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'THE OCEAN WE NEED' - EUROPE'S LEADING OCEAN EXPERTS LAUNCH ADVICE FOR GOVERNMENTS

Leading European ocean experts have launched a publication, titled **Navigating the Future V** (NFV), which will provide governments with robust, independent scientific advice on future seas and ocean research to 2030 and beyond. The launch took place during EurOCEAN2019, the European Marine Board conference in Paris today.

The experts from the European Marine Board, an independent non-governmental advisory body that represents more than 10,000 marine scientists across Europe, have identified the key areas of marine science where there are still gaps in knowledge.

In the Foreword, Jan Mees, Chair of the European Marine Board states: "This knowledge is critical in understanding the four-dimensional ocean, to predict tsunamis and the impact of multiple stressors on biogeochemistry and biology, and to understand the impact of the future blue economy on our marine ecosystems. NFV shows that we need transdisciplinary science and sustainability science to address the management of a holistic four-dimensional ocean. It also highlights the technological advances and modelling needed for a possible future virtual ocean that would enhance public engagement and understanding of the ocean".

NFV proposes the science we need for the forthcoming [UN Decade of Ocean Science for Sustainable Development](#) (2021-2030), the next European Framework Programme, [Horizon Europe](#), and Mission on Healthy Oceans, Seas, Coastal and Inland Waters."

Specifically, the report recommends a solutions-oriented marine research agenda, co-designed with all stakeholders, and with the governance of sustainability at its core. It should address the following key knowledge gaps and actions:

- The four-dimensional ocean i.e. a three-dimensional volume that changes over space and time. An interdisciplinary research program on ocean connectivity is needed including more knowledge of the functional links that connect the components of the marine system, i.e. physics, chemistry, biology, geology, ecology and humans. The four-dimensional structure and function of marine ecosystems should be better integrated into management and conservation practices;
- The impact of multiple stressors (e.g. climate change, pollution, overfishing) on the functioning of marine ecosystems, their interactions, evolution and adaptation over time, and the ecosystem services they provide;
- Climate-related extreme events and geohazards including marine heat waves, storm surges, meteotsunamis and submarine earthquakes, landslides, volcanic eruptions and their associated tsunamis. We need to better understand their characteristics, probability,

impacts and potential changes under climate change. An early-warning system for these events that will include enhanced observations, modelling and forecasting is a priority;

- Ocean technologies, modelling, data and artificial intelligence needed for sustainable ocean observations to understand, predict and manage human impacts on the ocean. A key action includes the development of a business model ensuring the long-term economic sustainability of ocean observations; and
- A new generation of sustainability scientists needs to be trained to focus on a holistic vision of the marine ecosystem. We also need to establish a sustainability forum within Europe bringing together all actors including industry and civil society.

The report has been a collaborative effort starting in November 2017 with a planning meeting of 19 leading European marine scientists to decide the high-level content. Larger collaborative working groups with representatives from 13 European countries then worked to identify knowledge gaps and draft the recommendations of the report.

Notes to editors

[For more information or to receive a pre-launch copy of Navigating the Future V please contact:](#)

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The European Marine Board (EMB) is a leading European think tank in marine science policy. EMB is a network with a membership comprising over 10,000 marine scientists from the major national marine/oceanographic institutes, research funding agencies and national networks of universities from countries across Europe. The Board provides a platform for its member organizations to develop common priorities, to advance marine research, and to bridge the gap between science and policy to meet future marine science challenges and opportunities.

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