Commissioned by

HIGH LEVEL PANEL *for*
A SUSTAINABLE
OCEAN ECONOMY

BLUE PAPER

Summary for Decision-Makers

Technology, Data and New Models for Sustainably Managing Ocean Resources

Ocean knowledge and technology are more developed today than ever before. Despite this progress, our understanding and ability to manage ocean resources sustainably continues to be hindered. Limitations include a lack of capacity to gather ocean data and an inability to translate such data into accessible and useful information for decision-makers.

New research[1] commissioned by the High Level Panel for a Sustainable Ocean Economy indicates that the current explosion in new data and technology brings with it a significant opportunity for better management of ocean resources. The paper assesses how this revolution in ocean data and technology can be leveraged to secure better ocean monitoring and management.

Advances in data and technology are spurring new opportunities for scientific data collection and provide a significant opportunity to improve oversight of the impact of human activity on the ocean at global and local scales. Such advances include: the exponential increase in the number and variety of ocean observing systems (including profiling floats and cabled observatories); the appearance of new communication pathways (such as acoustic modems, hybrid systems and high-bandwidth communications); the developments in microelectronics and mechanical design (allowing measurements of physical properties, identification of harmful algal blooms and environmental DNA analysis; and advanced processing and visualisation capabilities (such as artificial intelligence, which is rapidly expanding our ability to extract information from data).

However, these advancements come with technical and non-technical challenges. On the technical side, challenges continue to exist with sensor power availability, navigation and communication. The costs of sustaining long-term observing systems and remote infrastructure remain high, as most ocean instruments and platforms are expensive and many are crafted by hand. On the non-technical side, we lack the tools to translate the explosion in unstructured data into knowledge that is actionable and accessible for global resource users. Current models of technology development may exacerbate existing inequalities and resource depletion.

Seizing the opportunity presented by these advances in technology and data availability will require breakthroughs on several fronts. The paper identifies three priorities to create an open, actionable and equitable digital ecosystem for the ocean:

End the segregation of data to create a new era of open and automated data access. We need to ensure that the data now locked in the servers of government agencies, businesses and researchers are much more broadly available, through data tagging, federated data networks and, where possible, data "lakes," and to enable the development of an ocean "Internet of Things."

Harness this revolution to support vital innovations in management. Real-time information and automation can allow robust and nimble adaptation to changing conditions and create new accountabilities in government and in business.

Create the incentives, investments and business models that will support the innovations that are needed not just by wealthy governments and resource users but by all who depend on the ocean and have a role in sustaining the ocean's future.

The Six Critical Steps to Realise the Vision of a Digital Ocean

In the pursuit of the outlined priorities, the paper also identifies six critical steps required to achieve them. Taken together, these steps aim to realise the vision of a digital ocean and to enable the development of new capabilities to understand and steward ocean resources.

1. **Capitalise on the UN Decade of Ocean Science for Sustainable Development:** Scientists, government and industry should build on existing efforts to create a global data network that provides broad and automated access to ocean data.
2. **Liberate ocean data:** Enabled by federated networks, data holders should establish a new default – that ocean data are broadly available to other users unless there are compelling security, proprietary or other interests preventing this.
3. **Create an "Internet of Things" for the ocean:** Coordinated efforts by industry, researchers and governments can create advanced sensor networks that provide high-resolution, real-time information about the ocean to anyone who needs it.
4. **Automate ocean management based on near real-time data on ocean conditions and resource use:** Governments and companies should expand the use of dynamic management, the application of automated mitigation measures and the creation of mechanisms for data-based proof of compliance.
5. **Create incentives for innovation:** Existing markets do not incentivise many of the technological innovations that are needed for ocean stewardship and research. Governments and companies can change that via better regulation, increased transparency/traceability and partnerships with the private sector.
6. **Mobilise capital for technologies for under-served markets:** Many markets for ocean technologies do not offer commercial returns. We therefore need innovative financial instruments that can leverage the different expectations and risk tolerances of different investors.

The High Level Panel for a Sustainable Ocean Economy (Ocean Panel) is a unique initiative by 14 world leaders who are building momentum for a sustainable ocean economy in which effective protection, sustainable production and equitable prosperity go hand in hand.

Co-chaired by Norway and Palau, the Ocean Panel comprises members from Australia, Canada, Chile, Fiji, Ghana, Indonesia, Jamaica, Japan, Kenya, Mexico, Namibia, Norway, Palau and Portugal and is supported by the UN Secretary-General's Special Envoy for the Ocean.

The Ocean Panel gathers input from a wide array of stakeholders, including an Expert Group and an Advisory Network. The Secretariat, based at World Resources Institute, assists with analytical work, communications and stakeholder engagement.

The Blue Paper that this brief summarises is an independent input to the Ocean Panel process and does not necessarily represent the thinking of the Ocean Panel, Sherpas or Secretariat.

For more information, including the full report, visit **www.oceanpanel.org**

Endnotes

1 Leape, J., M. Abbott, H. Sakaguchi et al. 2020. *Technology, Data and New Models for Sustainably Managing Ocean Resources*. Washington, DC: World Resources Institute. Available online at www.oceanpanel.org/blue-papers/technology-data-and-new-models-sustainably-managing-ocean-resources.