Agenda Item 07E

MSDIWG

Report to IRCC14

Denpasar - Bali, Indonesia + VTC (Hybrid Meeting)

6 – 8 June 2022

By Jens Peter Weiss Hartmann

MSDIWG Chair

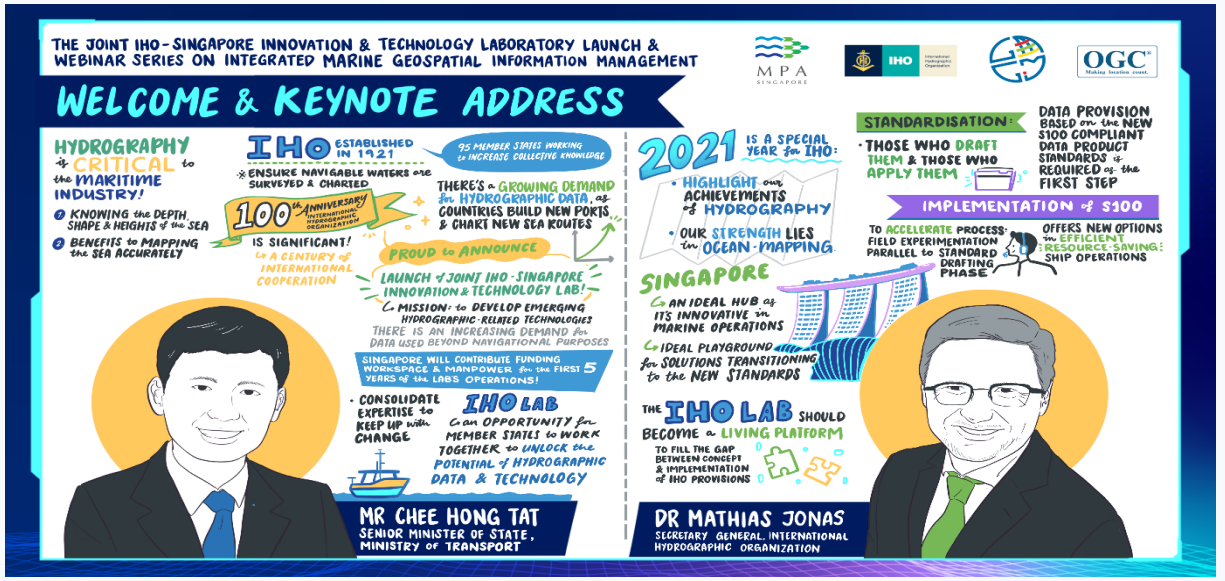
Meetings Held During Reporting Period

The thirteenth meeting of the Marine Spatial Data Infrastructure Working Group of the International Hydrographic Organization took place on the 9 th and 13th May 2022 in Singapore.

The meeting was arranged by MPA Singapore as a hybrid meeting.
The MSDIWG 13 meeting was arranged as a joint meeting together with the Marine Domain Working Group (MDWG) of the Open Geospatial Consortium (OGC) and the UN-GGIM Working Group on Marine Geospatial Information (WG-MGI).

The International Seminar on United Nations Global Geospatial Information Management

Joint Webinar Series on Integrated Marine Geospatial Information Management 26 – 29 October 2021



FAIR principles.

The FAIR Data Principles (**Findable, Accessible, Interoperable, Re-usable**) are used widely in the geospatial community, promoting and supporting knowledge discovery and innovation as well as data and knowledge integration, and sharing and reuse of data.

The FAIR principles do not strictly define how to achieve a state of "FAIRness". Rather they describe a continuum of features, attributes, and behaviours that will move a digital resource closer to that goal.

The principles help data and metadata to be 'machine readable', supporting new discoveries through the harvest and analysis of multiple datasets.

In order to have a Hydrographic Offices approach to the FAIR Data Principles the MSDIWG has now included the FAIR principles in the MSDIWG work and intends to provide recommendations to IRCC 15 on how IHO MS can use the FAIR principles in their work with their national and regional MSDI and a HO MSDI FAIR principles check list
The OGC MDW is included in this work.

Digital Twins.

The concept of Digital Twins is now widely used and in the marine community, the concept of Digital Twin of the Ocean or Digital Twin of the Sea are now under development.

"A digital twin is a virtual representation of an object or system that spans its lifecycle, is updated from real-time data, and uses simulation, machine learning and reasoning to help decision-making."

A digital twin should be seen as a digital replica of a living or non-living physical entity. By combining the physical and the virtual world, data is provided enabling the virtual entity to exist at the same time with the physical entity.

As seen from a MSDIWG perspective a MSDI could be an important component in a Digital Twin of the Ocean or Digital Twin of the Sea allowing users to simulate and learn from it and apply these learnings to the actual assets or objects.

In order to have a Hydrographic Office approach to the Maritime Digital Twins the MSDIWG has now included the Maritime Digital Twins in the MSDIWG work and intends to provide recommendations to IRCC 15 on how MSDI and HOs can be part of Digital Twins in the future.

Updating/modifying the IHO publication C-17

Taking the development of UN-GGIM, Integrated Geospatial Information Framework (IGIF) and in consideration, it is important that there is better alignment and integration with IGIF and IGIF-H as this will ensure a uniform approach to data management between land and sea.

As a consequence, the MSDIWG has now initiated a process for updating/modifying the IHO publication C-17 in response to the two IGIF initiatives and the MSDIWG has established a drafting PT.

The focus of a new version of C-17 will be on how Hydrographic Offices can act in response to IGIF and IGIF Hydro and the broader global perspective and will focus on some of the working issues, like data consistency, data quality, multiple-use best practices, business models, the FAIR principles, maritime digital twins etc. leaving IGIF and IGIF-H to define broader use cases.

S-100 initiatives from a MSDI perspective

A summary of suggested initiatives, with relation to S-100 from a MSDI perspective is:

1. Investigate, in discussion with the S-100WG and IHO Registry Manager whether a proposal for an MSDI domain in the registry is required
2. Assess the potential for MSDI-specific products using S-100 addressing key use cases
3. Prepare, through stakeholder input, proposals for revision of C-17 in respect of S-100 implementation.

If S-100 is better addressed by the MSDI community then IHO C-17 could include specific guidance in respect of S-100, specifically:

1. Using C-17 as a "Meta-Standard", guiding implementers showing how S-100 data can be defined, re-used and made interoperable with external data frameworks.
2. Detailing specific use cases addressed by future MSDI product specifications within the S-100 framework
3. Defining better the relationships between the IGIF/IGIF-W and MSDI communities.

Joint OGC/ IHO Pilots

The goal of the joint OGC/ IHO Pilots is to show the value of interoperability and to demonstrate the benefits of standards through pilot(s) and demonstrations. This is done by piloting a recommended SDI architecture to support a Marine SDI and developing demonstrations. The pilots will allow MSDIWG members to access the results from the MSDI-CDS and assist members who are interested in supporting a MSDI follow-on Pilot initiative.

The IHO-OGC Federated MSDI Pilot (Phase 1 and 2)

Built on multi- stakeholder IHO-OGC MSDI Concept Development study

Demonstrate aspects of multi-country/region, Federated Marine Spatial Data Infrastructure (SDI) to:

- Delivery - Demonstrate simple, secure access using Modern Standards-based approaches (OGC APIs, IHO S-122)
- Examine S-122 data availability, and what appropriate governance considerations should be taken
- Explore how to incorporate additional domain data (land content standards, meteorological, oceanography, etc.)
- Information Framework (IGIF) to develop a roadmap for MSDI maturity

The IHO-OGC Federated MSDI Pilot Arctic (Phase 3)

Phase 4. Building on progress to date – what should the focus be?

- Climate Change, Disasters, Environment, Open Science. Potential Themes
  Sea level Rise, Coastal Erosion, Species tracking, Continued Cross Boundary / Domain sharing (e.g. Arctic)
- Related Technology and Standards
  Discrete Global Grid, 3D Visualisation and Data Management, Simulation and Modelling, Cloud Native

Strategic Performance Indicators

The MSDIWG members agreed to recommend to IRCC14 that the IHO MSDI portal should serve as a focal point for access to datasets with a global theme. The implementation of a portal should be divided in 2 steps.

Step 1.

- Establishing a basis portal solution building on the already existing INToGIS solution and already available data.
- This can be global metadata on hydrographic product services and assisting global datasets relevant for the conduct of hydrographic activities in support of the three Strategic Goals.
- The technical solution should be to set up a portal of portals.
- The content should be maintained either by the IHO Secretariat and/or IHO subordinate bodies, collaborating entities like RENCS which provide datasets with a global theme or composed out of the respective contributions by Member States.
- This suggestion will require a minimum of resources and can relatively easily be implemented by the IHO Secretariat.

Step 2.

- To establish an IHO marine data hub network following the same principles as e.g. the established UN-GGIM SDG data hub network.
- The idea with the Marine hub will be to have a user driven approach where the IHO MS will be able to update the hub with relevant information and data.
- In order to take a decision about implementing step 2 there is a need to evaluate on how to proceed with step 2 and to investigate the different possibilities and challenges and resources needed.

The MSDIWG suggest that the MSDIWG should be tasked to investigate the different possibilities, challenges and resources need for step 2 in order to have the information needed to take a decision about implementing step 2 and to present the recommendations at IRCC 15 in 2023.

Strategic Performance Indicators II

Draft questionnaire

A draft questionnaire has been developed by the MSDIWG. The purpose of the questionnaire is to identify the relevant information and datasets with a global theme to be hosted under the future basic IHO portal.

The expected uptake of S-100 products should make the portal solution attractive as the authoritative source to inform about the ongoing test phase and later the status of global production of such datasets.

Therefore, the questionnaire is designed to get an initial impression of the ongoing activities and use cases and for the planned regular provision of such services. There is a split between those S-100 products which have been assigned to the two different IHO priorities and others which do not belong to the S-1xx domain, such as S-2xx and S-4xx.

The use of a questionnaire will be in accordance with the ISO 9001 Quality management principles. 1. Customer-focus. Customer-focus is a crucial principle of quality management. Customer-focused companies are committed to meeting their customers' needs and providing them with high levels of customer service.

The MSDIWG suggest that the draft questionnaire should be forwarded to the IHO Secretariat and if deemed appropriate, to send it out to the IHO MS

Action Required of IRCC

The IRCC is invited to:

a. note the report

b. appoint RHC MSDI ambassadors and inform the MSDIWG with contact details

c. take note of the proposed initiative's and give guidance on way ahead

- MSDIWG to provide recommendations to IRCC 15 on how IHO MS can use the FAIR principles and establish a HO MSDI FAIR principles check list
- MSDIWG to provide recommendations to IRCC 15 on how MSDI and HOs can be part of Digital Twins in the future
- Updating/modifying the IHO publication C-17
- S-100 initiatives from a MSDI perspective
- Strategic Performance Indicators:
  - Step 1. Establishing a basis portal solution building on the already existing INToGIS solution and already available data.
  - Step 2. The MSDIWG should be tasked to investigate the different possibilities, challenges and resources need for step 2 in order to have the information needed to take a decision about implementing step 2 and to present the recommendations at IRCC 15 in 2023
  - The draft questionnaire to be forwarded to the IHO Secretariat and if deemed appropriate, to send it out to the IHO MS

d. discuss any item with relevance to SDI/MSDI/MSP and to take appropriate actions