Back to Blue

An initiative of
Economist Impact and The Nippon Foundation

WORKSHOP 3: BUILDING A FEDERATED ARCHITECTURE OF INTEROPERABLE DATABASES

—summary notes

This virtual workshop was held on September 5th, 2023

ECONOMIST IMPACT

THE NIPPON FOUNDATION

Workshop 3:

Back to Blue calls on a broad group of stakeholders to co-design a roadmap to close the marine pollution data gap. Please *visit our website* to learn more.

This workshop, the third of five, sought to answer:

- How do we assemble and integrate existing datasets?
- What governance structures will be needed?
- Who should be responsible for creating and operating a global marine pollution data framework?

This summary report does not attempt to represent all the views shared during the workshop; rather, it is a brief synthesis. The purpose of this report is to inform the first draft of the roadmap. We welcome further comments on this summary and the roadmap.

Attendees:

- Dr Anna Silyakova, Science lead, HubOcean
- Heidi Savelli-Soderberg, Marine and Coastal resources, United Nations Environment Programme (UNEP)
- Jamie McMichael-Phillips, Director, Seabed2030
- Katherina Schoo, Associate Project Officer - Ocean Acidification, Ocean Science Section, Intergovernmental Oceanographic Commission (IOC) of UNESCO
- Kazuhiro Yagasaki, Senior Project Coordinator, Global Ocean Environment Division, Ocean Affairs Department, The Nippon Foundation
- Kirsten Isensee, Programme Specialist – Ocean Carbon Sources and Sink, Intergovernmental Oceanographic Commission (IOC) of UNESCO
- Lucy Scott, Ocean InfoHub Project Manager, UNESCO/IOC Project Office for IODE
- Marina Lipizer, Researcher, National Institute of Oceanography and of Applied Geophysics (OGS), Division of Oceanography
- Oliver Steeds, CEO, Nekton Foundation
- Peter Pissierssens, Head, IOC Project Office for IODE and IOC CD coordinator, UNESCO - Intergovernmental Oceanographic Commission
- Pier Luigi Buttigieg, Principal Investigator and Senior Data Scientist, Alfred Wegener Institute Helmholtz centre for polar and marine research
- Sandra Topic, Environmental Equity BD, AWS - Amazon
- Steve Widdicombe, Director of Science and Deputy Chief Executive, Plymouth Marine Lab
- Vicky Honda, manager, Oceans Affairs Division, The Nippon Foundation (Observer)

Moderators:

- Charles Goddard, executive director, Back to Blue
- Louis Demargne, Data & Knowledge Management Officer, Intergovernmental Oceanographic Commission of UNESCO

Access, integration and interoperability of disparate datasets

Bringing together existing frameworks and data custodians

- It is crucial for initiatives like Back to Blue to maximise impact by analysing and making use of existing frameworks rather than creating new ones.
- The Ocean Info Hub project and the IOC Ocean Data and Information System (ODIS) represent a huge first step in building mechanisms that allow data discoverability and accessibility.
- Gap analysis is a priority; it will be important not to inadvertently duplicate existing efforts.
- Participants emphasised the necessity of a proactive approach to bring data custodians together, especially when engaging major players.
- One crucial lesson learned from established structures such as ODIS is the importance of having a well-thought-out architecture, complete with digital bridges and interoperability, rather than addressing these as an afterthought.
- It will be important to create demand for systems from the outset. This helps establish them as necessary tools and also helps attract funding to ensure longevity. For instance, ODIS now benefits from core funding within the IOC.
- Existing partners should develop comprehensive data management plans to guarantee future accessibility of their data. As part of the framework, the federation can implement specific data conditions before granting entry.
- Amazon Web Services agreed to the need for open data and offered to host the federated architecture.
- Agreeing terms of use will be critical to protect the intellectual property of scientists and other data owners.

Recommendation 1:

Reinventing the wheel is unnecessary. Initiatives such as Back to Blue should prioritise bolstering existing infrastructures. Major data custodians can lead the way in an initial gap analysis.

Data quality and end users are essential

- Useful systems rely on quality data. To ensure data is fit for purpose, its quality must be established, particularly when dealing with issues such as marine chemical pollution.
- However, the framework should also recognise that federation partners may have diverse quality standards. Being overly strict could exclude critical stakeholders.
- The key is to ensure quality control processes are as transparent as possible. The system may increase quality selection as it grows and develops.
- Parsimony is key. Excessive differentiation between various formats including data and metadata should be avoided.

Recommendation 2:

Start small. Focus on building a dataset for a few pollution types and develop this with a limited group of expert partners.

- Usability of data for end-users is a top priority. This requires creating a seamless experience that focuses on user-centric design and does not make assumptions about user needs.
- Establishing a consensus on metadata fit for purpose will enable meaningful data comparisons and maximise impact of policymakers.

Recommendation 2:

Place end users at the heart of the data federation. They play a pivotal role in driving policy change and fostering meaningful impact.

Governance

Data archeology and ownership

- A substantial amount of data is invisible to the scientific community. This data could fill significant gaps in existing understandings of ocean pollution.
- Industry and government must collaborate and share their data.
- Governments can possess data without full awareness of what it contains. The process of aggregating and integrating data can inhibit timely availability.
- Academic data can be difficult to use because of lengthy embargo periods or a lag in the publication process.
- Ownership of government data is often unclear, especially when departments merge or change focus, sometimes leading to a default denial when pressed for more transparent data.
- National oceanographic data centres are unsure how and where to share data globally sustainably.
- High-level government structures are needed to develop and enforce data governance practices that will trickle down throughout organisations.
- The GODAR (Global Oceanographic Data Archaeology and Rescue) project of IOC/IODE is an existing project that may provide a useful template. Likewise, existing data policies of UN agencies and IGOs (such as the new IOC data policy and terms of use) will provide a useful starting point.

Recommendation 4:

Engage in open and constructive dialogues. Privacy concerns and matters of national secrecy are fixed limitations, but better coordination and communication among governments and data custodians globally can improve the amount and quality of data shared.

Capacity development

The importance of the back-end technology

- Achieving interoperability between databases for different types of pollution is critical to align objectives toward a shared purpose.
- The back-end technology should be accessible through cloud services, flexible and easy to maintain.
- National data repositories need not overhaul their existing processes. Efforts should be focused on easily connecting to the system via simple software.
- Equitable access is a cornerstone of the development process. While the primary users may be statisticians, the system should provide a simple user experience and be accessible to high-level officials.
- The end goal is for users to build the capacity to control their data rather than only submitting it for use.
- Capacity development should focus on information management, not only in existing data centres but also among scientists and at all levels of government. Capacity development in government should focus on using data and information for decision-making.

Recommendation 5:

Cloud-based, flexible and easy-to-maintain back-end technology is the key to creating a positive user experience.

Incentives for data accessibility

The carrot and the stick

- Unlocking industry data hinges on compelling incentives, regulatory force, or a combination of both.
- While industry and the private sector often cite resource constraints as a barrier to data sharing, most workshop participants are sceptical and believe that if an organisation profits from pollution, they should be forced to release the associated data.
- Governments often withhold data due to public secrets or national security concerns, and the collection of ocean data is often carried out by the navy; this creates further barriers to access.
- Strategic data withholding is often linked to concerns about coastal pollution, meaning coastal hypoxia is overlooked in pollution discussions.
- Organisations need to see a return on investment for making their data open access.
- Demonstrating the impact of pollution on providers could help them understand why their data is useful.
- Federation partners are "prosumers" – producers and consumers – meaning the incentive vectors are diverse and require careful consideration.

Recommendation 6:

Build a narrative around the dangers of inaccessible data. Make sure data custodians understand the economic and environmental impacts on marine environments. Data purveyors can let the federation know about their data, even if they aren't ready to share it.

Next steps:

- Please share your comments with the Back to Blue team, either in this document or by email to jessicabrown@economist.com
- Please feel free to share this document with other colleagues who may be interested; we welcome their comments and feedback
- We will keep you updated with information about our upcoming publications workshops and other opportunities to contribute to the roadmap's development.

Additional resources

- Please visit our ***stakeholder resource centre*** for further information about Back to Blue's initiative to develop a roadmap to close the marine pollution data gap and about our series of virtual stakeholder workshops.
- ***The Invisible Wave: Getting to zero chemical pollution in the ocean***, Back to Blue (2022)
- ***The Zero-pollution ocean: A call to close the evidence gap***, Back to Blue (2023)

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