



# THE MARITIME ROLE OF SDIS

SEAS AND COASTS DO NOT RESPECT NATIONAL BOUNDARIES, SO  
MULTINATIONAL COOPERATION IS MANDATORY WHEN IT COMES TO  
DEVELOPING SPATIAL DATA INFRASTRUCTURE. ROGER LONGHORN REPORTS

The dynamic nature of marine and coastal environments requires implementation of spatial data tools and processes to enhance knowledge, management and decision-making for these complex territories. Marine and coastal spatial data infrastructures aid in the sharing and use of spatial data across a broad range of stakeholders by promoting the harmonisation of data and metadata and the interoperability of services.

The physical environment of the seas and coasts do not respect national boundaries, so multinational cooperation is mandatory. Efforts at national and international level are underway to increase efficiency in marine spatial data production and management, and improve data availability and accessibility to support the concepts of integrated coastal zone management (ICZM), maritime spatial planning (MSP) and establishing effective marine cadastres.

Over the past two decades, most of the activity surrounding implementation of spatial data infrastructure (SDI) has been driven by the terrestrial data communities – topographic mapping, cadastral and environmental agencies, which focus on land-based spatial data. What about the marine communities and maritime governance and business sectors? Where do they benefit from and contribute to creating and using the wider global SDI?

As an example of maritime spatial data requirements, look no further than the EU Maritime Spatial Planning (MSP) Directive, published in August 2014. The directive requires EU member states to use the 'best available data', including environmental, social and economic data and 'marine physical data about marine waters', considering data and services policies such as those set out in the pan-European SDI INSPIRE Directive.

Article 8 of the MSP Directive states that spatial plans 'shall take into consideration relevant interactions of activities and uses'. These include: aquaculture and fishing areas; installations and infrastructure for the exploration, exploitation and extraction of oil, gas and other energy resources, minerals and aggregates; production of renewable energy; maritime transport routes and traffic flows; military training areas; nature and species conservation sites and protected areas; raw material extraction areas; submarine cable and pipeline routes; scientific research; tourism and underwater cultural heritage.

This list shows that many different types of spatial and non-spatial data must be collected and shared across numerous agencies at different levels of government (local to national) operating in often quite different sectors and areas of responsibility, including legal mandates. This is especially true where spatial planning at the coastline is concerned. This is a complex physical environment where land-based activities and uses meet those of the near-shore marine community, creating a complex 'information territory' for spatial planners.

Significant challenges exist regarding coastal spatial datasets, which typically span multiple SDI data themes, both terrestrial and marine in nature, collected and managed by different organisations, including in some cases the private sector. Regarding coastal data, cross-border issues are especially relevant since water related data themes in marine and coastal environments do not respect national borders.

## Role of hydrographic offices

Historically, much of the data collected by national hydrographic offices (HOs) was discarded if it was not directly relevant to their legal mandate

of ensuring safe navigation in their territorial waters. Underpinning data, such as bathymetry, is required by Chapter V of the International Convention for the Safety of Life at Sea (SOLAS), which identifies certain navigation safety services to be provided by contracting governments.

One of the reasons for this waste of data was lack of standards across the hydrographic community for collecting, managing and disseminating such data. The main standard for navigational charts was the International Hydrographic Organization (IHO) S-57 standard, which focused on information directly relevant to safe navigation of ships at sea and in coastal waters.

IHO Publication C-17, *Spatial Data Infrastructures – The Marine Dimension – Guidance for Hydrographic Offices*, recognises “the need for greater access and sharing of public data; open data initiatives; the development of new and potentially disruptive technologies and the advent of the power of ‘place’ driven by the expectations of users viewing, analysing and using spatial data.”

Since 2013, the GSDI Association has participated in the IHO marine SDI working group (MSDWG), while IHO is promulgating a new series of marine information standards – S-100 (based on ISO 19xxx standards). The S-100 series is intended to aid HOs in making much better use of the large volumes of marine information they collect as part of their safe navigation mandates across the globe.

The 2018-2020 workplan agreed by the IHO MSDIWG at their meeting in Vancouver, Canada, in February this year includes:

- Implementing an MSDI maturity assessment process to enable consistent reporting of how Marine SDIs are being developed and implemented
- Identifying definitions, appropriate and relevant standards and components for MSDI
- Developing guidelines on MSDI implementation and case studies
- Creating an agreed implementation ‘roadmap’ template for MSDI at national and/or regional level
- Identifying core MSDI data to support multiple applications, including wider user requirements for bathymetry data
- Developing MSDI data policy statements, a governance model and a conceptual architecture
- Identifying relevant standards to support MSDI implementation and operation while assessing suitability and shortcomings of current standards for data interoperability
- Developing and maintaining training syllabi and delivery of e-learning platforms.

### The OGC marine domain working group

In May last year, the Open Geospatial Consortium (OGC) formed a marine domain working group (MDWG) to address the gap in the OGC baseline with regards to marine geospatial data and to ensure knowledge is exchanged effectively between the relevant standards organisations, the OGC membership and the broader geospatial community. The MDWG is currently investigating land and sea integration, wider use of marine data and related standards and current Marine SDI initiatives, and works closely with the IHO’s MSDIWG.

### GSDI marine best practice project

In November 2015, GSDI launched the Marine/Coastal SDI Best Practice Project, which will run until October. One of the goals of the project is to examine the challenges faced by national mapping and cadastral agencies (NMCAs) and HOs in working together to provide underpinning spatial data to aid governments in implementing marine spatial planning programmes and decision-making in both the maritime and coastal environments. The project is examining:

- The use of marine and coastal data and services across multiple sectors, and benchmark assessments of those services
- Frameworks for marine and coastal geographic data, services and infrastructures, and governance structures enabling effective use
- Challenges and solutions in building capacity
- Building a repository of good practice.



The project was strengthened with additional funding from EuroSDR that will run until next year, with a strong focus on the ‘land-sea interaction’ aspect of marine/coastal data. Two ‘best practice’ webinars were held in November and March, and further webinars will focus on the land-sea interface, cross-sector/cross-agency governance and data policy issues and marine cadastre.

### Conclusion

In the past, there have been few marine and coastal SDI developments across the globe. Recent recognition by international organisations, including the UN, GEO and OECD, of the socioeconomic value of our global marine assets is driving a new agenda that will see more rapid development of the marine and coastal components of both national and global SDIs. Standards for data harmonisation and interoperability are at the heart of these initiatives, as with all SDI developments. Global organisations such as the IHO, OGC and GSDI are taking up that challenge.

## HISTORICALLY, MUCH OF THE DATA COLLECTED BY NATIONAL HYDROGRAPHIC OFFICES WAS DISCARDED

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