

How to shape global standards for blue data, technology and capacity-building

“How to” workshop summary

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Summary

Ocean health, climate resilience and sustainable economic growth are separate, but interconnected, challenges. The solutions, which will be essential for building resilient and sustainable ocean economies, are varied. But data must be part of all three. Collaboration and better sharing of data between governments, industries, scientists, NGOs and local communities, as well as the innovative use of new technologies, can provide new insights for marine conservation, climate modelling and disaster response.

Multi-directional data and capacity-sharing for collective benefit

Traditional models of data and technology sharing have tended to be unidirectional: from well-resourced nations, organisations and institutions to others. Instead, panellists called for multi-directional knowledge exchange, where all contributors play an active role in shaping global standards. Co-designing data collection and sharing frameworks with scientists, policymakers, local communities and private-sector users ensures that data are not just abundant but actionable.

Emerging technologies such as AI-enhanced mapping, satellite-derived bathymetry and autonomous systems must be integrated into global standards with a focus on accessibility. Technology transfer should not be one-way. Local and indigenous knowledge systems contribute valuable insights that should be incorporated into global frameworks. Capacity-building of end-users and the general public can enhance reliability, for example, educating fishers on the importance and utility of bathymetry data.

Regional and global best practices

Thinking global and acting local is critical. Good examples of this approach include the European Marine Observation and Data Network (EMODnet), the International Bathymetric Chart of the Arctic Ocean (IBCAO), Seabed 2030 and the WIObathy project in the Western Indian Ocean Region. Assessment of region-specific needs should look at areas such as regional versus global data resolutions (high or low), as well as quality to be achieved for sector-specific needs, for example, fisheries, harbour infrastructure and marine spatial planning.

It is essential to know what is wanted out of the data before embarking on data collection or sharing. Data sovereignty and ownership need to be explicitly captured and acknowledged. Balancing incentives for data-sharing can be supported



by easily interpretable metadata. By developing and describing the entire data continuum, data-sharing policies can help to capture the process from sounding to the final end-user and the different aspects of each step. Clarity of data standards is crucial, e.g. ISO metadata formats. The use of data needs to be made relatable and multidisciplinary. For example, the Ecological Benthic Unit project seeks to utilise the General Bathymetric Chart of the Oceans (GEBCO) grid to ecologically characterise the seafloor for several reasons and multiple sectors.

Making data collection cheaper and more efficient

A lack of funding and how to increase funds to gather data is often discussed. However, the current framework is making ocean-data collection more expensive than it needs to be. There are two avenues through which the entire suite of ocean-data collection can be more efficient and cheaper:

- Permits
- A complete and openly available higher-resolution seafloor map

A universal permit across the ocean would allow for the gathering of scientific data.

Fostering a culture of data-sharing is important. Sometimes there is mistrust or lack of open sharing of data, so the same area is mapped multiple times by scientists and industry. Data-sharing is critical to enhance scale, accessibility, efficiency and data quality. Collaborations with vessels of opportunity, including small research vessels, fishing fleets and indigenous communities, demonstrate how decentralised data collection can enrich global datasets and foster mutual benefits. For example, Schmidt Ocean Institute provides its vessel and all the tools and facilities on board at no cost to scientists, and in exchange asks that the data be made openly available as quickly as possible.

The crucial role of data partnerships

Organisations such as the United Nations Environment Programme and Schmidt Ocean Institute as well as several governments are part of the Ocean Decade Alliance, a global platform that focuses on action and the shared development of solutions. Seabed mapping has been identified as a core issue that aligns with a flagship priority of the UN Ocean Decade.

Boosting ocean literacy is important, for example via strengthening blue-economy curricula in universities and technical training institutes. Knowledge-sharing between the global north and south should be facilitated and local innovation hubs in coastal and island nations supported. Capacity-building efforts must move beyond traditional training workshops to foster sustained partnerships. This includes creating pathways for regional leadership in ocean mapping, ensuring long-term investment in infrastructure, and promoting open and reciprocal exchanges of knowledge and skills.

A global approach to blue data, technology and capacity-building is essential for ocean health. This workshop highlighted the need for multi-directional data-sharing, regional adaptability and cost-effective solutions to improve access to high-quality ocean data. By integrating emerging technologies, fostering inclusive collaborations and strengthening data partnerships, stakeholders can create global standards that drive sustainable economic growth, climate resilience and marine conservation. Aligning financial mechanisms with these efforts will not only enhance investment opportunities but also ensure that ocean data becomes a fundamental pillar of decision-making across industries, governments and communities.

