard the research vessel B/O *Sarmiento de Gamboa*.

References

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