

POLICY BRIEF

Open Data: enabling conservation and sustainable use of biodiversity in areas beyond national jurisdiction

Nic Bax, Harriet Harden-Davies, Torsten Thiele, Pat Halpin, & Daniel Dunn

Introduction

Open data is critically important for effective conservation and sustainable use of biodiversity in areas beyond national jurisdiction (ABNJ). Open data enables effective and efficient environmental impact assessments, area-based management, sharing of non-monetary benefits of marine genetic resources and achieving marine technology transfer. As components of marine technology transfer, data acquisition (including biological, genetic, environmental and other forms of data) and accessibility are therefore both important issues for the new instrument. Interpreting datasets and translating data into useful information, however, requires technical tools and knowledge. Capacity development is, therefore, needed to enable all countries to access and use data, samples and information and benefit from the outcomes of marine scientific research. This would also have broader benefits in areas within national jurisdiction. While information available to managers will never be perfect, we suggest that the guidelines provided below will assist timely and effective management in ABNJ.

Sustainable data streams are an essential part of management infrastructure. Collecting sufficient data to inform effective decision making requires dedicated infrastructure to ensure that sampling and data collection are directly linked to, and sufficient for, management needs. However, the cost and other challenges of obtaining data and samples is greater in the deep remote environments of ABNJ. This places great importance on developing novel approaches to gather and share data in a robust and timely way.

International cooperation is urgently needed to address challenges to share, manage and use data collected from a variety of platforms for a diversity of different purposes in ABNJ. All ocean projects will rely to some extent on existing global data collection and synthesis. Integrating scientific sampling with commercial exploration and management could increase sampling coverage and support the provision of science to inform management. At the same time, data needs to be linked in a way to insure that it can be traced to its original source and



GLOBAL OCEAN TRUST



continues to be accessible even if the initial digital location changes. The upcoming summit on global open data for agriculture and nutrition provides an example of the important role open data has in achieving the Sustainable Development Goals.

Increasing availability of open data as an intrinsic component of future use in ABNJ would expand the collective knowledge and capacity to sustainably develop and manage this vast area. Data should be accessible online through databases meeting international standards. However, there are already a number of existing databases that disseminate data relevant to biodiversity in ABNJ (Box 1) and there are issues relating to interoperability and linkage between databases. Improving the accessibility of data would require significant and sustained scale-up of resources. The following priorities are proposed to improve the accessibility of data and information to enable conservation and sustainable use of biodiversity in ABNJ.

Priorities

1. **New mechanisms are needed to enable open data.**

An international meta-database or clearing-house mechanism could facilitate open-access by assisting users to identify where data is located in various databases (Box 1) relevant to the conservation and sustainable use of marine biodiversity in ABNJ and improve accessibility. Data scientists and digital librarians would help ensure the new structure on the basis of universality and searchability. However, given the scale of this undertaking, a feasibility scoping study should be conducted to examine the needs and challenges, including financial, technical and other resourcing requirements and possible pathways forward to facilitate open access. The Ocean Biogeographic Information System (OBIS) could function as a central open repository of datasets.

2. **Scientific sampling, data collection, and reporting needs to meet international standards and guidelines.**

Effective sharing of data and information requires that it be collected by comparable methods, developed using similar protocols, recorded with appropriate interpretive information and made available in a recognized format. The Global Ocean Observing System (GOOS) is developing guidelines for Essential Ocean Variables that will support this goal. This will provide a sub-set of variables that partners would agree to collect in a standardized and quantitative way. The expertise of networks such as OBIS and GOOS Biology and Ecosystems Panel in setting international data standards will be informative.

3. **Sample sharing should be supported.**

Enabling samples to be shared between researchers internationally and archived is important to support scientific knowledge of ABNJ. This could include samples collected by publicly funded research activities as well as commercial exploration and exploitation. Museums already serve an important role in sample sharing as trusted collections. One option could be to develop a centralised marine sample bank for ABNJ to facilitate sample sharing.

4. **Adequate support for rapid post-survey workup of collected samples, including taxonomy, is needed.**

Samples collected from deep-sea ABNJ will contain many new species. Analysis will take time and require cross-examination of similar samples collected in different areas to enable an assessment of biodiversity. Support for rapid sample analysis is needed to enable timely provision of data.

5. **Regional marine science and technology centres could enable sample analysis, data management and capacity development.**

Developing countries would benefit broadly from the infrastructure and knowledge obtained

from regional marine science and technology centres (as envisaged in Part XIV of the United Nations Convention on the Law of the Sea). This new capacity would provide indirect benefits in

areas within national jurisdiction and support an adaptive approach to management to respond to the availability of new data.

Box 1: Examples of data systems that could have a role in providing data relevant to conserving biodiversity in ABNJ:

- Ocean Biogeographic Information System (OBIS): www.iobis.org – global repository for marine data
- World Register of Marine Species (WoRMS): www.marinespecies.org – global database supporting consistent species identification
- Global Biodiversity Information Facility (GBIF): <http://www.gbif.org/> – interoperable network of biodiversity databases and information technology tools
- Encyclopedia of Life (EOL): www.eol.org – online collaborative bio-encyclopedia
- Global Ocean Observing System (GOOS): <http://www.ioc-goos.org/> – network identifying and supporting global collection of Essential Ocean Variables
- GenBank: <http://www.ncbi.nlm.nih.gov/genbank/> – annotated collection of all publically available DNA sequences
- IODE: <http://www.iode.org> – UNESCO-IOC’s programme on oceanographic data and information exchange and network of 80 National Oceanographic Data Centres
- World Ocean Database: <https://www.nodc.noaa.gov/OC5/WOD13/> – Global central database on oceanographic variables.
- Ocean Data Publication Cookbook (with reference to DOI): http://www.iode.org/index.php?option=com_oe&task=viewDocumentRecord&docID=10574
- OceanDataPractices (ODPr): <http://www.oceandatapactices.net/> – a repository containing a wide variety of “practices” such as manuals and guides related to oceanographic data and information management.

Acknowledgement

This policy brief is part of the Nereus Scientific & Technical Briefs on ABNJ series. The briefs are products of a workshop held prior to the 4th International Marine Conservation Congress in St. John’s, Newfoundland (July-August 2016). The series includes policy briefs on 1) Area-based management tools, 2) Climate change in oceans beyond national jurisdictions, 3) Open data, 4) Tech transfer, 5) AIS data as a tool to monitor ABMTs and identify governance gaps in ABNJ fisheries, and 6) Impacts of fisheries on open-ocean ecosystems. These briefs were prepared for the second meeting of the BBNJ Prep Com. Further briefs will be prepared for upcoming Prep Com meetings. All briefs are available at nereusprogram.org/briefs. The briefs were organised by Dr. Daniel Dunn, Nippon Foundation Nereus Program Senior Fellow & research scientist in the Duke University Marine Geospatial Ecology Lab. Please contact daniel.dunn@duke.edu for any further inquiries. The workshop and coordination of the briefs was supported by the Nippon Foundation Nereus Program. All briefs are the product of the specified authors, not the organiser or Nereus. We thank them for their incredible generosity with their time and effort to inform this important process.