



Back to Blue

An initiative of
Economist Impact and The Nippon Foundation

TOWARDS A POLLUTION FREE OCEAN

Briefing note on
the development
of Back to Blue's
Roadmap for Action

March 2025

Endorsed by



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Intergovernmental
Oceanographic
Commission



2021 United Nations Decade
of Ocean Science
2030 for Sustainable Development



Towards a roadmap

Despite the serious effects of ocean pollution, our understanding of its impact remains limited. Pollution, climate change, and nature loss comprise a complex 'triple planetary crisis,' yet there has been no cohesive global assessment of ocean pollution and its cumulative effects on ecosystems, economies and human health.

The challenge of addressing ocean pollution is much broader than the well-known plastics problem. Pollution encompasses nutrients like fertilisers and sewage, which create dead zones, and chemicals such as PFAS, the so-called "forever chemicals" that accumulate in sea water. Pharmaceuticals and numerous synthetic chemicals further complicate the issue.

Most ocean pollution stems from land-based activities such as stormwater runoff, poor waste management, and industrial practices. Rivers transport pollution to the sea. Offshore industries, such as shipping and energy, also contribute. The lack of a singular pollution source means there is no straightforward solution.

Back to Blue, an initiative of Economist Impact and The Nippon Foundation, has spent the past three years engaging with stakeholders from science, industry, policy and finance, and the United Nations system to understand their perspectives on ocean pollution and co-design an approach to address it.

A Global Ocean Free from the Harmful Impacts of Pollution: Roadmap for Action, (herein referred to as 'the roadmap') published in March 2024, represents the culmination of this process.

The roadmap sets out a strategic framework for a global group of stakeholders to collaboratively build a comprehensive evidence base about the impact and extent of ocean pollution and, in turn, spark action to beat it.

Back to Blue's unashamedly ambitious aim is to have a transformational impact on awareness and understanding of marine pollution. We have sought to catalyse—and contribute to shaping—a coordinated global response to marine pollution.

This briefing note outlines the roadmap's key recommendations and its genesis.

CO-DESIGNING THE ROADMAP: TIMELINE

Towards a pollution free ocean: Briefing note on the development of Back to Blue's Roadmap for Action

2022

- Back to Blue publishes *The Invisible Wave: Getting to zero chemical pollution in the ocean*
- IOC UNESCO publishes the pilot *State of the Ocean* report

2023

- Back to Blue publishes *The Zero Pollution Ocean: A call to close the evidence gap* and *Closing the marine pollution data gap: a roadmap in the making*
- Back to Blue conducts an extensive stakeholder engagement process, including five thematic workshops and a series of surveys
- UN Ocean Decade Vision 2030 Working group 1: Understand and beat marine pollution is convened

2024

- Back to Blue launches *A global ocean free from the harmful impacts of pollution: Roadmap for action* at the World Ocean Summit in Lisbon
- Back to Blue, IOC UNESCO and other stakeholders convene an event at the UN Ocean Decade Conference, *How to Understand and Beat Marine Pollution by 2050: An Action Plan*
- Back to Blue delivers a brief on the roadmap to the IOC UNESCO Executive Council

2025

- IOC UNESCO - UNEP develop a proposal for a UN Ocean Decade Programme entitled 'A global ocean free from the harmful impacts of pollution by 2050,' with support from The Nippon Foundation.



The Invisible Wave

Back to Blue's pathbreaking investigation into marine chemical pollution

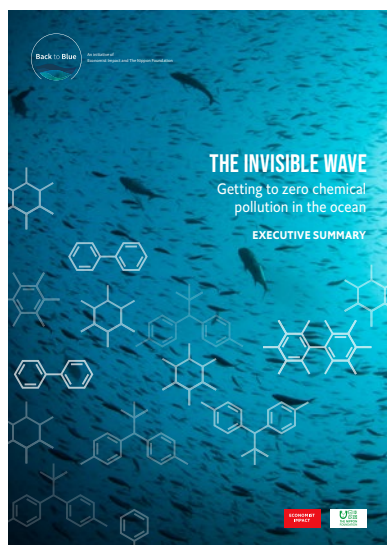
2022

Published in 2022, Back to Blue's *The Invisible Wave: Getting to Zero Chemical Pollution in the Ocean*, makes the case for chemical pollution in the ocean to be treated with the same gravity—and urgency—as plastic pollution. The findings of the report show that marine chemical pollution poses a serious and escalating threat to ocean health, that demands urgent, coordinated action.

Marine chemical pollution, plastic waste, and climate change are interlinked challenges. Pollution can exacerbate the adverse effects of climate change. Simultaneously, the impacts of climate change, such as rising water temperatures, heightened acidification, and increased salinity, can amplify the harmful effects of chemicals in the marine environment. This damage has cascading effects on the functioning and resilience of ocean ecosystems. The impacts of ocean pollution are likely to worsen as the increasing production and use of chemicals result in more pollutants entering the ocean.

The *Invisible Wave* recommends:

- **Stricter regulations and enforcement** to control chemical pollution. International cooperation to tackle pollution beyond coastal areas and support for less developed countries to tackle ocean pollution is critical.
- That the **chemicals industry and businesses along the chemicals value chain**, including downstream users, play a leading role in finding solutions to ocean pollution. Innovative approaches to develop sustainable products and processes such as green chemistry, circular principles and better waste management will be key.
- **Investors and regulators need better information about the risks** of marine chemical pollution. This will help them make informed investment decisions and support the transition to a sustainable economy. Likewise, **better information will enable consumers to make informed choices** and drive demand for non-polluting products.



The Invisible Wave: Getting to zero chemical pollution in the ocean

Published by Back to Blue, 2022.

- [Executive Summary](#)
- [Full report](#)
- [Chapter 1: Ocean chemical pollutants of major concern](#)
- [Chapter 2: Sources of marine chemical pollution](#)
- [Chapter 5: Regulations](#)
- [Chapter 6: Industry](#)
- [Chapter 7: Finance](#)



The Challenge—Understand and beat marine pollution

In 2022, just a few months after *The Invisible Wave* was published, The Intergovernmental Oceanographic Commission of UNESCO (IOC UNESCO) published its pilot State of the Ocean Report (StOR). It listed ten challenges for the ocean, the first to "understand and beat marine pollution."

- The StOR found "...indisputable evidence of the continued, widespread and unabated increase of land pollution in the ocean".
- However, it concluded that "despite the global significance of ocean pollution, observations remain limited, geographically and thematically, being mainly concentrated at the ocean surface and in coastal areas".
- The StOR recommended that "a more resourced and systematic approach to observations and synthesis of ocean pollution is urgently required".

[Read the State of the Ocean report](#)

A roadmap in the making

Back to Blue's comprehensive stakeholder engagement process

2023

The Zero-Pollution Ocean: A call to close the evidence gap, published in 2023, built on *The Invisible Wave* and the *StOR* to examine the ways in which inadequate data prevents scientists from properly assessing the extent and impact of ocean pollution.

Data collection is fragmented and usually concentrated on specific pollutants or regions. Most studies capture a single moment in time, with minimal large-scale monitoring. Inconsistent methodologies make it difficult to compare datasets. These gaps hinder trend analysis and make it difficult to evaluate the cumulative impact of pollution on ecosystems.

However, new technology increasingly presents solutions to these challenges. Tools such as

satellites, remote sensors, uncrewed vessels, and AI are being deployed in other areas of ocean monitoring and can enhance marine pollution monitoring, too. Better collaboration will be vital, and the UN Ocean Decade offers a framework for promoting cooperation.

Based on stakeholder interviews, meetings and submissions in response to *The Zero-Pollution Ocean* recommendations, Back to Blue published *Closing the marine pollution data gap: a roadmap in the making* in early 2023. It poses a framework for stakeholders from the UN system, other multilaterals, NGOs, universities and research institutes, governments, and the private sector to collaborate to co-design a science-based roadmap incorporating existing data and knowledge about various forms of pollution.

THEORY OF CHANGE: BUILDING AN EVIDENCE BASE

The purpose of a roadmap to close the marine pollution data gap is to understand and reduce the impact of pollution on ocean health and provide an evidence base to galvanise action



ROADMAP DEVELOPMENT



Define

Discussion paper, *The Zero-Pollution Ocean: A call to close the evidence gap.*

January 2023



Discuss

Issues paper summaries and analyses feedback from submissions process and direct stakeholder engagement.

May 2023



Consult

A series of 5 stakeholder workshops to design the roadmap.

June-Nov 2023



Build

A 6-week virtual hackathon to co-design the detailed elements of the roadmap.

Oct-Nov 2023



Publish

Draft roadmap.

Feb 2024



An initiative of Economist Impact and The Nippon Foundation

The Invisible Wave: Getting to Zero Chemical Pollution

Final roadmap

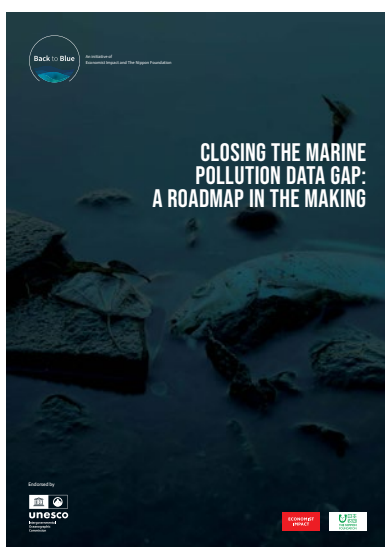




The Zero-Pollution Ocean: A call to close the evidence gap recommends

1. Marine pollution, beyond plastic, should be central to the 2025 UN Ocean Conference and other key meetings such as the UN Environment Assembly to raise awareness and encourage action among policymakers.
2. The UN Ocean Decade framework should be used to enhance collaboration among agencies that gather data on marine pollution, involving UN agencies, governments, universities, scientific organisations, and the private sector.
3. A strategic plan should be developed by 2025 to build a comprehensive understanding of marine pollution, engaging diverse actors from the UN, national governments, scientific agencies, universities, NGOs, and the technology sector.
4. Various projects, including Back to Blue, should collaborate with scientists to raise awareness and leverage existing marine pollution data to inform policymakers, business leaders, and the public.

Read the report

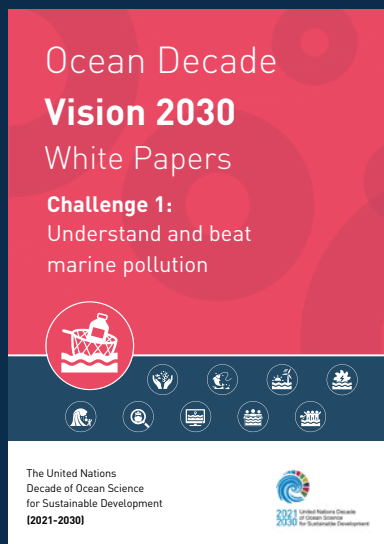


Closing the marine pollution data gap: a roadmap in the making recommends

1. Closer collaboration between UN bodies and other stakeholders to build a more comprehensive understanding of marine pollution to spark action by policymakers.
2. UN bodies and scientific and non-government organisations (NGOs) work collaboratively to raise awareness about marine pollution and use data analysis and storytelling to engage policymakers, business leaders and the public.

The report called for submissions on the most effective way to catalyse a co-ordinated global response to marine pollution, and set out a plan to engage with stakeholders in the ocean community to co-design a roadmap, as part of the UN Ocean Decade, by 2025.

Read the report



Vision 2030: The UN Ocean Decade

The UN Decade of Ocean Science for Sustainable Development, which runs from 2021 to 2030, has set ten challenges to promote a healthy, resilient, and productive ocean. The Vision 2030 process brought together working groups to set targets and milestones for each challenge.

Working Group One, which published its findings at the UN Ocean Decade Conference in April 2024, aimed to “understand and beat marine pollution.” The working group identified a lack of harmonised scientific protocols and poor data accessibility, particularly in the Global South and deep ocean, as the key barriers to addressing ocean pollution. It noted that existing Ocean Decade projects are disjointed, with geographical and thematic coverage gaps. Back to Blue collaborated closely with the working group co-chairs to ensure that the roadmap incorporated the working groups's findings and reflected its recommendations. These included:

- Establishing an Ocean Decade coordinating centre for marine pollution by 2025;
- A thorough review of existing data gaps by 2028;
- Creating a global network of sentinel stations for long-term monitoring by 2030;
- Developing regional laboratory hubs for data generation and capacity building by 2030;
- Encouraging partnerships and funding mechanisms to support these initiatives.

[Read the working group's white paper](#)

Back to Blue's roadmap for action

A framework to radically reform our approach to addressing ocean pollution.

2024

Back to Blue conducted a series of stakeholder workshops, meetings and surveys throughout 2023. *A Global Ocean Free from the Harmful Impacts of Pollution: Roadmap for Action*, published in March 2024, synthesised this process.

The roadmap's vision of a global ocean free from the harmful impacts of pollution by 2050 reflects the shared ambition of Back to Blue and many others working to understand and address ocean pollution.

Stakeholders overwhelmingly warned that while improved data is crucial, it is just a first step. Achieving the roadmap's vision will require a step-by-step approach to close the data gap, implement and assess solutions, engage more stakeholders, and attract investment. The aim must be to spark action and utilise evidence to catalyse decision-makers in the public and private sectors to tackle ocean pollution.

Impact is also critical. Stakeholders, particularly scientists, told us that the presence of pollution is of less concern than its effect on the ocean. The roadmap therefore considers ocean pollution's impact on the environment, human health and society, and economies.

The roadmap considers three dimensions of ocean pollution

1. Environmental impacts

including ecosystem functioning, biodiversity and interdependencies with climate change.

2. Impacts on human health and society

including through seafood consumption, direct and indirect exposure to toxic pollutants, and loss of amenity.

3. Economic impacts

including direct costs to industry, economic costs to coastal communities, the indirect economic cost of degraded ecosystems, and risks to exposed companies and industries.

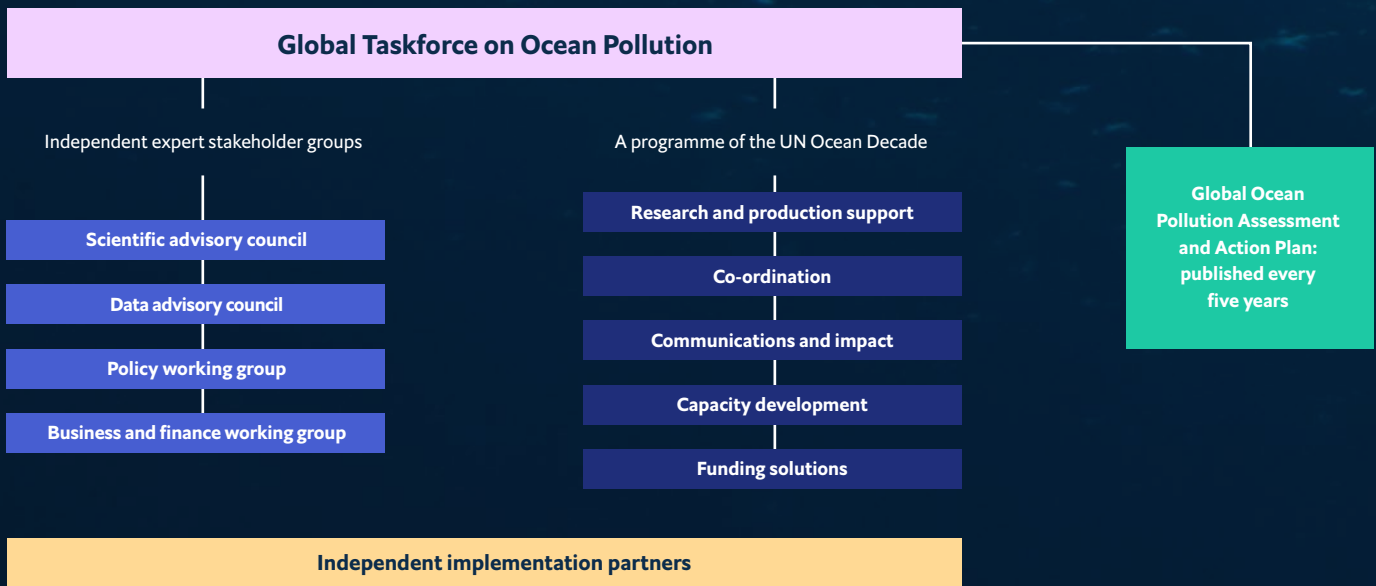
THE ROADMAP SETS OUT A FRAMEWORK FOR ACHIEVING A GLOBAL OCEAN FREE FROM THE HARMFUL IMPACTS OF POLLUTION BY 2050

| Objective | By 2030 | By 2040 | By 2050 |
|--|---|---|--|
| Closing the data gap | <p>A comprehensive review of all available evidence about ocean pollution has been conducted. This will involve knitting together existing data sets using AI and other technologies, and drawing conclusions about pollution's impact on the ocean.</p> <p>An analysis of data gaps, including a strategy for closing them is available, identifying priority areas for action and providing globally consistent monitoring, data collection, storage and sharing protocols.</p> | <p>Large-scale and ongoing monitoring of marine pollution makes it possible to create a comprehensive evidence "map" of ocean pollution and deduce trends.</p> <p>Data about the impact of marine pollution and the efficacy of solutions to combat its negative effects is comprehensive and widely available.</p> <p>Where data gaps exist, a strategy is in place to close them.</p> | <p>Monitoring of marine pollution is ongoing and widespread; the vast majority of data gaps have been closed.</p> <p>The most relevant and critical information is widely available to inform decision-making about solutions.</p> |
| Solutions to address the impacts of ocean pollution | <p>An analysis of solutions has been completed to address and prevent the negative effects of marine pollution, including recommendations on how stakeholders from the public and private sectors, including policymakers, businesses and financial institutions, can successfully enact solutions.</p> | <p>A growing cohort of public- and private-sector stakeholders are enacting solutions to prevent and address the impacts of ocean pollution, including:</p> <ul style="list-style-type: none"> • policy and regulation; • voluntary and mandated changes in corporate behaviour; and • public- and private-sector investment in innovation and technology. | <p>Action to prevent the negative effects of ocean pollution is widespread across the public and private sectors.</p> |
| Engaging stakeholders | <p>A voluntary coalition of decision-makers from the public and private sectors and other stakeholders have collaboratively developed a global strategy to understand and beat marine pollution.</p> | <p>A growing cohort of public- and private-sector stakeholders and organisations are working collaboratively to monitor the effects of ocean pollution and enact and test solutions to prevent and address it.</p> | |
| Securing funding | <p>A wide range of stakeholder organisations can access ongoing funding from government, philanthropic and private-sector sources to collect and analyse data about the impact of ocean pollution.</p> | <p>Sustainable, ongoing funding is available for widespread global monitoring of ocean pollution and its impacts, solutions to which enjoy substantial and growing investment.</p> | |

THE ROADMAP FOR ACTION RECOMMENDS

1. Establishing a high-level global multi-stakeholder co-ordinating task force charged with mobilising, supporting and harmonising existing and emerging initiatives;
2. Publishing a Global Ocean Pollution Assessment and Action Plan every five years;
3. Convening a network of independently operated and funded implementation partners from across the UN, universities, and the public, private and not-for-profit sectors, to work collaboratively to implement the roadmap;
4. Establishing four independent stakeholder groups to advise the co-ordinating task force:
 - a. scientific advisory council,
 - b. data advisory council,
 - c. policy working group, and
 - d. business and finance working group.

THE ROADMAP'S RECOMMENDED STRUCTURE FOR A GLOBAL CO-ORDINATING TASK FORCE ON OCEAN POLLUTION





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Intergovernmental
Oceanographic
Commission



2021 United Nations Decade
of Ocean Science
2030 for Sustainable Development



A proposal to implement the roadmap

Translating the roadmap's bold and transformative goal into measurable positive outcomes

2025

The roadmap recommends that The Intergovernmental Oceanographic Commission of UNESCO (IOC UNESCO) and The UN Environment Programme (UNEP) lead its implementation. In June 2024, Back to Blue presented the roadmap to the 57th session of the IOC UNESCO Executive Council.

Both agencies have responded positively as the roadmap's recommendations align with their ongoing work and respective mandates. With the support of The Nippon Foundation, they are now developing a plan to implement the roadmap's recommendations. This plan, part of the UN Ocean Decade, aims to integrate ongoing projects, stimulate new initiatives, and combat ocean pollution. It builds on the advancements made by IOC UNESCO and UNEP in addressing this issue over the past 50 years.

Yet, while IOC UNESCO and UNEP can lead, they cannot tackle ocean pollution alone. Achieving a vision this ambitious will require a concerted, global effort involving diverse stakeholders from the UN system, the scientific community, data collection agencies, governments, business, finance and local communities. Join us in turning the vision of a pollution-free ocean by 2050 into a reality.

[Download an overview of the IOC UNESCO - UNEP proposal for a UN Ocean Decade Programme entitled 'A global ocean free from the harmful impacts of pollution by 2050,' March 2025.](#)

About this report

'Towards a pollution free ocean: Briefing note on the development of Back to Blue's Roadmap for Action' is a report from Back to Blue, an initiative of Economist Impact and The Nippon Foundation. The report was written by Economist Impact. The lead author was Jessica Brown, while editorial management was provided by Naka Kondo. The initiative lead for Economist Impact is Charles Goddard.

This report draws substantially upon Back to Blue's previously published research and engagement activities, including:

- **"The Invisible Wave: Getting to Zero Chemical Pollution in the Ocean"**, a first-of-its-kind examination of the extent and impact of this issue, informed by an expert panel of eminent scientists and drawing on more than 100 interviews with industry leaders, investors, scientists, activists and policy experts.
- **"The Zero-Pollution Ocean: A Call to Close the Evidence Gap"**, which called for a co-ordinated response to build a comprehensive and global evidence base about the extent and impact of marine pollution.
- **"Closing the Marine Pollution Data Gap: A Roadmap in the Making"**, which proposed a framework for this roadmap.
- Five stakeholder workshops conducted between June and November 2023 explored:
 - **defining a science-based and purpose-driven approach to marine chemical pollution;**
 - **leveraging existing pollution data sources and knowledge;**
 - **building a federated architecture of interoperable databases;**
 - **technology to increase the visibility of marine chemical pollution;** and
 - **financing and implementation.**
- A virtual "hackathon" that invited detailed comments on several aspects of the roadmap.
- **"A Global Ocean Free from the Harmful Impacts of Pollution: Roadmap for Action,"** which synthesised Back to Blue's previous research and engagement into a framework for action.

Thank you to all of the interviewees and workshop participants who contributed their insights to this process. Please refer to the individual reports and workshop summaries for a full list. Thank you to the experts and individuals who shared their views over the past three years.

Over the past three years, to inform the development of the roadmap and the wider Back to Blue initiative, we have spoken with people from many businesses, financial institutions, governments, NGOs and scientific research institutes. Not all are mentioned here, yet we nevertheless thank them for their time and insights, along with the following:

| | |
|---|--|
| Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research | Ocean Sewage Alliance |
| Amazon Web Services | Oceano Azul Foundation |
| Arizona State University | Organisation for Economic Co-operation and Development (OECD) |
| Aviva Investors | Plymouth Marine Laboratory |
| Centre for Environment Justice and Development, Kenya | REV Ocean |
| China Water Risk | Rise Up Blue Call to Action |
| City University of Hong Kong | Roadmap to Zero |
| Clariant | Royal Netherlands Institute for Sea Research |
| Climate Adaptation Center | SCCP, Romania |
| Cornell University | Seabed 2030 |
| Dyson School of Applied Economics and Management | Sourcemap |
| Ecowaste Coalition, Philippines | Swiss Federal Laboratories for Materials Science and Technology (EMPA) |
| ETH Zurich | Tech to the Rescue |
| EyeSea | UK Centre for Ecology & Hydrology |
| Federal University of Bahia, Brazil | UN Environment Programme (UNEP) |
| Food and Agriculture Organisation of the UN | UN Foundation |
| Friends of the Upper Wye | UN Global Compact |
| Global Ocean Trust | UNEP Finance Initiative |
| Greensquare Ventures | UNEP World Conservation Monitoring Centre |
| Group of Experts on the Scientific Aspects of Marine Environment (GESAMP) | University of Amsterdam |
| Harvard University | University of Delaware |
| Hub Ocean | University of Gothenburg |
| Imperial College London | University of Massachusetts Lowell |
| Indiana University | University of Michigan |
| Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO) | University of New South Wales |
| International Chemical Secretariat (ChemSec) | University of Newcastle |
| International Maritime Organisation | University of Queensland |
| International Pollutants Elimination Network | University of the Western Cape |
| IODE Invemar | University of Tokyo |
| Japan National Institute for Environmental Studies | University of Toronto |
| Kenya Marine and Fisheries Research Institute | Varda Group |
| Lonely Whale | Venezuelan Institute for Scientific Research |
| Minderoo Foundation | Veolia |
| Monterey Bay Aquarium | Wildlife Conservation Society |
| National Institute of Oceanography and Applied Geophysics (OGS), Italy | Wood Mackenzie |
| National Oceanic and Atmospheric Administration | World Bank |
| National Sea Rescue Institute | World Business Council on Sustainable Development |
| Nekton Foundation | World Maritime University |
| Nexus3 Foundation | World Resources Institute |
| Norwegian University of Science and Technology | World Wide Fund for Nature (WWF) |
| Ocean Community Association | ZDHC Foundation |
| Ocean InfoHub Project | |

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