



European Marine Board Expert Working Group

Navigating the Future VI

Terms of Reference

May 2022

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1. Background and rationale

The European Marine Board Navigating the Future flagship publication series¹ provides regular pan-European summaries of the current status of marine research, priority recommendations and future scientific challenges in the context of societal needs. Navigating the Future is a blueprint to guide both the research and the science policy agendas at European and national level.

Navigating the Future V (NFV; European Marine Board, 2019) focused on the marine science needs for a sustainable future, with a timeline up to 2030 and beyond, and recommended a solutions-oriented, transdisciplinary marine research agenda, co-designed with all stakeholders and with the governance of sustainability at its core.

Building on this foundation, Navigating the Future VI (NFVI) will aim to take a holistic perspective to highlight the science needed to achieve a broad societal understanding of the links between the Ocean and the global Earth system, society, and public policy, so that knowledge about the Ocean can take a central role in planning for a sustainable future. In short, it aims to highlight the Ocean's place in the world. This includes taking a systems approach to understanding and managing the water system, weather and climate systems, biodiversity, and the links between the Ocean and human societies, economy, health, and wellbeing.

A key principle that needs to be strongly represented across all chapters of NFVI is a transdisciplinary approach to knowledge production. To achieve a sustainable future, difficult decisions will need to be made. This will require stronger connections between academic disciplines including natural sciences, humanities, social sciences, and political sciences, as well as engaging government, industry, and citizens to co-design the knowledge needed for sustainable development. NFVI will develop recommendations for knowledge-based solutions to address key societal challenges on how humanity is going to live in harmony with the Ocean. It will also identify and describe critical unknowns in Ocean natural and social sciences, including biology, chemistry, physics, geology, humanities, economics, and psychology. It will provide recommendations on how to close knowledge gaps on these fundamental aspects of marine science and how to make these discoveries visible and understandable to policy makers, industry, and society at large.

NFVI seeks to build on key concepts within NFV, including co-designed transdisciplinary sustainability science, digitalization, a four-dimensional and connected Ocean, science of surprises, and multiple stressors. NFVI will take stock in terms of progress towards achieving the goals of UN Decade of Ocean Science for Sustainable Development², the EU's Mission *Restore our Ocean and Waters*³ (and other EU Missions), and Horizon Europe⁴ at their mid-term points. It will provide a vision and recommendations for what is missing in terms of research needs and will ensure that the science is accessible for informing these initiatives. NFVI will highlight the recommendations from previous Navigating the Future editions where further work still needs to be done and will make recommendations on next steps to ensure the success of these initiatives.

¹ <https://www.marineboard.eu/navigating-future>

² <https://www.oceandecade.org/>

³ https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/healthy-oceans-seas-coastal-and-inland-waters_en

⁴ https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en

2. Working Group Objectives

Navigating the Future VI will be structured around four key chapters, selected due to their link to policy interest at national, European, and international level and their transdisciplinary nature: **Ocean and Climate; Ocean and People; Ocean and Fresh Water; and Ocean and Biodiversity**. These chapters should identify and describe knowledge-based solutions to societal challenges; environmental and social-economic impacts of pressures and solutions; fundamental knowledge gaps; and how to fill these knowledge gaps. The following **tentative themes** are proposed and **will be further defined and expanded** by the Working Group members, and could move between chapters:

Ocean and Climate – This chapter may include topics such as the impact of climate change on Ocean processes, including Ocean warming, acidification, deoxygenation, and sea-level rise. It also may discuss Ocean-based solutions to the impacts of climate change and de-carbonization pathways. Climate and weather prediction, including extreme events may also be a topic of interest. It will link to the Ocean Decade societal outcomes of a Clean Ocean, A Healthy Ocean, a Safe Ocean, a Predicted Ocean, and a Transparent Ocean.

Ocean and People – This chapter may include topics such as feeding a growing global population, Ocean and human health, developing a sustainable Ocean economy, and human engagement with the Ocean via culture. It will link to the Ocean Decade societal outcomes of a Productive Ocean, a Safe Ocean, a Predicted Ocean, a Transparent Ocean, an Inspiring and engaging Ocean.

Ocean and Fresh Water – This chapter may include topics such as links between the Ocean and water cycle, coastal groundwater, nutrient pollution and eutrophication, and other pollutants. It will link to the Ocean Decade societal outcomes of a Clean Ocean, a Predicted Ocean, and a Transparent Ocean.

Ocean and Biodiversity – This chapter may include topics such as biodiversity loss and ecosystem impacts, invasive Species, and Ocean-based solutions for biodiversity action, including conservation and restoration. It will link to the Ocean Decade societal outcomes of a Healthy Ocean, a Productive Ocean, a Clean Ocean, a Predicted Ocean, and a Transparent Ocean.

All chapters will include knowledge gaps and research needs and cross-cutting themes that should be included in all chapters and for which recommendations should be developed are: **transdisciplinarity, digitalization and digital twins, technology, open science, training needs, links to relevant European and international science-policy initiatives, and how to engage citizens including via Ocean Literacy.**

These chapters have been selected because together they cover the main global Earth systems. They are transdisciplinary by nature and represent the key frontiers on which the Ocean science community must engage to help make the difficult decisions that we face. The aim of this document, via these four chapters, is to highlight the central role that the Ocean plays in the Earth system and therefore the importance of Ocean science for our future.

The final publication is expected to be a clear, concise and visual publication in the range of 50-100 pages in length.

3. Working Group Composition

Working Group Chair and Co-Chair

The Working Group (WG) Chair and Co-Chair represent the WG and take responsibility for its deliverables.

For the NFVI working group, the role of Chair will be taken on by the EMB Chair. The EMB Executive Director, Professor Sheila Heymans, will take on the role of Co-Chair.

Roles and responsibilities of Working Group Chairs

The Working Group (WG) Co-Chairs are responsible for ensuring the scientific quality of the WG output(s) and its timely delivery according to the WG Terms of Reference and as agreed at the kick-off meeting. The WG Chairs provide scientific leadership and act as the driving force for the WG activities with the support of dedicated European Marine Board Science Officers who act in the capacity of WG facilitators (see below). **The time contribution estimated for the Chair and Co-Chair is 15 days per year per person** (not including time to travel to in person meetings), considering the roles listed here below.

The WG Chairs (lead Chair primarily and Co-Chair when the lead Chair is not available):

- Chairs WG meetings, i.e. moderate discussions and ensure delivery of meeting outputs;
- Coordinate the scientific contributions to the document draft according to the objectives defined at the kick-off meeting;
- Maintain an overview of the content and quality of the various inputs and requests additional expertise if necessary;
- Ensure timely delivery of the WG document; and
- Enhance the document's strategic impact by promoting WG activities and the output.

Working Group Members

The Navigating the Future publication series is the conduit for EMB members to provide strategic direction to the future of marine science. Therefore, one Working Group member will be selected per member organization, resulting in a working group of 37 members (one for each of EMB's 35 members plus the Chair and Co-Chair).

Profile

The selected Working Group members will preferably have a background related to at least one of the four document chapters and in addition:

- Should be blue-sky thinkers;
- Should have a holistic and forward-looking perspective of marine science and its role in society;
- Should ideally take a transdisciplinary approach in their work;
- May have a natural and/or social science background; and
- Should enable the composition of a balanced Working Group with diverse representation.

Working Group Member selection process

The Working Group (WG) experts will be selected as a result of a call for WG Members' nominations issued by the European Marine Board Secretariat to the European Marine Board Member Organizations. Each Member Organization will be invited to send up to four nominations, ideally one per chapter and ideally also including one early career researcher. The final Working Group Member selection will be done by the Chair, Co-Chair, EMB ExCom and EMB Secretariat, based on the nominations received. Decisions on the composition of the WG are guided primarily on the basis of achieving the correct balance of expertise required to comprehensively address the four topics in question. When the expertise criterion has been exhausted, decisions between candidates can be made on the basis of ensuring a diversity and gender balance for the WG. Non-selection of some nominated candidates is therefore normal and bears no relation to the scientific excellence of those candidates not selected.

Subsequently, chapter leads will be selected by each chapter writing team during the kick-off meeting.

Roles and responsibilities of Working Group Members

Working Group (WG) members are responsible for ensuring the scientific quality of their inputs and their timely delivery according to the WG Terms of Reference. **The time contribution estimated for the Working Group Members is 7.5 days per year per person** (not including time to travel to in person meetings), considering the roles listed here below.

WG Members:

- Prepare for and attend the WG meetings;
- Submit written contributions in a timely manner as agreed at the kick-off meeting;
- Guide and adhere to the high-level strategic objectives of the publication;
- Promote the resulting publication at national and European levels;
- Provide feedback on dissemination activities and opportunities, impact and uptake to the EMB Secretariat.

Engaging the wider community

Interaction with relevant international and European initiatives working in this field should be explored. This could be achieved through informal interactions during the writing process, through consultation and/or workshops held during the lifetime of the activity, by engaging key people as external reviewers, or by selecting several key experts to serve as additional contributors of the WG (subject to approval by ExCom).

EMB Secretariat facilitation

A dedicated EMB Science Officer will act in the capacity of facilitator, and will support the Chair and Working Group in this activity. Other EMB Secretariat staff will also be involved in supporting this activity as required, including supporting the drafting of the separate chapters.

- WG facilitators: Sheila Heymans, Executive Director, and Paula Kellett, Science Officer

4. Mode of Operation

Work programme

The work programme for the Working Group (WG) will consist of:

- One in-person kick-off meeting on Ostend, Belgium, hosted by the European Marine Board (with the possibility to connect remotely where travel is not possible);
- Writing assignments;
- Regular email interactions and online progress meetings (as agreed by the WG);
- Editing to publication standard by the WG Chair/Co-Chair and EMB Secretariat;
- Revisions based on peer review comments (see section 5); and
- Final copy-editing and design by the EMB Secretariat and WG Chair /Co-Chair.

Support from the EMB Secretariat includes:

- Organizational support for all WG meetings;
- Costs of publication (including design and printing) and dissemination of the document to relevant stakeholders; and
- Writing and dissemination of meeting minutes, and maintenance of regular dialogue with the WG Chair and Co-Chair to ensure timely delivery of the document.

Note: The establishment of a WG is for a limited duration and the WG will be disbanded by the Board when it has fulfilled its mandate.

General Data Protection Regulation (GDPR) policy for EMB Working Groups

Personal data for EMB Working Group (WG) members and those involved in other EMB core activities is used for internal communication with the activity as well as external communication of the EMB activity via publications, the EMB website and EMB social media outlets.

For any new EMB activities, consent is sought at the kick-off of the activity to cover all relevant use and storage of personal data. The personal data of the Working Group members is retained beyond the end of the activity to enable follow-up communications for impact reporting and on related topics, and thus their data will continue to be stored, unless consent is later withdrawn. A template consent form can be found in Annex 1.

Reviewers are also contacted within the context of EMB activities. The template email they receive clearly outlines their right to act as such that their input remains anonymous, in which case the reviewer would simply be listed as "Anonymous". The reviewers will be informed of how and where their personal data will be stored. The consent of the reviewers will also be specifically sought for their personal data to be used outside of any activities directly relating to their role as reviewer, using the template text included in this document.

The [EMB privacy policy](#) contains information about our compliance with GDPR (data protection law). In this document you can find how to send us a request to gain access to your data that EMB has collected, request us to delete your data, correct any inaccuracies or restrict our processing of your data. Please contact us at info@marineboard.eu for more information or concerns. You have the right to lodge a complaint about the way we handle your data with [Belgian Data Protection Authority](#).

5. Deliverables

The output of this Working Group (WG) is expected to be a Position Paper.

The document will be peer-reviewed by a minimum of two external reviewers (one European and one international) selected from proposals by the Working Group members, and will be coordinated by the EMB Secretariat. In accordance with the EMB procedures, the document will also be sent to EMB Member organizations for internal review and approval prior to finalization and publication.

The impact of the publication will be achieved via a targeted dissemination strategy as described below. WG members will be required to make suggestions on how to reach end-user contacts and to contribute to the dissemination. Promotion of the document may include dedicated presentations at stakeholder events. WG members will also be asked to notify the Secretariat of any dissemination activities or observed uptake / impact for up to two years following publication, for future impact reporting. A full outline of the decision-making procedure and system for WG operations is outlined in Annex 2.

6. Target Audience and Expected Impact

This specific publication/event targets the following stakeholders:

- Decision- and policy-makers at the European level (EU Parliament and EU Commission, namely DG RTD, DG Mare, DG ENV, DG CLIMA and DG SANTE);
- Decision- and policy-makers at a Global Level (United Nations, i.e. IOC-UNESCO, and G7);
- Equivalent national authorities with responsibility for national and regional marine science strategy and funding, and marine management;
- The marine natural and social science communities;
- The scientific communities relating to the publication's four chapters and related disciplines; and
- NGO's and private companies working in fields relating to the publication's four chapter.

7. Communication and Dissemination Strategy

The EMB Secretariat will collaborate with the European Marine Board Communication Panel (EMBCP) to develop a communication and dissemination strategy for NFVI that will span the full lifetime of this activity.

The targeted dissemination strategy includes, but is not limited to:

- communication about the publication and its main themes / chapters;
- development of infographics to communicate key concepts and main messages from the document;
- collection of photographs and other graphics to include in the document, social media, and other communication activities;
- a dedicated launch event;
- a news release on the EMB website and shared with EMB member organizations to share on their websites;

- social media content for launch of the document;
- a printed version of the document sent to relevant stakeholders; and
- presentation of the document by WG members and EMB Secretariat at relevant national, European and International events.

8. Indicative Timetable

The Working Group (WG) activities are foreseen to start in spring 2022 and continue for 1.5 to 2 years from kick-off. It is foreseen to publish the final document in spring 2024, which will include a dedicated launch event (tbc) and electronic and hard copy dissemination to relevant stakeholders. The European Marine Board will conduct impact reporting, based on feedback from WG members and wider stakeholders, for a period of up to 2 years following publication.

An indicative timetable and order of activities is presented below.

Tasks (2022-2024)	2022												2023												2024			
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A			
Approval of ToR by EMB member organizations																												
Nominations and expert selection																												
WG member list confirmed, invitations and planning for kick-off meeting																												
In person kick-off meeting <ul style="list-style-type: none"> ▪ discuss ToR ▪ objectives and scope of the WG ▪ discuss and agree on table of contents and work plan ▪ allocation of chapter leads and writing assignments 																												
Drafting of content (with remote meetings as necessary)																												
Editing and finalization of advanced draft (text and illustrations)																												

Tasks (2022-2024)	2022										2023										2024				
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A
Approval of publication by WG members and EMB delegates																									
External review and revisions																									
Design of the publication																									
Publication and news release, followed by dissemination and uptake /impact tracking																									

9. References

European Marine Board. (2019). Navigating the Future V: Marine Science for a Sustainable Future. In *EMB Position Paper 24*. <https://doi.org/10.5281/zenodo.2809392>

Annex 1: Consent form for Core Activities

EMB holds personal data for anyone involved in core EMB activities, including Working Groups.

The following personal data may be held by the EMB Secretariat:

- Name
- Title
- Job title
- Areas of expertise and research interests
- Previously held roles
- Institute
- Country
- Institutional email address
- Institutional postal address
- Institutional telephone number
- Photographs
- Video

This information is stored in a secure spreadsheet and folder locations, and only EMB Secretariat staff have access to this.

EMB may:

- Contact you regarding the EMB activity that you are directly involved with
- Contact you regarding other EMB activities
- Add you to the EMB stakeholder mailing list
- Make your name, institution and country publicly available on the EMB website, in EMB communications, e.g. presentations regarding the activity you are involved in, and in EMB publications
- Take your photograph during EMB activities and use these pictures in publications, on the EMB website and on EMB social media outlets
- Take video footage during EMB activities and use these pictures in publications, on the EMB website and on EMB social media outlets

The data held may be reviewed and revised by the subject, and consent for any or all of the above may be withdrawn at any time.

Please tick this box to confirm that you understand the above, and that you give EMB permission to obtain, use and store your personal data as outlined above.

Name:

Date:

Annex 2: Decision Making Procedure

EMB Working Groups & Publications

Decision making procedures

Horizon Scanning



① Brainstorming

Topics of strategic importance for marine sciences are discussed by EMB members at plenary meetings (Board)



② Topic selection

Board selects topics to be further elaborated in a short scoping document



③ Topic approval

Board discusses topic content and approves the set-up of a new EMB Working Group (WG)

Establishment of EMB Working Group



⑥ Expert selection

EMB Secretariat & ExCom select WG Chair (and co-Chair); the Chair and co-Chair select the WG members from the nominations



⑤ Call for Nominations

EMB members propose experts from within their network to participate in the EMB Working Group



④ Terms of Reference

The content, purpose, and format of the WG are described in the ToR and submitted for Board

EMB Working Group Operations



⑦ WG meetings

The selected experts meet in person at least once to discuss the work plan/content of the working group



⑧ Publication development

WG members work remotely to provide input to the publication. EMB Secretariat & WG Chair(s) collate info into a draft document



⑨ Design

Finalized draft is circulated to all members of WG for comments & designed by EMB Secretariat

EMB Publication



⑫ Impact tracking

Impact of the document is tracked for up to 2-years



⑪ Launch & dissemination

The publication is launched at a dedicated event, promoted to targeted stakeholders online and hard copies are distributed



⑩ Review process

The draft publication is sent for internal review to all EMB member organisations and to at least 2-3 external reviewers