Why should we share data?

Unlocking the value in hydrographic offices' data

SUSTAINABLE DEVELOPMENT GOALS

Version 1.0 - February 2023

SWPHC supports the Sustainable Development Goals

Contents

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For more information, visit the SWPHC MSDI Working Group website at https://iho.int/en/msdiwg-0

Introduction

Hydrographic offices hold and manage significant collections of marine spatial data, including environmental and historical assets. While hydrographic offices traditionally use their data to support safe navigation, their responsibilities may extend further, supporting all maritime activities, including economic development and environmental protection. Unlike published charts or tide tables, statistical or geographic information systems can directly analyse datasets, making them useful in many applications.

Trusted marine spatial data support:

- Safe navigation and the Safety of Life at Sea (SOLAS)
- The enforcement of environmental protection rules and regulations
- Increased capability of commercial operators (Blue Economy)
- The effective management of marine resources and marine planning

Public understanding

Releasing marine spatial data raises public understanding of the importance of hydrography.

Routinely and proactively releasing data makes it discoverable to governments, aid agencies, commercial users, and the public. Sharing data reduces the burden on potential data users and increases the reuse of marine spatial data to support a wide range of activities. Publicly released data is better if it is made as FAIR (Findable, Accessible, Interoperable, Reusable) (Wilkinson et al. 2016) as possible, using appropriate community standards for the data and its metadata.

Hydrographic offices often manage data with national security implications, limiting the data they can make public; however, we must balance these risks against the potential public benefits of sharing data to make potentially valuable datasets accessible where practicable. Where hydrographic offices cannot publish data fully, they can release partial datasets or bounding polygons and associated metadata to ensure the public can discover some data. Internally applying the FAIR principles makes it easier for hydrographic offices to incorporate public datasets into their products and lowers the administrative burden of releasing data publicly.

Quality assurance

Data held by hydrographic offices have particular value because it is often unique; it captures characteristics and features of the ocean and the seafloor that are usually difficult to observe and expensive to acquire. Hydrographic offices are trusted sources of marine spatial data because of their data-collecting capabilities. Hydrographic offices systematically collect data across large geographic areas and invest in QA/QC processes beyond the capacity of most data-collecting agencies due to the legal liabilities associated with official navigational products.

However, the accuracy and precision of datasets are often difficult for a user to interrogate, notably when the dataset describes something that is typically invisible to the human eye, like a seafloor. Therefore, it is crucial to provide potential users with the education and tools to assess the trustworthiness of datasets. Publicly releasing data acquired for navigational safety purposes offers easy access to high-quality, trusted data. If data from hydrographic offices are not easily accessible, many users will use data from readily available sources but of unknown quality.

International obligations

Sharing data is a crucial part of international conventions that guide the work of hydrographic offices, including the United Nations Convention on the Law of the Sea (UNCLOS), the International Convention for the Prevention of Pollution from Ships (MARPOL), and the International Convention for the Safety of Life at Sea (SOLAS).

Sharing data also supports global regulators and reporting authorities, including the International Seabed Authority (ISA), Particularly Sensitive Sea Areas (PSSAs), the Convention on Biological Diversity (CBD), the United Nations Fish Stocks Agreement (UNFSA), the Agreement on Port State Measures (PMSA) and the Western and Central Pacific Fisheries Commission (WCPFC), and cooperation with global and regional scientific organisations.

Public good

Public access to trusted marine spatial data creates many opportunities to understand the marine environment; it is crucial data for almost every maritime activity, supporting more intelligent and sustainable decision-making.

The UN Sustainable Development Goals (SDGs) are a set of 17 goals adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that, by 2030, all people have peace and prosperity.

The UN has integrated 17 SDGs because the action in one area will affect outcomes in others; accordingly, development must balance social, economic and environmental sustainability. The UN also recognise that creativity, technology, expertise and financial resources are needed from every part of society to achieve the SDGs; therefore, businesses and organisations have a crucial role in delivering them.

The SWPHC MSDI Working Group identified seven crucial social benefits aligned with the 17 UN SDGs that may stem from the public release of hydrographic offices' data:

- Food security
- Education and capacity development
- Safety
- Sustainable resources
- Environmental sustainability
- Public release sovereignty
- Heritage

The information on pages 6-10 demonstrates our work observing the SDGs by making the data holdings of hydrographic offices publicly available.

Hydrographic data and its uses beyond navigation:	Food security	Education and capacity development	Safety	Sustainable resources	Environmental sustainability	Public release sovereignty	Heritage
Bathymetry, seabed backscatter, and water column backscatter data can inform fishing industry management, including future planning.	✓						
Bathymetry, seafloor backscatter and water temperature data can help to identify potential aquaculture sites.	✓			✓	✓		
Seafloor backscatter data supports marine habitat mapping.	✓			✓	✓		
Sea level and water characteristics data, such as temperature and salinity, enable a better understanding of climate changes impact on marine environments.	✓				✓		
Bathymetric, geomorphic features and historical data help community groups understand their local marine environment.		✓		✓	✓	✓	✓
Access to and reuse of open hydrographic data supports exciting real-world projects that inspire students to become the maritime workforce of tomorrow.		✓					
Hydrographic data and derived products can help identify marine locations suitable for renewable energy production.			✓		✓		

Hydrographic data and its uses beyond navigation:	Food security	Education and capacity development	Safety	Sustainable resources	Environmental sustainability	Public release sovereignty	Heritage
Hydrographic data includes a variety of data types which can support independent environmental monitoring.		✓			✓	✓	
Indigenous peoples can use hydrographic data to identify marine phenomena that may affect them collectively and individually and (re)connect to cultural identities.		✓				✓	✓
Hydrographic data and derived products, such as habitat maps, inform decisions related to customary marine rights/native title claims.		✓				✓	
Hydrographic data and derived products represent maritime boundaries and their associated rights, restrictions, and responsibilities.				✓		✓	
Hydrographic data and derived products support historical research and a better understanding of human heritage.		✓					✓
Higher resolution bathymetry and sea level data improve the accuracy of tsunami modelling, including inundation.			✓				
Higher resolution bathymetric data and sea level data improve the accuracy of storm surge and flood modelling to protect human life and critical infrastructure.			✓				

Hydrographic data and its uses beyond navigation:	Food security	Education and capacity development	Safety	Sustainable resources	Environmental sustainability	Public release sovereignty	Heritage
Accurate, high-resolution bathymetry and sea level data support the development of crucial infrastructure; this is critical to enable effective and efficient maritime transportation and trade supply chains, including port optimisation.			✓				
Hydrographic data and derived products help communities identify and protect wrecks.				✓			✓
In an emergency requiring Humanitarian Aid and Disaster Relief (HADR) or maritime incident, rapid access to hydrographic data from multiple sources improves the outcomes of emergency responses.			✓				
Hydrographic data and derived products help communities understand and manage the impact of pollution from the land on the sea (e.g. from agriculture or sewage runoff).			✓	✓	✓		
Coastal mapping (based on hydrographic data) improves efforts to assess, plan and mitigate the effects of climate change and other impacts on the coastal environment.			✓				
Hydrographic data and derived products help communities identify hypoxic zones and manage their impacts on fisheries and marine environments.				✓	✓		

Hydrographic data and its uses beyond navigation:	Food security	Education and capacity development	Safety	Sustainable resources	Environmental sustainability	Public release sovereignty	Heritage
Hydrographic data and derived products support commercial uses, including site selection, engineering, and start-up industries.				✓	✓		
Hydrographic data and derived products support tourism through transport and other planning in coastal areas.				✓			✓
Hydrographic data and derived products help communities, regulators, and companies make data-based decisions about deep-sea mining.				✓			
Scientific research develops an understanding of the marine environment across many disciplines which may not have direct contact with hydrographic offices. High-quality, trusted hydrographic data:							
› Increases confidence in policy decisions to better use and protect ocean resources.	✓	✓	✓		✓	✓	
› Provides ground-truthing and validation observations for scientific modelling.	✓	✓	✓		✓	✓	
› Improves ability to monitor impact of policy decisions.	✓	✓	✓		✓	✓	

Hydrographic data and its uses beyond navigation:	Food security	Education and capacity development	Safety	Sustainable resources	Environmental sustainability	Public release sovereignty	Heritage
Examples of scientific research that may be supported by the open release of data from hydrographic offices include:							
› Investigations of change processes in marine and coastal geomorphology.					✓		
› Regional oceanographic models; these are increasingly used to predict climate impacts and rely on higher resolution data than global models.					✓		
› Geomorphology drives benthic ecosystems, so better knowledge improves ecological knowledge of those systems and marine park planning.					✓		
› Biogeochemical and biodiversity; this data can be used to calculate blue carbon quantities.					✓		
› The development of digital twins relies on high-resolution data across many disciplines.		✓		✓	✓		