# OPEN GEOSPATIAL CONSORTIUM (OGC)

## Proposed Partnership with

# INTERNATIONAL HYDROGRAPHIC ORGANIZATION (IHO)
# Member States

## OGC – IHO Federated Marine SDI Demonstration Pilot: FMSDI

## Land/Sea Interface

## Call for Support



*Ocean Data Information and Services, - France*

# Introduction

The development and implementation of a successful Marine Spatial Data Infrastructure (MSDI) is critical to enable a broad range of significant societal benefits. Data and information on the condition and variability of the marine environment are crucial for understanding changes that result from human activity, including the effects of human-induced climate change. Large quantities of this data are collected and stored globally for a wide variety of purposes and by diverse groups of both public and private entities; however, the following questions continue to be asked by end-users and stakeholders of the MSDI:

- *Can it be Found?* Can an individual or organization find the data and information they are looking for?
- *Can it be Accessed?* - Once discovered, can the data be accessed or retrieved? Are there ways to easily access the data?
- *Can it be Used?* The data is accessible, but is it in a format that can be used and what are the permissions and licensing terms and conditions?
- *Can it be Shared Outside an Organisation?* The data is available, but can it be shared across organizations, countries, and regions, for example, when and if necessary?

These questions have been addressed with varying degrees of success through a wide variety of data-sharing initiatives. These efforts faced common challenges unlocking the full societal and economic potential of the wealth of marine data and observations at local, national, regional and international levels. The landscape remains fragmented and complex, and the need for a better federated, integrated and sustained MSDI remains high.

*As recommended by the successful OGC-IHO MSDI Concept Development Study (CDS), and as evidenced by the success of the OGC-IHO collaboration in the on-going OGC-IHO Maritime Limits and Boundaries pilot, we are seeking support to initiate a full-scale Pilot to demonstrate a multi-country, federated MSDI under a land/sea boundary use case. This Pilot will show how the value of MSDI can unlock data and information for use beyond traditional providers and consumers of hydrographic data, across borders, and across domains inclusive of improved connections between the terrestrial and marine foundational communities.*

## What is the Scenario?

Based on the recommendations from the OGC-IHO MSDI CDS, the Pilot will include one or more land/sea Interface scenarios, *potentially focussed on the Arctic, European Coastal Waters, and South East Asia.* A land/sea boundary/interface scenario would exercise an MSDI for multiple scenarios including, for example, coastal zone protection, shoreline management, transboundary Marine Spatial Planning (MSP), Marine Protected Areas (MPAs), Maritime Limits and Boundaries modeling and the creation of multiple domain coastal zone data based on the categories identified in the MSDI CDS.

*Appendix A* contains the general description of the scenario as extracted from the MSDI CDS. Details of the specific requirements, test site locations, and other requirements will be determined by the sponsoring organizations of the Pilot.

## Why Support the Pilot?

Improving MSDI globally means contributing to an important and growing international collaborative that *mutually benefits society and the individual sponsoring and participating* organizations. Benefits for sponsoring organizations include:

- Improve discovery and sharing of data within your organization and other related government departments
- Ensure the results of the pilot are fit for purpose for your organization
- Builds on best-of-breed standards and conventions for sponsoring and participating organizations in a highly collaborative environment.
- Experience how automated techniques reduce labor-intensive/manual tasks and increase staff productivity
- Include new, current and historical spatial data assets
- Maximize return on investment by collaborating with other sponsors
- Sponsor an agile, adaptive, well-governed process inclusive of new data sources and technologies
- Support for open standards, policy and improved information sharing with international partners.

## What are the Outcomes?

The proposed joint OGC/ IHO Pilot leads to three main outcomes:

1. **Demonstration -** A practical technology demonstration from global community experts showcasing federated MSDI for the Land/Sea use case. The demonstration

will show how using OGC, IHO and other open standards, enables the community's ability to find, obtain, utilize, share, interoperate and reuse data.

2. **Impact on OGC Standards** - Lessons learned, gaps, and the need for changes to the OGC standards baseline, will be summarized in an Engineering Report which informs the OGC standard program.

3. **Impact on IHO Standards** - Practical testing of relevant S-100 based IHO standards helps accelerate the process for adoption and implementation of IHO standards. The engineering report helps to inform the work of the IHO HSSCs Working Groups and will provide inputs to those groups to enhance the framework and its component standards

## What is the Sponsorship Target?

The rough order of magnitude for sponsorship is *USD 400,000, shared across multiple supporting sponsors. The OGC pilot process accounts for varying sponsor requirements, varying levels of available funding, and is flexible enough to account for different procurement processes and timelines, meaning sponsorship can be staggered*.  The process is also open to the contribution of high-value data to the pilot.  Sponsorship funds are used to provide offset funding to participants, who are required to contribute significant in-kind resources.

## When Would the Pilot Start?

The current plan is for the kick-off of the pilot in the fourth quarter of 2020, with the full Pilot being completed in 2021, subject to change based on sponsor requirements.

## Who do I Contact for More Information?

For more information or to confirm your organization's preliminary interest in sponsorship please contact Trevor Taylor  ( ttaylor@ogc.org) or Scott Simmons (ssimmons@ogc.org ) of OGC.

# Appendix A

## Except: The MSDI Concept Development Study - Land/Sea Boundary Use Case

*Important note: The information below is not intended as the definitive use case(s) for the proposed pilot, but to provide ideas collected through the Study. Final selection of scenarios, use cases and demonstration sites for the pilot will be determined by the sponsors.*

The Marine Spatial Data Infrastructure Concept Development Study (MSDI-CDS) has been completed and was organized by the Open Geospatial Consortium (OGC), and supported by the National Geospatial-Intelligence Agency on behalf of the IHO.

The OGC MSDI-CDS assessed the current state of data management and exchange technologies used in the marine domain. The knowledge gained from the MSDI-CDS was captured in this technical report and provides both an interoperability reference architecture for MSDI and the foundation for a future pilot that in turn would advance the state of Spatial Data Infrastructures (SDIs) that support discoverability, accessibility, and interoperability of marine geospatial data across the globe. The purpose of the Concept Development Study and its workshops was to bring together the marine and broader geospatial standards community to guide future OGC Innovation Program partnership with the following activities:

- Engage executive-level participants to understand the most important challenges
- Engage different marine geospatial data stakeholders (i.e. data providers, developers, and users)
- Help participants better understand activities occurring at OGC, the International Hydrographic Organization (IHO) and other key organizations
- Engage operational and technical stakeholders to gather and share information on the current and future state for using marine geospatial data and services, including:
  o Understand what data, applications, tools, and services are currently available;
  o Understand what data, applications, tools, and services stakeholders need;
  o Understanding discoverability, accessibility, and usability challenges;
  o Understand interoperability challenges and integration opportunities;
  o Identify gaps in data, applications, tools, and services

**Land / Sea Boundary Scenario**

A land/sea boundary scenario would exercise an MSDI for coastal protection and shoreline management. In this context, coastal protection would include protection of land and property from erosion or encroachment by the sea, and sea/tidal defense in estuaries (prevention of temporary flooding events overland). Shoreline management would be a long term, strategic approach to managing risk from land instability, coastal erosion, and tidal flooding.

The last two decades have seen a significant increase in coastal hazards such as storms, tsunamis, typhoons, flooding, and their impact is more serious now than it would have been 50 years ago, not only because the events are bigger than before, but also because more people are living in the coastal zones. According to the United Nations, about 40% of the world's population lives within 100 kilometers of a coast.

According to the Intergovernmental Panel on Climate Change (IPCC), over the 1901-2010 period, the global mean sea level rose by approximately 19 cm (7.5 inches). The rate of sea-level rise since the mid-19th century has been larger than the mean rate during the previous two millennia. These factors have increased the importance of coastal protection and shoreline management for many nations.

For this scenario, an MSDI will be exercised to aid the development of a shoreline management plan and coastal protection and mitigation. The following list provides a sample of MSDI data that would possibly be required for this scenario.

- Maritime Limits and Boundaries
- Bathymetry Data (Crowdsourced, Multibeam, Single-beam, Etc.)
- Historic Marine Environment Data
- Coastline Data
- Continental Shelf Boundary
- Digital Elevation Models
- Seafloor and Water Column Backscatter Data
- Marine Meteorological Data
- Ocean Current Data
- Sea State Observation Data
- Sea State Forecast Data
- Sea Level Data
- Tide Forecast Data
- Marine Ecosystems
- Fisheries Data
- Geographical Regions (Marine Names / Gazetteer)
- Aids to Navigation
- Pipelines
- Ports and Harbour Facilities
- Shoreline Constructions (e.g., Tide Gauges, Jetties)

*A specific nation or region has not been identified and would be determined during the full pilot definition stage, based on sponsor requirements. However, suggested regions would be The Arctic, Europe or South East, Asia*

**Other Scenario Aspects**

Several aspects are independent of a specific Marine SDI scenario. These include:

- Issues caused by cross-boundary events, e.g., a stranded cruise ship in the Arctic near an international border, such as between the United States and Canada or the effects of sea-level rise as described in the land/sea boundary scenario. This requires bringing together a wide variety of disparate data and cross border interoperability.
- The reality of dealing with low to no Internet bandwidth in some areas. This aspect, that was mentioned several times by respondents, should be addressed in at least one pilot implementation scenario.
- A Marine SDI scenario should include at least one use-case involving both public and private sector entities sharing a diverse array of marine data.
- The scenario should focus on integrating multiple types of data (coverages, imagery, vector, sensor feeds) over a large scale to fully appreciate the value of a unified map service with shared semantics and a shared tiling approach.
- Crowdsourcing marine data through Mobile applications that provide real-time geolocated visual or other sensor data should be investigated.
- Specific scenarios or use cases for future pilots will be selected by the Sponsors during the Pilot Collaboration Phase for each of the pilots. The scenarios or use cases may be chosen from the previous topics described in this report or developed independently by the participants. The Sponsors will decide what possible Marine SDI issues or shortcomings they wish to address during the pilot.