Building Blocks for an Ocean Act

IV. Ocean research, knowledge, literacy and skills

From observation to action: Europe's ocean knowledge system

Why is the Ocean Act needed for Europe's ocean research and knowledge

The ocean remains one of the least understood components of the Earth system. Despite major advances in marine science, significant knowledge gaps persist regarding the state of marine ecosystems, the impacts of human activities and the consequences of climate change.

Robust scientific knowledge is essential for effective ocean governance. Better observation, monitoring and data-sharing support more informed policy decisions, improve implementation and help anticipate emerging challenges.

Europe possesses some of the world's most advanced ocean observation and research capabilities. However, these capacities remain fragmented and scientific knowledge does not always translate effectively into policymaking.

The Ocean Act should strengthen the foundations of science-based ocean governance by improving coordination, knowledge-sharing and public engagement.

Policy context and Ocean Pact commitments

The Horizon Europe programme and the EU Mission Ocean and Waters have placed research, innovation and knowledge generation at the centre of European ocean policy. More recently, the Ocean Pact announced several initiatives aimed at improving coordination and strengthening Europe's leadership in ocean observation.

These include OceanEye, which seeks to improve the integration of European ocean observation systems and strengthen the global ocean observing system, and a future Ocean and Water Research and Innovation (R&I) Strategy intended to promote a more coordinated source-to-sea approach.

The launch of Partners4Ocean further reflects growing recognition that ocean governance requires collaboration between scientists, policymakers, civil society and economic actors.

The Ocean Act should provide the governance framework necessary to connect these initiatives and ensure that knowledge is effectively translated into action.

Key measures for the Ocean Act

1. Develop a European strategy for marine research

The Ocean Act should establish a science to policy interface for European marine research capable of responding to the concrete societal needs of EU Member States, building upon OceanEye and the forthcoming Ocean R&I Strategy. Without undermining fundamental research, it should strengthen the connection between marine science and political priorities by identifying priority areas for research, including the ocean-climate nexus and ocean currents; environmental, military and economic security; marine nature-based solutions; and the development of metrics for the revaluation of natural capital generated by the ocean, notably blue carbon sequestration.

2. Strengthen science-based decision-making

The Act should reaffirm the use of the best available scientific evidence in policymaking while clarifying the application of the precautionary principle where significant environmental risks exist despite remaining uncertainties.

3. Facilitate data sharing and interoperability

The Ocean Act should promote greater accessibility, interoperability and (re)use of marine data in order to improve reporting, reduce administrative burden, and facilitate cross-border cooperation. Building on initiatives such as OceanEye, it should facilitate the integration of data flows across ocean-related legislation and reporting processes, including the Marine Strategy Framework Directive, Maritime Spatial Planning Directive and Nature Restoration Regulation.

4. Develop a pan-European ambition for ocean exploration

Building on existing or emerging initiatives, including the International Alliance and the Neptune Mission, the EU should establish a long-term objective for coordinated ocean exploration and observation efforts, helping address persistent knowledge gaps and strengthen Europe's scientific leadership.

5. Promote dual-use and multi-purpose ocean knowledge systems

The Ocean Act should support the development of integrated digital ocean infrastructures capable of serving not only environmental management but also maritime surveillance, emergency preparedness and broader public-interest objectives. Tools such as the Digital Twin of the Ocean and related services developed by Mercator Ocean International – in the process of becoming an intergovernmental organisation (IGO) – can help maximise synergies between environmental, economic and security objectives.